Facility: V.C. SUMMER (UNIT 1) Date of Exam: MAY 2015

Tier	Group	RO K/A Category Points K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	SRO-Only Points A2	G*	Total
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A		3	18	3	3	6
	2	1	1	2	N/A			2	2	N/A		1	9	2	2	4
	Tier Totals	4	4	5	N/A			4	5	N/A		4	27	5	5	10
2. Plant Systems	1	3	2	3	3	2	3	2	2	2	3	3	28	3	2	5
	2	1	1	1	1	1	1	1	1	1	1	0	10	1 / 1	1	3
	Tier Totals	4	3	4	4	3	4	3	3	3	4	3	38	5	3	8

3. Generic Knowledge and Abilities Categories	RO 1	RO 2	RO 3	RO 4	RO Total	SRO 1	SRO 2	SRO 3	SRO 4	SRO Total
	3	2	2	3	10	2	2	1	2	7

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
1	007EK2.02	Reactor Trip - Stabilization - Recovery / 1	2.6	2.8		✓										Breakers, relays and disconnects
2	008AA2.06	Pressurizer Vapor Space Accident / 3	3.3	3.6								✓				PORV logic control under low-pressure conditions
3	009EK1.01	Small Break LOCA / 3	4.2	4.7	✓											Natural circulation and cooling, including reflux boiling
4	011EG2.4.6	Large Break LOCA / 3	3.7	4.7											✓	Knowledge symptom based EOP mitigation strategies.
1	015AK2.07	RCP Malfunctions / 4	2.9	2.9		✓										RCP seals
1	022AA1.09	Loss of Rx Coolant Makeup / 2	3.2	3.3							✓					RCP seal flows, temperatures, pressures and vibrations
3	025AG2.2.39	Loss of RHR System / 4	3.9	4.5											✓	Knowledge of less than one hour technical specification action statements for systems.
4	026AA2.06	Loss of Component Cooling Water / 8	2.8	3.1								✓				The length of time after the loss of CCW flow to a component before that component may be damaged
2	027AG2.1.31	Pressurizer Pressure Control System Malfunction / 3	4.6	4.3											✓	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.
2	029EK1.01	ATWS / 1	2.8	3.1	✓											Reactor nucleonics and thermo-hydraulics behavior
3	038EA1.14	Steam Gen. Tube Rupture / 3	4.1	3.9							✓					AFW pump control and flow indicators

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
3	040AK3.04	Steam Line Rupture - Excessive Heat Transfer / 4	4.5	4.7	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Actions contained in EOPs for steam line rupture
4	055EK1.02	Station Blackout / 6	4.1	4.4	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Natural circulation cooling
2	057AK3.01	Loss of Vital AC Inst. Bus / 6	4.1	4.4	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Actions contained in EOP for loss of vital ac electrical instrument bus
1	058AA2.01	Loss of DC Power / 6	3.7	4.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	That a loss of dc power has occurred; verification that substitute power sources have come on line
4	077AA1.01	Generator Voltage and Electric Grid Disturbances / 6	3.6	3.7	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Grid frequency and voltage
1	WE05EK2.1	Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	3.7	3.9	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Components and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes and automatic and manual features.
2	WE11EK3.1	Loss of Emergency Coolant Recirc. / 4	3.3	3.9	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure and reactivity changes and operating limitations and reasons for these operating characteristics.

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
3	005AK1.05	Inoperable/Stuck Control Rod / 1	3.3	4.1	✓											Calculation of minimum shutdown margin
4	028AG2.4.31	Pressurizer Level Malfunction / 2	4.2	4.1											✓	Knowledge of annunciators alarms, indications or response procedures
1	036AK3.03	Fuel Handling Accident / 8	3.7	4.1			✓									Guidance contained in EOP for fuel handling incident
2	051AA2.02	Loss of Condenser Vacuum / 4	3.9	4.1								✓				Conditions requiring reactor and/or turbine trip
3	068AK3.13	Control Room Evac. / 8	3.3	3.9			✓									Performing a shutdown margin calculation, including boron needed and boration time
4	074EA1.19	Inad. Core Cooling / 4	3.7	3.8							✓					AFW supply tank level indicators
1	076AA2.03	High Reactor Coolant Activity / 9	2.5	3								✓				RCS radioactivity level meter
2	WE03EK2.2	LOCA Cooldown - Depress. / 4	3.7	4.0		✓										Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems and relations between the proper operation of these systems to the operation of the facility.
3	WE08EA1.1	RCS Overcooling - PTS / 4	3.8	3.8							✓					Components and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes and automatic and manual features.

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
1	003K6.02	Reactor Coolant Pump	2.7	3.1	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	RCP seals and seal water supply
4	004G2.2.22	Chemical and Volume Control	4.0	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of limiting conditions for operations and safety limits.
4	004K6.07	Chemical and Volume Control	2.7	2.8	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Heat exchangers and condensers
3	005K5.01	Residual Heat Removal	2.6	2.9	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Nil ductility transition temperature (brittle fracture)
1	006A4.10	Emergency Core Cooling	3.8	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	Safety parameter display system
1	006K6.10	Emergency Core Cooling	2.6	2.8	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Valves
4	007K5.02	Pressurizer Relief/Quench Tank	3.1	3.4	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Method of forming a steam bubble in the PZR
3	008K3.01	Component Cooling Water	3.4	3.5	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Loads cooled by CCWS
2	010A4.03	Pressurizer Pressure Control	4.0	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	PORV and block valves
4	012A2.07	Reactor Protection	3.2	3.7	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Loss of dc control power
2	013K2.01	Engineered Safety Features Actuation	3.6	3.8	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	ESFAS/safeguards equipment control

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
2	022A2.03	Containment Cooling	2.6	3.0								✔				Fan motor thermal overload/high-speed operation
2	022A4.01	Containment Cooling	3.6	3.6										✔		CCS fans
1	026K1.01	Containment Spray	4.2	4.2	✔											ECCS
1	026K3.02	Containment Spray	4.2	4.3			✔									Recirculation spray system
3	039K4.02	Main and Reheat Steam	3.1	3.2				✔								Utilization of T-ave. program control when steam dumping through atmospheric relief/dump valves, including T-ave. limits
2	059A1.07	Main Feedwater	2.5	2.6							✔					Feed Pump speed, including normal control speed for ICS
2	059K3.02	Main Feedwater	3.6	3.7			✔									AFW system
3	061K1.03	Auxiliary/Emergency Feedwater	3.5	3.9	✔											Main steam system
3	061K4.08	Auxiliary/Emergency Feedwater	2.7	2.9				✔								AFW recirculation
4	062A1.01	AC Electrical Distribution	3.4	3.8							✔					Significance of D/G load limits
1	063A3.01	DC Electrical Distribution	2.7	3.1									✔			Meters, annunciators, dials, recorders and indicating lights

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
1	063G2.1.32	DC Electrical Distribution	3.8	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to explain and apply all system limits and precautions.
4	064G2.4.50	Emergency Diesel Generator	4.2	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.
3	073K4.01	Process Radiation Monitoring	4.0	4.3	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Release termination when radiation exceeds setpoint
2	076K2.08	Service Water	3.1	3.3	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	ESF-actuated MOVs
4	078K1.05	Instrument Air	3.4	3.5	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	MSIV air
3	103A3.01	Containment	3.9	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Containment isolation

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
4	001K1.01	Control Rod Drive	3.0	3.2	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	CCW
1	002K6.04	Reactor Coolant	2.5	2.9	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	RCS vent valves
2	015K3.01	Nuclear Instrumentation	3.9	4.3	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	RPS
3	016K5.01	Non-nuclear Instrumentation	2.7	2.8	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Separation of control and protection circuits
2	033A3.02	Spent Fuel Pool Cooling	2.9	3.1	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Spent fuel leak or rupture
4	034K4.02	Fuel Handling Equipment	2.5	3.3	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Fuel movement
3	072A4.01	Area Radiation Monitoring	3.0	3.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	Alarm and interlock setpoint checks and adjustments
1	075K2.03	Circulating Water	2.6	2.7	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Emergency/essential SWS pumps
4	079A2.01	Station Air	2.9	3.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Cross-connection with IAS
1	086A1.01	Fire Protection	2.9	3.3	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Fire header pressure

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
2	G2.1.29	Conduct of operations	4.1	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.
3	G2.1.42	Conduct of operations	2.5	3.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of new and spent fuel movement procedures
4	G2.1.5	Conduct of operations	2.9	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to locate and use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.
1	G2.2.1	Equipment Control	4.5	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.
2	G2.2.13	Equipment Control	4.1	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of tagging and clearance procedures.
3	G2.3.14	Radiation Control	3.4	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities
4	G2.3.7	Radiation Control	3.5	3.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to comply with radiation work permit requirements during normal or abnormal conditions
1	G2.4.14	Emergency Procedures/Plans	3.8	4.5	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of general guidelines for EOP usage.
2	G2.4.34	Emergency Procedures/Plans	4.2	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects
3	G2.4.43	Emergency Procedures/Plans	3.2	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of emergency communications systems and techniques.

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
2	008AG2.4.18	Pressurizer Vapor Space Accident / 3	3.3	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the specific bases for EOPs.
1	054AA2.03	Loss of Main Feedwater / 4	4.1	4.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Conditions and reasons for AFW pump startup
4	055EG2.1.19	Station Blackout / 6	3.9	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to use plant computer to evaluate system or component status.
1	058AA2.02	Loss of DC Power / 6	3.3	3.6	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	125V dc bus voltage, low/critical low, alarm
4	we04EG2.2.4	LOCA Outside Containment / 3	4.2	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions
1	WE05EA2.1	Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	3.4	4.4	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
3	005AA2.03	Inoperable/Stuck Control Rod / 1	3.5	4.4	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Required actions if more than one rod is stuck or inoperable
2	we03EG2.4.30	LOCA Cooldown - Depress. / 4	2.7	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of events related to system operations/status that must be reported to internal orginizations or outside agencies.
4	we09EG2.4.20	Natural Circ. / 4	3.8	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of operational implications of EOP warnings, cautions and notes.
1	WE14EA2.2	Loss of CTMT Integrity / 5	3.3	3.8	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
3	005G2.2.25	Residual Heat Removal	3.2	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.
3	008A2.07	Component Cooling Water	2.5	2.8	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Consequences of high or low CCW flow rate and tempera- ture; the flow rate at which the CCW standby pump will start
1	026A2.03	Containment Spray	4.1	4.4	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Failure of ESF
4	062G2.1.20	AC Electrical Distribution	4.6	4.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to execute procedure steps.
2	063A2.02	DC Electrical Distribution	2.3	3.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Loss of ventilation during battery charging

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4	011A2.03	Pressurizer Level Control	3.8	3.9	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Loss of PZR level
4	034K6.01	Fuel Handling Equipment	2.1	3.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Fuel handling equipment
3	086G2.4.41	Fire Protection	2.9	4.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the emergency action level thresholds and classifications.

	KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
2	G2.1.23	Conduct of operations	4.3	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to perform specific system and integrated plant procedures during all modes of plant operation.
4	G2.1.35	Conduct of operations	2.2	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the fuel handling responsibilities of SRO's
2	G2.2.23	Equipment Control	3.1	4.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to track Technical Specification limiting conditions for operations.
1	G2.2.37	Equipment Control	3.6	4.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to determine operability and/or availability of safety related equipment
2	G2.3.6	Radiation Control	2.0	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to aprove release permits
3	G2.4.37	Emergency Procedures/Plans	3.0	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the lines of authority during implamentation of an emergency plan.
3	G2.4.38	Emergency Procedures/Plans	2.4	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator.

Facility: VC SUMMER		Date of Examination:	**5/4/2015**
Examination Level (circle one): RO / SRO		Operating Test Number:	**NRC-ILO-13-01**

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations (A1-a)	R,M	**RO/SRO Common** Determine the volume required to be available in the holdup tanks to accommodate dilution of the RCS to the estimated critical boron concentration. K/A: 2.1.25 (RO: 3.9, SRO: 4.2) K/A: 2.1.37 (RO: 4.3, SRO: 4.6)
Conduct of Operations (A1-b)	R,N	**RO/SRO Common** Calculate work hour limitations for a covered worker based on a current schedule and additional activities using SAP-0152. K/A: 2.1.5 (RO: 2.9, SRO: 3.9)
Equipment Control (A2)	R,N	Given a loss of a DC power panel affecting annunciators use AOP-100.5 to determine applicable Surveillance requirements. K/A: 2.2.14 (RO: 3.9, SRO: 4.3)
Radiation Control (A3)	R,D,P	**RO/SRO Common** Calculate the expected dose for two work options in a radiation area with airborne activity and prioritize them according to the VC Summer ALARA philosophy. K/A: 2.3.12 (RO: 3.2, SRO: 3.7)
Emergency Plan (A4)		Not selected for RO.

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

*Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

JPM SUMMARY STATEMENTS

CONDUCT OF OPERATIONS (A1-a): This is modified from a JPM in the bank. The plant will be in Mode 3 pending Reactor start up. A current RCS boron concentration and the estimated critical boron concentration will be provided along with a copy of the Curve Book. The candidate will determine the volume required to be available in the holdup tanks to accommodate dilution of the RCS to the estimated critical boron concentration. This JPM will be modified from JPMs in the bank by changing the current and critical boron concentrations. (NJPA-021A)

K/A 2.1.25 - Ability to interpret reference materials such as graphs, curves, tables, etc. (RO: 3.9, SRO: 4.2)

K/A 2.1.37 - Knowledge of procedures, guidelines, or limitations associated with reactivity management. (RO: 4.3, SRO: 4.6)

VCS Task: O-004-006-01-01: Perform boric acid concentration change calculations.

CONDUCT OF OPERATIONS (A1-b): This is a new JPM. The candidate will be provided with a work hour history for three covered workers and a current work schedule for the individuals. Additional proposed work activities with planned durations will be provided. The additional activities will require inclusion in the work hour calculation. Candidate will calculate work hour limitations based on the current schedule and the added activities using SAP-0152, Fatigue Management and Work Hour Limits based on requirements of OAP-100.6, Control Room Conduct and Control of Shift Activities. (NJPA-1000)

K/A: 2.1.5 – Ability to use procedures related to shift staffing, such as minimum crew compliment, overtime limitations, etc. (RO: 2.9, SRO: 3.9)

VCS Task: O-341-038-03-02: Interpret and ensure compliance with plant administrative procedures during normal and off normal plant operations.

EQUIPMENT CONTROL (A2): This is a new JPM. The candidate will be given a loss of a DC power panel and a copy of AOP-100.5, Loss of Main Control Board Annunciators. The candidate will determine applicable Surveillance requirements for the lost Annunciators using AOP-100.5. (NJPA-1006)

K/A: 2.2.14 – Knowledge of the process for controlling equipment configuration or status. (RO: 3.9, SRO: 4.3)

VCS Task: O-000-170-05-01: Respond to loss of Main Control Board annunciators per AOP-100.5.

RADIATION CONTROL (A3): This is a bank JPM that was used on the 2011 NRC Exam. The candidate will compare two options to conduct work in a high radiation area with airborne activity due to a hydrogen explosion in the waste gas system. The candidate will calculate the expected dose for the two options and prioritize them according to the VC Summer ALARA philosophy. (NJPA-083A(R1))

K/A: 2.3.12 - Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirement, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (RO: 3.2,SRO: 3.7)

VCS Task: O-000-061-05-01: Respond to area radiation monitoring system alarms.

EMERGENCY PLAN (A4): Not selected for RO.

Facility: VC SUMMER		Date of Examination:	**5/4/2015**
Examination Level (circle one): RO/SRO		Operating Test Number:	**NRC-ILO-13-01**

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations (A1-a)	R,M	**RO/SRO Common** Determine the volume required to be available in the holdup tanks to accommodate dilution of the RCS to the estimated critical boron concentration. K/A: 2.1.25 (RO: 3.9, SRO: 4.2) K/A: 2.1.37 (RO: 4.3, SRO: 4.6)
Conduct of Operations (A1-b)	R,N	**RO/SRO Common** Calculate work hour limitations for a covered worker based on a current schedule and additional activities using SAP-0152. K/A: 2.1.5 (RO: 2.9, SRO: 3.9)
Equipment Control (A2)	R,D	Determine administrative actions required for transfer of 7.2Kv bus1DB to alternate feed using SAP-205. K/A: 2.2.14 (RO: 3.9, SRO: 4.3)
Radiation Control (A3)	R,D,P	**RO/SRO Common** Calculate the expected dose for two work options in a radiation area with airborne activity and prioritize them according to the VC Summer ALARA philosophy. K/A: 2.3.12 (RO: 3.2, SRO: 3.7)
Emergency Plan (A4)	S,N	Declare a Site Area Emergency in accordance with EPP-001 and complete the EPP-002 notification form. K/A: 2.4.41 (RO: 2.9 ,SRO: 4.6) K/A: 2.4.40 - (RO: 2.7 ,SRO: 4.5)

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

*Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

JPM SUMMARY STATEMENTS

CONDUCT OF OPERATIONS (A1-a): This is modified from a JPM in the bank. The plant will be in Mode 3 pending Reactor start up. A current RCS boron concentration and the estimated critical boron concentration will be provided along with a copy of the Curve Book. The candidate will determine the volume required to be available in the holdup tanks to accommodate dilution of the RCS to the estimated critical boron concentration. This JPM will be modified from JPMs in the bank by changing the current and critical boron concentrations. (NJPA-021A)

K/A 2.1.25 - Ability to interpret reference materials such as graphs, curves, tables, etc. (RO: 3.9, SRO: 4.2)

K/A 2.1.37 - Knowledge of procedures, guidelines, or limitations associated with reactivity management. (RO: 4.3, SRO: 4.6)

VCS Task: O-004-006-01-01: Perform boric acid concentration change calculations.

CONDUCT OF OPERATIONS (A1-b): This is a new JPM. The candidate will be provided with a work hour history for three covered workers and a current work schedule for the individuals. Additional proposed work activities with planned durations will be provided. The additional activities will require inclusion in the work hour calculation. Candidate will calculate work hour limitations based on the current schedule and the added activities using SAP-0152, Fatigue Management and Work Hour Limits based on requirements of OAP-100.6, Control Room Conduct and Control of Shift Activities. (NJPA-1000)

K/A: 2.1.5 – Ability to use procedures related to shift staffing, such as minimum crew compliment, overtime limitations, etc. (RO: 2.9, SRO: 3.9)

VCS Task: O-341-038-03-02: Interpret and ensure compliance with plant administrative procedures during normal and off normal plant operations.

EQUIPMENT CONTROL (A2): This JPM is direct from the bank. The candidate will determine administrative actions to place 7.2Kv bus 1DB on alternate feed. Candidate will complete SAP-205, Status Control and Removal and Restoration, Attachment 1, Removal and Restoration Checksheet for XSW1DB 16, BUS 1DB NORMAL INCOMING BKR to track all the requirements associated with transferring Bus 1DB to XTF-4/6. It will be critical to indicate that TS 3.8.1.1.a and 3.0.4 do apply. (NJPA-210A)

K/A: 2.2.14 - Knowledge of the process for controlling equipment configuration or status. (RO: 3.9, SRO: 4.3)

VCS Task: O-341-038-03-02: Interpret and ensure compliance with plant administrative procedures during normal and off normal plant operations.

RADIATION CONTROL (A3): This is a bank JPM that was used on the 2011 NRC Exam. The candidate will compare two options to conduct work in a high radiation area with airborne activity due to a hydrogen explosion in the waste gas system. The candidate will calculate the expected dose for the two options and prioritize them according to the VC Summer ALARA philosophy. (NJPA-083A(R1))

K/A: 2.3.12 - Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirement, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (RO: 3.2,SRO: 3.7)

VCS Task: O-000-061-05-02: Respond to area radiation monitoring system alarms.

EMERGENCY PLAN (A4): This is a new JPM. The candidate will declare a Site Area Emergency in accordance with EPP-001, Activation and Implementation of Emergency Plan. The candidate will declare the Site Area Emergency due to an inadequate core cooling event that results in a potential loss of the Fuel Clad Barrier and a loss of the Reactor Coolant System Barrier. The candidate will also be required to complete the EPP-002, Communication and Notification, Attachment I, Nuclear Power Plant Notification Form. This is a time critical JPM. (NJPA-1003)

K/A: 2.4.41 - Knowledge of the emergency action level thresholds and classifications.
(RO: 2.9, SRO: 4.6)

K/A: 2.4.40 - Knowledge of the SRO's responsibilities in emergency plan implementation.
(RO: 2.7, SRO: 4.5)

VCS Task: O-344-019-03-02: Classify Events requiring Emergency Plan Implementation

Facility:	**VC Summer**	Date of Examination:	**5/4/2015**
Exam Level (circle one):	RO / SRO(I) / SRO(U)	Operating Test No.:	**NRC-ILO-13-01**

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

	System / JPM Title	Type Code*	Safety Function
a.	Generic Abnormal Plant Evolution 001 [NJPSF-141A] Continuous Rod Withdrawal. (AOP-403.3, EOP-1.0, E-0)	P,D,A,L,S	1
b.	System 010 [NJPSF-007A] Steam Generator Tube Rupture (Depressurize RCS to < Ruptured S/G pressure). (EOP-4.0, E-3)	M,A,L,S	3
c.	Generic Abnormal Plant Evolution 025 [NJPS-065] Establish hot leg injection during loss of RHR at mid-loop conditions. (AOP-115.5)	D,L,S	4P
d.	System 026 [NJPSF-019A] Manually initiate Reactor Building Spray. (EOP-1.0, E-0)	M,A,L,S,EN	5
e.	System 064 [NJPSF-025A] Start and load "A" Emergency Diesel Generator. (SOP-306)	M,S,A	6
f.	System 016 [NJPS-1000] Respond to Steam Generator Pressure Channel malfunction. (AOP-401.3)	N,S	7
g.	System 033 [NJPS-084] Restore Spent Fuel Pool level during refueling. (AOP-123.1)	D,L,S	8
h.	System 029 [NJPS-1001] Establish Reactor Building Purge Supply and Exhaust. (SOP-114)	N,L,S	9

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

	System / JPM Title	Type Code*	Safety Function
i.	Generic Emergency Plant Evolution 055 [NJPP-402] Locally Dilute the Boric Acid Tanks (EOP-6.0, ECA-0.0)	D,L,E,R	1
j.	Generic Abnormal Plant Evolution 068 [NJPPF-049] Control Room evacuation (duties of BOP operator) (AOP-600.1)	P,D,A,L,E	4S
k.	System 062 [NJPP-040] Transfer a Vital 120 volt Instrument Power Supply (SOP-310)	D	6

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes	Criteria for: RO / SRO-I / SRO-U	RO
(A)lternate path	4-6 / 4-6 / 2-3	5
(C)ontrol room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	6
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	2
(EN)gineered safety feature	NA / NA / ≥ 1(control room system)	
(L)ow-Power	≥ 1 / ≥ 1 / ≥ 1	8
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	5
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	2
(R)CA	≥ 1 / ≥ 1 / ≥ 1	1
(S)imulator		8

VC SUMMER 2015 NRC JPM SUMMARY

a. This is a bank JPM that was previously used on the 2013 License exam. The candidate will respond to continuous rod withdrawal in accordance with AOP-403.3, Continuous Control Rod Motion, and EOP-1.0 (E-0), Reactor Trip/Safety Injection Actuation. The candidate will be told to withdraw rods to criticality (Shutdown Banks will be withdrawn, but Control Banks will be fully inserted). Candidate will withdraw Control Bank A to 10 steps and verify indications that all the Control Bank A rods came off the bottom. On pulling rods so that rods reach 103 steps, rods will continue to withdraw with no operator input. A failure of all automatic trips will make it critical that the candidate trip the reactor. The continuous rod motion is where this JPM becomes alternate path. The critical step will be to pull rods, then to trip the reactor when uncontrolled rod motion occurs prior to reaching the Estimated Critical Position of 100 steps on bank D.

   K/A 001AA1.05: Ability to operate and/or monitor the following as they apply to the Continuous Rod Withdrawal: Reactor Trip switches (RO: 4.3, SRO: 4.2)

   NUREG 1122 APE: Continuous rod withdrawal

   VCS Task: O-000-006-05-01: Respond to Continuous Rod Motion per AOP-403.3/SOP-403.

b. This JPM is modified from a bank JPM. The candidate will take actions to depressurize the RCS to less than the pressure of the ruptured steam generator in accordance with EOP-4.0 (E-3), Steam Generator Tube Rupture. The candidate will attempt to open the only available pressurizer spray valve to depressurize the RCS but the valve will fail to open. This leads to the alternate path for this JPM. In order to accomplish the depressurization, the applicant will have to utilize a Pressurizer PORV. When criteria to stop the depressurization are met the chosen PORV will not shut. The candidate must then close the associate PORV block valve. This JPM is significantly modified from another JPM in the bank by failing the spray valve closed and by the failure of the selected PORV to close when demanded. The critical step is closing the PORV block valve to terminate the RCS depressurization.

K/A 010000A203: Pressurizer Pressure Control System (PZR PCS). Ability to (a) predict the impacts of PORV failures on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: PORV failures. (RO: 4.1, SRO: 4.2)

NUREG 1122 System: Pressurizer Pressure Control System (PZR PCS)

VCS Task: O-000-038-05-01: Respond to Steam Tube Rupture per EOP-4.0.

c. This is a bank JPM. The initial conditions for this JPM have the plant in Mode 5 and RCS at Mid-loop conditions. Due to lowering hot leg level, the crew will have entered AOP-115.1, RHR Pump Vortexing and then AOP-115.5, Loss of RHR with the RCS not Intact (Modes 5 and 6). The candidate will be given the following parameters: RCS hot leg level off scale low, core exit TC temperatures >200°F and increasing and the “A” Charging pump available. The candidate will be directed to implement AOP-115.5 Attachment 2, Establishing Hot Leg Injection as an alternative action from AOP-115.5 step 17. Candidate should manually align hot leg injection, start “A” Charging pump and raise hot leg level. The critical step will be to start “A” Charging pump.

K/A 000025K301: Knowledge of the reasons for the following responses as they apply to the Loss of Residual Heat Removal System: Shift to alternate flow path (RO: 3.1, SRO: 3.4)

NUREG 1122 APE: Loss of Residual Heat Removal System

VCS Task: O-000-083-05-01: Respond to Loss of Residual Heat Removal System While at Mid-loop Conditions per AOP-115.5/SOP-115.

d. This JPM is modified from a bank JPM. The initial conditions for this JPM are a Reactor Trip from 100% power with Safety Injection actuated. Neither train of Reactor Building spray will have auto actuated and RB pressure will be greater than 12.0 psig. The Candidate will be directed to perform Step 8 of EOP-1.0 (E-0), Reactor Trip/Safety Injection Actuation. The Train “A” RB Spray manual actuation will fail to operate. If Train “B” RB Spray is manually actuated then the discharge valve on the “A” RB Spray Pump must also be manually opened. If the Train “B” RB Spray manual actuation is NOT attempted then the candidate must manually align flow paths (Spray and Phase B) and start RB Spray pumps. Candidate will then verify RB Spray flow and ensure that all RCPs are stopped. Manual alignment of the required equipment is where the JPM becomes alternate path. This JPM is significantly modified from another JPM in the bank by requiring the manual positioning of the Train “A” RB spray pump discharge valve. Critical steps will be to manually actuate at least one train of containment spray with >2500 gpm per EOP-1.0 and to secure RCPs to prevent damage to RCP motors due to loss of CCW as evident from Motor Bearing temperature exceeding 195°F or Lower Seal Water Bearing temperature exceeding 225°F or Seal Water Outlet temperature exceeding 235°F.

K/A 026000A4.01 Ability to manually operate and/or monitor in the Control Room: CSS controls (RO: 4.5, SRO: 4.3)

NUREG 1122 System Containment Spray System (CSS)

VCS Task: O-026-005-01-01: Manually Initiate Reactor Building Spray per SOP-116/EOP1.0.

e. This JPM is modified from a bank JPM. The initial conditions for this JPM have the plant operating at 100% power with normal AC power available to all buses. Relay testing will be in progress on 7.2Kv Switchgear bus 1DA and this has necessitated the removal of Bus 1DA from its normal and emergency feed. The "A" D/G is to be started and loaded onto bus 1DA. All pre-start check steps for the “A” DG will have been completed. The candidate will be directed to start and load "A" D/G per SOP-306, Emergency Diesel Generator, Section IV.A, Steps 2.2.j. After starting the Diesel, Annunciator panel 636, 6-3, DG A ENG TEMP TRBL will light due to high lube oil temperature (167°F). Reports of high lube oil temperature (170°F rising, 176°F rising) will be provided to the candidate once the Diesel is started and after the alarm is lit. The Diesel will not trip automatically at 175°F Lube Oil Temperature. Candidate should trip the diesel prior to parallel due to failure of the automatic trip on high Lube Oil temperature. This JPM becomes alternate path upon reaching 175°F Lube Oil temperature with no automatic trip. This JPM is significantly modified from another JPM in the bank by adding the high Lube Oil temperature condition and auto trip failure prior to parallel. The critical step will be to manually trip the Diesel once the auto trip fails and prior to parallel.

K/A 064000A401 Ability to manually operate and/or monitor in the control room: Local and remote operation of the ED/G (RO: 4.0, SRO: 4.3)

K/A 064000A101 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G system controls including: ED/G lube oil temperature and pressure. (RO: 3.0, SRO: 3.1)

NUREG 1122 System Emergency Diesel Generators

VCS Task: O-064-003-01-01: Load the Diesel Generator.

f. This is a new JPM. The initial conditions for this JPM have the plant operating at 100% power. The candidate will be directed to respond to plant conditions. The “B” Steam Generator pressure channel PT-485 will fail high. Since the pressure channel compensates the controlling Steam Flow channel this will cause the Steam Flow signal to fail high for the “B” Feed regulating valve. The FRV will then travel open in auto in response to the failed input. The candidate implements AOP-401.3, Steam Flow – Feedwater Flow Protection Channel Failure and performs immediate actions. The operable Steam Flow and Feed Flow channels will be selected; Turbine load will be reduced 40 – 50 MWe, feed flow and Feedwater Pump speed will be adjusted as necessary. Candidate verifies SG level is within band and returns controls to auto. Candidate will identify the failed channel. The critical step will be to restore Feedwater Flow control to “B” SG before reaching turbine trip criteria on high SG level.

K/A 059000A211 Ability to (a) predict the impacts of the following malfunctions or operations on the MFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure of feedwater control system. (RO: 3.0, SRO: 3.3)

NUREG 1122 System Main Feedwater (MFW) System

VCS Task: O-000-103-05-01: Respond to Excessive Feedwater Increase per AOP-401.3

g. This is a bank JPM. The initial conditions for this JPM have the plant in Mode 6 with core off load in progress. The 'A' RHR loop is in service providing core cooling. Due to decreasing level in the Spent fuel Pool, AOP-123.1, Decreasing Level in the Spent Fuel Pool or Refueling Cavity During Refueling has been entered. The leakage has been isolated in step 8. The candidate will be directed to respond to a decreasing level in the spent fuel pool in accordance with AOP-123.1. The critical steps are aligning RHR pump suction to the RWST and isolating RHR suction from the RCS.

K/A 033000A203 Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Abnormal spent fuel pool water level or loss of water level. (RO: 3.1, SRO: 3.5)

NUREG 1122 System Spent Fuel Pool Cooling System (SFPCS)

VCS Task: O-000-140-05-01: Respond to decreasing Water Level in the Spent Fuel Pool or Refueling Cavity per AOP-123.5/AOP-123.1.

h. This is a new JPM. The initial conditions for this JPM have the plant in Mode 5 preparing for a refueling outage. The equipment hatch is open. The candidate will be directed to place Reactor Building purge in service using SOP-114, Reactor Building Ventilation System. After entering SOP-114 section III.C candidate will proceed with placing both RB Purge exhaust fans in service. Candidate should then start no more than one Purge supply fan to maintain negative pressure on the RB. The critical steps will be to start the exhaust fans and no more than one supply fan to maintain negative pressure on the RB and prevent an unmonitored release.

K/A 029000A201 Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Maintenance or other activity taking place inside containment (RO: 2.9, SRO: 3.6)

NUREG 1122 System Containment Purge System (CPS)

VCS Task: O-088-505-01-04 Perform Line ups of the Reactor Building Ventilation Systems.

i. This is a bank JPM. The initial conditions for this JPM have the plant shutdown and experiencing a Loss of all Offsite and Onsite AC power. Procedure EOP-6.0 (ECA-0.0) Loss of All ESF AC Power has been implemented. Annunciator panel 613, 4-2, "BAT A TEMP HI/LO" is standing (low setpoint 70°F) and local verification has indicated that temperature is 68°F in 'A' BAT room. The candidate will be directed to dilute the “A” BAT using EOP-6.0, Attachment 6, Locally Diluting the Boric Acid Tanks. The candidate will simulate the following actions; connect the drain rig, open the drain isolation valve, drain the BAT to 50%, close the drain and remove the rig. The candidate then simulates flushing a nearby fire hose to a floor drain and simulates connecting the fill rig and use of the fire hose to restore “A” BAT to 90-95%. The critical step will be assuring that desired volume of fire water is added to the BAT and that the drain is isolated.

K/A 000055K302 Knowledge of the reasons for the following responses as they apply to the Station Blackout: Actions Contained in EOP for loss of offsite and onsite power (RO: 4.3, SRO: 4.6)

NUREG 1122 EPE Loss of Offsite and Onsite Power (Station Blackout)

VCS Task: O-000-055-05-01 Respond to loss of offsite and on site ESF power per EOP-6.0/EOP-1.0

j. This is a bank JPM that was last used on the 2011 License exam. The initial conditions for this JPM have the reactor tripped due to the need to evacuate the control room. Evacuation is necessary due to a bomb threat and no equipment will have been tripped from the MCB. Both ESF busses are energized from offsite power. The “A” and “C” RCP will have been tripped. The candidate will be directed to take actions in accordance with AOP-600.1, Control Room Evacuation, Attachment 2 Duties of the BOP Operator. Candidate will simulate locally tripping the Main Feedwater pumps and the “B” Rod Drive MG set. Using a photograph of the inside of a 7.2 Kv breaker the candidate will simulate stopping two Condensate pumps by opening the breakers and three of four Feedwater Booster pumps by opening the breakers. The candidate will NOT trip “B” RCP as “A” and “C” are already off. The alternate path for the RO is that the “A” RCP is tripped and so “B” RCP will have to be left running. The critical step is not tripping the “B” RCP.

K/A 0000682130 Conduct of Operations: Ability to locate and operate components, including local controls (RO: 4.4, SRO: 4.0)

NUREG 1122 APE Control Room Evacuation

VCS Task: 0-000-068-05-01 Perform Control Room Evacuation per AOP-600.1.

k. This is a bank JPM. The initial conditions for this JPM have the plant at 100% power. Vital AC Inverter, XIT-5901 is scheduled for preventive maintenance. The candidate is directed to remove XIT-5901 from service and place Vital AC distribution panel, APN-5901 on its alternate power source in accordance with SOP-310, Engineered Safety Features 120 VAC Instrumentation and Control Power System, Section IV.I. Initial conditions have been completed through step 1.4. Candidate simulate placing the Test Transfer switch to the ALT position and verifies ON Alternate light illuminates and the ON Inverter light goes out. Candidate simulates depressing the Inverter STOP push button and verifies the SYNCH MONITOR light is lit. Simulates placing the MAN Bypass switch to BYP TO ALT position. Simulates opening the Backup Source breaker and the Normal AC Source breakers. The critical step is to place the Test Transfer switch to the ALT position.

K/A 062000A203 Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Consequences of improper sequencing when transferring to or from an inverter. (RO: 2.9, SRO: 3.4)

NUREG 1122 System A.C. Electrical Distribution

VCS Task: O-062-010-01-04 Remove Engineering Safety Features Vital Inverter from Service.

Facility:	**VC Summer**	Date of Examination:	**5/4/2015**
Exam Level (circle one):	RO / SRO(I) / SRO(U)	Operating Test No.:	**NRC-ILO-13-01**

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)			
System / JPM Title		Type Code*	Safety Function
a.	Not selected for SRO-U		
b.	System 010 [NJPSF-007A] Steam Generator Tube Rupture (Depressurize RCS to < Ruptured S/G pressure). (EOP-4.0, E-3)	M,A,L,S	3
c.	Not selected for SRO-U		
d.	System 026 [NJPSF-019A] Manually initiate Reactor Building Spray. (EOP-1.0, E-0)	M,A,L,S,EN	5
e.	Not selected for SRO-U		
f.	Not selected for SRO-U		
g.	Not selected for SRO-U		
h.	Not selected for SRO-U		
In-Plant Systems @ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
i.	Generic Emergency Plant Evolution 055 [NJPP-402] Locally Dilute the Boric Acid Tanks (EOP-6.0, ECA-0.0)	D,L,E,R	1
j.	Generic Abnormal Plant Evolution 068 [NJPPF-049] Control Room evacuation (duties of BOP operator) (AOP-600.1)	P,D,A,L,E	4S
k.	System 062 [NJPP-040] Transfer a Vital 120 volt Instrument Power Supply (SOP-310)	D	6

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes	Criteria for: RO / SRO-I / SRO-U	SRO - U
(A)lternate path	4-6 / 4-6 / 2-3	3
(C)ontrol room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	3
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	2
(EN)gineered safety feature	NA / NA / ≥ 1(control room system)	1
(L)ow-Power	≥ 1 / ≥ 1 / ≥ 1	4
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	2
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	1
(R)CA	≥ 1 / ≥ 1 / ≥ 1	1
(S)imulator		2

VC SUMMER 2015 NRC JPM SUMMARY

a. Not selected for SRO-U

b. This JPM is modified from a bank JPM. The candidate will take actions to depressurize the RCS to less than the pressure of the ruptured steam generator in accordance with EOP-4.0 (E-3), Steam Generator Tube Rupture. The candidate will attempt to open the only available pressurizer spray valve to depressurize the RCS but the valve will fail to open. This leads to the alternate path for this JPM. In order to accomplish the depressurization, the applicant will have to utilize a Pressurizer PORV. When criteria to stop the depressurization are met the chosen PORV will not shut. The candidate must then close the associate PORV block valve. This JPM is significantly modified from another JPM in the bank by failing the spray valve closed and by the failure of the selected PORV to close when demanded. The critical step is closing the PORV block valve to terminate the RCS depressurization.

   K/A 010000A203: Pressurizer Pressure Control System (PZR PCS). Ability to (a) predict the impacts of PORV failures on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: PORV failures. (RO: 4.1, SRO: 4.2)

   NUREG 1122 System: Pressurizer Pressure Control System (PZR PCS)

   VCS Task: O-000-038-05-01: Respond to Steam Tube Rupture per EOP-4.0.

c. Not selected for SRO-U

d. This JPM is modified from a bank JPM. The initial conditions for this JPM are a Reactor Trip from 100% power with Safety Injection actuated. Neither train of Reactor Building spray will have auto actuated and RB pressure will be greater than 12.0 psig. The Candidate will be directed to perform Step 8 of EOP-1.0 (E-0), Reactor Trip/Safety Injection Actuation. The Train “A” RB Spray manual actuation will fail to operate. If Train “B” RB Spray is manually actuated then the discharge valve on the “A” RB Spray Pump must also be manually opened. If the Train “B” RB Spray manual actuation is NOT attempted then the candidate must manually align flow paths (Spray and Phase B) and start RB Spray pumps. Candidate will then verify RB Spray flow and ensure that all RCPs are stopped. Manual alignment of the required equipment is where the JPM becomes alternate path. This JPM is significantly modified from another JPM in the bank by requiring the manual positioning of the Train “A” RB spray pump discharge valve. Critical steps will be to manually actuate at least one train of containment spray with >2500 gpm per EOP-1.0 and to secure RCPs to prevent damage to RCP motors due to loss of CCW as evident from Motor Bearing temperature exceeding 195°F or Lower Seal Water Bearing temperature exceeding 225°F or Seal Water Outlet temperature exceeding 235°F.

K/A 026000A4.01 Ability to manually operate and/or monitor in the Control Room: CSS controls (RO: 4.5, SRO: 4.3)

NUREG 1122 System Containment Spray System (CSS)

VCS Task: O-026-005-01-01: Manually Initiate Reactor Building Spray per SOP-116/EOP1.0.

e. Not selected for SRO-U

f. Not selected for SRO-U

g. Not selected for SRO-U

h. Not selected for SRO-U

i. This is a bank JPM. The initial conditions for this JPM have the plant shutdown and experiencing a Loss of all Offsite and Onsite AC power. Procedure EOP-6.0 (ECA-0.0) Loss of All ESF AC Power has been implemented. Annunciator panel 613, 4-2, "BAT A TEMP HI/LO" is standing (low setpoint 70°F) and local verification has indicated that temperature is 68°F in 'A' BAT room. The candidate will be directed to dilute the “A” BAT using EOP-6.0, Attachment 6, Locally Diluting the Boric Acid Tanks. The candidate will simulate the following actions; connect the drain rig, open the drain isolation valve, drain the BAT to 50%, close the drain and remove the rig. The candidate then simulates flushing a nearby fire hose to a floor drain and simulates connecting the fill rig and use of the fire hose to restore “A” BAT to 90-95%. The critical step will be assuring that desired volume of fire water is added to the BAT and that the drain is isolated.

K/A 000055K302 Knowledge of the reasons for the following responses as they apply to the Station Blackout: Actions Contained in EOP for loss of offsite and onsite power (RO: 4.3, SRO: 4.6)

NUREG 1122 EPE Loss of Offsite and Onsite Power (Station Blackout)

VCS Task: O-000-055-05-01 Respond to loss of offsite and on site ESF power per EOP-6.0/EOP-1.0

j. This is a bank JPM that was last used on the 2011 License exam. The initial conditions for this JPM have the reactor tripped due to the need to evacuate the control room. Evacuation is necessary due to a bomb threat and no equipment will have been tripped from the MCB. Both ESF busses are energized from offsite power. The “A” and “C” RCP will have been tripped. The candidate will be directed to take actions in accordance with AOP-600.1, Control Room Evacuation, Attachment 2 Duties of the BOP Operator. Candidate will simulate locally tripping the Main Feedwater pumps and the “B” Rod Drive MG set. Using a photograph of the inside of a 7.2 Kv breaker the candidate will simulate stopping two Condensate pumps by opening the breakers and three of four Feedwater Booster pumps by opening the breakers. The candidate will NOT trip “B” RCP as “A” and “C” are already off. The alternate path for the RO is that the “A” RCP is tripped and so “B” RCP will have to be left running. The critical step is not tripping the “B” RCP.

K/A 0000682130 Conduct of Operations: Ability to locate and operate components, including local controls (RO: 4.4, SRO: 4.0)

NUREG 1122 APE Control Room Evacuation

VCS Task: 0-000-068-05-01 Perform Control Room Evacuation per AOP-600.1.

k. This is a bank JPM. The initial conditions for this JPM have the plant at 100% power. Vital AC Inverter, XIT-5901 is scheduled for preventive maintenance. The candidate is directed to remove XIT-5901 from service and place Vital AC distribution panel, APN-5901 on its alternate power source in accordance with SOP-310, Engineered Safety Features 120 VAC Instrumentation and Control Power System, Section IV.I. Initial conditions have been completed through step 1.4. Candidate simulate placing the Test Transfer switch to the ALT position and verifies ON Alternate light illuminates and the ON Inverter light goes out. Candidate simulates depressing the Inverter STOP push button and verifies the SYNCH MONITOR light is lit. Simulates placing the MAN Bypass switch to BYP TO ALT position. Simulates opening the Backup Source breaker and the Normal AC Source breakers. The critical step is to place the Test Transfer switch to the ALT position.

K/A 062000A203 Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Consequences of improper sequencing when transferring to or from an inverter. (RO: 2.9, SRO: 3.4)

NUREG 1122 System A.C. Electrical Distribution

VCS Task: O-062-010-01-04 Remove Engineering Safety Features Vital Inverter from Service.

The 2015 V.C. Summer written exam was drafted by the NRC utilizing various exam authors.

Facility: VC SUMMER	Scenario No: 1	Op Test No: NRC-ILO-13-01	

Examiners: ______________________ Operators: CRS: ______________________

______________________ RO: ______________________

______________________ BOP: ______________________

Initial Conditions:

- The plant has completed a Mid-Cycle outage.
- The Reactor is Critical at 10^{-3} % power.
- Critical Data has been recorded.
- The National Weather Service has declared a Severe Weather Warning for Richland, Fairfield, and Kershaw counties for the next four (4) hours.
- The secondary has been warmed.
- “B1” Train Work Week.
- Alternate Seal Injection is OOS.

Turnover:

- Following turnover start RBCU 2B, then secure RBCU 1B per an Engineering Request to monitor the RBCU 2B.
- Following turnover raise Reactor Power to between 1% and 3%.

Critical Tasks:

- Maintain SG levels using EFW without causing a Reactor trip.
- Align at least one CHG/SI flowpath prior to ORANGE path on Core Cooling.
- Isolate LOCA prior to exiting EOP-2.5.

Event No.	Malf No.	Event Type*	Event Description
1	NA	N-BOP	Start RBCU 2B, then secure RBCU 1B.
2	NA	R-RO, N-CRS	Raise power to between 1% and 3%.
3	EF002B EF002T	C-BOP, CRS TS-CRS	MD EFW “B” Pump Bearing Failure leading to trip of the pump.
4	EPS005C EPS006B	C-BOP, CRS TS-CRS	Loss of Emergency Auxiliary transformer (1DB). DG fails to AUTO start.
5	CRF004F8 CRF007	C-RO, CRS TS-CRS	Partially Dropped Rod (F8) – Rod slips to approximately 200 steps withdrawn.

6	CRF004F8 CRF004D4 CRF007		Two Dropped Rods (F8 and D4) – Trip the reactor
7	CVC015A	I-RO, CRS	Letdown pressure control valve PCV-145 fails CLOSED (AUTO ONLY).
8	RHR013E RHR013B RHR011	M-ALL	LOCA Outside the Reactor Building.
	PCS005A		SI Train "A" Actuation Failure (Auto and Manual). Manually configure Pumps and Valves.
	CS004P CS006F		"A" CHG/SI pump trips (cannot be reset). "B" CHG/SI pump fails to Auto-Start. Manually Start. "C" CHG/SI pump breaker cannot be racked-up.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

The following notation is used in the ES-D-2 form "Time" column:

IOA designates **Immediate Operator Action** steps.
***** designates **Continuous Action** steps.

The crew will assume the watch having been pre-briefed on the Initial Conditions, the plan for this shift and any related operating procedures.

The scenario involves a plant startup so GOP-3, Reactor Startup from Hot Standby to Startup (Mode 3 To Mode 2), is being implemented. Step 3.13, recording Critical Data, has been completed and the reactor is critical in Mode 2 at 10E-3% power. The secondary plant has been warmed with the turbine on turning gear.

The simulator will be frozen until the crew assumes the watch.

The crew will be briefed to have the BOP start the 2B RBCU and then stop the 1B RBCU following turnover due to a request from Engineering. The crew will then increase to between 1% and 3% in accordance with GOP-3 beginning at step 3.14.

GTP-702 Attachment II G, Operational Mode Change Plant Startup - Entering Mode 1, has been completed.

Sections of GOP-4A, Power Operation (Mode 1 - Ascending) have been completed to perform initial lineups and to warm the secondary plant.

EVENT 1: Start RBCU 2B, then secure RBCU 1B.

Three Reactor Building Cooling Units (RBCUs) will be running in fast speed at turnover. After turnover is complete, the BOP will start the 2B RBCU in fast speed then secure the 1B RBCU in accordance with SOP-114, Reactor Building Ventilation System.

EVENT 2: Raise power to between 1% and 3%.

The RO will increase Reactor Power by withdrawing control rods. The RO will recognize the negative reactivity feedback as the Point of Adding Heat is achieved and stabilize power between 1-3%. The BOP will adjust Emergency Feedwater flow to the Steam Generators as steam flow increases.

The crew will transition to GOP-4A, Power Operation (Mode 1 - Ascending).

EVENT 3: MD EFW "B" Pump Bearing Failure leading to trip of the pump.

- TRIGGER 1
  - PMP-EF002B
    XPP0021B MOTOR DRIVEN EFW PMP B BRG FAILURE
    RAMP = 5 seconds
    FINAL = 10
  - PMP-EF002T
    XPP0021B MOTOR DRIVEN EFW PMP B TRIP ON COMMAND
    DELAY = 35 seconds

On cue from the Examiner at approximately 2-3% power the "B" MDEFW bearing will fail and the "B" EFW Pump will trip after a short delay if not stopped by the BOP.

In accordance with XCP-623 1-5, MD EFP B MOTOR OVRLD and XCP-623 1-3, MD EFP B Trip, EFW flow must be reduced to below 400 gpm. The EFW flow requirement is approximately 180 gpm/percent so power is limited to approximately 2% using the "A" MDEFW unless the crew decides to use the TDEFW Pump.

The BOP will throttle EFW flow to the SGs using the "A" MDEFW in accordance with SOP-211, Emergency Feedwater System. The CRS will evaluate the failure and determine that the "B" MDEFW Pump is inoperable.

The CRS will refer to Technical Specification 3.7.1.2, Emergency Feedwater System.

EVENT 4: Loss of Emergency Auxiliary Transformer (1DB), DG fails to AUTO Start

- TRIGGER 2
  - MAL-EPS006B
    DIESEL GENERATOR B FAILURE
    FAIL TO: No Auto Start
  - MAL-EPS005C
    LOSS OF ESF BUS 1DB (NORMAL FEED BREAKER)
    DELAY = 1 second

On cue from the Examiner, power will be lost to the 1DB bus due to a breaker failure and the Auto-Start failure of the "B" EDG. The BOP will start the "B" EDG. The "B" EDG will then load onto the 1DB Bus.

The CRS will refer to Technical Specification 3.8.1.1, AC Sources.

EVENT 5: Partially Dropped Rod (F8) – Rod slips to approximately 200 steps withdrawn.

- TRIGGER 3
  - MAL-CRF004F8
    DROPPED ROD F8
    FINAL = STATIONARY
    DELETE = 1 second
  - LOA-CRF007
    CONTROL ROD F8 STICKING POSITION
    FINAL VALUE = 200
    DELETE = 1 second

On cue from the Examiner, F8 will slip to the 200 steps withdrawn position. The RO will take immediate actions in accordance with AOP-403.6, Dropped Control Rod, by verifying that only one Control Rod has slipped and by placing the Rod Cntrl Bank Sel Switch in Manual.

The CRS will refer to Technical Specifications: 3.1.1.1 Shutdown Margin, 3.1.3.1 Group Height, Insertion and Power Distribution Limits, 3.1.3.6 Control Rod Insertion Limits, and 3.2.4 Quadrant Power Tilt Ratio.

EVENT 6: Two Dropped Rods (F8 and D4) – Trip the Reactor

- TRIGGER 4
  - LOA-CRF007
    CONTROL ROD F8 STICKING POSITION
    (NOTE: This LOA is inserted allow F8 to fall when dropped)
    FINAL VALUE = 0
  - MAL-CRF004F8
    DROPPED ROD F8
    FINAL = STATIONARY
  - MAL-CRF004D4
    DROPPED ROD D4
    FINAL =STATIONARY

After Technical Specifications have been addressed for a single dropped rod the examiner will cue the booth operator to drop a second rod. The RO will trip the Reactor and implement EOP-1.0 (E-0) Reactor Trip/Safety Injection Actuation in accordance with AOP-403.6, Dropped Control Rod.

EVENT 7: Letdown pressure control valve PCV-145 fails CLOSED (AUTO ONLY).

- TRIGGER 5
  - MAL-CVC015A
    LETDOWN PRESSURE CONTROL VALVE PCV-145 FAILURE (AUTO ONLY)
    RAMP = 5 seconds
    FINAL = 35

On cue from the Examiner, PCV-145 pressure controller will drift LOW in auto causing letdown pressure to increase to the alarm setpoint. The RO will respond to annunciators, XCP-613 2-4, LP LTDN FLO/PRESS HI and take manual control of PCV-145.

EVENT 8: LOCA Outside RB, SI Train "A" Actuation Failure (AUTO and MANUAL), "A" CHG/SI Pump TRIP and "B" CHG/SI Pump Fails to Auto-Start

- TRIGGER 6
  - MAL-PCS005A
    SAFETY INJECTION FAILURE TRAIN A
    FAIL TO: Total Failure
  - MAL-RHR013E
    RHR DISCH CHECK VALVE 8973C LEAKAGE (0.05=800 GPM)
    SEVERITY = 0.05
  - MAL-RHR013B
    RHR DISCH CHECK VALVE 8974B LEAKAGE (0.05=800 GPM)
    SEVERITY = 0.05
  - FLX-RHR011
    FLEX LEAK RLF VLV 8864B
    SEVERITY = 5000
- AUTO-TRIGGER 7
  LPPLSI ==1 SAFETY INJECTION ACTUATED
  - PMP-CS004T
    XPP0043A CHRG/SI PMP A TRIP ON COMMAND
  - PMP-CS006F
    XPP0043B CHRG/SI PMP B FAIL TO START
- TRIGGER 8
  LOA-CVC041
  CHARGING PUMP A SUPPLY BRKR
  POSITION TO: RACK OUT

On cue from the Examiner, a LOCA will be inserted in the RHR suction line outside the Reactor Building. This leak is in the discharge line from the B RHR Pump to the RCS.

The crew will implement AOP-101.1, Loss of Reactor Coolant Not Requiring SI, and determine that an SI is required.

The crew will implement EOP-1.0 (E-0) and determine that the RCS leak is outside of containment and transition to EOP-2.5 (ECA-1.2). The crew will isolate the leak by closing 8888B, RHR LP A to Cold Legs, and transition to EOP-2.0 (E-1).

"A" Train Safety Injection will fail to actuate automatically or manually. Individual components will be started/positioned to their required SI condition.

When Safety Injection actuation is attempted the running "A" Charging pump will trip and the "B" Charging pump will fail to auto-start resulting in the loss of all High Head Safety injection. It is a critical task to start one High Head Safety Injection Pump.

If the crew attempts to rack-up the "C" Charging/SI pump they will be informed that the breaker will not rack-up. Both the "A" and "C" Charging pumps are failed in this step to limit the flow rate from High Head Safety Injection. Too much flow would mask the leak as RCS pressure is lowered.

CRITICAL TASKS:

It is a critical task to:

- align at least one CHG/SI flowpath by starting the "B" Charging Pump, prior to ORANGE path on Core Cooling.
- isolate the LOCA prior to exiting EOP-2.5 (ECA-1.2).
- maintain SG levels using EFW without causing a Reactor trip.

TERMINATION:

The scenario can be terminated after the crew has isolated the leak in EOP-2.5 (ECA-1.2), and transitions to EOP -2.0 then EOP-1.2 (ES-1.1) and terminates Safety Injection or at any time at the discretion of the Examiner.

Scenario Attributes		Events
Total Malfunctions (5-8)	9	· MD EFW “B” Pump Bearing Failure leading to Trip · Loss of Emergency Auxiliary transformer (1DB) · DG fails to auto-start · Rod F8 slips to approximately 200 steps withdrawn · 2 Dropped Rods (F8 and D4) · Control Card Output for Letdown PCV-145 Drifts LOW · SI Train “A” Actuation Failure (Auto and Manual) · “A” Charging Pump Trip · “B” CHG/SI pump fails to Auto-Start
Malfunctions after EOP entry (1-2)	4	· SI Train “A” Actuation Failure (Auto and Manual). · “A” Charging Pump Trip · “B” CHG/SI pump fails to Auto-Start · “C” CHG/SI pump fails to Rack-Up
Abnormal Events (2-4)	5	· MD EFW “B” Pump Bearing Failure leading to Trip · Loss of Emergency Auxiliary transformer (1DB) with DG failing to auto-start · Rod F8 slips to approximately 200 steps withdrawn · 2 Dropped Rods (F8 and D4) · Control Card Output for Letdown PCV-145 Drifts LOW
Major Transient (1-2)	1	· LOCA Outside the Reactor Building.
EOPs Entered (1-2)	3	· EOP-2.5 (ECA-1.2), LOCA Outside Containment · EOP-2.0 (E-1), Loss Of Reactor Or Secondary Coolant · EOP-1.2 (ES-1.1), Safety Injection Termination
EOP Contingencies (0-2)	1	· EOP-2.5 (ECA-1.2), LOCA Outside Containment
Critical Tasks (2-3)	3	· Maintain SG levels using EFW without causing a Reactor trip. · Align at least one CHG/SI flowpath prior to ORANGE path on Core Cooling. · Isolate LOCA prior to exiting EOP-2.5 (ECA-1.2).

SIMULATOR SCENARIO SETUP

INITIAL CONDITIONS:

- IC Set 290
- 10^{-3}% Power EOL
- Burnup = 20,000 MWD/MTU
- RCS Boron Concentration = 652 ppm
- FCV-113 Pot Setting = 2.80
- Rod Position: Group D = 94
- Tavg = 557.9
- Xe = - 0.0 pcm
- Prior to the scenario, crew should pre-brief on conditions and expectations for the Shift (maintain power, repairs estimated to be complete well before LCO action time expires.)

PRE-EXERCISE:

- Ensure simulator has been checked for hardware problems (DORT, burnt out light bulbs, switch malfunctions, chart recorders, etc.).

- VCS-TQP-0807 Attachment I-A, Unit 1 Booth Instructor Checklist, has been completed.

- Hang Red Tags for equipment out of service:

  - Hang Caution Tag on HCV-186 due to ASI being OOS

- Mark up procedures in use with “Circle and slash” as applicable:

  - GOP-3, Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2)
  - GOP-4A, Power Operation (Mode 1 - Ascending)

- Conduct two-minute drill.

PRE-LOAD:

STANDARD SIMULATOR SETUP:
- PMP-LD003P, XPP0138 Leak Detection Sump Pmp Loss of Power
- VLV-FW028W, XVG01676-FW FW Hdr Recirc Isol Vlv Loss of Power
- VLV-FW029W, XVG01679-FW FW HTR Recirc Iso Vlv Loss of Power
- VLV-CS052W, XVT08141A-CS RCP A Seal Leakoff Vlv Loss of Power
- VLV-CS054W, XVT08141C-CS RCP C Seal Leakoff Vlv Loss of Power
- VLV-CS053W, XVT08141B-CS RCP B Seal Leakoff Vlv Loss of Power

SCENARIO RELATED:
- ANN-TA030 , GEN AUX PNL TRBL FAIL TO: OFF
- ANN-CS044, ALT SEAL INJ PUMP TRBL FAIL TO: ON
- MAL-CVC027, ALT SEAL INJ D/G FAIL TO START
- MAL-CVC029, ALT SEAL INJ PUMP FAIL TO START

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 1	Page: 10 of 49
Event Description: Start RBCU 2B, then secure RBCU 1B.			

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: No triggers for this event.			
	CRS	Direct BOP to start RBCU 2B, then secure RBCU 1B in accordance with SOP-114, Reactor Building Ventilation System, Section III.A.	
NOTE 2.1 a. Due to eddy current brakes, RBCU control switches must be held in START position until the red breaker closed light is lit and starting current is indicated on appropriate meter. b. Normal and preferred lineup is three RBCUs running in NORM (fast speed). c. To increase stay times for teams entering containment, four RBCUs may be placed in service in NORM (fast speed).			SOP-114
	BOP	2.1 Place RBCUs in service by starting three or four RBCUs in SLOW or NORM as follows:	SOP-114
	BOP	b. For XFN0064B-AH, REACTOR BLDG COOLING UNIT 1B EMERG FAN, start one of the following: 1) XFN 0064B-AH, 1B NORM.	SOP-114
NOTE 2.1.e Contact PSE to evaluate, if RBCU fan motor amps exceed the values given.			SOP-114
	BOP	e. Verify RBCU Fan motor amps return to normal operating range: 1) For fast speed operation, 275 amps to 300 amps.	SOP-114
NOTE 2.1.f The RBCU TRAIN A (B) EMERG switch must be selected to an operable RBCU.			SOP-114
	BOP	f. Verify the following switches are in the desired position: 2) XFN-64B/XFN 65B - RBCU TRAIN B EMERG.	SOP-114
	BOP	2.2 Shut down RBCUs by placing appropriate switch(es) in STOP: c. XFN 0064B-AH, 1B NORM.	SOP-114
	BOP	Report that the 2B RBCU is running and the 1B RBCU has been secured.	SOP-114
EVALUATOR NOTE: The next event is a power change which does not require a trigger.			

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 2	Page: 11 of 49
Event Description: Raise power to between 1% and 3%.			

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: No triggers for this event.			
EVALUATOR NOTE: The Unit is stable in Mode 3 at turnover with all surveillances completed for a Mode change to Mode 2. GOP-3 is complete to step 3.14. The RO will bring the Reactor to the POAH and transition to GOP-4A Power Operation (Mode 1 – Ascending). GOP-4A steps have been signed off to indicate that lineups have been completed and the secondary warmed.			
NOTE 3.14 Ensure sufficient Emergency Feedwater Flow exists prior to raising power.			GOP-3
	RO	3.14 Increase Reactor Power to between 1% and 3%.	GOP-3
	RO	3.15 At the Point of Adding Heat, if NR-45, NIS RECORDER, had previously been selected to HI speed place the recorder in LO speed.	GOP-3
CAUTION 3.16 a. Adjustment of Tavg with the Rod Control System must not be attempted with the ROD CNTRL BANK SEL Switch in any position other than MAN. b. Manual rod control is required to establish equilibrium conditions, since C-5 blocks automatic rod withdrawal.			GOP-3
	RO	3.16 Maintain Tavg between 555°F and 559°F.	GOP-3
	BOP	Adjust EFW flow to the Steam Generators (SG) as power is increased to maintain Narrow Range SG levels between 60% and 65%.	
EVALUATOR NOTE: Attachment II.G was completed prior to turnover			
	N/A	3.17 Complete Attachment II.G, Operational Mode Change Plant Startup - Entering Mode 1, of GTP-702.	GOP-3
	CRS	3.18 Proceed to GOP-4A, Power Operation (Mode 1 - Ascending).	GOP-3
EVALUATOR NOTE: GOP-4A POWER OPERATION (MODE 1 - ASCENDING) has several line-up verifications. GOP-4A lineups and secondary plant warming have been completed.			
NOTE 3.1 through 3.11 Steps 3.1 through 3.11 raise Reactor Power from 1% to 25%.			GOP-4A
EVALUATOR NOTE: The next event may be initiated after GOP-4A is entered.			

Op Test No:	NRC-ILO-13-01	Scenario #	1	Event #	3	Page:	12	of 49

Event Description: MD EFW "B" Pump Bearing Failure leading to trip of the pump.

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: When directed - Initiate Event 3 (TRIGGER 1).			
EVALUATOR NOTE: • Event 3 should be initiated on entry into EOP-4A, Power Operation (Mode 1 - Ascending). • Power should be between 2.0 - 3% when this event is triggered.			
Indications Available: MD EFP B Amps > 60 amps XCP-623 1-5, MD EFP B MOTOR OVRLD			
	CRS	Enters ARP-001-XCP-623, 1-5	XCP-623 1-5
		CORRECTIVE ACTIONS:	XCP-623 1-5
	BOP	1. If possible, reduce demand to less than 400 gpm by throttling the flow control valves to the Steam Generators.	XCP-623 1-5
	BOP	2. Start Motor Driven Emergency Feedwater Pump A if necessary to maintain Steam Generator levels.	XCP-623 1-5
EVALUATOR NOTE: The guidance in SOP-211, Emergency Feedwater System, is not relevant for this failure because both pumps are running initially.			
	BOP	3. Refer to SOP-211.	XCP-623 1-5
	BOP	4. Determine if a single phasing event is in progress by diagnosis of any combination of the following symptoms: a. Vibration Alarms are received for other equipment. b. MCB Potential Lights are not lit. c. MCB Amber Overload lights are lit for running equipment or Motor Overload Alarms are received. d. MCB Undervoltage Alarms. e. Affected bus local 7.2 KV Bus ammeters	XCP-623 1-5
EVALUATOR NOTE: The CRS could direct the RO to Stop the B MD EFW Pump, reduce power to ensure MD EFW Pump "A" is sufficient and/or for the BOP to start the TD EFW Pump. The TD EFW Pump is not normally used for SG level control during heatup/cooldown.			
Indications Available: MD EFP B Amps > 60 amps XCP-623 1-5, MD EFP B MOTOR OVRLD XCP-623 1-3, MD EFP B TRIP			

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 3	Page: 13 of 49
Event Description: MD EFW “B” Pump Bearing Failure leading to trip of the pump.			

Time	Position	Applicant's Actions or Behavior	
EVALUATOR NOTE: The crew will enter ARP-001-XCP-622, 1-5 first but since the “B” MD EFW Pump will trip within one minute only the actions associated with XCP-623 1-3, MD EFP B TRIP are included.			
	CRS	Enters ARP-001-XCP-622, 1-5	XCP-623 1-5
	CRS	Enters ARP-001-XCP-623, 1-3	XCP-623 1-3
EVALUATOR NOTE: The CRS could direct the RO to reduce power to ensure MD EFW Pump “A” is sufficient and/or for the BOP to start the TD EFW Pump. The TD EFW Pump is not normally used for SG level control during heatup/cooldown.			
		CORRECTIVE ACTIONS:	XCP-623 1-3
	BOP	1. Start Motor Driven Emergency Feedwater Pump A if necessary to maintain Steam Generator levels.	XCP-623 1-3
	RO	2. Reduce feedwater demand to less than 400 gpm.	XCP-623 1-3
	CRS	3. Refer to SOP-211.	XCP-623 1-3
		SUPPLEMENTAL ACTIONS:	XCP-623 1-3
	BOP	1. If Steam Generator levels cannot be maintained with one motor driven pump, start the Turbine Driven Emergency Feedwater Pump. 2. Place PUMP B control switch in NORMAL-AFTER-STOP to clear the alarm.	XCP-623 1-3
	CRS	3. Determine the cause of the trip and correct as soon as possible. 4. If the pump is inoperable, refer to Technical Specification 3.7.1.2.	XCP-623 1-3
EVALUATOR NOTE: Emergency Feedwater requirements are approximately 180 gpm per percent power.			

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 3	Page: 14 of 49
Event Description: MD EFW “B” Pump Bearing Failure leading to trip of the pump.			

Time	Position	Applicant’s Actions or Behavior	
CRITICAL TASK	RO/BOP	Maintain SG level without tripping the unit by reducing feedwater demand (Reactor Power) and/or controlling Emergency Feedwater flow.	
BOOTH OPERATOR: If contacted to investigate the condition of the “B” MD EFW wait 3 minutes and report that the pump bearing are hot and the breaker is tripped with no flags.			
	CRS	Contacts Work Control and/or Maintenance for assistance.	
EVALUATOR NOTE: Technical Specification 3.0.4 is applicable so entry into Mode 1 is prohibited.			
	CRS	Enters Technical Specification 3.7.1.2, Action a: With one emergency feedwater pump inoperable, restore the required emergency feedwater pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.	TECH SPEC
EVALUATOR NOTE: The next event may be initiated after SG levels are under control and the Technical Specification determination is complete.			

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 4	Page: 15 of 49
Event Description: Loss of Emergency Auxiliary transformer (1DB). DG fails to AUTO start.			

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: When directed - Initiate Event 4 (TRIGGER 2). **BOOTH OPERATOR:** Silence the HVAC Alarms.			
INDICATIONS AVAILABLE: Multiple Alarms XCP-637 5-2 7KV ESF CHAN B BKR TRIP 1DB Volts = 0 1DB Feed Amps = 0			
		AUTOMATIC ACTIONS:	XCP-637 5-2
		1. If XSW1DB 07, TRANS 1DB1 & 1DB2, tripped, XSW1DB1 4B, MAIN INCOMING BREAKER, and XSW1DB2 4B, MAIN INCOMING BREAKER, will trip. 2. If XSW1DB 16, BUS 1DB NORMAL INCOMING BKR, tripped, Diesel Generator B will automatically start. 3. If XSW1EB 03, TRANSF 1EB1 FEEDER BREAKER, tripped, SW1EB1 4B, MAIN INCOMING BREAKER, will trip.	XCP-637 5-2
EVALUATOR NOTE: The "B" DB failed to start and load onto the 1DB bus. After determining that there are no lockout on the "B" DG or the 1DB Bus the operator should perform an emergency start of the "B" DG.			
	BOP	Perform an Emergency Start of the 1B Diesel Generator.	
		CORRECTIVE ACTIONS:	XCP-637 5-2
	BOP	1. Using MCB indication, determine which breaker tripped. 2. Verify appropriate automatic actions. 3. Dispatch an operator to investigate the cause of the breaker trip. 4. Request Electrical Maintenance to troubleshoot and correct the cause of the breaker trip.	XCP-637 5-2
		SUPPLEMENTAL ACTIONS:	XCP-637 5-2
		1. When the cause has been corrected, reclose the breaker.	XCP-637 5-2
	CRS	2. Refer to Technical Specifications 3.8.1 and 3.8.3 for LCO requirements.	XCP-637 5-2

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 4	Page: 16 of 49
Event Description: Loss of Emergency Auxiliary transformer (1DB). DG fails to AUTO start.			

Time	Position	Applicant's Actions or Behavior
	CRS	T.S. 3.8.1.1 AC SOURCES Actions c. With one offsite circuit and one EDG inoperable: 1. Demonstrate the OPERABILITY of the remaining offsite AC source by performing Surveillance Requirement 4.8.1.1.1 within one hour and at least once per 8 hours thereafter, and 2. *If the EDG became inoperable due to any cause other than preplanned preventative maintenance or testing: a) determine the OPERABLE EDG is not inoperable due to a common cause failure within 8 hours, or b) demonstrate the OPERABILITY of the remaining EDG by performing Surveillance Requirement 4.8.1.1.2.a.3 within 8 hours, and 3. Within 2 hours, verify that required systems, subsystems, trains, components and devices that depend on the remaining EDG as a source of emergency power are also OPERABLE and in MODE 1, 2, or 3, that the Turbine Driven Emergency Feed Pump is OPERABLE. If these conditions are not satisfied within 2 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. 4. Restore one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, and 5. Restore the other AC power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Section 3.8.1.1 Action Statement a. or b.,as appropriate, with the time requirement of that Action Statement based on the time of initial loss of the remaining inoperable A.C. power source.

T.S. 3.8 1.1

EVALUATOR NOTE: The Operators may have re-energized the 1DB bus using the 1B Diesel Generator.

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 4	Page: 17 of 49
Event Description: Loss of Emergency Auxiliary transformer (1DB). DG fails to AUTO start.			

Time	Position	Applicant's Actions or Behavior	
	CRS	T.S. 3.8.3.1 Actions a. With one of the required trains of AC Emergency busses not fully energized, re-energize the division within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.	T.S. 3.8 3.1
EVALUATOR NOTE: The next event may be initiated after the 1B Diesel Generator is powering the 1DB 7.2 KV Bus.			
	CRS	Implement SOP-306, Emergency Diesel Generator, B. Operation Of Diesel Generator B After An Automatic Start And Load.	
	BOP	2.1 Verify B TRN BLACKOUT SEQ COMPLETE Status Light is lit.	SOP-306
	RO	2.2 Ensure one Charging Pump is running.	SOP-306
	BOP	2.3 Ensure the following loads have started: a. RHR Pump B. b. One Train B Service Water Pump. c. One Train B HVAC Chilled Water Pump. d. One Train B CCW Pump. e. MD EFW Pump B. f. The Train B RBCU selected for emergency operation (slow speed). g. Train B FHB Exhaust Fan. h. Service Water Booster Pump B. i. The Train B HVAC Chiller associated with the running Train B HVAC Chilled Water Pump.	SOP-306
	BOP	2.4 Verify greater than or equal to 2000 gpm flow on FI-4496, SWBP B DISCH FLOW.	SOP-306

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 4	Page: 18 of 49

Event Description: Loss of Emergency Auxiliary transformer (1DB). DG fails to AUTO start.

Time	Position	Applicant's Actions or Behavior	
	BOP	2.5 Perform the following per SOP-220: a. Ensure Instrument Air is supplied by one of the following: 1) Either Station Instrument Air Compressor A or B. 2) Diesel Driven Air Compressor.	SOP-306
	BOP	2.6 Supply Reactor Building Instrument Air from Station Instrument Air with Reactor Building Instrument Air Compressors secured per SOP-121, Section IV.	SOP-306
	BOP	2.7 Maintain RB temperature as follows: a. Monitor RB temperature and pressure for indications of insufficient cooling. b. If required, supply Service Water to the Train A RBCUs per SOP-117.	SOP-306
	BOP	2.8 With Shift Supervisor concurrence perform the following: a. Secure Emergency Feedwater Pumps. b. Realign the Emergency Feedwater System for standby operation per SOP-211.	SOP-306
NOTE 2.9 Spent Fuel Cooling Loop B is unavailable until NON-ESF LCKOUTS is reset.			SOP-306
	BOP	2.9 If required, startup Spent Fuel Cooling Loop A aligned to the Spent Fuel Pool per SOP-123.	SOP-306
CAUTION 2.10 De-energizing the following Atmospheric Gaseous Module rate meters when the appropriate Interlock Switch is in NORMAL/OFF will result in the generation of a High Radiation signal and component realignment: a. RMA0001-RM, ATM GASEOUS IODINE - CONT ROOM SUPP AIR. b. RMA0002-RM, ATM GASEOUS IODINE - RB SAMPLE LINE. c. RMA0010-RM, WASTE GAS DISCHARGE RADIATION MONITOR.			SOP-306

Op Test No: NRC-ILO-13-01 Scenario # 1 Event # 4 Page: 19 of 49		
Event Description: Loss of Emergency Auxiliary transformer (1DB). DG fails to AUTO start.		
Time	Position	Applicant's Actions or Behavior
	BOP	2.10 Perform either of the following for Train B radiation monitors: a. Restore Train B radiation monitors to normal operation per SOP-124. b. If Train B radiation monitors are unable to be restored to normal operation, contact Health Physics to perform compensatory actions per HPP-904 for loss of electrical power to Train B radiation monitors.

SOP-306

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 5	Page: 20 of 49
Event Description: Partially Dropped Rod (F8) – Rod slips to approximately 200 steps withdrawn.			

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: When directed - Initiate Event 5 (TRIGGER 3).			
Indication Available: XCP-620 2-5 CMPTR ROD DEV			
		CORRECTIVE ACTIONS:	XCP-621 3-1
	RO	1 If a shutdown or control group rod fails to withdraw, implement AOP-403.5, Stuck or Misaligned Control Rod. 2 If a shutdown or control group rod has dropped and the Reactor did not trip, implement AOP-403.6, Dropped Control Rod.	XCP-621 3-1
	CRS	Implement AOP-403.6, Dropped Control Rod.	
IOA	RO	1 Verify only one Control Rod has dropped.	AOP-403.6
IOA	RO	2 Place ROD CNTRL BANK SEL Switch in MAN.	AOP-403.6
	RO	3 Stabilize the plant: a. Decrease Main Turbine load to maintain Tavg within 5°F of Tref . b. Verify PZR pressure is stable at OR trending to 2235 psig (2220 psig to 2250 psig). c. Verify PZR level is stable at OR trending to program level.	AOP-403.6
	RO	4 Check if Reactor power is LESS THAN 75%.	AOP-403.6
	CRS	5 Initiate GTP‑702, Attachments IV.A, IV.B, and IV.C.	AOP-403.6
	CRS	6 Notify the following plant personnel prior to moving Control Rods: ● Management Duty Supervisor. ● Rod Control System Engineer. ● Reactor Engineering	AOP-403.6
BOOTH OPERATOR: As Reactor Engineering – after receiving the report of plant conditions, recommend that Reactor Power be maintained at the current level until a recovery plan is developed.			

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 5	Page: 21 of 49	
Event Description: Partially Dropped Rod (F8) – Rod slips to approximately 200 steps withdrawn.				

Time	Position	Applicant's Actions or Behavior	
	CRS	7 Provide Reactor Engineering with the following information: Time rod dropped: ________. Dropped rod location: ________. Initial Reactor power level: ________. Current Reactor power level: ________. Current QPTR: ________.	AOP-403.6
	CRS	8 Determine and correct the cause of the failure.	AOP-403.6
NOTE - Step 9 This Step must be completed before continuing with Step 10.			AOP-403.6
	CRS	9 Obtain the following information from Reactor Engineering: Power level at which recovery is to be performed: ________. Rate of Control Rod movement during recovery: ________.	AOP-403.6

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 5	Page: 22 of 49	
Event Description: Partially Dropped Rod (F8) – Rod slips to approximately 200 steps withdrawn.				

Time	Position	Applicant's Actions or Behavior	
	CRS	Enter Technical Specification 3.1.3.1.d.3 d. With one full length rod inoperable due to causes other than addressed by ACTION a., above, or misaligned from its group step counter demand height by more than ± 12 steps (indicated position), POWER OPERATION may continue provided that within one hour either: 3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that: a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days… b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 - is determined at least once per 12 hours. c) A core power distribution measurement is obtained and F0(z) and Fj~5 are verified to be within their limits within 72 hours, and d) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within the next hour and within the following 4 hours the high neutron flux tip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER.	TECH SPEC

EVALUATOR NOTE: This scenario does NOT include Control Rod recovery. The next event may be inserted after Technical Specifications have been addressed. The Technical Specifications may be addressed in post-exam questioning if it is desired to expedite the scenario.

Op Test No: NRC-ILO-13-01	Scenario # 1 Event # 6	Page: 23 of 49
Event Description: Two Dropped Rods (F8 and D4) – Trip the reactor		

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: When directed - Initiate Event 6 (TRIGGER 4).			
EVALUATOR NOTE: The following steps occur after the 2nd rod drops.			
Indications Available: XCP-621, 3-2 RODS ON BOTTOM			
	RO	CORRECTIVE ACTIONS: 1 If two or more rods have dropped, manually trip the Reactor and implement EOP-1.0, Reactor Trip/Safety Injection Actuation. SUPPLEMENTAL ACTIONS: 1 Have I&C verify proper operation of the DRPI System and repair if necessary.	XCP-621 3-2
	CRS	Direct EOP-1.0 (E-0) Reactor Trip/Safety Injection Actuation, entry.	
IOA	Crew	1 Verify Reactor Trip: • Trip the Reactor using either Reactor Trip Switch. • Verify all Reactor Trip and Bypass Breakers are open. • Verify all Rod Bottom Lights are lit. • Verify Reactor Power level is decreasing.	EOP-1.0
IOA	BOP	2 Verify Turbine/Generator Trip: a. Verify all Turbine STM STOP VLVs are closed. b. Ensure Generator Trip (after 30 second delay): 1) Ensure the GEN BKR is open. 2) Ensure the GEN FIELD BKR is open. 3) Ensure the EXC FIELD CNTRL is tripped	EOP-1.0
IOA	BOP	3 Verify both ESF buses are energized.	EOP-1.0

Op Test No: NRC-ILO-13-01 Scenario # 1 Event # 6 Page: 24 of 49

Event Description: Two Dropped Rods (F8 and D4) – Trip the reactor

Time	Position	Applicant's Actions or Behavior	
IOA	BOP	4 Check if SI is actuated: a. Check if either: **(NO)** • SI ACT status light is bright on XCP-6107 1-1. OR • Any red first-out SI annunciator is lit on XCP-626 top row. **<u>ALTERNATIVE ACTION</u>** a. GO TO Step 5.	EOP-1.0
IOA	CREW	5 Check if SI is required: a. Check if any of the following conditions exist: **(NO)** • PZR pressure LESS THAN 1850 psig. OR • RB pressure GREATER THAN 3.6 psig. OR • Steamline pressure LESS THAN 675 psig. OR • Steamline differential pressure GREATER THAN 97 psid. **<u>ALTERNATIVE ACTION</u>** a. GO TO EOP-1.1, REACTOR TRIP RECOVERY, Step 1.	EOP-1.0
	CRS	Direct EOP-1.1 entry.	

Op Test No:	NRC-ILO-13-01	Scenario #	1	Event #	6	Page:	25	of	49

Event Description: Two Dropped Rods (F8 and D4) – Trip the reactor

Time	Position	Applicant's Actions or Behavior

EOP-1.1

REFERENCE PAGE FOR EOP-1.1

1 SI ACTUATION CRITERIA

IF either of the following conditions occurs, THEN actuate SI and GO TO EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION, Step 1:

- PZR level can NOT be maintained GREATER THAN 8%.
  OR
- RCS subcooling on TI-499A(B), A(B) TEMP °F, is LESS THAN the value listed in the table below:

RCS PRESSURE (psig)	RCS SUBCOOLING (°F)
1576-3075	42.5
876-1575	45
576-875	47.5
476-575	50
375-475	52.5

CAUTION

If SI actuation occurs during this procedure, EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION, should be performed to stabilize the plant. EOP-1.1

NOTE

- Main Turbine vibration should be monitored during coastdown.
- The EOP REFERENCE PAGE should be monitored throughout the use of this procedure.

EOP-1.1

Time	Position	Applicant's Actions or Behavior	
	CREW	1 Announce plant conditions over the page system.	EOP-1.1

EVALUATOR NOTE: Initiate Event 7 (TRIGGER 5) after EOP-1.1 has been entered. Remaining steps of EOP-1.1 will be run concurrently with Event 7 (next section) for PCV-145 failure.

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 6	Page: 26 of 49
Event Description: Two Dropped Rods (F8 and D4) – Trip the reactor			

Time	Position	Applicant's Actions or Behavior	
	BOP	2 Check FW status: a. Check if RCS Tavg is LESS THAN 564°F. b. Verify FW Isolation: • Ensure the FW Flow Control Valves, FCV-478(488)(498), are closed. • Ensure the Main FW Isolation Valves, PVG-1611A(B)(C), are closed. • Ensure the FW Flow Control Bypass Valves, FCV-3321 (3331)(3341), are closed.	EOP-1.1
EVALUATOR NOTE: "B" MDEFW Pump tripped during an earlier event.			
	BOP	c. Ensure EFW Pumps are running: 1) Ensure both MD EFW Pumps are running. **(NO)** 2) Verify the TD EFW Pump is running if necessary to maintain SG levels. d. Verify total EFW flow is GREATER THAN 450 gpm. e. Trip all Main FW Pumps.	EOP-1.1
*	RO	3 Check RCS temperature: • With any RCP running, RCS Tavg is stable at OR trending to 557°F. OR • With no RCP running, RCS Tcold is stable at OR trending to 557°F.	EOP-1.1
	BOP	4 IF EOP-1.0 was entered from AOP-112.2, THEN RETURN TO AOP-112.2, STEAM GENERATOR TUBE LEAK NOT REQUIRING SI, Step 7. **(NO)** **ALTERNATIVE ACTION** 4 GO TO Step 5.	EOP-1.1
	BOP	5 Verify all Control Rods are fully inserted.	EOP-1.1

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 6	Page: 27 of 49
Event Description: Two Dropped Rods (F8 and D4) – Trip the reactor			

Time	Position	Applicant's Actions or Behavior	
	BOP	6 Check DA level control: a. Open LCV-3235, DEAER START UP DRAIN CNTRL, as necessary to maintain DA level LESS THAN 10.5 ft as indicated on LI-3135, DEAER STOR TK WR LVL FEET. b. Locally adjust ITV-3062A(B)(C), BD COOLER A(B)(C) CDSTE OUT TEMP, to 90% (XPN-0029, NUCLEAR BLOWDOWN PROCESSING PANEL, AB-436).	EOP-1.1
	RO	7 Check PZR level control: a. Verify PZR level is GREATER THAN 17%. b. Verify Charging and Letdown are in service. c. Verify PZR level is trending to 25%.	EOP-1.1
	RO	8 Check PZR pressure control: a. Verify PZR pressure is GREATER THAN 1850 psig. b. Verify PZR pressure is stable at OR trending to 2230 psig (2220 psig to 2250 psig).	EOP-1.1
*	BOP	9 Check SG levels: a. Verify Narrow Range level in all SGs is GREATER THAN 26%. b. Control EFW flow to maintain Narrow Range SG level between 40% and 60%.	EOP-1.1
*	BOP	10 Verify all AC buses are energized by offsite power: • ESF AC buses. • BOP AC buses.	EOP-1.1

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 6	Page: 28 of 49	

Event Description: Two Dropped Rods (F8 and D4) – Trip the reactor

Time	Position	Applicant's Actions or Behavior	
	BOP	11 Transfer Condenser Steam Dumps to the Steam Pressure Mode: a. Verify PERMISV C-9 status light is bright on XCP-6114 1-3. b. WHEN RCS Tavg is LESS THAN P-12 (552"F), THEN place both STM DUMP INTERLOCK Switches to BYP INTLK. c. Perform the following: • Verify the MS Isolation Valves, PVM-2801A(B)(C), are open. OR • Open MS Isolation Bypass Valves: 1) Depress both MAIN STEAM ISOL VALVES RESET TRAIN A(B). 2) Open MS Isolation Bypass Valves, PVM-2869A(B)(C). d. Place the STM DUMP CNTRL Controller in MAN and closed. e. Ensure the STM DUMP CNTRL Controller is set to 8.4. f. Place the STM DUMP MODE SELECT Switch in STM PRESS. g. Place the STM DUMP CNTRL Controller in AUTO.	EOP-1.1
		NOTE - Step 12 • Priority should be given to running RCP A to supply Normal PZR Spray. • Since a time lag is expected after increasing steam flow before natural circulation parameters can be verified, this procedure should be continued concurrently with the establishment of natural circulation.	EOP-1.1
	RO	12 Verify RCP A is running.	EOP-1.1
	RO	13 Verify PERMISV C-9 status light is bright on XCP-6114 1-3.	EOP-1.1

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 6	Page: 29 of 49	
Event Description: Two Dropped Rods (F8 and D4) – Trip the reactor				

Time	Position	Applicant's Actions or Behavior	
	RO	14 Check the position of NR-45, NIS RECORDER: a. Verify Intermediate Range Power is LESS THAN P-6 (7.5x10-6%). b. Transfer NR-45, NIS RECORDER, to both Source Range channels. c. Initiate GTP-702, Attachment VI.KK.	EOP-1.1
	BOP	15 Shut down and stabilize the Secondary Plant. REFER TO AOP-214.1, TURBINE TRIP.	EOP-1.1
	RO	16 Maintain stable plant conditions: a. Maintain PZR pressure at 2230 psig (2220 psig to 2250 psig). b. Maintain PZR level at 25%. c. Maintain Narrow Range SG levels between 40% and 60%. d. Maintain RCS temperature: • With any RCP running, Tavg at 557°F. OR • With no RCP running, Tcold at 557°F. e. REFER TO GOP-5, REACTOR SHUTDOWN FROM STARTUP TO HOT STANDBY (MODE 2 TO MODE 3).	EOP-1.1

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 7	Page: 30 of 49
Event Description: Letdown pressure control valve PCV-145 fails CLOSED (AUTO ONLY)			

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: When directed - Initiate Event 7 (TRIGGER 5).			
Indications Available: XCP-613 2-4 LP LTDN FLO/PRESS HI			
	CRS	Direct implementation of ARP-001-XCP-613	
		CORRECTIVE ACTIONS:	XCP-613 2-4
	RO	1. Verify proper operation of PCV-145, LO PRESS LTDN.	XCP-613 2-4
EVALUATOR NOTE: The Operator should identify the malfunction of PCV-145 automatic control and adjust letdown pressure with Manual control of PCV-145.			
	RO	2. If necessary, place PCV-145, LO PRESS LTDN, in MAN and adjust as necessary to reduce flow or pressure.	XCP-613 2-4
	RO	3. Close Letdown orifice isolation valves as necessary to reduce flow or pressure.	XCP-613 2-4
	RO	4. Isolate Charging flow if Letdown is isolated.	XCP-613 2-4
	CRS	Contacts Work Control/Maintenance for assistance.	
EVALUATOR NOTE: The next event may be initiated after letdown pressure control is established in manual.			

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8	Page: 31 of 49

Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.

Time	Position	Applicant's Actions or Behavior

BOOTH OPERATOR: When directed - Initiate Event 8 (TRIGGER 6).

EVALUATOR NOTE: The CRS may, at his/her discretion, implement AOP-101.1 LOSS OF REACTOR COOLANT NOT REQUIRING SI to attempt leak isolation in parallel with EOP-1.1. The leak rate will quickly exceed the capability of available makeup to maintain Pressurizer level. EOP-1.1, REACTOR TRIP RECOVERY reference page will also direct actuation of Safety Injection if AOP-101.1 is not entered.

Indications Available:
XCP-614 5-1 CHG LINE FLO HI/LO
XCP-616 1-5 PZR LCS DEV HI/LO
XCP-616 2-3 PZR PRESS HI/LO
XCP-616 3-6 PZR PCS LO BU HTRS ON
XCP-607 3-4 LD TRBL AB SMP/FLDRN LVL HI
XCP-644 3-2 PLANT VENT PARTIC RM-A3 TRBL
XCP-645 2-2 AB VENT DUCTS RM-A11 TRBL

- Decreasing Pressurizer level with increased Charging flow and normal Letdown flow.
- Decreasing Pressurizer pressure.
- Increased Heater output and Backup Heaters on.
- Increased VCT makeup frequency.

	CRS	Diagnose an RCS Leak.	
	CRS	Implement AOP-101.1, Loss of Reactor Coolant Not Requiring SI.	AOP-101.1

NOTE: AOP-101.1

- If a Reactor Trip occurs AND SI is NOT required, this procedure should be continued after the actions of EOP-1.1, REACTOR TRIP RECOVERY, are completed.
- As valves are isolated, it may be necessary to monitor RCS pressure for a period of time to determine if the leak is isolated.

EVALUATOR NOTE:
PCV-145 has previously been placed in manual due to a failure of the controller in auto. Letdown should be controlled in manual rather the placing the failed controller back in service.

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8	Page: 32 of 49
Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.			

Time	Position	Applicant's Actions or Behavior	
*	RO	**1.** Verify PZR level is at or trending to program level. **(NO)** **<u>ALTERNATIVE ACTION</u>** **1.** IF PZR level is decreasing, THEN perform the following: a) Open FCV-122, CHG FLOW, as necessary to maintain PZR level. b) IF PZR level continues to decrease, THEN reduce Letdown to one 45 gpm orifice: 1) Set PCV-145, LO PRESS LTDN, to 70%. 2) Ensure PVT-8149A, LTDN ORIFICE A ISOL, is open. 3) Close both PVT-8149B(C), LTDN ORIFICE B(C) ISOL. 4) Adjust PCV-145, LO PRESS LTDN, to maintain PI-145, LO PRESS LTDN PRESS PSIG, between 300 psig and 400 psig. 5) Place PCV-145, LO PRESS LTDN, in AUTO.	AOP-101.1
*	CRS, RO	2 Check if SI is required: a. Check if any of the following criteria are met: • PZR level is decreasing with Charging maximized and Letdown minimized. **(YES)** OR • PZR level is approaching 8%. OR • PZR pressure is approaching 1870 psig. OR • VCT level is approaching 5%. b. Perform the following: 1) Trip the Reactor. 2) GO TO EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION. WHEN EOP-1.0 Immediate Actions are complete, THEN actuate SI.	AOP-101.1
	CRS	Implement EOP-1.0, Reactor Trip/Safety Injection Actuation.	

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Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.

Time	Position	Applicant's Actions or Behavior	
		REFERENCE PAGE FOR EOP-1.0 1 RCP TRIP CRITERIA a. IF Phase B Containment Isolation has actuated (XCP-612 4-2), THEN trip all RCPs. b. IF both of the following conditions occur, THEN trip all RCPs: • SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. AND • RCS Wide Range pressure is LESS THAN 1418 psig. 2 REDUCING CONTROL ROOM EMERGENCY VENTILATION Reduce Control Room Emergency Ventilation to one train in operation within 30 minutes of actuation. REFER TO SOP-505, CONTROL BUILDING VENTILATION SYSTEM. 3 MONITOR SPENT FUEL COOLING Periodically check status of Spent Fuel Cooling by monitoring the following throughout event recovery: • Spent Fuel Pool level. • Spent Fuel Pool temperature.	EOP-1.0 See step 11 note for RCP Trip Criteria
IOA	RO	1 Verify Reactor Trip: • Trip the Reactor using either Reactor Trip Switch. • Verify all Reactor Trip and Bypass Breakers are open. • Verify all Rod Bottom Lights are lit. • Verify Reactor Power level is decreasing.	EOP-1.0
IOA	BOP	2 Verify Turbine/Generator Trip: a. Verify all Turbine STM STOP VLVs are closed. b. Ensure Generator Trip (after 30 second delay): 1) Ensure the GEN BKR is open. 2) Ensure the GEN FIELD BKR is open. 3) Ensure the EXC FIELD CNTRL is tripped.	EOP-1.0
IOA	BOP	3 Verify both ESF buses are energized.	EOP-1.0

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8		Page: 34 of 49	
Event Description: LOCA Outside the Reactor Building, SI Train “A” Actuation Failure, “A” Chg Pp Trip, “B” CHG/SI Auto-Start Failure.					

Time	Position	Applicant’s Actions or Behavior	
IOA	RO	4 Check if SI is actuated: a. Check if either: • SI ACT status light is bright on XCP-6107 1-1. OR • Any red first-out SI annunciator is lit on XCP-626 top row. b. Actuate SI using either SI ACTUATION Switch. c. GO TO Step 6.	EOP-1.0
EVALUATOR NOTE: The CRS may direct that SI be actuated during or after this step based on the instruction in AOP-101.1 to actuate SI following the EOP-1.0, Immediate Operator Actions.			
IOA	RO	**5** Check if SI is required: a. Check if any of the following conditions exist: • PZR pressure LESS THAN 1850 psig. OR • RB pressure GREATER THAN 3.6 psig. OR • Steamline pressure LESS THAN 675 psig. OR • Steamline differential pressure GREATER THAN 97 psid.	EOP-1.0
	RO	b. Actuate SI using either SI ACTUATION Switch.	EOP-1.0
EVALUATOR NOTE: • “A” Train Actuation is failed. The BOP will need to manually align the “A” Train Components to their SI condition in accordance with Attachment 3. • SI Actuation is a Trigger to trip the “A” Charging/SI pump. • The “B” Charging/SI pump will not Auto-Start on SI. • Attachment 3, SI Equipment Verification, is included as an attachment to this guide on page 42.			

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Event Description: LOCA Outside the Reactor Building, SI Train “A” Actuation Failure, “A” Chg Pp Trip, “B” CHG/SI Auto-Start Failure.

Time	Position	Applicant’s Actions or Behavior	
BOOTH OPERATOR: If contacted about the “A” Charging Pump Trip wait 2 minutes and report that the breaker is tripped. If contacted to align the “C” CHG/SI wait 1 minute: • Use LOA-CVC041 to rack-down “A” CHG/SI. • Report the “C” CHG/SI breaker will not rack-up. • Acknowledge requests for support.			
	BOP	6 Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.	EOP-1.0
	Crew	7 Announce plant conditions over the page system.	EOP-1.0
*	RO	8 Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen.	EOP-1.0
*	RO	9 Check RCS temperature: • With any RCP running, RCS Tavg is stable at OR trending to 557°F. OR • With no RCP running, RCS Tcold is stable at OR trending to 557°F.	EOP-1.0
	RO	10 Check PZR PORVs and Spray Valves: a. PZR PORVs are closed. b. PZR Spray Valves are closed. c. Verify power is available to at least one PZR PORV Block Valve: • MVG-8000A, RELIEF 445 A ISOL. • MVG-8000B, RELIEF 444 B ISOL. • MVG-8000C, RELIEF 445 B ISOL. d. Verify at least one PZR PORV Block Valve is open.	EOP-1.0
<u>NOTE - Step 11</u> Seal Injection flow should be maintained to all RCPs.			EOP-1.0

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8	Page: 36 of 49
Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.			

Time	Position	Applicant's Actions or Behavior	
	RO	11 Check if RCPs should be stopped: a. Check if either of the following criteria is met: • Annunciator XCP-612 4-2 is lit (PHASE B ISOL). OR • RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM.	EOP-1.0
EVALUATOR NOTE: In accordance with OAP-134.4, EOP/AOP User's Guide, RCP Trip Criteria for RCS pressure less than 1418 psig with SI flow do not apply in an event initiated from Mode 2.			
	RO	b. Stop all RCPs.	EOP-1.0
	RO	12 Verify no SG is FAULTED: • No SG pressure is decreasing in an uncontrolled manner. • No SG is completely depressurized.	EOP-1.0
	RO	13 Verify Secondary radiation levels indicate SG tubes are NOT RUPTURED: • RM-G19A(B)(C), STMLN HI RNG GAMMA. • RM-A9, CNDSR EXHAUST GAS ATMOS MONITOR. • RM-L3, STEAM GENERATOR BLOWDOWN LIQUID MONITOR. • RM-L10, SG BLOWDOWN CW DISCHARGE LIQUID MONITOR.	EOP-1.0
	RO	14 Check if the RCS is INTACT: a. RB radiation levels are normal on: • RM-G7, CNTMT HI RNG GAMMA. • RM-G18, CNTMT HI RNG GAMMA. b. RB Sump levels are normal. c. RB pressure is LESS THAN 1.5 psig. d. The following annunciators are NOT lit: • XCP-606 2-2 (RBCU 1A/2A DRN FLO HI). • XCP-607 2-2 (RBCU 1B/2B DRN FLO HI).	EOP-1.0

Op Test No:	NRC-ILO-13-01	Scenario #	1	Event #	8	Page:	37	of	49

Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.

Time	Position	Applicant's Actions or Behavior	
	RO	15 Reset both SI RESET TRAIN A(B) Switches.	EOP-1.0
	RO	16 Reset Containment Isolation: • RESET PHASE A - TRAIN A(B) CNTMT ISOL. • RESET PHASE B - TRAIN A(B) CNTMT ISOL.	EOP-1.0
	RO	17 Place both ESF LOADING SEQ A(B) RESETS to: a. NON-ESF LCKOUTS. b. AUTO-START BLOCKS.	EOP-1.0
	RO	18 Establish Instrument Air to the RB: a. Start one Instrument Air Compressor and place the other in Standby. b. Open PVA-2659, INST AIR TO RB AIR SERV. c. Open PVT-2660, AIR SPLY TO RB.	EOP-1.0
	RO	19 Check if SI flow should be reduced: a. RCS subcooling on TI-499A(B), A(B) TEMP °F, is GREATER THAN 52.5°F. b. Secondary Heat Sink is adequate: • Total EFW flow to the SGs is GREATER THAN 450 gpm. OR • Narrow Range level is GREATER THAN 26% in at least one SG. c. RCS pressure is stable OR increasing. **(NO)** **<u>ALTERNATIVE ACTION</u>** c. GO TO Step 20.	EOP-1.0

NOTE - Step 20 (EOP-1.0)

Procedures referenced in EOP-12.0, MONITORING OF CRITICAL SAFETY FUNCTIONS, may now be implemented.

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8	Page: 38 of 49

Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.

Time	Position	Applicant's Actions or Behavior	
	CRS	20 Initiate monitoring of the Critical Safety Function Status Trees. REFER TO EOP-12.0, MONITORING OF CRITICAL SAFETY FUNCTIONS.	EOP-1.0
*	RO	21 Check SG levels: a. Verify Narrow Range level in all SGs is GREATER THAN 26%. b. Control EFW flow to maintain Narrow Range SG levels between 40% and 60%.	EOP-1.0
BOOTH OPERATOR: Acknowledge request to sample SGs.			
	RO	22 Check if Secondary activity is normal: a. Place SVX-9398A(B)(C), SG A(B)(C) SMPL ISOL, in AUTO. b. Notify Chemistry to sample all SG secondary sides for abnormal activity.	EOP-1.0
	CRS	23 Check for loss of Reactor Coolant outside Containment: a. Verify AB radiation levels are normal on: **(NO)** • RM-A3, MAIN PLANT VENT EXH ATMOS MONITOR: PARTICULATE, IODINE, GAS. • RM-A13, PLANT VENT HI RANGE. • RM-A11, AB VENT GAS ATMOS MONITOR. • Local area monitors. b. Verify annunciator XCP-631 6-1 is NOT lit (AB SMP LVL HI). c. Verify annunciators XCP-606 3-4 and XCP-607 3-4 are NOT lit (LD TRBL AB SMP/FLDRN LVL HI). **ALTERNATIVE ACTION** 23 Evaluate the cause of abnormal AB conditions. IF the cause is a loss of RCS inventory outside Containment, THEN GO TO EOP-2.5, LOCA OUTSIDE CONTAINMENT, Step 1.	EOP-1.0
	CRS	Transition to EOP-2.5, LOCA OUTSIDE CONTAINMENT, Step 1.	

Op Test No:	NRC-ILO-13-01	Scenario #	1	Event #	8	Page:	39	of	49

Event Description: LOCA Outside the Reactor Building, SI Train “A” Actuation Failure, “A” Chg Pp Trip, “B” CHG/SI Auto-Start Failure.

Time	Position	Applicant’s Actions or Behavior	
		NOTE • As valves are isolated, it may be necessary to monitor RCS pressure for a period of time to determine if the leak is isolated. • Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.	
	Crew	1 Announce plant conditions over the page system.	EOP-2.5
	RO	2 Ensure the following are closed: a. RHR Pump Suction Valves from the RCS: 1) MVG-8701A and MVG-8702A, RCS LP A TO PUMP A (Status Lights XCP-6106 1-11(2-11)), for Train A. 2) MVG-8701B and MVG-8702B, RCS LP C TO PUMP B (Status Lights XCP-6106 1-12(2-12)), for Train B. b. Other paths out of Containment: • 1) Normal Letdown Isolation:PVT-8149A(B)(C), LTDN ORIFICE A(B)(C) ISOL. • PVT-8152, LTDN LINE ISOL. 2) RCP Seal Return Isolation: • MVT-8100, SEAL WTR RTN ISOL. • MVT-8112, SEAL WTR RTN ISOL. 3) PZR Sample Isolation: • SVX-9356A, PZR STM SMPL ISOL. • SVX-9356B, PZR LIQ SMPL ISOL. 4) RCS Loop B Sample Isolation: • SVX-9364B, RCS LP B SMPL ISOL. • SVX-9365B, RCS LP B SMPL ISOL. 5) RCS Loop C Sample Isolation: • SVX-9364C, RCS LP C SMPL ISOL. • SVX-9365C, RCS LP C SMPL ISOL.	EOP-2.5
	RO	3 Check if RCS pressure is continuing to decrease.	EOP-2.5

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8	Page: 40 of 49
Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.			

Time	Position	Applicant's Actions or Behavior	
	RO	4 Try to identify and isolate the break: a. Close MVG-8888A, RHR LP A TO COLD LEGS. b. Check if RCS pressure is continuing to decrease. c. Open MVG-8888A, RHR LP A TO COLD LEGS.	EOP-2.5
EVALUATOR NOTE: The following step isolates the leak from the RCS.			
CRITICAL TASK	RO	d. Close MVG-8888B, RHR LP B TO COLD LEGS. e. Check if RCS pressure is continuing to decrease. **(NO)** **<u>ALTERNATIVE ACTION</u>** e. GO TO EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.	EOP-2.5
	CRS	Direct the implementation of EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.	

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8	Page: 41 of 49
Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.			

Time	Position	Applicant's Actions or Behavior

REFERENCE PAGE FOR EOP-2.0

EOP-2.0

1 SI REINITIATION CRITERIA
IF either of the following conditions occurs, THEN start Charging Pumps and operate valves as necessary:

- RCS subcooling on TI-499A(B), A(B) TEMP °F, is LESS THAN 52.5°F [67.5°F].
- PZR level can NOT be maintained GREATER THAN 10% [28%].

2 RCP TRIP CRITERIA
IF either of the following criteria is met, THEN trip all RCPs:

- Annunciator XCP-612 4-2 is lit (PHASE B ISOL).
- RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM.

See note on next page for RCP Trip Criteria

3 SECONDARY INTEGRITY TRANSITION CRITERIA
IF any unisolated SG pressure is decreasing in an uncontrolled manner OR is completely depressurized, THEN GO TO EOP-3.0, FAULTED STEAM GENERATOR ISOLATION, Step 1.

4 TUBE RUPTURE TRANSITION CRITERIA
IF any SG level increases in an uncontrolled manner OR if any SG has abnormal radiation, THEN start Charging Pumps and operate valves as necessary, and GO TO EOP-4.0, STEAM GENERATOR TUBE RUPTURE, Step 1.

5 COLD LEG RECIRCULATION TRANSITION CRITERION
IF RWST level decreases to LESS THAN 18%, THEN GO TO EOP-2.2, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

6 LOSS OF EMERGENCY COOLANT RECIRCULATION TRANSITION CRITERION
IF Emergency Coolant Recirculation is established and subsequently lost, THEN GO TO EOP-2.4, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

7 REDUCING CONTROL ROOM EMERGENCY VENTILATION
Reduce Control Room Emergency Ventilation to one train in operation within 30 minutes of actuation. REFER TO SOP-505, CONTROL BUILDING VENTILATION SYSTEM.

NOTE

EOP-2.0

- The EOP REFERENCE PAGE should be monitored throughout the use of this procedure.
- Seal Injection flow should be maintained to all RCPs.
- Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.

EVALUATOR NOTE: If flow has been High Head Safety Injection flow has been established with RCS pressure < 1418 psig and the RCPs are running they should be stopped in the following step.

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8	Page: 42 of 49
Event Description: LOCA Outside the Reactor Building, SI Train “A” Actuation Failure, “A” Chg Pp Trip, “B” CHG/SI Auto-Start Failure.			

Time	Position	Applicant’s Actions or Behavior	
EVALUATOR NOTE: In accordance with OAP-134.4, EOP/AOP User’s Guide, RCP Trip Criteria for RCS pressure less than 1418 psig with SI flow do not apply in an event initiated from Mode 2.			
	RO	1 Check if RCPs should be stopped: a. Check if either of the following criteria is met: • Annunciator XCP-612 4-2 is lit (PHASE B ISOL). OR • RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. b. Stop all RCPs.	EOP-2.0
	RO	2 Verify no SG is FAULTED: • No SG pressure is decreasing in an uncontrolled manner. • No SG is completely depressurized.	EOP-2.0
*	RO	3 Check INTACT SG levels: a. Verify Narrow Range level in INTACT SGs is GREATER THAN 26%. b. Control EFW flow to maintain Narrow Range level in each INTACT SG between 40% and 60%.	EOP-2.0
	RO	4 Reset both SI RESET TRAIN A(B) Switches.	EOP-2.0
	RO	5 Reset Containment Isolation: • RESET PHASE A - TRAIN A(B) CNTMT ISOL. • RESET PHASE B - TRAIN A(B) CNTMT ISOL.	EOP-2.0

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8	Page: 43 of 49

Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.

Time	Position	Applicant's Actions or Behavior	
	RO	6 Check if Secondary radiation levels are normal: a. Check radiation levels normal on: • RM-G19A(B)(C), STMLN HI RNG GAMMA. • RM-A9, CNDSR EXHAUST GAS ATMOS MONITOR. • RM-L3, STEAM GENERATOR BLOWDOWN LIQUID MONITOR. • RM-L10, SG BLOWDOWN CW DISCHARGE LIQUID MONITOR. b. Place SVX-9398A(B)(C), SG A(B)(C) SMPL ISOL, in AUTO. c. Notify Chemistry to sample all SG secondary sides, and screen samples for abnormal activity using a frisker.	EOP-2.0
*	RO	7 Check PZR PORVs and Block Valves: a. Verify power is available to the PZR PORV Block Valves: 1) MVG-8000A, RELIEF 445 A ISOL. 2) MVG-8000B, RELIEF 444 B ISOL. 3) MVG-8000C, RELIEF 445 B ISOL.	EOP-2.0
CAUTION - Step 7.b If any PZR PORV opens because of high PZR pressure, Step 7.b should be repeated after pressure decreases to LESS THAN 2330 psig, to ensure the PORV recloses.			EOP-2.0
	RO	b. Verify all PZR PORVs are closed. c. Verify at least one PZR PORV Block Valve is open.	EOP-2.0
	RO	8 Place both ESF LOADING SEQ A(B) RESETS to: a. NON-ESF LCKOUTS. b. AUTO-START BLOCKS.	EOP-2.0
	RO	9 Establish Instrument Air to the RB: a. Start one Instrument Air Compressor and place the other in Standby. b. Open PVA-2659, INST AIR TO RB AIR SERV. c. Open PVT-2660, AIR SPLY TO RB.	EOP-2.0

Op Test No: NRC-ILO-13-01 Scenario # 1 Event # 8 Page: 44 of 49

Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.

Time	Position	Applicant's Actions or Behavior	
*	RO	10 Check if SI flow should be reduced: a. RCS subcooling on TI-499A(B), A(B) TEMP °F, is GREATER THAN 52.5°F. b. Secondary Heat Sink is adequate: • Total EFW flow to INTACT SGs is GREATER THAN 450 gpm. OR • Narrow Range level is GREATER THAN 26% in at least one INTACT SG. c. RCS pressure is stable OR increasing.	EOP-2.0
NOTE - Step 10.d If PZR level is LESS THAN 10% [28%], the PZR should refill from SI flow after pressure is stabilized.			EOP-2.0
	RO	d. PZR level is GREATER THAN 10%.	EOP-2.0
	RO	e. GO TO EOP-1.2, SAFETY INJECTION TERMINATION, Step 1.	EOP-2.0

REFERENCE PAGE FOR EOP-1.2 (EOP-1.2)

1 SI REINITIATION CRITERIA
Following SI termination, IF either of the following conditions occurs, THEN start Charging Pumps and operate valves as necessary, and GO TO EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1:

- RCS subcooling on TI-499A(B), A(B) TEMP °F, is LESS THAN 52.5°F [67.5°F].
  OR
- PZR level can NOT be maintained GREATER THAN 10% [28%].

2 SECONDARY INTEGRITY TRANSITION CRITERIA
IF any unisolated SG pressure is decreasing in an uncontrolled manner OR is completely depressurized, THEN GO TO EOP-3.0, FAULTED STEAM GENERATOR ISOLATION, Step 1.

3 REDUCING CONTROL ROOM EMERGENCY VENTILATION
Reduce Control Room Emergency Ventilation to one train in operation within 30 minutes of actuation. REFER TO SOP-505, CONTROL BUILDING VENTILATION SYSTEM.

NOTE (EOP-1.2)
The EOP REFERENCE PAGE should be monitored throughout the use of this procedure.

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8	Page: 45 of 49

Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.

Time	Position	Applicant's Actions or Behavior	
	RO	1 Stop all but one Charging Pump and place in Standby.	EOP-1.2
	RO	2 Verify RCS pressure is stable OR increasing.	EOP-1.2
	RO	3 Establish Normal Charging: a. Close FCV-122, CHG FLOW. b. Open both MVG-8107 and MVG-8108, CHG LINE ISOL. c. Adjust FCV-122, CHG FLOW, to obtain 70 gpm Charging flow. d. Close both MVG-8801A(B), HI HEAD TO COLD LEG INJ.	EOP-1.2
	RO	4 Control FCV-122, CHG FLOW, to maintain PZR level.	EOP-1.2
	RO	5 Check if RHR Pumps should be stopped: a. Check if any RHR Pump is running with suction aligned to the RWST. b. Stop any RHR Pump which is running with suction aligned to the RWST and place in Standby.	EOP-1.2
	RO	6 Verify SI flow is NOT required: a. RCS subcooling on TI-499A(B), A(B) TEMP °F, is GREATER THAN 52.5°F. b. PZR level is GREATER THAN 10%.	EOP-1.2

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # 8	Page: 46 of 49
Event Description: LOCA Outside the Reactor Building, SI Train "A" Actuation Failure, "A" Chg Pp Trip, "B" CHG/SI Auto-Start Failure.			

Time	Position	Applicant's Actions or Behavior
	RO	7 Check if Letdown can be established: a. Verify PZR level is GREATER THAN 22%. b. Establish Normal Letdown: 1) Adjust FCV-122, CHG FLOW, to obtain 70 gpm Charging flow. 2) Set PCV-145, LO PRESS LTDN, to 70%. 3) Open TCV-144, CC TO LTDN HX. 4) Open PVT-8152, LTDN LINE ISOL. 5) Open both LCV-459 and LCV-460, LTDN LINE ISOL. 6) Open desired Orifice Isolation Valve(s) to obtain 60 gpm to 120 gpm: • PVT-8149A, LTDN ORIFICE A ISOL (45 gpm). • PVT-8149B, LTDN ORIFICE B ISOL (60 gpm). • PVT-8149C, LTDN ORIFICE C ISOL (60 gpm). 7) Adjust FCV-122, CHG FLOW, to maintain TI-140, REGEN HX OUT TEMP °F, between 250°F and 350°F while maintaining PZR level. 8) Adjust PCV-145, LO PRESS LTDN, to maintain PI-145, LO PRESS LTDN PRESS PSIG, between 300 psig and 400 psig. 9) Place PCV-145, LO PRESS LTDN, in AUTO. 10) Place TCV-144, CC TO LTDN HX, in AUTO.
EVALUATOR NOTE: Terminate scenario after normal charging and letdown is established.		

EOP-1.2

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # NA	Page: 47 of 49
Event Description: SI Equipment Verification (ATTACHMENT 3)			

Time	Position	Applicant's Actions or Behavior	
EVALUATOR NOTE: Due to the Failure of Safety Injection Train "A" Actuation, Train "A" Pumps and Valves will need to be manually positioned to their required condition.			
	BOP	1 Ensure EFW Pumps are running: a. Ensure both MD EFW Pumps are running. b. Verify the TD EFW Pump is running if necessary to maintain SG levels.	EOP-1.0 Attachment 3
	BOP	2 Ensure the following EFW valves are open: • FCV-3531(3541)(3551), MD EFP TO SG A(B)(C). • FCV-3536(3546)(3556), TD EFP TO SG A(B)(C). • MVG-2802A(B), MS LOOP B(C) TO TD EFP.	Attachment 3
	BOP	3 Verify total EFW flow is GREATER THAN 450 gpm.	Attachment 3
	BOP	4 Ensure FW Isolation: a. Ensure the following are closed: • FW Flow Control, FCV-478(488)(498). • FW Isolation, PVG-1611A(B)(C). • FW Flow Control Bypass, FCV-3321(3331)(3341). • SG Blowdown, PVG-503A(B)(C). • SG Sample, SVX-9398A(B)(C). b. Ensure all Main FW Pumps are tripped.	Attachment 3
EVALUATOR NOTE: It is a critical task to start the "B" Charging Pump, if it has not been previously started, to provide High Head Safety Injection.			
CRITICAL TASK	BOP	5 Ensure SI Pumps are running: • Two Charging Pumps are running. • Both RHR Pumps are running.	Attachment 3
	BOP	6 Ensure two RBCU Fans are running in slow speed (one per train).	Attachment 3

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # NA	Page: 48 of 49
Event Description: SI Equipment Verification (ATTACHMENT 3)			

Time	Position	Applicant's Actions or Behavior	
	BOP	7 Verify Service Water to the RBCUs: a. Ensure two Service Water Pumps are running. b. Verify both Service Water Booster Pumps A(B) are running. c. Verify GREATER THAN 2000 gpm flow for each train on: • FI-4466, SWBP A DISCH FLOW GPM. • FI-4496, SWBP B DISCH FLOW GPM.	Attachment 3
	BOP	8 Verify two CCW Pumps are running.	Attachment 3
	BOP	9 Ensure two Chilled Water Pumps and Chillers are running.	Attachment 3
	BOP	10 Verify both trains of Control Room Ventilation are running in Emergency Mode.	Attachment 3
	BOP	11 Check if Main Steamlines should be isolated: a. Check if any of the following conditions are met: • RB pressure GREATER THAN 6.35 psig. OR • Steamline pressure LESS THAN 675 psig. OR • Steamline flow GREATER THAN 1.6 MPPH AND Tavg LESS THAN 552°F. b. Ensure all the following are closed: • MS Isolation Valves, PVM-2801A(B)(C). • MS Isolation Bypass Valves, PVM-2869A(B)(C).	Attachment 3
	BOP	12 Ensure Excess Letdown Isolation Valves are closed: • PVT-8153, XS LTDN ISOL. • PVT-8154, XS LTDN ISOL.	Attachment 3
	BOP	13 Verify ESF monitor lights indicate Phase A AND Containment Ventilation Isolation on XCP-6103, 6104, and 6106. REFER TO ATTACHMENT 4, CONTAINMENT ISOLATION VALVE MCB STATUS LIGHT LOCATIONS, as needed.	Attachment 3

Op Test No: NRC-ILO-13-01	Scenario # 1	Event # NA	Page: 49 of 49
Event Description: SI Equipment Verification (ATTACHMENT 3)			

Time	Position	Applicant's Actions or Behavior	
	BOP	14 Verify proper SI alignment: a. Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104.	Attachment 3
	BOP	b. Verify all SAFETY INJECTION monitor lights are dim on XCP-6106. c. Verify SI flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. d. Check if RCS pressure is LESS THAN 325 psig. **(NO)** **ALTERNATIVE ACTION** d. ATTACHMENT 3, SI EQUIPMENT VERIFICATION, is complete.	Attachment 3
	BOP	Report completion of Attachment 3.	
EVALUATOR NOTE: ATTACHMENT 3 is complete.			

TURNOVER NOTES
(read at the start of the scenario)

Turnover Notes
Mode 2 // 10E-3% Power // Work Week B1 // 2 Trains VU // EOOS: Yellow (LOSP x 2 Thunderstorms and ASI) // Grid Risk: Red // FEP Risk: Green The plant has completed a Mid-Cycle outage to repair a steam leak on the turbine. The Reactor is critical at 10^{-3} % power. Critical Data has been recorded. Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102. The secondary has been warmed and the MSIVs are open. The National Weather Service has issued a Severe Weather Warning for Richland, Fairfield and Kershaw counties for the next one hour. Current RCS Boron Concentration by chemistry sample is 652 ppm. The BOP will be directed to start the 2B RBCU and then stop the 1B RBCU following turnover due to a request from Engineering. GOP-3, Reactor Startup From Hot Standby To Startup (Mode 3 to Mode 2) to step 3.14 GOP-4A Power Operation (Mode 1 - Ascending) has been started. Continue the Reactor Startup.

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CONTROL ROOM SUPERVISOR RELIEF CHECKLIST

DATE/TIME: today

RELIEF SECTION

Turnover Notes
Mode 2 // 10E-3% Power // Work Week B1 // 2 Trains VU // EOOS: Yellow (LOSP x 2 Thunderstorms and ASI) // Grid Risk: Red // FEP Risk: Green The plant has completed a Mid-Cycle outage to repair a steam leak on the turbine. The Reactor is critical at 10^{-3} % power. Critical Data has been recorded. Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102. The secondary has been warmed and the MSIVs are open. The National Weather Service has issued a Severe Weather Warning for Richland, Fairfield and Kershaw counties for the next one hour. Current RCS Boron Concentration by chemistry sample is 652 ppm. The BOP will be directed to start the 2B RBCU and then stop the 1B RBCU following turnover due to a request from Engineering. GOP-3, Reactor Startup From Hot Standby To Startup (Mode 3 to Mode 2) to step 3.14 GOP-4A Power Operation (Mode 1 - Ascending) has been started. Continue the Reactor Startup.

Offgoing Control Room Supervisor	
Operations in progress (GOPs, SOPs, load changes, etc.):	
GOP-3, Reactor Startup From Hot Standby To Startup (Mode 3 to Mode 2) to Step 3.14 with additional steps completed as possible	
GOP-4A, Power Operation (Mode 1 - Ascending), has been started	
Operations scheduled for oncoming shifts:	
Direct the BOP to start the 2B RBCU and then stop the 1B RBCU following turnover due to a request from Engineering.	
Continue up-power in accordance with the reactivity plan	
Plant safeguard systems in degraded status:	
	Initials
In the Control Room, all books are replaced, the desk and console tops are clear, and all trash is properly disposed of.	CRS
Station Log completed.	CRS

Oncoming Control Room Supervisor			**Initials**
Oncoming watch has reviewed the VCS Switchgear mailbox for switching orders.			
Plant Status (to be completed prior to turnover):			
	Plant ESF System Status:		
	Component Cooling System		
	Service water System		
	Reactor Building Cooling System		
	Reactor Building Spray System		
	Accumulator Tanks		
	RHR System		
	Charging/Safety Injection System Emergency Feedwater System		
	Accumulator Tanks		
	Diesel Generator		
	Chilled Water System		
	Control Room Ventilation System		
	Position indications, power availability, and annunciator alarms are normal for present plant conditions.		
	Plant Parameters	Limit	
	Reactor Power	0-100%	
	RCS Tavg	≤589.2°F per loop	
	RCS Pressure	<2385 psig	
	RCS Flow	>100% per loop	
	RCS Subcooling	Normal	
All parameters within allowable limits for plant conditions. If not, what actions are being taken to correct conditions:			
	Review of Logs:		
	Station Log		
	Removal and Restoration Log		
	Tagout Log		
	Special Orders		
Shift Turnover (to be completed during turnover):			
	Briefing on plant conditions by offgoing Control Room Supervisor.		
	Review of SPDS and BISI displays.		
	Discussion of Protected Equipment.		
	Identification of in-progress procedures including their present status and locations.		

C02→	To the best of my knowledge, I am fully qualified to assume this watch taking into consideration fitness for duty, requalification status, and minimum watchstanding qualification.	
Shift relief completed:	Oncoming Control Room Supervisor	
	Offgoing Control Room Supervisor	CR Supervisor
	Shift Supervisor review	

REACTOR OPERATOR RELIEF CHECKLIST

DATE/TIME: today

LOG SECTION

Date	Entry

RELIEF SECTION

Turnover Notes
Mode 2 // 10E-3% Power // Work Week B1 // 2 Trains VU // EOOS: Yellow (LOSP x 2 Thunderstorms and ASI) // Grid Risk: Red // FEP Risk: Green The plant has completed a Mid-Cycle outage to repair a steam leak on the turbine. The Reactor is critical at 10^{-3} % power. Critical Data has been recorded. Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102. The secondary has been warmed and the MSIVs are open. The National Weather Service has issued a Severe Weather Warning for Richland, Fairfield and Kershaw counties for the next one hour. Current RCS Boron Concentration by chemistry sample is 652 ppm. The BOP will be directed to start the 2B RBCU and then stop the 1B RBCU following turnover due to a request from Engineering. GOP-3, Reactor Startup From Hot Standby To Startup (Mode 3 to Mode 2) to step 3.14 GOP-4A Power Operation (Mode 1 - Ascending) has been started. Continue the Reactor Startup.

Offgoing Reactor Operator	Initials
Main Control Board (Reactor Operator portion) properly aligned for the applicable mode.	RO
Housekeeping is satisfactory in the Reactor Operator area of responsibility.	RO
Discussion of Protected Equipment.	RO

Oncoming Reactor Operator	Initials
Review of HVAC Panel.	
Review of Station Log.	
Review of Removal & Restoration Log.	
Review of Main Control Board Panels.	

System Alignment	A	B	C	Train aligned to	Reasons for any inoperable equipment
Service Water Pumps	X	X		A	
Component Cooling Pumps	X			A	
Charging Pumps	X			A	
HVAC Chillers	X	X		A	
Reactor Building Spray Pumps					
RHR Pumps					
			TDEFP		

Emergency Feedwater Pumps					
Inoperable Radiation Monitors					

C02→	To the best of my knowledge, I am fully qualified to assume this watch taking into consideration fitness for duty, requalification status, and minimum watchstanding qualification.	
Shift relief completed:	Oncoming Reactor Operator	
	Offgoing Reactor Operator	Reactor Operator
	Shift Supervisor review	

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BALANCE OF PLANT RELIEF CHECKLIST

Date	Entry

RELIEF SECTION

Turnover Notes

Mode 2 // 10E-3% Power // Work Week B1 // 2 Trains VU // EOOS: Yellow (LOSP x 2 Thunderstorms and ASI) // Grid Risk: Red // FEP Risk: Green

The plant has completed a Mid-Cycle outage to repair a steam leak on the turbine.

The Reactor is critical at 10^{-3} % power. Critical Data has been recorded.

Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102.

The secondary has been warmed and the MSIVs are open.

The National Weather Service has issued a Severe Weather Warning for Richland, Fairfield and Kershaw counties for the next one hour.

Current RCS Boron Concentration by chemistry sample is 652 ppm.

The BOP will be directed to start the 2B RBCU and then stop the 1B RBCU following turnover due to a request from Engineering.

GOP-3, Reactor Startup From Hot Standby To Startup (Mode 3 to Mode 2) to step 3.14

GOP-4A Power Operation (Mode 1 - Ascending) has been started.

Continue the Reactor Startup.

Offgoing Reactor Operator	Initials
Main Control Board (Reactor Operator portion) properly aligned for the applicable mode.	BOP
Housekeeping is satisfactory in the Reactor Operator area of responsibility.	BOP
Discussion of Protected Equipment.	BOP

Oncoming Reactor Operator	Initials
Review of Main Control Room Panels.	
Review of Station Log.	
Review of Removal & Restoration Log.	
Test annunciator lights (with Offgoing operator concurrence).	

C02→	To the best of my knowledge, I am fully qualified to assume this watch taking into consideration fitness for duty, requalification status, and minimum watchstanding qualification.	
Shift relief completed:	Oncoming Balance of Plant	
	Offgoing Balance of Plant	Balance of Plant
	Shift Supervisor review	

REACTIVITY MANAGEMENT BRIEF MODES 1 - 3

NOTE

PART 1 REACTIVITY MANAGEMENT TURNOVER should be read at Shift Turnover Meeting.

PART 2 REACTOR STATUS should be discussed between the NROATC, BOP, and CRS.

PART 1 **REACTIVITY MANAGEMENT TURNOVER:**

- Date of last Automatic or Manual Make-Up: today
- Is Auto Makeup expected this shift (circle)? YES NO
- Expected Boric Acid total gallons on a normal Auto Makeup based on current BAT in service: 25 gallons
- FCV 113 A&B, pot setting for current RCS boron concentration: 2.80
- Expected Boric Acid flowrate for VCT makeup: 12
- Total gallons Diluted 0 Borated 0 (Last Shift)
- Last evolution (circle one): Borate / Dilute / Blended
- Expected Borations, Dilutions, or Blended changes to the RCS:
- List Reactivity Concerns in progress or planned and action(s) necessary (i.e. Steam or Feed Flow transmitter in test, Steam Generator Blowdown out of service, Calorimetric inputs in service, etc.).

Rx Startup and Power ascension

REACTIVITY MANAGEMENT BRIEF MODES 1 – 3 (Cont'd)

PART 2 **REACTOR STATUS:** (circle one below)

- Delta I on Target (± 2%)? YES NO Not in Mode 1

  If NO is circled, identify plan to re-establish target band: ____________________

  ____

  ____

- Xenon Trend: Stable Building In Burning Out

- Demineralizers:

  Mixed Bed in service: A B PRC01 Y / N

  Standby Demineralizer: Filled Borated Empty PRC01

  Cation Bed: Date last in service 2 weeks ago

  Boron Concentration when in service 255

- ATTACHMENT IA reviewed and current: YES NO

- Midnight Boron Concentration and Date when CHG/SI pump was secured:

  C_B A ____________________ Date ____________________

  C_B B 652 Date 3 days ago

  C_B C 250 Date 1 month ago

CHG G

CYCLE 22 PLAN# 2015 - TRNG

REACTIVITY MANAGEMENT PLAN VERIFICATION

BEACON Filenames:

Model Input filename	training
Summary Results filename	training
Calibration filename	training
Power Profile filename	training

Sign and date steps below to document performance.

Step Number	Signature	Date
*3.0 Prerequisites	Signature 1	today
*7.36 Verify 9.0 Criteria	Signature 1	today
*7.38 RE Verifier	RE Signature	today
*7.39 Operations Reviewer	Ops Signature	today

COMMENTS

CYCLE 22 PLAN# 2015 - TRNG

REACTIVITY MANAGEMENT PLAN VERIFICATION

OPERATIONS GUIDELINES FOR CYCLE 22 MID-CYCLE STARTUP

INITIAL CONDITIONS AND ASSUMPTIONS:

- Reactor is at 2% RTP
- Burnup is approximately 20,000 MWD/MTU
- RCS Boron is approximately 652 ppm
- D Bank is approximately 110 steps

TRANSIENT ASSUMPTIONS:
Change power per Attachment II schedule

PREDICTION CONSTRAINTS:

- Use control bank D and boron for reactivity compensation.
- Maintain Control Bank D position at least 15 steps above RIL.

Note: See attached predictive trends. (BEACON predicted xenon will NOT match the xenon displayed on the plant computer.)

Contact the following if there are questions about this guidance:

Reactor Engineering	**office**	**pager**
Mike Strickland	54625	251-5767
Damon Bryson	54814	733-7618
Nate Smith	54733	758-8590
Bill Herwig	54414	540-9111

CYCLE 22 PLAN# 2015 - TRNG

REACTIVITY MANAGEMENT PLAN VERIFICATION

PROPOSED POWER MANEUVER

Time after Start	Reactor Power	Comments (e.g. control rod or boron issues, activities to be performed, holds, etc.)
00:00	2%	Begin startup
31:00	100%	100% power

COMMENTS – list power plateau activities, unusual operational restraints, contingency plans, alternate power history variations to address, time periods to avoid boration, etc.

This plan increases power continuously at 3% per hour until 100% power.

Cycle 22 Simulator 20k MWD/MTU Startup 2-100%

Hours After Start	Rx Power	D Bank Pos	Boron PPM	Boron (gal)	Water (gal)	Total Boron (gal)	Total Water (gal)	Delta-I (%)	RAOC Band Low	RAOC Band High	Xenon Worth (pcm)	RIL Limit (steps)
0.00	2%	110	652.2	0	0	0	0	1.03	-22.0	20.0	0	0
0.25	4%	110	646.4	0	448	0	448	2.04	-22.0	20.0	-1	0
0.50	6%	126	646.4	0	0	0	448	2.47	-22.0	20.0	-4	2
0.75	8%	134	646.4	0	0	0	448	3.06	-22.0	20.0	-7	6
1.00	10%	143	646.4	0	0	0	448	3.60	-22.0	20.0	-10	10
1.25	11%	149	646.4	0	0	0	448	4.26	-22.0	20.0	-15	13
1.50	13%	155	646.4	0	0	0	448	4.96	-22.0	20.0	-21	17
1.75	15%	161	646.4	0	0	0	448	5.68	-22.0	20.0	-29	21
2.00	15%	162	646.4	0	0	0	448	5.69	-22.0	20.0	-37	21
2.25	16%	164	646.4	0	0	0	448	6.02	-22.0	20.0	-46	22
2.50	17%	167	646.4	0	0	0	448	6.37	-22.0	20.0	-56	24
2.75	17%	170	646.4	0	0	0	448	6.80	-22.0	20.0	-67	25
3.00	18%	173	646.4	0	0	0	448	7.30	-22.0	20.0	-79	27
3.25	19%	159	627.3	0	1513	0	1961	5.82	-22.0	20.0	-88	28
3.50	20%	140	608.8	0	1514	0	3475	4.46	-22.0	20.0	-98	30
3.75	20%	118	590.7	0	1514	0	4989	4.16	-22.0	20.0	-111	31
4.00	21%	90	573.2	0	1515	0	6504	5.29	-22.0	20.0	-129	33
4.25	22%	78	556.2	0	1515	0	8019	4.30	-22.0	20.0	-139	34
4.50	22%	69	539.7	0	1516	0	9535	3.15	-22.0	20.0	-149	36
4.75	23%	59	523.6	0	1517	0	11052	2.23	-22.0	20.0	-159	37
5.00	24%	54	512.7	0	1050	0	12101	1.97	-22.0	20.0	-173	39
5.25	25%	55	510.2	0	246	0	12347	1.73	-22.0	20.0	-188	40
5.50	25%	57	509.1	0	108	0	12455	1.47	-22.0	20.0	-203	42
5.75	26%	58	506.8	0	233	0	12688	1.27	-22.0	20.0	-219	43
6.00	27%	60	505.6	0	117	0	12806	1.09	-22.0	20.0	-236	45
6.25	28%	61	503.2	0	238	0	13044	0.98	-22.0	20.0	-253	46
6.50	28%	63	501.9	0	128	0	13171	0.78	-22.0	20.0	-271	48
6.75	29%	64	499.3	0	259	0	13430	0.66	-22.0	20.0	-290	49
7.00	30%	66	498.0	0	135	0	13565	0.51	-22.0	20.0	-309	51
7.25	30%	67	495.3	0	269	0	13833	0.39	-22.0	20.0	-328	52
7.50	31%	69	493.9	0	144	0	13977	0.26	-22.0	20.0	-348	54
7.75	32%	70	491.2	0	274	0	14251	0.20	-22.0	20.0	-368	55
8.00	33%	72	489.7	0	157	0	14408	0.09	-22.0	20.0	-389	56
8.25	33%	73	486.8	0	288	0	14696	0.03	-22.0	20.0	-410	58
8.50	34%	75	485.2	0	173	0	14869	-0.04	-22.0	20.0	-432	60
8.75	35%	76	482.2	0	309	0	15177	-0.10	-22.0	20.0	-454	61
9.00	36%	77	479.1	0	324	0	15501	-0.30	-22.0	20.0	-475	63
9.25	36%	79	477.1	0	201	0	15702	-0.36	-22.0	20.0	-498	64
9.50	37%	80	474.0	0	335	0	16037	-0.55	-22.0	20.0	-519	65
9.75	38%	82	472.1	0	198	0	16235	-0.67	-22.0	20.0	-542	67
10.00	38%	83	468.8	0	348	0	16583	-0.71	-22.0	20.0	-565	68
10.25	39%	85	466.5	0	245	0	16828	-0.84	-22.0	20.0	-587	70
10.50	40%	86	463.0	0	377	0	17206	-0.90	-22.0	20.0	-611	71
10.75	41%	88	460.5	0	273	0	17479	-1.11	-22.0	20.0	-633	73
11.00	41%	89	457.1	0	368	0	17847	-1.39	-22.0	20.0	-656	74
11.25	42%	91	454.1	0	331	0	18178	-1.77	-22.0	20.0	-678	76
11.50	43%	92	450.2	0	425	0	18603	-2.04	-22.0	20.0	-701	77
11.75	44%	94	447.2	0	338	0	18941	-2.52	-22.0	20.0	-723	79
12.00	44%	95	443.3	0	426	0	19367	-2.62	-22.0	20.0	-747	80
12.25	45%	97	440.2	0	357	0	19724	-3.16	-22.0	20.0	-768	82
12.50	46%	98	436.3	0	445	0	20170	-3.56	-22.0	20.0	-791	83

Tech Spec Ref: N/A　　Procedure Ref: REP-102.001　　Figure Ref: N/A

Cycle 22 Simulator 20k MWD/MTU Startup 2-100%

Hours After Start	Rx Power	D Bank Pos	Boron PPM	Boron (gal)	Water (gal)	Total Boron (gal)	Total Water (gal)	Delta-I (%)	RAOC Band Low	RAOC Band High	Xenon Worth (pcm)	RIL Limit (steps)
12.75	46%	112	440.1	28	0	28	20170	-4.47	-22.0	20.0	-808	85
13.00	47%	124	442.8	20	0	48	20170	-4.46	-22.0	20.0	-827	86
13.25	48%	136	446.6	28	0	76	20170	-3.46	-22.0	20.0	-849	88
13.50	49%	136	442.4	0	469	76	20639	-3.51	-22.0	20.0	-873	89
13.75	49%	136	438.0	0	493	76	21132	-3.57	-22.0	20.0	-896	91
14.00	50%	136	433.7	0	496	76	21628	-3.71	-22.0	20.0	-919	92
14.25	51%	148	438.9	39	0	115	21628	-1.42	-21.8	19.8	-943	94
14.50	52%	148	434.3	0	530	115	22158	-1.60	-21.6	19.7	-966	95
14.75	52%	148	429.9	0	510	115	22667	-1.86	-21.4	19.5	-988	97
15.00	53%	148	425.4	0	524	115	23191	-1.92	-21.2	19.3	-1011	98
15.25	54%	151	422.6	0	328	115	23520	-1.90	-21.0	19.1	-1034	100
15.50	54%	151	418.7	0	460	115	23980	-1.96	-20.8	18.9	-1056	101
15.75	55%	152	415.0	0	437	115	24417	-1.99	-20.6	18.8	-1079	103
16.00	56%	153	411.4	0	436	115	24853	-2.04	-20.4	18.6	-1101	104
16.25	57%	154	407.8	0	428	115	25281	-2.06	-20.2	18.4	-1123	106
16.50	57%	155	404.3	0	431	115	25712	-2.03	-19.9	18.2	-1145	107
16.75	58%	155	400.1	0	525	115	26236	-2.06	-19.7	18.1	-1167	109
17.00	59%	156	396.5	0	443	115	26680	-2.09	-19.5	17.9	-1189	110
17.25	60%	156	392.3	0	524	115	27204	-2.13	-19.3	17.7	-1211	112
17.50	60%	157	388.7	0	454	115	27658	-2.23	-19.1	17.5	-1233	113
17.75	61%	158	385.4	0	431	115	28089	-2.26	-18.9	17.4	-1254	115
18.00	62%	159	381.9	0	448	115	28537	-2.28	-18.7	17.2	-1275	116
18.25	63%	160	378.3	0	464	115	29001	-2.30	-18.5	17.0	-1296	118
18.50	63%	161	374.9	0	448	115	29449	-2.31	-18.3	16.8	-1317	119
18.75	64%	162	371.5	0	453	115	29902	-2.32	-18.1	16.7	-1338	121
19.00	65%	163	367.8	0	491	115	30393	-2.33	-17.9	16.5	-1358	122
19.25	65%	164	364.5	0	448	115	30842	-2.30	-17.7	16.3	-1379	123
19.50	66%	165	361.0	0	470	115	31312	-2.31	-17.5	16.1	-1399	125
19.75	67%	165	357.2	0	533	115	31845	-2.35	-17.3	15.9	-1419	127
20.00	68%	166	353.7	0	483	115	32328	-2.50	-17.1	15.8	-1438	128
20.25	68%	167	350.5	0	439	115	32767	-2.53	-16.9	15.6	-1458	130
20.50	69%	168	347.2	0	465	115	33232	-2.56	-16.7	15.4	-1477	131
20.75	70%	169	343.9	0	470	115	33703	-2.56	-16.4	15.2	-1496	133
21.00	71%	170	340.8	0	455	115	34158	-2.58	-16.2	15.1	-1514	134
21.25	71%	171	337.6	0	464	115	34622	-2.54	-16.0	14.9	-1533	136
21.50	72%	172	334.3	0	471	115	35093	-2.55	-15.8	14.7	-1551	137
21.75	73%	173	331.2	0	463	115	35556	-2.49	-15.6	14.5	-1569	139
22.00	74%	173	327.4	0	562	115	36118	-2.53	-15.4	14.4	-1587	140
22.25	74%	174	324.1	0	496	115	36614	-2.57	-15.2	14.2	-1605	142
22.50	75%	175	321.0	0	479	115	37093	-2.67	-15.0	14.0	-1622	143
22.75	76%	176	318.0	0	453	115	37546	-2.70	-14.8	13.8	-1639	144
23.00	77%	177	315.0	0	472	115	38017	-2.73	-14.6	13.7	-1656	146
23.25	77%	178	312.0	0	473	115	38490	-2.74	-14.4	13.5	-1673	148
23.50	78%	179	309.0	0	468	115	38958	-2.75	-14.2	13.3	-1689	149
23.75	79%	180	306.1	0	466	115	39424	-2.70	-14.0	13.1	-1706	151
24.00	79%	181	303.2	0	459	115	39883	-2.70	-13.8	12.9	-1722	152
24.25	80%	181	299.6	0	577	115	40460	-2.75	-13.6	12.8	-1738	153
24.50	81%	182	296.5	0	506	115	40966	-2.85	-13.4	12.6	-1753	155
24.75	82%	183	293.7	0	470	115	41436	-2.89	-13.2	12.4	-1769	157
25.00	82%	184	290.8	0	476	115	41912	-2.96	-12.9	12.2	-1783	158
25.25	83%	185	288.0	0	472	115	42385	-2.98	-12.7	12.1	-1799	160

Cycle 22 Simulator 20k MWD/MTU Startup 2-100%

Hours After Start	Rx Power	D Bank Pos	Boron PPM	Boron (gal)	Water (gal)	Total Boron (gal)	Total Water (gal)	Delta-I (%)	RAOC Band Low	RAOC Band High	Xenon Worth (pcm)	RIL Limit (steps)
25.50	84%	186	285.2	0	481	115	42865	-3.00	-12.5	11.9	-1813	161
25.75	85%	187	282.4	0	482	115	43347	-2.99	-12.3	11.7	-1828	163
26.00	85%	188	279.6	0	480	115	43827	-3.00	-12.1	11.5	-1842	164
26.25	86%	189	277.0	0	463	115	44291	-2.94	-11.9	11.4	-1856	165
26.50	87%	190	274.3	0	468	115	44759	-2.95	-11.7	11.2	-1870	167
26.75	88%	191	271.6	0	484	115	45243	-2.89	-11.5	11.0	-1883	169
27.00	88%	191	268.3	0	591	115	45834	-2.93	-11.3	10.8	-1897	170
27.25	89%	192	265.5	0	509	115	46343	-2.99	-11.1	10.7	-1911	172
27.50	90%	193	262.8	0	487	115	46830	-3.12	-10.9	10.5	-1924	173
27.75	90%	194	260.1	0	496	115	47325	-3.21	-10.7	10.3	-1937	174
28.00	91%	195	257.4	0	503	115	47828	-3.29	-10.5	10.1	-1950	176
28.25	92%	196	254.8	0	490	115	48318	-3.33	-10.3	9.9	-1962	177
28.50	93%	197	252.2	0	497	115	48815	-3.39	-10.1	9.8	-1975	179
28.75	93%	198	249.7	0	481	115	49295	-3.42	-9.9	9.6	-1987	181
29.00	94%	199	247.2	0	499	115	49794	-3.45	-9.7	9.4	-1999	182
29.25	95%	200	244.6	0	498	115	50292	-3.48	-9.4	9.2	-2011	184
29.50	96%	201	242.0	0	518	115	50810	-3.51	-9.2	9.1	-2023	185
29.75	96%	203	240.0	0	390	115	51200	-3.38	-9.0	8.9	-2034	186
30.00	97%	204	237.4	0	523	115	51723	-3.21	-8.8	8.7	-2045	188
30.25	98%	205	235.0	0	498	115	52221	-3.22	-8.6	8.5	-2056	190
30.50	99%	206	232.4	0	536	115	52758	-3.25	-8.4	8.4	-2068	191
30.75	99%	208	230.4	0	417	115	53174	-3.21	-8.2	8.2	-2078	193
31.00	100%	209	227.8	0	535	115	53710	-3.20	-8.0	8.0	-2089	194

SCHEDULED WORK APPROVAL/DENIAL

Scheduled Work/Activity Date today

Description of Work/Activity to be performed:
Scheduled maintenance on Alternate Seal Injection pump

I. This Moderate Risk, Elevated Risk, High Risk, or Cross Train activity is approved for work provided the required plant conditions are available on the scheduled due date.

OR

This specific activity has been reviewed for EOOS Risk Reassessment. Set EOOS Environmental Variance ________ Set Risk at Times ________

The following items were considered for making this approval:

Shift Supervisor Operations Supervisor (Moderate Risk or Cross Train)
In the absence of the Operations Supervisor:
Operations Scheduling, Shift Supervisor

________ GMNPO/MDS (Elevated Risk)

________ PSRC (High Risk)

II. This work activity/package cannot be performed on the scheduled date due to the following reason(s):

________ SRO (WCC or On Shift)

________ Operations Scheduling Supervisor

III. Recommended re-schedule date or plant conditions:

SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

NUCLEAR OPERATIONS
COPY NO.________

GENERAL OPERATING PROCEDURE

GOP-3

REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2)

REVISION 13

SAFETY RELATED

RECORD OF CHANGES

CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE	CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE
A	P	01/25/10					
B	P	06/19/12					
C	P	07/02/12					
D	P	04/26/14					
E	P	06/30/14					
F	P	11/14/14					

CONTINUOUS USE

Continuous Use of Procedure Required.
Read Each Step Prior to Performing.

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TABLE OF CONTENTS

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1.0 PURPOSE/SCOPE

1.1 This procedure provides instructions for Reactor Startup, from Hot Standby to Startup.

1.2 The following governing regulations apply to this procedure:

a. 10CFR50.59.

b. 10CFR50, Appendix B.

c. SAP-630, Procedure/Commitment Accountability Program.

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NOTE 2.0 and 3.0
a. All personnel who sign off steps in this procedure must enter their names and initials on Attachment I.
b. Each step should be initialed and dated when all its substeps are either completed and checked-off or marked N/A and initialed.

NOTE 2.0
If this procedure must be initiated under conditions other than those in Section 2.0, INITIAL CONDITIONS, the Shift Supervisor or Control Room Supervisor will review Sections 2.0, INITIAL CONDITIONS, and 3.0, INSTRUCTIONS. Steps that are not applicable due to plant conditions will be marked N/A and initialed by the Shift Supervisor or Control Room Supervisor. All other items will require sign-off or check-off.

2.0 INITIAL CONDITIONS

		INITIALS/DATE
2.1	RCS status is as follows:	CRS / today
	a. System temperature is being maintained between 555°F and 559°F using the Bank 1 Condenser Steam Dumps or Steamline PORVs.	☐
	b. System pressure is being maintained between 2230 psig and 2240 psig in AUTO control.	☐
	c. All Reactor Coolant Pumps are in operation.	☐
	d. Pressurizer level is being maintained at 25% in AUTO control.	☐
2.2	All Safety Injection Systems are aligned and operable.	CRS / today
2.3	Excore NIs are aligned for critical operation per SOP-404, Excore Nuclear Instrumentation System.	CRS / today
2.4	The Reactor is shutdown with all Control Bank Rods fully inserted.	CRS / today

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INITIALS/DATE

2.5 Shutdown Margin is being maintained for Mode 3 conditions per STP-134.001, Shutdown Margin Verification. CRS / today

2.6 Reactor Makeup Control is in AUTO and set for blended flow equal to the existing boron concentration. CRS / today

2.7 Secondary Plant status is as follows: CRS / today

a. The Main Turbine is on the Turning Gear per SOP-215, Main Turbine Lube Oil Supply System. ☐

b. The Main Feedwater Pumps are on their Turning Gears per SOP-209, Feedwater Turbine Lube Oil System. ☐

c. Narrow Range Steam Generator levels are being maintained between 60% and 65% with chemistry within specification using the following:

1) Blowdown per SOP-212, Steam Generator Blowdown. ☐

2) Emergency Feedwater per SOP-211, Emergency Feedwater System. ☐

d. Main Steam is being warmed per SOP-201, Main Steam System. ☐

e. Feedwater is being warmed per SOP-210, Feedwater System. ☐

f. Condensate is in operation per SOP-208, Condensate System. ☐

g. Circulating Water is in operation per SOP-207, Circulating Water. ☐

2.8 The Rod Control and Position Indicating Systems are in operation per SOP-403, Rod Control And Position Indicating System. CRS / today

2.9 The Control Rod Drive Mechanism Ventilation System is in operation per SOP-114, Reactor Building Ventilation System. CRS / today

2.10 GOP Appendix A review has been completed. CRS / today

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

3.0 INSTRUCTIONS

INITIALS/DATE

3.1 Shut down and isolate BTRS as follows: CRS / today

a. Place HCV-387, BTRS BYP FLOW, in BYP. ☒

b. Place BTRS SELECT Switch in OFF. ☒

3.2 Verify RCS Chemistry control for startup: CRS / today

a. Contact Chemistry to ensure RCS Chemistry control is satisfactory for startup per CP-625, Chemistry Refueling Shutdown And Startup Plan. ☒

b. Record current Boron concentration: ☒

652 ppm

CHG F

CRS today

3.3 Perform the following if an RB entry is in progress or will occur during the reactor startup: ______ / ______

a. Obtain the approval of the General Manager, Nuclear Plant Operations, for personnel to be in the RB during the reactor startup ☐

b. Notify Health Physics that a reactor startup is about to commence and dose rates in the RB could change rapidly. ☐

NA

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

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2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

3.4 Align Excore NIs for Reactor Startup as follows: CRS / today

Z005→ a. Ensure INI00033-NI, REMOTE SOURCE RANGE MONITOR, is de-energized with fuses removed per SOP-404, Excore Nuclear Instrumentation System, Section IV.F. ☐ CHG D

Z007→ b. Ensure the following Nuclear Instrumentation Channels are in operation per SOP-404, Excore Nuclear Instrumentation System, Section III.A and tested per the applicable STPs:

1) Two Source Range Channels. ☐

2) Two Intermediate Range Channels. ☐

3) At least three Power Range Channels. ☐

c. Verify both Source Range Channels are indicating a minimum of two counts per second. ☐

d. Perform either of the following to monitor Source and Intermediate Range Channels as follows:

1) Select the highest reading Source Range Channel and either Intermediate Range Channel on recorder NR-45, NIS RECORDER. ☐

2) Monitor the highest reading Source Range Channel and either Intermediate Range Channel using computer display NR45 in FAST SPEED. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.4 continued

NOTE 3.4.e
Audio Count Rate is not required to be operable.

e. At the AUDIO COUNT RATE CHANNEL drawer, perform the following:

1) Select the highest reading Source Range Channel on the CHANNEL SELECTOR Switch. ☐

2) Adjust the AUDIO MULTIPLIER Switch as necessary to maintain a distinguishable audio countrate. ☐

3) Place the SR COUNTER/SCALER, POWER switch in the POWER position. ☐

3.5 Complete Attachment III.A, Prior to Closing Reactor Trip Breakers in Modes 3, 4 & 5, of GTP-702. CRS / today

C01→ N01→ 3.6 Ensure the P-4 trip actuating device operational test is performed and Reactor Trip breakers are closed per STP-345.039, Reactor Trip P-4 Trip Actuating Device Operational Test. CRS / today

Z008→ 3.7 Ensure both Rod Control MG sets are supplying load to to Rod Control per SOP-403, Rod Control and Position Indicating System, Section III.A. CRS / today CHG B CHG D

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

3.8 If necessary, withdraw the Shutdown Banks as follows: CRS / today

a. Verify Shutdown Margin Boron Concentration is satisfactory by performing STP-134.001, Shutdown Margin Verification for Mode 3 with S/D Banks OUT ☐

b. Place ROD CNTRL START UP RESET Switch in START UP. ☐

> **CAUTION 3.8.c**
>
> To minimize the possibility of binding at the full in position, rods should not be driven below the 000 indication on the Group Demand Step Counters.

c. Ensure the Step Counters indicate zero (000) steps. ☐ CHG D

Z009→ d. Update Rod Bank positions on the IPCS, refer to OAP-107.1, Control of IPCS Functions, Step 6.2.b. ☐ CHG C

e. Ensure IZM01200, DRPI Main Control Board Display Monitor, and IZM01201, DRPI Main Control Board Display Monitor, indicate RB. ☐ CHG F

f. Momentarily depress the ROD CNTRL ALARM RESET Pushbutton. ☐

g. Verify ROD CNTRL SYS FAIL URGENT (XCP-620 5-1) and ROD CNTRL SYS FAIL NON-URGENT (XCP-620 5-5) alarms cleared. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.8 continued

CAUTION 3.8.h
To prevent any inadvertent inward rod motion the ROD CNTRL BANK SEL Switch should not be placed in or pass through AUTO.

NOTE 3.8.h
Reactor Coolant System temperature is being maintained between 555°F and 559°F using the Bank 1 Condenser Steam Dumps or Steamline PORVs.

h. Place ROD CNTRL BANK SEL Switch in SBA. ☐

CAUTION 3.8.i
12 steps should **NOT** be exceeded until Rod Bottom lights are off. If all Shutdown Bank A Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

i. Using the ROD CONTROL ROD MOTION Lever, perform the following:

1) Withdraw Shutdown Bank A to ten Steps. ☐

2) Verify that all RB lights for Shutdown Bank A are off. ☐

3) Using the ROD CONTROL ROD MOTION Lever, withdraw SBA to 230 steps. ☐

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.8 continued

CAUTION 3.8.j
To prevent any inadvertent inward rod motion the ROD CNTRL BANK SEL Switch should not be placed in or pass through AUTO.

j. Place ROD CNTRL BANK SEL Switch in SBB. ☐

CAUTION 3.8.k
12 steps should **NOT** be exceeded until Rod Bottom lights are off. If all Shutdown Bank B Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

k. Using the ROD CONTROL ROD MOTION Lever, perform the following:

1) Withdraw Shutdown Bank B to ten steps. ☐

2) Verify that all RB lights for Shutdown Bank B are off. ☐

3) Using the ROD CONTROL ROD MOTION Lever, withdraw SBB to 230 steps. ☐

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

3.9 Contact Reactor Engineering for recommended rod heights and Estimated Critical Condition information. CRS / today

NOTE 3.10
Reactor Coolant System temperature is being maintained between 555°F and 559°F using the Bank 1 Condenser Steam Dumps or Steamline PORVs.

3.10 Perform a Shutdown Margin verification per STP-134.001, Shutdown Margin Verification, using Estimated Critical Condition boron, desired RCS temperature, and expected xenon. CRS / today

STTS # 15xxxxx

NOTE 3.11 through 3.13
For initial criticality following refueling, REP-107.001, Controlling Procedure For Refueling Startup And Power Ascension Testing, is the controlling document for Reactor Startup. Appropriate steps of GOP-3 should be initialed as they are performed.

3.11 Prepare for Reactor Startup as follows: CRS / today

a. Adjust Boron concentration as required by Estimated Critical Condition calculation as follows:

Z003→ Z010→ Z017→ 1) Borate or dilute per SOP-106, Reactor Makeup Water System, Sections III.D, III.E, or III.F. ☐ CHG D

2) When complete, direct Chemistry to sample the RCS and the Pressurizer for boron. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.11 continued

b. Block HIGH FLUX AT SHUTDOWN as follows:

1) Disable the IPCS High Flux At Shutdown alarm function as follows:

a) Type the Turn-On-Code HFAS. ☐

b) Verify OPERATOR DISABLED is indicated above the ENABLE CALCS box. ☐ CHG D

c) If OPERATOR ENABLED is indicated, select DISABLE CALCS. ☐

2) Place HIGH FLUX AT SHUTDOWN Switch for SOURCE RANGE N-31 in BLOCK. ☐

3) Place HIGH FLUX AT SHUTDOWN Switch for SOURCE RANGE N-32 in BLOCK. ☐

4) Verify SR HI FLUX AT SHUTDN BLOCK (XCP-620 4-4) annunciator alarms. ☐

c. Review Estimated Critical Condition calculation within four hours prior to criticality, verifying predicted rod height is above the Rod Insertion Limit per Tech Spec 4.1.1.1.1.c. ☐

Time 4 hours ago

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.11 continued

d. Review the following for current status and limitations for Mode escalation:

1) Removal and Restoration Log.

2) Danger Tag Log.

3) 31 Day Surveillance Book.

4) Ensure completion of Attachment II.F, Operational Mode Change Plant Startup - Entering Mode 2, of GTP-702.

5) Ensure SAP-116, PLANT TRIP/SAFETY INJECTION PLANT RECOVERY, is completed, if necessary.

Z011→ e. Perform OAP-100.4, Communication, Attachment I, Mode Change Brief Checklist. CHG D

f. Update the IPCS Plant Mode indicator to indicate Mode 2 as the current Plant Mode as follows:

1) Type the Turn-On-Code MODE to display the PLANT MODE CHANGE DISPLAY window

2) Select the SET MODE 2 Pushbutton.

3) Verify the selected Mode is displayed on the left end of the top toolbar.

g. Verify all Shutdown Bank Rods fully withdrawn within 15 minutes of commencing Control Bank Rod withdrawal.

Time 3 hours ago

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.11 continued

NOTE 3.11.h
Reactor Coolant System temperature is being maintained between 555°F and 559°F using the Bank 1 Condenser Steam Dumps or Steamline PORVs.

h. Obtain the Shift Supervisor's permission to commence a Reactor Startup. ☐

i. Announce Reactor Startup over the page system. ☐

j. If used, place NR-45 CHART in HI speed. ☐

k. Initiate REP-109.002, Inverse Count Rate Ratio Plot. ☐

Time 3 hours ago

CRS today

NA l. ~~If performing an initial cycle startup, refer to REP-107.001, Controlling Procedure For Refueling Startup And Power Ascension Testing, for additional actions.~~ ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

3.12 Achieve Reactor criticality as follows: CRS / today

a. Review GOP Appendix A, Generic Operating Precautions, for Reactor Startup. ☐

CAUTION 3.12.b

To prevent any inadvertent inward rod motion the ROD CNTRL BANK SEL Switch should not be placed in or pass through AUTO.

b. Place the ROD CNTRL BANK SEL Switch in MAN. ☐

NOTE 3.12.c

A stable Startup Rate of one decade per minute should **NOT** be exceeded.

c. Using ROD CONTROL ROD MOTION lever, commence Control Bank Rod withdrawal to ten steps on Bank A. ☐

Time 2 hours ago

CAUTION 3.12.d

12 steps should **NOT** be exceeded until all Rod Bottom lights are off. If all Control Bank A Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

d. At ten steps on Control Bank A, stop and verify:

1) Bank A RB lights clear. ☐

2) ONE ROD ON BOTTOM (XCP-621 3-1) annunciator clears. ☐

3) RODS ON BOTTOM (XCP-621 3-2) annunciator clears. ☐

e. Recommence withdrawing rods while observing that the groups sequence properly. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.12 continued

CAUTION 3.12.f

12 steps should **NOT** be exceeded until all Rod Bottom lights are off. If all Control Bank B Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

f. At ten steps on Control Bank B, stop and verify Bank B RB lights clear. ☐

g. Recommence withdrawing rods while observing that the groups sequence properly. ☐

h. Verify 102 step Bank Overlap between Control Bank A and Control Bank B. ☐

CAUTION 3.12.i

12 steps should **NOT** be exceeded until all Rod Bottom lights are off. If all Control Bank C Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

i. At ten steps on Control Bank C, stop and verify Bank C RB lights clear. ☐

j. Recommence withdrawing rods while observing that the groups sequence properly. ☐

k. Verify 102 step Bank Overlap between Control Bank B and Control Bank C. ☐

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.12 continued

CAUTION Step 3.12.l
Reactor startup should be stopped and I&C notified if the CRB INSERT LMT LO-LO (XCP-621 1-1) annunciator fails to clear between 118 steps and 134 steps on Bank C.

l. Verify CRB INSERT LMT LO-LO (XCP-621 1-1) annunciator clears between 118 steps and 134 steps on Bank C. ☐

Steps 120

CAUTION 3.12.m
12 steps should **NOT** be exceeded until all Rod Bottom lights are off. If all Control Bank D Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

NOTE 3.12.m
Reactor Coolant System temperature is being maintained between 555°F and 559°F using the Bank 1 Condenser Steam Dumps or Steamline PORVs.

m. At ten steps on Control Bank D, stop and verify Bank D RB lights clear ☐

n. Recommence withdrawing rods while observing that the groups sequence properly. ☐

o. Verify the CRB INSERT LMT LO (XCP-621 1-2) annunciator clears between 138 steps and 144 steps on Bank C. ☐ CHG A

Steps 140

p. Verify 102 step Bank Overlap between Control Bank C and Control Bank D. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.12 continued

q. Within 15 minutes before achieving criticality, verify T_{avg} greater than or equal to 551°F. ☐

Time 1 hour ago Tave 557.8

r. Announce criticality over the page system. ☐

Time 1 hour ago

s. Verify critical rod position is above the Rod Insertion Limit per Tech Spec 3.1.3.6. ☐

t. Maintain as close to 0 SUR as reasonably achievable. ☐

u. At the AUDIO COUNT RATE CHANNEL drawer, place the following switches in OFF:

1) AUDIO MULTIPLIER. ☐

2) CHANNEL SELECTOR. ☐

3) SR COUNTER/SCALER, POWER switch. (Toggle down) ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

A. Shutdown Bank Control:

1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

a) The RCS is borated to Cold Shutdown concentration and verified by sample.

b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

B. Source Range Control:

1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

2) While in the Source Range, positive reactivity may be changed by only one controlled method.

C. Anticipate criticality anytime:

1) During rod motion.

2) Boron dilution is in progress.

INITIALS/DATE

3.13 Increase Reactor Power to 10^{-3}% as follows: CRS / today

a. Establish a stable Startup Rate of less than one decade per minute. ☐

b. At 7.5×10^{-6}%, perform the following:

1) Verify P6 Permissive energizes to bright. ☐

2) Verify a minimum of one decade overlap between Source Range Channels and Intermediate Range Channels. ☐

c. Prior to 10^{5} CPS, perform the following:

1) Momentarily place SR TRAIN A Switch in BLOCK. ☐

2) Verify SR A TRIP BLCK Permissive energizes to bright. ☐

3) Momentarily place SR TRAIN B Switch in BLOCK. ☐

4) Verify SR B TRIP BLCK Permissive energizes to bright. ☐

d. Perform one of the following for continued monitoring of Intermediate and Power Range instrument:

1) If available for use, select one Intermediate Range Channel and one Power Range Channel on NR-45, NIS RECORDER. ☐

2) Ensure at least one Intermediate Range and at least one Power Range instrument are selected for continuous monitoring using computer display NR45. ☐

e. Stabilize Reactor Power at 10^{-3}%. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.13 continued

f. Record the following Critical Data:

1) RCS pressure: 2225 psig ☐

2) T_{avg}: 557.5 °F ☐

3) Bank D at 94 steps ☐

4) Boron Concentration: 652 ppm ☐

5) Time: 5 minutes ago ☐

6) Stable Power: 10^{-3} % ☐

CRS today

g. ~~If performing an initial cycle startup, refer to REP-107.001, Controlling Procedure For Refueling Startup And Power Ascension Testing, for physics testing instructions.~~ ☐

NA

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

CAUTION 3.14

While operating with a positive Moderator Temperature Coefficient:

a. All reactivity additions should be slow and controlled.

b. A stable Startup Rate of 0.3 decade per minute should not be exceeded.

c. Rods should be moved in 1/2 step increments until the effect of rod motion has been evaluated.

NOTE 3.14

Ensure sufficient Emergency Feedwater Flow exists prior to raising power.

3.14 Increase Reactor Power to between 1% and 3%. ______/______

3.15 At the Point of Adding Heat, if NR-45, NIS RECORDER, had previously been selected to HI speed place the recorder in LO speed. ______/______

CAUTION 3.16

a. Adjustment of Tavg with the Rod Control System must not be attempted with the ROD CNTRL BANK SEL Switch in any position other than MAN.

b. Manual rod control is required to establish equilibrium conditions, since C-5 blocks automatic rod withdrawal.

3.16 Maintain T_{avg} between 555°F and 559°F. ______/______

3.17 Complete Attachment II.G, Operational Mode Change Plant Startup - Entering Mode 1, of GTP-702. CRS / today

3.18 Proceed to GOP-4A, Power Operation (Mode 1 - Ascending). ______/______

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4.0 REFERENCES

4.1 CP-625, Chemistry Refueling Shutdown And Startup Plan. CHG F

4.2 FSAR Section 5.0.

4.3 GOP Appendix A.

4.4 GOP-4A, Power Operation (Mode 1 - Ascending).

4.5 GTP-702, Operational Mode Change and Contingency Surveillance Requirements.

4.6 OAP-100.4, Communication.

4.7 REP-107.001, Controlling Procedure For Refueling Startup And Power Ascension Testing.

4.8 REP-109.002, Inverse Count Rate Ratio Plot.

4.9 SAP-630, Procedure / Commitment Accountability Program.

4.10 SOP-103, Boron Thermal Regeneration System.

4.11 SOP-106, Reactor Makeup Water System.

4.12 SOP-114, Reactor Building Ventilation System.

4.13 SOP-201, Main Steam System.

4.14 SOP-205, Turbine Sealing Steam System.

4.15 SOP-206, Main and Auxiliary Condenser Air Removal System.

4.16 SOP-207, Circulating Water.

4.17 SOP-208, Condensate System.

4.18 SOP-209, Feedwater Turbine Lube Oil System.

4.19 SOP-210, Feedwater System.

4.20 SOP-211, Emergency Feedwater System.

4.21 SOP-212, Steam Generator Blowdown.

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4.22 SOP-215, Main Turbine Lube Oil Supply System.

4.23 SOP-403, Rod Control And Position Indicating System.

4.24 SOP-404, Excore Nuclear Instrumentation System.

4.25 STP-134.001, Shutdown Margin Verification.

4.26 STP-345.039, Reactor Trip P-4 Trip Actuating Device Operational Test.

4.27 V.C. Summer Precautions, Limitations, and Setpoints.

4.28 V.C. Summer Reactor Engineering Procedures.

4.29 V.C. Summer Tech Specs.

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SIGN-OFF IDENTIFICATION LIST

PERSONNEL NAME (PRINTED)	PERSONNEL NAME (SIGNATURE)	PERSONNEL INITIALS

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Document Review Form (DRF)

Section I	**Document Identification**	**Page 1 of 2**

Preparer Name: R. Perrill **Ext:** 55524 **Mail Code** 410

Date: 07/17/14 **Document #:** GOP-3 **Revision:** 13 **Change** F

Title: REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2) ☒ **SR** ☐**QR** ☐ **NNS**

Development Process: ☐New ☒ Revision/Change ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: See attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #________________

Qualified Reviewer	**DCRM person notified**	**Shift Supervisor**	**Date**

Section II **List Required Reviewers** including All Impacted Groups
Additional Reviewers – identify with an *

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
QR	JAMES GEIB	☐ Yes ☒ No			☐ Yes ☐ No
CHEM	ROD BURCH	☐ Yes ☒ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

9/19/14
Designated Supervisor Concurrence **Date**

Comment Due Date 10/10/14
GM concurrence________for expedited review

Section III	**Pre- implementation Actions**

All Comments Resolved? ☒ **NA** ☐ **YES** R Perrill 10/27/14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☐ NA ☒ YES	Attached? YES ☒ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
Commitments (PCAP and MLSA) Addressed?	☒ NA ☐ YES	PCAP # _______ _______ NL Initial/Date
QR Qualification Verified?	☒ YES	
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	
Training required after implementation?	☒ NA ☐ YES	CR#_______________
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #_______________
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #_______________
CMMS Update Required? [Unit 1]	☒ NA ☐ YES	Planner Notified YES ☐_______

11/13/14
Designated Supervisor Approval **Date**

11/14/14
Approval Authority Approval **Date**
Effective Date:__________________

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DRF Form (Continued)

DOCUMENT # GOP-3 Rev. 13 Chg. F

DESCRIPTION CONTINUED:

a. Corrected the description for the DRPI Main Control Board Display in Step 3.8.e.

b. Reworded Step 3.2 addressing RCS Chemistry parameters prior to startup to verify RCS Chemistry control with the Chemist is satisfactory per CP-625, Chemistry Refueling Shutdown And Startup Plan. Directed the recording of the current RCS boron concentration. Added CP-625 to Reference Section.

REASON/BASIS CONTINUED:

a. Procedure feedback #140528 (Galloway) and #140657 (Billingsley);

"Step 3.8.e refers to the obsolete DRPI XCP-6030."

b. Procedure feedback #140655 (Ray):

Step 3.2 is somewhat confusing. It asks to record the various RCS Chemistry parameters. Three issues:

1) No limits are listed. Conceivably you could record out of spec readings and proceed on.

2) It is not clear that a new sample is not required. This step should just be to verify Fluoride, Chloride, and O2 are in spec.

3) We do want the current boron.

Recommended change:

Revise the step into two parts:

1) Record actual current boron concentration

2) Verify with Chemistry that RCS chemistry parameters are in spec for start up.

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Document Review Form (DRF)

Section I	**Document Identification**	**Page 1 of 2**

Preparer Name: Randall Perrill **Ext:** 55524 **Mail Code** 410

Date: 06/26/14 **Document #:** GOP-3 **Revision:** 13 **Change** ~~E~~ R 6/30/14

Title: REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process: ☐ New ☐ Revision/Change ☒ Editorial Correction ☐ Temporary Approval

Description: See attached.
Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: See attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #__________

Qualified Reviewer	**DCRM person notified**	**Shift Supervisor**	**Date**

Section II **List Required Reviewers** including All Impacted Groups
Additional Reviewers – identify with an *

Position	**Type/Print Name**	**Comments**	**Position**	**Type/Print Name**	**Comments**
QR	Bobby Kunkle	☐ Yes ☒ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

[signature] 6/30/14
Designated Supervisor Concurrence **Date**

Comment Due Date ASAP
GM concurrence________for expedited review

Section III	**Pre- implementation Actions**

All Comments Resolved? ☒ **NA** ☐ **YES** [signature] 06/30/14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
Commitments (PCAP and MLSA) Addressed?	☒ NA ☐ YES	PCAP # ______ ______ NL Initial/Date
QR Qualification Verified?	☒ YES	
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	
Training required after implementation?	☒ NA ☐ YES	CR#______
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #______
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #______
CMMS Update Required? [Unit 1]	☒ NA ☐ YES	Planner Notified YES ☐______

[signature] 6/30/14
Designated Supervisor Approval **Date**

N/A
Approval Authority Approval **Date**
Effective Date: N/A

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DRF Form (Continued)

Page 2 of 2

DOCUMENT # GOP-3 Rev. 13 Chg. ~~K~~ E SBU 6/30/14

DESCRIPTION CONTINUED:

Restored missing Reference Pages.

REASON/BASIS CONTINUED:

Reference Pages were inadvertently dropped from some Action step pages during the transmittal of the previous change.

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: R. Perrill **Ext:** 55524 **Mail Code:** 410

Date: 10/27/13 **Document No.:** GOP-3 **Revision No.:** 13 **Change Letter:** D

Title: Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Reason/Basis for Change: See attached.

Is the SCOPE of the procedure affected by this change? NO ☒ **YES** ☐

Temporary Approval **Final approval required by: (30 days)**

QR	DC&R (Person Notified)	SS	Date
		/	

Document Reviewers (Enclosure C)

	Position	Type/Print Name	Comments Yes/No			Position	Type/Print Name	Comments Yes/No	
Required	QR	S. Purcell 2-3-14 ~~STEVE WILLIS~~ 2-3-14	☐	☑	*Additional			☐	☐
			☐	☐				☐	☐
			☐	☐				☐	☐
			☐	☐				☐	☐

Concurrence by Designated Supervisor: 12/10/13
Supervisor/Date **or** enter CR # ____________ (per 6.4.8.C)

2/11/14 ~~12/31/13~~ 3 Feb 14 Comment Due Date
Standard review period is 21 days
GM concurrence ________ for expedited review period

Pre- implementation Actions

All Comments Resolved ☒ None Received ☐ Yes 02/03/14 Originator/Date

Commitments Addressed per SAP-0630 ☒ NA ☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date

QR Qualification Verified? ☒ Yes
50.59 Applicability/Review Completed (SAP-0107) ☐ NA ☒ Yes, Attached
Security Compliance Review Completed (SAP-0163) ☒ NA ☐ Yes (Security review required)
Pre-implementation Training Completed ☒ NA ☐ Yes
Training required after implementation ☒ NA ☐ Yes, CR # ____________
PSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ________
NSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ________
CMMS Update Required ☒ NA ☐ Yes Planner Notified ________ Initial/Date

3/25/14
Supervisor/Date

4/26/14
Approval Authority/Date

Effective Date________________________

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-3 Rev. No. 13 Chg. Ltr. D

DESCRIPTION CONTINUED:

a. Changed Step 3.4.a to describe that the expectation is the removal of INI00033-NI, REMOTE SOURCE RANGE MONITOR, fuses.

b. In Step 3.11.b.1) b) changed the word "Enable" to "Verify".

c. Added administrative linkage symbols.

REASON/BASIS FOR CHANGE CONTINUED:

a. CR-13-03493:

"OE-302695 and OE-307046, Westinghouse Source Range High Voltage circuitry turned on at power. This was due to the High Voltage Cutoff circuitry failing. Here at V C SUMMER UNIT 1, INI00033, N-33, Source Range Drawer located in CREP Room is vulnerable to this failure. If this failure occurs at power, turning on the High Voltage to N-33 Detector, the Detector would very likely fail and would have to be replaced during an Extended Primary Outage.

Note: Instrument power fuse removed and caution tagged #1302273, to prevent any possibility of the High Voltage Supply from turning on before being required per SOP-404."

b. Procedure feedback #130303 (Anderson):

"Step 3.11.b says to:

b) Ensure OPERATOR DISABLED is indicated above the ENABLE CALCS box. By usage rules this mean if it does not to make it so Therefore step c) If OPERATOR ENABLED is indicated, select DISABLE CALCS. Is redundant."

c. Administrative guidance.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: MD Johnson **Ext:** 54300 **Mail Code:** 410

Date: 6/21/2012 **Document No.:** GOP-3 **Revision No.:** 13 **Change Letter:** C

Title: REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ~~☒~~ Normal Rev/Chg 6/21/12 or ☒ Editorial Correction ☐ Temporary Approval

Description: Page 6, Step 3.8.d, Changed OAP-100.7, Control of IPCS Functions to OAP107.1, Control of IPCS Functions

Reason/Basis for Change: Originator Feedback, Editorial per SAP-139, Enclosure A.

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval **Final approval required by: (30 days)**

QR	DC&R (Person Notified)	SS	Date
		/	

Document Reviewers (Enclosure C)

	Position	Type/Print Name	Comments Yes/No		Position	Type/Print Name	Comments Yes/No
Required	QR	B Stroup	☐ ☒	*Additional			☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐

QR Qualification Verified? ☒ Yes
Concurrence by Designated Supervisor: 6/21/12
Supervisor/Date **or** enter CR # (per 6.4.8.C)

ASAP Comment Due Date
Standard review period is 21 days
GM concurrence ________ **for expedited review period**

B

Pre- implementation Actions

All Comments Resolved	☑ None Received	☐ Yes	6/22/12 Originator/Date
Commitments Addressed per SAP-0630	☑ NA	☐ Yes P/CAP # ______ ☐ MLSA	Initial/Date
50.59 Applicability/Review Completed (SAP-0107)	☑ NA	☐ Yes, Attached	
Security Compliance Review Completed (SAP-0163)	☑ NA	☐ Yes (Security review required)	
Pre-implementation Training Completed	☒ NA	☐ Yes	
Training required after implementation	☒ NA	☐ Yes, CR #	
PSRC Review Completed	☒ NA	☐ Yes, Mtg. No.	
NSRC Review Completed	☒ NA	☐ Yes, Mtg. No.	
CMMS Update Required	☒ NA	☐ Yes Planner Notified	Initial/Date

7/2/12
Supervisor/Date

N/A
Approval Authority/Date

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: MD Johnson **Ext:** 54300 **Mail Code:** 410

Date: 5/14/2012 **Document No.:** GOP-3 **Revision No.:** 13 **Change Letter:** B

Title: REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: SEE PAGE 2.

Reason/Basis for Change: SEE PAGE 2.

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval **Final approval required by: (30 days)**

QR	**DC&R** (Person Notified)	**SS**	**Date**
		/	

Document Reviewers (Enclosure C)

Required: Position	Type/Print Name	Comments Yes	Comments No	*Additional: Position	Type/Print Name	Comments Yes	Comments No
QR	~~Doherty~~ WC 6/19/12	☐	☐			☐	☐
QR	Jason Galloway	☐	☒			☐	☐
		☐	☐			☐	☐
		☐	☐			☐	☐
		☐	☐			☐	☐

QR Qualification Verified? ☒ Yes
Concurrence by Designated Supervisor:
[signature] 5-23-12
Supervisor/Date **or** enter CR # ________ (per 6.4.8.C)

Comment Due Date 6-13-12
Standard review period is 21 days
GM concurrence ________ **for expedited review period**

B

Pre- implementation Actions

All Comments Resolved	☒ None Received	☐ Yes [signature] 6/2/12 Originator/Date	
Commitments Addressed per SAP-0630	☒ NA	☐ Yes P/CAP # ______ ☐ MLSA	______ Initial/Date
50.59 Applicability/Review Completed (SAP-0107)	☐ NA	☒ Yes, Attached	
Security Compliance Review Completed (SAP-0163)	☒ NA	☐ Yes (Security review required)	
Pre-implementation Training Completed	☒ NA	☐ Yes	
Training required after implementation	☒ NA	☐ Yes, CR # ________	
PSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______	
NSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______	
CMMS Update Required	☒ NA	☐ Yes Planner Notified ______	Initial/Date

[signature] 6/18/12 Supervisor/Date (OPUS)	[signature] 6/19/12 Approval Authority/Date (OS)

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-3 Rev. No. 13 Chg. Ltr. B

DESCRIPTION CONTINUED:

1. Page 6:
   a. Added new step 3.7 to ensure both Rod MG sets are supplying load to Rod Control per SOP-403, Rod Control and Position Indicating System.
   b. Modified step 3.8.d to read: Update Rod Bank positions on the IPCS, refer to OAP-100.7, Control of IPCS Functions.

REASON/BASIS FOR CHANGE CONTINUED:

1a. PF110387 (Lucas) We need load on the Rod drive MGs in order to run in parallel. We sometimes forget to do it. Place a flag in GOP -3 between step 3.6 and 3.7 to ensure that both mgs are supplying Rod Control.

1b. PF110185 (Lindler, K) Step 3.7.d does not provide guidance to properly perform a Rod Bank Update on the IPCS. The guidance is provided in OAP-I00.7 CONTROL OF IPCS. FUNCTIONS. Change step 3.7.d in GOP-3 to Update Rod Bank positions on the IPCS, refer to OAP-I00.7, CONTROL OF IPCS FUNCTIONS

DOCUMENT REVIEWERS CONTINUED:

	Position	Type/Print Name	Comments Yes/No		Position	Type/Print Name	Comments Yes/No
Required			☐ ☐	*Additional			☐ ☐
			☐ ☐				☐ ☐
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* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: R. Perrill **Ext:** 55524 **Mail Code:** 410

Date: 12/17/09 **Document No.:** GOP-3 **Revision No.:** 13 **Change Letter:** A

Title: Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Reason/Basis for Change: See attached.

Is the SCOPE of the procedure affected by this change? NO ☒ **YES** ☐

Temporary Approval **Final approval required by: (30 days)**

QR	**DC&R** (Person Notified)	**SS**	**Date**
		/	

Document Reviewers (Enclosure C)

Required	Position	Type/Print Name	Comments Yes/No	*Additional	Position	Type/Print Name	Comments Yes/No
	QR	NICK O'KIMOSH	☐ ☒				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐

Concurrence [signature] 1/11/10
Supervisor/Date or enter CR #

Comment Due Date 1/18/10

Pre- implementation Actions

All Comments Resolved	☒ None Received	☐ Yes	R Perrill / 01/18/10 Originator/Date
Commitments Addressed per SAP-0630	☒ NA	☐ Yes, P/CAP # ______ ☐ MLSA	______ Initial/Date
50.59 Applicability/Review Completed (SAP-0107)	☐ NA	☒ Yes, Attached	
Pre-implementation Training Completed	☒ NA	☐ Yes	
Training required after implementation	☒ NA	☐ Yes, CR # ______	
PSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______	
NSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______	
CMMS Update Required	☒ NA	☐ Yes Planner Notified ______	Initial/Date

[signature] 1-25-10
Supervisor/Date

[signature] 1/25/10
Approval Authority/Date

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-3 Rev. No. 13 Chg. Ltr. A

DESCRIPTION CONTINUED:

Moved step 3.11.m to Step 3.11.o to ensure proper placement of CRB INSERT LMT LO-LO verification.

REASON/BASIS FOR CHANGE CONTINUED:

Procedure feedback #091285.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: R. Perrill **Ext:** 55524 **Mail Code:** 410

Date: 06/16/09 **Document No.:** GOP-3 **Revision No.:** 13 **Change Letter:** N/A

Title: Reactor Startup From Hot Standby To Startup (Mode 3 To Mode 2) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Reason/Basis for Change: See attached.

Is the SCOPE of the procedure affected by this change? NO ☒ **YES** ☐

Temporary Approval **Final approval required by: (30 days)**

QR	DC&R (Person Notified)	SS	Date
		/	

Document Reviewers (Enclosure C)

Required: Position	Type/Print Name	Comments Yes/No	*Additional: Position	Type/Print Name	Comments Yes/No
QR	JEFF PURCELL	☐ ☒			☐ ☐
		☐ ☐			☐ ☐
		☐ ☐			☐ ☐
		☐ ☐			☐ ☐
		☐ ☐			☐ ☐

Concurrence [signature] 9/18/9
Supervisor/Date or enter CR #

Comment Due Date 9/25/9

Pre- implementation Actions

All Comments Resolved	☒ None Received	☐ Yes [signature] 9/24/09 Originator/Date	
Commitments Addressed per SAP-0630	☒ NA	☐ Yes, P/CAP # ______	☐ MLSA ______ Initial/Date
50.59 Applicability/Review Completed (SAP-0107)	☐ NA	☒ Yes, Attached	
Pre-implementation Training Completed	☒ NA	☐ Yes	
Training required after implementation	☒ NA	☐ Yes, CR # ______	
PSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______	
NSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______	
Champs Update Required	☒ NA	☐ Yes Planner Notified ______ Initial/Date	

[signature] 9/25/9
Supervisor/Date

[signature] 10/4/09
Approval Authority/Date

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-3 Rev. No. 13 Chg. Ltr. N/A

DESCRIPTION CONTINUED:

1) Incorporated Changes A through K.

2) Deleted Section 4.0, Final Conditions.

3) Added new Step 3.4.a for ensuring INI00033-NI, REMOTE SOURCE RANGE MONITOR, is secured. Deleted Step 3.12.g which had previously ensured NI00033-NI, REMOTE SOURCE RANGE MONITOR, was secured by placing N33 DET HIGH VOLTAGE Switch in OFF at XPN7300, REMOTE SOURCE RANGE INSTRUMENT PANEL (IB-436).

4) Changed Step 3.2 by adding substeps to ensure RCS Lithium and Hydrogen are within the normal bands.

5) Evaluated procedure for proper signature pages, place keeping steps, etc required to ensure procedure meets current procedure format and development standards.

6) Modified Step 3.10.f to emphasize that Mode 2 is declared as the Plant Mode when the IPCS Plant Mode indicator is changed.

7) Evaluated the issue of resetting Feedwater Pumps and their effect upon Emergency Feedwater Pump operability.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-3 Rev. No. 13 Chg. Ltr. N/A

REASON/BASIS FOR CHANGE CONTINUED:

1) General Revision.

2) Procedure feedback #08378 (Beckham).

3) Procedure feedback #08616 (Smith).

4) Procedure feedback #080774 (Mosely). CR-08-02682-002 (Due 08/31/09).

5) Procedure feedback #090109 (Beckham).

6) CR-08-00425-003 (Due 10/29/09): "Need guidance in GOP-3 as to when to declare Mode 2 entry during Rx Startup".

7) CR-08-02024-001. Verification of EFW Operability (Due 07/24/09).

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

NUCLEAR OPERATIONS
COPY NO.____________

GENERAL OPERATING PROCEDURE

GOP-4A

POWER OPERATION (MODE 1 - ASCENDING)

REVISION 2

SAFETY RELATED

RECORD OF CHANGES

CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE	CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE
A	P	10/31/11		F	P	06/30/14	
B	P	04/25/12		G	P	07/20/14	
C	P	11/01/12		H	P	07/21/14	
D	P	05/01/14					
E	P	05/23/14					

CONTINUOUS USE

Continuous Use of Procedure Required.
Read Each Step Prior to Performing.

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TABLE OF CONTENTS

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1.0 PURPOSE/SCOPE

1.1 The purpose of this procedure is to provide the steps required to be performed to startup the plant from the Point of Adding Heat to 100% Reactor Power.

1.2 10CFR50 Appendix B, SAP-630, and 10CFR50.59 apply to this procedure.

~~NOTE 2.0 through 4.0~~

a. If this procedure must be initiated under conditions other than those in Section 2.0, INITIAL CONDITIONS, the Shift Supervisor or Control Room Supervisor will review Sections 2.0, INITIAL CONDITIONS, and 3.0, INSTRUCTIONS. Steps that are not applicable due to plant conditions will be marked N/A and initialed by the Shift Supervisor or Control Room Supervisor. All other items will require sign-off or check-off.

b. All personnel who sign off steps in this procedure must enter their names and initials on Attachment I.

c. Each step should be initialed and dated when all its substeps are either completed and checked-off or marked as N/A and initialed.

2.0 INITIAL CONDITIONS

INITIALS/DATE

2.1 RCS status is as follows: CRS / today

a. System temperature is being maintained between 555°F and 559°F using the Steam Dump System or Steamline PORVs. ☐

b. System pressure is being maintained between 2220 psig and 2250 psig in AUTO control. ☐

c. All Reactor Coolant Pumps are in operation. ☐

d. Pressurizer level is being maintained at 25% in AUTO control. ☐

2.2 All Safety Injection Systems are aligned and operable. CRS / today

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INITIALS/DATE

2.3 Excore NIs are aligned for Power Operation per SOP-404, Excore Nuclear Instrumentation System. CRS / today

2.4 Reactor Power is being maintained between 1% and 3%. /

2.5 For Mode 2, with no untrippable or dropped Control Rods, Shutdown Margin requirements are satisfied once per 12 hours by verification of Control Rods above the Rod Insertion Limit. CRS / today

2.6 Reactor Makeup Control is in AUTO and set for the existing RCS boron concentration. CRS / today

2.7 The Rod Control and Position Indicating Systems are in operation per SOP-403, Rod Control And Position Indicating System. CRS / today

2.8 Secondary Plant status is as follows: CRS / today

a. The Main Turbine is on the Turning Gear per SOP-215, Main Turbine Lube Oil Supply System. ☐

b. The Main Feedwater Pumps are on their Turning Gears per SOP-209, Feedwater Turbine Lube Oil System, or otherwise rotating via system flow. ☐

c. Narrow Range Steam Generator levels are being maintained between 60% and 65% with chemistry within specification using the following:

1) Steam Generator Blowdown per SOP-212, Steam Generator Blowdown if desired, with Condensate return temperature maintained less than or equal to DA temperature. ☐

2) Emergency Feedwater per SOP-211, Emergency Feedwater System. ☐

d. Main Steam heatup is complete per SOP-201, Main Steam System. ☐

e. Feedwater is being warmed per SOP-210, Feedwater System. ☐

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For printing 2 sided sheets.

INITIALS/DATE

f. Condensate is in operation per SOP-208, Condensate System.

g. Circulating Water is in operation per SOP-207, Circulating Water.

h. Condenser Vacuum is established per SOP-205, Turbine Sealing Steam System, and SOP-206, Main and Auxiliary Condenser Air Removal System in the following:

1) Main Condenser.

2) Auxiliary Condensers.

2.9 The following controller setpoints are aligned as follows: CRS / today

a. LCV 3235, DEAER START UP DRAIN CNTRL
AUTO with setpoint potentiometer set at 7.1

b. Feedwater Pumps:

1) PUMP A SPEED CONTROL
AUTO with setpoint potentiometer set at 0.25.

2) PUMP B SPEED CONTROL
AUTO with setpoint potentiometer set at 0.50.

3) PUMP C SPEED CONTROL
AUTO with setpoint potentiometer set at 0.75.

c. IFK3136, FLOW TO DEAERATOR
AUTO with setpoint potentiometer set at 5.0.

d. TURB OIL TEMP
AUTO with setpoint potentiometer set at 2.0 - 2.66. CHG D

e. EHC HYDRO OIL
AUTO with setpoint potentiometer set at 2.4 - 7.1.

f. H2 GAS TEMP
AUTO.

g. ALT COOLER TEMP
AUTO.

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INITIALS/DATE

> NOTE 2.9.h.
>
> IPV-2231, MS/PEGGING STM TO DEAERATOR, should be adjusted to maintain DA temperature between 130°F and 150°F.

h. IPV-2231, MS/PEGGING STM TO DEAERATOR MAN or AUTO. ☐

2.10 Reactor Engineering has verified the LEFM constants are removed per SAP-119, Control Of The Station Calorimetric Computer Program. CRS / today

2.11 Reactor Engineering has provided a Reactivity Management Plan for the Turbine Startup and power ascension per SAP-0155, Reactivity Management. CRS / today

2.12 A Pre-job brief has been conducted, including a review of GOP-Appendix A and the Reactivity Management Plan. CRS / today

2.13 ~~IPCS is available to monitor Heat Up Rate during Startup when Moderator Temperature Coefficient is near zero or positive.~~ CRS today ____ / ____
NA

2.14 Initiate a work order for Electrical Maintenance to perform Thermography per steps 3.12.d.2 and 3.16.h. of this procedure. CRS / today

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

3.0 INSTRUCTIONS

INITIALS/DATE

NOTE 3.1 through 3.11
Steps 3.1 through 3.11 raise Reactor Power from 1% to 25%.

3.1 Consult the following for current system status, Mode escalation limitations, and Reactor Power level restrictions: CRS / today

a. Complete Attachment II for required system alignments. ☐

b. Removal and Restoration Log. ☐

c. Danger Tag Log. ☐

d. Reactor Engineering. ☐

e. Chemistry. ☐

f. Ensure completion of GTP-702 Attachment II.G, Category "C1" Operational Mode Change Plant Startup - Entering Mode 1. ☐

Z156→ g. Initiate STP-120.003, Emergency Feedwater Valve Verification. (Free of air section 6.1 only.) ☐ CHG D

3.2 Perform OAP-100.4, Communication, Attachment I, Mode Change Brief Checklist. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

N01→3.3 Ensure the following disconnects are properly closed: CRS / today

a. The associated disconnect switch mechanical operator is locked in position:

1) Manual Disconnect 8891.

2) Manual Disconnect 8893.

3) Manual Disconnect 8901.

4) Manual Disconnect 8903.

b. Inform the Electrical Department that disconnects have been closed and initiate a work order to have Electrical perform thermography when disconnect is energized:

1) Manual Disconnect 8891.

2) Manual Disconnect 8893.

3) Manual Disconnect 8901.

4) Manual Disconnect 8903.

CHG G

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

3.4 Align Steam Dump control for Automatic operation as follows: CRS / today

a. Transfer Steamline PORVs to Automatic operation as follows:

1) Place the Steamline PWR RELIEF A(B)(C) SETPT Controller(s) in MAN.

2) Adjust the PWR RELIEF SETPT Controllers to 8.4 (1092 psig).

3) Place the Steamline Power Relief Mode Switches in AUTO.

4) Place the PWR RELIEF SETPT Controllers in AUTO.

b. Transfer STM DUMP CNTRL to Automatic operation as follows:

1) Place the STM DUMP CNTRL Controller in MAN.

2) Adjust the STM DUMP CNTRL setpoint to 8.4 (1092 psig).

3) Place the STM DUMP CNTRL Controller in AUTO.

c. If necessary, reset C-7A and C-7B by taking STM DUMP MODE SELECT to RESET and return to STM PRESS.

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

> **NOTE 3.5**
>
> Main Steamline GP-A and GP-B drains should be cycled open at least once every thirty minutes when left closed to minimize cooldown, in order to ensure moisture removal.

3.5 Complete Secondary Plant warm-up as follows: CRS / today

Z137→ a. Secure the Feedwater Recirculation flowpath per SOP-210, Feedwater System, Section III.B., Feedwater System Header Warming, Step 2.3. ☐

Z130→ b. Perform SOP-204, Extraction Steam, Reheat Steam, Heater Vents and Drains, Section III.A, Start Up Of Extraction Steam, Reheat Steam, Heater Vents and Drains Step 2.1. ☐

Z149→ c. Complete Main Turbine warm-up per SOP-214, Main Turbine And Controls, Section III.A, Turbine Startup, starting at Step 2.8.q. ☐ CHG D

Z131→ d. At the completion of the Main Turbine warm-up, continue with SOP-204, Extraction Steam, Reheat Steam, Heater Vents and Drains, Section III.A, Start Up Of Extraction Steam, Reheat Steam, Heater Vents and Drains, Step 2.2. ☐

e. Maintain DA temperature between 130°F and 150°F as follows:

1) As required, adjust IPV-2231, MS/PEGGING STM TO DEAERATOR, in Automatic or Manual. ☐

2) As required, LCV 3235, DEAER START UP DRAIN CNTRL, may be used to raise flow through the DA. ☐

f. Verify Feedwater and Condensate System chemistry is in specification per CP-615, Feedwater And Condensate Chemistry Control. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

3.6 Prepare the Secondary Plant for power ascension as follows: ______/______

a. Ensure the Main Turbine is reset. ☐

Z158→ b. Ensure the Main Generator Breaker Disconnect Switch 89 is Closed per SOP-303, Main Generator Breaker And Isophase Bus Duct Cooling, Section IV.B, Closing The Main Generator Breaker Disconnect Switch 89 ☐ CHG D

c. Place 43-TS12, UNDER FREQ. TRIP CONTROL SW, in OFF. ☐

d. Direct Electricians to verify proper phase-phase voltages between the Main Generator Breaker and the low side of the Main Transformer as indicated by the G6 set of potential transformer voltage readings in XPN6222 on fuse block 2BU (FU3) (Reference 210-121, Sheet 3) are approximately 120 Vac and are balanced: ☐ CHG A

1) $V_{2\,-}\,V_4$

2) $V_{2\,-}\,V_6$

3) $V_{4\,-}\,V_6$

e. Verify at least two Circulating Water Pumps are operating. ☐

f. Verify that at least one Condensate Pump is operating per SOP-208, Condensate System. ☐

g. Ensure Sparging Steam to the Deaerator is secured. ☐

Z139→ h. Ensure all available Feedwater Booster Pumps are operating per SOP-210, Feedwater System, Section III.D, Feedwater Booster Pump Startup. ☐ CHG D

i. Ensure Deaerator temperature is between 130°F and 150°F. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.6 continued

j. Raise condensate flow to the Blowdown Heat Exchangers to between 150 gpm and 250 gpm per Steam Generator (450-750 gpm total) on FI-3061, CONDENSATE BLOWDOWN COOLERS FLOW IND, using the following controllers in MANUAL (AB-436): ☐

1) ITV-3062A, BD COOLER A CDSTE OUT TEMP.

2) ITV-3062B, BD COOLER B CDSTE OUT TEMP.

3) ITV-3062C, BD COOLER C CDSTE OUT TEMP.

3.7 Align the Feedwater System for power ascension as follows: ________/________

C01→ Z128→ a. Perform PTP-102.005, Main Feedwater Pump Turbine Checks, quarterly portion Steps 6.1 through 6.12. ☐ CHGD

PMTS#_________

b. Ensure the following are MAN/CLOSED:

1) PVT-478, SG A FWF ☐

2) PVT-488, SG B FWF ☐

3) PVT-498, SG C FWF ☐

Z141→ c. Start one Main Feedwater Pump per SOP-210, Feedwater System, Section III.E, Feedwater Pump Startup. ☐ CHGD

d. Reset the Feedwater Isolation signal by momentarily turning the following switches to the right:

1) FW ISOL TRAIN A RESET. ☐

2) FW ISOL TRAIN B RESET. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.7 continued

CAUTION 3.7.e

1) Feedwater Header pressure should be maintained on program prior to opening Feedwater Isolation Valves to minimize water hammer.

2) Annunciator Point XCP-625 3-3 (FIV A/B/C ACCUM PRESS LO) should be verified clear or pressure locally verified greater than 500 psi prior to Mode 1 entry to ensure Feedwater Isolation Valve operability. (ref. Tech Spec 3.7.1.6)

e. Open the following:

1) PVG-1611A, A ISOL. ☐

2) PVG-1611B, B ISOL. ☐

3) PVG-1611C, C ISOL. ☐

NOTE 3.7.f

Use MANUAL control only if the Master Speed Controller is unable to control in AUTO.

Z140→ f. Ensure the MASTER SPEED CNTRL (MCB M/A station) is in Automatic per SOP-210, Feedwater System, Section III.E, Feedwater Pump Startup, Step 2.8. ☐

Z197→ g. Prepare the Main Generator for startup per SOP-301, MAIN GENERATOR SYSTEM, SECTION III.A, Startup, Steps 2.1 and 2.2. ☐ CHG D

h. Contact Reactor Engineering to verify LEFM constants are removed per SAP-119, Control Of The Station Calorimetric Computer Program. ☐ CHG G

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

CAUTION 3.8
Reactor Power must be maintained less than or equal to 10% until Emergency Feedwater is aligned per STP-120.003, Emergency Feedwater Valve Verification. (refer to Tech Spec 4.7.1.2.a.4)

3.8 Prepare for power ascension as follows: ________/________

a. Verify the accumulator pressure for each Feedwater Isolation Valve is greater than 500 psi as indicated by either of the following:

1) XCP-625 3-3 (FIV A/B/C ACCUM PRESS LO) is clear. ☐

2) Accumulator pressure locally verified is greater than 500 psi for each valve. ☐

b. Commence Reactor Power increase to between 6% and 9% (Target 8% power, at a reasonably achievable ramp rate up to 1/2%/minute). ☐

c. Log the time and date the plant entered Mode 1: ☐

Mode 1 Entry: ________________/____________
Time Date

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.8 continued

NOTE 3.8.d
C03→ Maintaining Main Feedwater Pump discharge pressure 50 psi -150 psi greater than Main Steam header pressure will maintain Steam Generator levels until Main Feedwater Pump speed control is placed in Automatic.

d. If the MASTER SPEED CNTRL will **NOT** control in AUTO, perform the following:

1) Place the MASTER SPEED CNTRL in Manual. ☐

2) Adjust Main Feedwater Pump speed as necessary to maintain Main Feedwater Pump discharge pressure 50 psi to 150 psi greater than Main Steam header pressure. ☐

Z142→ e. Perform SOP-210, Feedwater System, Section III.F, Transferring Emergency Feed Flow To The Main Feed Reg Valves (Preferred method). ☐

f. Transfer Feedwater Flow from (Alternate method):

Z143→ 1) Emergency Feed to the Bypass Valves per SOP-210, Feedwater System, Section IV.A, Transferring Feedwater Flow From The Emergency Feed To The Bypass Valves. ☐

CHG D

Z144→ 2) The Bypass Valves to the Main Feed Reg Valves per SOP-210, Feedwater System, Section IV.B, Transferring Feedwater Flow From The Bypass Valves To The Main Feed Reg Valves. ☐

Z140→ g. Establish automatic Feedwater Pump speed control per SOP-210, Feedwater System, Feedwater System, Section III.E, Feedwater Pump Startup, Step 2.8. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.8 continued

h. Update the IPCS Plant Mode indicator to indicate Mode 1 as follows:

1) Type the Turn-On-Code MODE to display the PLANT MODE CHANGE DISPLAY window. ☐

2) Select the SET MODE 1 Pushbutton. ☐

3) Verify POWER OPER is displayed on the left end of the top toolbar. ☐

CAUTION 3.8.i

1) Moisture Separator/Reheater temperature changes and Main Turbine vibration levels must be monitored closely while placing the MSRs in service.

2) To minimize stress in the Low Pressure Turbines, Hot Reheat Steam temperature changes must be limited to 125°F/hr.

Z134→ i. Start up MSR A and B, in RAMP (TEMP CONTROL) mode, per SOP-204, Extraction Steam, Reheat Steam, Heater Vents And Drains, Section III.D, Normal Startup And Operation Of The MSRs. ☐ CHG D

j. When less than 15% power, ensure the following valves are open:

1) XVT02072A-HD, REHEAT A 4TH-PASS DUMP TO CNDSR THROT. ☐

2) XVT02072B-HD, REHEAT B 4TH-PASS DUMP TO CNDSR THROT. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.8 continued

k. Ensure the following as Reactor Power increases to no more than 9%:

1) DA temperature is being maintained between 130°F and 150°F by adjusting IPV-2231, MS/PEGGING STM TO DEAERATOR, as necessary. ☐

2) Narrow Range Steam Generator levels are maintained between 55% and 65%. ☐

3) Condensate flow to the Deaerator increases. ☐

Z145→ l. Secure Emergency Feedwater per SOP-211, Emergency Feedwater System, Section III.B, Motor Driven Emergency Feedwater Pump Shutdown. ☐ CHG D

m. Complete STP-120.003, Emergency Feedwater Valve Verification (Valve Position Verification portion). ☐

STTS# ___________

NOTE 3.9

RCS TAVG – TREF DEV HI/LO (XCP-615 2-5) is expected to alarm as TAVG is increased and TREF remains constant. Compensatory actions should be taken per the ARP for this alarm.

3.9 When Emergency Feedwater is aligned for power operation, prepare to synchronize and load the Main Generator as follows: _______/_______

a. Slowly raise Reactor Power to between 12% and 15% while continuing with this procedure. ☐

b. At 10% Reactor Power, perform the following:

1) Verify P10, NIS PR, permissive energizes to bright. ☐

2) Verify P7, REACTOR TRIP BLOCKED, permissive de-energizes to dim. ☐

3) Verify normal Power Range Channel indication. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.9.b continued

4) Monitor the highest indicating Power Range Channel and Delta Flux on either of the following:

a) NR-45, NIS RECORDER. ☐

b) Computer display NR45. ☐

5) Ensure REGULATOR CORE 1 ALARM and REGULATOR CORE 2 ALARM (XCP-633) are reset. ☐

c. Stabilize Reactor Power to establish and maintain the following conditions prior to and during the Main Turbine rollup to 1800 RPM:

1) Reactor Power between 12% and 15%. ☐

2) Steam Dump Demand between 8% and 14% as indicated on TI-408, SD CNTRL S/G %. ☐

3) Main Steam Header Pressure less than 1120 psig. ☐

d. If not completed previously, perform the following per SOP-210, Feedwater System:

Z140→ 1) Establish automatic Feedwater Pump speed control, Section III.E, Feedwater Pump Startup, Step 2.8. ☐

Z142→ 2) Transfer Feedwater from the Main Feed Bypass Valves to the Main Feed Regulating Valves, Section IV.F, Transferring Feedwater Flow From The Bypass Valves To The Main Feed Reg Valves. ☐ CHG D

Z135→ e. Transfer Gland Sealing Steam to Main Steam per SOP-205, Turbine Sealing Steam System, Section III.A, Startup Of The Turbine Sealing Steam System Using Main Steam. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.9 continued

f. Momentarily place the following RESET-BLOCK Switches in BLOCK:

1) IR TRAIN A. ☐

2) IR TRAIN B. ☐

3) PR LOW SP TRAIN A. ☐

4) PR LOW SP TRAIN B. ☐

g. Verify the following status lights energize to bright:

1) IR A TRIP BLCK. ☐

2) IR B TRIP BLCK. ☐

3) PR A TRIP BLCK. ☐

4) PR B TRIP BLCK. ☐

Z147→ h. Roll the Main Turbine to 1800 RPM, per SOP-214, Main Turbine And Controls, Section III.A, Turbine Startup, Step 2.13. ☐ CHG D

i. Ensure 0.5 scfh flow through FLOW METER FOR GAS ANALYZER (XPN-7201, HYDROGEN AND STATOR COOLING WTR CNT PNL) by adjusting XVT12205-HY, MACHINE GAS ANALYZER INLET ISOL VALVE (TB-412). ☐ CHG G

j. Obtain a Switching Order from the System Controller. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

CAUTION 3.10

a. Thermal Power changes of greater than 15% in any one hour period require completion of GTP-702 Attachment III.H.

b. VCS DDS Report, POWER CHANGE SEARCH, should be periodically performed to ensure a thermal power change of greater than 15% in any one hour period is detected.

c. Prolonged operation at low loads (less than 150 MWe) may result in Turbine rubs and elevated bearing vibration caused by low Exhaust Hood temperatures.

d. To prevent equipment damage, Step 3.10 should be completed as conditions allow. This is especially true when a Turbine load increase is stopped prior to reaching 150 MWe. CHG D

NOTE 3.10 through 3.18

a. IFK3136, FLOW TO DEAERATOR, AUTO setpoint should be adjusted during power changes to maintain LI-3136, DEAER STOR TK NR LVL, between 2.5 feet and 5.0 feet as LCV 3235, DEAR START UP DRAIN CNTRL, is closed.

b. Acknowledging dialog boxes is considered a “skill of the craft”. CHG B

3.10 Synchronize and load the Main Generator to as follows: ________/________

a. Adjust Reactor Power as necessary to maintain between 8% and 14% Steam Dump Demand as indicated on TI-408, SD CNTRL S/G %, while continuing with this procedure. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

NOTE 3.10.b

When the Main Generator Breaker is closed the Generator icon will swap from speed (rpm's) indication to load (MW) indication.

Z152→ b. Synchronize and load the Main Generator to 50 MWe per SOP-301, Main Generator System, Section III.A, Startup, Step 2.3. ☐ CHG D

c. Monitor Exhaust Hood temperature using any of the following:

1) On the EHC HMI select Monitor/LP Hoods ☐

2) Computer display TURBRG. ☐

3) Computer points T3058A, EXHAUST SPRAY HOOD A TEMP, and T3068A, EXHAUST SPRAY HOOD B TEMP. ☐

d. Raise Turbine load to 150 MWe as follows:

1) Verify Exhaust Hood temperature is less than 175°F as indicated on the EHC HMI, Monitor/LP Hoods screen. ☐ CHG D

2) Using the EHC HMI, Control/Load screen, on Load Set, select Ramp Rate and enter desired rate of 1% or less. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

3) Increase Turbine load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐ CHG D

(2) Enter 13.59%. ☐

(3) Confirm setpoint. ☐

(4) Verify proper plant response. ☐

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

CAUTION 3.10.e

Do not stop the Turbine load increase with Exhaust Hood temperature less than 80°F as indicated on the EHC HMI, Monitor/LP Hoods.

e. If necessary, stop the Turbine load increase by one of the following methods:

   1) Depress the HOLD button. ☐

   2) Release the Raise Pushbutton on the MCB. ☐

f. Maintain Exhaust Hood temperature greater than 80°F as indicated on the EHC HMI, Monitor/LP Hoods screen, by Turbine load adjustments. ☐ CHG D

g. If necessary, re-commence the Turbine load increase by one of the following methods:

   1) Using the EHC HMI, Control/Load screen, on Load Set, select Ramp Rate and enter desired rate of 1% or less. ☐

   2) Manually using the raise/lower pushbuttons:

      a) Select the desired ramp rate of 1%/min or less. ☐

      b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe). ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

   1) Power and temperature changes should be slow and will require constant operator attention.

   2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

   3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

h. As Turbine load increases, perform the following:

1) Ensure 1st Stage Shell Inner heatup rate as indicated on EHC HMI, Aux/Metal Temps screen does not exceed 150°F/hr. ☐

2) Maintain DA temperature as follows:

a) Adjust IPV-2231, MS/PEGGING STM TO DEAERATOR, as necessary, to maintain DA temperature per Enclosure B, DA Low Power Temperature Curve. ☐

b) If required, LCV 3235, DEAER START UP DRAIN CNTRL, may be used to raise flow through the DA. ☐ CHG D

Z138→ c) Ensure Feedwater Booster Pump warm-up criteria are maintained with DA temperature changes per SOP-210, Feedwater System, Section III.D, Step 2.1. ☐

d) Maintain Blowdown Heat Exchanger condensate outlet temperatures at least 30˚F below DA temperature. ☐

i. Adjust Reactor Power as necessary to maintain between 2% and 14% Steam Dump Demand as indicated on TI-408, SD CNTRL S/G % while continuing with this procedure. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

Z148→ j. Close GP-A drain valves per SOP-214, Main Turbine And Controls, Section III.A, Turbine Startup, Step 2.24. ☐ CHGD

k. Place 43-TS12, UNDER FREQ. TRIP CONTROL SW, in ON. ☐

l. Reset VOLT. UNBAL. RELAY 60G. ☐

Z132→ m. Perform the 50 MWe Main Control Board Extraction Drain Switch alignment per SOP-204, Extraction Steam, Reheat Steam, Heater Vents and Drains, Section III.A, Startup Of Extraction Steam, Reheat Steam, Heater Vents And Drains, Step 2.3. ☐ CHGD

n. Perform PTP-102.003, Main Generator Temperature Monitoring. ☐

PMTS# ___________

o. When the Turbine Load is greater than 10% (100 MWe), as indicated on any DCS graphic screen or EHC HMI, perform the following:

1) Open MVG-1212, EXTR STM TO DEAER ISOL. ☐

2) Adjust the IPV-2231, MS/PEGGING STM TO DEAERATOR, setpoint to a setting of 7.0 in AUTO. ☐

3) Ensure the following are closed (TB-412):

a) XVG02075-HD, HP FW HEATER 2A DRAIN TO DEAER HDR ISOLATION. ☐

b) XVG02074-HD, HP FW HEATER 2B DRAIN TO DEAER HDR ISOLATION. ☐

4) Place the following in NORMAL (GRAPHIC 101 and 102 or 110 screens - I icons):

a) FW HTR 2A OPRTR SELECT ISOLATION. ☐

b) FW HTR 2B OPRTR SELECT ISOLATION. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

p. Verify P13, 1st STAGE PRESSURE, permissive de-energizes to dim. ☐

q. When Turbine Load has stabilized at 150 MWe, perform the following:

1) Close the following Main Steam GP-B drain valves:

a) MVG-2899A, X-AROUND DRN VLV-1. ☐

b) MVG-2899B, X-AROUND DRN VLV-2. ☐

c) MVG-2899C, X-AROUND DRN VLV-3. ☐

d) MVG-2899D, X-AROUND DRN VLV-4. ☐

Z133→ 2) Close heater startup vents and bypass valves for 15% Turbine Load, SOP-204, Extraction Steam, Reheat Steam, Heater Vents and Drains, Section III.A, Startup Of Extraction Steam, Reheat Steam, Heater Vents And Drains, Step 2.4. ☐ CHG D

3) Perform the following (TB-412):

a) Throttle XVT02072A-HD, REHEAT A 4TH-PASS DUMP TO CNDSR THROT, to 2.0 turns open. ☐

b) Throttle XVT02072B-HD, REHEAT B 4TH-PASS DUMP TO CNDSR THROT, to 3.25 turns open. ☐

4) If desired, secure the Auxiliary Boiler per SOP-506, Auxiliary Boiler Operation:

Z153→ a) Section III.B, Shutdown ☐ CHG D

Z154→ b) Section IV.E, Operation Of The Temporary Boiler. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10.q continued

5) Perform PTP-102.003, Main Generator Temperature Monitoring. ☐

PMTS# ___________

Z155→ 6) Align Extraction Steam to Auxiliary Building Steam per SOP-507, Auxiliary Steam System, Section III.A, Supplying Auxiliary Building Steam From Extraction Steam ☐ CHG D

NOTE 3.10.q.7)
If returning from a power level of greater than 75 %, per Reactor Engineering, the LEFM constants are not required to be adjusted (i.e. quarterly valve testing).

CHG G

7) Contact Reactor Engineering to determine if LEFM constants need to be re-determined for current power history. ☐

3.11 Raise Reactor Power to 25%, as follows:

a. Maintain DA temperature during load increases as follows:

1) Adjust IPV-2231, MS/PEGGING STM TO DEAERATOR, as necessary, to maintain DA temperature per Enclosure B, DA Low Power Temperature Curve. ☐

Z138→ 2) Ensure Feedwater Booster Pump warm-up criteria are maintained with DA temperature changes per SOP-210, Feedwater System, Section III.D, Feedwater Booster Pump Startup, Step 2.1. ☐ CHG D

3) Maintain Blowdown Heat Exchanger condensate outlet temperatures at least 30˚F below DA temperature. ☐

b. Ensure the A(B)(C) FPT SETPOINT RAMP LIMIT (A icon) RV value for operating Feedwater Pump A(B)(C) is set to 3000 rpm per minute. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.11 continued

c. Verify Exhaust Hood temperature is less than 175°F as indicated on the EHC HMI, select Monitor/LP Hoods. ☐

d. Using the EHC HMI, Control/Load screen, on Load Set, select Ramp Rate and enter desired rate of 1% or less. ☐

e. Increase Turbine load to 300 MWe by one of the following methods:

1) Slowly Raise Turbine load automatically as follows (preferred method):

(a) Select the Load pushbutton (a dialog box opens). ☐

(b) Enter 27.17%. ☐

(c) Confirm setpoint. ☐

(d) Verify proper plant response. ☐

2) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

3) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

CHG B

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.11.f continued

f. As Turbine load increases, perform the following:

1) Ensure First Stage Shell heatup rate as indicated on EHC HMI, Aux/Metal Temps screen is maintained less than 150°F/hr. ☐

2) Adjust Reactor Power as necessary to maintain between 2% and 14% Steam Dump Demand as indicated on TI-408, SD CNTRL S/G %. ☐

3) When C5 (15% Turbine Load), 1st STAGE PRESSURE, permissive de-energizes to dim, perform the following in the order listed:

a) Hold Reactor Power constant. ☐

NOTE 3.11.f.3)b)

Establishing approximately a 0°F/hr to 30°F/hr cooldown rate will allow Tavg to slowly approach Tref.)

b) Continue raising turbine load to match Tavg and Tref. ☐

c) Verify Tref is within 1°F of Tavg. ☐

d) Place the ROD CNTRL BANK SEL Switch in AUTO. ☐

e) Ensure the STM DUMP CNTRL auto setpoint is set to 8.4 (1092 psig). ☐

f) Transfer Steam Dump control to the Tavg mode as follows by placing the STM DUMP MODE SELECT Switch in TAVG. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.11. continued

g. When Turbine load has stabilized, perform the following:

1) Perform STP-102.002, NIS Power Range Heat Balance. ☐

STTS# ____________

C02→ 2) As a second check on Nuclear Instrumentation, compare RCS Loop ΔT to the results of STP-102.002. ☐

3) Perform PTP-102.003, Main Generator Temperature Monitoring. ☐

PMTS# ____________

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.11 continued

h. Raise Turbine load to attain 25% Reactor Power as follows:

1) Select Ramp Rate and enter desired rate of 1% or less. ☐

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐

(2) Enter 18.2% ☐

(3) Confirm setpoint. ☐ CHG B

(4) Verify proper plant response. ☐

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.11 continued

i. At 25% Reactor Power, verify the following status lights energize to bright:

1) CHAN I IR FLUX HI. ☐

2) CHAN II IR FLUX HI. ☐

3) CHAN I PR FLUX LO SET PT. ☐

4) CHAN II PR FLUX LO SET PT. ☐

5) CHAN III PR FLUX LO SET PT. ☐

6) CHAN IV PR FLUX LO SET PT. ☐

NOTE 3.12 and 3.13
Steps 3.12 and 3.13 raise Reactor Power from 25% to 48%.

3.12 Raise Reactor Power to 38% as follows: ________/________

a. Contact Chemistry to verify there are no 30% power Chemistry holds. ☐

b. Ensure the following are closed (TB-412):

1) XVG02075-HD, HP FW HEATER 2A DRAIN TO DEAER HDR ISOLATION. ☐

2) XVG02074-HD, HP FW HEATER 2B DRAIN TO DEAER HDR ISOLATION. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.12 continued

c. Raise Turbine load to attain 38% Reactor Power as follows:

1) Select Ramp Rate and enter desired rate of 1% or less. ☐

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐

(2) Enter 29.9% ☐

(3) Confirm setpoint. ☐ CHG B

(4) Verify proper plant response. ☐

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

d. At 250 MWe perform the following:

1) Ensure all Extraction Drain Valves are latched. ☐

2) Contact Electrical Maintenance to perform thermography on manual disconnects 8901 and 8903. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.12 continued

e. At 300 MWe, perform the following to start filling the drain lines from the 2A and 2B Heaters to the DA:

1) Open XVT12083-HD, 1" BYPASS VALVE FOR XVG-02075 (TB-412) (requires ladder). ☐

2) Open XVT12085-HD, 1" BYPASS VALVE FOR XVG-02074 (TB-412). ☐

3) Throttle XVT02018A-HD, FW HTR 2A DRN TO DEAER LVL CONT VLV BYP, ten turns off the closed seat (TB-463). ☐

4) Throttle XVT02018B-HD, FW HTR 2B DRN TO DEAER LVL CONT VLV BYP, ten turns off the closed seat (TB-463). ☐

Z136→ f. Place a second Condensate Pump in service per SOP-208, Condensate System, Section III.B, Condensate Pump Startup when total Condensate flow approaches 9000 gpm as indicated on the following: ☐ CHG D

1) FI 3026, PUMP A DISCH FLOW.

2) FI 3036, PUMP B DISCH FLOW.

3) FI 3046, PUMP C DISCH FLOW.

g. Between 30% and 35% Reactor Power, perform the following:

Z138→ 1) Ensure Feedwater Booster Pump warm-up criteria are maintained with DA temperature changes per SOP-210, Feedwater System, Section III.D, Feedwater Booster Pump Startup, Step 2.1. ☐ CHG D

Z139→ 2) Ensure at least three Feedwater Booster Pumps are in service per SOP-210, Feedwater System, Section III.D, Feedwater Booster Pump Startup. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.12 continued

h. At 38% Reactor Power verify P8, REACTOR TRIP BLOCKED, de-energizes to dim. ☐ CHG E

Z146→ i. Establish automatic Steam Generator blowdown temperature control per SOP-212, Steam Generator Blowdown, Section III.A, Steam Generator Blowdown System Startup And Operation Steps 2.19 and 2.20. ☐ CHG D

Z141→ j. Between 35% and 48% Reactor Power, place a second Main Feedwater Pump in service per, SOP-210, Feedwater System, Section III.E, Feedwater Pump Startup. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.12 continued

k. When 40% is indicated in the INTERMEDIATE PRESSURE block on the PLU test Screen perform the following: CHG H

1) On the EHC HMI, Control/Load Screen, select HOLD. ☐ CHG G

2) Perform the Power Load Unbalance (PLU) test as follows:

(a) Verify P9, REACTOR TRIP BLOCKED, permissive is BRIGHT. ☐

(b) On the EHC HMI, select Tests/PLU test. ☐

(c) Verify all PLU Status indicate OFF. ☐

(d) Select PLU Test ON. ☐

(e) Select OK. ☐

(f) Verify the following:

(1) Test initiation on all 6 status indicators. ☐

(2) Final status indication for all 6 indicators PLU TEST FOR R/S/T COMPLETE. ☐

(g) Select PLU Test OFF ☐

(h) Select OK. ☐

(i) Select desired Ramp Rate, %/min increase on Control/Load screen. ☐

l. Determine the GOP Appendix A recommended power ascension rate. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

3.13 Raise Reactor Power to 48% at the GOP Appendix A recommended power ascension rate, as follows: ______/______

a. Verify Steam Generator chemistry is in specification per CP-613, Steam Generator Chemistry Control. ☐

b. Raise Turbine load to attain 48% Reactor Power as follows:

1) Select Ramp Rate and enter the recommended Load Ramp Rate. ☐

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐

(2) Enter 39.5.%. ☐ CHG B

(3) Confirm setpoint. ☐

(4) Verify proper plant response. ☐

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.13 continued

c. When Turbine Load is greater than 40% (385 MWe), verify C20, 1st STG PRESS, de-energizes to dim. ☐

d. Monitor the following for proper operation:

1) Stator Water Cooling. ☐

2) Hydrogen Seal Oil. ☐

e. Between 400 MWe and 450 MWe, open the following valves to align the 2A and 2B Heaters to the DA (TB-412):

1) XVG02075-HD, HP FW HEATER 2A DRAIN TO DEAER HDR ISOLATION. ☐

2) XVG02074-HD, HP FW HEATER 2B DRAIN TO DEAER HDR ISOLATION. ☐

Z129→ f. Secure the Condensate Polishing per SOP-203, Condensate Polishing System, Section III.F, Removing The Condensate Polishing System From Service. ☐

Z157→ g. Maintain the following SOP-401, Reactor Protection And Control System, Section III.B, Load Variations With Manual Or Automatic Reactor Control parameters using CHG D
Z017→ SOP-106, Reactor Makeup Water System Section III.E,
Z003→ Alternate Dilute Operations or Section III.F, Borate Operations:

1) ΔI within limits. ☐

2) Control Rods above the Rod Insertion Limit. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

   1) Power and temperature changes should be slow and will require constant operator attention.

   2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

   3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.13 continued

> **NOTE 3.13.h**
>
> Above 40% Turbine load MSR 4th pass drains to the Condenser close and the MSR 4th pass drains to the #1 Feedwater Heaters open.

h. Using the DCS Computer Graphic Screens 101 and 102, verify MSR 4th pass drain valves have repositioned:

1) XVT-2071A indicates closed. ☐

2) XVT-2071B indicates closed. ☐

3) XVT-02068A indicates open. ☐

4) XVT-02068B indicates open. ☐

i. When Reactor Power is stable at or below 48%, perform the following:

1) STP-102.002, NIS Power Range Heat Balance. ☐

STTS# ___________

C02→ 2) As a second check on Nuclear Instrumentation, compare RCS Loop ΔT to the results of STP-102.002. ☐

3) Determine the operability of the Axial Flux Difference alarm:

a) Perform STP-133.001, Axial Flux Difference Calculation. ☐

STTS# ____________

b) Verify Annunciator Point XCP-620 2-4 (CMPTR ΔFLUX LMT EXCEEDS) is clear. ☐

4) PTP-102.003, Main Generator Temperature Monitoring. ☐ CHG C

PMTS# ____________

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

NOTE 3.14 through 3.16

Steps 3.14 through 3.16 raise Reactor Power from 48% to 90%.

3.14 At the GOP Appendix A recommended power ascension rate, continue the Reactor Power ascension above 50% as follows: _______/_______

a. Ensure ΔI, Axial Flux Difference, is within limits per V.C.Summer Curve Book, Figure I-4.1 prior to increasing Reactor Power above 50% per Tech Spec 3.2.1. ☐

b. When greater than 50% Rated Thermal Power perform STP-108.001, Quadrant Power Tilt Ratio. ☐ CHG C

STTS# ____________

c. Raise Turbine load to attain 90% Reactor Power as follows:

1) Select Ramp Rate and enter the recommended. Load Ramp Rate. ☐

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐

(2) Enter 81.52% ☐ CHG B

(3) Confirm setpoint. ☐

(4) Verify proper plant response. ☐

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.14 continued

d. As power increases, verify the following annunciators clear:

1) PR UP DET FLUX HI DEV AUTO DEFEAT (XCP-620 1-5). ☐

2) PR LOW DET FLUX HI DEV AUTO DEFEAT (XCP-620 1-6). ☐

e. Adjust Megavars using GEN FIELD VOLT ADJ as requested by the System Controller and within the Estimated Generator Capability Curve (Enclosure A). ☐

Z157→ f. Maintain the following SOP-401, Reactor Protection And Control System, Section III.B, Load Variations With Manual Or Automatic Reactor Control parameters using
Z017→ SOP-106, Reactor Makeup Water System Section III.E,
Z003→ Alternate Dilute Operations or Section III.F, Borate Operations: CHG D

1) ΔI within limits. ☐

2) Control Rods above the Rod Insertion Limit. ☐

g. Verify P9, REACTOR TRIP BLOCKED, permissive de-energizes to dim. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

3.15 When Turbine Load is greater than 50%, as indicated on any DCS graphic screen, place IZY03783A and IZY03793A, MANUAL OPERATOR STATIONs in Automatic as follows (GRAPHIC 101 and 102 or 110 screens): ______/______

a. Ensure the following are open (TB-412):

1) XVG02075-HD, HP FW HEATER 2A DRAIN TO DEAER HDR ISOLATION. ☐

2) XVG02074-HD, HP FW HEATER 2B DRAIN TO DEAER HDR ISOLATION. ☐

b. Ensure HTR 2A&B DRN VLV TO DEAERATOR CLOSE is selected to CNTRL (C icon). ☐

c. Ensure both FW HTR 2A OPRTR SELECT ISOLATION and FW HTR 2B OPRTR SELECT ISOLATION are in NORMAL (I icon). ☐

NOTE 3.15.d

The #2 Heaters utilize the lowest controller signal to maintain level, regardless of the M/A station output (in Manual or Automatic). As a result, manipulation of the M/A station in manual may not yield the anticipated result.

d. Slowly raise OUT on both ILY03783A and ILY03793A MANUAL OPERATOR STATIONs (M/A - icons) until the associated IZY03783B and IZY03793B (2A/2B Heater drain to the Condenser) are fully closed. ☐

e. When FEEDWATER HEATER 2A(B) levels are stable and slightly below setpoint, place ILY03783A and ILY03793A MANUAL OPERATOR STATIONs (M/A - icons) in Automatic. ☐

f. Adjust IFK3136, FLOW TO DEAERATOR, AUTO setpoint as necessary to ensure LI-3136, DEAER STOR TK NR LVL is between 2.5 feet and 5.0 feet with LCV 3235, DEAR START UP DRAIN CNTRL closed. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step3.15 continued

g. Close the following bypass valves:

1) XVT12083-HD, 1" BYPASS VALVE FOR XVG-02075 (TB-412) (requires ladder). ☐

2) XVT12085-HD, 1" BYPASS VALVE FOR XVG-02074 (TB-412). ☐

3) XVT02018A-HD, FW HTR 2A DRN TO DEAER LVL CONT VLV BYP (TB-463). ☐

4) XVT02018B-HD, FW HTR 2B DRN TO DEAER LVL CONT VLV BYP (TB-463). ☐

3.16 As the Reactor Power ascension to 90% continues perform the following: ________/________

a. Between 60% and 65% Reactor Power, perform the following:

Z138→ 1) Ensure Feedwater Booster Pump warm-up criteria are maintained with DA temperature changes per SOP-210, Feedwater System, Section III.D Feedwater Booster Pump Startup, Step 2.1. ☐ CHG D

Z139→ 2) Ensure four Feedwater Booster Pumps are in service per SOP-210, Feedwater System, Section III.D, Feedwater Booster Pump Startup. ☐ CHG G

Z141→ 3) Start a third Main Feedwater Pump per SOP-210. Feedwater System, Section III.E, Feedwater Pump Startup. ☐ CHG D

b. At 65% Reactor Power, perform PTP-102.003, Main Generator Temperature Monitoring. ☐

PMTS# ____________

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.16 continued

c. When Reactor Power is between 60% and 75%, perform PTP-102.001, Main Turbine Tests (Power Operated Extraction System Check Valve portion only). ☐

PMTS# ___________

d. At 75% Reactor Power, perform STP-102.002, NIS Power Range Heat Balance. ☐ CHG G

STTS# ___________

e. At 80% Reactor Power, align Control Valve drain valves as follows:

1) Ensure PVG-2898B, DV-4, is open as follows:

a) Verify Control Valve #4 is closed. ☐

b) Verify PVG-2898B, DV-4, is open. ☐

c) If both PVG-2898B, DV-4, and Control Valve #4 are closed, open PVG-2898B, DV-4, by opening MVG-2898D, STM LEAD DRN FOR CV-1. ☐

2) Open MVG-2897, COMB CNTRL VLV BSD. ☐

f. When Control Valve #4 indicates greater than 5% open, perform the following:

1) Ensure PVG-2898B, DV-4, is CLOSED. ☐

2) Close MVG-2897, COMB CNTRL VLV BSD. ☐

g. At 85% Reactor Power, perform PTP-102.003, Main Generator Temperature Monitoring. ☐

PMTS# ___________

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.16 continued

h. Contact Electrical Maintenance to perform thermography on manual disconnects 8901 and 8903. ☐

i. Adjust Megavars using GEN FIELD VOLT ADJ as requested by the System Controller and within the Estimated Generator Capability Curve (Enclosure A). ☐

j. If desired stabilize Reactor Power at 90%, otherwise proceed to Step 3.17. ☐

NOTE 3.17 and 3.18

Steps 3.17 and 3.18 raise Reactor Power from 90% to 100%.

3.17 At the GOP Appendix A recommended power ascension rate, increase Reactor Power from 90% to 95% as follows: ________/________

a. Raise Turbine load to attain 95% Reactor Power.

1) Select Ramp Rate and enter the recommended. Load Ramp Rate. ☐

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐

(2) Enter 87.41%. ☐

(3) Confirm setpoint. ☐ CHG B

(4) Verify proper plant response. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.17.a.2) continued

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

CHG B

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

b. Place the following Blowdown Temperature Controllers in AUTOMATIC (AB-436):

1) ITV-3062A, BD COOLER A CDSTE OUT TEMP. ☐

2) ITV-3062B, BD COOLER B CDSTE OUT TEMP. ☐

3) ITV-3062C, BD COOLER C CDSTE OUT TEMP. ☐

c. Adjust Megavars using GEN FIELD VOLT ADJ as requested by the System Controller and within the Estimated Generator Capability Curve (Enclosure A). ☐

Z157→ d. Maintain the following SOP-401, Reactor Protection And Control System, Section III.B, Load Variations With Manual Or Automatic Reactor Control parameters using
Z017→ SOP-106, Reactor Makeup Water System Section III.E,
Z003→ Alternate Dilute Operations or Section III.F, Borate Operations:

CHG D

1) ΔI within limits. ☐

2) Control Rods above the Rod Insertion Limit. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.17 continued

e. Stabilize Reactor Power at 95% and perform the following:

1) STP-102.002, NIS Power Range Heat Balance. ☐

STTS# ____________

2) During the first power ascension following refueling, contact Reactor Engineering to continue the power ascension per REP-107.001, Controlling Procedure For Refueling Startup And Power Ascension Testing. ☐

3.18 Slowly increase Reactor Power to 100% as follows: ________/________

a. If the IPCS is available, verify the NSSS CRT is displaying the following computer points:

1) SHIFT AVG POWER (U9002). ☐

2) QCORE 1 (C1M) (U9003). ☐

b. Raise Turbine load to attain 100% Reactor Power per the GOP Appendix A recommended power ascension rate, while continuing with this procedure. ☐

1) Select Ramp Rate and enter the recommended. Load Ramp Rate. ☐

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐ CHG B

(2) Enter 92.12%. ☐

(3) Confirm setpoint. ☐

(4) Verify proper plant response. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.18.b.2) continued

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

CHG B

c. Adjust Turbine load to attain 100% Reactor Power, while continuing with this procedure.

1) Using the EHC HMI, Control/Load screen, on Load Set, select Ramp Rate and enter desired rate of 1% or less. ☐

2) Adjust Turbine Load as follows:

a) Select the Load pushbutton (a dialog box opens). ☐

b) Adjust the setpoint in incremental values not to exceed 0.2%. ☐

c) Confirm setpoint. ☐

d) Verify proper plant response. ☐

CHG D

d. Adjust Megavars using GEN FIELD VOLT ADJ as requested by the System Controller and within the Estimated Generator Capability Curve (Enclosure A). ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.18 continued

e. Monitor the following for proper operation:

Z099→ 1) Stator Water per SOP-218, Stator Cooling Water System, Section III.A ☐

Z150→ 2) Hydrogen Seal Oil per SOP-216, Seal Oil System, Section III.A. ☐ CHG D

Z151→ 3) Generator Gas per SOP-217, Generator Gas And Vent System, Section III.A ☐

f. Stabilize at 100% Reactor Power and perform STP-102.002, NIS Power Range Heat Balance. ☐

STTS# ____________

g. If desired, place the Load Limit circuit in service as follows:

1. Select desired Ramp Rate on Load Limit. (usually Normal). ☐

2. Select Setpoint on Load Limit, (a dialog box opens). ☐

3. Enter the desired setpoint (must be less than the indicated Load Reference). ☐ CHG B

4. Confirm setpoint. ☐ CHG B

5. Verify the Load Limit status indicates LIMITING. ☐

6. Verify proper system response. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.18 continued

NOTE 3.18.h

f returning from a power level of greater than 75 %, per Reactor Engineering, the LEFM constants are not required to be adjusted (i.e. quarterly valve testing).

h. Contact Reactor Engineering to determine if LEFM constants need to be re-determined for current power history. ☐

i. Adjust Reactor Power to 100% Rated Thermal Power, and perform the following:

1) STP-102.002, NIS Power Range Heat Balance. ☐

STTS# ____________

2) PTP-102.003, Main Generator Temperature Monitoring. ☐

PMTS# ____________

j. Maintain operation as close to 100% of licensed core power (2900 MWt) as possible, per OAP-100.6, Control Room Conduct and Control of Shift Activities. ☐

k. Notify Reactor Engineering to evaluate the requirements for performing STP-201.001, Monthly Reactor Engineering Surveillances. ☐

NOTE 3.18.l

For purposes of record, this procedure is complete when all steps through 3.18.l are initialed and dated. It should then be routed to the Operations Supervisor. CHG C

l. 100% Reactor Power achieved:

1) Date ______/______/______ ☐

2) Time ____________________ ☐

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4.0 REFERENCES

4.1 CP-613, Steam Generator Chemistry Control.

4.2 CP-615, Feedwater And Condensate Chemistry Control.

4.3 ES560.120, Feedwater Flow Rate And Temperature Normalization Surveillance.

4.4 FSAR Section 5.0.

4.5 GOP-Appendix A.

C03→ 4.6 LER 97002.

N01→ 4.7 MRB 9501.

4.8 OAP-100.4, Communication.

4.9 PTP-102.002, Main Turbine Monthly Oil System Test.

4.10 PTP-102.003, Main Generator Temperature Monitoring.

4.11 PTP-102.005, Main Feedwater Pump Turbine Checks.

4.12 PTP-102.008, Main Turbine Overspeed Testing.

4.13 SAP-119, Control Of The Station Calorimetric Computer Program.

C01→ 4.14 SER 880024.

C02→ 4.15 SOER 90-3.

4.16 SOP-102, Chemical And Volume Control System.

4.17 SOP-106, Reactor Makeup Water System.

4.18 SOP-201, Main Steam System.

4.19 SOP-203, Condensate Polishing System.

4.20 SOP-204, Extraction Steam, Reheat Steam, Heater Vents And Drains.

4.21 SOP-205, Turbine Sealing Steam System.

4.22 SOP-206, Main and Auxiliary Condenser Air Removal System.

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4.23 SOP-207, Circulating Water.

4.24 SOP-208, Condensate System.

4.25 SOP-209, Feedwater Turbine Lube Oil System.

4.26 SOP-210, Feedwater System.

4.27 SOP-211, Emergency Feedwater System.

4.28 SOP-212, Steam Generator Blowdown.

4.29 SOP-214, Main Turbine And Controls.

4.30 SOP-215, Main Turbine Lube Oil Supply System.

4.31 SOP-216, Seal Oil System.

4.32 SOP-217, Generator Gas And Vent System.

4.33 SOP-218, Stator Cooling Water System.

4.34 SOP-301, Main Generator System.

4.35 SOP-403, Rod Control And Position Indicating System.

4.36 SOP-404, Excore Nuclear Instrumentation System.

4.37 SOP-506, Auxiliary Boiler Operation.

4.38 SOP-507, Auxiliary Steam System.

4.39 STP-102.002, Nis Power Range Heat Balance.

4.40 STP-108.001, Quadrant Power Tilt Ratio.

4.41 STP-120.003, Emergency Feedwater Valve Verification.

4.42 STP-133.001, Axial Flux Difference Calculation.

4.43 STP-134.001, Shutdown Margin Verification.

4.44 STP-201.001, Monthly Reactor Engineering Surveillances.

4.45 V.C. Summer Precautions, Limitations, and Setpoints.

4.46 V.C. Summer Tech Specs.

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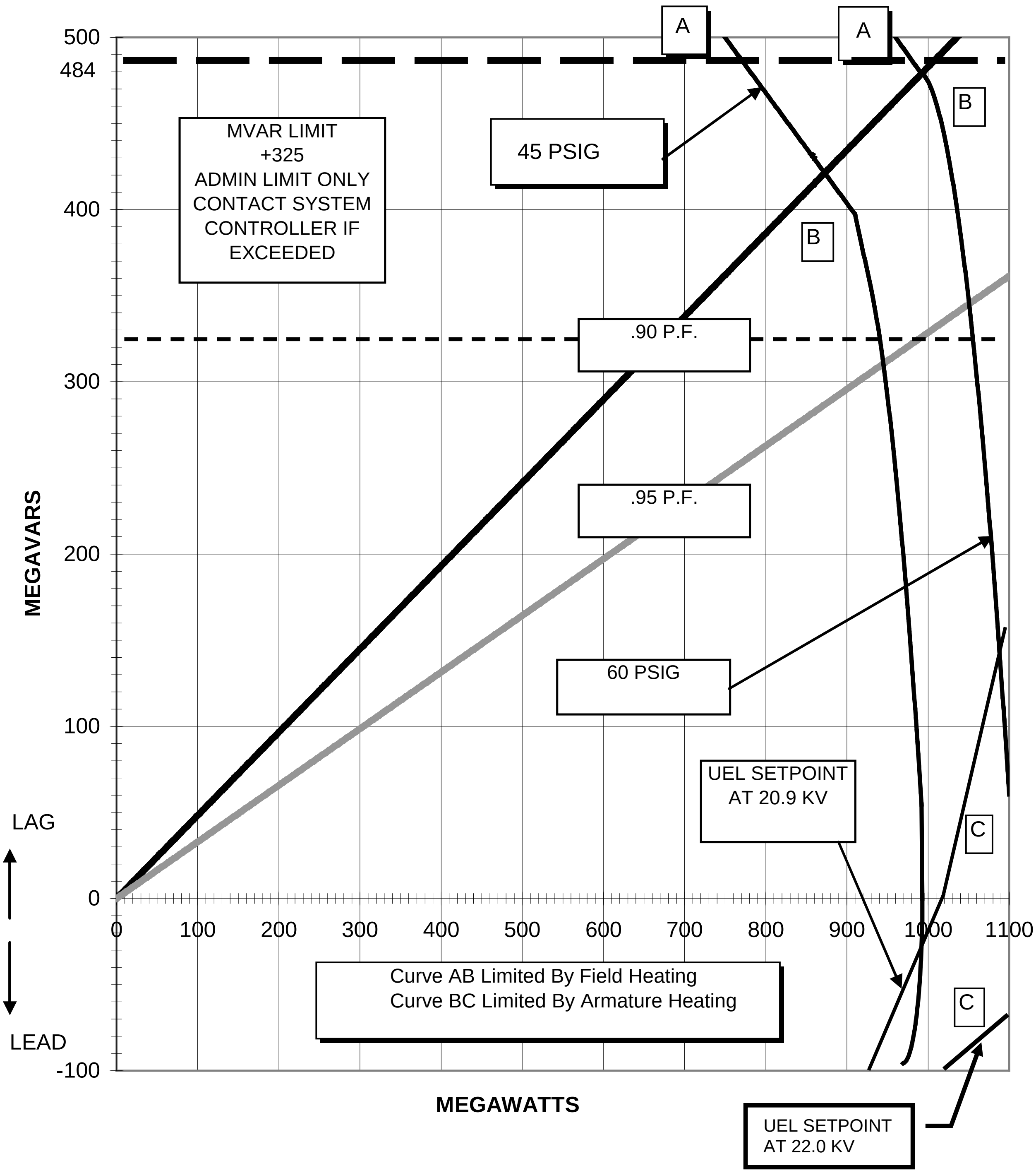
ESTIMATED GENERATOR CAPABILITY



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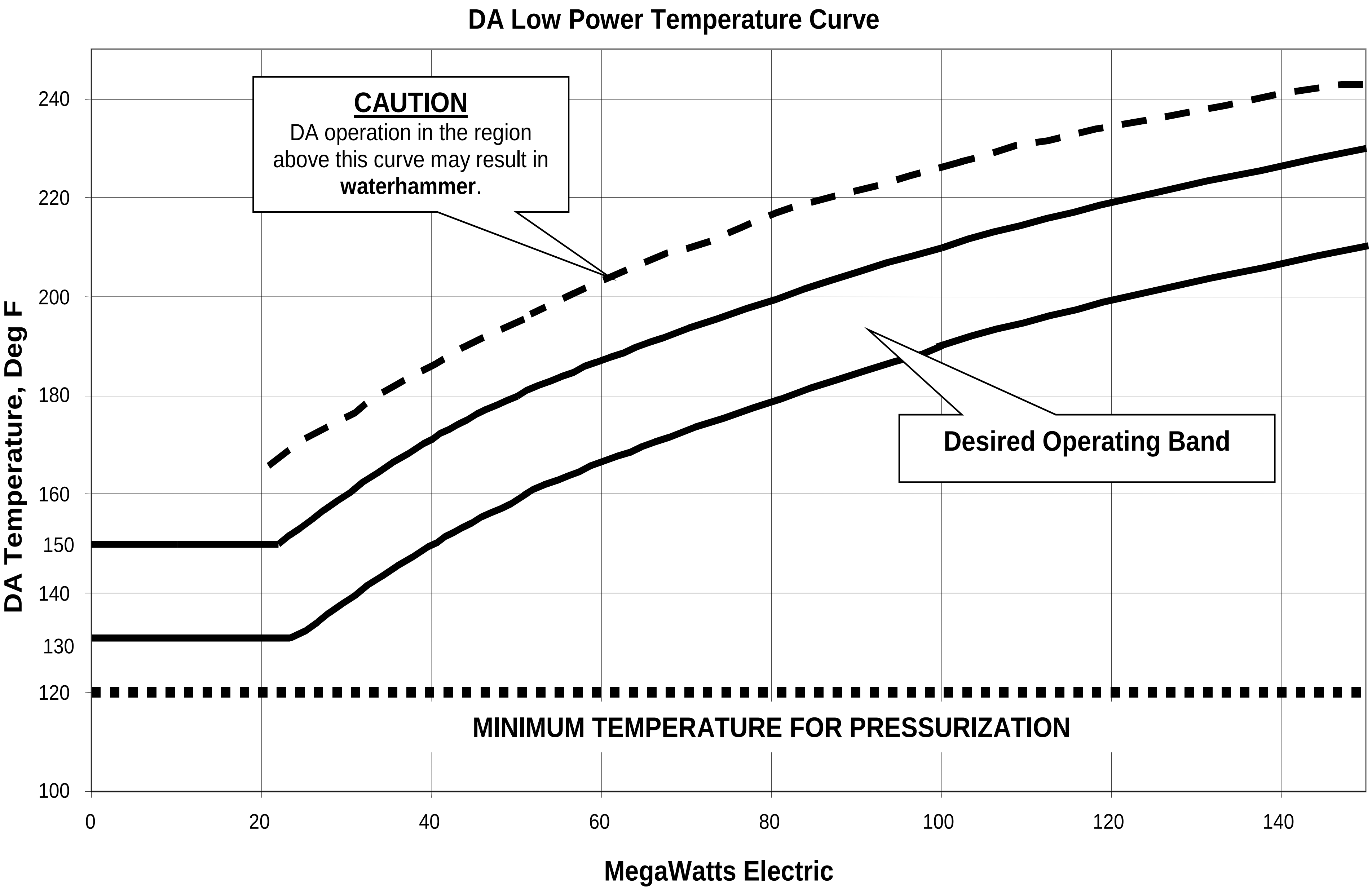
DA Low Power Temperature Curve
CAUTION
DA operation in the region above this curve may result in waterhammer.
Desired Operating Band
MINIMUM TEMPERATURE FOR PRESSURIZATION
DA Temperature, Deg F
240
220
200
180
160
150
140
130
120
100
0
20
40
60
80
100
120
140
MegaWatts Electric

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SIGN-OFF IDENTIFICATION LIST

PERSONNEL NAME (PRINTED)	PERSONNEL NAME (SIGNATURE)	PERSONNEL INITIALS

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REQUIRED SYSTEM ALIGNMENT VERIFICATION

PROCEDURE NUMBER	PROCEDURE TITLE	Date of Last Alignment	Has the System been 00S > 14 days		Has the System undergone Significant Maintenance		Does the System Require a Complete new Alignment		Date of Record for this Procedure	Verification by Shift Supervisor Initials/Date
			Yes	No	Yes	No	Yes	No		
GOP-2	Required Systems Alignments Current and Completed	NA	NA	NA	NA	NA	NA	NA		/
LIST OTHERS REQUIRED										
										/
										/
										/
										/
										/

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Document Review Form (DRF)

Section I	**Document Identification**	**Page 1 of 2**

Preparer Name: R. Perrill **Ext:** 55524 **Mail Code** 410

Date: 07/21/14 **Document #:** GOP-4A **Revision:** 2 **Change** H

Title: Power Operation (Mode 1 - Ascending) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process: ☐ New ☒ Revision/Change ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: See attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #____________

Qualified Reviewer	**DCRM person notified**	**Shift Supervisor**	**Date**

Section II **List Required Reviewers** including All Impacted Groups
Additional Reviewers – identify with an *

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
QR	Randy Todd	☐ Yes ☒ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

7/21/14
Designated Supervisor Concurrence **Date**

Comment Due Date ASAP
GM concurrence________for expedited review

Section III	**Pre- implementation Actions**

All Comments Resolved? ☒ **NA** ☐ **YES** RPerrill 07/21/14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☐ NA ☒ YES	Attached? YES ☒ No ☐	
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐	
Commitments (PCAP and MLSA) Addressed?	☒ NA ☐ YES	PCAP # ______	NL Initial/Date
QR Qualification Verified?	☒ YES		
Security Compliance Review Completed?	☒ NA ☐ YES		
Pre-Implementation Training Completed?	☒ NA ☐ YES		
Training required after implementation?	☒ NA ☐ YES	CR#______	
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #______	
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #______	
CMMS Update Required? [Unit 1]	☒ NA ☐ YES	Planner Notified YES ☐	

7/21/14
Designated Supervisor Approval **Date**

7/21/14
Approval Authority Approval **Date**
Effective Date:__________

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DRF Form (Continued)

DOCUMENT # GOP-4A Rev. 2 Chg. H

DESCRIPTION CONTINUED:

In Step 3.12.k, changed the referenced power used to perform the Power Load Unbalance test to the Intermediate Pressure indicated percent from the PLU test Screen from 45% to 40%.

REASON/BASIS CONTINUED:

Procedure feedback via e-mail from Chris Robertson stating that 45% "*may present a problem because we will probably be above 50% Rx power and therefore P9 will be inactive*". His recommendation is 40%.

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Document Review Form (DRF)

Section I	**Document Identification**	**Page 1 of 3**

Preparer Name: R. Perrill **Ext:** 55524 **Mail Code** 410

Date: 07/17/14 **Document #:** GOP-4A **Revision:** 2 **Change** G

Title: Power Operation (Mode 1 - Ascending) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process: ☐ New ☒ Revision/Change ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: See attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #________________

Qualified Reviewer	**DCRM person notified**	**Shift Supervisor**	**Date**

Section II **List Required Reviewers** including All Impacted Groups
Additional Reviewers – identify with an *

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
SRO QR	M. Kranendonk	☐ Yes ☒ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

[signature] 7/20/14
Designated Supervisor Concurrence **Date**

Comment Due Date ASAP
GM concurrence________for expedited review

Section III	**Pre- implementation Actions**

All Comments Resolved? ☒ **NA** ☐ **YES** [signature] 7/20/14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☐ NA ☒ YES	Attached? YES ☒ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
Commitments (PCAP and MLSA) Addressed?	☒ NA ☐ YES	PCAP # _______ ____________
QR Qualification Verified?	☒ YES	NL Initial/Date
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	
Training required after implementation?	☒ NA ☐ YES	CR#____________
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #____________
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #____________
CMMS Update Required? [Unit 1]	☒ NA ☐ YES	Planner Notified YES ☐________

[signature] 7/20/14
Designated Supervisor Approval **Date**

[signature] 7/20/14
Approval Authority Approval **Date**
Effective Date:________________

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DRF Form (Continued)

DOCUMENT # GOP-4A Rev. 2 Chg. G

DESCRIPTION CONTINUED:

a. Added new Step 3.9.i for ensuring 0.5 scfh flow through FLOW METER FOR GAS ANALYZER (XPN-7201, HYDROGEN AND STATOR COOLING WTR CNT PNL) by adjusting XVT12205-HY, MACHINE GAS ANALYZER INLET ISOL VALVE, after the Main Turbine has been rolled to 1800 rpm.

b. Changed Step 3.3 for ensuring manual disconnects are closed by applying the requirements of SOP-302, 230KV SUBSTATION, Section III.A, Closing Operation For Manual Disconnects, to inform the Electrical Department that disconnects have been closed and initiate a work order to have Electrical perform thermography when disconnect is energized.

c. Moved Step 3.16.d.1) for contacting Reactor Engineering to verify LEFM constants are removed per SAP-119, Control Of The Station Calorimetric Computer Program, to Step 3.7.h. Replicated Note 3.18.h and Step 3.18.h as new Note and Step 3.10.q.7).

d. In Step 3.16.a.2), corrected the number of Feedwater Booster Pumps in operation from three to four as required for operation of three Feedwater Pumps.

e. In Step 3.12.k, changed the referenced power used to perform the Power Load Unbalance test to the Intermediate Pressure indicated percent from the PLU test Screen. Broke the Step 3.12 step up into two substeps (3.12.k.1) and 2) with the conditional Step 3.12.k as the step initiator.

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DRF Form (Continued)

DOCUMENT # GOP-4A Rev. 2 Chg. G

REASON/BASIS CONTINUED:

a. Procedure feedback #140509 (Snipes):

"Add to the procedure of GOP4A to perform SOP 217 (Operation With Hydrogen in Generator) Step 2.2 page 2 of 31 when turbine speed reaches 1800RPM."

b. Procedure feedback #140530 (Price):

"Step 3.3 has you verified disc's 8901 8903 8891 and 8893 are closed, but you can't see the contact paddle or contact fingers on the new style disc's for 8901 and 8903. Also the others are difficult to see at night."

c. Procedure feedback #140533 (Anderson):

"LEFM can be calculated any time Feedwater temperature is >238 IAW REP-200.1. However after Rx Trip the LEFM constants should be "Zeroed" out prior to entering mode 1. Currently the GOP says to ensure constants are "Zeroed" out prior to 75% and then has RX Eng calculate new constants after we achieve 100%. We should be able to calculate new constants any time Feedwater temp is > 238 IAW REP-200.1. Move step 3.16.d.1) in GOP-4A to somewhere prior to step 3.8.b, maybe include in step 3.6. Move step 3.18.h to sometime after we have tied the main generator on line (this should ensure feed water temp is > 238) (Also the higher the better but we need the flexibility to perform whenever Rx Eng desires) During a normal hold point."

d. Procedure feedback #140535 (Goldston):

"Step 3.16 should say Four FWBP, not three."

e. Procedure feedback #140538 (Anderson):

"Step 3.12.k refers to 45% reactor power it should refer to power as indicated by "Intermediate pressure" on the Test PLU screen. We do not want to perform the test if above P-9 though."

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Document Review Form (DRF)

Section I	**Document Identification**	**Page 1 of 2**

Preparer Name: Randall Perrill **Ext:** 55524 **Mail Code** 410

Date: 06/26/14 **Document #:** GOP-4A **Revision:** 2 **Change** F ~~E~~ G SB 6/30/14

Title: POWER OPERATION (MODE 1 - ASCENDING) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process: ☐ New ☐ Revision/Change ☒ Editorial Correction ☐ Temporary Approval

Description: See attached.

Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: See attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #_______________

Qualified Reviewer	**DCRM person notified**	**Shift Supervisor**	**Date**

Section II **List Required Reviewers** including All Impacted Groups
Additional Reviewers – identify with an *

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
QR	Bobby Kunkle	☐ Yes ☒ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

[signature] 6/30/14
Designated Supervisor Concurrence **Date**

Comment Due Date ASAP
GM concurrence________for expedited review

Section III	**Pre- implementation Actions**

All Comments Resolved? ☒ **NA** ☐ **YES** [signature] 06/30/14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
Commitments (PCAP and MLSA) Addressed?	☒ NA ☐ YES	PCAP # _______ _______ NL Initial/Date
QR Qualification Verified?	☒ YES	
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	
Training required after implementation?	☒ NA ☐ YES	CR#__________
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #__________
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #__________
CMMS Update Required? ~~[Unit 1]~~	☒ NA ☐ YES	Planner Notified YES ☐ ______

[signature] 6/30/14
Designated Supervisor Approval **Date**

N/A
Approval Authority Approval **Date**
Effective Date: N/A

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DRF Form (Continued)

Page 2 of 2

DOCUMENT # GOP-4A Rev. 2 Chg. ~~G~~ F SB 6/30/14

DESCRIPTION CONTINUED:

Restored missing Reference Pages.

REASON/BASIS CONTINUED:

Reference Pages were inadvertently dropped from some Action step pages during the transmittal of the previous change.

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Document Review Form (DRF)

Document Identification		**Page 1 of 2**
Preparer Name: Bobby Kunkle	**Ext:** 89559	**Mail Code** 410
Date: 5/14/14 **Document #:** GOP-4A	**Revision:** 2	**Change** E
Title: POWER OPERATION (MODE 1 – ASCENDING)		☒ **SR** ☐**QR** ☐ **NNS**

A

Development Process: ☐New ☒ Revision/Change ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: See attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #______________

Qualified Reviewer	**DCRM person notified**	**Shift Supervisor**	**Date**

List Required Reviewers including All Impacted Groups
Additional Reviewers – identify with an *

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
QR	Dan Fisher	☐ Yes ☑ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

[signature] 5/15/14
Designated Supervisor Concurrence **Date**

Comment Due Date ASAP
GM concurrence________for expedited review

Pre- implementation Actions

All Comments Resolved? ☒ **NA** ☐ **YES** [signature] 5-23-14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☐ NA ☒ YES	Attached? YES ☒ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
Commitments Addressed?	☒ NA ☐ YES	PCAP #____MSLA_______
QR Qualification Verified?	☒ YES	
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	
Training required after implementation?	☒ NA ☐ YES	CR#______________
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #______________
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #______________
CMMS Update Required? [Unit 1]	☒ NA ☐ YES	Planner Notified YES ☐

[signature] 5/23/14
Designated Supervisor Approval **Date**

[signature] 5/23/14
Approval Authority Approval **Date**
Effective Date:__________________

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DRF Form (Continued)

DOCUMENT # GOP-4A Rev. 2 Chg. E

DESCRIPTION CONTINUED:

Removed Step 3.12.h, "At 35% Reactor Power, on the EHC HMI, Control/Load screen, select HOLD and perform the Power LoadUnbalance (PLU) test as follows:"

REASON/BASIS CONTINUED:

PF140400 (Robertson). This test was performed as part of the commission of the Mark VI Turbine Controls system to verify that the software would not allow Power Load Unbalance operation to be performed below 40% turbine load. No longer needed.

REQUIRED REVIEWERS CONTINUED:

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: Brian Seo **Ext:** 5730 **Mail Code:** 410

Date: 1/5/14 **Document No.:** GOP-4A **Revision No.:** ~~22~~ **Change Letter:** D

Title: POWER OPERATION (MODE 1 – ASCENDING) WC 5/1/14 ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See Page 2.

Reason/Basis for Change: See Page 2.

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval **Final approval required by: (30 days)**

QR	DC&R (Person Notified)	SS	Date
		/	

Document Reviewers (Enclosure C)

	Position	Type/Print Name	Comments Yes/No		*Additional	Position	Type/Print Name	Comments Yes/No	
Required	QR	James R. Geib	☐	☑				☐	☐
			☐	☐				☐	☐
			☐	☐				☐	☐
			☐	☐				☐	☐

Concurrence by Designated Supervisor: 4/11/14
Supervisor/Date **or** enter CR # ________ (per 6.4.8.C)

ASAP Comment Due Date
Standard review period is 21 days
GM concurrence / **for expedited review period**

Pre- implementation Actions

All Comments Resolved ☑ None Received ☐ Yes 4-12-14
Originator/Date

Commitments Addressed per SAP-0630 ☒ NA ☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date

QR Qualification Verified? ☒ Yes
50.59 Applicability/Review Completed (SAP-0107) ☐ NA ☒ Yes, Attached
Security Compliance Review Completed (SAP-0163) ☒ NA ☐ Yes (Security review required)
Pre-implementation Training Completed ☒ NA ☐ Yes
Training required after implementation ☒ NA ☐ Yes, CR # ________
PSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______
NSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______
CMMS Update Required ☒ NA ☐ Yes Planner Notified ______ Initial/Date

4/14/14
Supervisor/Date

5-1-14
Approval Authority/Date

Effective Date 5-1-14

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. D

DESCRIPTION CONTINUED: 1. Update Initial Condition 2.9.d to reflect new setpoint.
2. Add Step 3.6.b to ensure Main Generator Breaker Disconnect is closed.
3. Add Step 3.7.g to prepare the Main Generator for startup.
4. Add CAUTION Step 3.10 warning of the risk of equipment damage if a delay occurs prior to reaching 150 MWe. Revise Step 3.10.d to raise turbine load to 150MWe. Add Steps 3.10.e through 3.10.g for guidance on stopping a load increase while less than 150 MWe.
5. Add Step 3.18.c to allow flexibility in the adjustment of turbine load at 100% power.
6. Pages 5, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 31, 32, 35, 38, 40, 43, and 46, add zCaps to link to referenced procedure sections. Add referenced procedure section and steps.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

REASON/BASIS FOR CHANGE CONTINUED: 1. Feedback 130380 (Elliot) GE has established new oil temperature guidelines.

2. Feedback 130091 (Goldston) Actions in SOP-301 stall plant startup. Provide better coordination of the preparation for a Main Generator Startup.

3. Feedback 130091 (Goldston) Actions in SOP-301 stall plant startup. Provide better coordination of the preparation for a Main Generator Startup.

4. Feedback 120915 (Crawford) Step 3.10.d is poorly worded and does not always apply.

5. CR-13-04054-001 Turbine Load setting at 100% varies with current conditions.

6. Referenced procedures do not provide specific procedure section.

DOCUMENT REVIEWERS CONTINUED:

	Position	Type/Print Name	Comments Yes/No		Position	Type/Print Name	Comments Yes/No
Required	___	___	☐ ☐	*Additional	___	___	☐ ☐
	___	___	☐ ☐		___	___	☐ ☐
	___	___	☐ ☐		___	___	☐ ☐
	___	___	☐ ☐		___	___	☐ ☐
	___	___	☐ ☐		___	___	☐ ☐
	___	___	☐ ☐		___	___	☐ ☐
	___	___	☐ ☐		___	___	☐ ☐
	___	___	☐ ☐		___	___	☐ ☐

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: Buddy Sessoms **Ext:** 55681 **Mail Code:** 410

Date: 09/03/12 **Document No.:** GOP-4A **Revision No.:** 2 **Change Letter:** C

Title: Power Operation (Mode 1 – Ascending) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See Page 2

Reason/Basis for Change: See Page 2

Is the SCOPE of the procedure affected by this change? NO ☒ **YES** ☐

Temporary Approval **Final approval required by: (30 days)**

QR	DC&R (Person Notified)	SS	Date
		/	

Document Reviewers (Enclosure C)

Required Position	Type/Print Name	Comments Yes/No	*Additional Position	Type/Print Name	Comments Yes/No
QR	MICKLASH	☐ ☒			☐ ☐
		☐ ☐			☐ ☐
		☐ ☐			☐ ☐
		☐ ☐			☐ ☐
		☐ ☐			☐ ☐

QR Qualification Verified? ☑ Yes
Concurrence by Designated Supervisor: 10/27/12
Supervisor/Date **or** enter CR # ______ (per 6.4.8.C)

Comment Due Date
11/17/12 **Standard review period is 21 days**
GM concurrence ______ **for expedited review period**

B

Pre- implementation Actions

All Comments Resolved ☒ None Received ☐ Yes E Sessoms 10/30/12
Originator/Date

Commitments Addressed per SAP-0630 ☒ NA ☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date

50.59 Applicability/Review Completed (SAP-0107) ☐ NA ☒ Yes, Attached

Security Compliance Review Completed (SAP-0163) ☒ NA ☐ Yes (Security review required)

Pre-implementation Training Completed ☒ NA ☐ Yes

Training required after implementation ☒ NA ☐ Yes, CR # ______

PSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______

NSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______

CMMS Update Required ☒ NA ☐ Yes Planner Notified ______ Initial/Date

Supervisor/Date	Approval Authority/Date
10/30/12	11-1-12

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. C

DESCRIPTION CONTINUED:

1. FB120389B & 120033C - Corrected typographical error in procedure. Changed referenced step in the note at step 3.18.k from 3.18.l to 3.18.k.
2. FB120442C, moved step 3.13.i.4) to 3.14.b and reordered steps as necessary. STP-108.001 has an initial condition of being greater than 50% power so the step to perform the STP was moved after 3.14.a to meet that initial condition.

REASON/BASIS FOR CHANGE CONTINUED:

1. FB120389B & 120033C requested the correction be made.
2. FB091076 requested the step be moved.

DOCUMENT REVIEWERS CONTINUED:

	Position	Type/Print Name	Comments Yes/No		Position	Type/Print Name	Comments Yes/No
Required			☐ ☐	*Additional			☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
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			☐ ☐				☐ ☐
			☐ ☐				☐ ☐

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: MD Johnson	**Ext:** 54300	**Mail Code:** 410	
Date: 1/23/2012	**Document No.:** GOP-4A	**Revision No.:** 2	**Change Letter:** B

Title: POWER OPERATION (MODE 1 - ASCENDING) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See page 2.

Reason/Basis for Change: See page 2.

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval **Final approval required by: (30 days)**

QR	**DC&R** (Person Notified)	**SS**	**Date**
		/	

Document Reviewers (Enclosure C)

Required

Position	Type/Print Name	Comments Yes/No
QR	JEFF PURCELL	☑ Yes ☐ No
PSE	TIM GILLHAM	☑ Yes ☐ No
		☐ ☐
		☐ ☐
		☐ ☐

***Additional**

Position	Type/Print Name	Comments Yes/No
		☐ ☐
		☐ ☐
		☐ ☐
		☐ ☐
		☐ ☐

QR Qualification Verified? ☒ Yes
Concurrence by: [signature] 1/31/12
Supervisor/Date or Enter CR # (per 6.4.8.C)

Comment Due Date ASAP

Pre- implementation Actions

All Comments Resolved	☐ None Received	☑ Yes [signature] 2/7/12 Originator/Date
Commitments Addressed per SAP-0630	☒ NA	☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date
50.59 Applicability/Review Completed (SAP-0107)	☐ NA	☒ Yes, Attached
Security Compliance Review Completed (SAP-0163)	☒ NA	☐ Yes (Security review required)
Pre-implementation Training Completed	☐ NA	☒ Yes
Training required after implementation	☐ NA	☒ Yes, CR # CR-10-00097-185
PSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______
NSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______
CMMS Update Required	☒ NA	☐ Yes Planner Notified ______ Initial/Date

[signature] 4/17/12	[signature] 4/25/12
Supervisor/Date	Approval Authority/Date

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. B

DESCRIPTION CONTINUED:

1. Page 16, Added a note to NOTE 3.10 through 3.18, Acknowledging dialog boxes is considered a "skill of the craft".
2. Page 17:
   a. Changed step 3.10.d.1) to read: On the EHC HMI, Control/Load screen, select Ramp Rate and enter desired rate of 1% or less.
   b. Changed step 3.10.d.2) to read: Increase Turbine load....using one of the following methods:
   c. Changed step 3.10.d.2) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
3. Page 18:
   a. Changed step 3.10.d.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   b. Changed step 3.10.d.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)
4. Page 20:
   a. Changed step 3.10.I.2) to read: On the EHC HMI, Control/Load screen, select Ramp Rate and enter desired rate of 1% or less.
   b. Changed step 3.10.I.3) to read: Increase Turbine load....using one of the following methods:
   c. Changed step 3.10.I.3) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
   d. Changed step 3.10.I.3) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   e. Changed step 3.10.I.3) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)
5. Page 24:
   a. Changed step 3.11.d. to read: On the EHC HMI, Control/Load screen, select Ramp Rate and enter desired rate of 1% or less.
   b. Changed step 3.11.e. to read: Increase Turbine load....using one of the following methods:
   c. Changed step 3.11.e.1) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
6. Page 25:
   a. Changed step 3.11.e.2):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   b. Changed step 3.11.e.3):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. B

7. Page 27:
   a. Changed step 3.11.h.1) to read: Select Ramp Rate and enter desired rate of 1% or less.
   b. Changed step 3.11.h.2) to read Raise Turbine Load by one of the following methods:
   c. Changed step 3.11.h.2) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
   d. Changed step 3.11.h.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   e. Changed step 3.11.h.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)
8. Page 29:
   a. Changed step 3.12.c.1) to read: Select Ramp Rate and enter desired rate of 1% or less.
   b. Changed step 3.12.c.2) to read Raise Turbine Load by one of the following methods:
   c. Changed step 3.12.c.2) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
   d. Changed step 3.12.c.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   e. Changed step 3.12.c.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)
9. Page 33:
   a. Changed Step 3.13.b.1), Changed to Select Ramp Rate and enter the recommended Load Ramp Rate.
   b. Changed step 3.13.b.2) to read Raise Turbine Load by one of the following methods:
   c. Changed step 3.13.b.2) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
   d. Changed step 3.13.b.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   e. Changed step 3.13.b.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)
10. Page 36:
    a. Changed Step 3.14.b.1), Changed to Select Ramp Rate and enter the recommended Load Ramp Rate.
    b. Changed step 3.14.b.2) to read Raise Turbine Load by one of the following methods:
    c. Changed step 3.14.b.2) a) to read:
       Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. B

11 Page 37:
  a. Changed step 3.14.b.2) b):
     Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
  b. Changed step 3.14.b.2) c):
     Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

12. Page 41:
  a. Changed Step 3.17.a.1), Changed to Select Ramp Rate and enter the recommended Load Ramp Rate.
  b. Changed step 3.17.b.2) to read Raise Turbine Load by one of the following methods:
  c. Changed step 3.17.b.2) a) to read:
     Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.

13 Page 42:
  a. Changed step 3.17.b.2) b):
     Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
  b. Changed step 3.17.b.2) c):
     Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

14. Page 43:
  a. Changed Step 3.18.b.1), Changed to Select Ramp Rate and enter the recommended Load Ramp Rate.
  b. Changed Step 3.18.b.2) to read Raise Turbine Load by one of the following methods:
  c. Changed Step 3.18.b.2) a) to read:
     Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.

15. Page 44:
  a. Changed step 3.17.b.2) b):
     Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
  b. Changed step 3.17.b.2) c):
     Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

16. Page 45, Changed step 3.18.f, by deleting "select OK" steps.

17. Reference page:
    Under Turbine Controls
  a. Deleted the following: (under Ramp Rate %/min)
  b. Deleted old step C, EHC Panel Load Raise / Lower pushbuttons are Time / Rate Sensitive and can be used for significant load changes authorized by the Control Room Supervisor.
  c. Added new Step C, Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. B

REASON/BASIS FOR CHANGE CONTINUED:

1. Ops management request.

2a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

2b-c Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

3a-b. Review comments (Gillham) to list the methods for increasing turbine load in preferred order.

4a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

4b-e. Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

5a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

5b-c. Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

6a-b. Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

7a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

7b-e Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

8a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

8b-e Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

9a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

9b-e Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

10a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

10b-c. Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

11a-b Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. B

12a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

12b-c Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

13a-b Increasing Turbine load was not consistent throughout procedure modified to ensure consistency.
Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

14a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

14b-c Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

15a-b Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

16. Ops management request to delete select OK.

17. ECR50592T Box title replaced with Ramp Rate button for variable rate entry other than program buttons of 1%, 3%, 5%, and 10%.
Review Comments (Goldston) to clarify expectations concerning Turbine loading.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: R. Perrill **Ext:** 55524 **Mail Code:** 410

Date: 05/22/11 **Document No.:** GOP-4A **Revision No.:** 2 **Change Letter:** A

Title: POWER OPERATION (MODE 1 - ASCENDING) ☒ SR ☐ QR ☐ NNS

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Reason/Basis for Change: See attached.

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval **Final approval required by: (30 days)**

QR ______ DC&R (Person Notified) ______ SS ______ / Date ______

Document Reviewers (Enclosure C)

	Position	Type/Print Name	Comments Yes/No		*Additional	Position	Type/Print Name	Comments Yes/No	
Required	QR	MIKE JOHNSON (C)	☐	☒				☐	☐
	PSE	RICHARD SLONE	☒	☐				☐	☐
	EM	~~JACKSON~~ BARRY WRIGHT II	☒	☐				☐	☐
			☐	☐				☐	☐
			☐	☐				☐	☐

Concurrence [signature] 8/30/11
Supervisor/Date or Enter CR # (per 6.4.8.C)

Comment Due Date 9/20/11

Pre- implementation Actions

All Comments Resolved ☐ None Received ☒ Yes [signature] / 09/28/11
Originator/Date

Commitments Addressed per SAP-0630 ☒ NA ☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date

50.59 Applicability/Review Completed (SAP-0107) ☐ NA ☒ Yes, Attached
Security Compliance Review Completed (SAP-0163) ☒ NA ☐ Yes (Security review required)
Pre-implementation Training Completed ☒ NA ☐ Yes
Training required after implementation ☒ NA ☐ Yes, CR # ______
PSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______
NSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______
CMMS Update Required ☒ NA ☐ Yes Planner Notified ______ Initial/Date

[signature] 10/31/11
Supervisor/Date

[signature] 10/31/11
Approval Authority/Date

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. A

DESCRIPTION CONTINUED:

Changed Step 3.6.c to specify where Electricians should take voltages.

REASON/BASIS FOR CHANGE CONTINUED:

Procedure feedback from Richard Slone requesting that voltage readings to be taken for all the potential transformers and to provide better guidance as to where these readings are to be taken.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Page 1 of 3

Document Identification

Originators Name: C J Dickey | Ext: 54066 | Mail Code: 410

Date: 4-26-11 | Document No.: GOP-4A | Revision No.: 2 | Change Letter:

Title: POWER OPERATION (MODE 1 - ASCENDING) | ☒ SR ☐ QR ☐ NNS

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See Page 2

Reason/Basis for Change: See Page 2

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval | **Final approval required by: (30 days)**

QR | DC&R (Person Notified) | SS | Date

Document Reviewers (Enclosure C)

	Position	Type/Print Name	Comments Yes/No		Position	Type/Print Name	Comments Yes/No
Required	QR	LEON SMITH	☐ ☒	*Additional			☐ ☐
	DE	GLEN MEYER	☒ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐

Concurrence [signature] 4/27/11
Supervisor/Date or Enter CR # ______ (per 6.4.8.C)

Comment Due Date ASAP

Pre- implementation Actions

All Comments Resolved ☐ None Received ☒ Yes [signature] 5/12/11 Originator/Date

Commitments Addressed per SAP-0630 ☒ NA ☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date

50.59 Applicability/Review Completed (SAP-0107) ☐ NA ☒ Yes, Attached
Security Compliance Review Completed (SAP-0163) ☒ NA ☐ Yes (Security review required)
Pre-implementation Training Completed ☒ NA ☐ Yes
Training required after implementation ☒ NA ☐ Yes, CR # ______
PSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______
NSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______
CMMS Update Required ☒ NA ☐ Yes Planner Notified ______ Initial/Date

[signature] 5/13/11
Supervisor/Date

[signature] 5/14/2011
Approval Authority/Date

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. ______

DESCRIPTION CONTINUED:

1. Page 14, Deleted Step 3.9.c as it no longer applies due to ECR 50680 Generator Breaker Replacement
2. Page 16, Added NOTE 3.10.b to describe new DEHC control function.
3. Pages 17 &18, Reworded Step 3.10.c.1 and all of Step 3.10.d to describe new DEHC function.
4. Page 20, Reworded all of Step 3.10.l.1 through Step 3.10.l.3 to describe new DEHC function.
5. Page 21, Reworded Step 3.10.m.1 to describe new DEHC function.
6. Page 22, Reworded Step 3.10..n to describe new DEHC function.
7. Page 24, Reworded Step 3.11.c. through e to describe new DEHC function.
8. Page 25, Reworded Step 3.11.f.1 to describe new DEHC function.
9. Pages 27 and 28, Reworded all of Step 3.11.h to describe new DEHC function.
10. Page 29:
    a. Added new Step 3.12.a to contact Chemistry prior to 30% as result from FB 100411C.
    b. Reworded all of Step 3.12.c to describe new DEHC function.
11. Page 32, Reworded all of Step 3.12.h to describe new DEHC function (35% PLU test).
12. Page 33, Reworded all of Step 3.12.l to describe new DEHC function (45% PLU test).
13. Page 34, Reworded all of Step 3.13.b to describe new DEHC function.
14. Page 38, Reworded all of Step 3.14.b to describe new DEHC function.
15. Pages 43 & 44, Reworded all of Step 3.17.a to describe new DEHC function.
16. Pages 45 & 46, Reworded all of Step 3.18.b to describe new DEHC function.
17. Page 47, Reworded all of Step 3.18.f to describe new DEHC function.
18. Reference Page, Turbine Control deleted old Mark I requirements, added A, B, & C.
19. Removed all Change bars from body of procedure.
20. Updated TOC.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

REASON/BASIS FOR CHANGE CONTINUED

Item 1 ECR # 50680 Generator Breaker Replacement

Items 2-16 ECR # 50592 Digital Electrohydraulic Controls Replacement

Item 10FB 100411C (Rob Ray) added Step 3.12.a

Item 12 FB 110161 (Goldston) added Step 3.12.m.1 for items 5 and 10 of FB

Items 3, 4, 7, 9, 10, 13, 14, 15, 16, 17 and 18 FB 110161 (Goldston) created Step 3.10.d.2.c and similar steps in body of procedure to Automatically raise load item 4 of FB.

Items 19 &20, per SAP-139.

FB 100409B (Rob Ray) Not applicable per MDJ

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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Facility: VC SUMMER Scenario No: 2 Op Test No: NRC-ILO-13-01

Examiners: ______________ Operators: CRS: ______________

______________ RO: ______________

______________ BOP: ______________

Initial Conditions:
- 60% Power MOL.
- “B1” Train Work Week.
- The National Weather Service has declared a Severe Weather Warning for Richland, Fairfield, and Kershaw counties for the next four (4) hours.
- Alternate Seal Injection is OOS.
- “C” MFW Pump is not running.
- Investigating small steam leak on “C” MFW Pump Casing.

Turnover:
- Maintain current power until Maintenance releases the “C” MFW Pump for operation.

Critical Tasks:
- Maintain SG Level without causing a Reactor/Turbine trip.
- Close "A" or "B" MSIV Prior to Orange path on Integrity or Containment.
- Isolate EFW to the faulted SG prior to Orange path reached on Integrity.

Event No.	Malf No.	Event Type*	Event Description
1	CVC008	C-RO, CRS TS-CRS	Isolable Letdown Line Leak Inside Reactor Building - 50 gpm.
2	MS005O	I-BOP, CRS TS-CRS	FT-494 (“C” Steam Flow Transmitter) fails LOW.
3	NA	N-BOP, CRS R-RO	Rapid downpower due to “B” MFW pump vibration.
4	CRF007H14	C-RO, CRS TS-CRS	Rod H14 stuck but trippable (blown fuse).
5	FW017O	I-BOP, CRS	PT-508 (MFW Pump Discharge Header Pressure) Fails LOW. (Manual control of MFW Pp speed)

6	MSS003A AUX009AA AUX009AB AUX009AC	M-ALL	"A" Main Steamline Break inside the RB due to a seismic event.
	EPS013		Main Generator and Voltage Regulator Breakers Fail to Trip.
	MSS006A MSS006B		SG "A" and "B" MSIV Fails to Close in AUTO.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

The following notation is used in the ES-D-2 form "Time" column:

IOA designates **Immediate Operator Action** steps.

***** designates **Continuous Action** steps.

The crew will assume the watch having been pre-briefed on the Initial Conditions, the plan for this shift and any related operating procedures.

GOP-4A, Power ascension was halted at 60% due to a mechanical problem with the "C" MFW Pump. The current power level has been maintained for 24 hours. Xenon is stable. The crew instructions are to maintain the current power until mechanical maintenance releases the "C" MFW Pump for operation.

EVENT 1: Isolable Letdown Line Leak Inside Reactor Building - 50 gpm.

- **TRIGGER 1**
  - MAL-CVC008
    LETDOWN LINE LEAK INSIDE CONTAINMENT
    FINAL=30%

On cue from the Examiner, a 50 gpm leak will be inserted on the letdown line inside the Reactor Building. The crew will identify that a leak exists and implement AOP-101.1, Loss of Reactor Coolant Not Requiring SI. The RO will isolate the leak by isolating letdown. The RO will then place excess letdown in service.

The CRS will refer to Technical Specification 3.4.6.2, Operational Leakage.

EVENT 2: FT-494 ("C" Steam Flow Transmitter) fails LOW.

- **TRIGGER 2**
  - XMT-MS005O
    IFT00494 SG C STEAM FLOW FAIL TO POSN
    FINAL=0

On cue from the Examiner, FT-494 will fail LOW. This is the selected "C" SG selected Steam Flow transmitter for SG level control. FCV-498 will stroke closed causing SG level to lower. The crew will implement AOP-401.3 Steam Flow - Feedwater Flow Protection Channel Failure and select the operable Steam Flow Transmitter for control. This is a Technical Specification transmitter.

The CRS will refer to Technical Specification 3.3.1, Reactor Trip System Instrumentation, Action 6 and 3.3.2, Engineered Safety Feature Actuation System Instrumentation, Action 24.

EVENT 3: Rapid downpower due to "B" MFW pump vibration.

The Shift Supervisor will call the CRS and report that the B Main Feedwater Pump vibration is in alert. He will instruct to crew to lower power to less than 45% at 3% per minute in accordance with GOP-4C Rapid Power Reduction and leave the pump running for engineering to evaluate. The RO will utilize boration and/or rod control to lower power while coordinating the downpower with the BOP who will be controlling turbine demand.

EVENT 4: Rod H14 stuck but trippable (blown fuse).

- **AUTO-TRIGGER 3**
  FNISPR(2) < 56 (N-42 indicates < 56% Power)
  - MAL-CRF007H14
    STUCK ROD H-14
    FAIL TO: TRIPPABLE
- **TRIGGER 4**
  - MAL-CRF007H14
    STUCK ROD H-14
    FAIL TO: TRIPPABLE
    DELETE=00:00:01
    Removes failure to allow rod recovery

This event will occur when power is reduced to less than 56% or earlier if directed by the Examiner. Control Rod H-14 in Control Bank D will stop moving. This event must be inserted early enough in the downpower so that the failure will be apparent as power is lowered. The RO will realign the control rods in accordance with AOP-403.5 Stuck or Misaligned Control Rod.

The CRS will refer to Technical Specification 3.1.3.1, Movable Control Assemblies.

EVENT 5: PT-508 (MFW Pump Discharge Header Pressure) Fails LOW. (Manual control of MFW Pp speed).

- **TRIGGER 5**
  - XMT-FW017O
    IPT00508 FW PP DSCHG HDR PRESS PI-508 FAIL TO POSN
    FINAL=200

On cue from the Examiner, a Main Feedwater Header Pressure transmitter will fail LOW causing the MFW Pump speed to increase and raise SG level. The operators will respond to annunciators and implement AOP-210.3, Feedwater Pump Malfunction.

The BOP will take manual control of the master Speed control and adjust speed to maintain Feedwater Pump discharge pressure 150 to 250 psi greater than Main Steam Header pressure and restore SG levels.

EVENT 6: “A” Main Steamline Break inside the RB due to a seismic event.

- **TRIGGER 6**
  - MAL-AUX009AB SEISMIC EVENT EARTHQUAKE 2/3 O.B.E.(UP/DOWN VERTICAL)
    Final Value = 2.1
    Delay = 0
  - MAL-AUX009AA SEISMIC EVENT EARTHQUAKE 2/3 O.B.E.(NORTH/SOUTH HORIZONTAL)
    Final Value = 3.2
    Delay = 1 sec
  - MAL-AUX009AC SEISMIC EVENT EARTHQUAKE 2/3 O.B.E.(EAST/WEST HORIZONTAL)
    Final Value = 4.2
    Delay = 1 sec
  - MAL-MSS003A STEAMLINE S/G A BREAK INSIDE CONTAINMENT
    Final Value = 3E+6 lbm/hr
    Delay = 10 sec
  - MAL-EPS013 GENERATOR BREAKER FAILS TO TRIP
  - MAL-MSS006A MAIN STEAM ISOLATION VALVE (S/G A) FAILURE
    Fail to: FAILURE TO CLOSE
  - MAL-MSS006B MAIN STEAM ISOLATION VALVE (S/G B) FAILURE
    Fail to: FAILURE TO CLOSE
- **AUTO-TRIGGER 7** X10I041C == 1 (MSIV “A” Taken to CLOSE)
  - MAL-MSS006A MAIN STEAM ISOLATION VALVE (S/G A) FAILURE
    Delete = 00:00:01
- **AUTO-TRIGGER 8** X10I042C == 1 (MSIV “B” Taken to CLOSE)
  - MAL-MSS006B MAIN STEAM ISOLATION VALVE (S/G B) FAILURE
    Delete = 00:00:01

On cue from the Examiner, seismic monitors will indicate a seismic event has occurred. Ten (10) seconds later a steamline break inside the Reactor Building will be inserted. The Reactor will trip and the crew will implement EOP-1.0 (E-0) Reactor Trip/Safety Injection Actuation. The crew will identify that at least one Steam generator is faulted and transition to EOP-3.0 (E-2), Faulted Steam Generator Isolation. When the faulted SG is isolated the crew will transition to EOP-1.2 (ES-1.1), Safety Injection Termination.

The malfunction will be apparent after the Reactor Trip. The crew will identify that the Main Generator Output Breaker failed to automatically trip and the BOP will manually open the breaker from the control board.

The BOP must identify that the MSIVs are open and manually close them from the control board to isolate the faulted Steam Generator and prevent over-pressurization of the Reactor Building.

TERMINATION:

The scenario can be terminated after the crew has transitioned to EOP-1.2 (ES-1.1), Safety Injection Termination, and terminated Safety Injection or at the discretion of the Examiner.

Scenario Attributes		Events
Total Malfunctions (5-8)	7	· Letdown Line Leak Inside Reactor Building - 50 gpm. · FT-494 (“C” Steam Flow Transmitter) fails LOW · Rod H14 stuck but it can be tripped (blown fuse). · PT-508 (MFW Discharge Header Pressure) Fails LOW · “A” MSLB inside Reactor Building · Main Gen and Voltage Regulator Breakers Fail to Trip · SG "A" and “B” MSIV Fails to Close in AUTO.
Malfunctions after EOP entry (1-2)	2	· Main Generator and Voltage Regulator breakers fail to trip. · A and B MSIVs fail to close in auto.
Abnormal Events (2-4)	4	· Letdown Line Leak Inside Reactor Building - 50 gpm. · FT-494 (“C” Steam Flow Transmitter) fails LOW · Rod H14 stuck but it can be tripped (blown fuse). · PT-508 (MFW Discharge Header Pressure) Fails LOW
Major Transient (1-2)	1	· Faulted Steam Generator (MSLB inside RB)
EOPs Entered (1-2)	2	· EOP-3.0 (E-2), Faulted Steam Generator Isolation · EOP-1.2 (ES-1.1), Safety Injection Termination
EOP Contingencies (0-2)	0	
Critical Tasks (2-3)	3	· Maintain SG Level without a Reactor/Turbine trip. · Close "A" or "B" MSIV Prior to Orange path on Integrity or Containment. · Isolate EFW to the faulted SG prior to Orange path reached on Integrity.

SIMULATOR SCENARIO SETUP

INITIAL CONDITIONS:

- IC Set 291
- 60% Power
- Rod Position = 173
- FCV-113 Pot Setting = 4.81
- Boron = 1122 ppm
- Xe = - 2815 pcm
- Burnup = 10,000 MWD/MTU
- Prior to the scenario, crew should pre-brief on conditions and expectations for the Shift (maintain power, repairs estimated to be complete well before LCO action time expires.)

PRE-EXERCISE:

- Ensure simulator has been checked for hardware problems (DORT, burnt out light bulbs, switch malfunctions, chart recorders, etc.)
- VCS-TQP-0807 Attachment I-A, Unit 1 Booth Instructor Checklist, has been completed.
- Hang Tags for equipment out of service.
  - Hang Caution Tag on HCV-186 due to ASI being OOS
- Mark up procedures in use with “Circle and Slash” as applicable.
  - GOP-4A, POWER OPERATION (MODE 1 - ASCENDING) marked to step 3.16
- Prepare a turnover sheet for each position.
- Conduct two-minute drill.
- The simulator may be left running at turnover (stable plant conditions).
- Ensure SIPCS rod position is matched to DRPI indication.

PRELOAD:

STANDARD SIMULATOR SETUP:
- PMP-LD003P, LEAK DETECTION SUMP PMP LOSS OF POWER
- VLV-FW028W, FW HDR RECIRC ISOL VLV LOSS OF POWER
- VLV-FW029W, FW HTR RECIRC ISO VLV LOSS OF POWER
- VLV-CS052W, RCP A SEAL LEAKOFF VLV LOSS OF POWER
- VLV-CS053W, RCP B SEAL LEAKOFF VLV LOSS OF POWER
- VLV-CS054W, RCP C SEAL LEAKOFF VLV LOSS OF POWER

SCENARIO RELATED

- ALTERNATE SEAL INJECTION OUT-OF-SERVICE
  ANN-CS044, ALT SEAL INJ PUMP TRBL Fail to: ON
- ANN-CS046, ALT SEAL D/G TRBL Fail to: ON
- MAL-CVS027, ASI D/G FAIL TO START
- MAL-CVC029, ASI PUMP FAIL TO START

Op Test No:	NRC-ILO-13-01	Scenario #	2	Event #	1	Page:	9	of	51

Event Description: Isolable Letdown Line Leak Inside Reactor Building - 50 gpm.

Time	Position	Applicant's Actions or Behavior

BOOTH OPERATOR: When directed, initiate Event 1 (TRIGGER 1).

EVALUATOR NOTE: On cue from the Examiner, a 50 gpm leak will be inserted on the letdown line inside the Reactor Building. The crew will identify that a leak exists and implement AOP-101.1, Loss of Reactor Coolant Not Requiring SI. The RO will isolate the leak by isolating letdown. The RO will then place excess letdown in service.

Indications Available:

Charging increasing with no change in Letdown
Changing RB environmental conditions
XCP-606/607-2-2, RBCU Drain Flow alarms
XCP-614-5-1, CHG LINE FLO HI/LO
XCP-615-3-6, RCS Leak Calculation alarm
RM-A2 HI RAD

EVALUATOR NOTE: If the BOP responds to the HVAC alarms the BOOTH OPERATOR will ENSURE that an INSTRUCTOR notifies the BOP that the Control Building Operator will handle all future HVAC alarms.

BOOTH OPERATOR:

If necessary direct an Instructor to relieve the BOP as the Control Building Operator. Inform the BOP that you will handle all future HVAC alarms.

When the HVAC panel annunciates – acknowledge the alarm.

Report as the Control Building Operator (Unit 4)

- High Temperature alarm in STEAM GENERATOR “A” COMPARTMENT and
- High Temperature alarm in REACTOR COMPARTMENT COOLING SYSTEM.

EVALUATOR NOTE: If Primary containment average air temperature exceeds 120°F then Technical Specification 3.6.1.5 Action applies:

With the containment average air temperature greater than 120”F, reduce the average air temperature to within the limit within 8 hours, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 1	Page: 10 of 51
Event Description: Isolable Letdown Line Leak Inside Reactor Building - 50 gpm.			

Time	Position	Applicant's Actions or Behavior	
	RO	**CORRECTIVE ACTIONS:** 3. Monitor LT-112A and LT-115, % LEVEL, to verify proper VCT level. 4. Monitor FI-122A, CHG FLOW GPM. **SUPPLEMENTAL ACTIONS:** 6. If RCS leakage is indicated, determine the leak rate and refer to Technical Specification 3.4.6.2.	XCP-614 5-1
	CRS	Determines than RCS leakage is indicated and implements AOP-101.1, LOSS OF REACTOR COOLANT NOT REQUIRING SI.	
NOTE • If a Reactor Trip occurs AND SI is NOT required, this procedure should be continued after the actions of EOP-1.1, Reactor Trip Recovery, are completed. • As valves are isolated, it may be necessary to monitor RCS pressure for a period of time to determine if the leak is isolated.			AOP-101.1
*	RO	1 Verify PZR level is at or trending to program level.	AOP-101.1
*	RO	2 Check if SI is required: **(NO)** a. Check if any of the following criteria are met: • PZR level is decreasing with Charging maximized and Letdown minimized. OR • PZR level is approaching 8%. OR • PZR pressure is approaching 1870 psig. OR • VCT level is approaching 5%. **ALTERNATIVE ACTION** a. GO TO Step 3.	AOP-101.1

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 1	Page: 11 of 51
Event Description: Isolable Letdown Line Leak Inside Reactor Building - 50 gpm.			

Time	Position	Applicant's Actions or Behavior	
		NOTE - Step 3 Conditions for implementing Emergency Plan Procedures should be evaluated using EPP.001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.	AOP-101.1
	CRS	3 Determine RCS leak rate: a. Estimate the RCS leak rate: ● REFER TO IPCS CHGNET. ● REFER TO IPCS 4RW1. b. Estimate the RCS leak rate using IPCS VCT level. (14 gal/percent) c. If necessary, calculate the RCS leak rate. REFER TO STP-114.002, OPERATIONAL LEAK TEST.	AOP-101.1
	CRS	4 Check if the RCS leak rate is GREATER THAN Technical Specification 3.4.6.2 limits.	AOP-101.1
	CRS	5 Comply with the applicable Technical Specification 3.4.6.2 action statement.	AOP-101.1
	CRS	TS 3.4.6.2 Reactor Coolant System operational leakage shall be limited to: b. 1 GPM UNIDENTIFIED LEAKAGE, ACTION b. With any operational Reactor Coolant System leakage greater than any one of the above limits, excluding PRESSURE BOUNDARY LEAKAGE, primary-to-secondary leakage, and leakage from Reactor Coolant System Pressure Isolation Valves, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.	TS 3.4.6.2

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 1	Page: 12 of 51
Event Description: Isolable Letdown Line Leak Inside Reactor Building - 50 gpm.			

Time	Position	Applicant's Actions or Behavior	
	RO	6 Verify RCS pressure is GREATER THAN 2210 psig.	AOP-101.1
EVALUATOR NOTE: Step 7 isolates the letdown leak.			
	RO	7 Close all Letdown Isolation Valves: a. PVT-8149A, LTDN ORIFICE A ISOL. b. PVT-8149B, LTDN ORIFICE B ISOL. c. PVT-8149C, LTDN ORIFICE C ISOL. d. LCV-459, LTDN LINE ISOL. e. LCV-460, LTDN LINE ISOL.	AOP-101.1
	RO	8 Check if the leak has been isolated: a. Evaluate the following: ● IPCS CHGNET ● IPCS 4RW1 ● Pressurizer level ● VCT Level ● Reactor Building Conditions b. If necessary, calculate the RCS leak rate. REFER TO STP-114.002, OPERATIONAL LEAK TEST.	AOP-101.1
BOOTH OPERATOR: If directed to investigate Relay Room Alarms - report there are Reactor Building Sump "A" and "B" alarms for High Level and Leakage greater than 10 GPM.			
	RO	9 Place Letdown in service using Attachment 1, Establishing Excess Letdown.	AOP-101.1

Op Test No: NRC-ILO-13-01 Scenario # 2 Event # 1 Page: 13 of 51

Event Description: Isolable Letdown Line Leak Inside Reactor Building - 50 gpm.

Time	Position	Applicant's Actions or Behavior
	RO	1 Place Excess Letdown in service: a. Close FCV-122, CHG FLOW. b. Maintain Core Power LESS THAN 2898 MWt prior to and during Excess Letdown operation. c. Close all Letdown Isolation Valves: 1) PVT-8149A(B)(C), LTDN ORIFICE A(B)(C) ISOL. 2) LCV-459, LTDN LINE ISOL. 3) LCV-460, LTDN LINE ISOL. d. Isolate Charging by closing either of the following: ● MVG-8107, CHG LINE ISOL. ● MVG-8108, CHG LINE ISOL. e. Reduce Seal Injection flow to 7 gpm per RCP as indicated on the following: ● FI-130A, RCP A INJ FLO GPM. ● FI-127A, RCP B INJ FLO GPM. ● FI-124A, RCP C INJ FLO GPM. f. Ensure HCV-137, XS LTDN HX, is closed.

AOP-101.1
ATTACH 1

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 1	Page: 14 of 51
Event Description: Isolable Letdown Line Leak Inside Reactor Building - 50 gpm.			

Time	Position	Applicant's Actions or Behavior	
		g. Place PVM-8143, XS LTDN TO VCT OR RCDT, in VCT position. h. Ensure the following are open: ● MVT-8100, SEAL WTR RTN ISOL. ● MVT-8112, SEAL WTR RTN ISOL. i. Ensure MVG-9583, FROM XS LTDN HX, is open. j. Open the following: ● PVT-8153, XS LTDN ISOL. ● PVT-8154, XS LTDN ISOL. k. Establish Excess Letdown flow: 1) Slowly throttle open HCV-137, XS LTDN HX. 2) Maintain temperature on TI-139, XS LETDOWN HX OUT TEMP °F, LESS THAN 165°F. l. Monitor the following to ensure flow between 0.2 gpm and 5.0 gpm: ● FR-154A, RCP SL LKOFF HI RANGE. ● FR-154B, RCP SL LKOFF LO RANGE.	AOP-101.1 ATTACH 1
		10 GO TO Step 42.	AOP-101.1
		42 Evaluate Plant status: a. Maintain stable plant conditions. b. Consult with the Shift Supervisor to determine further actions.	AOP-101.1
		43 RETURN TO Procedure and Step in effect.	AOP-101.1

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 1	Page: 15 of 51
Event Description: Isolable Letdown Line Leak Inside Reactor Building - 50 gpm.			

Time	Position	Applicant's Actions or Behavior

EVALUATOR NOTE: The next event may be inserted after excess letdown is placed in service.

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 2	Page: 16 of 51
Event Description: FT-494 (“C” Steam Flow Transmitter) fails LOW.			

Time	Position	Applicant’s Actions or Behavior

BOOTH OPERATOR: When directed, initiate Event 2 (TRIGGER 2).

EVALUATOR NOTE:
On cue from the Examiner, FT-494 will fail LOW. This is the selected “C” SG selected Steam Flow transmitter for SG level control. FCV-498 will stroke closed causing SG level to lower. The crew will implement AOP-401.3 Steam Flow - Feedwater Flow Protection Channel Failure and select the operable Steam Flow Transmitter for control. This is a Technical Specification transmitter.

Technical Specifications 3.3.1, Reactor Trip System Instrumentation, Action 6 and 3.3.2, Engineered Safety Feature Actuation System Instrumentation, Action 24 requires that the inoperable channel is placed in the tripped condition within 72 hours.

Indications Available:
XCP-624 3-5, SG C LVL DEV
XCP-624 6-4, SG C FWF>STF MISMATCH

	CRS	Implements AOP-401.3, Steam Flow - Feedwater Flow Protection Channel Failure	

NOTE AOP-401.3

Throughout this procedure, "AFFECTED" refers to any SG experiencing level control problems.

IOA	BOP	1 Verify the failed channel is the controlling channel.	AOP-401.3

NOTE - Step 2 AOP-401.3

FW AND STEAM CONTROL CHANNEL SEL Switches for a SG should be selected to the same direction (both to the left or both to the right).

IOA	BOP	2 Select the operable flow channel: • Place FW CONTROL CHANNEL SEL Switch to the operable channel. • Place STEAM CONTROL CHANNEL SEL Switch to the operable channel.	AOP-401.3

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 2	Page: 17 of 51

Event Description: FT-494 (“C” Steam Flow Transmitter) fails LOW.

Time	Position	Applicant’s Actions or Behavior	
		NOTE - Step 3 CTRL+ALT+S on either EHC HMI is equivalent to 50 MWe, and is the preferred method to accomplish a rapid load reduction.	AOP-401.3
IOA	BOP	3 Verify Turbine Load is LESS THAN 950 MWe.	AOP-401.3
IOA	BOP	4 Verify only one SG is AFFECTED.	AOP-401.3
IOA	BOP	5 Adjust the Feedwater Flow Control Valve as necessary to restore feed flow to the AFFECTED SG.	AOP-401.3
IOA	BOP	6 Check if Feedwater Pump speed control is operating properly: • Feedwater Header pressure is GREATER THAN Main Steam Header pressure. • Feed flow is normal for steam flow and power level. • All operating Feedwater Pump speeds and flows are balanced.	AOP-401.3
	BOP	7 Verify Narrow Range levels in all SGs are between 60% and 65%.	AOP-401.3
	BOP	8 Restore the AFFECTED SG control systems to normal: • Place the Feedwater Flow Control Valve in AUTO. • Place the Feedwater Pump Speed Control System in AUTO. REFER TO SOP-210, FEEDWATER SYSTEM.	AOP-401.3
		NOTE - Step 9 Steam flow transmitters FT-474, FT-484, FT-494, FT-475, FT-485, and FT-495 are density compensated by steam pressure transmitters PT-475, PT-485, PT-495, PT-476, PT-486, and PT-496.	AOP-401.3
	CRS	9 Within 72 hours, place the failed channel protection bistables in a tripped condition: a. Identify the associated bistables for the failed channel. REFER TO Attachment 1.	AOP-401.3

Op Test No:	NRC-ILO-13-01	Scenario #	2	Event #	2	Page:	18	of	51

Event Description: FT-494 (“C” Steam Flow Transmitter) fails LOW.

Time	Position	Applicant's Actions or Behavior	
		FT-494 | FB-494A FB-498B | C3-748-BS-1 C3-749-BS-1 | CHAN III LP C FB-494A CHAN III SG C FB-498B | TABLE 3.3-1 ITEM 14 TABLE 3.3-3 ITEM 4.d | 302.030 395.006	AOP-401.3 Attachment 1
	CRS	Identifies FB-474A and FB-478B as the affected Bistables.	AOP-401.3 Attachment 1
	CRS	b. Record the following for each associated bistable on SOP-401, REACTOR PROTECTION AND CONTROL SYSTEM, Attachment I: • Instrument. • Associated Bistable. • Bistable Location. • STPs.	AOP-401.3
	CRS	Refers to Technical Specifications: Table 3.3-1 item 14 (Action 6 within 72 hrs) - The inoperable channel is placed in the tripped condition within 72 hours. Table 3.3-3 item 4.d (Action 24 within 72 hrs) - The inoperable channel is placed in the tripped condition within 72 hours.	Tech Specs

BOOTH OPERATOR: Acknowledge requests for support in troubleshooting and placing channel in trip.

Time	Position	Applicant's Actions or Behavior	
	CRS	c. Notify the I&C Department to place the identified bistables in trip.	AOP-401.3

EVALUATE NOTE: The next event may be initiated after the applicable Technical Specification Actions have been identified.

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 3	Page: 19 of 51

Event Description: Rapid downpower due to B MFW pump vibration.

Time	Position	Applicant's Actions or Behavior

BOOTH OPERATOR: When directed by the Evaluator

Call the Control Room as the Shift Supervisor

- The AO has reported to me that the "B" MFW Pump sounds unusual.
- I am at the "B" MFW Pump with Engineering and Mechanical Maintenance.
- Reduce power to less than 45% at 3% per minute IAW GOP-4C, Rapid Power Reduction.
- Leave the MFW Pump "B" running for Engineering to evaluate.

GOP-4C

GOP-4C REFERENCE PAGE

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

C. If Reactor Power is stabilized during this procedure for the purpose of raising power per GOP-4A, a Power Range Heat Balance shall be performed.

D. Once a Rapid Power Reduction has begun, every effort should be made to prevent the Turbine from reaching "AT SET LOAD" unless it is desired to stabilize the plant.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient, power and temperature changes will require constant operator attention.

B. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

C02→ C. If at any time, power decreases unexpectedly below 0.1% on any Power Range NI (computer indication available) OR below 1.0% on any Power Range NI control board indication (computer not available):

1) No positive reactivity will be added by rods or dilution.

2) A complete reactor shutdown shall be performed per GOP-5.

3) A controlled reactor startup may be commenced per GOP-3 once the event has been reviewed by Reactor Engineering.

REACTOR TRIP CRITERIA DURING RAPID LOAD REDUCTION

A. If any of the following conditions occur, trip the Reactor and implement EOP-1.0:

1) RCS T_{avg} is less than 551°F for greater than 15 minutes.

2) T_{avg}/T_{ref} mismatch exceeds 10°F.

3) Pressurizer pressure approaches 1870 psig.

4) Power reduction at 5% per minute is not sufficient to mitigate the event.

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 3	Page: 20 of 51
Event Description: Rapid downpower due to B MFW pump vibration.			

Time	Position	Applicant's Actions or Behavior	
EVALUATOR NOTE: The crew will lower power from 60% in accordance with GOP-4C, Rapid Power Reduction. The RO will utilize boration and/or rod control to lower power while coordinating the downpower with the BOP who will be controlling turbine demand.			
NOTE 3.0 If time allows, load reductions should be discussed with the Load Dispatcher.			GOP-4C
CAUTION 3.1 through 3.12 a. Thermal Power changes of greater than 15% in any one-hour period requires completion of GTP-702 Attachment III.H. b. VCS PID Report, POWER CHANGE SEARCH, should be periodically performed to ensure a thermal power change of greater than 15% in any one-hour period is detected.			GOP-4C
	RO	3.1 Commence rapid Plant Shutdown as follows: a. Energize all Pressurizer Heaters.	GOP-4C
NOTE 3.1.b Setting FCV-113A&B, BA FLOW SET PT to 8.3 will yield 33 gpm Boration flow rate.			GOP-4C
	RO	b. Maintain the following with rod motion or boron concentration changes: 1) Tavg within 10°F and trending to Tref. 2) ΔI within limits. 3) Control Rods above the rod insertion limit.	GOP-4C
	RO	c. Maintain Tavg within the control band by Control Rod motion or boron concentration changes.	GOP-4C
EVALUATOR NOTE: Applicable portions of SOP-106 are attached.			
	RO	3.1.d. Borate or dilute per SOP-106, Reactor Makeup Water System, to maintain the following parameters: 1) ΔI within limits. 2) Control Rods above the Rod Insertion Limit.	GOP-4C

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 3	Page: 21 of 51
Event Description: Rapid downpower due to B MFW pump vibration.			

Time	Position	Applicant's Actions or Behavior	
NOTE 3.2 a. Step 3.2 lowers Reactor Power from 90% to 48%. b. While the plant is being maneuvered, total condensate flow through the Blowdown Heat Exchangers must be maintained greater than 450 gpm, which should maintain condensate outlet temperature at least 30°F below the DA temperature.			GOP-4C
	BOP	3.2 Reduce Reactor Power to 48% as follows:	GOP-4C
EVALUATOR NOTE: Applicable portions of SOP-214 are attached.			
	BOP	a. Using the EHC HMI, Control/Load screen, reduce load per SOP-214 at a rate of 3% per minute or less.	GOP-4C
NOTE 3.2.b The System Controller should be notified prior to manually changing MVARs by more than 50 MVARs in a five minute period, unless the change is needed to prevent equipment damage.			GOP-4C
	BOP	b. As load decreases, adjust Megavars using GEN FIELD VOLT ADJ as requested by the System Controller and within the Estimated Generator Capability curve (Enclosure A).	GOP-4C
	BOP	c. When Reactor Power is between 60% and 80%, reduce to the following pumps in service per SOP-210, Feedwater System: 1) Two Main Feedwater Pumps. 2) Three Feedwater Booster Pumps.	GOP-4C
	BOP	d. When Reactor Power is between 60% and 75%, perform PTP-102.001, Main Turbine Tests (Power Operated Extraction System Check Valve portion only). NA – Power was never increased above 60%,	GOP-4C
EVALUATOR NOTE: Event 4 (Stuck Rod) will be auto-triggered at 56% power so that it is apparent that a rod is not moving.			

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 4	Page: 22 of 51

Event Description: Rod H14 stuck but trippable (blown fuse).

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: NO ACTION REQUIRED. Event 4 (TRIGGER 3) will auto-initiate when power is below 56%.			
EVALUATOR NOTE: This event will auto-actuate when power is reduced below 56%. Control Rod H-14 in Control Bank D will stop moving. The RO will realign the control rods in accordance with AOP-403.5 Stuck or Misaligned Control Rod.			
Indications available: IPCS alarm, XCP-620 2-5 CMPTR ROD DEV			
	CRS	Refer to Alarm Response Procedure ARP-001-XCP-620 2-5	
		CORRECTIVE ACTIONS: 1. Observe the Digital Rod Position Indication display for proper rod positions. 2. Determine if the cause is a dropped or misaligned rod. 3. If DRPI ALARM URGENT is in refer to ARP-001-XCP-621, 2-1.	XCP-620 2-5
		SUPPLEMENTAL ACTIONS: 1. If a rod is misaligned, refer to AOP-403.5, Stuck or Misaligned Rod. 3. Operate the Rod Control System in MAN as described in SOP-403 until proper automatic Rod Control in restored. 4. Refer to Technical Specification 3.1.3.1.	XCP-620 2-5
	CRS	Implement AOP-403.5, Stuck or Misaligned Rod.	

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 4	Page: 23 of 51
Event Description: Rod H14 stuck but trippable (blown fuse).			

Time	Position	Applicant's Actions or Behavior	
	CRS	Apply Technical Specification 3.1.3.1 Action d d. With one full length rod inoperable due to causes other than addressed by ACTION a., above, or misaligned from its group step counter demand height by more than12 steps (indicated position), POWER OPERATION may continue provided that within one hour either: 1. The rod is restored to OPERABLE status within the above alignment requirements, or … 2. The remainder of the rods in the group with the inoperable rod are aligned to within 12 steps of the inoperable rod within one hour while maintaining the rod sequence and insertion limits specified in the CORE OPERATING LIMITS REPORT (COLR); the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or …	TS-3.1.3.1 Action d
IOA	RO	1 Place ROD CNTRL BANK SEL Switch in MAN.	AOP-403.5
IOA	RO	2 Check if Reactor Power is GREATER THAN OR EQUAL TO 5%.	AOP-403.5
IOA	BOP	3 Stabilize Main Turbine load/Steam Dumps demand.	AOP-403.5
*	CREW	4 Maintain Tavg within 5°F of Tref using the following: • Main Turbine load or Steam Dumps demand adjustment. • RCS Boration or Dilution. REFER TO SOP-106, REACTOR MAKEUP WATER SYSTEM.	AOP-403.5
		NOTE - Steps 5 through 16 Throughout the following steps, "AFFECTED" refers to any Rod Bank which contains a misaligned Control Rod.	AOP-403.5
	RO	5 Record the misaligned Control Rod and AFFECTED Bank: • Misaligned Rod: _________. • AFFECTED Bank: _________.	AOP-403.5

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 4	Page: 24 of 51
Event Description: Rod H14 stuck but trippable (blown fuse).			

Time	Position	Applicant's Actions or Behavior	
		<u>NOTE - Step 6</u> Computer rod positions can be found at Group Display DRPIRODS.	AOP-403.5
	RO	6 Record the Control Rod positions and Group Step Counter demands: • Control Bank A DRPI: ___________. Computer: ___________. Demand Group 1: ___________. Demand Group 2: ___________. • Control Bank B DRPI: ___________. Computer: ___________. Demand Group 1: ___________. Demand Group 2: ___________. • Control Bank C DRPI: ___________. Computer: ___________. Demand Group 1: ___________. Demand Group 2: ___________. • Control Bank D DRPI: ___________. Computer: ___________. Demand Group 1: ___________. Demand Group 2: ___________. • Shutdown Bank A DRPI: ___________. Computer: ___________. Demand Group 1: ___________. Demand Group 2: ___________. • Shutdown Bank B DRPI: ___________. Computer: ___________. Demand Group 1: ___________. Demand Group 2: ___________.	AOP-403.5
	CRS	7 Notify the following plant personnel prior to moving Control Rods: • Management Duty Supervisor. • Rod Control System Engineer. • Reactor Engineering.	AOP-403.5
	CRS	8 Notify the I&C Department to investigate the cause of the Control Rod misalignment.	AOP-403.5

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 4	Page: 25 of 51
Event Description: Rod H14 stuck but trippable (blown fuse).			

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: Acknowledge request for I&C support • Wait 3 minutes • Report as I&C "a blown lift coil fuse has been identified in Power Cabinet 1BD" • Request permission to replace blown fuse. • Insert TRIGGER 4 - Removes the blown fuse failure. • Report as I&C that the "blown lift coil fuse in Power Cabinet 1BD" was replaced			
CAUTION - Step 9 IF rod alignment could result in a mode change or a subcritical Reactor reaching criticality, then the plant shall be shut down to Mode 3.			AOP-403.5
	RO	9 Verify the misaligned Control Rod is NOT located on bottom of core.	AOP-403.5
	CRS	10 Provide Reactor Engineering with the following information: • Time Control Rod noticed to be AFFECTED: _________. • AFFECTED Control Rod location: _________. • Initial Reactor power level: _________. • Current Reactor power level: _________. • Current QPTR: _________.	AOP-403.5

Acknowledge request for Reactor Engineering support
 	
• Wait 2 minutes after being provided with the information from step 10.
 	
• Notify the CRS
  ○ Perform rod recovery at the current power level.
  ○ There is no restriction on rod withdrawal speed.			

NOTE - Step 11 This Step must be completed before continuing with Step 12.			AOP-403.5
	CRS	11 Obtain the following information from Reactor Engineering: • Power level at which recovery is to be performed: _________. • Rate of Control Rod movement during recovery: _________.	AOP-403.5

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 4	Page: 26 of 51
Event Description: Rod H14 stuck but trippable (blown fuse).			

Time	Position	Applicant's Actions or Behavior	
	RO	12 Rotate the ROD CNTRL BANK SEL Switch clockwise to the AFFECTED Bank position.	AOP-403.5
	RO	13 Check if the misaligned Control Rod can be moved: a. Monitor DRPI. b. Using the rate of Control Rod movement determined in Step 11, move the AFFECTED Bank six steps in the direction of the misaligned rod. c. Using the rate of Control Rod movement determined in Step 11, move the AFFECTED Bank six to eight steps in the direction of its original position.	AOP-403.5
NOTE - Step 13.d Technical Specification 3.1.3.1 requires plant shutdown if a Control Rod can NOT be moved due to excessive friction or mechanical interference in Mode 1 or 2 OR is known to be untrippable.			AOP-403.5
	RO	d. Check if the misaligned Control Rod moved. e. Using the rate of Control Rod movement determined in Step 11, return the AFFECTED Bank to its original position.	AOP-403.5
	RO	14 If necessary, reduce Reactor power to the power level determined in Step 11. REFER TO GOP-4B, Power Operation (Mode 1 - Descending) Or Gop-4c, Rapid Power Reduction.	AOP-403.5
	RO	15 Align the misaligned Control Rod with the AFFECTED Bank: a. At the CONTROL ROD DISCONNECT SWITCH BOX inside the MCB, place all Lift Coil Disconnect Switches for the AFFECTED Bank, except the switch for the misaligned Control Rod, to the ROD DISCONNECTED position. b. Dispatch an operator with the Rod Control Cabinets Key to the Rod Control Cabinet room (IB-463).	AOP-403.5
NOTE - Step 15.c This step is only applicable for Control Banks.			AOP-403.5

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 4	Page: 27 of 51
Event Description: Rod H14 stuck but trippable (blown fuse).			

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: • Acknowledge request for a field operator. • Report you are located at the Rod Control Cabinet. • If directed to report to the Control Room for the key REPORT I&C is with you and they have a key. • Use INSIGHT ZCRFPA(6), REAL PA VALUE to PCSROD, for the P/A converter reading for the bank D.			
	NA	c. Locally at XCA4-CR, P/A CONVERTER CABINET (IB-463), record the P/A CONVERTER reading for the AFFECTED Bank: ___________.	AOP-403.5
NOTE - Step 15.d ROD CNTRL SYS FAIL URGENT (XCP-620 5-1), annunciator will alarm when a misaligned rod is moved in this step.			AOP-403.5
	RO	d. Using the rate of Control Rod movement determined in Step 11, move the misaligned Control Rod six steps in the direction of the AFFECTED Bank. e. Verify only the misaligned Control Rod moved. f. Using the rate of Control Rod movement determined in Step 11, continue moving the misaligned Control Rod until it is realigned with the AFFECTED Bank.	AOP-403.5
	RO	16 Reset the Group Step Counters and P/A CONVERTER: a. Reset the Bank Group Step Counters to indicate the Group Demands recorded in Step 6.	AOP-403.5
NOTE - Step 16.b This step is only applicable for Control Banks.			AOP-403.5

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 4	Page: 28 of 51
Event Description: Rod H14 stuck but trippable (blown fuse).			

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: When directed - reset P/A converter using Remote Functions • Insert LOA-CRF005, P/A MAN HEIGHT VALUE (USE BEFORE SETTING LOA CRF1), to the value recorded in step 15. • Insert LOA-CRF001, P/A MAN BANK SELECT (USE AFTER SETTING LOA CRF5), to CB D.			
		b. Locally at XCA4-CR, P/A CONVERTER CABINET (IB-463), reset the P/A CONVERTER as follows: 1) Ensure the Bank Position Display Switch is in the AFFECTED Bank position. 2) Place MANUAL/AUTOMATIC Switch in MANUAL. 3) Depress the UP or DOWN Pushbutton to reset the P/A CONVERTER to the reading recorded in Step 15. 4) Place the MANUAL/AUTOMATIC Switch in AUTOMATIC. 5) Place the Bank Position Display Switch to DISPLAY OFF.	AOP-403.5
NOTE - Step 17 If the Control Rods are near the All Rods Out position, SOP-403, ROD CONTROL AND POSITION INDICATING SYSTEM, should be used for final alignment.			AOP-403.5
	BOP	17 Restore the Rod Control System to normal alignment: a. Place all Lift Coil Disconnect Switches to the ROD CONNECTED position. b. Rotate the ROD CNTRL BANK SEL Switch counter-clockwise to MAN. c. Depress the ROD CNTRL ALARM RESET Pushbutton. d. Verify the ROD CNTRL SYS FAIL URGENT (XCP-620 5-1), annunciator clears.	AOP-403.5
EVALUATOR NOTE: Initiate the next event after rod alignment has been restored.			

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 5	Page: 29 of 51
Event Description: PT-508 (MFW Pump Discharge Header Pressure) Fails LOW. (Manual control of MFW Pp speed)			

Time	Position	Applicant's Actions or Behavior
BOOTH OPERATOR: When directed, insert Event 5 (TRIGGER 5)		
EVALUATOR NOTE: On cue from the Examiner, a Main Feedwater Header Pressure transmitter will fail LOW causing the MFW Pump speed to increase and raise SG level. The operators will respond to annunciators and implement AOP-210.3, Feedwater Pump Malfunction. The BOP will take manual control of the master Speed control and adjust speed to maintain Feedwater Pump discharge pressure 150 to 250 psi greater than Main Steam Header pressure and restore SG levels.		
Indications Available: XCP-624 1-5; 2-5; 3-5, SG LVL DEV XCP-624 4-4, 5-4, 6-4, FWF>STF MISMATCH		
	CREW	Responds to multiple SG LVL DEV alarms and/or change in feedwater flow.
EVALUATOR NOTE: The crew may first enter an ARP but could go directly to AOP-210.3, FEEDWATER PUMP MALFUNCTION, based on multiple alarms or early diagnosis.		
	CRS	Enters ARP-001-XCP-624 1-5 or 2-5 or 3-5
	BOP	**CORRECTIVE ACTIONS:** 1. If required, restore Steam Generator A level to between 60% and 65% by performing either or both of the following: a. Manually control PVT-478, SG A FWF, as required. b. Manually control Feedwater Pump speed as follows: 1) Place the Feedwater Pump MASTER SPEED CNTRL in MAN. 2) Adjust the differential pressure between Feedwater Pump discharge header pressure and Main Steam header pressure, as required, to restore Steam Generator water level.

XCP-624 1-5

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 5	Page: 30 of 51
Event Description: PT-508 (MFW Pump Discharge Header Pressure) Fails LOW. (Manual control of MFW Pp speed)			

Time	Position	Applicant's Actions or Behavior	
	BOP	2. Evaluate SG A Narrow Range level indicators LI-474, LI-475, and LI-476: a. For increasing level: 1) At 70% Narrow Range level: (a) During startups (below 15% power) close the Feed Regulating valves with the B Train Switches. (b) When above 15% power take manual control of PVT-478, SG A FWF. (c) Ensure Feed Flow is 200 kbh to 400 kbh less than Steam Flow. 2) At 75% Narrow Range level: (a) Trip the Reactor if above 15% power. (b) Close the Feed Isolation valves. (c) Trip the Turbine. (d) Trip the Feed Pumps. (e) Close the Feedwater Regulating valves, if not closed earlier. (f) If the Reactor has NOT been tripped, reduce power to between 1% and 3% (g) Reestablish Emergency Feed.	XCP-624 1-5
	CRS	3. If FCV-478, A FCV, malfunctioned go to AOP-210.1, Feedwater Flow Control Valve Failure. **(NO)**	XCP-624 1-5
	CRS	4. If a Main Feedwater Pump has tripped or is malfunctioning go to AOP-210.3, Feedwater Pump Malfunction.	XCP-624 1-5
	CRS	Implements AOP-210.3, Feedwater Pump Malfunction.	

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 5	Page: 31 of 51
Event Description: PT-508 (MFW Pump Discharge Header Pressure) Fails LOW. (Manual control of MFW Pp speed)			

Time	Position	Applicant's Actions or Behavior	
		REFERENCE PAGE FOR AOP-210.3 1 Manual Control of Main Feedwater Regulating Valves is permissible at any time as deemed necessary during the performance of this procedure. If a Main Feedwater Regulating Valve has been placed in Manual it should be returned to Automatic as soon as possible. 2 IF only one Main Feedwater Pump is operating and cannot be controlled THEN trip the Main Turbine and go to AOP-214.1, TURBINE TRIP. 3 IF Narrow Range SG level decreases to LESS THAN 40%, THEN Trip the reactor and enter EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION. 4 IF Reactor Power is GREATER THAN 15% and NR Steam Generator level exceeds 75%, THEN Trip the reactor and enter EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION.	AOP-210.3
IOA	BOP	1 Verify at least one Feedwater Pump is running.	AOP-210.3
IOA	BOP	2 Check if a Feedwater Pump trip occurred. **(NO)** **ALTERNATIVE ACTION** 2 GO TO Step 4.	AOP-210.3
IOA	BOP	4 Check Main Feedwater Pump operation. a. Verify all Main Feedwater Pumps are affected. b. Place the MCB MASTER SPEED CNTRL in MAN. and adjust the MCB MASTER SPEED CNTRL as necessary to match Steam Flow and Feedwater Flow.	AOP-210.3
	BOP	5 If necessary, place the Main Feed Regulating valves in Manual.	AOP-210.3
		NOTE - Step 6 Due to the slow operation of the Main Feedwater Pump Recirculation Valves, a constant Main Feedwater Pump speed should be maintained until the recirculation valves have become relatively stable while adjusting Feedwater Flow.	AOP-210.3

Op Test No: NRC-ILO-13-01 Scenario # 2 Event # 5 Page: 32 of 51

Event Description: PT-508 (MFW Pump Discharge Header Pressure) Fails LOW. (Manual control of MFW Pp speed)

Time	Position	Applicant's Actions or Behavior	
*		6 Maintain Narrow Range Steam Generator Water level between 60% and 65%	AOP-210.3

EVALUATOR NOTE: Manual speed control will be maintained for the remainder of the scenario.

EVALUATOR NOTE: The NEXT EVENT may be initiated after the Main Feedwater Pump Master speed controller is in manual.

Time	Position	Applicant's Actions or Behavior	
		7 WHEN conditions allow, Place Main Feed Regulating valves in AUTO.	AOP-210.3

NOTE - Step 8 AOP-210.3

Main Feedwater Program ΔP should be established using the following as available:

- PI-508, FW PP DISCH HDR PRESS PSIG.
- Any operating Main Feedwater Pump Discharge Pressure.
- PI-464C, MS HDR PRESS PSIG.
- Any available MCB Main Steam Header Pressure.
- IPCS (ZZMENU S/G SU Trend or FW Start)

Time	Position	Applicant's Actions or Behavior	
		8 Restore Feedwater Pump D/P to program. a. Using the Feedwater Pump Speed Control method established in Step 4, slowly adjust Feedwater Pump discharge header pressure to within the limits of ATTACHMENT 1, FEEDWATER PUMP D/P LIMITS. b. Adjust PUMP A(B)(C) SPEED CNTRL (MCB M/A Stations) as necessary to balance all operating Feedwater Pumps speed to within 120 rpm of each other.	AOP-210.3

Op Test No:	NRC-ILO-13-01	Scenario #	2	Event #	6	Page:	33	of	51

Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.

Time	Position	Applicant's Actions or Behavior

BOOTH OPERATOR: When directed, initiate Event 6 (TRIGGER 6).

EVALUATOR NOTE (EVENT 6):
On cue from the Examiner, a steamline break inside the Reactor Building will be inserted. The Reactor will trip and the crew will implement EOP-1.0 (E-0) Reactor Trip/Safety Injection Actuation. The crew will identify that at least one Steam generator is faulted and transition to EOP-3.0 (E-2), Faulted Steam Generator Isolation. When the faulted SG is isolated the crew will transition to EOP-1.2 (ES-1.1), Safety Injection Termination.

The crew will identify that the Main Generator Output Breaker failed to automatically trip and the BOP will manually open the breaker from the control board.

The BOP must identify that the MSIVs are open and manually close them from the control board to isolate the faulted Steam Generator and prevent over-pressurization of the Reactor Building.

Indications Available:

XCP-621 3-2 RODS ON BOTTOM
XCP-624 2-4 STMLN PRESS LO
XCP-626 4-1 STM PRESS LO SI
XCP-626 6-1 RB PRESS HI-1 SII

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 6	Page: 34 of 51

Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.

Time	Position	Applicant's Actions or Behavior	

REFERENCE PAGE FOR EOP-1.0 EOP-1.0

1 RCP TRIP CRITERIA

a. IF Phase B Containment Isolation has actuated (XCP-612 4-2), THEN trip all RCPs.

b. IF both of the following conditions occur, THEN trip all RCPs:

- SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM.

AND

- RCS Wide Range pressure is LESS THAN 1418 psig.

2 REDUCING CONTROL ROOM EMERGENCY VENTILATION

Reduce Control Room Emergency Ventilation to one train in operation within 30 minutes of actuation. **REFER TO SOP-505, CONTROL BUILDING VENTILATION SYSTEM.**

3 MONITOR SPENT FUEL COOLING

Periodically check status of Spent Fuel Cooling by monitoring the following throughout event recovery:

- Spent Fuel Pool level.
- Spent Fuel Pool temperature.

NOTE EOP-1.0

- Steps 1 through 5 are Immediate Operator Actions.
- The EOP REFERENCE PAGE should be monitored throughout the use of this procedure.
- Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.

Time	Position	Applicant's Actions or Behavior	
IOA	RO	1 Verify Reactor Trip: • Trip the Reactor using either Reactor Trip Switch. • Verify all Reactor Trip and Bypass Breakers are open. • Verify all Rod Bottom Lights are lit. • Verify Reactor Power level is decreasing.	EOP-1.0

Op Test No: NRC-ILO-13-01 Scenario # 2 Event # 6 Page: 35 of 51

Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.

Time	Position	Applicant's Actions or Behavior	
IOA	BOP	2 Verify Turbine/Generator Trip: a. Verify all Turbine STM STOP VLVs are closed.	EOP-1.0
EVALUATOR NOTE: The GEN BKR and GEN FIELD BKR are failed and need to be manually opened.			
IOA	BOP	b. Ensure Generator Trip (after 30 second delay): 1) Ensure the GEN BKR is open. **(NO)** 2) Ensure the GEN FIELD BKR is open. **(NO)** 3) Ensure the EXC FIELD CNTRL is tripped.	EOP-1.0
IOA	BOP	3 Verify both ESF buses are energized.	EOP-1.0
IOA	RO	4 Check if SI is actuated: a. Check if either: • SI ACT status light is bright on XCP-6107 1-1. OR • Any red first-out SI annunciator is lit on XCP-626 top row. b. Actuate SI using either SI ACTUATION Switch. c. GO TO Step 6.	EOP-1.0
EVALUATOR NOTE: ATTACHMENT 3, SI EQUIPMENT VERIFICATION is included in a separate section.			
	BOP	6 Initiate ATTACHMENT 3, SI EQUIPMENT VERIFICATION.	EOP-1.0
	CREW	7 Announce plant conditions over the page system.	EOP-1.0

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 6	Page: 36 of 51

Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.

Time	Position	Applicant's Actions or Behavior
*	RO	8 Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen. **(NO)** **ALTERNATIVE ACTION** 8 Perform the following: a) Verify both the following annunciators are lit: • XCP-612 3-2 (RB SPR ACT). • XCP-612 4-2 (PHASE B ISOL). IF either annunciator is NOT lit, THEN actuate RB Spray by placing the following switches to ACTUATE: • Both CS-SGA1 and CS-SGA2. OR • Both CS-SGB1 and CS-SGB2. b) Verify Phase B Isolation by ensuring RB SPRAY/PHASE B ISOL monitor lights are bright on XCP-6105. c) Ensure the following are open: • MVG-3001A(B), RWST TO SPRAY PUMP A(B) SUCT. • MVG-3002A(B), NAOH TO SPRAY PUMP A(B) SUCT. • MVG-3003A(B), SPRAY HDR ISOL LOOP A(B). d) Ensure both RB Spray Pumps are running. e) Verify RB Spray flow is GREATER THAN 2500 gpm for each operating train on: • FI-7368, SPR PP A DISCH FLOW GPM. • FI-7378, SPR PP B DISCH FLOW GPM. f) Stop all RCPs.

EOP-1.0

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 6	Page: 37 of 51

Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.

Time	Position	Applicant's Actions or Behavior	
*	RO	9 Check RCS temperature: • With any RCP running, RCS Tavg is stable at OR trending to 557°F. OR • With no RCP running, RCS Tcold is stable at OR trending to 557°F. **ALTERNATIVE ACTION** 9 IF RCS temperature is LESS THAN 557°F AND decreasing, THEN stabilize temperature by performing the following as required: a) Close IPV-2231, MS/PEGGING STM TO DEAERATOR. b) Perform one of the following: • IF Narrow Range SG level is LESS THAN 41% in all SGs, THEN reduce EFW flow as necessary to stop cooldown, while maintaining total EFW flow GREATER THAN 450 gpm. OR • WHEN Narrow Range SG level is GREATER THAN 41% in at least one SG, THEN control EFW flow as necessary to stabilize RCS temperature at 557°F. c) Initiate ATTACHMENT 6, STEAM VALVE ISOLATION, while continuing with this procedure.	EOP-1.0
EVALUATOR NOTE: Close "A" or "B" MSIV Prior to Orange path on Integrity or Containment.			
* **Critical Task**	RO	d) IF RCS cooldown continues, THEN close: • MS Isolation Valves, PVM-2801A(B)(C). • MS Isolation Bypass Valves, PVM-2869A(B)(C).	EOP-1.0

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 6	Page: 38 of 51
Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.			

Time	Position	Applicant's Actions or Behavior	
	RO	10 Check PZR PORVs and Spray Valves: a. PZR PORVs are closed. b. PZR Spray Valves are closed. c. Verify power is available to at least one PZR PORV Block Valve: • MVG-8000A, RELIEF 445 A ISOL. • MVG-8000B, RELIEF 444 B ISOL. • MVG-8000C, RELIEF 445 B ISOL. d. Verify at least one PZR PORV Block Valve is open.	EOP-1.0
		NOTE - Step 11 Seal Injection flow should be maintained to all RCPs.	EOP-1.0
	RO	11 Check if RCPs should be stopped: a. Check if either of the following criteria is met: • Annunciator XCP-612 4-2 is lit (PHASE B ISOL). OR • RCS pressure is LESS THAN 1418 psig AND SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. b. Stop all RCPs.	EOP-1.0
	RO	12 Verify no SG is FAULTED: • No SG pressure is decreasing in an uncontrolled manner. • No SG is completely depressurized. **ALTERNATIVE ACTION** 12 GO TO EOP-3.0, FAULTED STEAM GENERATOR ISOLATION, Step 1.	EOP-1.0
	CRS	Implement EOP-3.0, Faulted Steam Generator Isolation, Step 1.	

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 6	Page: 39 of 51

Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.

Time	Position	Applicant's Actions or Behavior	
EVALUATOR NOTE: If EFW pump runout protection has occurred, the CRS may enter and exit EOP-15.0, Response To Loss Of Secondary Heat Sink.			
CAUTION • At least one SG must be maintained available for RCS cooldown. • Any FAULTED SG or secondary break should remain isolated during subsequent recovery actions unless needed for RCS cooldown, to prevent reinitiating the break.			EOP-3.0
NOTE Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.			EOP-3.0
	BOP	1 Ensure all the following are closed: • MS Isolation Valves, PVM-2801A(B)(C). • MS Isolation Bypass Valves, PVM-2869A(B)(C).	EOP-3.0
	BOP	2 Check if any SG is NON-FAULTED: • Pressure in any SG is stable OR increasing. • Any SG is NOT completely depressurized.	EOP-3.0
	BOP	3 Identify any FAULTED SG(s): • Any SG pressure decreasing in an uncontrolled manner. OR • Any SG completely depressurized.	EOP-3.0
	BOP	4 Close the following for each FAULTED SG: • FW Flow Control, FCV-478. • FW Isolation, PVG-1611A. • SG Blowdown, PVG-503A. • FW Flow Control Bypass, FCV-3321.	EOP-3.0

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 6	Page: 40 of 51
Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.			

Time	Position	Applicant's Actions or Behavior	
	BOP	5 Complete the isolation of each FAULTED SG: a. Close SG Chemical Feed Isolation, MVK-1633A. b. Close MS Drain Isolation, PVT-2843A. c. Close MS Drain Isolation, PVT-2877A for SG A PVT-2877B for SG C. d. Place the Steamline PWR RELIEF A SETPT Controller(s) in MAN and closed. e. Place the Steamline Power Relief A Mode Switch(s) in PWR RLF.	EOP-3.0
CRITICAL TASK	BOP	f. Close FCV-3531, MD EFP TO SG A. g. Close FCV-3536, TD EFP TO SG A.	EOP-3.0
<u>CAUTION - Step 5.h</u> If the TD EFW Pump is the only available source of feed flow, the steam supply to the TD EFW Pump must be maintained from at least one SG, to maintain a secondary heat sink.			EOP-3.0
	BOP	h. Close and locally deenergize the appropriate valve if SG B or SG C is FAULTED: **(NA)**	EOP-3.0
<u>NOTE - Step 6</u> Any high radiation level received on a radiation monitor that was unisolated at event initiation, may be considered a valid alarm.			EOP-3.0

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 6	Page: 41 of 51

Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.

Time	Position	Applicant's Actions or Behavior	
	CRS	6 Check if Secondary radiation levels are normal: a. Check radiation levels normal on all unisolated radiation monitors: • RM-G19A(B)(C), STMLN HI RNG GAMMA. • RM-L3, STEAM GENERATOR BLOWDOWN LIQUID MONITOR. • RM-L10, SG BLOWDOWN CW DISCHARGE LIQUID MONITOR. • RM-A9, CNDSR EXHAUST GAS ATMOS MONITOR. b. Notify Chemistry to sample all SG secondary sides, and screen samples for abnormal activity using a frisker.	EOP-3.0
	CRS	7 Check if SI flow should be reduced: a. RCS subcooling on TI-499A(B), A(B) TEMP °F, is GREATER THAN 52.5°F [67.5°F]. b. Secondary Heat Sink is adequate: • Total EFW flow to INTACT SGs is GREATER THAN 450 gpm. OR • Narrow Range level is GREATER THAN 41% in at least one INTACT SG. c. RCS pressure is stable OR increasing. d. PZR level is GREATER THAN 28%.	EOP-3.0
	RO	8 Reset both SI RESET TRAIN A(B) Switches.	EOP-3.0
	RO	9 Reset Containment Isolation: • RESET PHASE A - TRAIN A(B) CNTMT ISOL. • RESET PHASE B - TRAIN A(B) CNTMT ISOL.	EOP-3.0

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 6	Page: 42 of 51

Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.

Time	Position	Applicant's Actions or Behavior	
	BOP	10 Place both ESF LOADING SEQ A(B) RESETS to: a. NON-ESF LCKOUTS. b. AUTO-START BLOCKS.	EOP-3.0
	BOP	11 Establish Instrument Air to the RB: a. Start one Instrument Air Compressor and place the other in Standby. b. Open PVA-2659, INST AIR TO RB AIR SERV. c. Open PVT-2660, AIR SPLY TO RB.	EOP-3.0
	CRS	12 GO TO EOP-1.2, SAFETY INJECTION TERMINATION, Step 1.	EOP-3.0

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 6	Page: 43 of 51

Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.

Time	Position	Applicant's Actions or Behavior	

REFERENCE PAGE FOR EOP-1.2 — EOP-1.2

1 SI REINITIATION CRITERIA

Following SI termination, IF either of the following conditions occurs, THEN start Charging Pumps and operate valves as necessary, and **GO TO EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1:**

- RCS subcooling on TI-499A(B), A(B) TEMP °F, is LESS THAN 52.5°F [67.5°F].

OR

- PZR level can NOT be maintained GREATER THAN 10% [28%].

2 SECONDARY INTEGRITY TRANSITION CRITERIA

IF any unisolated SG pressure is decreasing in an uncontrolled manner OR is completely depressurized, THEN **GO TO EOP-3.0, FAULTED STEAM GENERATOR ISOLATION, Step 1.**

3 REDUCING CONTROL ROOM EMERGENCY VENTILATION

Reduce Control Room Emergency Ventilation to one train in operation within 30 minutes of actuation. **REFER TO SOP-505, CONTROL BUILDING VENTILATION SYSTEM.**

NOTE — EOP-1.2

The EOP REFERENCE PAGE should be monitored throughout the use of this procedure.

Time	Position	Applicant's Actions or Behavior	
	RO	1 Stop all but one Charging Pump and place in Standby.	EOP-1.2
	RO	2 Verify RCS pressure is stable OR increasing.	EOP-1.2

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # 6	Page: 44 of 51

Event Description: "A" Main Steamline Break inside the RB due to a seismic event. Generator breaker failure. A and B MSIVs fail to close.

Time	Position	Applicant's Actions or Behavior
	RO	3 Establish Normal Charging: a. Close FCV-122, CHG FLOW. b. Open both MVG-8107 and MVG-8108, CHG LINE ISOL. c. Adjust FCV-122, CHG FLOW, to obtain 70 gpm Charging flow. d. Close both MVG-8801A(B), HI HEAD TO COLD LEG INJ.

EOP-1.2

EVALUATOR NOTE: The scenario may be terminated now the Safety Injection has been terminated (i.e. normal charging restored).

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # NA	Page: 45 of 51	
Event Description: SOP-106, BORATE OPERATIONS				

Time	Position	Applicant's Actions or Behavior	
		NOTE 2.0 1. Energizing additional Pressurizer Heaters will enhance mixing. 2. LCV-115A, LTDN DIVERT TO HU-TK, will begin to modulate to the HU-TK position at 70% level on LI-115, VCT LEVEL %.	SOP-106
	RO	2.1 Ensure at least one Reactor Coolant Pump is running.	SOP-106
	RO	2.2 Place RX COOL SYS MU switch to STOP.	SOP-106
	RO	2.3 Place RX COOL SYS MU MODE SELECT switch to BOR.	SOP-106
	RO	2.4 Set FIS-113, BA TO BLNDR FLOW, batch integrator to the desired volume.	SOP-106
	RO	2.5 Place RX COOL SYS MU switch to START.	SOP-106
		NOTE 2.6 Step 2.6 may be omitted when borating less than 10 gallons.	SOP-106
	RO	2.6 Place FCV-113 A&B, BA FLOW, controller in AUTO.	SOP-106
		NOTE 2.7 The AUTO setpoint dial for FCV-113A&B, BA FLOW, controller may be adjusted slowly to obtain the desired flow rate.	SOP-106
	RO	2.7 Verify the desired Boric Acid flow rate on FR-113, BA TO BLNDR GPM (F-113).	SOP-106
	RO	2.8 When the preset volume of boric acid has been reached, perform the following: a. Place FCV-113A&B, BA flow controller in MAN. b. Verify boration stops.	SOP-106
	RO	2.9 Place RX COOL SYS MU switch to STOP.	SOP-106
		NOTE 2.10 a. If plant conditions require repeated borations, Step 2.10 may be omitted. b. The volume in the piping between the blender and the VCT outlet is approximately 3.8 gallons.	SOP-106

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # NA	Page: 46 of 51
Event Description: SOP-106, BORATE OPERATIONS			

Time	Position	Applicant's Actions or Behavior	
	RO	2.10 Alternate Dilute 4 to 6 gallons of Reactor Makeup Water to flush the line down stream of the blender by performing the following: a. Place RX COOL SYS MU MODE SELECT switch to ALT DIL. b. Adjust FCV-168, TOTAL MU FLOW SET PT, to desired flow rate. c. Set FIS-168, TOTAL MU FLOW, batch integrator to desired volume. d. Place RX COOL SYS MU switch to START. e. Verify desired flow rate on FR-113, TOTAL MU GPM (F-168). f. Verify alternate dilution stops when preset volume is reached on FIS-168, TOTAL MU FLOW, batch integrator. g. Place RX COOL SYS MU switch to STOP.	SOP-106
	RO	2.11 Place RX COOL SYS MU MODE SELECT switch to AUTO.	SOP-106
	RO	2.12 Adjust FCV-168, TOTAL MU FLOW SET PT, to 7.5 (120 gpm).	SOP-106
	RO	2.13 In MAN, adjust FCV-113 A&B, BA FLOW OUTPUT, to the required position which will ensure proper Boric Acid addition for subsequent Automatic Makeup operations.	SOP-106
	RO	2.14 Adjust FCV-113A&B, BA FLOW SET PT, to the desired position to ensure proper boric acid addition for subsequent Automatic Makeup operations.	SOP-106
	RO	2.15 Place RX COOL SYS MU switch to START.	SOP-106
	RO	2.16 Perform the following: a. Start XPP-13A(B), BA XFER PP A(B), for the in-service Boric Acid Tank. b. If necessary, start XPP-13A(B), BA XFER PP A(B), for the Boric Acid Tank on recirculation.	SOP-106
		END OF SECTION	SOP-106

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # NA	Page: 47 of 51
Event Description: SOP-214,			

Time	Position	Applicant's Actions or Behavior	
	BOP	2.1 Ensure the Control/Load screen is selected.	SOP-214
		NOTE 2.2 The turbine will come off the limiter and turbine load will lower once Load Set Reference is less than Load Limit Reference. Acknowledging dialog boxes is "skill of the Craft".	SOP-214
	BOP	2.2 To lower Turbine Load using Load Set, perform the following: a. If directed by Operations Management, disable the Turbine Vibration Trips per Section III. b. Select (or enter) the desired Rate %/min on Load Set. c. Select Load on Load Set (a dialog box will open). d. Enter the desired load and confirm. e. Verify proper system response. f. If during a load reduction, it is desired to stop the load reduction, perform the following: 1) Select Hold on Load Set. 2) Select the desired Rate %/min to resume load reduction. 3) If desired, place LOAD LIMIT in service per Section III.	SOP-214
	BOP	2.3 For rapid load shedding of 50 MWe, on an HMI keypad select Ctrl + Alt + S.	SOP-214
		EVALUATOR NOTE: The remainder of this section deals with actions after Turbine Load is below 15%.	

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # NA	Page: 48 of 51
Event Description: EOP-1.0, Attachment 3			

Time	Position	Applicant's Actions or Behavior	
	BOP	1 Ensure EFW Pumps are running: a. Ensure both MD EFW Pumps are running. b. Verify the TD EFW Pump is running if necessary to maintain SG levels.	EOP-1.0 Attachment 3
	BOP	2 Ensure the following EFW valves are open: • FCV-3531(3541)(3551), MD EFP TO SG A(B)(C). • FCV-3536(3546)(3556), TD EFP TO SG A(B)(C). • MVG-2802A(B), MS LOOP B(C) TO TD EFP.	Attachment 3
	BOP	3 Verify total EFW flow is GREATER THAN 450 gpm.	Attachment 3
	BOP	4 Ensure FW Isolation: a. Ensure the following are closed: • FW Flow Control, FCV-478(488)(498). • FW Isolation, PVG-1611A(B)(C). • FW Flow Control Bypass, FCV-3321(3331)(3341). • SG Blowdown, PVG-503A(B)(C). • SG Sample, SVX-9398A(B)(C). b. Ensure all Main FW Pumps are tripped.	Attachment 3
	BOP	5 Ensure SI Pumps are running: • Two Charging Pumps are running. • Both RHR Pumps are running.	Attachment 3
	BOP	6 Ensure two RBCU Fans are running in slow speed (one per train).	Attachment 3
	BOP	7 Verify Service Water to the RBCUs: a. Ensure two Service Water Pumps are running. b. Verify both Service Water Booster Pumps A(B) are running. c. Verify GREATER THAN 2000 gpm flow for each train on: • FI-4466, SWBP A DISCH FLOW GPM. • FI-4496, SWBP B DISCH FLOW GPM.	Attachment 3
	BOP	8 Verify two CCW Pumps are running.	Attachment 3

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # NA	Page: 49 of 51
Event Description: EOP-1.0, Attachment 3			

Time	Position	Applicant's Actions or Behavior	
	BOP	9 Ensure two Chilled Water Pumps and Chillers are running.	Attachment 3
	BOP	10 Verify both trains of Control Room Ventilation are running in Emergency Mode.	Attachment 3
EVALUATOR NOTE: It is a critical task to close the "A" or "B" MSIV Prior to Orange path on Integrity or RB pressure.			
CRITICAL TASK	BOP	11 Check if Main Steamlines should be isolated: a. Check if any of the following conditions are met: • RB pressure GREATER THAN 6.35 psig. OR • Steamline pressure LESS THAN 675 psig. OR • Steamline flow GREATER THAN 1.6 MPPH AND Tavg LESS THAN 552°F. b. Ensure all the following are closed: • MS Isolation Valves, PVM-2801A(B)(C). • MS Isolation Bypass Valves, PVM-2869A(B)(C).	Attachment 3
	BOP	12 Ensure Excess Letdown Isolation Valves are closed: • PVT-8153, XS LTDN ISOL. • PVT-8154, XS LTDN ISOL.	Attachment 3
	BOP	13 Verify ESF monitor lights indicate Phase A AND Containment Ventilation Isolation on XCP-6103, 6104, and 6106. REFER TO ATTACHMENT 4, CONTAINMENT ISOLATION VALVE MCB STATUS LIGHT LOCATIONS, as needed.	Attachment 3

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # NA	Page: 50 of 51

Event Description: EOP-1.0, Attachment 3

Time	Position	Applicant's Actions or Behavior
	BOP	14 Verify proper SI alignment: a. Verify SI valve alignment by verifying SAFETY INJECTION/PHASE A ISOL monitor lights are bright on XCP-6104. b. Verify all SAFETY INJECTION monitor lights are dim on XCP-6106. c. Verify SI flow on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM. d. Check if RCS pressure is LESS THAN 325 psig.
	BOP	Report completion of Attachment 3.
EVALUATOR NOTE: ATTACHMENT 3 is complete.		

Attachment 3

Op Test No: NRC-ILO-13-01	Scenario # 2	Event # NA	Page: 51 of 51
Event Description: EOP-1.0, STEAM VALVE ISOLATION, Attachment 6			

Time	Position	Applicant's Actions or Behavior	
	BOP	1 Close Feedwater Pump TURB DRN VLVs: • MOV-1-5A. • MOV-1-5B. • MOV-1-5C.	EOP-1.0 Attachment 6
	BOP	2 Close the following turbine drain valves: • MVG-2896A, SV-1 BSD. • MVG-2896B, SV-2 BSD. • MVG-2896C, SV-3 BSD. • MVG-2896D, SV-4 BSD.	EOP-1.0 Attachment 6
	BOP	3 Ensure the following drain valves are in AUTO: • PVT-2851A,B,C,D, MS LINES TO TURB DRN. • PVT-2713A,B,C,D, STM DUMP DRN BYP. • PVT-2870, TO MSR A & B DRN. • PVT-2875, TO MSR A & B DRN. • PVT-2845A,B,C, PVT-2824, PVT-2879A,B, LINE DRN. • PVT-2838A,B, HDR DRNS.	EOP-1.0 Attachment 6
	BOP	4 Place the STM DUMP CNTRL Controller in MAN and CLOSED.	EOP-1.0 Attachment 6
	BOP	5 Place the STM DUMP MODE SELECT Switch in STM PRESS.	EOP-1.0 Attachment 6
	BOP	6 Place the STM DUMP CNTRL Controller in AUTO.	EOP-1.0 Attachment 6
*	BOP	7 WHEN the Condenser is NOT available, THEN perform the following: a. Place the Steamline Power Relief A(B)(C) Mode Switches in PWR RLF. b. Adjust the PWR RELIEF A(B)(C) SETPT Controllers as necessary to control RCS temperature.	EOP-1.0 Attachment 6
	BOP	8 Verify proper response of all Steamline PORVs and Condenser Steam Dumps for existing plant conditions.	EOP-1.0 Attachment 6
	BOP	9 Ensure SG Blowdown Valves, PVG-503A(B)(C), are closed.	EOP-1.0 Attachment 6
	BOP	10 If desired, drain valves may be aligned per Shift Supervisor discretion based on current and expected plant status.	EOP-1.0 Attachment 6

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TURNOVER NOTES
(read at the start of the scenario)

Turnover Notes
Mode 1 // 60% Power // Work Week B1 // 2 Trains VU // EOOS: Yellow (LOSP x 2 Thunderstorms and ASI) // Grid Risk: Red // FEP Risk: Green Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102. The National Weather Service has issued a Severe Weather Warning for Richland, Fairfield and Kershaw counties for the next four hours. The “C” MFW Pump is OOS for maintenance. Maintenance is investigating a small steam leak on “C” MFW Pump Casing. GOP-4A is in progress to step 3.16. The power ascension was halted until repairs to the “C” MFW Pump are completed. Reactor Engineering will provide an updated Reactivity Plan prior to continuing the up-power. Maintain power below 65% until the “C” MFW Pump is repaired. The plant has been at the current power level for 24 hours. Xenon is stable.

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CONTROL ROOM SUPERVISOR RELIEF CHECKLIST

DATE/TIME: today

RELIEF SECTION

Turnover Notes

Mode 1 // 60% Power // Work Week B1 // 2 Trains VU // EOOS: Yellow (LOSP x 2 Thunderstorms and ASI) // Grid Risk: Red // FEP Risk: Green

Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102.

The National Weather Service has issued a Severe Weather Warning for Richland, Fairfield and Kershaw counties for the next four hours.

The "C" MFW Pump is OOS for maintenance. Maintenance is investigating a small steam leak on "C" MFW Pump Casing.

GOP-4A is in progress to step 3.16. The power ascension was halted until repairs to the "C" MFW Pump are completed.

Reactor Engineering will provide an updated Reactivity Plan prior to continuing the up-power.

Maintain power below 65% until the "C" MFW Pump is repaired.

The plant has been at the current power level for 24 hours.

Xenon is stable.

Offgoing Control Room Supervisor	
Operations in progress (GOPs, SOPs, load changes, etc.):	
GOP-4A is in progress to step 3.16	
Operations scheduled for oncoming shifts:	
Increase power to 100% after "C" MFW Pump repairs have been completed.	
Plant safeguard systems in degraded status:	
	Initials
In the Control Room, all books are replaced, the desk and console tops are clear, and all trash is properly disposed of.	CRS
Station Log completed.	CRS

Oncoming Control Room Supervisor			**Initials**
Oncoming watch has reviewed the VCS Switchgear mailbox for switching orders.			
Plant Status (to be completed prior to turnover):			
	Plant ESF System Status:		
	Component Cooling System		
	Service water System		
	Reactor Building Cooling System		
	Reactor Building Spray System		
	Accumulator Tanks		
	RHR System		
	Charging/Safety Injection System Emergency Feedwater System		
	Accumulator Tanks		
	Diesel Generator		
	Chilled Water System		
	Control Room Ventilation System		
	Position indications, power availability, and annunciator alarms are normal for present plant conditions.		
	Plant Parameters	Limit	
	Reactor Power	0-100%	
	RCS Tavg	≤589.2°F per loop	
	RCS Pressure	<2385 psig	
	RCS Flow	>100% per loop	
	RCS Subcooling	Normal	
All parameters within allowable limits for plant conditions. If not, what actions are being taken to correct conditions:			
	Review of Logs:		
	Station Log		
	Removal and Restoration Log		
	Tagout Log		
	Special Orders		
Shift Turnover (to be completed during turnover):			
	Briefing on plant conditions by offgoing Control Room Supervisor.		
	Review of SPDS and BISI displays.		
	Discussion of Protected Equipment.		
	Identification of in-progress procedures including their present status and locations.		

C02→	To the best of my knowledge, I am fully qualified to assume this watch taking into consideration fitness for duty, requalification status, and minimum watchstanding qualification.	
Shift relief completed:	Oncoming Control Room Supervisor	
	Offgoing Control Room Supervisor	CR Supervisor
	Shift Supervisor review	

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REACTOR OPERATOR RELIEF CHECKLIST

DATE/TIME: today

LOG SECTION

Date	Entry

RELIEF SECTION

Turnover Notes
Mode 1 // 60% Power // Work Week B1 // 2 Trains VU // EOOS: Yellow (LOSP x 2 Thunderstorms and ASI) // Grid Risk: Red // FEP Risk: Green Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102. The National Weather Service has issued a Severe Weather Warning for Richland, Fairfield and Kershaw counties for the next four hours. The “C” MFW Pump is OOS for maintenance. Maintenance is investigating a small steam leak on “C” MFW Pump Casing. GOP-4A is in progress to step 3.16. The power ascension was halted until repairs to the “C” MFW Pump are completed. Reactor Engineering will provide an updated Reactivity Plan prior to continuing the up-power. Maintain power below 65% until the “C” MFW Pump is repaired. The plant has been at the current power level for 24 hours. Xenon is stable.

Offgoing Reactor Operator	Initials
Main Control Board (Reactor Operator portion) properly aligned for the applicable mode.	RO
Housekeeping is satisfactory in the Reactor Operator area of responsibility.	RO
Discussion of Protected Equipment.	RO

Oncoming Reactor Operator	Initials
Review of HVAC Panel.	
Review of Station Log.	
Review of Removal & Restoration Log.	
Review of Main Control Board Panels.	

System Alignment	A	B	C	Train aligned to	Reasons for any inoperable equipment
Service Water Pumps	X	X		A	
Component Cooling Pumps	X			A	
Charging Pumps	X			A	
HVAC Chillers	X	X		A	
Reactor Building Spray Pumps					
RHR Pumps					
			TDEFP		
Emergency Feedwater Pumps					
Inoperable Radiation Monitors					

C02→	To the best of my knowledge, I am fully qualified to assume this watch taking into consideration fitness for duty, requalification status, and minimum watchstanding qualification.	
Shift relief completed:	Oncoming Reactor Operator	
	Offgoing Reactor Operator	Reactor Operator
	Shift Supervisor review	

SCE&G A SCANA COMPANY

BALANCE OF PLANT RELIEF CHECKLIST

DATE/TIME: today

Date	Entry

RELIEF SECTION

Turnover Notes
Mode 1 // 60% Power // Work Week B1 // 2 Trains VU // EOOS: Yellow (LOSP x 2 Thunderstorms and ASI) // Grid Risk: Red // FEP Risk: Green Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102. The National Weather Service has issued a Severe Weather Warning for Richland, Fairfield and Kershaw counties for the next four hours. The “C” MFW Pump is OOS for maintenance. Maintenance is investigating a small steam leak on “C” MFW Pump Casing. GOP-4A is in progress to step 3.16. The power ascension was halted until repairs to the “C” MFW Pump are completed. Reactor Engineering will provide an updated Reactivity Plan prior to continuing the up-power. Maintain power below 65% until the “C” MFW Pump is repaired. The plant has been at the current power level for 24 hours. Xenon is stable.

Offgoing Reactor Operator	Initials
Main Control Board (Reactor Operator portion) properly aligned for the applicable mode.	BOP
Housekeeping is satisfactory in the Reactor Operator area of responsibility.	BOP
Discussion of Protected Equipment.	BOP

Oncoming Reactor Operator	Initials
Review of Main Control Room Panels.	
Review of Station Log.	
Review of Removal & Restoration Log.	
Test annunciator lights (with Offgoing operator concurrence).	

C02→	To the best of my knowledge, I am fully qualified to assume this watch taking into consideration fitness for duty, requalification status, and minimum watchstanding qualification.	
Shift relief completed:	Oncoming Balance of Plant	
	Offgoing Balance of Plant	Balance of Plant
	Shift Supervisor review	

REACTIVITY CONTROL PARAMETERS

NOTE
This information should be recalculated every Sunday Dayshift (when the plant is in Mode 1) to be available for Reactor Engineering review Monday morning or following work day.

RCS Boron Concentration (**C**RCS) 1122 ppm Burnup 10,000 MWD/MTU

(Check BAT in Service)

- ☐ **C**B "A" BAT 7350 ppm
- ☒ **C**B "B" BAT 7100 ppm

Moderator Temperature Coefficient (**MTC**) (Fig. II-3.7, HFP) -17.872 pcm/°F

Differential Boron Worth (**DBW**) (Fig. II-7.2, HFP) -6.953 pcm/ppm

Gallons of Boric Acid or Reactor Makeup Water required to change RCS average temperature by one (1) degree:

MTC/DBW = -17.872 / -6.953 = (Δ**B**) 2.57 ppm Boron Change/°F

gal. Acid/°F = 20.94 From Fig. III-2: gal. Acid/°F = $49640 \ln\left(\frac{(CB-CRCS)}{CB-(CRCS+\Delta B)}\right)$

gal. RMW/°F = 127.14 From Fig. III-3: gal. RMW/°F = $49640 \ln\left(\frac{CRCS}{(CRCS-\Delta B)}\right)$

Power Defect (PD) for 10% power change (100% to 90%) (Fig. II-2):

1766 PD @ 100% RTP - 1592.8 PD @ 90% RTP = 173.2 Δ Power Defect, pcm

Gallons of Boric Acid only to reduce reactor power from 100% to 90%:

Δ Power Defect/DBW = 173.2 / 6.953 = 24.91 ppm Boron

(Fig. III-2) 203.3 gal. Boric Acid/10% RTP

Final rod height using rods only to reduce reactor power from 100% to 90%:
(Assume ARO)

Δ Power Defect = Integrated Rod Worth (IRW) = 173.2 pcm

(Fig. II-10) 185 final rod height Bank D

REACTIVITY CONTROL PARAMETERS

NOTE
For a 10% reduction in load, ½ of the calculated boric acid should be used and ½ the calculated Control Rod motion.

For a 100% to 90% load reduction:

Use 102 **gallons boric acid** (½ the gallons calculated above), and expect the rods to be at approximately 200 **steps on bank D** (Fig. II-10 series, ½ the IRW, NOT ½ the steps).

To change T_{AVG} by 1° F: 20.9 **gallons Boric Acid/°F**

124.1 **gallons Reactor Makeup Water/°F**

For a 100% to 90% load reduction: **Use** 101.7 **gallons boric acid**

and expect 200 **steps on bank D**

NOTE:
This calculation is to provide a second check to the batch integrator setting to establish continuity between the setting and actual make-up results.

FCV 113 A&B, pot setting for current RCS boron concentration 4.81

Expected Boric Acid flowrate for VCT makeup 19

Expected Boric Acid total gallons on an Auto Makeup based on current BAT in service:

$\frac{\text{Current RCS CB}}{\text{CB for BAT in service}}$ $\frac{1122}{7100}$ x 270 gallons* = 42.7

* Normal Auto Makeup is 267 to 275 gallons

Calculation and Auto Makeup pot settings by Reactor Operator 1 Sunday
Signature / Date

Calculation and Auto Makeup pot settings verified by Reactor Operator 2 Sunday
Signature / Date

Reactor Engineering Review Reactor Engineer Date Monday

REACTIVITY MANAGEMENT BRIEF MODES 1 - 3

NOTE

PART 1 REACTIVITY MANAGEMENT TURNOVER should be read at Shift Turnover Meeting.

PART 2 REACTOR STATUS should be discussed between the NROATC, BOP, and CRS.

PART 1 **REACTIVITY MANAGEMENT TURNOVER:**

- Date of last Automatic or Manual Make-Up: today
- Is Auto Makeup expected this shift (circle)? YES NO
- Expected Boric Acid total gallons on a normal Auto Makeup based on current BAT in service: 42.7 gallons
- FCV 113 A&B, pot setting for current RCS boron concentration: 4.81
- Expected Boric Acid flowrate for VCT makeup: 19
- Total gallons Diluted 227.3 Borated 42.7 (Last Shift)
- Last evolution (circle one): Borate / Dilute / Blended
- Expected Borations, Dilutions, or Blended changes to the RCS:___________
- List Reactivity Concerns in progress or planned and action(s) necessary (i.e. Steam or Feed Flow transmitter in test, Steam Generator Blowdown out of service, Calorimetric inputs in service, etc.).

REACTIVITY MANAGEMENT BRIEF MODES 1 – 3 (Cont'd)

PART 2 **REACTOR STATUS:** (circle one below)

- Delta I on Target (± 2%)? YES NO Not in Mode 1

  If NO is circled, identify plan to re-establish target band: ______________________

  ____

  ____

- Xenon Trend: Stable Building In Burning Out

- Demineralizers:

  Mixed Bed in service: A B PRC01 Y / N

  Standby Demineralizer: Filled Borated Empty PRC01

  Cation Bed: Date last in service 1 month ago

  Boron Concentration when in service 1098

- ATTACHMENT IA reviewed and current: YES NO

- Midnight Boron Concentration and Date when CHG/SI pump was secured:

  C_B A ______________ Date ______________

  C_B B 1005 Date 3 days ago

  C_B C 1012 Date 1 week ago

CYCLE 22 PLAN# 2015- TRNG

REACTIVITY MANAGEMENT PLAN VERIFICATION

BEACON Filenames:

Model Input filename training

Summary Results filename training

Calibration filename training

Power Profile filename training

Sign and date steps below to document performance.

Step Number	Signature	Date
*3.0 Prerequisites	RE Signature 1	today
*7.36 Verify 9.0 Criteria	RE Signature 1	today
*7.38 RE Verifier	RE Signature 2	today
*7.39 Operations Reviewer	Ops Signature	today

COMMENTS

CYCLE 22 PLAN# 2015 TRNG

REACTIVITY MANAGEMENT PLAN INPUTS

PROPOSED POWER MANEUVER

Date/Time	Reactor Power	Comments (e.g. control rod or boron issues, activities to be performed, holds, etc.)
t = 0	60%	Continue power ascension
14:00	100%	Stabilize power

COMMENTS – list power plateau activities, unusual operational restraints, contingency plans, alternate power history variations to address, time periods to avoid boration, etc.

Cycle 22 Simulator 10k MWD/MTU Startup 60-100%

Hours After Start	Rx Power	D Bank Pos	Boron PPM	Boron (gal)	Water (gal)	Total Boron (gal)	Total Water (gal)	Delta-I (%)	RAOC Band Low	RAOC Band High	Xenon Worth (pcm)	RIL Limit (steps)
0.00	60%	173	1121.6	0	0	0	0	-2.91	-19.2	17.6	-2839	112
0.25	61%	174	1122.6	8	0	8	0	-2.93	-19.0	17.4	-2828	114
0.50	61%	175	1123.5	8	0	16	0	-2.76	-18.8	17.3	-2817	115
0.75	62%	175	1123.5	0	0	16	0	-2.78	-18.6	17.1	-2805	117
1.00	63%	175	1123.5	0	0	16	0	-2.82	-18.4	16.9	-2792	118
1.25	64%	175	1124.5	8	0	24	0	-2.85	-18.2	16.7	-2778	120
1.50	64%	175	1124.5	0	0	24	0	-2.90	-18.0	16.6	-2764	121
1.75	65%	176	1126.1	13	0	37	0	-2.94	-17.8	16.4	-2750	123
2.00	66%	177	1127.4	11	0	48	0	-2.95	-17.6	16.2	-2735	124
2.25	66%	177	1128.2	7	0	55	0	-2.99	-17.4	16.1	-2720	126
2.50	67%	178	1129.5	10	0	65	0	-3.01	-17.2	15.9	-2704	127
2.75	68%	178	1130.4	8	0	72	0	-3.04	-17.0	15.7	-2689	129
3.00	69%	179	1131.7	11	0	83	0	-3.05	-16.8	15.5	-2673	130
3.25	69%	179	1132.6	7	0	90	0	-3.08	-16.6	15.4	-2658	131
3.50	70%	179	1133.3	6	0	97	0	-3.12	-16.4	15.2	-2642	133
3.75	71%	180	1134.5	9	0	106	0	-3.15	-16.2	15.0	-2627	134
4.00	71%	180	1135.5	8	0	114	0	-3.19	-16.0	14.9	-2611	136
4.25	72%	181	1136.6	10	0	124	0	-3.21	-15.8	14.7	-2596	137
4.50	73%	182	1138.0	11	0	135	0	-3.21	-15.6	14.5	-2580	139
4.75	74%	182	1138.9	7	0	142	0	-3.24	-15.4	14.3	-2565	140
5.00	74%	182	1138.9	0	0	142	0	-3.28	-15.2	14.2	-2551	142
5.25	75%	183	1140.5	13	0	156	0	-3.31	-15.0	14.0	-2536	143
5.50	76%	183	1141.3	7	0	162	0	-3.36	-14.8	13.8	-2522	144
5.75	76%	184	1142.3	8	0	170	0	-3.39	-14.6	13.7	-2508	146
6.00	77%	185	1143.4	9	0	180	0	-3.23	-14.4	13.5	-2494	147
6.25	78%	185	1143.4	0	0	180	0	-3.27	-14.2	13.3	-2481	149
6.50	79%	185	1144.3	7	0	187	0	-3.32	-14.0	13.1	-2468	150
6.75	79%	185	1144.3	0	0	187	0	-3.39	-13.8	13.0	-2456	152
7.00	80%	186	1145.7	12	0	199	0	-3.53	-13.6	12.8	-2443	153
7.25	81%	187	1145.7	0	0	199	0	-3.57	-13.4	12.6	-2432	155
7.50	81%	188	1147.1	11	0	210	0	-3.59	-13.2	12.5	-2420	156
7.75	82%	189	1147.9	7	0	217	0	-3.57	-13.0	12.3	-2409	158
8.00	83%	189	1147.9	0	0	217	0	-3.60	-12.8	12.1	-2398	159
8.25	84%	189	1147.9	0	0	217	0	-3.65	-12.6	11.9	-2388	161
8.50	84%	191	1149.1	10	0	227	0	-3.63	-12.4	11.8	-2377	162
8.75	85%	191	1149.1	0	0	227	0	-3.65	-12.2	11.6	-2368	163
9.00	86%	191	1149.1	0	0	227	0	-3.69	-12.0	11.4	-2359	165
9.25	86%	192	1149.1	0	0	227	0	-3.73	-11.8	11.3	-2350	166
9.50	87%	192	1149.1	0	0	227	0	-3.78	-11.6	11.1	-2342	168
9.75	88%	193	1149.1	0	0	227	0	-3.83	-11.4	10.9	-2334	169
10.00	89%	194	1149.1	0	0	227	0	-3.84	-11.2	10.7	-2326	171
10.25	89%	194	1149.1	0	0	227	0	-3.88	-11.0	10.6	-2319	172
10.50	90%	195	1149.1	0	0	227	0	-3.91	-10.8	10.4	-2312	174
10.75	91%	196	1149.1	0	0	227	0	-3.94	-10.6	10.2	-2306	175
11.00	91%	196	1149.1	0	0	227	0	-3.98	-10.4	10.1	-2300	176
11.25	92%	197	1148.3	0	36	227	36	-4.06	-10.2	9.9	-2294	178
11.50	93%	198	1148.3	0	0	227	36	-4.09	-10.0	9.7	-2289	180
11.75	94%	199	1148.3	0	0	227	36	-4.05	-9.8	9.5	-2283	181
12.00	94%	199	1147.3	0	44	227	80	-4.09	-9.6	9.4	-2279	182
12.25	95%	200	1147.3	0	0	227	80	-4.13	-9.4	9.2	-2275	184
12.50	96%	201	1146.6	0	31	227	110	-4.16	-9.2	9.0	-2271	185

Tech Spec Ref: N/A

Procedure Ref: REP-102.001

Figure Ref: N/A

Cycle 22 Simulator 10k MWD/MTU Startup 60-100%

Hours After Start	Rx Power	D Bank Pos	Boron PPM	Boron (gal)	Water (gal)	Total Boron (gal)	Total Water (gal)	Delta-I (%)	RAOC Band Low	RAOC Band High	Xenon Worth (pcm)	RIL Limit (steps)
12.75	96%	202	1146.6	0	0	227	110	-4.16	-9.0	8.9	-2266	187
13.00	97%	202	1145.2	0	61	227	172	-4.20	-8.8	8.7	-2263	188
13.25	98%	203	1145.2	0	0	227	172	-4.24	-8.6	8.5	-2260	190
13.50	99%	204	1144.0	0	53	227	224	-4.29	-8.4	8.3	-2258	191
13.75	99%	206	1144.0	0	0	227	224	-4.41	-8.2	8.2	-2255	193
14.00	100%	207	1143.1	0	36	227	260	-4.42	-8.0	8.0	-2253	194
14.25	100%	208	1143.1	0	0	227	260	-4.32	-8.0	8.0	-2252	194
14.50	100%	209	1144.1	8	0	235	260	-3.28	-8.0	8.0	-2250	194
14.75	100%	207	1143.4	0	31	235	292	-3.42	-8.0	8.0	-2251	194
15.00	100%	206	1142.5	0	40	235	332	-3.79	-8.0	8.0	-2253	194
15.25	100%	206	1142.5	0	0	235	332	-3.82	-8.0	8.0	-2255	194
15.50	100%	206	1142.5	0	0	235	332	-3.84	-8.0	8.0	-2258	194
15.75	100%	206	1141.6	0	39	235	371	-3.87	-8.0	8.0	-2261	194
16.00	100%	206	1141.6	0	0	235	371	-3.89	-8.0	8.0	-2264	194

SCHEDULED WORK APPROVAL/DENIAL

Scheduled Work/Activity Date today

Description of Work/Activity to be performed:
Scheduled maintenance on Alternate Seal Injection pump

I. This Moderate Risk, Elevated Risk, High Risk, or Cross Train activity is approved for work provided the required plant conditions are available on the scheduled due date.

OR

This specific activity has been reviewed for EOOS Risk Reassessment. Set EOOS Environmental Variance ____________________ Set Risk at Times __________

The following items were considered for making this approval:

Shift Supervisor Operations Supervisor (Moderate Risk or Cross Train)
In the absence of the Operations Supervisor:
Operations Scheduling, Shift Supervisor

______________ GMNPO/MDS (Elevated Risk)

______________ PSRC (High Risk)

II. This work activity/package cannot be performed on the scheduled date due to the following reason(s):

______________ SRO (WCC or On Shift)

______________ Operations Scheduling Supervisor

III. Recommended re-schedule date or plant conditions:

SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

NUCLEAR OPERATIONS
COPY NO.____________

GENERAL OPERATING PROCEDURE

GOP-4A

POWER OPERATION (MODE 1 - ASCENDING)

REVISION 2

SAFETY RELATED

RECORD OF CHANGES

CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE	CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE
A	P	10/31/11		F	P	06/30/14	
B	P	04/25/12		G	P	07/20/14	
C	P	11/01/12		H	P	07/21/14	
D	P	05/01/14					
E	P	05/23/14					

CONTINUOUS USE

Continuous Use of Procedure Required.
Read Each Step Prior to Performing.

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TABLE OF CONTENTS

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1.0 PURPOSE/SCOPE

1.1 The purpose of this procedure is to provide the steps required to be performed to startup the plant from the Point of Adding Heat to 100% Reactor Power.

1.2 10CFR50 Appendix B, SAP-630, and 10CFR50.59 apply to this procedure.

NOTE 2.0 through 4.0

a. If this procedure must be initiated under conditions other than those in Section 2.0, INITIAL CONDITIONS, the Shift Supervisor or Control Room Supervisor will review Sections 2.0, INITIAL CONDITIONS, and 3.0, INSTRUCTIONS. Steps that are not applicable due to plant conditions will be marked N/A and initialed by the Shift Supervisor or Control Room Supervisor. All other items will require sign-off or check-off.

b. All personnel who sign off steps in this procedure must enter their names and initials on Attachment I.

c. Each step should be initialed and dated when all its substeps are either completed and checked-off or marked as N/A and initialed.

2.0 INITIAL CONDITIONS

INITIALS/DATE

2.1 RCS status is as follows: RO / today

a. System temperature is being maintained between 555°F and 559°F using the Steam Dump System or Steamline PORVs. ☐

b. System pressure is being maintained between 2220 psig and 2250 psig in AUTO control. ☐

c. All Reactor Coolant Pumps are in operation. ☐

d. Pressurizer level is being maintained at 25% in AUTO control. ☐

2.2 All Safety Injection Systems are aligned and operable. RO / today

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INITIALS/DATE

2.3 Excore NIs are aligned for Power Operation per SOP-404, Excore Nuclear Instrumentation System. CRS / today

2.4 Reactor Power is being maintained between 1% and 3%. CRS / today

2.5 For Mode 2, with no untrippable or dropped Control Rods, Shutdown Margin requirements are satisfied once per 12 hours by verification of Control Rods above the Rod Insertion Limit. CRS / today

2.6 Reactor Makeup Control is in AUTO and set for the existing RCS boron concentration. CRS / today

2.7 The Rod Control and Position Indicating Systems are in operation per SOP-403, Rod Control And Position Indicating System. CRS / today

2.8 Secondary Plant status is as follows: CRS / today

a. The Main Turbine is on the Turning Gear per SOP-215, Main Turbine Lube Oil Supply System. ☐

b. The Main Feedwater Pumps are on their Turning Gears per SOP-209, Feedwater Turbine Lube Oil System, or otherwise rotating via system flow. ☐

c. Narrow Range Steam Generator levels are being maintained between 60% and 65% with chemistry within specification using the following:

1) Steam Generator Blowdown per SOP-212, Steam Generator Blowdown if desired, with Condensate return temperature maintained less than or equal to DA temperature. ☐

2) Emergency Feedwater per SOP-211, Emergency Feedwater System. ☐

d. Main Steam heatup is complete per SOP-201, Main Steam System. ☐

e. Feedwater is being warmed per SOP-210, Feedwater System. ☐

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INITIALS/DATE

f. Condensate is in operation per SOP-208, Condensate System.

g. Circulating Water is in operation per SOP-207, Circulating Water.

h. Condenser Vacuum is established per SOP-205, Turbine Sealing Steam System, and SOP-206, Main and Auxiliary Condenser Air Removal System in the following:

1) Main Condenser.

2) Auxiliary Condensers.

2.9 The following controller setpoints are aligned as follows: CRS / today

a. LCV 3235, DEAER START UP DRAIN CNTRL
AUTO with setpoint potentiometer set at 7.1

b. Feedwater Pumps:

1) PUMP A SPEED CONTROL
AUTO with setpoint potentiometer set at 0.25.

2) PUMP B SPEED CONTROL
AUTO with setpoint potentiometer set at 0.50.

3) PUMP C SPEED CONTROL
AUTO with setpoint potentiometer set at 0.75.

c. IFK3136, FLOW TO DEAERATOR
AUTO with setpoint potentiometer set at 5.0.

d. TURB OIL TEMP
AUTO with setpoint potentiometer set at 2.0 - 2.66. CHG D

e. EHC HYDRO OIL
AUTO with setpoint potentiometer set at 2.4 - 7.1.

f. H2 GAS TEMP
AUTO.

g. ALT COOLER TEMP
AUTO.

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INITIALS/DATE

NOTE 2.9.h.
IPV-2231, MS/PEGGING STM TO DEAERATOR, should be adjusted to maintain DA temperature between 130°F and 150°F.

h. IPV-2231, MS/PEGGING STM TO DEAERATOR MAN or AUTO. ☐

2.10 Reactor Engineering has verified the LEFM constants are removed per SAP-119, Control Of The Station Calorimetric Computer Program. CRS / today

2.11 Reactor Engineering has provided a Reactivity Management Plan for the Turbine Startup and power ascension per SAP-0155, Reactivity Management. CRS / today

2.12 A Pre-job brief has been conducted, including a review of GOP-Appendix A and the Reactivity Management Plan. CRS / today

2.13 IPCS is available to monitor Heat Up Rate during Startup when Moderator Temperature Coefficient is near zero or positive. CRS / today

2.14 Initiate a work order for Electrical Maintenance to perform Thermography per steps 3.12.d.2 and 3.16.h. of this procedure. CRS / today

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

3.0 INSTRUCTIONS

INITIALS/DATE

> NOTE 3.1 through 3.11
>
> Steps 3.1 through 3.11 raise Reactor Power from 1% to 25%.

3.1 Consult the following for current system status, Mode escalation limitations, and Reactor Power level restrictions: CRS / today

a. Complete Attachment II for required system alignments. ☐

b. Removal and Restoration Log. ☐

c. Danger Tag Log. ☐

d. Reactor Engineering. ☐

e. Chemistry. ☐

f. Ensure completion of GTP-702 Attachment II.G, Category “C1” Operational Mode Change Plant Startup - Entering Mode 1. ☐

Z156→ g. Initiate STP-120.003, Emergency Feedwater Valve Verification. (Free of air section 6.1 only.) ☐ CHG D

3.2 Perform OAP-100.4, Communication, Attachment I, Mode Change Brief Checklist. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

N01→3.3 Ensure the following disconnects are properly closed: CRS / today

a. The associated disconnect switch mechanical operator is locked in position:

1) Manual Disconnect 8891.

2) Manual Disconnect 8893.

3) Manual Disconnect 8901.

4) Manual Disconnect 8903.

b. Inform the Electrical Department that disconnects have been closed and initiate a work order to have Electrical perform thermography when disconnect is energized:

1) Manual Disconnect 8891.

2) Manual Disconnect 8893.

3) Manual Disconnect 8901.

4) Manual Disconnect 8903.

CHG G

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

3.4 Align Steam Dump control for Automatic operation as follows: CRS / today

a. Transfer Steamline PORVs to Automatic operation as follows:

1) Place the Steamline PWR RELIEF A(B)(C) SETPT Controller(s) in MAN.

2) Adjust the PWR RELIEF SETPT Controllers to 8.4 (1092 psig).

3) Place the Steamline Power Relief Mode Switches in AUTO.

4) Place the PWR RELIEF SETPT Controllers in AUTO.

b. Transfer STM DUMP CNTRL to Automatic operation as follows:

1) Place the STM DUMP CNTRL Controller in MAN.

2) Adjust the STM DUMP CNTRL setpoint to 8.4 (1092 psig).

3) Place the STM DUMP CNTRL Controller in AUTO.

c. If necessary, reset C-7A and C-7B by taking STM DUMP MODE SELECT to RESET and return to STM PRESS.

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

   1) Power and temperature changes should be slow and will require constant operator attention.

   2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

   3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

NOTE 3.5
Main Steamline GP-A and GP-B drains should be cycled open at least once every thirty minutes when left closed to minimize cooldown, in order to ensure moisture removal.

3.5 Complete Secondary Plant warm-up as follows: CRS / today

Z137→ a. Secure the Feedwater Recirculation flowpath per SOP-210, Feedwater System, Section III.B., Feedwater System Header Warming, Step 2.3. ☐

Z130→ b. Perform SOP-204, Extraction Steam, Reheat Steam, Heater Vents and Drains, Section III.A, Start Up Of Extraction Steam, Reheat Steam, Heater Vents and Drains Step 2.1. ☐

Z149→ c. Complete Main Turbine warm-up per SOP-214, Main Turbine And Controls, Section III.A, Turbine Startup, starting at Step 2.8.q. ☐ CHG D

Z131→ d. At the completion of the Main Turbine warm-up, continue with SOP-204, Extraction Steam, Reheat Steam, Heater Vents and Drains, Section III.A, Start Up Of Extraction Steam, Reheat Steam, Heater Vents and Drains, Step 2.2. ☐

e. Maintain DA temperature between 130°F and 150°F as follows:

1) As required, adjust IPV-2231, MS/PEGGING STM TO DEAERATOR, in Automatic or Manual. ☐

2) As required, LCV 3235, DEAER START UP DRAIN CNTRL, may be used to raise flow through the DA. ☐

f. Verify Feedwater and Condensate System chemistry is in specification per CP-615, Feedwater And Condensate Chemistry Control. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

3.6 Prepare the Secondary Plant for power ascension as follows: CRS / today

a. Ensure the Main Turbine is reset. ☐

Z158→ b. Ensure the Main Generator Breaker Disconnect Switch 89 is Closed per SOP-303, Main Generator Breaker And Isophase Bus Duct Cooling, Section IV.B, Closing The Main Generator Breaker Disconnect Switch 89 ☐ CHG D

c. Place 43-TS12, UNDER FREQ. TRIP CONTROL SW, in OFF. ☐

d. Direct Electricians to verify proper phase-phase voltages between the Main Generator Breaker and the low side of the Main Transformer as indicated by the G6 set of potential transformer voltage readings in XPN6222 on fuse block 2BU (FU3) (Reference 210-121, Sheet 3) are approximately 120 Vac and are balanced: ☐ CHG A

1) $V_{2-}V_4$

2) $V_{2-}V_6$

3) $V_{4-}V_6$

e. Verify at least two Circulating Water Pumps are operating. ☐

f. Verify that at least one Condensate Pump is operating per SOP-208, Condensate System. ☐

g. Ensure Sparging Steam to the Deaerator is secured. ☐

Z139→ h. Ensure all available Feedwater Booster Pumps are operating per SOP-210, Feedwater System, Section III.D, Feedwater Booster Pump Startup. ☐ CHG D

i. Ensure Deaerator temperature is between 130°F and 150°F. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.6 continued

j. Raise condensate flow to the Blowdown Heat Exchangers to between 150 gpm and 250 gpm per Steam Generator (450-750 gpm total) on FI-3061, CONDENSATE BLOWDOWN COOLERS FLOW IND, using the following controllers in MANUAL (AB-436):

1) ITV-3062A, BD COOLER A CDSTE OUT TEMP.

2) ITV-3062B, BD COOLER B CDSTE OUT TEMP.

3) ITV-3062C, BD COOLER C CDSTE OUT TEMP.

3.7 Align the Feedwater System for power ascension as follows: CRS / today

C01→ Z128→ a. Perform PTP-102.005, Main Feedwater Pump Turbine Checks, quarterly portion Steps 6.1 through 6.12. CHG D

PMTS# 15xxxxx

b. Ensure the following are MAN/CLOSED:

1) PVT-478, SG A FWF

2) PVT-488, SG B FWF

3) PVT-498, SG C FWF

Z141→ c. Start one Main Feedwater Pump per SOP-210, Feedwater System, Section III.E, Feedwater Pump Startup. CHG D

d. Reset the Feedwater Isolation signal by momentarily turning the following switches to the right:

1) FW ISOL TRAIN A RESET.

2) FW ISOL TRAIN B RESET.

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.7 continued

CAUTION 3.7.e
1) Feedwater Header pressure should be maintained on program prior to opening Feedwater Isolation Valves to minimize water hammer.
2) Annunciator Point XCP-625 3-3 (FIV A/B/C ACCUM PRESS LO) should be verified clear or pressure locally verified greater than 500 psi prior to Mode 1 entry to ensure Feedwater Isolation Valve operability. (ref. Tech Spec 3.7.1.6)

e. Open the following:

1) PVG-1611A, A ISOL. ☐

2) PVG-1611B, B ISOL. ☐

3) PVG-1611C, C ISOL. ☐

NOTE 3.7.f
Use MANUAL control only if the Master Speed Controller is unable to control in AUTO.

Z140→ f. Ensure the MASTER SPEED CNTRL (MCB M/A station) is in Automatic per SOP-210, Feedwater System, Section III.E, Feedwater Pump Startup, Step 2.8. ☐

CHG D

Z197→ g. Prepare the Main Generator for startup per SOP-301, MAIN GENERATOR SYSTEM, SECTION III.A, Startup, Steps 2.1 and 2.2. ☐

h. Contact Reactor Engineering to verify LEFM constants are removed per SAP-119, Control Of The Station Calorimetric Computer Program. ☐

CHG G

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

CAUTION 3.8

Reactor Power must be maintained less than or equal to 10% until Emergency Feedwater is aligned per STP-120.003, Emergency Feedwater Valve Verification. (refer to Tech Spec 4.7.1.2.a.4)

3.8 Prepare for power ascension as follows: CRS / today

a. Verify the accumulator pressure for each Feedwater Isolation Valve is greater than 500 psi as indicated by either of the following:

1) XCP-625 3-3 (FIV A/B/C ACCUM PRESS LO) is clear. ☐

2) Accumulator pressure locally verified is greater than 500 psi for each valve. ☐

b. Commence Reactor Power increase to between 6% and 9% (Target 8% power, at a reasonably achievable ramp rate up to 1/2%/minute). ☐

c. Log the time and date the plant entered Mode 1: ☐

Mode 1 Entry: 01:00 / 2 days ago
Time Date

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.8 continued

> NOTE 3.8.d
>
> C03→ Maintaining Main Feedwater Pump discharge pressure 50 psi -150 psi greater than Main Steam header pressure will maintain Steam Generator levels until Main Feedwater Pump speed control is placed in Automatic.

d. If the MASTER SPEED CNTRL will **NOT** control in AUTO, perform the following:

1) Place the MASTER SPEED CNTRL in Manual. ☐

2) Adjust Main Feedwater Pump speed as necessary to maintain Main Feedwater Pump discharge pressure 50 psi to 150 psi greater than Main Steam header pressure. ☐

Z142→ e. Perform SOP-210, Feedwater System, Section III.F, Transferring Emergency Feed Flow To The Main Feed Reg Valves (Preferred method). ☐

f. Transfer Feedwater Flow from (Alternate method):

Z143→ 1) Emergency Feed to the Bypass Valves per SOP-210, Feedwater System, Section IV.A, Transferring Feedwater Flow From The Emergency Feed To The Bypass Valves. ☐

Z144→ 2) The Bypass Valves to the Main Feed Reg Valves per SOP-210, Feedwater System, Section IV.B, Transferring Feedwater Flow From The Bypass Valves To The Main Feed Reg Valves. ☐

Z140→ g. Establish automatic Feedwater Pump speed control per SOP-210, Feedwater System, Feedwater System, Section III.E, Feedwater Pump Startup, Step 2.8. ☐

CHG D

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.8 continued

h. Update the IPCS Plant Mode indicator to indicate Mode 1 as follows:

1) Type the Turn-On-Code MODE to display the PLANT MODE CHANGE DISPLAY window. ☐

2) Select the SET MODE 1 Pushbutton. ☐

3) Verify POWER OPER is displayed on the left end of the top toolbar. ☐

CAUTION 3.8.i
1) Moisture Separator/Reheater temperature changes and Main Turbine vibration levels must be monitored closely while placing the MSRs in service.
2) To minimize stress in the Low Pressure Turbines, Hot Reheat Steam temperature changes must be limited to 125°F/hr.

Z134→ i. Start up MSR A and B, in RAMP (TEMP CONTROL) mode, per SOP-204, Extraction Steam, Reheat Steam, Heater Vents And Drains, Section III.D, Normal Startup And Operation Of The MSRs. ☐ CHG D

j. When less than 15% power, ensure the following valves are open:

1) XVT02072A-HD, REHEAT A 4TH-PASS DUMP TO CNDSR THROT. ☐

2) XVT02072B-HD, REHEAT B 4TH-PASS DUMP TO CNDSR THROT. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.8 continued

k. Ensure the following as Reactor Power increases to no more than 9%:

1) DA temperature is being maintained between 130°F and 150°F by adjusting IPV-2231, MS/PEGGING STM TO DEAERATOR, as necessary. ☐

2) Narrow Range Steam Generator levels are maintained between 55% and 65%. ☐

3) Condensate flow to the Deaerator increases. ☐

Z145→ l. Secure Emergency Feedwater per SOP-211, Emergency Feedwater System, Section III.B, Motor Driven Emergency Feedwater Pump Shutdown. ☐ CHG D

m. Complete STP-120.003, Emergency Feedwater Valve Verification (Valve Position Verification portion). ☐

STTS# 15xxxxx

NOTE 3.9

RCS TAVG – TREF DEV HI/LO (XCP-615 2-5) is expected to alarm as TAVG is increased and TREF remains constant. Compensatory actions should be taken per the ARP for this alarm.

3.9 When Emergency Feedwater is aligned for power operation, prepare to synchronize and load the Main Generator as follows: CRS / today

a. Slowly raise Reactor Power to between 12% and 15% while continuing with this procedure. ☐

b. At 10% Reactor Power, perform the following:

1) Verify P10, NIS PR, permissive energizes to bright. ☐

2) Verify P7, REACTOR TRIP BLOCKED, permissive de-energizes to dim. ☐

3) Verify normal Power Range Channel indication. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.9.b continued

4) Monitor the highest indicating Power Range Channel and Delta Flux on either of the following:

   a) NR-45, NIS RECORDER. ☐

   b) Computer display NR45. ☐

5) Ensure REGULATOR CORE 1 ALARM and REGULATOR CORE 2 ALARM (XCP-633) are reset. ☐

c. Stabilize Reactor Power to establish and maintain the following conditions prior to and during the Main Turbine rollup to 1800 RPM:

1) Reactor Power between 12% and 15%. ☐

2) Steam Dump Demand between 8% and 14% as indicated on TI-408, SD CNTRL S/G %. ☐

3) Main Steam Header Pressure less than 1120 psig. ☐

d. If not completed previously, perform the following per SOP-210, Feedwater System:

Z140→ 1) Establish automatic Feedwater Pump speed control, Section III.E, Feedwater Pump Startup, Step 2.8. ☐

Z142→ 2) Transfer Feedwater from the Main Feed Bypass Valves to the Main Feed Regulating Valves, Section IV.F, Transferring Feedwater Flow From The Bypass Valves To The Main Feed Reg Valves. ☐ CHG D

Z135→ e. Transfer Gland Sealing Steam to Main Steam per SOP-205, Turbine Sealing Steam System, Section III.A, Startup Of The Turbine Sealing Steam System Using Main Steam. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.9 continued

f. Momentarily place the following RESET-BLOCK Switches in BLOCK:

1) IR TRAIN A.

2) IR TRAIN B.

3) PR LOW SP TRAIN A.

4) PR LOW SP TRAIN B.

g. Verify the following status lights energize to bright:

1) IR A TRIP BLCK.

2) IR B TRIP BLCK.

3) PR A TRIP BLCK.

4) PR B TRIP BLCK.

Z147→ h. Roll the Main Turbine to 1800 RPM, per SOP-214, Main Turbine And Controls, Section III.A, Turbine Startup, Step 2.13. CHG D

i. Ensure 0.5 scfh flow through FLOW METER FOR GAS ANALYZER (XPN-7201, HYDROGEN AND STATOR COOLING WTR CNT PNL) by adjusting XVT12205-HY, MACHINE GAS ANALYZER INLET ISOL VALVE (TB-412). CHG G

j. Obtain a Switching Order from the System Controller.

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

CAUTION 3.10

a. Thermal Power changes of greater than 15% in any one hour period require completion of GTP-702 Attachment III.H.

b. VCS DDS Report, POWER CHANGE SEARCH, should be periodically performed to ensure a thermal power change of greater than 15% in any one hour period is detected.

c. Prolonged operation at low loads (less than 150 MWe) may result in Turbine rubs and elevated bearing vibration caused by low Exhaust Hood temperatures.

d. To prevent equipment damage, Step 3.10 should be completed as conditions allow. This is especially true when a Turbine load increase is stopped prior to reaching 150 MWe. CHG D

NOTE 3.10 through 3.18

a. IFK3136, FLOW TO DEAERATOR, AUTO setpoint should be adjusted during power changes to maintain LI-3136, DEAER STOR TK NR LVL, between 2.5 feet and 5.0 feet as LCV 3235, DEAR START UP DRAIN CNTRL, is closed.

b. Acknowledging dialog boxes is considered a “skill of the craft”. CHG B

3.10 Synchronize and load the Main Generator to as follows: CRS / today

a. Adjust Reactor Power as necessary to maintain between 8% and 14% Steam Dump Demand as indicated on TI-408, SD CNTRL S/G %, while continuing with this procedure. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

> NOTE 3.10.b
>
> When the Main Generator Breaker is closed the Generator icon will swap from speed (rpm's) indication to load (MW) indication.

Z152→ b. Synchronize and load the Main Generator to 50 MWe per SOP-301, Main Generator System, Section III.A, Startup, Step 2.3. ☐ CHG D

c. Monitor Exhaust Hood temperature using any of the following:

1) On the EHC HMI select Monitor/LP Hoods ☐

2) Computer display TURBRG. ☐

3) Computer points T3058A, EXHAUST SPRAY HOOD A TEMP, and T3068A, EXHAUST SPRAY HOOD B TEMP. ☐

d. Raise Turbine load to 150 MWe as follows:

1) Verify Exhaust Hood temperature is less than 175°F as indicated on the EHC HMI, Monitor/LP Hoods screen. ☐

2) Using the EHC HMI, Control/Load screen, on Load Set, select Ramp Rate and enter desired rate of 1% or less. ☐

CHG D

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

3) Increase Turbine load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐

CHG D

(2) Enter 13.59%. ☐

(3) Confirm setpoint. ☐

(4) Verify proper plant response. ☐

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

> CAUTION 3.10.e
>
> Do not stop the Turbine load increase with Exhaust Hood temperature less than 80°F as indicated on the EHC HMI, Monitor/LP Hoods.

e. If necessary, stop the Turbine load increase by one of the following methods:

   1) Depress the HOLD button. ☐

   2) Release the Raise Pushbutton on the MCB. ☐

f. Maintain Exhaust Hood temperature greater than 80°F as indicated on the EHC HMI, Monitor/LP Hoods screen, by Turbine load adjustments. ☐ CHG D

g. If necessary, re-commence the Turbine load increase by one of the following methods:

   1) Using the EHC HMI, Control/Load screen, on Load Set, select Ramp Rate and enter desired rate of 1% or less. ☐

   2) Manually using the raise/lower pushbuttons:

      a) Select the desired ramp rate of 1%/min or less. ☐

      b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe). ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

h. As Turbine load increases, perform the following:

1) Ensure 1st Stage Shell Inner heatup rate as indicated on EHC HMI, Aux/Metal Temps screen does not exceed 150°F/hr. ☐

2) Maintain DA temperature as follows:

a) Adjust IPV-2231, MS/PEGGING STM TO DEAERATOR, as necessary, to maintain DA temperature per Enclosure B, DA Low Power Temperature Curve. ☐

b) If required, LCV 3235, DEAER START UP DRAIN CNTRL, may be used to raise flow through the DA. ☐ CHG D

Z138→ c) Ensure Feedwater Booster Pump warm-up criteria are maintained with DA temperature changes per SOP-210, Feedwater System, Section III.D, Step 2.1. ☐

d) Maintain Blowdown Heat Exchanger condensate outlet temperatures at least 30˚F below DA temperature. ☐

i. Adjust Reactor Power as necessary to maintain between 2% and 14% Steam Dump Demand as indicated on TI-408, SD CNTRL S/G % while continuing with this procedure. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

   1) Power and temperature changes should be slow and will require constant operator attention.

   2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

   3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

Z148→ j. Close GP-A drain valves per SOP-214, Main Turbine And Controls, Section III.A, Turbine Startup, Step 2.24. CHG D

k. Place 43-TS12, UNDER FREQ. TRIP CONTROL SW, in ON.

l. Reset VOLT. UNBAL. RELAY 60G.

Z132→ m. Perform the 50 MWe Main Control Board Extraction Drain Switch alignment per SOP-204, Extraction Steam, Reheat Steam, Heater Vents and Drains, Section III.A, Startup Of Extraction Steam, Reheat Steam, Heater Vents And Drains, Step 2.3. CHG D

n. Perform PTP-102.003, Main Generator Temperature Monitoring.

PMTS# 15xxxxx

o. When the Turbine Load is greater than 10% (100 MWe), as indicated on any DCS graphic screen or EHC HMI, perform the following:

1) Open MVG-1212, EXTR STM TO DEAER ISOL.

2) Adjust the IPV-2231, MS/PEGGING STM TO DEAERATOR, setpoint to a setting of 7.0 in AUTO.

3) Ensure the following are closed (TB-412):

a) XVG02075-HD, HP FW HEATER 2A DRAIN TO DEAER HDR ISOLATION.

b) XVG02074-HD, HP FW HEATER 2B DRAIN TO DEAER HDR ISOLATION.

4) Place the following in NORMAL (GRAPHIC 101 and 102 or 110 screens - I icons):

a) FW HTR 2A OPRTR SELECT ISOLATION.

b) FW HTR 2B OPRTR SELECT ISOLATION.

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10 continued

p. Verify P13, 1st STAGE PRESSURE, permissive de-energizes to dim.

q. When Turbine Load has stabilized at 150 MWe, perform the following:

1) Close the following Main Steam GP-B drain valves:

a) MVG-2899A, X-AROUND DRN VLV-1.

b) MVG-2899B, X-AROUND DRN VLV-2.

c) MVG-2899C, X-AROUND DRN VLV-3.

d) MVG-2899D, X-AROUND DRN VLV-4.

Z133→ 2) Close heater startup vents and bypass valves for 15% Turbine Load, SOP-204, Extraction Steam, Reheat Steam, Heater Vents and Drains, Section III.A, Startup Of Extraction Steam, Reheat Steam, Heater Vents And Drains, Step 2.4. CHG D

3) Perform the following (TB-412):

a) Throttle XVT02072A-HD, REHEAT A 4TH-PASS DUMP TO CNDSR THROT, to 2.0 turns open.

b) Throttle XVT02072B-HD, REHEAT B 4TH-PASS DUMP TO CNDSR THROT, to 3.25 turns open.

4) If desired, secure the Auxiliary Boiler per SOP-506, Auxiliary Boiler Operation:

Z153→ a) Section III.B, Shutdown CHG D

Z154→ b) Section IV.E, Operation Of The Temporary Boiler.

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.10.q continued

5) Perform PTP-102.003, Main Generator Temperature Monitoring. ☐

PMTS# 15xxxxx

Z155→ 6) Align Extraction Steam to Auxiliary Building Steam per SOP-507, Auxiliary Steam System, Section III.A, Supplying Auxiliary Building Steam From Extraction Steam ☐ CHG D

NOTE 3.10.q.7)
If returning from a power level of greater than 75 %, per Reactor Engineering, the LEFM constants are not required to be adjusted (i.e. quarterly valve testing).

CHG G

7) Contact Reactor Engineering to determine if LEFM constants need to be re-determined for current power history. ☐

3.11 Raise Reactor Power to 25%, as follows:

a. Maintain DA temperature during load increases as follows:

1) Adjust IPV-2231, MS/PEGGING STM TO DEAERATOR, as necessary, to maintain DA temperature per Enclosure B, DA Low Power Temperature Curve. ☐

Z138→ 2) Ensure Feedwater Booster Pump warm-up criteria are maintained with DA temperature changes per SOP-210, Feedwater System, Section III.D, Feedwater Booster Pump Startup, Step 2.1. ☐ CHG D

3) Maintain Blowdown Heat Exchanger condensate outlet temperatures at least 30˚F below DA temperature. ☐

b. Ensure the A(B)(C) FPT SETPOINT RAMP LIMIT (A icon) RV value for operating Feedwater Pump A(B)(C) is set to 3000 rpm per minute. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.11 continued

c. Verify Exhaust Hood temperature is less than 175°F as indicated on the EHC HMI, select Monitor/LP Hoods.

d. Using the EHC HMI, Control/Load screen, on Load Set, select Ramp Rate and enter desired rate of 1% or less.

e. Increase Turbine load to 300 MWe by one of the following methods:

1) Slowly Raise Turbine load automatically as follows (preferred method):

(a) Select the Load pushbutton (a dialog box opens).

(b) Enter 27.17%.

(c) Confirm setpoint.

(d) Verify proper plant response.

2) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)

3) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

CHG B

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.11.f continued

f. As Turbine load increases, perform the following:

1) Ensure First Stage Shell heatup rate as indicated on EHC HMI, Aux/Metal Temps screen is maintained less than 150°F/hr. ☐

2) Adjust Reactor Power as necessary to maintain between 2% and 14% Steam Dump Demand as indicated on TI-408, SD CNTRL S/G %. ☐

3) When C5 (15% Turbine Load), 1st STAGE PRESSURE, permissive de-energizes to dim, perform the following in the order listed:

a) Hold Reactor Power constant. ☐

NOTE 3.11.f.3)b)
Establishing approximately a 0°F/hr to 30°F/hr cooldown rate will allow Tavg to slowly approach Tref.)

b) Continue raising turbine load to match Tavg and Tref. ☐

c) Verify Tref is within 1°F of Tavg. ☐

d) Place the ROD CNTRL BANK SEL Switch in AUTO. ☐

e) Ensure the STM DUMP CNTRL auto setpoint is set to 8.4 (1092 psig). ☐

f) Transfer Steam Dump control to the Tavg mode as follows by placing the STM DUMP MODE SELECT Switch in TAVG. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.11. continued

g. When Turbine load has stabilized, perform the following:

1) Perform STP-102.002, NIS Power Range Heat Balance.

STTS# 15xxxxx

C02→ 2) As a second check on Nuclear Instrumentation, compare RCS Loop ΔT to the results of STP-102.002.

3) Perform PTP-102.003, Main Generator Temperature Monitoring.

PMTS# 15xxxxx

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.11 continued

h. Raise Turbine load to attain 25% Reactor Power as follows:

1) Select Ramp Rate and enter desired rate of 1% or less. ☐

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐

(2) Enter 18.2% ☐

(3) Confirm setpoint. ☐

(4) Verify proper plant response. ☐

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

CHG
B

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.11 continued

i. At 25% Reactor Power, verify the following status lights energize to bright:

1) CHAN I IR FLUX HI. ☐
2) CHAN II IR FLUX HI. ☐
3) CHAN I PR FLUX LO SET PT. ☐
4) CHAN II PR FLUX LO SET PT. ☐
5) CHAN III PR FLUX LO SET PT. ☐
6) CHAN IV PR FLUX LO SET PT. ☐

NOTE 3.12 and 3.13

Steps 3.12 and 3.13 raise Reactor Power from 25% to 48%.

3.12 Raise Reactor Power to 38% as follows: CRS / today

a. Contact Chemistry to verify there are no 30% power Chemistry holds. ☐

b. Ensure the following are closed (TB-412):

1) XVG02075-HD, HP FW HEATER 2A DRAIN TO DEAER HDR ISOLATION. ☐
2) XVG02074-HD, HP FW HEATER 2B DRAIN TO DEAER HDR ISOLATION. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.12 continued

c. Raise Turbine load to attain 38% Reactor Power as follows:

1) Select Ramp Rate and enter desired rate of 1% or less.

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens).

(2) Enter 29.9%

(3) Confirm setpoint.

(4) Verify proper plant response.

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

CHG B

d. At 250 MWe perform the following:

1) Ensure all Extraction Drain Valves are latched.

2) Contact Electrical Maintenance to perform thermography on manual disconnects 8901 and 8903.

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.12 continued

e. At 300 MWe, perform the following to start filling the drain lines from the 2A and 2B Heaters to the DA:

1) Open XVT12083-HD, 1" BYPASS VALVE FOR XVG-02075 (TB-412) (requires ladder).

2) Open XVT12085-HD, 1" BYPASS VALVE FOR XVG-02074 (TB-412).

3) Throttle XVT02018A-HD, FW HTR 2A DRN TO DEAER LVL CONT VLV BYP, ten turns off the closed seat (TB-463).

4) Throttle XVT02018B-HD, FW HTR 2B DRN TO DEAER LVL CONT VLV BYP, ten turns off the closed seat (TB-463).

Z136→ f. Place a second Condensate Pump in service per SOP-208, Condensate System, Section III.B, Condensate Pump Startup when total Condensate flow approaches 9000 gpm as indicated on the following: CHG D

1) FI 3026, PUMP A DISCH FLOW.

2) FI 3036, PUMP B DISCH FLOW.

3) FI 3046, PUMP C DISCH FLOW.

g. Between 30% and 35% Reactor Power, perform the following:

Z138→ 1) Ensure Feedwater Booster Pump warm-up criteria are maintained with DA temperature changes per SOP-210, Feedwater System, Section III.D, Feedwater Booster Pump Startup, Step 2.1. CHG D

Z139→ 2) Ensure at least three Feedwater Booster Pumps are in service per SOP-210, Feedwater System, Section III.D, Feedwater Booster Pump Startup.

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.12 continued

h. At 38% Reactor Power verify P8, REACTOR TRIP BLOCKED, de-energizes to dim. ☐ CHG E

Z146→ i. Establish automatic Steam Generator blowdown temperature control per SOP-212, Steam Generator Blowdown, Section III.A, Steam Generator Blowdown System Startup And Operation Steps 2.19 and 2.20. ☐ CHG D

Z141→ j. Between 35% and 48% Reactor Power, place a second Main Feedwater Pump in service per, SOP-210, Feedwater System, Section III.E, Feedwater Pump Startup. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.12 continued

k. When 40% is indicated in the INTERMEDIATE PRESSURE block on the PLU test Screen perform the following: CHG H

1) On the EHC HMI, Control/Load Screen, select HOLD. CHG G

2) Perform the Power Load Unbalance (PLU) test as follows:

(a) Verify P9, REACTOR TRIP BLOCKED, permissive is BRIGHT.

(b) On the EHC HMI, select Tests/PLU test.

(c) Verify all PLU Status indicate OFF.

(d) Select PLU Test ON.

(e) Select OK.

(f) Verify the following:

(1) Test initiation on all 6 status indicators.

(2) Final status indication for all 6 indicators PLU TEST FOR R/S/T COMPLETE.

(g) Select PLU Test OFF

(h) Select OK.

(i) Select desired Ramp Rate, %/min increase on Control/Load screen.

l. Determine the GOP Appendix A recommended power ascension rate.

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

3.13 Raise Reactor Power to 48% at the GOP Appendix A recommended power ascension rate, as follows: CRS / today

a. Verify Steam Generator chemistry is in specification per CP-613, Steam Generator Chemistry Control.

b. Raise Turbine load to attain 48% Reactor Power as follows:

1) Select Ramp Rate and enter the recommended Load Ramp Rate.

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens).

(2) Enter 39.5.%. CHG B

(3) Confirm setpoint.

(4) Verify proper plant response.

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.13 continued

c. When Turbine Load is greater than 40% (385 MWe), verify C20, 1st STG PRESS, de-energizes to dim. ☐

d. Monitor the following for proper operation:

1) Stator Water Cooling. ☐

2) Hydrogen Seal Oil. ☐

e. Between 400 MWe and 450 MWe, open the following valves to align the 2A and 2B Heaters to the DA (TB-412):

1) XVG02075-HD, HP FW HEATER 2A DRAIN TO DEAER HDR ISOLATION. ☐

2) XVG02074-HD, HP FW HEATER 2B DRAIN TO DEAER HDR ISOLATION. ☐

Z129→ f. Secure the Condensate Polishing per SOP-203, Condensate Polishing System, Section III.F, Removing The Condensate Polishing System From Service. ☐

Z157→ g. Maintain the following SOP-401, Reactor Protection And Control System, Section III.B, Load Variations With Manual Or Automatic Reactor Control parameters using CHG D
Z017→ SOP-106, Reactor Makeup Water System Section III.E,
Z003→ Alternate Dilute Operations or Section III.F, Borate Operations:

1) ΔI within limits. ☐

2) Control Rods above the Rod Insertion Limit. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.13 continued

NOTE 3.13.h
Above 40% Turbine load MSR 4th pass drains to the Condenser close and the MSR 4th pass drains to the #1 Feedwater Heaters open.

h. Using the DCS Computer Graphic Screens 101 and 102, verify MSR 4th pass drain valves have repositioned:

1) XVT-2071A indicates closed. ☐

2) XVT-2071B indicates closed. ☐

3) XVT-02068A indicates open. ☐

4) XVT-02068B indicates open. ☐

i. When Reactor Power is stable at or below 48%, perform the following:

1) STP-102.002, NIS Power Range Heat Balance. ☐

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C02→ 2) As a second check on Nuclear Instrumentation, compare RCS Loop ΔT to the results of STP-102.002. ☐

3) Determine the operability of the Axial Flux Difference alarm:

a) Perform STP-133.001, Axial Flux Difference Calculation. ☐

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b) Verify Annunciator Point XCP-620 2-4 (CMPTR ΔFLUX LMT EXCEEDS) is clear. ☐ CHG C

4) PTP-102.003, Main Generator Temperature Monitoring. ☐

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GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

NOTE 3.14 through 3.16

Steps 3.14 through 3.16 raise Reactor Power from 48% to 90%.

3.14 At the GOP Appendix A recommended power ascension rate, continue the Reactor Power ascension above 50% as follows: CRS / today

a. Ensure ΔI, Axial Flux Difference, is within limits per V.C.Summer Curve Book, Figure I-4.1 prior to increasing Reactor Power above 50% per Tech Spec 3.2.1. ☐

b. When greater than 50% Rated Thermal Power perform STP-108.001, Quadrant Power Tilt Ratio. ☐ CHG C

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c. Raise Turbine load to attain 90% Reactor Power as follows:

1) Select Ramp Rate and enter the recommended. Load Ramp Rate. ☐

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐

(2) Enter 81.52% ☐ CHG B

(3) Confirm setpoint. ☐

(4) Verify proper plant response. ☐

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.14 continued

d. As power increases, verify the following annunciators clear:

1) PR UP DET FLUX HI DEV AUTO DEFEAT (XCP-620 1-5).

2) PR LOW DET FLUX HI DEV AUTO DEFEAT (XCP-620 1-6).

e. Adjust Megavars using GEN FIELD VOLT ADJ as requested by the System Controller and within the Estimated Generator Capability Curve (Enclosure A).

Z157→ f. Maintain the following SOP-401, Reactor Protection And Control System, Section III.B, Load Variations With Manual Or Automatic Reactor Control parameters using
Z017→ SOP-106, Reactor Makeup Water System Section III.E,
Z003→ Alternate Dilute Operations or Section III.F, Borate Operations: CHG D

1) ΔI within limits.

2) Control Rods above the Rod Insertion Limit.

g. Verify P9, REACTOR TRIP BLOCKED, permissive de-energizes to dim.

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

3.15 When Turbine Load is greater than 50%, as indicated on any DCS graphic screen, place IZY03783A and IZY03793A, MANUAL OPERATOR STATIONs in Automatic as follows (GRAPHIC 101 and 102 or 110 screens): CRS / today

a. Ensure the following are open (TB-412):

1) XVG02075-HD, HP FW HEATER 2A DRAIN TO DEAER HDR ISOLATION. ☐

2) XVG02074-HD, HP FW HEATER 2B DRAIN TO DEAER HDR ISOLATION. ☐

b. Ensure HTR 2A&B DRN VLV TO DEAERATOR CLOSE is selected to CNTRL (C icon). ☐

c. Ensure both FW HTR 2A OPRTR SELECT ISOLATION and FW HTR 2B OPRTR SELECT ISOLATION are in NORMAL (I icon). ☐

NOTE 3.15.d

The #2 Heaters utilize the lowest controller signal to maintain level, regardless of the M/A station output (in Manual or Automatic). As a result, manipulation of the M/A station in manual may not yield the anticipated result.

d. Slowly raise OUT on both ILY03783A and ILY03793A MANUAL OPERATOR STATIONs (M/A - icons) until the associated IZY03783B and IZY03793B (2A/2B Heater drain to the Condenser) are fully closed. ☐

e. When FEEDWATER HEATER 2A(B) levels are stable and slightly below setpoint, place ILY03783A and ILY03793A MANUAL OPERATOR STATIONs (M/A - icons) in Automatic. ☐

f. Adjust IFK3136, FLOW TO DEAERATOR, AUTO setpoint as necessary to ensure LI-3136, DEAER STOR TK NR LVL is between 2.5 feet and 5.0 feet with LCV 3235, DEAR START UP DRAIN CNTRL closed. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step3.15 continued

g. Close the following bypass valves:

1) XVT12083-HD, 1" BYPASS VALVE FOR XVG-02075 (TB-412) (requires ladder). ☐

2) XVT12085-HD, 1" BYPASS VALVE FOR XVG-02074 (TB-412). ☐

3) XVT02018A-HD, FW HTR 2A DRN TO DEAER LVL CONT VLV BYP (TB-463). ☐

4) XVT02018B-HD, FW HTR 2B DRN TO DEAER LVL CONT VLV BYP (TB-463). ☐

3.16 As the Reactor Power ascension to 90% continues perform the following: ______/______

a. Between 60% and 65% Reactor Power, perform the following:

Z138→ 1) Ensure Feedwater Booster Pump warm-up criteria are maintained with DA temperature changes per SOP-210, Feedwater System, Section III.D Feedwater Booster Pump Startup, Step 2.1. ☐ CHG D

Z139→ 2) Ensure four Feedwater Booster Pumps are in service per SOP-210, Feedwater System, Section III.D, Feedwater Booster Pump Startup. ☐ CHG G

Z141→ 3) Start a third Main Feedwater Pump per SOP-210. Feedwater System, Section III.E, Feedwater Pump Startup. ☐ CHG D

b. At 65% Reactor Power, perform PTP-102.003, Main Generator Temperature Monitoring. ☐

PMTS# ____________

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.16 continued

c. When Reactor Power is between 60% and 75%, perform PTP-102.001, Main Turbine Tests (Power Operated Extraction System Check Valve portion only). ☐

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d. At 75% Reactor Power, perform STP-102.002, NIS Power Range Heat Balance. ☐ CHG G

STTS# ____________

e. At 80% Reactor Power, align Control Valve drain valves as follows:

1) Ensure PVG-2898B, DV-4, is open as follows:

a) Verify Control Valve #4 is closed. ☐

b) Verify PVG-2898B, DV-4, is open. ☐

c) If both PVG-2898B, DV-4, and Control Valve #4 are closed, open PVG-2898B, DV-4, by opening MVG-2898D, STM LEAD DRN FOR CV-1. ☐

2) Open MVG-2897, COMB CNTRL VLV BSD. ☐

f. When Control Valve #4 indicates greater than 5% open, perform the following:

1) Ensure PVG-2898B, DV-4, is CLOSED. ☐

2) Close MVG-2897, COMB CNTRL VLV BSD. ☐

g. At 85% Reactor Power, perform PTP-102.003, Main Generator Temperature Monitoring. ☐

PMTS# ____________

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.16 continued

h. Contact Electrical Maintenance to perform thermography on manual disconnects 8901 and 8903. ☐

i. Adjust Megavars using GEN FIELD VOLT ADJ as requested by the System Controller and within the Estimated Generator Capability Curve (Enclosure A). ☐

j. If desired stabilize Reactor Power at 90%, otherwise proceed to Step 3.17. ☐

NOTE 3.17 and 3.18
Steps 3.17 and 3.18 raise Reactor Power from 90% to 100%.

3.17 At the GOP Appendix A recommended power ascension rate, increase Reactor Power from 90% to 95% as follows: ________/________

a. Raise Turbine load to attain 95% Reactor Power.

1) Select Ramp Rate and enter the recommended. Load Ramp Rate. ☐

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐

(2) Enter 87.41%. ☐

(3) Confirm setpoint. ☐

(4) Verify proper plant response. ☐

CHG B

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.17.a.2) continued

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

CHG B

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

b. Place the following Blowdown Temperature Controllers in AUTOMATIC (AB-436):

1) ITV-3062A, BD COOLER A CDSTE OUT TEMP. ☐

2) ITV-3062B, BD COOLER B CDSTE OUT TEMP. ☐

3) ITV-3062C, BD COOLER C CDSTE OUT TEMP. ☐

c. Adjust Megavars using GEN FIELD VOLT ADJ as requested by the System Controller and within the Estimated Generator Capability Curve (Enclosure A). ☐

Z157→ d. Maintain the following SOP-401, Reactor Protection And Control System, Section III.B, Load Variations With Manual Or Automatic Reactor Control parameters using
Z017→ SOP-106, Reactor Makeup Water System Section III.E,
Z003→ Alternate Dilute Operations or Section III.F, Borate Operations:

CHG D

1) ΔI within limits. ☐

2) Control Rods above the Rod Insertion Limit. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.17 continued

e. Stabilize Reactor Power at 95% and perform the following:

1) STP-102.002, NIS Power Range Heat Balance. ☐

STTS# ____________

2) During the first power ascension following refueling, contact Reactor Engineering to continue the power ascension per REP-107.001, Controlling Procedure For Refueling Startup And Power Ascension Testing. ☐

3.18 Slowly increase Reactor Power to 100% as follows: ________/________

a. If the IPCS is available, verify the NSSS CRT is displaying the following computer points:

1) SHIFT AVG POWER (U9002). ☐

2) QCORE 1 (C1M) (U9003). ☐

b. Raise Turbine load to attain 100% Reactor Power per the GOP Appendix A recommended power ascension rate, while continuing with this procedure. ☐

1) Select Ramp Rate and enter the recommended. Load Ramp Rate. ☐

2) Raise Turbine Load by one of the following methods:

a) Slowly Raise Turbine load automatically as follows (preferred method):

(1) Select the Load pushbutton (a dialog box opens). ☐ CHG B

(2) Enter 92.12%. ☐

(3) Confirm setpoint. ☐

(4) Verify proper plant response. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.18.b.2) continued

b) Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate) ☐

c) Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.) ☐

CHG B

c. Adjust Turbine load to attain 100% Reactor Power, while continuing with this procedure.

1) Using the EHC HMI, Control/Load screen, on Load Set, select Ramp Rate and enter desired rate of 1% or less. ☐

2) Adjust Turbine Load as follows:

a) Select the Load pushbutton (a dialog box opens). ☐

b) Adjust the setpoint in incremental values not to exceed 0.2%. ☐

c) Confirm setpoint. ☐

d) Verify proper plant response. ☐

CHG D

d. Adjust Megavars using GEN FIELD VOLT ADJ as requested by the System Controller and within the Estimated Generator Capability Curve (Enclosure A). ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.18 continued

e. Monitor the following for proper operation:

Z099→ 1) Stator Water per SOP-218, Stator Cooling Water System, Section III.A ☐

Z150→ 2) Hydrogen Seal Oil per SOP-216, Seal Oil System, Section III.A. ☐ CHG D

Z151→ 3) Generator Gas per SOP-217, Generator Gas And Vent System, Section III.A ☐

f. Stabilize at 100% Reactor Power and perform STP-102.002, NIS Power Range Heat Balance. ☐

STTS# ____________

g. If desired, place the Load Limit circuit in service as follows:

1. Select desired Ramp Rate on Load Limit. (usually Normal). ☐

2. Select Setpoint on Load Limit, (a dialog box opens). ☐

3. Enter the desired setpoint (must be less than the indicated Load Reference). ☐ CHG B

4. Confirm setpoint. ☐ CHG B

5. Verify the Load Limit status indicates LIMITING. ☐

6. Verify proper system response. ☐

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. Axial Flux Difference, ΔI, should be maintained within limits per V.C. Summer Curve Book, Figure I-4.1 during Reactor Power Operation above 50% per Tech Spec 3.2.1.

C. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

D. If time allows, all load changes should be discussed with the System Controller prior to commencing the load change.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient:

1) Power and temperature changes should be slow and will require constant operator attention.

2) T_{avg} should be maintained within 0.5°F of T_{ref} unless T_{avg} is being increased in preparation for Turbine startup.

3) All power and load changes should be performed in small increments.

B. Reactor Power increases should be made in accordance with the guidelines established in GOP Appendix A. The recommended rate of power increase is 1/2% per minute and need not be continuous.

C. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

TURBINE CONTROL

A. If during load changes, plant stabilization is required, under the Turbine HMI: Control/Load screen, select HOLD.

B. To resume power ascension select the recommended Load Ramp Rate.

C. Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed. CHG B

MSR CONTROL

A. Do not exceed 50°F ΔT between the inlets to the Low Pressure Turbine.

B. When in Manual, do not exceed 25°F per half-hour temperature change rate for the tube side of the Moisture Separator/Reheater.

INITIALS/DATE

Step 3.18 continued

NOTE 3.18.h

f returning from a power level of greater than 75 %, per Reactor Engineering, the LEFM constants are not required to be adjusted (i.e. quarterly valve testing).

h. Contact Reactor Engineering to determine if LEFM constants need to be re-determined for current power history. ☐

i. Adjust Reactor Power to 100% Rated Thermal Power, and perform the following:

1) STP-102.002, NIS Power Range Heat Balance. ☐

STTS# ___________

2) PTP-102.003, Main Generator Temperature Monitoring. ☐

PMTS# ___________

j. Maintain operation as close to 100% of licensed core power (2900 MWt) as possible, per OAP-100.6, Control Room Conduct and Control of Shift Activities. ☐

k. Notify Reactor Engineering to evaluate the requirements for performing STP-201.001, Monthly Reactor Engineering Surveillances. ☐

NOTE 3.18.l

For purposes of record, this procedure is complete when all steps through 3.18.l are initialed and dated. It should then be routed to the Operations Supervisor. CHG C

l. 100% Reactor Power achieved:

1) Date ______/______/______ ☐

2) Time ____________________ ☐

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4.0 REFERENCES

4.1 CP-613, Steam Generator Chemistry Control.

4.2 CP-615, Feedwater And Condensate Chemistry Control.

4.3 ES560.120, Feedwater Flow Rate And Temperature Normalization Surveillance.

4.4 FSAR Section 5.0.

4.5 GOP-Appendix A.

C03→ 4.6 LER 97002.

N01→ 4.7 MRB 9501.

4.8 OAP-100.4, Communication.

4.9 PTP-102.002, Main Turbine Monthly Oil System Test.

4.10 PTP-102.003, Main Generator Temperature Monitoring.

4.11 PTP-102.005, Main Feedwater Pump Turbine Checks.

4.12 PTP-102.008, Main Turbine Overspeed Testing.

4.13 SAP-119, Control Of The Station Calorimetric Computer Program.

C01→ 4.14 SER 880024.

C02→ 4.15 SOER 90-3.

4.16 SOP-102, Chemical And Volume Control System.

4.17 SOP-106, Reactor Makeup Water System.

4.18 SOP-201, Main Steam System.

4.19 SOP-203, Condensate Polishing System.

4.20 SOP-204, Extraction Steam, Reheat Steam, Heater Vents And Drains.

4.21 SOP-205, Turbine Sealing Steam System.

4.22 SOP-206, Main and Auxiliary Condenser Air Removal System.

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4.23 SOP-207, Circulating Water.

4.24 SOP-208, Condensate System.

4.25 SOP-209, Feedwater Turbine Lube Oil System.

4.26 SOP-210, Feedwater System.

4.27 SOP-211, Emergency Feedwater System.

4.28 SOP-212, Steam Generator Blowdown.

4.29 SOP-214, Main Turbine And Controls.

4.30 SOP-215, Main Turbine Lube Oil Supply System.

4.31 SOP-216, Seal Oil System.

4.32 SOP-217, Generator Gas And Vent System.

4.33 SOP-218, Stator Cooling Water System.

4.34 SOP-301, Main Generator System.

4.35 SOP-403, Rod Control And Position Indicating System.

4.36 SOP-404, Excore Nuclear Instrumentation System.

4.37 SOP-506, Auxiliary Boiler Operation.

4.38 SOP-507, Auxiliary Steam System.

4.39 STP-102.002, Nis Power Range Heat Balance.

4.40 STP-108.001, Quadrant Power Tilt Ratio.

4.41 STP-120.003, Emergency Feedwater Valve Verification.

4.42 STP-133.001, Axial Flux Difference Calculation.

4.43 STP-134.001, Shutdown Margin Verification.

4.44 STP-201.001, Monthly Reactor Engineering Surveillances.

4.45 V.C. Summer Precautions, Limitations, and Setpoints.

4.46 V.C. Summer Tech Specs.

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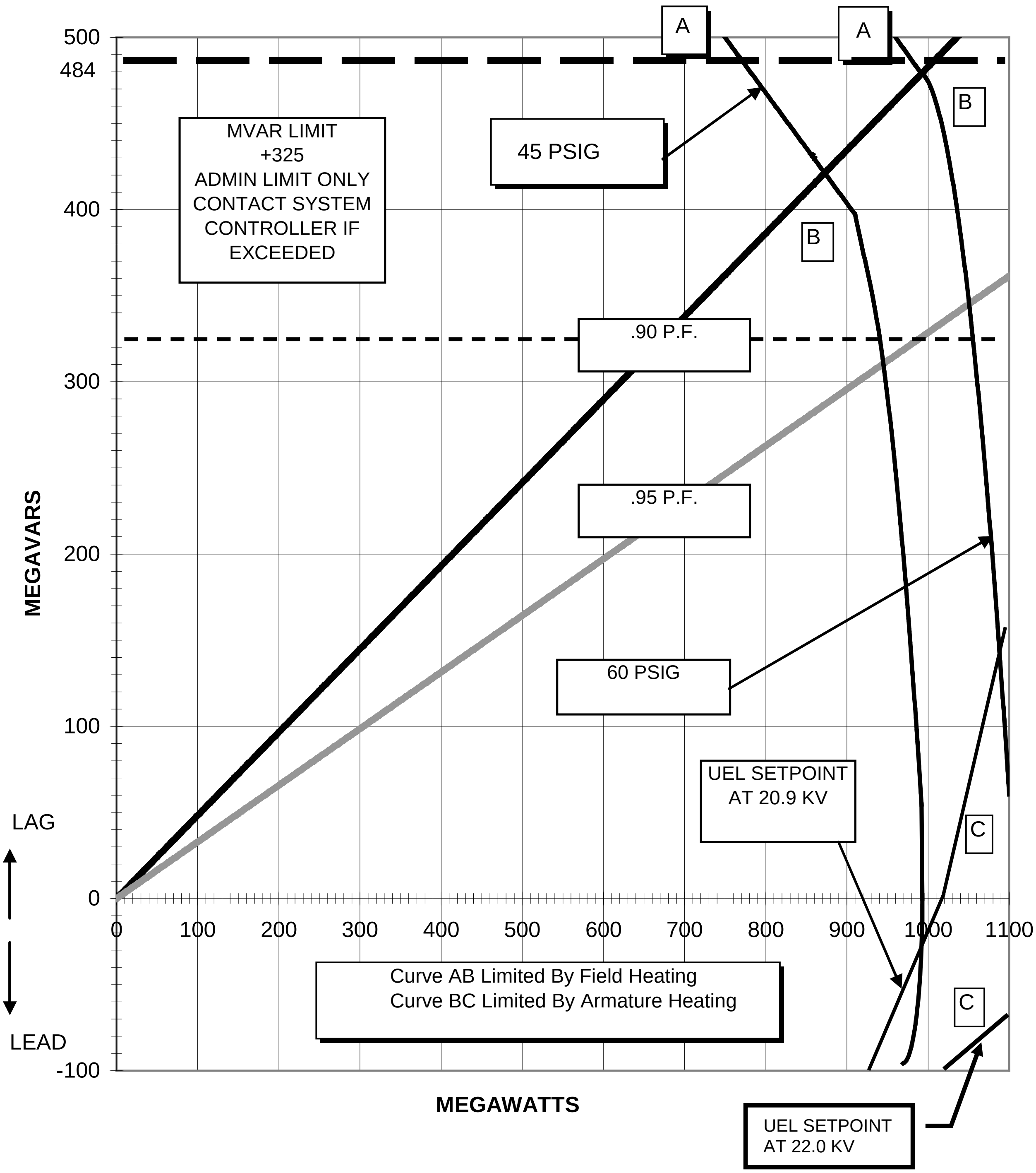
ESTIMATED GENERATOR CAPABILITY



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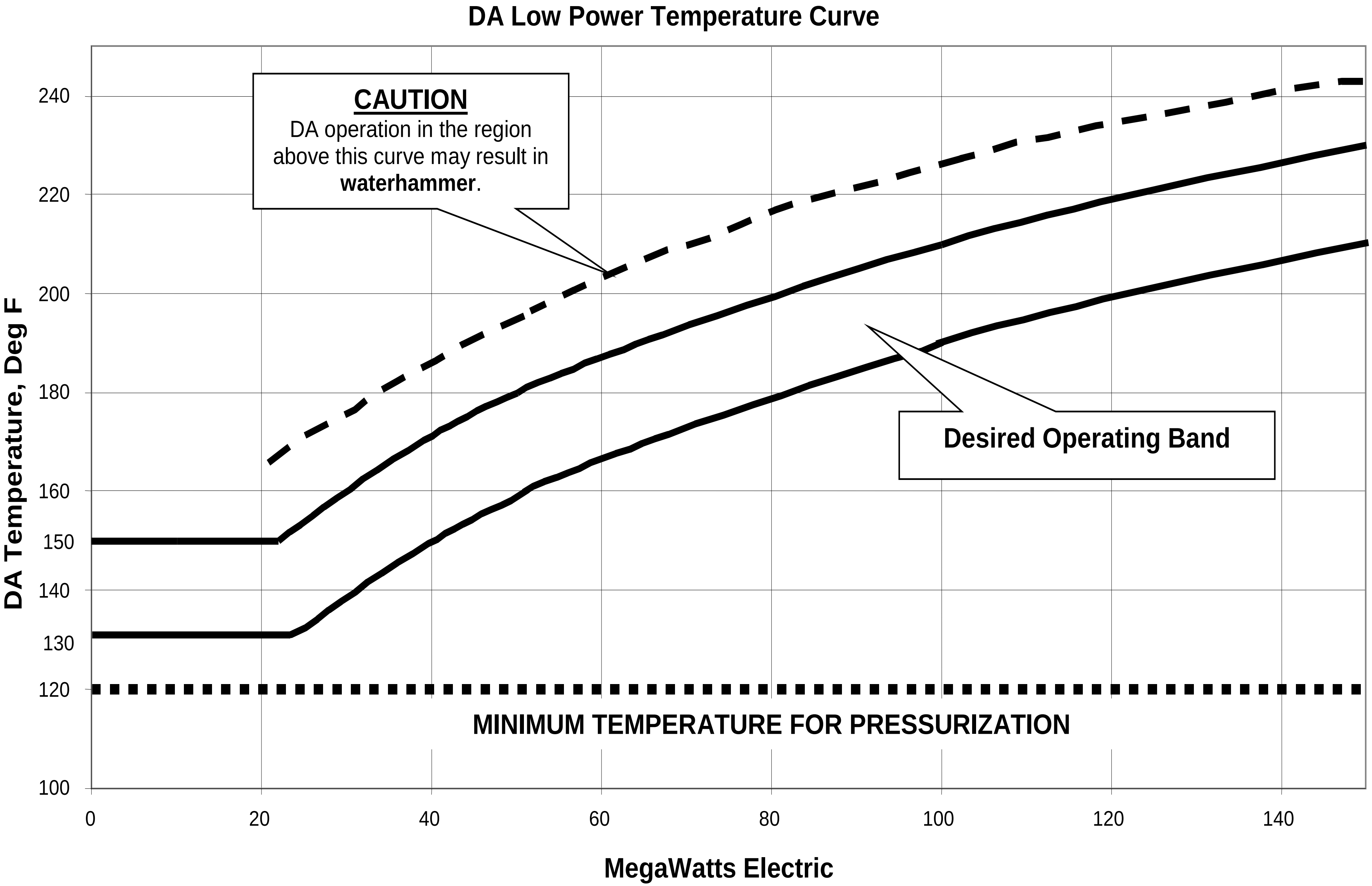
DA Low Power Temperature Curve
CAUTION
DA operation in the region above this curve may result in **waterhammer**.
Desired Operating Band
MINIMUM TEMPERATURE FOR PRESSURIZATION
DA Temperature, Deg F
MegaWatts Electric
240
220
200
180
160
150
140
130
120
100
0
20
40
60
80
100
120
140

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SIGN-OFF IDENTIFICATION LIST

PERSONNEL NAME (PRINTED)	PERSONNEL NAME (SIGNATURE)	PERSONNEL INITIALS

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REQUIRED SYSTEM ALIGNMENT VERIFICATION

PROCEDURE NUMBER	PROCEDURE TITLE	Date of Last Alignment	Has the System been 00S > 14 days		Has the System undergone Significant Maintenance		Does the System Require a Complete new Alignment		Date of Record for this Procedure	Verification by Shift Supervisor Initials/Date
			Yes	No	Yes	No	Yes	No		
GOP-2	Required Systems Alignments Current and Completed	NA	NA	NA	NA	NA	NA	NA		/
LIST OTHERS REQUIRED										
										/
										/
										/
										/
										/

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Document Review Form (DRF)

Section I — **Document Identification** — **Page 1 of 2**

Preparer Name: R. Perrill **Ext:** 55524 **Mail Code** 410

Date: 07/21/14 **Document #:** GOP-4A **Revision:** 2 **Change** H

Title: Power Operation (Mode 1 - Ascending) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process: ☐ New ☒ Revision/Change ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: See attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #__________

Qualified Reviewer	DCRM person notified	Shift Supervisor	Date

Section II — **List Required Reviewers** including All Impacted Groups
Additional Reviewers – identify with an *

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
QR	Randy Todd	☐ Yes ☒ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

[signature] 7/21/14
Designated Supervisor Concurrence **Date**

Comment Due Date ASAP
GM concurrence________for expedited review

Section III — **Pre- implementation Actions**

All Comments Resolved? ☒ **NA** ☐ **YES** [signature] 07/21/14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☐ NA ☒ YES	Attached? YES ☒ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
Commitments (PCAP and MLSA) Addressed?	☒ NA ☐ YES	PCAP # ______ ______ NL Initial/Date
QR Qualification Verified?	☒ YES	
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	
Training required after implementation?	☒ NA ☐ YES	CR#______
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #______
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #______
CMMS Update Required? [Unit 1]	☒ NA ☐ YES	Planner Notified YES ☐______

[signature] 7/21/14
Designated Supervisor Approval **Date**

[signature] 7/21/14
Approval Authority Approval **Date**
Effective Date:__________

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DRF Form (Continued)

DOCUMENT # GOP-4A Rev. 2 Chg. H

DESCRIPTION CONTINUED:

In Step 3.12.k, changed the referenced power used to perform the Power Load Unbalance test to the Intermediate Pressure indicated percent from the PLU test Screen from 45% to 40%.

REASON/BASIS CONTINUED:

Procedure feedback via e-mail from Chris Robertson stating that 45% "*may present a problem because we will probably be above 50% Rx power and therefore P9 will be inactive*". His recommendation is 40%.

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Document Review Form (DRF)

Section I	**Document Identification**	**Page 1 of 3**

Preparer Name: R. Perrill **Ext:** 55524 **Mail Code** 410

Date: 07/17/14 **Document #:** GOP-4A **Revision:** 2 **Change** G

Title: Power Operation (Mode 1 - Ascending) ☒ SR ☐ QR ☐ NNS

Development Process: ☐ New ☒ Revision/Change ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: See attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #________________

Qualified Reviewer	**DCRM person notified**	**Shift Supervisor**	**Date**

Section II **List Required Reviewers** including All Impacted Groups
Additional Reviewers – identify with an *

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
SRO QR	M. Kranendonk	☐ Yes ☒ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

[signature] 7/20/14
Designated Supervisor Concurrence **Date**

Comment Due Date ASAP
GM concurrence________for expedited review

Section III	**Pre- implementation Actions**

All Comments Resolved? ☒ **NA** ☐ **YES** [signature] 7/20/14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☐ NA ☒ YES	Attached? YES ☒ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
Commitments (PCAP and MLSA) Addressed?	☒ NA ☐ YES	PCAP # ______ ________ NL Initial/Date
QR Qualification Verified?	☒ YES	
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	
Training required after implementation?	☒ NA ☐ YES	CR#__________
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #__________
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #__________
CMMS Update Required? [Unit 1]	☒ NA ☐ YES	Planner Notified YES ☐______

[signature] 7/20/14
Designated Supervisor Approval **Date**

[signature] 7/20/14
Approval Authority Approval **Date**
Effective Date:________________

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DRF Form (Continued)

DOCUMENT # GOP-4A Rev. 2 Chg. G

DESCRIPTION CONTINUED:

a. Added new Step 3.9.i for ensuring 0.5 scfh flow through FLOW METER FOR GAS ANALYZER (XPN-7201, HYDROGEN AND STATOR COOLING WTR CNT PNL) by adjusting XVT12205-HY, MACHINE GAS ANALYZER INLET ISOL VALVE, after the Main Turbine has been rolled to 1800 rpm.

b. Changed Step 3.3 for ensuring manual disconnects are closed by applying the requirements of SOP-302, 230KV SUBSTATION, Section III.A, Closing Operation For Manual Disconnects, to inform the Electrical Department that disconnects have been closed and initiate a work order to have Electrical perform thermography when disconnect is energized.

c. Moved Step 3.16.d.1) for contacting Reactor Engineering to verify LEFM constants are removed per SAP-119, Control Of The Station Calorimetric Computer Program, to Step 3.7.h. Replicated Note 3.18.h and Step 3.18.h as new Note and Step 3.10.q.7).

d. In Step 3.16.a.2), corrected the number of Feedwater Booster Pumps in operation from three to four as required for operation of three Feedwater Pumps.

e. In Step 3.12.k, changed the referenced power used to perform the Power Load Unbalance test to the Intermediate Pressure indicated percent from the PLU test Screen. Broke the Step 3.12 step up into two substeps (3.12.k.1) and 2) with the conditional Step 3.12.k as the step initiator.

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DRF Form (Continued)

DOCUMENT # GOP-4A Rev. 2 Chg. G

REASON/BASIS CONTINUED:

a. Procedure feedback #140509 (Snipes):

"Add to the procedure of GOP4A to perform SOP 217 (Operation With Hydrogen in Generator) Step 2.2 page 2 of 31 when turbine speed reaches 1800RPM."

b. Procedure feedback #140530 (Price):

"Step 3.3 has you verified disc's 8901 8903 8891 and 8893 are closed, but you can't see the contact paddle or contact fingers on the new style disc's for 8901 and 8903. Also the others are difficult to see at night."

c. Procedure feedback #140533 (Anderson):

"LEFM can be calculated any time Feedwater temperature is >238 IAW REP-200.1. However after Rx Trip the LEFM constants should be "Zeroed" out prior to entering mode 1. Currently the GOP says to ensure constants are "Zeroed" out prior to 75% and then has RX Eng calculate new constants after we achieve 100%. We should be able to calculate new constants any time Feedwater temp is > 238 IAW REP-200.1. Move step 3.16.d.1) in GOP-4A to somewhere prior to step 3.8.b, maybe include in step 3.6. Move step 3.18.h to sometime after we have tied the main generator on line (this should ensure feed water temp is > 238) (Also the higher the better but we need the flexibility to perform whenever Rx Eng desires) During a normal hold point."

d. Procedure feedback #140535 (Goldston):

"Step 3.16 should say Four FWBP, not three."

e. Procedure feedback #140538 (Anderson):

"Step 3.12.k refers to 45% reactor power it should refer to power as indicated by "Intermediate pressure" on the Test PLU screen. We do not want to perform the test if above P-9 though."

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Document Review Form (DRF)

Section I	**Document Identification**	**Page 1 of 2**

Preparer Name: Randall Perrill **Ext:** 55524 **Mail Code** 410

Date: 06/26/14 **Document #:** GOP-4A **Revision:** 2 **Change** F G SB 6/30/14

Title: POWER OPERATION (MODE 1 - ASCENDING) ☒ SR ☐QR ☐ NNS

Development Process: ☐New ☐ Revision/Change ☒ Editorial Correction ☐ Temporary Approval

Description: See attached.

Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: See attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #________

Qualified Reviewer | **DCRM person notified** | **Shift Supervisor** | **Date**

Section II **List Required Reviewers** including All Impacted Groups
Additional Reviewers – identify with an *

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
QR	Bobby Kunkle	☐ Yes ☒ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

[signature] 6/30/14
Designated Supervisor Concurrence **Date**

Comment Due Date ASAP
GM concurrence________for expedited review

Section III **Pre- implementation Actions**

All Comments Resolved? ☒ NA ☐ YES [signature] 06/30/14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
Commitments (PCAP and MLSA) Addressed?	☒ NA ☐ YES	PCAP # ________ ________
QR Qualification Verified?	☒ YES	NL Initial/Date
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	
Training required after implementation?	☒ NA ☐ YES	CR#________
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #________
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #________
CMMS Update Required? ~~[Unit 1]~~	☒ NA ☐ YES	Planner Notified YES ☐________

[signature] 6/30/14
Designated Supervisor Approval **Date**

N/A
Approval Authority Approval **Date**
Effective Date: N/A

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DRF Form (Continued)

Page 2 of 2

DOCUMENT # GOP-4A Rev. 2 Chg. ~~G~~ F SB 6/30/14

DESCRIPTION CONTINUED:

Restored missing Reference Pages.

REASON/BASIS CONTINUED:

Reference Pages were inadvertently dropped from some Action step pages during the transmittal of the previous change.

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Document Review Form (DRF)

Document Identification	Page 1 of 2
Preparer Name: Bobby Kunkle	**Ext:** 89559 **Mail Code** 410
Date: 5/14/14 **Document #:** GOP-4A	**Revision:** 2 **Change** E
Title: POWER OPERATION (MODE 1 – ASCENDING)	☒ **SR** ☐ **QR** ☐ **NNS**

A

Development Process: ☐ New ☒ Revision/Change ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: See attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #__________

Qualified Reviewer	**DCRM person notified**	**Shift Supervisor**	**Date**

List Required Reviewers including All Impacted Groups
Additional Reviewers – identify with an *

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
QR	Dan Fisher	☐ Yes ☑ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

[signature] 5/15/14
Designated Supervisor Concurrence **Date**

Comment Due Date ASAP
GM concurrence______for expedited review

Pre- implementation Actions

All Comments Resolved? ☒ **NA** ☐ **YES** [signature] 5-23-14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☐ NA ☒ YES	Attached? YES ☒ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
Commitments Addressed?	☒ NA ☐ YES	PCAP #____MSLA______
QR Qualification Verified?	☒ YES	
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	
Training required after implementation?	☒ NA ☐ YES	CR#________
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #________
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #________
CMMS Update Required? [Unit 1]	☒ NA ☐ YES	Planner Notified YES ☐

[signature] 5/23/14
Designated Supervisor Approval **Date**

[signature] 5/23/14
Approval Authority Approval **Date**
Effective Date:__________

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DRF Form (Continued)

DOCUMENT # GOP-4A Rev. 2 Chg. E

DESCRIPTION CONTINUED:

Removed Step 3.12.h, "At 35% Reactor Power, on the EHC HMI, Control/Load screen, select HOLD and perform the Power LoadUnbalance (PLU) test as follows:"

REASON/BASIS CONTINUED:

PF140400 (Robertson). This test was performed as part of the commission of the Mark VI Turbine Controls system to verify that the software would not allow Power Load Unbalance operation to be performed below 40% turbine load. No longer needed.

REQUIRED REVIEWERS CONTINUED:

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: Brian Seo **Ext:** 5730 **Mail Code:** 410

Date: 1/5/14 **Document No.:** GOP-4A **Revision No.:** ~~22~~ WC 5/1/14 **Change Letter:** D

Title: POWER OPERATION (MODE 1 – ASCENDING) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See Page 2.

Reason/Basis for Change: See Page 2.

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval **Final approval required by: (30 days)**

QR	**DC&R** (Person Notified)	**SS**	**Date**
		/	

Document Reviewers (Enclosure C)

Required	Position	Type/Print Name	Comments Yes/No	*Additional	Position	Type/Print Name	Comments Yes/No
	QR	James R. Geib	☐ ☑				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐

Concurrence by Designated Supervisor: 4/11/14
Supervisor/Date or enter CR # ________ (per 6.4.8.C)

ASAP Comment Due Date
Standard review period is 21 days
GM concurrence / **for expedited review period**

Pre- implementation Actions

All Comments Resolved	☑ None Received	☐ Yes 4-12-14 Originator/Date
Commitments Addressed per SAP-0630	☒ NA	☐ Yes P/CAP # ____ ☐ MLSA ____ Initial/Date
QR Qualification Verified?		☒ Yes
50.59 Applicability/Review Completed (SAP-0107)	☐ NA	☒ Yes, Attached
Security Compliance Review Completed (SAP-0163)	☒ NA	☐ Yes (Security review required)
Pre-implementation Training Completed	☒ NA	☐ Yes
Training required after implementation	☒ NA	☐ Yes, CR # ____
PSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ____
NSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ____
CMMS Update Required	☒ NA	☐ Yes Planner Notified ____ Initial/Date

4/14/14
Supervisor/Date

5-1-14
Approval Authority/Date

Effective Date 5-1-14

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. D

DESCRIPTION CONTINUED: 1. Update Initial Condition 2.9.d to reflect new setpoint.
2. Add Step 3.6.b to ensure Main Generator Breaker Disconnect is closed.
3. Add Step 3.7.g to prepare the Main Generator for startup.
4. Add CAUTION Step 3.10 warning of the risk of equipment damage if a delay occurs prior to reaching 150 MWe. Revise Step 3.10.d to raise turbine load to 150MWe. Add Steps 3.10.e through 3.10.g for guidance on stopping a load increase while less than 150 MWe.
5. Add Step 3.18.c to allow flexibility in the adjustment of turbine load at 100% power.
6. Pages 5, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 31, 32, 35, 38, 40, 43, and 46, add zCaps to link to referenced procedure sections. Add referenced procedure section and steps.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

REASON/BASIS FOR CHANGE CONTINUED: 1. Feedback 130380 (Elliot) GE has established new oil temperature guidelines.

2. Feedback 130091 (Goldston) Actions in SOP-301 stall plant startup. Provide better coordination of the preparation for a Main Generator Startup.

3. Feedback 130091 (Goldston) Actions in SOP-301 stall plant startup. Provide better coordination of the preparation for a Main Generator Startup.

4. Feedback 120915 (Crawford) Step 3.10.d is poorly worded and does not always apply.

5. CR-13-04054-001 Turbine Load setting at 100% varies with current conditions.

6. Referenced procedures do not provide specific procedure section.

DOCUMENT REVIEWERS CONTINUED:

	Position	Type/Print Name	Comments Yes/No		Position	Type/Print Name	Comments Yes/No
Required			☐ ☐	*Additional			☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: Buddy Sessoms **Ext:** 55681 **Mail Code:** 410

Date: 09/03/12 **Document No.:** GOP-4A **Revision No.:** 2 **Change Letter:** C

Title: Power Operation (Mode 1 – Ascending) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See Page 2

Reason/Basis for Change: See Page 2

Is the SCOPE of the procedure affected by this change? NO ☒ **YES** ☐

Temporary Approval **Final approval required by: (30 days)**

QR	DC&R (Person Notified)	SS	Date
		/	

Document Reviewers (Enclosure C)

	Position	Type/Print Name	Comments Yes/No		Position	Type/Print Name	Comments Yes/No
Required	QR	MICKLASH	☐ ☒	*Additional			☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐

QR Qualification Verified? ☑ Yes
Concurrence by Designated Supervisor: 10/27/12
Supervisor/Date **or** enter CR # ________ (per 6.4.8.C)

Comment Due Date
11/17/12 **Standard review period is 21 days**
GM concurrence ________ **for expedited review period**

B

Pre- implementation Actions

All Comments Resolved	☒ None Received	☐ Yes EHSessoms 10/30/12 Originator/Date
Commitments Addressed per SAP-0630	☒ NA	☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date
50.59 Applicability/Review Completed (SAP-0107)	☐ NA	☒ Yes, Attached
Security Compliance Review Completed (SAP-0163)	☒ NA	☐ Yes (Security review required)
Pre-implementation Training Completed	☒ NA	☐ Yes
Training required after implementation	☒ NA	☐ Yes, CR # ________
PSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______
NSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______
CMMS Update Required	☒ NA	☐ Yes Planner Notified ______ Initial/Date

10/30/12
Supervisor/Date

11-1-12
Approval Authority/Date

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. C

DESCRIPTION CONTINUED:

1. FB120389B & 120033C - Corrected typographical error in procedure. Changed referenced step in the note at step 3.18.k from 3.18.l to 3.18.k.
2. FB120442C, moved step 3.13.i.4) to 3.14.b and reordered steps as necessary. STP-108.001 has an initial condition of being greater than 50% power so the step to perform the STP was moved after 3.14.a to meet that initial condition.

REASON/BASIS FOR CHANGE CONTINUED:

1. FB120389B & 120033C requested the correction be made.
2. FB091076 requested the step be moved.

DOCUMENT REVIEWERS CONTINUED:

	Position	Type/Print Name	Comments Yes/No		Position	Type/Print Name	Comments Yes/No
Required			☐ ☐	*Additional			☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document Identification

Originators Name:	MD Johnson	**Ext:**	54300	**Mail Code:**	410
Date: 1/23/2012	**Document No.:** GOP-4A	**Revision No.:**	2	**Change Letter:**	B

Title: POWER OPERATION (MODE 1 - ASCENDING) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See page 2.

Reason/Basis for Change: See page 2.

Is the SCOPE of the procedure affected by this change? NO ☒ **YES** ☐

Temporary Approval **Final approval required by: (30 days)**

QR	DC&R (Person Notified)	SS	Date
		/	

Document Reviewers (Enclosure C)

Required Position	Type/Print Name	Comments Yes	Comments No	*Additional Position	Type/Print Name	Comments Yes	Comments No
QR	JEFF PURCELL	☑	☐			☐	☐
PSE	TIM GILLHAM	☑	☐			☐	☐
		☐	☐			☐	☐
		☐	☐			☐	☐
		☐	☐			☐	☐

QR Qualification Verified? ☒ Yes
Concurrence by: [signature] 1/31/12
Supervisor/Date or Enter CR # (per 6.4.8.C)

Comment Due Date ASAP

Pre- implementation Actions

All Comments Resolved ☐ None Received ☑ Yes [signature] 2/7/12 Originator/Date

Commitments Addressed per SAP-0630 ☒ NA ☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date

50.59 Applicability/Review Completed (SAP-0107) ☐ NA ☒ Yes, Attached
Security Compliance Review Completed (SAP-0163) ☒ NA ☐ Yes (Security review required)
Pre-implementation Training Completed ☐ NA ☒ Yes
Training required after implementation ☐ NA ☒ Yes, CR # CR-10-00097-185
PSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______
NSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______
CMMS Update Required ☒ NA ☐ Yes Planner Notified ______ Initial/Date

[signature] 4/17/12
Supervisor/Date

[signature] 4/25/12
Approval Authority/Date

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. B

DESCRIPTION CONTINUED:

1. Page 16, Added a note to NOTE 3.10 through 3.18, Acknowledging dialog boxes is considered a "skill of the craft".
2. Page 17:
   a. Changed step 3.10.d.1) to read: On the EHC HMI, Control/Load screen, select Ramp Rate and enter desired rate of 1% or less.
   b. Changed step 3.10.d.2) to read: Increase Turbine load....using one of the following methods:
   c. Changed step 3.10.d.2) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
3. Page 18:
   a. Changed step 3.10.d.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   b. Changed step 3.10.d.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)
4. Page 20:
   a. Changed step 3.10.l.2) to read: On the EHC HMI, Control/Load screen, select Ramp Rate and enter desired rate of 1% or less.
   b. Changed step 3.10.l.3) to read: Increase Turbine load....using one of the following methods:
   c. Changed step 3.10.l.3) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
   d. Changed step 3.10.l.3) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   e. Changed step 3.10.l.3) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)
5. Page 24:
   a. Changed step 3.11.d. to read: On the EHC HMI, Control/Load screen, select Ramp Rate and enter desired rate of 1% or less.
   b. Changed step 3.11.e. to read: Increase Turbine load....using one of the following methods:
   c. Changed step 3.11.e.1) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
6. Page 25:
   a. Changed step 3.11.e.2):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   b. Changed step 3.11.e.3):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. B

7. Page 27:
   a. Changed step 3.11.h.1) to read: Select Ramp Rate and enter desired rate of 1% or less.
   b. Changed step 3.11.h.2) to read Raise Turbine Load by one of the following methods:
   c. Changed step 3.11.h.2) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
   d. Changed step 3.11.h.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   e. Changed step 3.11.h.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)
8. Page 29:
   a. Changed step 3.12.c.1) to read: Select Ramp Rate and enter desired rate of 1% or less.
   b. Changed step 3.12.c.2) to read Raise Turbine Load by one of the following methods:
   c. Changed step 3.12.c.2) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
   d. Changed step 3.12.c.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   e. Changed step 3.12.c.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)
9. Page 33:
   a. Changed Step 3.13.b.1), Changed to Select Ramp Rate and enter the recommended Load Ramp Rate.
   b. Changed step 3.13.b.2) to read Raise Turbine Load by one of the following methods:
   c. Changed step 3.13.b.2) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.
   d. Changed step 3.13.b.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   e. Changed step 3.13.b.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)
10. Page 36:
    a. Changed Step 3.14.b.1), Changed to Select Ramp Rate and enter the recommended Load Ramp Rate.
    b. Changed step 3.14.b.2) to read Raise Turbine Load by one of the following methods:
    c. Changed step 3.14.b.2) a) to read:
       Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. B

11 Page 37:
   a. Changed step 3.14.b.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   b. Changed step 3.14.b.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

12. Page 41:
   a. Changed Step 3.17.a.1), Changed to Select Ramp Rate and enter the recommended Load Ramp Rate.
   b. Changed step 3.17.b.2) to read Raise Turbine Load by one of the following methods:
   c. Changed step 3.17.b.2) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.

13 Page 42:
   a. Changed step 3.17.b.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   b. Changed step 3.17.b.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

14. Page 43:
   a. Changed Step 3.18.b.1), Changed to Select Ramp Rate and enter the recommended Load Ramp Rate.
   b. Changed Step 3.18.b.2) to read Raise Turbine Load by one of the following methods:
   c. Changed Step 3.18.b.2) a) to read:
      Slowly Raise Turbine load automatically as follows (preferred method): also deleted "select OK" steps and entered load value.

15. Page 44:
   a. Changed step 3.17.b.2) b):
      Manually by pushing and holding the Raise Pushbutton on the MCB to increase Turbine load in increments of less than or equal to 2% (20 MWe) (utilizes previously selected ramp rate)
   b. Changed step 3.17.b.2) c):
      Under Manual Adj momentarily select Raise to increase Turbine load in increments of 0.1-0.2% to a total of 2% (20 MWe). (one cycle utilizes 10%/min ramp rate and returns to previously selected ramp rate.)

16. Page 45, Changed step 3.18.f, by deleting "select OK" steps.

17. Reference page:
   Under Turbine Controls
   a. Deleted the following: (under Ramp Rate %/min)
   b. Deleted old step C, EHC Panel Load Raise / Lower pushbuttons are Time / Rate Sensitive and can be used for significant load changes authorized by the Control Room Supervisor.
   c. Added new Step C, Turbine Load values are approximate and provided as initial starting points for load changes. When desired Reactor or Turbine parameters are achieved stabilize (if necessary) and proceed as directed.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. B

REASON/BASIS FOR CHANGE CONTINUED:

1. Ops management request.

2a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

2b-c Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value. Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

3a-b. Review comments (Gillham) to list the methods for increasing turbine load in preferred order.

4a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

4b-e. Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value. Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

5a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

5b-c. Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value. Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

6a-b. Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value. Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

7a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

7b-e Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value. Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

8a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

8b-e Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value. Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

9a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

9b-e Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value. Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

10a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

10b-c. Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value. Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

11a-b Increasing Turbine load was not consistent throughout procedure modified to ensure consistency. Ops management request to delete select OK and enter an estimated value. Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. B

12a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

12b-c Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

13a-b Increasing Turbine load was not consistent throughout procedure modified to ensure consistency.
Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

14a. ECR50592T 21, ½% ramp rate button replaced with a custom (operator entered) ramp rate button and Ramp rate display changed from XX.X to XX.XXX.

14b-c Ops management request to delete select OK and enter an estimated value.
Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

15a-b Also review comments (Gillham) to list the methods for increasing turbine load in preferred order.

16. Ops management request to delete select OK.

17. ECR50592T Box title replaced with Ramp Rate button for variable rate entry other than program buttons of 1%, 3%, 5%, and 10%.
Review Comments (Goldston) to clarify expectations concerning Turbine loading.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document Identification

Originators Name: R. Perrill | Ext: 55524 | Mail Code: 410

Date: 05/22/11 | Document No.: GOP-4A | Revision No.: 2 | Change Letter: A

Title: POWER OPERATION (MODE 1 - ASCENDING) | ☒ SR ☐ QR ☐ NNS

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Reason/Basis for Change: See attached.

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval | Final approval required by: (30 days)

QR | DC&R (Person Notified) | SS / | Date

Document Reviewers (Enclosure C)

Required Position	Type/Print Name	Comments Yes/No	*Additional Position	Type/Print Name	Comments Yes/No
QR	MIKE JOHNSON (C)	☐ ☒			☐ ☐
PSE	RICHARD SLONE	☒ ☐			☐ ☐
EM	BARRY JACKSON / DARGUE II	☒ ☐			☐ ☐
		☐ ☐			☐ ☐
		☐ ☐			☐ ☐

Concurrence [signature] 8/30/11
Supervisor/Date or Enter CR # (per 6.4.8.C)

Comment Due Date 9/20/11

Pre- implementation Actions

All Comments Resolved ☐ None Received ☒ Yes [signature] / 09/28/11
Originator/Date

Commitments Addressed per SAP-0630 ☒ NA ☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date

50.59 Applicability/Review Completed (SAP-0107) ☐ NA ☒ Yes, Attached

Security Compliance Review Completed (SAP-0163) ☒ NA ☐ Yes (Security review required)

Pre-implementation Training Completed ☒ NA ☐ Yes

Training required after implementation ☒ NA ☐ Yes, CR # ______

PSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______

NSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______

CMMS Update Required ☒ NA ☐ Yes Planner Notified ______ Initial/Date

[signature] 10/31/11
Supervisor/Date

[signature] 10/31/11
Approval Authority/Date

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. A

DESCRIPTION CONTINUED:

Changed Step 3.6.c to specify where Electricians should take voltages.

REASON/BASIS FOR CHANGE CONTINUED:

Procedure feedback from Richard Slone requesting that voltage readings to be taken for all the potential transformers and to provide better guidance as to where these readings are to be taken.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Page 1 of 3

Document Identification

Originators Name: C J Dickey **Ext:** 54066 **Mail Code:** 410

Date: 4-26-11 **Document No.:** GOP-4A **Revision No.:** 2 **Change Letter:**

Title: POWER OPERATION (MODE 1 - ASCENDING) ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See Page 2

Reason/Basis for Change: See Page 2

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval **Final approval required by: (30 days)**

QR DC&R (Person Notified) SS / Date

Document Reviewers (Enclosure C)

Required Position	Type/Print Name	Comments Yes	Comments No	*Additional Position	Type/Print Name	Comments Yes	Comments No
QR	LEON SMITH	☐	☒			☐	☐
DE	GLEN MEYER	☒	☐			☐	☐
		☐	☐			☐	☐
		☐	☐			☐	☐
		☐	☐			☐	☐

Concurrence [signature] 4/27/11
Supervisor/Date or Enter CR # ________ (per 6.4.8.C)

Comment Due Date ASAP

Pre- implementation Actions

All Comments Resolved	☐ None Received	☒ Yes [signature] 5/12/11 Originator/Date
Commitments Addressed per SAP-0630	☒ NA	☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date
50.59 Applicability/Review Completed (SAP-0107)	☐ NA	☒ Yes, Attached
Security Compliance Review Completed (SAP-0163)	☒ NA	☐ Yes (Security review required)
Pre-implementation Training Completed	☒ NA	☐ Yes
Training required after implementation	☒ NA	☐ Yes, CR # ________
PSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______
NSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______
CMMS Update Required	☒ NA	☐ Yes Planner Notified ________ Initial/Date

[signature] 5/13/11
Supervisor/Date

[signature] 5/14/2011
Approval Authority/Date

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

Document No.: GOP-4A Rev. No. 2 Chg. Ltr. ______

DESCRIPTION CONTINUED:

1. Page 14, Deleted Step 3.9.c as it no longer applies due to ECR 50680 Generator Breaker Replacement
2. Page 16, Added NOTE 3.10.b to describe new DEHC control function.
3. Pages 17 &18, Reworded Step 3.10.c.1 and all of Step 3.10.d to describe new DEHC function.
4. Page 20, Reworded all of Step 3.10.l.1 through Step 3.10.l.3 to describe new DEHC function.
5. Page 21, Reworded Step 3.10.m.1 to describe new DEHC function.
6. Page 22, Reworded Step 3.10..n to describe new DEHC function.
7. Page 24, Reworded Step 3.11.c. through e to describe new DEHC function.
8. Page 25, Reworded Step 3.11.f.1 to describe new DEHC function.
9. Pages 27 and 28, Reworded all of Step 3.11.h to describe new DEHC function.
10. Page 29:
    a. Added new Step 3.12.a to contact Chemistry prior to 30% as result from FB 100411C.
    b. Reworded all of Step 3.12.c to describe new DEHC function.
11. Page 32, Reworded all of Step 3.12.h to describe new DEHC function (35% PLU test).
12. Page 33, Reworded all of Step 3.12.l to describe new DEHC function (45% PLU test).
13. Page 34, Reworded all of Step 3.13.b to describe new DEHC function.
14. Page 38, Reworded all of Step 3.14.b to describe new DEHC function.
15. Pages 43 & 44, Reworded all of Step 3.17.a to describe new DEHC function.
16. Pages 45 & 46, Reworded all of Step 3.18.b to describe new DEHC function.
17. Page 47, Reworded all of Step 3.18.f to describe new DEHC function.
18. Reference Page, Turbine Control deleted old Mark I requirements, added A, B, & C.
19. Removed all Change bars from body of procedure.
20. Updated TOC.

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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DOCUMENT REVIEW FORM

REASON/BASIS FOR CHANGE CONTINUED

Item 1 ECR # 50680 Generator Breaker Replacement

Items 2-16 ECR # 50592 Digital Electrohydraulic Controls Replacement

Item 10FB 100411C (Rob Ray) added Step 3.12.a

Item 12 FB 110161 (Goldston) added Step 3.12.m.1 for items 5 and 10 of FB

Items 3, 4, 7, 9, 10, 13, 14, 15, 16, 17 and 18 FB 110161 (Goldston) created Step 3.10.d.2.c and similar steps in body of procedure to Automatically raise load item 4 of FB.

Items 19 &20, per SAP-139.

FB 100409B (Rob Ray) Not applicable per MDJ

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

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Facility: VC SUMMER	Scenario No: 3	Op Test No: NRC-ILO-13-01	

Examiners: ____________________ Operators: CRS: ____________________

____________________ RO: ____________________

____________________ BOP: ____________________

Initial Conditions:
- 100% MOL.
- “B1” Train Work Week.
- Alternate Seal Injection is OOS.
- Thermography of transformer disconnects is in progress in the switchyard.

Turnover:
- Maintain 100% power.

Critical Tasks:
- Start Back-up EHC Pump prior to a Rx/Turbine Trip on Low EHC Pressure.
- Manually control “C” SG Feedwater without a Rx/Turbine Trip on SG Level.
- Manually trip the Reactor prior to completion of Immediate Actions of EOP-1.0 (E-0).
- Establish feed flow to at least one SG before RCS feed and bleed criteria is met.

Event No.	Malf No.	Event Type*	Event Description
1	TUR012A	I-RO, CRS TS-CRS	PT-446 (Turbine First Stage Pressure) fails LOW. (Rods Drive In)
2	NA	N-BOP, CRS R-RO	Rapid Power Reduction due to overheating of main generator disconnects.
3	EH001T EH002F	C-BOP	Running EHC Pump Trip. (Standby EHC must be manually started).
4	MS020O	I-BOP, CRS TS-CRS	LT-496 (“C” SG Level Instrument) fails HIGH. (Manually control feedwater to “C” SG)
5	CVC005C	C-RO, CRS	Progressive failure of #2 Seal on “A” RCP.
6	RCS003A PCS008A PCS008B FW025P	C-RO, CRS	RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip)

7	MSS015 EF001S EF002T	M-ALL	Loss Of Heat Sink (EFW) After Reactor Trip.
	FWM001A FWM001B FWM001C		All Main Feedwater Pumps Trip. (Feed with Condensate)
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

The following notation is used in the ES-D-2 form "Time" column:

IOA designates **Immediate Operator Action** steps.

***** designates **Continuous Action** steps.

The crew will assume the watch having been pre-briefed on the Initial Conditions, the plan for this shift and any related operating procedures.

EVENT 1: PT-446 (Turbine First Stage Pressure) fails LOW. (Rods Drive In)

- TRIGGER 1
  - MAL-TUR012A
    TURBINE IMPULSE PRESSURE TRANSMITTER PT-446 FAILURE
    FINAL=0
- TRIGGER 2
  - ANN-MI007
    AMSAC GENERAL WARNING
    Fail To: ON

On cue from the Examiner, the selected turbine first stage pressure transmitter (PT-446) will fail LOW. The failure causes a Tave -Tref mismatch resulting in rods inserting at the maximum speed. The crew will enter AOP-401.7, Turbine First Stage Pressure Channel Failure.

The RO will respond to the rod insertion by placing rod control in manual and restoring Tave to within 1 degree of Tref. The crew will then select the operable 1st stage pressure channel for control. The RO may restore automatic rod control after the operable channel is selected. The BOP will place the STM DUMP MODE SELECT in STM PRESS.

The CRS will refer to Technical Specification Table 3.3-1 Items 19.B, E and Table 3.3-3 Item 4.d.

EVENT 2: Rapid Power Reduction due to overheating of main generator disconnects.

On cue from the Examiner, the Booth Operator as the Shift Supervisor will direct the CRS to lower power 10% within the next 15 minutes in accordance with GOP-4C Rapid Power Reduction, due to a report that the transformer disconnects are overheating. The RO will lower Reactor power with boration and/or rod motion. The BOP will reduce turbine load using the Turbine controls.

EVENT 3: Running EHC Pump Trip. (Standby EHC must be manually started).

- TRIGGER 3
  - PMP-EH001T
    XPP0003-PP1 HFM PMP A TRIP ON COMMAND
  - PMP-EH002F
    XPP0003-PP2 HFM PMP B FAIL TO START

On cue from the Examiner, the running EHC pump will trip and the backup pump will not start in auto. The BOP will respond to annunciator XCP-631 1-4, EHC PP A MOTOR OVRLD, determine the cause of the event, and take corrective action by starting the backup EHC pump to prevent turbine stop valves from closing. A Turbine trip will occur within 2 minutes if the event is not mitigated.

EVENT 4: LT-496 ("C" SG Level Instrument) fails HIGH. (Manually control feedwater to "C" SG)

- TRIGGER 4
  - XMT-MS020O
    ILT00496 SG C NR LVL LI-496 FAIL TO POSN
    FINAL VALUE = 100
    RAMP = 00:00:10

On cue from the Examiner, "C" SG level transmitter will fail HIGH. The BOP will identify the failure and take manual control of the "C" SG Feedwater Regulating Valve to maintain/restore SG level to between 60% and 65% and prevent a reactor trip.

The crew will enter AOP-401.11, Steam Generator Level Control and Protection Channel Failure, and remove the channel from service.

The CRS will refer to Technical Specifications 3.3-1, Item 13 (Action 6) and 3.3-3, Items 5, and 6c (Action 24) .

EVENT 5: Progressive failure of #2 Seal on "A" RCP.

- TRIGGER 5
  - MAL-CVC005A, RCP 1 NUMBER 2 SEAL FAILURE
- TRIGGER 6
  - VLV-CS052W, XVT08141A-CS RCP A SEAL LEAKOFF VLV LOSS OF POWER
    DELETE: 1 second

On cue from the Examiner, RCP A Seal Number 2 will begin a ramped failure. The crew will respond to annunciator XCP-617 2-4, RCP A STNDPIP LVL HI/LO.

NOTE: The Annunciator will alarm within 4 minutes after the event is triggered and will not clear.

The RO will fill the standpipe for 2 minutes to determine that either the #1 or #2 seal is failing. The crew will implement AOP-101.2, Reactor Coolant Pump Seal Failure and determine that a reactor trip is not required. The RO will continue to monitor the RCP for further seal degradation.

EVENT 6: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip)

- TRIGGER 7
  - MAL-PCS009AB
    REACTOR TRIP BREAKER A FAILURE (FAIL TO OPEN)
    FAIL TO: AUTO
  - MAL-PCS009BB
    REACTOR TRIP BREAKER B FAILURE (FAIL TO OPEN)
    FAIL TO: AUTO
  - PCS008B
    FAILURE OF MANUAL REACTOR TRIP SWITCH CS-CR01A
  - MAL-RCS003A
    REACTOR COOLANT PUMP 1 TRIP
    FAIL TO: TRIP
  - VLV-FW025P
    XVG01611A-FW FEEDWTR ISO VLV A FAIL POSITION
    Final = 0
    Delay = 00:00:02
- EVENT TRIGGER 8
  - VLV-FW025P
    XVG01611A-FW FEEDWTR ISO VLV A FAIL POSITION
    Delete = 00:00:01
    X07D033M < 26 NR "A" SG Level < 26%

On cue from the Examiner, RCP “A” will trip but the Reactor will not trip. The crew will enter EOP-1.0 (E-0), Reactor Trip/Safety Injection Actuation. The RO will manually trip the Reactor. Only the Manual Reactor trip switch the RO normally operates is functional.

The Feedwater Isolator Value to the “A” SG (PVG-1611A) spuriously fails closed to lower level in the “A” SG. Because the associated RCP has tripped, this SG level would otherwise remain above 26% required to force the crew to EOP-15 (FR-H.1), Response to Loss of Secondary Heat Sink. The PVG-1611A failure is auto-removed after NR “A” SG level is less than 26%.

EVENT 7: Loss Of Heat Sink (EFW) After Reactor Trip.

- EVENT TRIGGER 9
  L52RTAO == 1 RX TRIP BRKR RTA OPEN = TRUE OR
  L52RTBO == 1 RX TRIP BRKR RTB OPEN = TRUE

  - MAL-MSS015
    STEAM FAILURE TO EFW TURBINE
    PRELOAD

  - PMP-EF001S
    XPP0021A MOTOR DRIVEN EFW PMP A SHEARED SHAFT
    PRELOAD

  - PMP-EF002T
    XPP0021B MOTOR DRIVEN EFW PMP B TRIP ON COMMAND

  - MAL-FWM001A
    MAIN FEEDWATER PUMP A TRIP

  - MAL-FWM001B
    MAIN FEEDWATER PUMP B TRIP

  - MAL-FWM001C
    MAIN FEEDWATER PUMP C TRIP

- TRIGGER 10

  - LOA-FWM040
    SS-FW61A XVG01611A,B,C KEY SWITCH
    Position To: BYPASS

- TRIGGER 11

  - LOA-FWM041
    SS-FW81A1 IFV03321,3331,3341 TRAIN A KEY SWITCH
    Position To: BYPASS

- TRIGGER 12
  - LOA-FWM042
    SS-FW81B1 IFV03321,3331,3341 TRAIN B KEY SWITCH
    Position To: BYPASS

This event is automatically triggered when the Reactor Trip Breakers open. The crew will continue in EOP-1.0 (E-0) Reactor Trip/Safety Injection Actuation and identify that there is no Emergency Feedwater flow to the Steam Generators. The crew will then transition to EOP-15.0 (FR-H.1) Response to Loss of Secondary Heat Sink.

All Main Feedwater Pumps will trip when the Reactor Trip Breakers open.

The BOP will depressurize one Steam Generator, reset the Safety Injection actuation, and attempt to establish Main Feedwater flow to one SG. The Main Feedwater pumps cannot be reset so the success path is to continue in EOP-15 (FR-H.1) and utilize Condensate flow to restore SG level.

Trigger 10, 11, 12 places local key-switches in bypass so that Feedwater Valves can be opened to restore flow to one steam generator using Condensate and Feedwater Booster pumps.

CRITICAL TASKS:

It is a critical task to:

· Start Back-up EHC Pump prior to a Rx/Turbine Trip on Low EHC Pressure.

· Manually control “C” SG Feedwater without a Rx/Turbine Trip on SG Level.

· Insert a manual Reactor Trip prior to completion of Immediate Actions of EOP-1.0 (E-0).

· Establish feed flow to at least one SG before RCS Feed and Bleed criteria is met (WR level in any two SGs is less than 12% or PZR pressure is greater than 2330 psig due to the loss of secondary heat sink) is met.

TERMINATION:

The scenario can be terminated after the crew has established feedwater to one Steam Generator or at the Examiners discretion.

Scenario Attributes		Events
Total Malfunctions (5-8)	9	· PT-446 (Turbine First Stage Pressure) fails LOW. · Running EHC Pump Trip. · LT-498 ("C" SG Level Instrument) fails HIGH. · Progressive failure of #2 Seal on "A" RCP · RCP Trip. · RX trip breakers fail to open. · FW Isol Valve 1611A Fails Closed. · EFW pumps trip. · MFW pumps trip.
Malfunctions after EOP entry (1-2)	3	· Loss of MFW. · Loss of MD EFW. · Loss of TD EFW.
Abnormal Events (2-4)	4	· PT-446 (Turbine First Stage Pressure) fails LOW. · Running EHC Pump Trip. · LT-498 ("C" SG Level Instrument) fails HIGH. · Progressive failure of #2 Seal on "A" RCP
Major Transient (1-2)	1	· Loss of all Feedwater MFW, MD EFW and TD EFW.
EOPs Entered (1-2)	1	· EOP-15.0 (FR-H.1) Response to Loss of Secondary Heat Sink.
EOP Contingencies (0-2)	1	· EOP-15.0 (FR-H.1) Response to Loss of Secondary Heat Sink.
Critical Tasks (2-3)	4	· Start Back-up EHC Pump prior to a Rx/Turbine Trip on Low EHC Pressure. · Manually control "C" SG Feedwater without a Rx/Turbine Trip on SG Level. · Manual Trip prior to completion of Immediate Actions of EOP-1.0 (E-0). · Establish feed flow to at least one SG before RCS feed and bleed criteria is met.

SIMULATOR SCENARIO SETUP

INITIAL CONDITIONS:

- IC Set 292
- 100% Power MOL
- Rod Position = 230
- FCV-113 Pot Setting = 4.31
- Boron = 1005 ppm
- Xe = - 2700 pcm
- Burnup = 10001 MWD/MTU
- Prior to the scenario, crew should pre-brief on conditions and expectations for the Shift (maintain power, repairs estimated to be complete well before LCO action time expires.)

PRE-EXERCISE:

- Ensure simulator has been checked for hardware problems (DORT, burnt out light bulbs, switch malfunctions, chart recorders, etc.)
- VCS-TQP-0807 Attachment I-A, Unit 1 Booth Instructor Checklist, has been completed.
- Hang Tags for equipment out of service.
  - Hang Caution Tag on HCV-186 due to ASI being OOS
- Mark up procedures in use with “Circle and slash” as applicable.
- A turnover sheet has been prepared for each position.
- Conduct two-minute drill.

PRE-LOAD:

STANDARD SIMULATOR SETUP:

- PMP-LD003P, XPP0138 LEAK DETECTION SUMP PMP LOSS OF POWER
- VLV-FW028W, XVG01676-FW FW HDR RECIRC ISOL VLV LOSS OF POWER
- VLV-FW029W, XVG01679-FW FW HTR RECIRC ISO VLV LOSS OF POWER
- VLV-CS052W, XVT08141A-CS RCP A SEAL LEAKOFF VLV LOSS OF POWER
- VLV-CS054W, XVT08141C-CS RCP C SEAL LEAKOFF VLV LOSS OF POWER
- VLV-CS053W, XVT08141B-CS RCP B SEAL LEAKOFF VLV LOSS OF POWER
- ANN-TA030, GEN AUX PNL TRBL

SCENARIO RELATED:

- ANN-TA030 , GEN AUX PNL TRBL FAIL TO: OFF
- ANN-CS044, ALT SEAL INJ PUMP TRBL FAIL TO: ON
- MAL-CVC027, ALT SEAL INJ D/G FAIL TO START
- MAL-CVC029, ALT SEAL INJ PUMP FAIL TO START

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 1	Page: 10 of 40

Event Description: PT-446 (Turbine First Stage Pressure) fails LOW. (Rods Drive In)

Time	Position	Applicant's Actions or Behavior	
EVALUATOR NOTE: On cue from the Examiner, the selected turbine first stage pressure transmitter (PT-446) will fail LOW. The failure causes a Tave -Tref mismatch resulting in rods inserting at the maximum speed. The crew will enter AOP-401.7, Turbine First Stage Pressure Channel Failure. The RO will respond to the rod insertion by placing rod control in manual and restoring Tave to within 1 degree of Tref. The crew will then select the operable 1st stage pressure channel for control. The RO may restore automatic rod control after the operable channel is selected. The BOP will place the STM DUMP MODE SELECT in STM PRESS. The Failed instrument is addressed in Technical Specification Table 3.3-1 Items 19.B, E and Table 3.3-3 Item 4.d. Within one hour verify the P7 and P13 permissives are dim, trip the affected bistables within 72 hours and place AMSAC in Bypass.			
BOOTH OPERATOR: When directed, insert Event 1 (TRIGGER 1)			
Indications available: Uncontrolled Rod Motion XCP-615, 2-5, RCS TAVG-TREF HI/LO; XCP-624-4-2, 5-2, 6-2; SG A, B, C STM FLO HI			
EVALUATOR NOTE: The crew could enter the ARP but it is likely that they will recognize the entry condition for AOP-401.7, Turbine First Stage Pressure Channel Failure.			
	CRS	Enters AOP-401.7, Turbine First Stage Pressure Channel Failure	AOP-401.7
EVALUATOR NOTE: If XCP-621 1-1 CRB INSERT LMT LO-LO is received the RO will immediately Emergency Borate per AOP-106.1, Emergency Boration until Shutdown Margin is restored.			
IOA	RO	1 Place Rod Control Bank Select Switch to MANUAL	AOP-401.7

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 1	Page: 11 of 40	

Event Description: PT-446 (Turbine First Stage Pressure) fails LOW. (Rods Drive In)

Time	Position	Applicant's Actions or Behavior	
	RO	2 Ensure TREF 1ST STG PRESS switch is positioned to the operable channel: P446, CH III. **(FAILED)** OR PT-447, CH IV	AOP-401.7
	RO	3 Adjust Control Rods until Tavg is within 1.0° F of Tref.	AOP-401.7
	BOP	4 Check if Main Turbine load is greater than 10%	AOP-401.7
	CRS	5 Within one hour, verify the following permissives are dim: • P-13, 1st STG PRESS • P-7, REACTOR TRIP BLOCKED	AOP-401.7

EVALUATOR NOTE:

- Due to the windup (integral) characteristic of the Rod Control function, the crew may not immediately place rods back in automatic.
- The crew may elect to restore rods to their previous position.

Time	Position	Applicant's Actions or Behavior	
	RO	6 Restore automatic rod control. a. Check if automatic rod control is desired. b. Verify Reactor power is GREATER THAN 15% (C-5 status light dim). c. Verify Tavg is within 1.0°F of Tref . d. Place ROD CNTRL BANK SEL Switch in AUTO.	AOP-401.7
	BOP	7 Place Steam Dump Mode Select Switch in STM PRESS.	AOP-401.7

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 1	Page: 12 of 40
Event Description: PT-446 (Turbine First Stage Pressure) fails LOW. (Rods Drive In)			

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: • Acknowledge requests for support. • Wait 3 minutes • Call for permission to proceed. • Use TRIGGER 2 to place AMSAC in BYPASS • Report that AMSAC is in Bypass			
	CRS	8 Notify I&C to place AMSAC in BYPASS.	AOP-401.7
	CRS	9 Within 72 hours, place the failed channel protection bistables in a tripped condition:	AOP-401.7
	CRS	a. Identify the associated bistables for the failed channel. REFER TO Attachment 1.	AOP-401.7

AOP-401.7 Attachment 1

TURBINE FIRST STAGE PRESSURE PROTECTION CHANNELS

INSTRUMENT	ASSOCIATED BISTABLE	BISTABLE LOCATION	TRIP STATUS LIGHT	TECH SPECS	STPS
PT-446	FB-474A FB-484A FB-494A	C3-741-BS-1 C3-746-BS-1 C3-748-BS-1	CHAN III LPA FB-474A CHAN III LPB FB-484A CHAN III LPC FB-494A	TABLE 3.3-1 ITEMS 19.B, E TABLE 3.3-3 ITEM 4.d	302.052 345.034

Time	Position	Applicant's Actions or Behavior	
	CRS	b. Record the following for each associated bistable on SOP-401, REACTOR PROTECTION AND CONTROL SYSTEM, Attachment I: • Instrument • Associated Bistable. • Bistable Location. • STPs.	AOP-401.7

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 1	Page: 13 of 40

Event Description: PT-446 (Turbine First Stage Pressure) fails LOW. (Rods Drive In)

Time	Position	Applicant's Actions or Behavior	
	CRS	Table 3.3-1 Action 7 Refers to Technical Specification Table 3.3-1 and within one hour determines by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition.	Tech Spec 3.3.1

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT		TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
19. Reactor Trip System Interlocks						
B. Low Power Reactor Trips Block, P-7	P-10 Input	4	2	3	1	7
	P-13 Input	2	1	2	1	7
E. Turbine First Stage Pressure, P-13		2	1	2	1	7

ACTION 7 - With less than the Minimum Number of Channels OPERABLE, within one hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

Time	Position	Applicant's Actions or Behavior	
	CRS	Table 3.3-3 Action 24 Refers to Technical Specification Table 3.3-3 and determines that the inoperable channel must be placed in a tripped condition within 72 hours.	Tech Spec 3.3.2

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
4. STEAM LINE ISOLATION					
d. Steam Flow in Two Steam Lines--High	2/steam line	1/steam line any 2 steam lines	1/steam line	1, 2, 3###	24*
COINCIDENT WITH T_{avg}--Low-Low	1 T_{avg}/loop	1 T_{avg} any 2 loops	1 T_{avg} any 2 loops	1, 2, 3###	24*

* The provisions of Specification 3.0.4 are not applicable.

ACTION 24 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 72 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.2.1.

BOOTH OPERATOR:

Acknowledge requests for assistance and inform the crew that support personnel will be assigned.

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 1	Page: 14 of 40
Event Description: PT-446 (Turbine First Stage Pressure) fails LOW. (Rods Drive In)			

Time	Position	Applicant's Actions or Behavior	
	CRS	c Notify I&C to place the failed channel protection bistables in a tripped condition within 72 hours: • FB-474A • FB-484A • FB-494A d Initiate a 30 day R&R for placing AMSAC in BYPASS.	AOP-401.7

EVALUATOR NOTE:

The next event may be initiated after I&C is called to trip the bistables and Technical Specifications have been addressed.

Op Test No:	NRC-ILO-13-01	Scenario #	3	Event #	2	Page:	15	of	40

Event Description: Rapid Power Reduction due to overheating of main generator disconnects.

Time	Position	Applicant's Actions or Behavior

EVALUATOR NOTE: On cue from the Examiner, the Booth Operator as the Shift Supervisor will direct the CRS to lower power to less than 90% within the next 15 minutes in accordance with GOP-4C Rapid Power Reduction, due to a report that the transformer disconnects are overheating. The RO will lower Reactor power with boration and/or rod motion. The BOP will reduce turbine load using the Turbine controls.

BOOTH OPERATOR:

- No triggers for this event.
- When directed, call the Control Room as the Shift Supervisor. Notify the CRS that thermography in the switchyard indicates a problem with the main Generator disconnects. Direct the CRS to lower power 10% within the next 15 minutes in accordance with GOP-4C, Rapid Power Reduction.

Time	Position	Applicant's Actions or Behavior
	CRS	Direct the crew to reduce power 10% in accordance with GOP-4C Rapid Power Reduction.

NOTE 2.0 through 3.0

GOP-4C

a. If this procedure must be initiated under conditions other than those in Section 2.0, INITIAL CONDITIONS, the Shift Supervisor or Control Room Supervisor will review Sections 2.0, INITIAL CONDITIONS, and 3.0, INSTRUCTIONS. Steps that are not applicable due to plant conditions will be marked N/A and initialed by the Shift Supervisor or Control Room Supervisor. All other items will require sign-off or check-off.

b. All personnel who sign off steps in this procedure must enter their names and initials on Attachment I.

c. Each step should be initialed and dated when all its substeps are either completed and checked-off or marked as N/A and initialed.

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 2	Page: 16 of 40

Event Description: Rapid Power Reduction due to overheating of main generator disconnects.

Time	Position	Applicant's Actions or Behavior

GOP- 4C REFERENCE PAGE GOP-4C

GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. After any Thermal Power change of greater than 15% within any one hour, Attachment III.H. of GTP-702 must be completed.

C. If Reactor Power is stabilized during this procedure for the purpose of raising power per GOP-4A, a Power Range Heat Balance shall be performed.

D. Once a Rapid Power Reduction has begun, every effort should be made to prevent the Turbine from reaching "AT SET LOAD" unless it is desired to stabilize the plant.

REACTOR CONTROL

A. During operation with a positive Moderator Temperature Coefficient, power and temperature changes will require constant operator attention.

B. Rod Control should be maintained in Automatic if any Pressurizer PORV is isolated.

C. If at any time, power decreases unexpectedly below 0.1% on any Power Range NI (computer indication available) OR below 1.0% on any Power Range NI control board indication (computer not available):

1) No positive reactivity will be added by rods or dilution.
2) A complete reactor shutdown shall be performed per GOP-5.
3) A controlled reactor startup may be commenced per GOP-3 once the event has been reviewed by Reactor Engineering.

REACTOR TRIP CRITERIA DURING RAPID LOAD REDUCTION

A. If any of the following conditions occur, trip the Reactor and implement EOP-1.0:

1) RCS Tavg is less than 551°F for greater than 15 minutes.
2) Tavg/Tref mismatch exceeds 10°F.
3) Pressurizer pressure approaches 1870 psig.
4) Power reduction at 5% per minute is not sufficient to mitigate the event.

NOTE 3.0 GOP-4C

If time allows, load reductions should be discussed with the Load Dispatcher.

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 2	Page: 17 of 40
Event Description: Rapid Power Reduction due to overheating of main generator disconnects.			

Time	Position	Applicant's Actions or Behavior	
		CAUTION 3.1 through 3.12 a. Thermal Power changes of greater than 15% in any one-hour period requires completion of GTP-702 Attachment III.H. b. VCS PID Report, POWER CHANGE SEARCH, should be periodically performed to ensure a thermal power change of greater than 15% in any one-hour period is detected.	GOP-4C
	RO	3.1 Commence rapid Plant Shutdown as follows: a. Energize all Pressurizer Heaters.	GOP-4C
		NOTE 3.1.b Setting FCV-113A&B, BA FLOW SET PT to 8.3 will yield 33 gpm Boration flow rate.	GOP-4C
	RO	b. Maintain the following with rod motion or boron concentration changes: 1) Tavg within 10°F and trending to Tref. 2) ΔI within limits. 3) Control Rods above the rod insertion limit.	GOP-4C
	BOP	c. Using the Turbine HMI, Control/Load screen, reduce to the desired load, as low as 5% (50 MWe), as follows: 1) Under Rate %/min, select desired ramp rate up to 5% per minute. 2) Select Load (a dialog box opens). 3) Enter desired load. 4) Select OK. 5) Confirm setpoint. 6) Select OK. 7) Verify proper plant response.	GOP-4C
	CREW	Stabilize the unit at 10% reduced power.	
		EVALUATOR NOTE: The next event may be initiated after a significant power change has been observed.	

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 3	Page: 18 of 40
Event Description: Running EHC Pump Trip. (Standby EHC must be manually started).			

Time	Position	Applicant's Actions or Behavior	
EVALUATOR NOTE: On cue from the Examiner, the running EHC pump will trip and the backup pump will not start in auto. The BOP will respond to annunciator XCP-631 1-4, EHC PP A MOTOR OVRLD, determine the cause of the event, and take corrective action by starting the backup EHC pump to prevent turbine stop valves from closing. A Turbine trip will occur within 2 minutes if the event is not mitigated.			
BOOTH OPERATOR: When directed, insert Event 3 (TRIGGER 3)			
Indications available: Control Switch Red and Green lights XCP-631, 1-4, EHC PP A MOTOR OVRLD XCP-631, 1-2, EHC FLUID PRESS LO			
	BOP	Enters ARP-001-XCP-631 1-4, EHC PP A MOTOR OVRLD	XCP-631 1-4
		CORRECTIVE ACTIONS:	XCP-631 1-4
	BOP	1. If EHC PUMP A is still running, verify high amps. **(NO)**	XCP-631 1-4
	BOP	2. Start EHC PUMP B and observe motor amps.	XCP-631 1-4
	BOP	3. If EHC PUMP A is still running with higher amps than EHC PUMP B, secure EHC PUMP A and continue to monitor EHC PUMP B **(NO)**	XCP-631 1-4
BOOTH OPERATOR: • Acknowledge request to check for EHC Leaks. 3 minutes later report no leaks. • If called to investigate the pump and/or breaker, wait 3 minutes and report the breaker for the "A" EHC Pump is tripped. No problems are apparent with the pump.			
	BOP	4. Dispatch an operator to check for EHC System leaks.	XCP-631 1-4
	BOP	5. If EHC PUMP B is drawing high amps with EHC PUMP A tripped, attempt to restart EHC PUMP A and run both pumps until an external leak is located or a low level in the EHC fluid tank alarm is received. **(NO)**	XCP-631 1-4

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 3	Page: 19 of 40
Event Description: Running EHC Pump Trip. (Standby EHC must be manually started).			

Time	Position	Applicant's Actions or Behavior
	BOP	6. If EHC PUMP B overload annunciator is received after starting, commence a Turbine Runback at 5% per minute per GOP-4C. **(NO)**
EVALUATOR NOTE: The failure of the backup EHC pump to auto-start results in EHC pressure continuing to decrease. The Low Pressure alarm will alert operators to the failure – if not previously discovered – however this alarm provides no additional operator actions		
	BOP	Respond to alarm EHC FLUID PRESS LO (XCP-631, 1-2) EHC FLUID PRESS LO
EVALUATOR NOTE: The next event may be initiated after the B EHC pump is started.		

XCP-631 1-4

Op Test No:	NRC-ILO-13-01	Scenario #	3	Event #	4	Page:	20	of	40

Event Description: LT-496 (“C” SG Level Instrument) fails HIGH. (Manually control feedwater to “C” SG)

Time	Position	Applicant’s Actions or Behavior

EVALUATOR NOTE: On cue from the Examiner, “C” SG level transmitter will fail HIGH. The BOP will identify the failure and take manual control of the “C” SG Feedwater Regulating Valve to maintain/restore SG level to between 60% and 65% and prevent a reactor trip.

The crew will enter AOP-401.11, Steam Generator Level Control and Protection Channel Failure, and remove the channel from service.

The CRS will refer to Technical Specifications 3.3-1, Item 13 (Action 6) and 3.3-3, Items 5, and 6c (Action 24) to determine that the protection bistables for the failed channels must be placed in the TRIPPED condition with 72 hours.

BOOTH OPERATOR: When directed, insert Event 4 (TRIGGER 4)

Indication Available:

- XCP-624 3-4, SG C LVL DEV
- XCP-624 6-4, SG C FWF>STF MISMATCH

Time	Position	Applicant’s Actions or Behavior	
	BOP	Responds to alarms.	
	BOP	Diagnoses/reports LT-496 failed.	
	CRS	Enters AOP-401.11.	
IOA	BOP	1 Adjust the Feedwater Flow Control Valve as necessary to restore Narrow Range level in the AFFECTED SG to between 60% and 65%.	AOP-401.11
	CRS	2 Within 72 hours, place the failed channel protection bistables in a tripped condition: a. Identify the associated bistables for the failed channel. REFER TO Attachment 1.	AOP-401.11

Op Test No:	NRC-ILO-13-01	Scenario #	3	Event #	4	Page:	21	of	40

Event Description: LT-496 (“C” SG Level Instrument) fails HIGH. (Manually control feedwater to “C” SG)

Time	Position	Applicant’s Actions or Behavior	
		STEAM GENERATOR LEVEL PROTECTION CHANNELS (see table below)	AOP-401.11 Excerpt from Attachment 1
	BOP	b. Record the following for each associated bistable on SOP-401, REACTOR PROTECTION AND CONTROL SYSTEM, Attachment I: • Instrument. • Associated Bistable. • Bistable Location. • STPs.	AOP-401.11
		EVALUATOR NOTE: The scenario does not allow time any bistables to be put in trip or bypass.	
		BOOTH OPERATOR: Acknowledge request to troubleshoot failure and place bistables in trip.	
	CRS	c. Notify the I&C Department to place the identified bistables in trip.	AOP-401.11
	CRS	d. For channels LT-474, LT-485, and LT-496, initiate a 30 day R&R for placing AMSAC in BYPASS.	AOP-401.11
		TABLE 3.3-1 (Continued) (see below)	Excerpt from Tech Spec

STEAM GENERATOR LEVEL PROTECTION CHANNELS

INSTRUMENT	ASSOCIATED BISTABLE	BISTABLE LOCATION	TRIP STATUS LIGHT	TECH SPECS	STPS
LT-496	LB-496A LB-496C *LB-496	C3-731-BS-1 C3-731-BS-2 XPN-6010(AMSAC)	CHAN III SG C LB-496A CHAN III SG C LB-496C	TABLE 3.3-1 ITEM 13 TABLE 3.3-3 ITEMS 5, 6.c	302.025 345.029

* Bistable defeated by placing AMSAC in BYPASS

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
13. Steam Generator Water Level--Low-Low	3/loop	2/loop in any operating loops	2/loop in each operating loop	1, 2	6#

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 72 hours; and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.

Op Test No:	NRC-ILO-13-01	Scenario #	3	Event #	4	Page:	22	of	40

Event Description: LT-496 ("C" SG Level Instrument) fails HIGH. (Manually control feedwater to "C" SG)

Time	Position	Applicant's Actions or Behavior

Excerpt from Tech Spec

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
5. TURBINE TRIP & FEEDWATER ISOLATION					
a. Steam Generator Water Level--High-High	3/loop	2/loop in any operating loop	2/loop in each operating loop	1, 2	24*
6. EMERGENCY FEEDWATER					
c. Stm. Gen. Water Level-Low-Low					
i. Start Motor-Driven Pumps	3/stm. gen.	2/stm. gen. any stm gen.	2/stm. gen.	1, 2, 3	24*
ii. Start Turbine-Driven Pump	3/stm. gen.	2/stm. gen. any 2 stm. gen.	2/stm. gen	1, 2, 3	24*

ACTION 24 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 72 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.2.1.

Time	Position	Applicant's Actions or Behavior
	CRS	Refers to: T.S. 3.4.3.1 Reactor Trip System Instrumentation - Table 3.3-1 Action 6 T.S. 3.4 3.2 Engineered Safety Feature Actuation System Instrumentation - Table 3.3-3 Action 24

EVALUATOR NOTE: The next event may be initiated after Technical Specifications have been addressed.

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 5	Page: 23 of 40
Event Description: Progressive failure of #2 Seal on "A" RCP.			

Time	Position	Applicant's Actions or Behavior	
EVALUATOR NOTE: On cue from the Examiner, RCP A Seal Number 2 will begin a ramped failure. The crew will respond to annunciator XCP-617 2-4, RCP A STNDPIP LVL HI/LO. **NOTE**: The Annunciator will alarm within 4 minutes after the event is triggered and will not clear. The RO will fill the standpipe for 2 minutes to determine that either the #1 or #2 seal is failing. The crew will implement AOP-101.2, Reactor Coolant Pump Seal Failure and determine that a reactor trip is not required. The RO will continue to monitor the RCP for further seal degradation.			
BOOTH OPERATOR: When directed, insert Event 5 (TRIGGER 5)			
Indications Available: XCP-617 2-4, RCP A STNDPIP LVL HI/LO.			
	RO	1. Determine which seal failed as follows:	XCP-617 2-4
	RO	a. Attempt to fill the standpipe as follows: 1) Ensure Reactor Makeup Water System Non-Essentials are aligned. 2) Open PVD-8028, PRT RMWST MU. 3) Open PVD-8168A, RX MU WTR TO STNDPIPE A.	XCP-617 2-4
	RO	4) When one of the following occurs, close PVD-8168A, RX MU WTR TO STNDPIPE A: a) RCP A STNDPIP LVL HI/LO alarm clears and re-annunciates on a standpipe high level. b) RCP A STNDPIP LVL HI/LO alarm does not clear within two minutes. 5) Close PVD-8028, PRT RMWST MU. 6) Monitor radiation levels in the Reactor Building.	XCP-617 2-4
EVALUATOR NOTE: The alarm will NOT clear by filling the standpipe.			

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 5	Page: 24 of 40
Event Description: Progressive failure of #2 Seal on “A” RCP.			

Time	Position	Applicant's Actions or Behavior	
	RO	b. If the standpipe alarm clears by filling, assume #2 or #3 Seal failure. c. If the standpipe alarm does not clear by filling, assume #1 or #2 Seal failure and go to AOP-101.2, Reactor Coolant Pump Seal Failure.	XCP-617 2-4
	CRS	Diagnose #1 or #2 Seal failure.	
	CRS	Implement AOP-101.2, Reactor Coolant Pump Seal Failure.	

CAUTION

AOP-101.2

- PVT-8141A(B)(C), A(B)(C) SEAL LKOFF, should be closed between three minutes and five minutes after the affected Reactor Coolant Pump is secured.
- Reactor Coolant System Controlled Leakage should be limited to 33 gpm per Technical Specification 3.4.6.2 in Modes 1,2,3, and 4.

BOOTH OPERATOR:

- Wait 3 minutes after being directed to install the fuses
- Use Trigger 6 to install XVT-8141A-FU-CS75 for RCP A
- Report power has been restored to the Seal Leakoff Valve for RCP A

Time	Position	Applicant's Actions or Behavior	
	RO	1 While continuing with this procedure, have an operator install the pre-staged fuses for the AFFECTED RCP's Seal Leakoff Valve in Main Control Board Panel XCP-6109 Subpanel #5: • XVT-8141A-FU-CS75. • XVT-8141B-FU-CS76. • XVT-8141C-FU-CS77.	AOP-101.2

NOTE - Step 2

AOP-101.2

IF Seal Injection flow has been throttled to optimize RCP Seal performance, THEN Step 2 does not need to be performed.

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 5	Page: 25 of 40
Event Description: Progressive failure of #2 Seal on "A" RCP.			

Time	Position	Applicant's Actions or Behavior	
	RO	2 Ensure seal injection flow is GREATER THAN 8 gpm for the affected Reactor Coolant Pump on FI-130A(127A)(124A), RCP A(B)(C) INJ FLO GPM.	AOP-101.2
	RO	3 Ensure Component Cooling Water flow to the affected Reactor Coolant Pump thermal barrier is between 35 gpm (50%) and 60 gpm (87.5%) on FM-7138(7158)(7178), RCP THERM BAR A(B)(C) (MODUFLASH M2 CC POINTS 19,18, and 20).	AOP-101.2
*	RO	4 Check the following conditions for the affected Reactor Coolant Pump on the IPCS: • Bearing water temperature (LOWER SEAL WTR BRG T) on T0417A (T0437A)(T0457A) is LESS THAN 225°F and NOT significantly increasing. AND • #1 seal leakoff temperature (SEAL WTR OUT TEMP) on T0181A (T0182A)(T0183A) is LESS THAN 235°F and NOT significantly increasing.	AOP-101.2
	RO	5 GO TO Step 11.	AOP-101.2
	RO	11 Check total #1 seal flow (#1 seal leakoff plus #2 seal leakoff) for the affected Reactor Coolant Pump from the following: a. Check if #1 seal leakoff flow is LESS THAN 6 gpm on FR-154A, RCP SL LKOFF HI RANGE.	AOP-101.2
	RO	b. Determine total #1 seal flow (#1 seal leakoff plus #2 seal leakoff) for the affected Reactor Coolant Pump from the following: 1) #1 seal leakoff flow by observing FR-154B, RCP SL LKOFF LO RANGE, and FR-154A, RCP SL LKOFF HI RANGE, or by having I&C install a temporary flow transmitter with readout on the IPCS per ICP-340.050, TEMPORARY INSTRUMENT INSTALLATION FOR RCP SEAL LEAKOFF MONITORING. 2) #2 seal leakoff flow by monitoring RCDT inleakage per the applicable portion of STP-114.002, OPERATIONAL LEAKAGE TEST, for any increase from the previous leak rate.	AOP-101.2

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 5	Page: 26 of 40
Event Description: Progressive failure of #2 Seal on "A" RCP.			

Time	Position	Applicant's Actions or Behavior	
	RO	12 IF total #1 seal flow is GREATER THAN 0.8 gpm AND LESS THAN 6 gpm, THEN perform the following: • Contact Plant Support Engineering for evaluation. • Continue to monitor for further seal degradation.	AOP-101.2
EVALUATOR NOTE: The next event may be initiated after #1 seal flow is identified as greater than 0.8 gpm.			
	CRS	13 Return to Procedure and Step in effect.	AOP-101.2
EVALUATOR NOTE: If this event is run for greater than 15 minutes XCP-617 2-1, RCP A #1 SL LKOFF FLO HI/LO, will alarm indicating that seal flow is less than 0.8 gpm. The Alternative Action for Step 12 would then require completion of steps 14-16.			
	CRS	14 Within eight hours, stop the affected Reactor Coolant Pump. REFER TO SOP-101, REACTOR COOLANT SYSTEM.	AOP-101.2
BOOTH OPERATOR: Acknowledge requests for support.			
	CRS	15 Contact Plant Support Engineering for evaluation.	AOP-101.2
	RO	16 Continue to monitor for further seal degradation.	AOP-101.2

Op Test No:	NRC-ILO-13-01	Scenario #	3	Event #	6, 7	Page:	27	of	40

Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.

Time	Position	Applicant's Actions or Behavior

EVALUATOR NOTE:

EVENT 6
On cue from the Examiner, RCP "A" will trip but the Reactor will not trip. The crew will enter EOP-1.0 (E-0) Reactor Trip/Safety Injection Actuation. The RO will manually trip the Reactor. Only the Manual Reactor trip switch the RO normally operates is functional.

EVENT 7
This event is automatically triggered when the Reactor Trip Breakers open. The crew will continue in EOP-1.0 (E-0) Reactor Trip/Safety Injection Actuation and identify that there is no Emergency Feedwater flow to the Steam Generators. The crew will then transition to EOP-15.0 (FR-H.1) Response to Loss of Secondary Heat Sink.

The BOP will depressurize one Steam Generator, reset the Safety Injection actuation, and attempt to establish Main Feedwater flow to one SG. The Main Feedwater pumps cannot be reset so the success path is to continue in EOP-15 (FR-H.1) and utilize Condensate flow to restore SG level.

BOOTH OPERATOR: When directed, insert Event 6 (TRIGGER 7)

Indications Available:
Indication of a Turbine trip w/o a reactor trip.

Op Test No:	NRC-ILO-13-01	Scenario #	3	Event #	6, 7	Page:	28	of	40

Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.

Time	Position	Applicant's Actions or Behavior

EOP-1.0

REFERENCE PAGE FOR EOP-1.0

1 RCP TRIP CRITERIA

a. IF Phase B Containment Isolation has actuated (XCP-612 4-2), THEN trip all RCPs.

b. IF both of the following conditions occur, THEN trip all RCPs:

- SI flow is indicated on FI-943, CHG LOOP B CLD/HOT LG FLOW GPM.

AND

- RCS Wide Range pressure is LESS THAN 1418 psig.

2 REDUCING CONTROL ROOM EMERGENCY VENTILATION

Reduce Control Room Emergency Ventilation to one train in operation within 30 minutes of actuation. **REFER TO SOP-505, CONTROL BUILDING VENTILATION SYSTEM.**

3 MONITOR SPENT FUEL COOLING

Periodically check status of Spent Fuel Cooling by monitoring the following throughout event recovery:

- Spent Fuel Pool level.
- Spent Fuel Pool temperature.

EOP-1.0

NOTE

- Steps 1 through 5 are Immediate Operator Actions.
- The EOP REFERENCE PAGE should be monitored throughout the use of this procedure.
- Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.

EVALUATOR NOTE: The Reactor will not automatically trip and the RO Trip switch will not work. The BOP must use his switch to manually trip the reactor.

Op Test No:	NRC-ILO-13-01	Scenario # 3	Event # 6, 7	Page: 29 of 40

Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.

Time	Position	Applicant's Actions or Behavior	
IOA	RO	1 Verify Reactor Trip: **(NO)** • Trip the Reactor using either Reactor Trip Switch. • Verify all Reactor Trip and Bypass Breakers are open. • Verify all Rod Bottom Lights are lit. • Verify Reactor Power level is decreasing.	EOP-1.0
IOA CRITICAL TASK	BOP	**ALTERNATIVE ACTION** 1 Trip the Reactor using both Reactor Trip Switches. If the Reactor is NOT subcritical, THEN GO TO EOP-13.0, RESPONSE TO ABNORMAL NUCLEAR POWER GENERATION, Step 1.	EOP-1.0
IOA	BOP	2 Verify Turbine/Generator a. Verify all Turbine VLVs are closed. b. Ensure Generator Trip (after 30 second delay): 1) Ensure the GEN BKR is open. 2) Ensure the GEN FIELD BKR is open. 3) Ensure the EXC FIELD CNTRL is tripped.	EOP-1.0
IOA	BOP	3 Verify both ESF buses are energized.	EOP-1.0
IOA	RO	4 Check if SI is actuated: **(NO)** a. Check if either: • SI ACT status light is bright on XCP-6107 1-1. OR • Any red first-out SI annunciator is lit on XCP-626 top row. b. Actuate SI using either SI ACTUATION Switch. c. GO TO Step 6. **ALTERNATIVE ACTION** a. GO TO Step 5.	EOP-1.0

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 6, 7	Page: 30 of 40
Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.			

Time	Position	Applicant's Actions or Behavior	
	RO	5 Check if SI is required: **(NO)** a. Check if any of the following conditions exist: • PZR pressure LESS THAN 1850 psig. OR • RB pressure GREATER THAN 3.6 psig. OR • Steamline pressure LESS THAN 675 psig. OR • Steamline differential pressure GREATER THAN 97 psid.	EOP-1.0
EVALUATOR NOTE: EOP-1.0 directs a transition to EOP-1.1 however a Red Path on Heat Sink requires implementation of EOP-15.0, Response To Loss of Secondary Heat Sink.			
	CRS	**ALTERNATIVE ACTION** a. GO TO EOP-1.1, REACTOR TRIP RECOVERY, Step 1.	EOP-1.0
CAUTION • If total EFW flow is LESS THAN 450 gpm due to operator action, this procedure should NOT be performed, since these actions are NOT appropriate if 450 gpm EFW flow is available. • If a NON-FAULTED SG is available, feed flow should NOT be reestablished to any FAULTED SG, to prevent thermal shock to SG tubes.			EOP-15.0
NOTE Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.			EOP-15.0
	RO	1 Check if a secondary heat sink is required: a. Verify RCS pressure is GREATER THAN any NON-FAULTED SG pressure. b. Verify RCS Thot is GREATER THAN 350°F.	EOP-15.0

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 6, 7	Page: 31 of 40

Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.

Time	Position	Applicant's Actions or Behavior	
	RO	2 Verify power is available to all PZR PORV Block Valves: a. MVG-8000A, RELIEF 445 A ISOL. b. MVG-8000B, RELIEF 444 B ISOL. c. MVG-8000C, RELIEF 445 B ISOL.	EOP-15.0
	RO	3 Open the Block Valve for any PZR PORV that has been isolated due to excessive seat leakage: • MVG-8000A, RELIEF 445 A ISOL. • MVG-8000B, RELIEF 444 B ISOL. • MVG-8000C, RELIEF 445 B ISOL.	EOP-15.0
		<u>CAUTION - Steps 4 through 16</u> If Wide Range level in any two SGs is LESS THAN 12% OR PZR pressure is GREATER THAN 2330 psig due to loss of secondary heat sink, Steps 17 through 24 should be immediately initiated for bleed and feed cooling.	EOP-15.0
	RO	4 Ensure the following valves are closed: • SG Blowdown, PVG-503A(B)(C). • SG Sample, SVX-9398A(B)(C).	EOP-15.0
		<u>NOTE - Step 5</u> If EFW flow control can NOT be reestablished from the Control Room, this procedure should be continued while local operator action is in progress to restore EFW flow.	EOP-15.0

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 6, 7	Page: 32 of 40

Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.

Time	Position	Applicant's Actions or Behavior	
	BOP	5 Try to establish EFW flow to at least one SG: a. Check Control Room indications for the cause of EFW failure: 1) Verify no EFW annunciators are lit: • XCP-621 3-5 (EFP SUCT HDR PRESS LO XFER TO SW). • Any alarm on XCP-622. • Any alarm on XCP-623. 2) Verify CST level is GREATER THAN 5 ft. 3) Ensure power is available to both MD EFW Pumps.	EOP-15.0
CAUTION - Step 5.a.4) • EFW valves should NOT be opened to SGs with Wide Range level LESS THAN 12%. • If Wide Range level in all SGs is LESS THAN 12%, EFW valves should be open to only one SG, until RCS temperatures are decreasing, to limit any failure to one SG.			EOP-15.0
	BOP	4) Ensure all EFW valves are open: • FCV-3531(3541)(3551), MD EFP TO SG A(B)(C). • FCV-3536(3546)(3556), TD EFP TO SG A(B)(C). • MVG-2802A(B), MS LOOP B(C) TO TD EFP. • PVG-2030, STM SPLY TO TD EFP TRN A(B).	EOP-15.0
	BOP	b. Try to restore any EFW flow.	EOP-15.0
BOOTH OPERATOR: Acknowledge requests to investigate the EFW problems. The following conditions exist: The "A" EFW Pp has a sheared shaft. The "B" EFW Pp has tripped and cannot be started. The TD EFW Pp Steam Supply Valves have failed closed and cannot be opened. After 5 minutes report to the control room that attempts to correct the problems are unsuccessful.			

Op Test No: NRC-ILO-13-01 Scenario # 3 Event # 6, 7 Page: 33 of 40

Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.

Time	Position	Applicant's Actions or Behavior	
	BOP	c. Check total EFW flow to SGs GREATER THAN 450 gpm. **<u>ALTERNATIVE ACTION</u>** c. IF any feed flow to at least one SG verified, THEN perform the following: … **(NO)** IF feed flow NOT verified, THEN perform the following: 1) Locally restore EFW flow. 2) GO TO Step 7.	EOP-15.0
	RO	7 Stop all RCPs.	EOP-15.0
		CAUTION - Step 8 Deaerator Storage Tank level should be monitored closely and maintained between 2.5 ft and 10.5 ft on LI-3135, DEAER STOR TK WR LVL FEET, to prevent tripping Condensate and Feedwater Booster Pumps.	EOP-15.0
	BOP	8 Align the MCB for establishing feed flow: a. Ensure one Condensate Pump is running. b. Ensure two Feedwater Booster Pumps are running. c. Ensure Main FW Control Valves are closed: • FCV-478, A FCV. • FCV-488, B FCV. • FCV-498, C FCV. d. Place all Main FW Bypass Valve Controllers in MAN and closed: • FCV-3321,LOOP A MAIN FW BYP. • FCV-3331,LOOP B MAIN FW BYP. • FCV-3341,LOOP C MAIN FW BYP.	EOP-15.0

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 6, 7	Page: 34 of 40

Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.

Time	Position	Applicant's Actions or Behavior	
BOOTH OPERATOR: When called to place local key-operated switches in bypass: Acknowledge request. Wait 3 minutes. Insert TRIGGER 10, TRIGGER 11, and TRIGGER 12. Wait 1 minute. Report that all switches are in BYPASS.			
	BOP	e. Locally place the following key switches in BYPASS (CB-448): • XVG01611A,B,C (XPN 7114). • IFV03321,3331,3341 TRAIN A (XPN 7115). • IFV03321,3331,3341 TRAIN B (XPN 7121).	EOP-15.0
	BOP	f. Verify XCP-612 2-1 is NOT lit (RB PRESS HI-2 STM LINE ISOL).	EOP-15.0
NOTE - Step 8.g • SG B or C is preferred, so that a steam supply for the TD EFP will be restored as soon as possible. • Before the Low Steamline Pressure SI signal is blocked, Main Steam Isolation will occur if the Low Steam Pressure rate setpoint is exceeded.			EOP-15.0
	BOP	g. Align the MS Isolation Valves to depressurize only one SG: 1) Verify the MS Isolation Valve, PVM-2801A(B)(C), is open for the SG to be depressurized. 2) Ensure the remaining two MS Isolation Valves, PVM-2801A(B)(C), are closed.	EOP-15.0
EVALUATOR NOTE: The Alternative Actions are only required if the Low Steam Pressure rate setpoint is exceeded before the Low Steamline Pressure SI signal is blocked as stated in Step Note 8.g.			
	BOP	**ALTERNATIVE ACTION** g. Open the MS Isolation Bypass Valve for one SG:	

Op Test No:	NRC-ILO-13-01	Scenario #	3	Event #	6, 7	Page:	35 of 40

Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.

Time	Position	Applicant's Actions or Behavior	
		1) IF RCS Tavg is LESS THAN P-12(552°F), THEN place STMLN SI TRAIN A(B) Switches to BLOCK. 2) Depress both MAIN STEAM ISOL VALVES RESET TRAIN A(B). 3) Open the MS Isolation Bypass Valve, PVM-2869A(B)(C), for only the SG to be depressurized. 4) Ensure the remaining two MS Isolation Bypass Valves, PVM-2869A(B)(C), are closed.	
		h. Place the following switches in AUTO: • PVG-1611A(B)(C), A(B)(C) ISOL. • FCV-3321,3331,3341, FW CNTRL BYP VLVS, Train A Switch. • FCV-3321,3331,3341, MAIN FW BYPASS VLVS, Train B Switch.	
	BOP	9 Reset both SI RESET TRAIN A(B) Switches.	EOP-15.0
EVALUATOR NOTE: The Main Feedwater Pumps will trip immediately if they are reset due to failure inserted in scenario.			
	BOP	10 Establish Main Feedwater flow to the unisolated SG: a. Verify PERMISV C-9 status light is bright on XCP-6114 1-3. b. Open MOV-1-5A(B)(C), TURB DRN VLV. c. Ensure Feedwater Pump to be started is RESET (MCB or DCS (T ICON)). (**NO** – If any pump resets it will trip immediately) **ALTERNATIVE ACTION** 10 GO TO Step 11. Observe the NOTE prior to Step 11.	EOP-15.0
NOTE - Step 11 • Step 11 should NOT be performed as long as the Main Feed Pump is supplying sufficient flow to increase SG level. • Before the Low Steamline Pressure SI signal is blocked, Main Steam Isolation will occur if the Low Steam Pressure rate setpoint is exceeded.			EOP-15.0

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 6, 7	Page: 36 of 40
Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.			

Time	Position	Applicant's Actions or Behavior	
	BOP	11 WHEN the Main Feed Pump will NOT supply adequate flow to the SG, THEN depressurize one SG to establish Condensate flow: a. WHEN RCS Tavg is LESS THAN P-12 (552°F), THEN: • Place both STM DUMP INTERLOCK Switches to BYP INTLK. • Place STMLN SI TRAIN A(B) Switches to BLOCK.	EOP-15.0
NOTE - Step 11.b SG B or C is preferred, so that a steam supply for the TD EFP will be restored as soon as possible.			EOP-15.0
	BOP	b. Open FCV-3321(3331)(3341), LOOP A(B)(C) MAIN FW BYP, to the SG to be depressurized.	EOP-15.0
	BOP	c. Dump steam to the Condenser at the maximum rate: 1) Verify PERMISV C-9 status light is bright on XCP-6114 1-3. 2) Place the STM DUMP MODE SELECT Switch in STM PRESS. 3) Adjust the STM DUMP CNTRL Controller to fully open the Bank 1 Steam Dump Valves.	EOP-15.0
CRITICAL TASK	BOP	d. Adjust Condensate flow to restore SG Narrow Range level to between 26% and 60%.	EOP-15.0
EVALUATOR NOTE: The scenario may be terminated after Condensate flow is established to one Steam Generator and SG Level increases.			
	BOP	12 Reset Containment Isolation: • RESET PHASE A - TRAIN A(B) CNTMT ISOL. • RESET PHASE B - TRAIN A(B) CNTMT ISOL.	EOP-15.0
	BOP	13 Place both ESF LOADING SEQ A(B) RESETS to:	EOP-15.0

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 6, 7	Page: 37 of 40

Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.

Time	Position	Applicant's Actions or Behavior	
		a. NON-ESF LCKOUTS. b. AUTO-START BLOCKS.	
	BOP	14 Establish Instrument Air to the RB: a. Start one Instrument Air Compressor and place the other in Standby. b. Open PVA-2659, INST AIR TO RB AIR SERV. c. Open PVT-2660, AIR SPLY TO RB.	EOP-15.0
		<u>NOTE - Steps 15 and 16</u> The specified SG level range (Narrow Range OR Wide Range) must be used in the following Steps.	EOP-15.0
		EVALUATOR NOTE: If this scenario is not terminated the crew may continue Step 15 until Narrow Range level is GREATER THAN 26%.	EOP-15.0
	BOP	15 Check SG levels: a. Verify Narrow Range level is GREATER THAN 26% in at least one SG. **(NO)** **<u>ALTERNATIVE ACTION</u>** a. IF feed flow to at least one SG is verified by: • Core exit TC temperatures decreasing, OR • Wide Range SG level increasing, THEN maintain flow to restore Narrow Range SG level to GREATER THAN 26%. RETURN TO Step 15.a. IF flow is NOT verified to any SG, THEN GO TO Step 16. (**NA**)	EOP-15.0
	CRS	b. RETURN TO the Procedure and Step in effect.	EOP-15.0

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # 6, 7 Page: 38 of 40
Event Description: RCP Trip, ATWS, FW Isol Valve 1611A Fails Closed. (Manual Reactor trip) Loss of Heat Sink (EFW), Trip of Main FW pumps.		
Time	Position	Applicant's Actions or Behavior

EVALUATOR NOTE: If the scenario continues to this point the crew will exit EOP-15.0 and implement EOP-1.1, Reactor Trip Recovery.

Op Test No: NRC-ILO-13-01 Scenario # 3 Event # NA Page: 39 of 40

Event Description: SOP-106, BORATE OPERATIONS

Time	Position	Applicant's Actions or Behavior	
		NOTE 2.0 1. Energizing additional Pressurizer Heaters will enhance mixing. 2. LCV-115A, LTDN DIVERT TO HU-TK, will begin to modulate to the HU-TK position at 70% level on LI-115, VCT LEVEL %.	SOP-106
	RO	2.1 Ensure at least one Reactor Coolant Pump is running.	SOP-106
	RO	2.2 Place RX COOL SYS MU switch to STOP.	SOP-106
	RO	2.3 Place RX COOL SYS MU MODE SELECT switch to BOR.	SOP-106
	RO	2.4 Set FIS-113, BA TO BLNDR FLOW, batch integrator to the desired volume.	SOP-106
	RO	2.5 Place RX COOL SYS MU switch to START.	SOP-106
		NOTE 2.6 Step 2.6 may be omitted when borating less than 10 gallons.	SOP-106
	RO	2.6 Place FCV-113 A&B, BA FLOW, controller in AUTO.	SOP-106
		NOTE 2.7 The AUTO setpoint dial for FCV-113A&B, BA FLOW, controller may be adjusted slowly to obtain the desired flow rate.	SOP-106
	RO	2.7 Verify the desired Boric Acid flow rate on FR-113, BA TO BLNDR GPM (F-113).	SOP-106
	RO	2.8 When the preset volume of boric acid has been reached, perform the following: a. Place FCV-113A&B, BA flow controller in MAN. b. Verify boration stops.	SOP-106
	RO	2.9 Place RX COOL SYS MU switch to STOP.	SOP-106
		NOTE 2.10 a. If plant conditions require repeated borations, Step 2.10 may be omitted. b. The volume in the piping between the blender and the VCT outlet is approximately 3.8 gallons.	SOP-106

Op Test No: NRC-ILO-13-01	Scenario # 3	Event # NA	Page: 40 of 40
Event Description: SOP-106, BORATE OPERATIONS			

Time	Position	Applicant's Actions or Behavior	
	RO	2.10 Alternate Dilute 4 to 6 gallons of Reactor Makeup Water to flush the line downstream of the blender by performing the following: a. Place RX COOL SYS MU MODE SELECT switch to ALT DIL. b. Adjust FCV-168, TOTAL MU FLOW SET PT, to desired flow rate. c. Set FIS-168, TOTAL MU FLOW, batch integrator to desired volume. d. Place RX COOL SYS MU switch to START. e. Verify desired flow rate on FR-113, TOTAL MU GPM (F-168). f. Verify alternate dilution stops when preset volume is reached on FIS-168, TOTAL MU FLOW, batch integrator. g. Place RX COOL SYS MU switch to STOP.	SOP-106
	RO	2.11 Place RX COOL SYS MU MODE SELECT switch to AUTO.	SOP-106
	RO	2.12 Adjust FCV-168, TOTAL MU FLOW SET PT, to 7.5 (120 gpm).	SOP-106
	RO	2.13 In MAN, adjust FCV-113 A&B, BA FLOW OUTPUT, to the required position which will ensure proper Boric Acid addition for subsequent Automatic Makeup operations.	SOP-106
	RO	2.14 Adjust FCV-113A&B, BA FLOW SET PT, to the desired position to ensure proper boric acid addition for subsequent Automatic Makeup operations.	SOP-106
	RO	2.15 Place RX COOL SYS MU switch to START.	SOP-106
	RO	2.16 Perform the following: a. Start XPP-13A(B), BA XFER PP A(B), for the in-service Boric Acid Tank. b. If necessary, start XPP-13A(B), BA XFER PP A(B), for the Boric Acid Tank on recirculation.	SOP-106
		END OF SECTION	SOP-106

TURNOVER NOTES
(read at the start of the scenario)

Turnover Notes
Mode 1 // 100% Power // Work Week B1 // EOOS: Green // Grid Risk: Green // FEP Risk: Green // Switchyard thermography is in progress. Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102. Xenon concentration is at equilibrium. Midnight RCS Boron Concentration is 1005 ppm.

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CONTROL ROOM SUPERVISOR RELIEF CHECKLIST

DATE/TIME: today

RELIEF SECTION

Turnover Notes
Mode 1 // 100% Power // Work Week B1 // EOOS: Green // Grid Risk: Green // FEP Risk: Green // Switchyard thermography is in progress. Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102. Xenon concentration is at equilibrium. Midnight RCS Boron Concentration is 1005 ppm.

Offgoing Control Room Supervisor	
Operations in progress (GOPs, SOPs, load changes, etc.):	
Operations scheduled for oncoming shifts:	
Plant safeguard systems in degraded status:	
	Initials
In the Control Room, all books are replaced, the desk and console tops are clear, and all trash is properly disposed of.	CRS
Station Log completed.	CRS

Oncoming Control Room Supervisor				**Initials**
Oncoming watch has reviewed the VCS Switchgear mailbox for switching orders.				
Plant Status (to be completed prior to turnover):				
	Plant ESF System Status:			
	Component Cooling System			
	Service water System			
	Reactor Building Cooling System			
	Reactor Building Spray System			
	Accumulator Tanks			
	RHR System			
	Charging/Safety Injection System Emergency Feedwater System			
	Accumulator Tanks			
	Diesel Generator			
	Chilled Water System			
	Control Room Ventilation System			
	Position indications, power availability, and annunciator alarms are normal for present plant conditions.			
		Plant Parameters	Limit	
		Reactor Power	0-100%	
		RCS Tavg	≤589.2°F per loop	
		RCS Pressure	<2385 psig	
		RCS Flow	>100% per loop	
		RCS Subcooling	Normal	
All parameters within allowable limits for plant conditions. If not, what actions are being taken to correct conditions:				
		Review of Logs:		
			Station Log	
			Removal and Restoration Log	
			Tagout Log	
			Special Orders	
Shift Turnover (to be completed during turnover):				
	Briefing on plant conditions by offgoing Control Room Supervisor.			
	Review of SPDS and BISI displays.			
	Discussion of Protected Equipment.			
	Identification of in-progress procedures including their present status and locations.			

C02→	To the best of my knowledge, I am fully qualified to assume this watch taking into consideration fitness for duty, requalification status, and minimum watchstanding qualification.	
Shift relief completed:	Oncoming Control Room Supervisor	
	Offgoing Control Room Supervisor	CR Supervisor
	Shift Supervisor review	

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REACTOR OPERATOR RELIEF CHECKLIST

DATE/TIME: today

LOG SECTION

Date	Entry

RELIEF SECTION

Turnover Notes
Mode 1 // 100% Power // Work Week B1 // EOOS: Green // Grid Risk: Green // FEP Risk: Green // Switchyard thermography is in progress. Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102. Xenon concentration is at equilibrium. Midnight RCS Boron Concentration is 1005 ppm.

Offgoing Reactor Operator	Initials
Main Control Board (Reactor Operator portion) properly aligned for the applicable mode.	RO
Housekeeping is satisfactory in the Reactor Operator area of responsibility.	RO
Discussion of Protected Equipment.	RO

Oncoming Reactor Operator	Initials
Review of HVAC Panel.	
Review of Station Log.	
Review of Removal & Restoration Log.	
Review of Main Control Board Panels.	

System Alignment	A	B	C	Train aligned to	Reasons for any inoperable equipment
Service Water Pumps	X	X		A	
Component Cooling Pumps	X			A	
Charging Pumps	X			A	
HVAC Chillers	X	X		A	
Reactor Building Spray Pumps					
RHR Pumps					
			TDEFP		
Emergency Feedwater Pumps					
Inoperable Radiation Monitors					

C02→	To the best of my knowledge, I am fully qualified to assume this watch taking into consideration fitness for duty, requalification status, and minimum watchstanding qualification.	
Shift relief completed:	Oncoming Reactor Operator	
	Offgoing Reactor Operator	Reactor Operator
	Shift Supervisor review	

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BALANCE OF PLANT RELIEF CHECKLIST

DATE/TIME: today

Date	Entry

RELIEF SECTION

Turnover Notes
Mode 1 // 100% Power // Work Week B1 // EOOS: Green // Grid Risk: Green // FEP Risk: Green // Switchyard thermography is in progress. Alternate Seal Injection is OOS for planned maintenance. It has been OOS for 2 hours and is expected back in 10 hours. A fire watch has been established IAW SOP-102. Xenon concentration is at equilibrium. Midnight RCS Boron Concentration is 1005 ppm.

Offgoing Reactor Operator	Initials
Main Control Board (Reactor Operator portion) properly aligned for the applicable mode.	BOP
Housekeeping is satisfactory in the Reactor Operator area of responsibility.	BOP
Discussion of Protected Equipment.	BOP

Oncoming Reactor Operator	Initials
Review of Main Control Room Panels.	
Review of Station Log.	
Review of Removal & Restoration Log.	
Test annunciator lights (with Offgoing operator concurrence).	

C02→	To the best of my knowledge, I am fully qualified to assume this watch taking into consideration fitness for duty, requalification status, and minimum watchstanding qualification.	
Shift relief completed:	Oncoming Balance of Plant	
	Offgoing Balance of Plant	Balance of Plant
	Shift Supervisor review	

REACTIVITY CONTROL PARAMETERS

NOTE

This information should be recalculated every Sunday Dayshift (when the plant is in Mode 1) to be available for Reactor Engineering review Monday morning or following work day.

RCS Boron Concentration (**C**RCS) 1005 ppm Burnup 10000 MWD/MTU

(Check BAT in Service)

- ☐ **C**B "A" BAT 7350 ppm
- ☒ **C**B "B" BAT 7100 ppm

Moderator Temperature Coefficient (**MTC**) (Fig. II-3.7, HFP) -17.872 pcm/°F

Differential Boron Worth (**DBW**) (Fig. II-7.2, HFP) -6.953 pcm/ppm

Gallons of Boric Acid or Reactor Makeup Water required to change RCS average temperature by one (1) degree:

MTC/DBW = -17.872 / -6.953 = (Δ**B**) 2.57 ppm Boron Change/°F

gal. Acid/°F = 20.94 From Fig. III-2: gal. Acid/°F = $49640\ \ln\left(\frac{(CB-CRCS)}{CB-(CRCS+\Delta B)}\right)$

gal. RMW/°F = 127.14 From Fig. III-3: gal. RMW/°F = $49640\ \ln\left(\frac{CRCS}{(CRCS-\Delta B)}\right)$

Power Defect (PD) for 10% power change (100% to 90%) (Fig. II-2):

1766 PD @ 100% RTP - 1592.8 PD @ 90% RTP = 173.2 Δ Power Defect, pcm

Gallons of Boric Acid only to reduce reactor power from 100% to 90%:

Δ Power Defect/DBW = 173.2 / 6.953 = 24.91 ppm Boron

(Fig. III-2) 203.3 gal. Boric Acid/10% RTP

Final rod height using rods only to reduce reactor power from 100% to 90%:
(Assume ARO)

Δ Power Defect = Integrated Rod Worth (IRW) = 173.2 pcm

(Fig. II-10) 185 final rod height Bank D

REACTIVITY CONTROL PARAMETERS

NOTE
For a 10% reduction in load, ½ of the calculated boric acid should be used and ½ the calculated Control Rod motion.

For a 100% to 90% load reduction:

Use 102 **gallons boric acid** (½ the gallons calculated above), and expect the rods to be at approximately 200 **steps on bank D** (Fig. II-10 series, ½ the IRW, NOT ½ the steps).

To change T_{AVG} by 1° F: 20.9 **gallons Boric Acid/°F**

124.1 **gallons Reactor Makeup Water/°F**

For a 100% to 90% load reduction: **Use** 101.7 **gallons boric acid**

and expect 200 **steps on bank D**

NOTE:
This calculation is to provide a second check to the batch integrator setting to establish continuity between the setting and actual make-up results.

FCV 113 A&B, pot setting for current RCS boron concentration 4.81

Expected Boric Acid flowrate for VCT makeup 19

Expected Boric Acid total gallons on an Auto Makeup based on current BAT in service:

$\frac{\text{Current RCS CB}}{\text{CB for BAT in service}}$ $\frac{1122}{7100}$ x 270 gallons* = 42.7

* Normal Auto Makeup is 267 to 275 gallons

Calculation and Auto Makeup pot settings by Reactor Operator 1 today
Signature / Date

Calculation and Auto Makeup pot settings verified by Reactor Operator 2 today
Signature / Date

Reactor Engineering Review Reactor Engineer Date today

REACTIVITY MANAGEMENT BRIEF MODES 1 - 3

NOTE

PART 1 REACTIVITY MANAGEMENT TURNOVER should be read at Shift Turnover Meeting.

PART 2 REACTOR STATUS should be discussed between the NROATC, BOP, and CRS.

PART 1 **REACTIVITY MANAGEMENT TURNOVER:**

- Date of last Automatic or Manual Make-Up: today
- Is Auto Makeup expected this shift (circle)? YES NO
- Expected Boric Acid total gallons on a normal Auto Makeup based on current BAT in service: 42.7 gallons
- FCV 113 A&B, pot setting for current RCS boron concentration: 4.81
- Expected Boric Acid flowrate for VCT makeup: 19
- Total gallons Diluted 227.3 Borated 42.7 (Last Shift)
- Last evolution (circle one): Borate / Dilute / Blended
- Expected Borations, Dilutions, or Blended changes to the RCS: __________
- List Reactivity Concerns in progress or planned and action(s) necessary (i.e. Steam or Feed Flow transmitter in test, Steam Generator Blowdown out of service, Calorimetric inputs in service, etc.).

  "A" Steam Generator Feed Flow Spikes

REACTIVITY MANAGEMENT BRIEF MODES 1 – 3 (Cont'd)

PART 2 **REACTOR STATUS:** (circle one below)

- Delta I on Target (± 2%)? YES NO Not in Mode 1

  If NO is circled, identify plan to re-establish target band: ____________________

- Xenon Trend: Stable Building In Burning Out
- Demineralizers:

  Mixed Bed in service: A B PRC01 Y / N

  Standby Demineralizer: Filled Borated Empty PRC01

  Cation Bed: Date last in service 1 month ago

  Boron Concentration when in service 1098

- ATTACHMENT IA reviewed and current: YES NO
- Midnight Boron Concentration and Date when CHG/SI pump was secured:

  C_B A ____________ Date ____________

  C_B B 1012 Date 3 days ago

  C_B C 1026 Date 1 week ago

SCHEDULED WORK APPROVAL/DENIAL

Scheduled Work/Activity Date today

Description of Work/Activity to be performed:
Scheduled maintenance on Alternate Seal Injection pump

I. This Moderate Risk, Elevated Risk, High Risk, or Cross Train activity is approved for work provided the required plant conditions are available on the scheduled due date.

OR

This specific activity has been reviewed for EOOS Risk Reassessment. Set EOOS Environmental Variance ________________ Set Risk at Times __________

The following items were considered for making this approval:

Shift Supervisor Operations Supervisor (Moderate Risk or Cross Train)
In the absence of the Operations Supervisor:
Operations Scheduling, Shift Supervisor

________________ GMNPO/MDS (Elevated Risk)

________________ PSRC (High Risk)

II. This work activity/package cannot be performed on the scheduled date due to the following reason(s):

________________ SRO (WCC or On Shift)

________________ Operations Scheduling Supervisor

III. Recommended re-schedule date or plant conditions:

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPSF-141A**

2013 and 2015 NRC Sim a;

RO, SRO-I & SRO-U: Continuous Rod Withdrawal

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

000-006-05-01 RESPOND TO CONTINUOUS ROD MOTION PER AOP-403.3/SOP-403

TASK STANDARD:

The reactor is tripped per AOP-403.3, CONTINUOUS CONTROL ROD MOTION, to terminate the transient prior to rods withdrawing to the point of adding heat (10e0 on Intermediate Range) and immediate actions of EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION, are completed.

TERMINATING CUE: Immediate actions of EOP-1.0, REACTOR TRIP/SAFETY INJECTION ACTUATION are complete.

PREFERRED EVALUATION LOCATION	***PREFERRED EVALUATION METHOD***
SIMULATOR	PERFORM

REFERENCES:

Curve Book	Station Curve Book
REP-109.001	Calculation of Estimated Critical Conditions
REP-109.002	Inverse Count Rate Ratio Plot
GOP Appendix A	Generic Operating Precautions
EOP-1.0	E-0, REACTOR TRIP/SAFETY INJECTION ACTUATION
AOP-403.3	CONTINUOUS CONTROL ROD MOTION
GOP-3	REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2)

INDEX NO.	***K/A NO.***		***RO***	***SRO***
0000012413	2.4.13	Knowledge of crew roles and responsibilities during EOP usage.	4.0	4.6
000001A105	AA1.05	Reactor trip switches	4.3	4.2

TOOLS:
GOP Appendix A, Generic Operating Precautions
NJPSF-141A Handout 1; GOP-3, Reactor Startup from Hot Standby to Startup (MODE 3 TO MODE 2), marked up through step 3.12.k
NJPSF-141A Handout 2; REP-109.002, Enclosure 9.2, Recommended Rod Positions for ICRR marked through Bank C at 129 steps.
AOP-403.3, Continuous Control Rod Motion
EOP-1.0, E-0, Reactor Trip/Safety Injection Actuation
Copy of REP-190.002, Inverse Count Rate Ratio Plot

EVALUATION TIME 30 ***TIME CRITICAL*** No ***10CFR55:*** 45.a.3

TIME START: ____________ TIME FINISH: ____________ PERFORMANCE TIME: __________

PERFORMANCE RATING: SAT: _____ UNSAT: _____

CANDIDATE: ____

EXAMINER: ___________________________ ______________________/__________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: A reactor start up is in progress after a short mini-outage.

GOP-3, REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2), has been completed through step 3.12.k.

The Rod Insertion Limit at 0% power is 118 steps on Control Bank C.

The CRB INSERT LMT LO-LO (XCP-621 1-1) annunciator is NOT clear.

Control bank C is at 129 steps with Control Bank D at 1 step.

The estimated critical position is 100 steps on bank "D".

The Minimum rod height for criticality (-500 pcm equivalent) is 38 steps on Bank D.

The Maximum rod height for criticality (+500 pcm equivalent) is 185 steps on Bank D.

INITIATING CUES: Complete the Reactor Start up and increase reactor power to 10-3% per GOP-3 starting at Step 3.12.l.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Procedure Caution: Reactor startup should be stopped and I&C notified if the CRB INSERT LMT LO-LO (XCP-621 1-1) annunciator fails to clear between 118 steps and 134 steps on Bank C.

Step 3.12.l; Verify CRB INSERT LMT LO-LO (XCP-621 1-1) annunciator clears between 118 steps and 134 steps on Bank C..

Steps________________

STEP STANDARD:

Verifies LO-LO insertion Limit Annunciator clears (XCP-621 1-1)

CUES:

Evaluator note: Provide Examinee with copies of NJPA-141A Handout 1 (GOP-3.0 markup) and NJPA-141A Handout 2 (REP-109.002 Enclosure 9.2 mark up) following initial conditions brief.

Surrogate cue: Once Examinee is ready (on evaluator prompt) provide the following direction "Pull to 6 steps on Control Bank D or until the LO-LO Insertion Limit Alarm Clears whichever occurs first"

Evaluator note: Expect alarm to clear at 3 steps withdrawn on Control Bank D.

Surrogate cue: Once Examinee stops and verifies LO-LO insertion limit annunciator is clear, provide the following direction "Pull to 10 steps on Control Bank D."

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 2

Procedure Caution: 12 steps should NOT be exceeded until all Rod Bottom lights are off. If all Control Bank D Rod Bottom lights are NOT off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

Step 3.12.m; At ten steps on Control Bank D, stop and verify Bank D RB lights clear.

STEP STANDARD:

Stops at 10 steps withdrawn on Control Bank D.

CUES:

Surrogate cue: After Examinee stops rod pull give the following direction "Inform me when counts are stable"

Surrogate cue: After Examinee announces counts are stable state "ICRR is 0.4 and criticality is predicted at 120 steps withdrawn on Control Bank D." Then give the following direction "Pull Control Bank D to 16 steps withdrawn or until LO Insertion Limit annunciator clears whichever comes first."

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 3

Step 3.12.n; Recommence withdrawing rods while observing that the groups sequence properly.

STEP STANDARD:

Continues to pull rods and stops at 16 steps withdrawn on Control Bank D or when the LO Insertion Limit Annunciator clears .

CUES:

Surrogate cue: Once Examinee stops and verifies LO insertion limit annunciator is clear, provide the following direction "Pull to 53 steps on Control Bank D."

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 4

Recommence withdrawing rods while observing that the groups sequence properly.

STEP STANDARD:

Continues rod withdrawal.

CUES:

Evaluator note: When rods are >51 steps on Bank D the continuous rod motion malfunction inserts. When examinee stops pull at 53 steps continuous rod motion occurs. This is the point that the JPM becomes alternate path.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 5

Enters AOP-403.3, CONTINUOUS CONTROL ROD MOTION.

STEP STANDARD:

Enters AOP-403.3, CONTINUOUS CONTROL ROD MOTION.

CUES:

Evaluator note: The examinee is not expected to pull out the procedure, but may perform the actions of this procedure from memory and trip the unit.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 6

Step 1; Verify rod motion is NOT required:

Tavg is within 1.5 °F of Tref.

AND

No load rejection has occurred (C7A OR C7B).

STEP STANDARD:

Notes Tavg and Tref matched and Status lights for C7A and C7B are dim: rod motion is not required.

CUES:

Evaluator note: This is an immediate operator action from AOP-403.3 and is expected to be performed from memory.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 7

Step 2; Place ROD CNTRL BANK SEL Switch in MAN.

STEP STANDARD:

Rods are already in manual no action required.

CUES:

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 8

Step 3; Verify rod motion is stopped.

STEP STANDARD:

Notes rods out light lit, step counters clicking and DRPI showing Bank D withdrawing, concludes that rod motion has NOT stopped.

CUES:

Evaluator note: This is an immediate operator action from AOP-403.3 and is expected to be performed from memory.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 9

Step 3 Alternative Action: Perform the following:

a) Trip the Reactor.

b) GO TO EOP-1.0. REACTOR TRIP/SAFETY INJECTION ACTUATION.

STEP STANDARD:

Turns one of the two reactor trip switches to trip prior to rods withdrawing to the Point of Adding Heat (10e0 on Intermediate Range instrumentation).

CUES:

Evaluator note: This is an immediate operator action from the Alternative Action of AOP-403.3 step 3. The Point of Adding Heat was noted at approximately 170 steps withdrawn on Control Bank D during development.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 10

Procedure Note:
-Steps 1 through 5 are Immediate Operator Actions.
-The EOP REFERENCE PAGE should be monitored throughout the use of this procedure.
- Conditions for implementing Emergency Plan Procedures should be evaluated using EPP-001, ACTIVATION AND IMPLEMENTATION OF EMERGENCY PLAN.

Step 1. Verify Reactor Trip:

- Trip the Reactor using either Reactor Trip Switch.

- Verify all Reactor Trip and Bypass Breakers are open.

- Verify all Rod Bottom Lights are lit.

- Verify Reactor Power level is decreasing.

STEP STANDARD:

Verifies:
-Reactor Trip and Bypass Breakers indicate Green light ON Red light OFF.
-Rod Bottom Lights are lit.
-Reactor Power level is decreasing.

CUES:

Evaluator note: This is an immediate operator action from EOP-1.0 and is expected to be performed from memory.

Evaluator cue: Direct Examinee to perform all Immediate actions from EOP-1.0 (both RO and BOP actions).

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 11

Step 2; Verify Turbine/Generator Trip:

a. Verify all Turbine STM STOP VLVs are closed.

b. Ensure Generator Trip (after 30 second delay):

1) Ensure the GEN BKR is open.

2) Ensure the GEN FIELD BKR is open.

3) Ensure the EXC FIELD CNTRL is tripped.

STEP STANDARD:

Verifies:
a. All Turbine STM STOP VLV indicate closed, status light for each valve is bright.

b. GEN BKR, GEN FIELD BKR, and EXC FIELD CNTRL indicate Green light ON and Red light OFF.

CUES:

Evaluator note: This is an immediate operator action from EOP-1.0 and is expected to be performed from memory.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 12

Step 3; Verify both ESF buses are energized.

STEP STANDARD:

Verifies potential lights on 1DA and 1DB are ON for all three phases on both buses.

CUES:

Evaluator note: This is an immediate operator action from EOP-1.0 and is expected to be performed from memory.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 13

Step 4; Check if SI is actuated:

a. Check if either:

SI ACT status light is bright on XCP-6107 1-1.

OR

Any red first-out SI annunciator is lit on XCP-626 top row.

Alternative Action go to Step 5.

STEP STANDARD:

Verifies: status light dim and no SI first out lit, goes to Step 5.

CUES:

Evaluator note: This is an immediate operator action from EOP-1.0 and is expected to be performed from memory.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 14

Step 5; Check if SI is required:

a. Check if any of the following conditions exist:

PZR pressure LESS THAN 1850 psig.

OR

RB pressure GREATER THAN 3.6 psig.

OR

Steamline pressure LESS THAN 675 psig.

OR

Steamline differential pressure GREATER THAN 97 psid.

Alternative action GO TO EOP-1.1, ES-0.1, REACTOR TRIP RECOVERY, Step 1.

STEP STANDARD:

Verifies:
PZR pressure is greater than 1850 psig
RB pressure less than 3.6 psig
All steam line pressures greater than 675 psig
All steam line pressures within 97 psi.

Transitions to EOP-1.1, ES-0.1, REACTOR TRIP RECOVERY.

CUES:

Evaluator note: This is an immediate operator action from EOP-1.0 and is expected to be performed from memory.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPSF-141A

DESCRIPTION: 2013 and 2015 NRC Sim a; RO, SRO-I & SRO-U: Continuous Rod Withdrawal

IC SET: 310

INSTRUCTIONS:

If IC 310 is designated for this JPM reset to IC 310.

1. RUN

2. Set up Audio Count Rate per GOP-3, step 3.4.e

3. Turn on Digital Reactivity Function of the IPCS per REP-109.002 step 7.6. set up display at ROATC SIPCS station using ZZREAC or RX STRT off the ZZ Menu.

4. Place HIGH FLUX AT SHUTDOWN in block per GOP-3, step 3.11.b.

5. Set SIPCS to MODE 2 per GOP-3, step 3.11.f

6. Set NR-45 to HI speed.

7. RUN until the Heat up or cooldown history clears on SIPCS. This may take 10-15 minutes on the initial reset.

8. FREEZE

9. When Examinee is ready (on Evaluator cue) go to RUN.

If IC 310 is not designated for this JPM then initial conditions may be established by resetting to IC 15 and following the below directions:

1. Go to RUN and withdraw Control Rods to 129 steps on Control bank C (1 step on Control Bank D).

2. Insert: MAL-PCS009AB REACTOR TRIP BREAKER A FAILURE (FAIL TO OPEN)
   Delay = 0, Fail To = AUTO (UV)

2. Insert MAL-PCS009BB REACTOR TRIP BREAKER B FAILURE (FAIL TO OPEN)
   Delay = 0, Fail To = AUTO (UV)

4. Set Event #1 as Mcrfpa(11) >51

5. Insert: MAL-CRF006B UNCONTROLLED MANUAL ROD MOTION, Delay=0, set to event #1

6. Set up Audio Count Rate per GOP-3, step 3.4.e

7. Place HIGH FLUX AT SHUTDOWN in block per GOP-3, step 3.11.b

8. Set SIPCS to MODE 2 per GOP-3, step 3.11.f

9. Turn on Digital Reactivity Function of the IPCS per REP-109.002 step 7.6.set up display at ROATC SIPCS station using ZZREAC or RX STRT off the ZZ Menu.

10. Set NR-45 to HI speed.

11. RUN until the Heat up or cooldown history clears on SIPCS. This may take 10-15 minutes on the initial reset.

12. FREEZE

13. When examinee is ready: RUN

COMMENTS:

Provide a surrogate in the role of CRS to simulate performing REP-109.002, Inverse Count Rate Ratio Plot and to provide cues for start up process.

During development, the Point of Adding Heat (10e0 on Intermediate Range) was observed at approximately 170 steps withdrawn on Control Bank D when the continuous rod withdrawal was allowed to proceed with auto trips failed malfunction in place. When the continuous rod motion malfunction was run without the auto trips blocked it took 2 minutes to reach the Source Range High Flux trip setpoint (10e5 CPS) and Control Bank D was at 147 steps withdrawn..

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS:

INITIAL CONDITION: A reactor start up is in progress after a short mini-outage.

GOP-3, REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2), has been completed through step 3.12.k.

The Rod Insertion Limit at 0% power is 118 steps on Control Bank C. The

CRB INSERT LMT LO-LO (XCP-621 1-1) annunciator is NOT clear.

Control bank C is at 129 steps with Control Bank D at 1 step.

The estimated critical position is 100 steps on bank "D".

The Minimum rod height for criticality (-500 pcm equivalent) is 38 steps on Bank D.

The Maximum rod height for criticality (+500 pcm equivalent) is 185 steps on Bank D.

INITIATING CUES: Complete the Reactor Start up and increase reactor power to 10-3% per GOP-3 starting at Step 3.12.l.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

NJPSF-141A Handout 1

SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

NUCLEAR OPERATIONS
COPY NO._________

GENERAL OPERATING PROCEDURE

GOP-3

REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2)

REVISION 13

SAFETY RELATED

RECORD OF CHANGES

CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE	CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE
A	P	01/25/10					
B	P	06/19/12					
C	P	07/02/12					
D	P	04/26/14					
E	P	06/30/14					
F	P	11/14/14					

CONTINUOUS USE

Continuous Use of Procedure Required.
Read Each Step Prior to Performing.

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TABLE OF CONTENTS

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1.0 PURPOSE/SCOPE

1.1 This procedure provides instructions for Reactor Startup, from Hot Standby to Startup.

1.2 The following governing regulations apply to this procedure:

a. 10CFR50.59.

b. 10CFR50, Appendix B.

c. SAP-630, Procedure/Commitment Accountability Program.

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NOTE 2.0 and 3.0

a. All personnel who sign off steps in this procedure must enter their names and initials on Attachment I.

b. Each step should be initialed and dated when all its substeps are either completed and checked-off or marked N/A and initialed.

NOTE 2.0

If this procedure must be initiated under conditions other than those in Section 2.0, INITIAL CONDITIONS, the Shift Supervisor or Control Room Supervisor will review Sections 2.0, INITIAL CONDITIONS, and 3.0, INSTRUCTIONS. Steps that are not applicable due to plant conditions will be marked N/A and initialed by the Shift Supervisor or Control Room Supervisor. All other items will require sign-off or check-off.

2.0 INITIAL CONDITIONS

INITIALS/DATE

2.1 RCS status is as follows: SRO / Today

a. System temperature is being maintained between 555°F and 559°F using the Bank 1 Condenser Steam Dumps or Steamline PORVs. ☐

b. System pressure is being maintained between 2230 psig and 2240 psig in AUTO control. ☐

c. All Reactor Coolant Pumps are in operation. ☐

d. Pressurizer level is being maintained at 25% in AUTO control. ☐

2.2 All Safety Injection Systems are aligned and operable. SRO / Today

2.3 Excore NIs are aligned for critical operation per SOP-404, Excore Nuclear Instrumentation System. SRO / Today

2.4 The Reactor is shutdown with all Control Bank Rods fully inserted. SRO / Today

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INITIALS/DATE

2.5 Shutdown Margin is being maintained for Mode 3 conditions per STP-134.001, Shutdown Margin Verification. SRO / Today

2.6 Reactor Makeup Control is in AUTO and set for blended flow equal to the existing boron concentration. SRO / Today

2.7 Secondary Plant status is as follows: SRO / Today

a. The Main Turbine is on the Turning Gear per SOP-215, Main Turbine Lube Oil Supply System. ☐

b. The Main Feedwater Pumps are on their Turning Gears per SOP-209, Feedwater Turbine Lube Oil System. ☐

c. Narrow Range Steam Generator levels are being maintained between 60% and 65% with chemistry within specification using the following:

1) Blowdown per SOP-212, Steam Generator Blowdown. ☐

2) Emergency Feedwater per SOP-211, Emergency Feedwater System. ☐

d. Main Steam is being warmed per SOP-201, Main Steam System. ☐

e. Feedwater is being warmed per SOP-210, Feedwater System. ☐

f. Condensate is in operation per SOP-208, Condensate System. ☐

g. Circulating Water is in operation per SOP-207, Circulating Water. ☐

2.8 The Rod Control and Position Indicating Systems are in operation per SOP-403, Rod Control And Position Indicating System. SRO / Today

2.9 The Control Rod Drive Mechanism Ventilation System is in operation per SOP-114, Reactor Building Ventilation System. SRO / Today

2.10 GOP Appendix A review has been completed. SRO / Today

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

3.0 INSTRUCTIONS

INITIALS/DATE

3.1 Shut down and isolate BTRS as follows: SRO / Today

a. Place HCV-387, BTRS BYP FLOW, in BYP. ☐

b. Place BTRS SELECT Switch in OFF. ☐

3.2 Verify RCS Chemistry control for startup: SRO / Today

a. Contact Chemistry to ensure RCS Chemistry control is satisfactory for startup per CP-625, Chemistry Refueling Shutdown And Startup Plan. ☐

CHG F

b. Record current Boron concentration: ☐

1658 ppm

3.3 Perform the following if an RB entry is in progress or will occur during the reactor startup: NA SRO Today

a. Obtain the approval of the General Manager, Nuclear Plant Operations, for personnel to be in the RB during the reactor startup ☐

b. Notify Health Physics that a reactor startup is about to commence and dose rates in the RB could change rapidly. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

3.4 Align Excore NIs for Reactor Startup as follows: SRO / Today

Z005→ a. Ensure INI00033-NI, REMOTE SOURCE RANGE MONITOR, is de-energized with fuses removed per SOP-404, Excore Nuclear Instrumentation System, Section IV.F. ☐ CHG D

Z007→ b. Ensure the following Nuclear Instrumentation Channels are in operation per SOP-404, Excore Nuclear Instrumentation System, Section III.A and tested per the applicable STPs:

1) Two Source Range Channels. ☐

2) Two Intermediate Range Channels. ☐

3) At least three Power Range Channels. ☐

c. Verify both Source Range Channels are indicating a minimum of two counts per second. ☐

d. Perform either of the following to monitor Source and Intermediate Range Channels as follows:

1) Select the highest reading Source Range Channel and either Intermediate Range Channel on recorder NR-45, NIS RECORDER. ☐

2) Monitor the highest reading Source Range Channel and either Intermediate Range Channel using computer display NR45 in FAST SPEED. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.4 continued

> NOTE 3.4.e
>
> Audio Count Rate is not required to be operable.

e. At the AUDIO COUNT RATE CHANNEL drawer, perform the following:

1) Select the highest reading Source Range Channel on the CHANNEL SELECTOR Switch. ☐

2) Adjust the AUDIO MULTIPLIER Switch as necessary to maintain a distinguishable audio countrate. ☐

3) Place the SR COUNTER/SCALER, POWER switch in the POWER position. ☐

3.5 Complete Attachment III.A, Prior to Closing Reactor Trip Breakers in Modes 3, 4 & 5, of GTP-702. SRO / Today

C01→ N01→ 3.6 Ensure the P-4 trip actuating device operational test is performed and Reactor Trip breakers are closed per STP-345.039, Reactor Trip P-4 Trip Actuating Device Operational Test. SRO / Today

Z008→ 3.7 Ensure both Rod Control MG sets are supplying load to to Rod Control per SOP-403, Rod Control and Position Indicating System, Section III.A. SRO / Today CHG B CHG D

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

3.8 If necessary, withdraw the Shutdown Banks as follows: SRO / Today

a. Verify Shutdown Margin Boron Concentration is satisfactory by performing STP-134.001, Shutdown Margin Verification for Mode 3 with S/D Banks OUT ☐

b. Place ROD CNTRL START UP RESET Switch in START UP. ☐

CAUTION 3.8.c
To minimize the possibility of binding at the full in position, rods should not be driven below the 000 indication on the Group Demand Step Counters.

c. Ensure the Step Counters indicate zero (000) steps. ☐ CHG D

Z009→ d. Update Rod Bank positions on the IPCS, refer to OAP-107.1, Control of IPCS Functions, Step 6.2.b. ☐ CHG C

e. Ensure IZM01200, DRPI Main Control Board Display Monitor, and IZM01201, DRPI Main Control Board Display Monitor, indicate RB. ☐ CHG F

f. Momentarily depress the ROD CNTRL ALARM RESET Pushbutton. ☐

g. Verify ROD CNTRL SYS FAIL URGENT (XCP-620 5-1) and ROD CNTRL SYS FAIL NON-URGENT (XCP-620 5-5) alarms cleared. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.8 continued

CAUTION 3.8.h

To prevent any inadvertent inward rod motion the ROD CNTRL BANK SEL Switch should not be placed in or pass through AUTO.

NOTE 3.8.h

Reactor Coolant System temperature is being maintained between 555°F and 559°F using the Bank 1 Condenser Steam Dumps or Steamline PORVs.

h. Place ROD CNTRL BANK SEL Switch in SBA. ☐

CAUTION 3.8.i

12 steps should **NOT** be exceeded until Rod Bottom lights are off. If all Shutdown Bank A Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

i. Using the ROD CONTROL ROD MOTION Lever, perform the following:

1) Withdraw Shutdown Bank A to ten Steps. ☐

2) Verify that all RB lights for Shutdown Bank A are off. ☐

3) Using the ROD CONTROL ROD MOTION Lever, withdraw SBA to 230 steps. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

A. Shutdown Bank Control:

1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

a) The RCS is borated to Cold Shutdown concentration and verified by sample.

b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

B. Source Range Control:

1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

2) While in the Source Range, positive reactivity may be changed by only one controlled method.

C. Anticipate criticality anytime:

1) During rod motion.

2) Boron dilution is in progress.

INITIALS/DATE

Step 3.8 continued

CAUTION 3.8.j To prevent any inadvertent inward rod motion the ROD CNTRL BANK SEL Switch should not be placed in or pass through AUTO.

j. Place ROD CNTRL BANK SEL Switch in SBB. ☐

CAUTION 3.8.k 12 steps should **NOT** be exceeded until Rod Bottom lights are off. If all Shutdown Bank B Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

k. Using the ROD CONTROL ROD MOTION Lever, perform the following:

1) Withdraw Shutdown Bank B to ten steps. ☐

2) Verify that all RB lights for Shutdown Bank B are off. ☐

3) Using the ROD CONTROL ROD MOTION Lever, withdraw SBB to 230 steps. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

3.9 Contact Reactor Engineering for recommended rod heights and Estimated Critical Condition information. SRO / Today

> NOTE 3.10
>
> Reactor Coolant System temperature is being maintained between 555°F and 559°F using the Bank 1 Condenser Steam Dumps or Steamline PORVs.

3.10 Perform a Shutdown Margin verification per STP-134.001, Shutdown Margin Verification, using Estimated Critical Condition boron, desired RCS temperature, and expected xenon. SRO / Today

STTS # 15-012345

> NOTE 3.11 through 3.13
>
> For initial criticality following refueling, REP-107.001, Controlling Procedure For Refueling Startup And Power Ascension Testing, is the controlling document for Reactor Startup. Appropriate steps of GOP-3 should be initialed as they are performed.

3.11 Prepare for Reactor Startup as follows: SRO / Today

a. Adjust Boron concentration as required by Estimated Critical Condition calculation as follows:

Z003→
Z010→
Z017→

1) Borate or dilute per SOP-106, Reactor Makeup Water System, Sections III.D, III.E, or III.F. ☐ CHG D

2) When complete, direct Chemistry to sample the RCS and the Pressurizer for boron. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.11 continued

b. Block HIGH FLUX AT SHUTDOWN as follows:

1) Disable the IPCS High Flux At Shutdown alarm function as follows:

a) Type the Turn-On-Code HFAS. ☐

b) Verify OPERATOR DISABLED is indicated above the ENABLE CALCS box. ☐ CHG D

c) If OPERATOR ENABLED is indicated, select DISABLE CALCS. ☐

2) Place HIGH FLUX AT SHUTDOWN Switch for SOURCE RANGE N-31 in BLOCK. ☐

3) Place HIGH FLUX AT SHUTDOWN Switch for SOURCE RANGE N-32 in BLOCK. ☐

4) Verify SR HI FLUX AT SHUTDN BLOCK (XCP-620 4-4) annunciator alarms. ☐

c. Review Estimated Critical Condition calculation within four hours prior to criticality, verifying predicted rod height is above the Rod Insertion Limit per Tech Spec 4.1.1.1.1.c. ☐

Time 3 Hours ago

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

A. Shutdown Bank Control:

1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

a) The RCS is borated to Cold Shutdown concentration and verified by sample.

b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

B. Source Range Control:

1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

2) While in the Source Range, positive reactivity may be changed by only one controlled method.

C. Anticipate criticality anytime:

1) During rod motion.

2) Boron dilution is in progress.

INITIALS/DATE

Step 3.11 continued

d. Review the following for current status and limitations for Mode escalation:

1) Removal and Restoration Log. ☐

2) Danger Tag Log. ☐

3) 31 Day Surveillance Book. ☐

4) Ensure completion of Attachment II.F, Operational Mode Change Plant Startup - Entering Mode 2, of GTP-702. ☐

5) Ensure SAP-116, PLANT TRIP/SAFETY INJECTION PLANT RECOVERY, is completed, if necessary. ☐

Z011→ e. Perform OAP-100.4, Communication, Attachment I, Mode Change Brief Checklist. ☐ CHG D

f. Update the IPCS Plant Mode indicator to indicate Mode 2 as the current Plant Mode as follows:

1) Type the Turn-On-Code MODE to display the PLANT MODE CHANGE DISPLAY window ☐

2) Select the SET MODE 2 Pushbutton. ☐

3) Verify the selected Mode is displayed on the left end of the top toolbar. ☐

g. Verify all Shutdown Bank Rods fully withdrawn within 15 minutes of commencing Control Bank Rod withdrawal. ☐

Time 10 Minutes prior to control bank withdrawal

1. GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

A. Shutdown Bank Control:

1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

a) The RCS is borated to Cold Shutdown concentration and verified by sample.

b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

B. Source Range Control:

1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

2) While in the Source Range, positive reactivity may be changed by only one controlled method.

C. Anticipate criticality anytime:

1) During rod motion.

2) Boron dilution is in progress.

INITIALS/DATE

Step 3.11 continued

NOTE 3.11.h
Reactor Coolant System temperature is being maintained between 555°F and 559°F using the Bank 1 Condenser Steam Dumps or Steamline PORVs.

h. Obtain the Shift Supervisor's permission to commence a Reactor Startup. ☐

i. Announce Reactor Startup over the page system. ☐

j. If used, place NR-45 CHART in HI speed. ☐

k. Initiate REP-109.002, Inverse Count Rate Ratio Plot. ☐

Time 5 minutes prior to Control Banks withdrawal

l. If performing an initial cycle startup, refer to REP-107.001, Controlling Procedure For Refueling Startup And Power Ascension Testing, for additional actions. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

A. Shutdown Bank Control:

1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

a) The RCS is borated to Cold Shutdown concentration and verified by sample.

b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

B. Source Range Control:

1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

2) While in the Source Range, positive reactivity may be changed by only one controlled method.

C. Anticipate criticality anytime:

1) During rod motion.

2) Boron dilution is in progress.

INITIALS/DATE

3.12 Achieve Reactor criticality as follows: ______/______

a. Review GOP Appendix A, Generic Operating Precautions, for Reactor Startup. ☐

> CAUTION 3.12.b
>
> To prevent any inadvertent inward rod motion the ROD CNTRL BANK SEL Switch should not be placed in or pass through AUTO.

b. Place the ROD CNTRL BANK SEL Switch in MAN. ☐

> NOTE 3.12.c
>
> A stable Startup Rate of one decade per minute should **NOT** be exceeded.

c. Using ROD CONTROL ROD MOTION lever, commence Control Bank Rod withdrawal to ten steps on Bank A. ☐

Time 2 hours ago

> CAUTION 3.12.d
>
> 12 steps should **NOT** be exceeded until all Rod Bottom lights are off. If all Control Bank A Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

d. At ten steps on Control Bank A, stop and verify:

1) Bank A RB lights clear. ☐

2) ONE ROD ON BOTTOM (XCP-621 3-1) annunciator clears. ☐

3) RODS ON BOTTOM (XCP-621 3-2) annunciator clears. ☐

e. Recommence withdrawing rods while observing that the groups sequence properly. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.12 continued

CAUTION 3.12.f
12 steps should **NOT** be exceeded until all Rod Bottom lights are off. If all Control Bank B Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

f. At ten steps on Control Bank B, stop and verify Bank B RB lights clear. ☐

g. Recommence withdrawing rods while observing that the groups sequence properly. ☐

h. Verify 102 step Bank Overlap between Control Bank A and Control Bank B. ☐

CAUTION 3.12.i
12 steps should **NOT** be exceeded until all Rod Bottom lights are off. If all Control Bank C Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

i. At ten steps on Control Bank C, stop and verify Bank C RB lights clear. ☐

j. Recommence withdrawing rods while observing that the groups sequence properly. ☐

k. Verify 102 step Bank Overlap between Control Bank B and Control Bank C. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.12 continued

> CAUTION Step 3.12.l
>
> Reactor startup should be stopped and I&C notified if the CRB INSERT LMT LO-LO (XCP-621 1-1) annunciator fails to clear between 118 steps and 134 steps on Bank C.

l. Verify CRB INSERT LMT LO-LO (XCP-621 1-1) annunciator clears between 118 steps and 134 steps on Bank C. ☐

Steps ______________

> CAUTION 3.12.m
>
> 12 steps should **NOT** be exceeded until all Rod Bottom lights are off. If all Control Bank D Rod Bottom lights are **NOT** off at ten steps, AOP-403.5, Stuck Or Misaligned Control Rod, should be entered.

> NOTE 3.12.m
>
> Reactor Coolant System temperature is being maintained between 555°F and 559°F using the Bank 1 Condenser Steam Dumps or Steamline PORVs.

m. At ten steps on Control Bank D, stop and verify Bank D RB lights clear ☐

n. Recommence withdrawing rods while observing that the groups sequence properly. ☐

o. Verify the CRB INSERT LMT LO (XCP-621 1-2) annunciator clears between 138 steps and 144 steps on Bank C. ☐ CHG A

Steps ______________

p. Verify 102 step Bank Overlap between Control Bank C and Control Bank D. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.12 continued

q. Within 15 minutes before achieving criticality, verify T_{avg} greater than or equal to 551°F. ☐

Time ____________ Tave ____________

r. Announce criticality over the page system. ☐

Time ____________

s. Verify critical rod position is above the Rod Insertion Limit per Tech Spec 3.1.3.6. ☐

t. Maintain as close to 0 SUR as reasonably achievable. ☐

u. At the AUDIO COUNT RATE CHANNEL drawer, place the following switches in OFF:

1) AUDIO MULTIPLIER. ☐

2) CHANNEL SELECTOR. ☐

3) SR COUNTER/SCALER, POWER switch. (Toggle down) ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

3.13 Increase Reactor Power to 10^{-3}% as follows: ______/______

a. Establish a stable Startup Rate of less than one decade per minute. ☐

b. At 7.5×10^{-6}%, perform the following:

1) Verify P6 Permissive energizes to bright. ☐

2) Verify a minimum of one decade overlap between Source Range Channels and Intermediate Range Channels. ☐

c. Prior to 10^{5} CPS, perform the following:

1) Momentarily place SR TRAIN A Switch in BLOCK. ☐

2) Verify SR A TRIP BLCK Permissive energizes to bright. ☐

3) Momentarily place SR TRAIN B Switch in BLOCK. ☐

4) Verify SR B TRIP BLCK Permissive energizes to bright. ☐

d. Perform one of the following for continued monitoring of Intermediate and Power Range instrument:

1) If available for use, select one Intermediate Range Channel and one Power Range Channel on NR-45, NIS RECORDER. ☐

2) Ensure at least one Intermediate Range and at least one Power Range instrument are selected for continuous monitoring using computer display NR45. ☐

e. Stabilize Reactor Power at 10^{-3}%. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

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         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

Step 3.13 continued

f. Record the following Critical Data:

1) RCS pressure: ________________ psig ☐

2) T_{avg}: _____________ °F ☐

3) Bank ___________ at ____________ steps ☐

4) Boron Concentration: ___________ ppm ☐

5) Time: _____________ ☐

6) Stable Power: ________________% ☐

g. If performing an initial cycle startup, refer to REP-107.001, Controlling Procedure For Refueling Startup And Power Ascension Testing, for physics testing instructions. ☐

GOP 3 REFERENCE PAGE

1. GENERAL NOTES

   A. Procedure steps should normally be performed in sequence. However, it is acceptable to perform steps in advance after thorough evaluation of plant conditions and impact by the Shift Supervisor or Control Room Supervisor.

   B. At least two licensed operators, one of whom is SRO licensed, must be present in the Control Room during Reactor Startup.

2. REACTOR CONTROL

   A. Shutdown Bank Control:

      1) The Shutdown Banks must be fully withdrawn whenever reactivity additions are being made by dilution, Xenon, T_{avg}, or control rods unless one of the following conditions exists:

         a) The RCS is borated to Cold Shutdown concentration and verified by sample.

         b) T_{avg} is 557°F and the RCS is borated to the hot, Xenon-free concentration and verified by sample.

      2) If the count rate on any source range channel increases by more than a factor of two during any increment of Shutdown Bank withdrawal, rod withdrawal shall be stopped and the Shutdown Bank reinserted. Until Reactor Engineering has made a satisfactory evaluation of the situation, rod withdrawal shall not resume.

   B. Source Range Control:

      1) Source Range Counts and Digital Rod Position indication should be monitored during any Shutdown and Control Bank withdrawal or insertion.

      2) While in the Source Range, positive reactivity may be changed by only one controlled method.

   C. Anticipate criticality anytime:

      1) During rod motion.

      2) Boron dilution is in progress.

INITIALS/DATE

CAUTION 3.14

While operating with a positive Moderator Temperature Coefficient:

a. All reactivity additions should be slow and controlled.

b. A stable Startup Rate of 0.3 decade per minute should not be exceeded.

c. Rods should be moved in 1/2 step increments until the effect of rod motion has been evaluated.

NOTE 3.14

Ensure sufficient Emergency Feedwater Flow exists prior to raising power.

3.14 Increase Reactor Power to between 1% and 3%. _______/_______

3.15 At the Point of Adding Heat, if NR-45, NIS RECORDER, had previously been selected to HI speed place the recorder in LO speed. _______/_______

CAUTION 3.16

a. Adjustment of Tavg with the Rod Control System must not be attempted with the ROD CNTRL BANK SEL Switch in any position other than MAN.

b. Manual rod control is required to establish equilibrium conditions, since C-5 blocks automatic rod withdrawal.

3.16 Maintain T_{avg} between 555°F and 559°F. _______/_______

3.17 Complete Attachment II.G, Operational Mode Change Plant Startup - Entering Mode 1, of GTP-702. _______/_______

3.18 Proceed to GOP-4A, Power Operation (Mode 1 - Ascending). _______/_______

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4.0 REFERENCES

4.1 CP-625, Chemistry Refueling Shutdown And Startup Plan. CHG F

4.2 FSAR Section 5.0.

4.3 GOP Appendix A.

4.4 GOP-4A, Power Operation (Mode 1 - Ascending).

4.5 GTP-702, Operational Mode Change and Contingency Surveillance Requirements.

4.6 OAP-100.4, Communication.

4.7 REP-107.001, Controlling Procedure For Refueling Startup And Power Ascension Testing.

4.8 REP-109.002, Inverse Count Rate Ratio Plot.

4.9 SAP-630, Procedure / Commitment Accountability Program.

4.10 SOP-103, Boron Thermal Regeneration System.

4.11 SOP-106, Reactor Makeup Water System.

4.12 SOP-114, Reactor Building Ventilation System.

4.13 SOP-201, Main Steam System.

4.14 SOP-205, Turbine Sealing Steam System.

4.15 SOP-206, Main and Auxiliary Condenser Air Removal System.

4.16 SOP-207, Circulating Water.

4.17 SOP-208, Condensate System.

4.18 SOP-209, Feedwater Turbine Lube Oil System.

4.19 SOP-210, Feedwater System.

4.20 SOP-211, Emergency Feedwater System.

4.21 SOP-212, Steam Generator Blowdown.

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4.22 SOP-215, Main Turbine Lube Oil Supply System.

4.23 SOP-403, Rod Control And Position Indicating System.

4.24 SOP-404, Excore Nuclear Instrumentation System.

4.25 STP-134.001, Shutdown Margin Verification.

4.26 STP-345.039, Reactor Trip P-4 Trip Actuating Device Operational Test.

4.27 V.C. Summer Precautions, Limitations, and Setpoints.

4.28 V.C. Summer Reactor Engineering Procedures.

4.29 V.C. Summer Tech Specs.

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NJPSF-141A Handout 2

Recommended Rod Positions for ICRR

Bank A		Bank B		Bank C		Bank D		Purpose
0	X							Start
10	X							Rod Bottom lights
53	X							**ICRR**
103	X							**ICRR**
129	X	1						Overlap
138		10	X					**ICRR**, RB lights
181		53	X					**ICRR**
230		103	X					**ICRR**, Overlap
		129	X	1				Overlap
		138		10	X			**ICRR**, RB lights
		181		53	X			**ICRR**
		230		103	X			**ICRR**, Overlap
				*118-134**	X			*LO-LO Alarm Clear*
				129	X	1		Overlap
				*118-134**		*0-6*		*LO-LO Alarm Clear*
				138		10		**ICRR**, RB lights,
				138-144		*10-16*		*LO Alarm Clear*
				181		53		**ICRR**
				206		78		**ICRR** (If < 0.2)
				230		103		**ICRR**, Overlap
						128		**ICRR** (If < 0.2)
						153		**ICRR**
						178		**ICRR**
						203		**ICRR**

☐ = placekeeping checkbox

*LO-LO Alarm should clear in the 118-134 range and overlap should be checked at 129.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPSF-007A**

2015 NRC Sim b SRO & RO: Steam Generator Tube Rupture
(Depressurize RCS to < Ruptured S/G Pressure)

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

000-038-05-01 RESPOND TO STEAM GENERATOR TUBE RUPTURE PER EOP-4.0

TASK STANDARD:

RCS pressure is reduced to less than ruptured S/G pressure with PZR level > 10% or PZR level 76% or RCS subcooling < 52.5°F. The use of applicable Human Performance Tools (3-way communications, self checking, peer checking, phonetic alphabet, etc) and industrial safety practices meets expectations. This JPM is related to PRA event OAP2 " Depressurize RCS to stop leakage into ruptured S/G"

TERMINATING CUE: RCS depressurization completed with task standard met and the chosen PORV Block valve closed.

PREFERRED EVALUATION LOCATION ***PREFERRED EVALUATION METHOL***

SIMULATOR PERFORM

REFERENCES:

EOP-4.0 E-3, STEAM GENERATOR TUBE RUPTURE

INDEX NO.	***K/A NO.***		***RO***	***SRO***
010000A203	A2.03	PORV failures	4.1	4.2

TOOLS: Copy of EOP-4.0 marked for current plant conditions (tube rupture on S/G "C") up to step 24.

EVALUATION TIME 10 ***TIME CRITICAL*** No ***10CFR55:*** 45(a)6

TIME START: __________ TIME FINISH: __________ PERFORMANCE TIME: __________

PERFORMANCE RATING: SAT: _____ UNSAT: _____

CANDIDATE: ____________________

EXAMINER: ____________________ ____________________ / __________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: A Steam Generator Tube Rupture is in progress. S/G "C" has been isolated per EOP-4.0. An operator initiated cooldown has been performed according to EOP-4.0, through Step 23.

INITIATING CUES: Control Room Supervisor directs you as ROATC to depressurize the RCS using PZR Spray, per EOP-4.0, Step 24.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Attempt to depressurize the RCS using normal spray valve PCV-444D.

STEP STANDARD:

Places PZR Spray Valve PCV-444D controller in MANUAL and increases output to 100% demand. Determines that PCV-444D did not open based on Red light OFF and Green light ON for PCV-444D.

CUES:

Evaluator note: Give candidate 1-2 minutes to become familiar with control board indications and status of procedure implementation.

Evaluator note: With "B" and "C" RCP secure candidate should NOT attempt to open PCV-444C. Proceeds to Step 25 based on alternative action Step 24 a.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

Verifies at least one PZR PORV is available.

STEP STANDARD:

Notes all three PZR PORVs are available by observing Green lights ON for all PORV position indicators.

CUES:

COMMENTS:

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 3

Opens one PZR PORV until any termination criteria is met; RCS pressure < 'C' (ruptured) S/G pressure and PZR level > 10%; or PZR level >76; or RCS subcooling <52.5°F.

STEP STANDARD:

Selected PORV indicates Red light ON, Green light OFF.

RCS pressure decreases.

Recognizes one of the following from MCB indications:

-RCS pressure < 'C' S/G pressure with PZR level >10% or,
-PZR level >76% or,
-RCS subcooling <52.5°F.

CUES:

Evaluator note: Using the MCB indicators it is most likely that candidate will terminate on RCS pressure < Ruptured ('C') S/G pressure and PZR level > 10%, but if using IPCS values it is possible that they will terminate on PZR level >76. Both termination criteria occur at about the same time and terminating on either one is satisfactory.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 4

Closes Selected PORV.

STEP STANDARD:

Takes PORV Control Switch for the Selected PORV to the CLOSE position.

- Notes Selected PORV position indicates Red light ON, Green light OFF and RCS pressure still decreasing.
- Candidate notes that selected PORV failed to close.

CUES:

Evaluator note: This is the point that the JPM becomes alternate path.

COMMENTS:

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 5

Stops RCS depressurization by closing block valve for associated PORV.

STEP STANDARD:

Places associated PORV Block Valve (MVG-8000A/B/C) to close observes Red light OFF, Green light ON.

CUES:

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPSF-007A

DESCRIPTION: 2015 NRC Sim b SRO & RO: Steam Generator Tube Rupture (Depressurize RCS to < Ruptured S/G Pressure)

IC SET: 311

INSTRUCTIONS:

If IC-311 is designated for this JPM then reset to IC-311, leaving simulator in FREEZE.

Set IPSC to display 2PS1 at the RO station.

Mark up EOP-4.0 for current plant conditions (tube rupture on SG "C") up to step 24.

When Examinee is ready, (on evaluator cue) go to RUN.

If IC-311 is not designated for this JPM then initial conditions may be established by reseting to IC-10 and following the below directions:

1. Insert: MAL-RCS002C Final Value = 600 Ramp = 0 (S/G Tube Rupture on 'C' S/G)
   MAL-PRS003B Final Value = 0 (PRESSURIZER SPRAY VALVE 444D FAILURE)
2. Set Event #1 as X05i386o >0
   Set Event #2 as X05i387o >0
   Set Event #3 as X05i388o >0
3. Insert: VLV-RC004P Final Value = 100 (PCV-445A STUCK OPEN), set to event #1
   VLV-RC001P Final Value = 100 (PCV-444B STUCK OPEN), set to event #2
   VLV-RC005P Final Value = 100 (PCV-445B STUCK OPEN), set to event #3
4. RUN 180 seconds
5. Manual SI and perform actions of EOP-1.0 & EOP-4.0 up through step 4.
6. Throttle EFW to 'C' S/G when level > 40%.
7. FREEZE
8. Insert: LOA-MSS033 Position To = RACK OUT, (RACK OUT BKR FOR MVG-2802B (STM SUPPLY TO TDEFP))
9. RUN
10. Trip RCPs "B" and "C".
11. Perform actions of steps 5 to step 23 of EOP-4.0.
12. FREEZE
13. Set IPSC to dsplay 2PS1 at the RO station.
14. Mark up EOP-4.0 for current plant conditions (tube rupture on SG "C") up to step 24.
15. When Examinee is ready: RUN

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS:

INITIAL CONDITION: A Steam Generator Tube Rupture is in progress. S/G "C" has been isolated per EOP-4.0. An operator initiated cooldown has been performed according to EOP-4.0, through Step 23.

INITIATING CUES: Control Room Supervisor directs you as ROATC to depressurize the RCS using PZR Spray, per EOP-4.0, Step 24.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPS-065**

2015 NRC Sim c RO:

Establish Hot Leg Injection During Loss of RHR at Mid-Loop Conditions

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

000-083-05-01 RESPOND TO LOSS OF RESIDUAL HEAT REMOVAL SYSTEM WHILE AT MID-LOOP CONDITIONS PER AOP-115.5/SOP-115

TASK STANDARD:

SI flow verified on FI-940, CHG LOOP A CLD/HOT LG FLOW and hot leg level increasing.

TERMINATING CUE: SI flow verified on FI-940 and hot leg level increasing.

PREFERRED EVALUATION LOCATION SIMULATOR

PREFERRED EVALUATION METHOD PERFORM

REFERENCES:

AOP-115.1 RHR PUMP VORTEXING

AOP-115.5 LOSS OF RHR WITH THE RCS NOT INTACT (MODES 5 AND 6)

INDEX NO.	K/A NO.		RO	SRO
000025K301	AK3.01	Shift to alternate flowpath	3.1	3.4

TOOLS: AOP-115.5 marked to match initial conditions.

EVALUATION TIME 10 ***TIME CRITICAL*** No ***10CFR55:*** 41(b)10

TIME START: ______________ TIME FINISH: ______________ PERFORMANCE TIME: ____________

PERFORMANCE RATING: SAT: _____ UNSAT: _____

CANDIDATE: ______________________________

EXAMINER: ______________________ ______________________ / ____________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The plant was in Mode 5 with RCS at Mid-loop conditions with the Reactor head installed and the Pressurizer Manway removed.

The 'A' RHR loop was the in-service loop.

Due to lowering hot leg level, the Crew entered AOP-115.1 and then AOP-115.5.

The present conditions are :

- RCS hot leg level is off scale low.
- Step 17 of AOP-115.5 has been reached and core exit TC temperatures are >200°F and increasing.
- The 'B' Charging pump is in service.

INITIATING CUES: The CRS directs you as NROATC to establish Hot Leg Injection per AOP-115.5, Attachment 2.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 1

Step 1. Check if a Charging Pump is available.

STEP STANDARD:

Verifies 'B' charging pump is available by observing Red light ON above pump control switch and amps indicated on ammeter.

CUES:

Evaluator cue: Inform Examinee that a surrogate will answer all annunciators that are not related to the task.

Evaluator note: Assure that SIPCS screens are set up per the JPM Setup Instructions.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 2

Step 2. Stop any running Charging Pump

STEP STANDARD:

Stops 'B' Charging pump by placing control switch to STOP.

CUES:

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 3

Step 3. Close MVG-8107 and MVG-8108, CHG LINE ISOL.

STEP STANDARD:

Positions MVG-8107 & 8108, CHG LINE ISOLs, to closed position, Red light OFF and Green light ON for each valve.

CUES:

Evaluator note: At least one of the valves must be closed to satisfy step.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 4

Step 4.a. Ensure all of the following are closed

MVG-8885, CHG LP A ALT TO COLD LEGS.

MVG-8801A(B), HI HEAD TO COLD LEG INJ.

STEP STANDARD:

Verifies MVG-8885, CHG LP A ALT TO COLD LEGS, indicates Red light OFF and Green light ON.

Verifies MVG-8801A & B, HI HEAD TO COLD LEG INJ, indicates Red light OFF and Green light ON.

CUES:

COMMENTS:

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 5

Step 4.b. Open MVG-8884, CHG LP A TO HOT LEGS..

STEP STANDARD:

Places TRN A PWR LCKOUT switch to ON.

Positions MVG-8884, CHG LP A ALT TO HOT LEGS, to Open position; Red light ON and Green light OFF.

CUES:

Evaluator note: The procedure does not describe operation of the Power Lockout Switch but this action is required to get MVG-8884 to change position.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 6

Step 4.c. Close MVG-8106, CHG PP, Miniflow Isolation.

STEP STANDARD:

Positions MVG-8106 CHG PP, Miniflow Isolation to Closed position; Red light OFF and Green light ON

Places TRN A LCKOUT switch to OFF.

CUES:

Evaluator note; MVG-8106 operation relies on the same power lockout switch as MVG-8884.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 7

Step 4.d. Close MVT-8105, SEAL WTR INJ ISOL.

STEP STANDARD:

Positions MVT-8105, SEAL WTR INJ ISOL, to Closed position; Red light OFF and Green light ON.

CUES:

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 8

Step 5. Start one Charging Pump.

STEP STANDARD:

Starts 'B' Charging pump by placing control switch to START position. Pump indicates Red light ON and Green light OFF with normal pump amps.

CUES:

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 9

Step 6. Verify SI flow on FI-940, CHG LOOP A CLD/HOT LG FLOW GPM.

STEP STANDARD:

SI flow verified on FI-940, CHG LOOP A CLD/HOT LG FLOW.

CUES:

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 10

Restores Hot Leg level

STEP STANDARD:

Hot Leg level > 15.5"

CUES:

Evaluator cue: End JPM when level begins to increase.

Evaluator note: The RCS Mid Loop Level Monitoring system LR-1330/1331 indicates in inches above the bottom of the Hot Leg and 15.5" is the desired indication. The Mansell indication is in feet elevation and 430' 10" is the desired reading.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPS-065

DESCRIPTION: 2015 NRC Sim c RO: Establish Hot Leg Injection During Loss of RHR at Mid-Loop Conditions

IC SET: 312

INSTRUCTIONS:

If IC 312 is designated for this JPM then reset to IC 312, leaving the simulator in FREEZE.

1. Set one SIPCS screen to HALFPIPE from the Map Menu selections and another to ZZSHTDWN, Shutdown off the ZZ Menu pad.

2. Set up Mansell Level monitoring and display on CRS SIPCS screen by typing MLMSA or MLMSB from any SIPCS screen NOTE: NEED to verify that SIM group has enabled the Mansell Function with exam security set. Discussed with Jody Lawter on 6/16/14 and Sim group is aware and working on this. If the SIPCS function is NOT enabled set up the lap top for Mansell Indication.

3. When Examinee is ready (on evaluator cue) go to RUN

If IC-312 is not designated for this JPM then initial conditions may be established by reseting to IC-20 and following the below directions:

1. Insert: MAL-RCS006C Final Value = 4000 (RCS Cold leg leak)
   OVR-AA028 Override To = True (Ann acknowledge)
   LOA-RCS053 Final Value = POWER_ON (Mid-loop Monitor Disconnect Switch)

2.Set one SIPCS screen to HALFPIPE from the Map Menu selections and another to ZZSHTDWN, Shutdown off the ZZ Menu pad..

3. Set up Mansell Level monitoring and display on CRS SIPCS screen by typing MLMSA or MLMSB from any SIPCS screen NOTE: NEED to verify that SIM group has enabled the Mansell Function with exam security set. Discussed with Jody Lawter on 6/16/14 and Sim group is aware and working on this. If the SIPCS function is NOT enabled set up the lap top for Mansell Indication.

4. RUN

5. Perform actions of AOP-115.1, step 1 waiting for break flow to require Alternative Action 1 d.

6. Perform actions of AOP-115.5 steps 1-4 and steps 11 - 17.

7. When core exit TC temperature is >200°F, with LT1330/1331 < 15.5" and Mansell < 430' 10" modify MAL-RCS006C to 2,000.

9. FREEZE

8. When Examinee is ready (on evaluator cue): RUN

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The plant was in Mode 5 with RCS at Mid-loop conditions with the Reactor head installed and the Pressurizer Manway removed.

The 'A' RHR loop was the in-service loop.

Due to lowering hot leg level, the Crew entered AOP-115.1 and then AOP-115.5.

The present conditions are :

- RCS hot leg level is off scale low.
- Step 17 of AOP-115.5 has been reached and core exit TC temperatures are >200°F and increasing.
- The 'B' Charging pump is in service.

INITIATING CUES: The CRS directs you as NROATC to establish Hot Leg Injection per AOP-115.5, Attachment 2.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPSF-019A**

2015 NRC Sim d RO & SRO-U:

Manually Initiate Reactor Building Spray

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

026-005-01-01 MANUALLY INITIATE REACTOR BUILDING SPRAY PER SOP-116/EOP1.0.

TASK STANDARD:

At least one train of containment spray is manually actuated with >2500 gpm per EOP-1.0 and RCPs are secured PRIOR to damaging RCP due to loss of CCW as evident from Motor Bearing temperature exceeding 195°F or Lower Seal Water Bearing temperature exceeding 225°F or Seal Water Outlet temperature exceeding 235°F.

TERMINATING CUE: RB Spray initiated.

PREFERRED EVALUATION LOCATION

SIMULATOR

PREFERRED EVALUATION METHOD

PERFORM

REFERENCES:

EOP-1.0 E-0, REACTOR TRIP/SAFETY INJECTION ACTUATION

INDEX NO.	***K/A NO.***		***RO***	***SRO***
026000A401	A4.01	CSS controls	4.5	4.3

TOOLS: EOP-1.0, E-0, REACTOR TRIP/SAFETY INJECTION ACTUATION marked through step 7.

EVALUATION TIME 5 ***TIME CRITICAL*** NO ***10CFR55:*** 45(b)(8)

TIME START: ____________ TIME FINISH: ____________ PERFORMANCE TIME: ____________

PERFORMANCE RATING: SAT: _____ UNSAT: _____

CANDIDATE: ______________________________

EXAMINER: ______________________________ ______________________ / __________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The reactor has tripped from 100% power and an SI has occurred.

INITIATING CUES: The CRS directs you as the ROATC to perform Step 8 of EOP-1.0, E-0, REACTOR TRIP/SAFETY INJECTION ACTUATION.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Step 8; Verify RB pressure has remained LESS THAN 12 psig on PR-951, RB PSIG (P-951), red pen

STEP STANDARD:

Verifies RB pressure >12 PSIG, moves to Alternative Action column for step 8.

CUES:

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 2

AA Step 8 a); Verify both the following annunciators are lit:

XCP-612 3-2 (RB SPR ACT).

XCP-612 4-2 (PHASE B ISOL).

IF either annunciator is NOT lit, THEN actuate RB Spray by placing the following switches to ACTUATE:

Both CS-SGA1 and CS-SGA2.

OR

Both CS-SGB1 and CS-SGB2.

STEP STANDARD:

Verifies both annunciators are NOT lit.

Places (CS-SGA1 and CS-SGA2) or (CS-SGB1 and CS-SGB2) to the ACTUATE position.

CUES:

Evaluator note: These switches require two hand operation to turn both switches at once.

Evaluator note: Examinee may try both trains of switches. If only "A" train switches are used they will fail to work and starting individual components becomes critical. If "B" train switches are used they will cause all spray system functions to occur EXCEPT the Train "A" RB Spray pump discharge valve, MVG-3003A, will not automatically open and must be manually opened. The JPM becomes alternate path once the Examinee begins manual realignment actions.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 3

AA Step 8 b); Verify Phase B Isolation by ensuring RB SPRAY/PHASE B ISOL monitor lights are bright on XCP-6105.

STEP STANDARD:

PHASE B Isol monitor lights are bright on XCP-6105.

CUES:

Evaluator cue: If told as the SS that Phase B monitor lights are not bright on XCP-6105 then direct Examinee to ensure valves are aligned as required for Phase B.

Evaluator note: If only the "A" train switches were used then PHASE B lights will not turn bright.

COMMENTS:

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 4

AA Step 8c); Ensure the following are open:

MVG-3001A(B), RWST TO SPRAY PUMP A(B) SUCT.

MVG-3002A(B), NAOH TO SPRAY PUMP A(B) SUCT.

MVG-3003A(B), SPRAY HDR ISOL LOOP A(B).

STEP STANDARD:

MVG-3001A(B), RWST TO SPRAY PUMP A(B) SUCT. Indicates Red light ON, Green light OFF.

MVG-3002A(B), NAOH TO SPRAY PUMP A(B) SUCT. Indicates Red light ON, Green light OFF.

MVG-3003A(B), SPRAY HDR ISOL LOOP A(B). Indicates Red light ON, Green light OFF.

CUES:

Evaluator Note: If only "A" train switches were used in JPM step 2 the Examinee must manually open all valves from their MCB switches.

Evaluator Note: MVG-3003A must be opened manually regardless of which train switches were attempted to actuate RB spray. Examinee must manually open the valve from its MCB switches.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 5

AA Step 8 d); Ensure both RB Spray Pumps are running.

STEP STANDARD:

Verifies 'A' and 'B' RB Spray Pumps are running by Red light ON indication and normal running amps.

CUES:

Evaluator Note: This step is critical if the "B" train switches were not attempted to actuate RB spray. If only "A" train switches were used in JPM step 2 the Examinee must manually start the pumps from their MCB switches.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 6

AA Step 8 e); Verify RB Spray flow is GREATER THAN 2500 gpm for each operating train on:

FI-7368, SPR PP A DISCH FLOW GPM.

FI-7378, SPR PP B DISCH FLOW GPM.

STEP STANDARD:

FI-7368, SPR PP A DISCH FLOW, and FI-7378, SPR PP B DISCH FLOW, are > 2500 gpm.

CUES:

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 7

AA Step 8 f); Stop all RCPs.

STEP STANDARD:

Places 'A', 'B', & 'C' RCP switches in Stop; Red light OFF, Green light ON, flow decreasing and 0 running amps PRIOR to damaging RCP due to loss of CCW as evident from Motor Bearing temperature exceeding 195°F or Lower Seal Water Bearing temperature exceeding 225°F or Seal Water Outlet temperature exceeding 235°F.

CUES:

Evaluator Note: It is possible that the Examinee may decide to trip RCPs at the beginning of this JPM based on RB Hi 3 pressure. The EOP-1.0 reference page lists the Phase B actuation annunciator (XCP-612 4-2) as criteria for tripping RCPs not the Hi 3 pressure. The phase B has not happened at the beginning of the JPM but it should have. The Examinee will ensure that it does happen. A premature trip of the RCPs would be technically incorrect but NOT grounds for failure.

****

Booth Operator note: Do not reset the simulator until Evaluator is satisfied that RCP temperatures were not exceeded. Provide information from SIPCS in the booth.

****

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPSF-019A

DESCRIPTION: 2015 NRC Sim d RO & SRO-U: Manually Initiate Reactor Building Spray

IC SET: 313

INSTRUCTIONS:

If IC-313 is designated for this JPM then reset to IC 313 leaving the simulator in FREEZE.

1. RUN, silence annunciators and FREEZE promptly.

2. Silence DCS speaker.

3. Set up SIPCS in Booth with RCP temperatures; Motor Bearings, Lower Seal Water Bearing and Seal Watrer Outlet.

4. When Examinee is ready (on Evaluator cue) go to run.

If IC-313 is not designated for this JPM then initial conditions may be established by reseting to IC-10 and following the below directions:

1. Insert: LOA-PCS109 Position To = AS IS (HI-3 Channel 1 fail as is)
   LOA-PCS110 Position To = AS IS (HI-3 Channel 2 fail as is)
   LOA-PCS116 Position To = AS IS (HI-3 Channel 4 fail as is)
   MAL-RHR008A Reactor Building Spray Pump "A" discharge valve (3003A) fail
   MAL-MSS003A Final Value = 1.2E7, (Steamline break inside containment)
   OVR-SG011 Override To = FALSE, (Fail RB Spray actuation switch) CS-SGA1 (Train A)
   OVR-SG012 Override To = FALSE, (Fail RB Spray actuation switch) CS-SGA2 (Train A)

2. Set event #1 as x02i101o = = 1 (Allows manual opening of 3003A when 101 switch taken to open)

3. Insert a "new" MAL-RHR008A, set to Event #1, set Delete in = 1 second.

4 .RUN until RB pressure >12 psig and ESF loading sequencer is complete (approximately 60 seconds). Leave RCPs running.

5. FREEZE

6. Ensure RCS pressure is greater than the 1418 psig RCP trip criteria then modify MAL-MSS003A to final value = 1.8E6

7. RUN, silence annunciators and FREEZE promptly.

8. Silence DCS speaker.

9. Set up SIPCS in Booth with RCP temperatures; Motor Bearings, Lower Seal Water Bearing and Seal Watrer Outlet.

10. When Examinee is ready (on evaluator cue): RUN

COMMENTS:

Failing 1/2 RB Spray Actuation switches in a train will disable that function.

CAUTION:*

Booth Operator do NOT reset simulator until Evaluator has verified RCP Temperatures did NOT exceed critical standard of Motor Bearing > 195°F, Lower Seal Water Bearing > 225°F and Seal Water Outlet >235°F.

****

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The reactor has tripped from 100% power and an SI has occurred.

INITIATING CUES: The CRS directs you as the ROATC to perform Step 8 of EOP-1.0, E-0, REACTOR TRIP/SAFETY INJECTION ACTUATION.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPSF-025A**

2015 NRC Sim e RO:

Start and Load "A" Emergency Diesel Generator

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

064-003-01-01 LOAD THE DIESEL GENERATOR

TASK STANDARD:

The "A" Diesel Generator is tripped from the MCB upon exceeding the high lube oil temperature trip setpoint and prior to paralleling. The use of applicable Human Performance Tools (3-way communications, self checking, peer checking, phonetic alphabet, etc) and industrial safety practices meets expectations.

TERMINATING CUE: "A" D/G tripped at the MCB.

PREFERRED EVALUATION LOCATION	***PREFERRED EVALUATION METHOD***
SIMULATOR	PERFORM

REFERENCES:

ARP-001-XCP-636 ANNUNCIATOR RESPONSE PROCEDURE (PANEL XCP-636)

SOP-306 EMERGENCY DIESEL GENERATOR

INDEX NO.	***K/A NO.***		***RO***	***SRO***
064000A401	A4.01	Local and remote operation of the ED/G	4.0	4.3
064000A101	A1.01	ED/G lube oil temperature and pressure	3.0	3.1

TOOLS: NJPSF-025A Handout 1; SOP-306 Section IV.A, Operation of Diesel Generator A from the Control Room in the Test Start Mode, marked up through step 2.2.i. Clean replacement copies of ARP-001-XCP-636, 6-3

EVALUATION TIME 15 ***TIME CRITICAL*** No ***10CFR55:*** 45(a)8

TIME START: ________ TIME FINISH: ________ PERFORMANCE TIME: ________

PERFORMANCE RATING: SAT: ____ UNSAT: ____

CANDIDATE: ________________

EXAMINER: ________________ ____________ / ______

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The plant is operating at 100% power.

Normal and Alternate AC power available to buses 1DA and 1DB.

It is an A2 Maintenance Work Week.

Relay testing is in progress on 1DA which requires the removal of 1DA from both NORMAL and ALTERNATE feed. Station and Operations Management have given approval for this work due to recent OE concerning maintenance of these relays.

"A" D/G is to be started and loaded onto bus 1DA. Bus 1DA will then be divorced from its NORMAL and ALTERNATE power sources until completion of testing.

All pre-start check steps have been completed.

INITIATING CUES: The CRS directs you as an RO to start and load "A" D/G per SOP-306, Section IV.A, Steps 2.2.j thru 2.5.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Step 2.2 j. At the Main Control Board, perform the following:

1) Depress the GEN RELAYS RESET Pushbutton.

2) Momentarily place the EXCITER Switch, to RESET.

3) Ensure XCP-636 1-2 (DG A AUTOSTART NOT READY) is NOT in alarm.

STEP STANDARD:

DG A GEN RELAYS RESET Pushbutton is depressed.

DG A EXCITER Switch taken to RESET.

DG A AUTOSTART NOT READY annunciator is clear.

CUES:

Evaluator cue: Provide NJPSF-025A Handout 1, SOP-306 Section IV.A marked up to the Examinee at conclusion of JPM brief.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

Step 2.3 a. To start Diesel Generator A from the Main Control Board, perform the following:

a. Ensure the diesel is ready to be started as indicated by the following:

1) XCP-636 1-2 (DG A AUTOSTART NOT READY) is NOT in alarm.

2) The READY FOR AUTO START Light is lit at the Diesel Generator A Local Control Panel (DB-436).

STEP STANDARD:

Verifies DG A AUTOSTART NOT READY annunciator is clear.

Calls the IB operator and verifies the "READY FOR AUTO START" light is ON at the "A" D/G Local Control Panel.

CUES:

Booth Operator cue: When requested, as the IB operator, inform the Examinee that the "READY FOR AUTO START" light is ON at the "A" D/G Local Control Panel.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 3

Step 2.3 b. Momentarily place the Diesel Generator A TEST Switch to START.

STEP STANDARD:

Momentarily rotates "A" Diesel Generator TEST switch to the START position.

CUES:

Evaluator note: Examinee should request a peer check.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 4

Step 2.3 c. Verify the Diesel Generator starts and stabilizes between the following:

1) 58.9 Hz and 61.1 Hz.

2) 6800 volts and 7600 volts.

STEP STANDARD:

DG A VOLTS indicates 6800-7600 volts and FREQUENCY indicates 58.9 - 61.1 Hertz.

CUES:

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 5

Step 2.3 d. Reset the tripped Diesel Generator 'A' relay flags at the local panel (XCX-5201, DB-436).

STEP STANDARD:

Calls the IB operator and verifies the Diesel Generator 'A' relay flags are reset at the Local Control Panel.

CUES:

Booth Operator cue: When requested, as the IB operator, inform the operator that the Diesel Generator 'A' relay flags have been reset.

Evaluator cue: If asked, as CRS direct Examinee to load "A" DG per the schedule contained in Note 2.4.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 6

Procedure note: Prior to closing the Diesel Generator Breaker, the Diesel should be run at no-load for at least ten minutes.

Step 2.4 If the Diesel Generator is to be loaded, perform the following:

a. Ensure the VOLT REG Switch is in AUTO.

b. Place the DG A SYNC SEL Switch in DSL.

STEP STANDARD:

Commences ten minute wait

Ensures VOLT REG Switch is in AUTO

Places the DG A SYNC SEL Switch in DSL.

CUES:

Evaluator cue: When the Examinee begins the 10 minute wait, cue that the 10 minute wait is complete.

Evaluator note: Annunciator 636, 6-3 DG A ENG TEMP TRBL will alarm when the Synch Selector is placed in DSL. Completion of step 2.4 is not expected or required.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 7

Contact IB Operator to identify cause of Annunciator 636, 6-3, DG A ENG TEMP TRBL when it alarms.

STEP STANDARD:

Calls IB Operator with request to identify cause for Temperature alarm on "A" DG.

References Annunciator response procedure for XCP 636, 6-3.

CUES:

Booth Operator cue: When contacted as IB Operator report that Lube Oil temperature locally is indicating 178°F and rising.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 8

Ensure AUTOMATIC ACTIONS of Annunciator 636, 6-3 since the alarm is due to High Temp.

STEP STANDARD:

Operator takes "A" DG TEST Switch to STOP.

CUES:

Booth Operator cue: If called as IB operator regarding LO temp report "A" DG Lube Oil Temperature locally indicated 185°F and rising.

Booth Operator cue: If called as IB operator to locally trip the DG reply that you left the DG room due to safety concerns since the Diesel was making loud noises.

Evaluator note: Examinee should recognize that "A" DG has exceeded trip setpoint and has not automatically tripped. It is critical that the Operator take action to trip the "A" EDG at this point.The JPM becomes alternate path once lube oil temperature exceeds 175°F and the auto trip has not occurred.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPSF-025A

DESCRIPTION: 2015 NRC Sim e RO: Start and Load "A" Emergency Diesel Generator

IC SET: 314

INSTRUCTIONS:

If IC-314 is designated for this JPM then reset to IC-314 leaving the simulator in FREEZE.

1. When Examinee is ready (on Evaluator cue) go to RUN.

If IC-314 is not designated for this JPM then initial conditions may be established by reseting to IC-10 and following the below directions:

1. Set event #1 as x13i101d==1 (DG 'A' Synch Selector Switch in DSL)

2. Insert: ANN-DG014 Delay = 0 Fail To = ON (DG A ENG TEMP TRBL), set to event #1

3. When Examinee is ready; RUN

COMMENTS:

Booth Operator note: Prepare a set of clean replacement copies of ARP-001-XCP-636, 6-3 and replace the page as necessary following completion of JPM.

JPM BRIEFING SHEET

<u>OPERATOR INSTRUCTIONS:</u>

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The plant is operating at 100% power.

Normal and Alternate AC power available to buses 1DA and 1DB.

It is an A2 Maintenance Work Week.

Relay testing is in progress on 1DA which requires the removal of 1DA from both NORMAL and ALTERNATE feed. Station and Operations Management have given approval for this work due to recent OE concerning maintenance of these relays.

"A" D/G is to be started and loaded onto bus 1DA. Bus 1DA will then be divorced from its NORMAL and ALTERNATE power sources until completion of testing.

All pre-start check steps have been completed.

INITIATING CUES: The CRS directs you as an RO to start and load "A" D/G per SOP-306, Section IV.A, Steps 2.2.j thru 2.5.

<u>HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.</u>

IV. INFREQUENT OPERATIONS

A. OPERATION OF DIESEL GENERATOR A FROM THE CONTROL ROOM IN THE TEST START MODE

1.0 INITIAL CONDITIONS

☐ 1.1 A **Pre-Job Brief** has been conducted per OAP-100.3.

☐ 1.2 The Precautions of Section II have been reviewed.

☐ 1.3 Diesel Generator A is prepared to start per Section III.

☐ 1.4 Enclosure F, Tech Spec/EOOS/Functionality Review has been reviewed.

2.0 INSTRUCTIONS

2.1 If XTF0004, UNIT 1 ENGINEERED SAFEGUARD TRANSFORMER is in service and Diesel Generator A will be paralleled to the 115KV line, perform one of the following (YD-380 SSW):

> NOTE 2.1.a
>
> Immediately prior to and during the time the XTF0006, XTF0004 7.2KV VOLTAGE REGULATOR, AUTO-OFF-MANUAL Switch is placed in MANUAL or OFF, the 115KV and the 7.2KV Bus voltages being supplied from XTF0006 should be monitored continuously. 115KV Bus voltage should be verified and recorded to be within the limits specified in OAP-106.1 for the present transformer configuration with the regulator out of service. If the OAP limits are exceeded, the System Controller should be notified to restore 115KV Bus voltage to within the limits.

a. With XTF0006, XTF0004 7.2KV VOLTAGE REGULATOR in service, perform the following:

☐ 1) Monitor ESF XFMR FEED KV (MCB) voltage and either 1DA VOLTS and/or 1DB VOLTS (MCB) Bus voltage being supplied from XTF0006.

☐ 2) Using the Generic Log attachment from OAP-106.1, Operating Rounds, record an initial ESF XFMR FEED KV (MCB) voltage and either 1DA VOLTS and/or 1DB VOLTS (MCB) Bus voltage and then record hourly thereafter.

Step 2.1 continued

☐ 3) Place the XTF0006, XTF0004 7.2KV VOLTAGE REGULATOR, AUTO-OFF-MANUAL Switch, in OFF.

☐ b. ~~With XTF0006, XTF0004 7.2KV VOLTAGE REGULATOR out of service, ensure XES0008, 7.2KV TRANSFER & DISC SWITCHES Transfer Switch is in the LOAD position.~~

NA
SRO
Today

NOTE 2.2
a. If Diesel Generator A has been run in the last twenty-four (24) hours, Step 2.2 may be omitted.

C01↓ 2.2 Verify the Diesel Generator A cylinders are free of fluid as follows:

☐ a. At the Main Control Board, momentarily place the EXCITER Switch, in SHUTDN. **(PEER ✓)**

☐ b. Place the REMOTE/LOCAL/MAINT Switch, in MAINT (DB-436). **(PEER ✓)**

☐ c. Verify the fuel injection racks move freely (DB-436).

☐ d. Open all twelve cylinder test cocks (DB-436).

☐ e. Place the fuel rack in the NO FUEL position by one of the following methods (DB-436):

1) Hold the Stop Lever in the STOP position.

2) Place the Stop Lever in the STOP position and install the Fuel Rack Stop Lever Blocking Device.

Step 2.2 continued

CAUTION 2.2.f
Personnel should stand clear of both sides of Diesel Generator A when barring the engine due to the exhaust of high pressure air from the test cocks.

NOTE 2.2.f
Some discharge from the cylinder test cocks, such as a spray or mist, is to be expected. Excessive discharge which results in accumulation of fluid in the area indicates a potential coolant leak in the cylinders. If excessive fluid is found in one or more cylinders, the Diesel Generator must be declared Inoperable and the appropriate actions taken.

☐ f. While observing the cylinder test cocks to detect the possibility of fluid leakage into the cylinders, bar the engine over by one of the following methods (DB-436):

1) Starting air by momentarily depressing the TEST START Pushbutton.

2) Starting air by using the spanner wrench on the top of one of the Main Air Start Valves on the engine.

3) Barring device motor.

4) Manually, using a wrench attached to the shaft end.

g. Remove the Stop Lever from STOP by one of the following methods (DB-436):

☐ 1) If the Stop Lever was held in the STOP position, release the Stop Lever from the STOP position.

2) If the Fuel Rack Stop Lever Blocking Device was installed, perform the following:

☐ a) Remove the Fuel Rack Stop Lever Blocking Device.

☐ b) Release the Stop Lever from the STOP position.

C01↑ ☐ h. Close all twelve cylinder test cocks (DB-436).

Step 2.2 continued

☐ i. Place the REMOTE/LOCAL/MAINT Switch, in REMOTE (DB-436). **(PEER ✓)**

j. At the Main Control Board, perform the following:

☐ 1) Depress the GEN RELAYS RESET Pushbutton.

☐ 2) Momentarily place the EXCITER Switch, to RESET.

☐ 3) Ensure XCP-636 1-2 (DG A AUTOSTART NOT READY) is NOT in alarm.

CAUTION 2.3 through 2.7
The REMOTE/LOCAL/MAINT Switch should NOT be operated anytime the Diesel Generator is running.

2.3 To start Diesel Generator A from the Main Control Board, perform the following:

a. Ensure the diesel is ready to be started as indicated by the following:

☐ 1) XCP-636 1-2 (DG A AUTOSTART NOT READY) is NOT in alarm.

☐ 2) The READY FOR AUTO START Light is lit at the Diesel Generator A Local Control Panel (DB-436).

☐ b. Momentarily place the Diesel Generator A TEST Switch to START. **(PEER ✓)**

c. Verify the Diesel Generator starts and stabilizes between the following:

☐ 1) 58.9 Hz and 61.1 Hz.

☐ 2) 6800 volts and 7600 volts.

☐ d. Reset the tripped Diesel Generator A relay flags at the local panel (XCX-5201, DB-436).

NOTE 2.4

If time permits, the following guidelines should be utilized to achieve the desired load:

a. Prior to closing the Diesel Generator Breaker, the Diesel should be run at no-load for at least ten minutes.

b. Once the Diesel Generator Breaker is closed, load should be adjusted to between 850 KW and 1000 KW and maintained for at least ten minutes.

c. Load should be adjusted to between 2250 KW and 2550 KW and maintained for at least ten minutes.

d. Load should be adjusted to between 3250 KW and 3550 KW and maintained for at least ten minutes.

e. Load should be adjusted to between 4150 KW and 4250 KW and maintained for at least ten minutes.

2.4 If the Diesel Generator is to be loaded, perform the following:

☐ a. Ensure the VOLT REG Switch is in AUTO. **(PEER ✓)**

☐ b. Place the DG A SYNC SEL Switch in DSL. **(PEER ✓)**

☐ c. Using the VOLT REG RAISE-LOWER Switch adjust Diesel Generator A SYNC VOLTS to slightly higher than 1DA SYNC VOLTS. **(PEER ✓)**

☐ d. Using the SPEED Switch, adjust Diesel Generator A frequency to cause the SYNCHROSCOPE to rotate slowly in the FAST direction (clockwise). **(PEER ✓)**

☐ e. When the SYNCHROSCOPE passes 11 o'clock and slowly approaches 12 o'clock, close BUS 1DA DG FEED Breaker. **(PEER ✓)**

Step 2.4 continued

NOTE 2.4.f

Limits per Enclosure B, Diesel Generator Power Factor, should be maintained.

f. Using the SPEED Switch adjust load as necessary while monitoring the following:

☐ 1) KILOWATTS Meter.

☐ 2) AMPS Meters.

☐ 3) KILOVARS Meter.

☐ g. Place the DG A SYNC SEL Switch in OFF. **(PEER ✓)**

☐ h. Using the VOLT REG RAISE-LOWER Switch adjust KILOVARS.

CAUTION 2.5

While operation in this configuration is not prohibited by Tech Specs, the time spent separated from Offsite Power should be limited to that required for troubleshooting.

2.5 If it is desired to divorce XSW1DA from Offsite Power, perform the following:

☐ a. Utilizing Enclosure C estimate the present load on XSW1DA.

☐ b. Using the SPEED Switch, adjust Diesel Generator A load until the estimated XSW1DA load is being carried by Diesel Generator A.

☐ c. Open one of the following as appropriate for the Offsite Power source currently in parallel with the Diesel Generator: **(PEER ✓)**

1) BUS 1DA NORM FEED Breaker.

2) BUS 1DA ALT FEED Breaker.

☐ d. Using the SPEED Switch, adjust Diesel Generator A as necessary to maintain frequency between 59.5 Hz and 60.5 Hz.

Step 2.5 continued

☐ e. Using the VOLT REG RAISE-LOWER Switch adjust Diesel Generator A as necessary to maintain voltage between 6800 VAC and 7600 VAC.

f. When time permits, perform the following:

1) Direct I&C to connect a Fluke 45 DMM to the back of Main Control Board meter DG A VOLTS (V-DGA) with the following settings (inside MCB):

☐ a) AC volts.

☐ b) AUTO.

☐ c) Medium rate.

☐ 2) Using the VOLT REG RAISE-LOWER Switch, adjust Diesel Generator A as necessary to maintain voltage between 114.67 VAC and 122.90 VAC by Fluke 45 indication connected at the MCB (between 6880.1 VAC and 7373.8 VAC).

2.6 If the Diesel Generator Breaker is closed and Diesel Generator A is no longer required as a source of power, perform one of the following:

a. If the Diesel Generator is the only power source supplying XSW1DA, perform the following to parallel with Offsite Power:

☐ 1) Place the DG A SYNC SEL Switch in one of the following positions as appropriate: **(PEER ✓)**

a) NORM - allows paralleling with the 115 KV offsite source.

b) EMERG - allows paralleling with the 230 KV offsite source.

☐ 2) Using the VOLT REG RAISE-LOWER Switch, adjust Diesel Generator A 1DA SYNC VOLTS to slightly lower than SYNC VOLTS. **(PEER ✓)**

☐ 3) Using the SPEED Switch adjust Diesel Generator A frequency to cause the SYNCHROSCOPE to rotate slowly in the SLOW direction (counter-clockwise). **(PEER ✓)**

Step 2.6 continued

☐ 4) When the SYNCHROSCOPE indicator passes 1 o'clock and slowly approaches 12 o'clock, close one of the following as appropriate for the synchroscope position selected: **(PEER ✓)**

a) BUS 1DA NORM FEED Breaker.

b) BUS 1DA ALT FEED Breaker.

☐ 5) Place the DG A SYNC SEL Switch in OFF. **(PEER ✓)**

NOTE 2.6.b

If time permits, the following guidelines should be utilized to unload the Diesel Generator:

1) Load should be reduced to between 2150 KW and 2550 KW and maintained for three to five minutes.

2) Load should be reduced to between 850 KW and 1250 KW and maintained for three to five minutes.

3) Load should be reduced to 50 KW.

b. If the Diesel Generator is running in parallel with an Offsite Power source, perform the following:

☐ 1) Unload Diesel Generator A by holding the SPEED Switch in LOWER until load is 50 KW.

☐ 2) Using the VOLT REG RAISE-LOWER Switch, reduce KILOVARS to minimum.

☐ 3) Open BUS 1DA DG FEED Breaker. **(PEER ✓)**

☐ 4) Ensure DG A VOLTS indicates between 6800 volts and 7600 volts.

☐ 5) Momentarily place the EXCITER Switch, in SHUTDN. **(PEER ✓)**

Step 2.6.b continued

NOTE 2.6.b.6)

The VOLT REG RAISE-LOWER Switch should not be adjusted for the remainder of this procedure.

6) Verify the steady-state, no-load, voltage for Diesel Generator A as follows:

☐ a) Momentarily depress the EMERG START Pushbutton. **(PEER ✓)**

☐ b) Verify DG A VOLTS indicates between 6800 volts and 7600 volts.

☐ c) Momentarily depress the EMERG START OVRRIDE Pushbutton. **(PEER ✓)**

☐ d) Momentarily place the Diesel Generator A TEST Switch, in START. **(PEER ✓)**

2.7 To return Diesel Generator A to standby status perform the following:

☐ a. Momentarily place the EXCITER Switch in SHUTDN. **(PEER ✓)**

☐ b. Momentarily place the TEST Switch in STOP. **(PEER ✓)**

☐ c. Unless otherwise directed, prepare Diesel Generator A for automatic/manual operation by performing the appropriate steps of Section III.

2.8 If Diesel Generator A has been run for greater than or equal to an hour, perform the following steps to check for and remove any accumulated water in XTK0020A DG, DG FUEL OIL DAY TANK A (DB-436):

☐ a. If required, install a drain hose between XVT30957-DG, HI ISOL VLV FOR TEST CONNECTION, and a suitable container.

☐ b. Throttle open XVT30957-DG, HI ISOL VLV FOR TEST CONNECTION.

☐ c. Unlock and throttle open XVT00990A-DG, DG FUEL OIL DAY TANK A DRAIN VALVE.

Step 2.8 continued

d. When Diesel Generator A Day Tank is free of water, perform the following:

☐ 1) Close XVT00990A-DG, DG FUEL OIL DAY TANK A DRAIN VALVE.

☐ 2) Lock XVT00990A-DG, DG FUEL OIL DAY TANK A DRAIN VALVE.

☐ 3) Close XVT30957-DG, HI ISOL VLV FOR TEST CONNECTION.

☐ 4) If necessary, remove the drain hose from XVT30957-DG, HI ISOL VLV FOR TEST CONNECTION.

NOTE 2.9

a. XTF0005, UNIT 2 ENGINEERED SAFEGUARD TRANSFORMER, must be in standby prior to placing XTF0006, XTF0004 7.2KV VOLTAGE REGULATOR, in AUTO.

b. If the Band Indicator HIGH or LOW light is lit, the Voltage Regulator will step immediately when placed in AUTO.

☐ 2.9 If AUTO operation is desired, place the XTF0006, XTF0004 7.2KV VOLTAGE REGULATOR, AUTO-OFF-MANUAL Switch in AUTO and stop recording hourly Bus Voltage readings (YD-380 SSW).

☐ 2.10 If previously installed, direct I&C to disconnect the Fluke 45 DMM from V-DGA (inside MCB)

END OF SECTION

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPS-1000**

2015 NRC Sim f RO: Respond to Steam Generator Pressure Channel Failure

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

000-103-05-01 Respond to Excessive Feedwater Increase per AOP-401.3

TASK STANDARD:

SG "B" level restored to between 60-65% with control in auto and the failed channel (PT-485) has been correctly identified.

TERMINATING CUE: SG "B" level is under control and the failed channel has been correctly identified.

PREFERRED EVALUATION LOCATION ***PREFERRED EVALUATION METHOD***

SIMULATOR PERFORM

REFERENCES:

SOP-401	REACTOR PROTECTION AND CONTROL SYSTEM
AOP-401.3	STEAM FLOW-FEEDWATER FLOW PROTECTION CHANNEL FAILURE

INDEX NO.	***K/A NO.***		***RO***	***SRO***
059000A211	A2.11	Failure of feedwater control system	3.0	3.3

TOOLS: AOP-401.3, Steam Flow - Feedwater Flow Protection Channel Failure

EVALUATION TIME 10 ***TIME CRITICAL*** ***10CFR55:*** 10CFR55.4

TIME START: ________ TIME FINISH: ________ PERFORMANCE TIME: ________

PERFORMANCE RATING: SAT: ____ UNSAT: ____

CANDIDATE: ________________________

EXAMINER: ________________ ________________ / ________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS: None

INITIAL CONDITION: The plant is operating at 100% power with all controls in automatic.

INITIATING CUES: Respond to developing plant conditions.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Step 1. Verify the failed channel is the controlling channel.

STEP STANDARD:

FI-484 indicates ~ 5 MPPH, PI-485 indicates ~ 1300 psig. Examinee notes FI-484 is the controlling channel.

CUES:

Evaluator cue: When Examinee has accepted turnover and has completed board walk down signal Booth Operator to activate Event #1.

Evaluator note: This is an immediate operator action.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

Step 2. Select the operable flow channel:

Place FW CONTROL CHANNEL SEL Switch to the operable channel.

Place STEAM CONTROL CHANNEL SEL Switch to the operable channel.

STEP STANDARD:

Places FW CONTROL CHANNEL SEL switch and STEAM CONTROL CHANNEL SEL switch to the opposite position.

CUES:

Evaluator note: This is an immediate operator action.

Evaluator note: This step is critical to remove the failed channel from control and to restore "B" SG level to program value (60-65%).

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 3

Step 3. Verify turbine load LESS THAN 950 MWE.

STEP STANDARD:

Notes > 950 MWE and per Alternative Action 3, using any available method, reduces turbine load by 40 MWE to 50 MWE.

CUES:

Evaluator note: This is an immediate operator action.

Procedure note: CTRL+ALT+S on either EHC HMI is equivalent to 50 MW e, and is the preferred method to accomplish a rapid load reduction.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 4

Step 4. Verify only one SG AFFECTED.

STEP STANDARD:

Verifies only "B" SG affected.

CUES:

Evaluator note: This is an immediate operator action.

Evaluator note: The failed channel does input to Feedwater Pump Speed Control and thus may have some slight impact on "A" and "C" SG level as well as "B" SG. It is not expected that there will be any appreciable impact on "A" or "C" SG levels.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 5

Step 5. Adjust the Feedwater Flow Control Valve as necessary to restore feed flow to the AFFECTED SG.

STEP STANDARD:

Manually controls the SG "B" FWC controller as necessary to restore SG "B" level.

CUES:

Evaluator note: This is an immediate operator action.

Evaluator note: Typically this step does not require any operator action once an operable channel is selected. Examinee may place Feedwater Flow Control Valve in manual and lower flow to obtain program SG level.

Evaluator note: This step is critical if the examinee is slow in selecting the operable SF and FF channels and SG NR level has exceeded 70% (approaching Hi Hi level Turbine trip)

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 6

Step 6. Check if Feedwater Pump speed control is operating properly:

Feedwater Header pressure is GREATER THAN Main Steam Header pressure.

Feed flow is normal for steam flow and power level.

All operating Feedwater Pump speeds and flows are balanced.

STEP STANDARD:

Verifies:

-FW Header Pressure > Main Steam Header Pressure.

-FW flow is normal.

-All operating FWP speeds and flows are balanced.

CUES:

Evaluator note: This is an immediate operator action.

Evaluator cue: As CRS provide a copy of AOP-401.3 and direct Examinee to complete AOP-401.3 steps 7 through 9. Examinee should reference the AOP for remaining actions.

Evaluator note: The failed Steam Pressure Channel affects the controlling Steam Flow Channel which in turn feeds into the program value for Main Feedwater Pump Delta P. Once the examinee has selected the non-failed Steam Flow channel the program Delta P will return to normal and Main Feed Pump speed should restore to normal without any Operator Action. Examinee may place Main Feedpump Speed Control in manual and lower FW Flow and FW Header pressure to obtain program SG level.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 7

Step 7. Verify Narrow Range levels in all SGs are between 60% and 65%.

Alternative Action 7. Adjust the Feedwater Flow Control Valve as necessary to restore feed flow to the AFFECTED SG(s).

STEP STANDARD:

Restores and maintains "B" SG level to between 60% and 65% in Manual as necessary.

CUES:

Evaluator note: It is not expected that candidate will need to take manual control of the Feedwater Flow Control Valve or Feedwater Pump Speed control for this failure.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 8

Step 8. Restore the AFFECTED SG control systems to normal:

Place the Feedwater Flow Control Valve in AUTO.

Place the Feedwater Pump Speed Control System in AUTO. REFER TO SOP-210, FEEDWATER SYSTEM.

STEP STANDARD:

Ensures Feedwater Control Valve is in automatic and Feedwater Pump Speed Control is in automatic

CUES:

Evaluator note: It is expected that the Feedwater Flow Control Valve and the Feedpump Speed Control will have remained in automatic for this failure.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 9

Step 9 a. Identify the associated bistables for the failed channel. REFER TO AOP 401.3, Attachment 1.

STEP STANDARD:

Examinee identifies instrument PT-485 (Compensates FT-484).

CUES:

Evaluator Cue: Have examinee identify the failed channel by pointing out the correct instrument number (PT-485) on AOP-401.3 Attachment 1.

Evaluator note: The task of completing the bistable tripping data sheet (SOP-401 Attachment 1) is performed by SROs with a Shift Engineer review.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPS-1000

DESCRIPTION: 2015 NRC Sim f RO: Respond to Steam Generator Pressure Channel Failure

IC SET: 315

INSTRUCTIONS:

If IC 315 is designated for this JPM then reset to IC-315 leaving the simulator in FREEZE.

1. When Examinee is ready (on Evaluator cue) go to RUN

2. On evaluator cue activate Event #1

If IC 315 is not designated for this JPM then initial conditions may be established by reseting to IC 10 and following the below directions:

1.Insert: MAL-MSS001E   Final Value = 1300, Ramp = 3 sec (SG PT 485 Fail) set to Event #1

2. When Examinee is ready: RUN

3. On evaluator cue activate Event #1

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS: None

INITIAL CONDITION: The plant is operating at 100% power with all controls in automatic.

INITIATING CUES: Respond to developing plant conditions.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPS-084**

2015 NRC Sim g RO: Restore Spent Fuel Pool Level During Refueling

CANDIDATE: ____

EXAMINER: ____

TASK:

000-140-05-01 RESPOND TO DECREASING WATER LEVEL IN THE SPENT FUEL POOL OR REFUELING CAVITY PER AOP-123.5/AOP-123.1.

TASK STANDARD:

Spent Fuel Pool Level greater than or equal to 460 ft 6 inches on LI-7431 and LI-7433.

TERMINATING CUE: Spent Fuel Pool Level greater than or equal to 460 ft 6 inches on LI-7431 and LI-7433.

PREFERRED EVALUATION LOCATION SIMULATOR

PREFERRED EVALUATION METHOD PERFORM

REFERENCES:

AOP-123.1 DECREASING LEVEL IN THE SPENT FUEL POOL OR REFUELING CAVITY DURING REFUELING

INDEX NO.	*K/A NO.*		*RO*	*SRO*
033000A203	A2.03	Abnormal spent fuel pool water level or loss of water level	3.1	3.5

TOOLS: AOP-123.1 marked up through step 10.

EVALUATION TIME 10 ***TIME CRITICAL*** No ***10CFR55:*** 45(a)(7)

TIME START: ______________ TIME FINISH: ______________ PERFORMANCE TIME: __________

PERFORMANCE RATING: SAT: _____ UNSAT: _____

CANDIDATE: ____

EXAMINER: ________________________________ ____________________________ / __________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The Plant is in MODE 6 with Core Off Load in Progress. The 'A' RHR Loop is in service providing Core Cooling. AOP-123.1 has been entered due to decreasing level in the Spent Fuel Pool. The leakage was isolated in step 8.

INITIATING CUES: The CRS has directed you as the ROATC, to respond to a decreasing level in the Spent Fuel Pool in accordance with AOP-123.1 starting with Step 10.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 1

Step 10 a: Check if the operating RHR train is intact.

STEP STANDARD:

Verifies normal pump amps and flow on 'A' RHR pump.

CUES:

Booth Operator cue: If examinee calls building operator regarding status of "A" RHR Train, report that it has been verified as intact.

COMMENTS:

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 2

Step 10 b: Open MVG-8809A(B), RWST TO RHR PP A(B).

STEP STANDARD:

Opens MVG-8809A, RWST TO RHR PP A, and verifies Red light ON and Green light OFF.

CUES:

Evaluator note: This step is critical because opening MVG-8809A assures that the "A" RHR pump has a suction source and that RHR can add inventory to the RCS.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 3

Step 10 c: Close MVG‑8701A(B), RCS LP A(C) TO PUMP A(B).

STEP STANDARD:

Closes MVG-8701A, RCS LP A TO PUMP A and verifies Red light OFF and Green light ON

CUES:

Evaluator note: This step is critical because closing MVG-8701A or MVG-8702A assures that the RHR suction source is the RWST and not the Refueling Cavity.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 4

Step 10 d: Close MVG‑8702A(B), RCS LP A(C) TO PUMP A(B).

STEP STANDARD:

Closes MVG-8702A, RCS LP A TO PUMP A and verifies Red light OFF and Green light ON

CUES:

Evaluator note: This step is critical because closing MVG-8701A or MVG-8702A assures that the RHR suction source is the RWST and not the Refueling Cavity.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 5

Step 10 e: Close HCV‑603A(B), A(B) OUTLET.

STEP STANDARD:

Closes HCV-603A, A OUTLET, by turning potentiometer to zero (0).

CUES:

COMMENTS:

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 6

Step 10 f: Adjust FCV‑605A(B), A(B) BYP, as necessary to establish the desired refueling water level.

STEP STANDARD:

Takes manual control of FCV-605A and controls flow to raise SFP level.

CUES:

Evaluator note: This step is critical because FCV-605A must remain open in order to assure a discharge flow path from the RHR pump to the refueling cavity/spent fuel pool.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 7

Step 10 g: Ensure the associated Component Cooling train is operating. REFER TO SOP-118, COMPONENT COOLING WATER.

STEP STANDARD:

Verifies 'A' CCW pump is running with normal pump amps and flow. Verifies 'A' CCW is the active loop by verifying MVB-9524A/9526A, LP A NON-ESSEN LOAD ISOL, and MVB-9687A/9525A, LP A NON-ESSEN LOAD ISOL, are open, and by verifying MVB-9524B/9526B, LP B NON-ESSEN LOAD ISOL, and MVB-9687B/9525B, LP B NON-ESSEN LOAD ISOL, are closed

CUES:

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 8

Step 10 h: Verify CCW flow through the RHR Pump A(B) Seal Cooler:

FM-7245, A RHR PP (IUR14400, M3/SW 5-3).

FM-7255, B RHR PP (IUR14401, M4/SW 5-3).

STEP STANDARD:

Verifies flow indicated on FM-7245, flow recorder for RHR Pump "A"

CUES:

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 9

Step 11: Locally align the Spent Fuel Cooling System to fill the Spent Fuel Pool via Spent Fuel Cooling Pump B. REFER TO SOP-123, SPENT FUEL COOLING SYSTEM.

STEP STANDARD:

Directs building operator to align Spent Fuel Cooling to fill the SFP from the RWST per SOP-123.

CUES:

Booth Operator cue: Inform Examinee as the building operator that you acknowledge the order to align Spent Pool Fuel Cooling to fill the Spent Fuel Pool.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 10

Step 12: Verify that Refueling Cavity AND Spent Fuel Pool level is recovering.

STEP STANDARD:

Verifies that Spent Fuel Pool level on LI-7431/7433 is increasing.

CUES:

Booth Operator cue: If examinee calls a building operator to verify Refueling Cavity Level, report that it is rising provided Examinee has observed Spent Fuel Pool level as rising on LI-7431/7433.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 11

Step 13: Check if Refueling Cavity AND Spent Fuel Pool level is adequate:

a. Refueling Cavity level is GREATER THAN OR EQUAL TO 460 ft 6 inches.

b. Spent Fuel Pool level is GREATER THAN OR EQUAL TO 460 ft 6 inches

STEP STANDARD:

Verifies that Spent Fuel Pool level on LI-7431/7433 is GREATER THAN OR EQUAL TO 460 ft 6 inches.

Verifies that Refueling Cavity level on LI-7403 and or Mansell is GREATER THAN OR EQUAL TO 460 ft 6 inches

CUES:

Booth Operator cue: If examinee calls a building operator to verify Refueling Cavity Level, report that it is 460 ft 6 inches once Spent Fuel Pool level is observed as 460 ft 6 inches on LI-7431/7433.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPS-084

DESCRIPTION: 2015 NRC Sim g RO: Restore Spent Fuel Pool Level During Refueling

IC SET: 316

INSTRUCTIONS:

Will also need to make sure that Mansell indication can be employed in exam mode. If Mansell is OK in exam mode then include directions for set up and incorporate into body of JPM.

If IC-316 is designated for this JPM then reset to IC-316 leaving the simulator in FREEZE.

1. Select 'shutdown' from ZZMENU on MCB1 IPCS screen.

2. Set up the Mansell level monitoring laptop and if available load MLMS on SIPCS.

3. Place red tags on RB spray pumps, PZR Back up heaters

4. When Examinee is ready (on Evaluator cue) go to RUN.

If IC-316 is not designated for this JPM then initial conditions may be established by reseting to IC-379 and following the below directions:

1. Insert: MAL-RHR005A Final Value = 3000 (RHR bypass line leak)
   OVR-AA028 Override To = True (Override Radiation Monitoring Panel Annunciators)

2. Verify: LOA-FHB001 Final Value = 1 (Fuel Transfer Tube Isolation - Open)
   LOA-FHB002 Final Value = 1 (Spent Fuel Gate to Transfer Tube - Open)

3. RUN

4. When refueling cavity/SFP levels indicate < 460 feet, FREEZE

5. Set MAL-RHR005A Final Value = 10

6. Select 'shutdown' from ZZMENU on MCB1 IPCS screen

7. Set up the Mansell level monitoring laptop and if available load MLMS on SIPCS.

8. Place red tags on RB spray pumps, PZR Back up heaters and whatever else Steve thinks would be appropriate.

9. When Examinee is ready (on Evaluator cue): RUN

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The Plant is in MODE 6 with Core Off Load in Progress. The 'A' RHR Loop is in service providing Core Cooling. AOP-123.1 has been entered due to decreasing level in the Spent Fuel Pool. The leakage was isolated in step 8.

INITIATING CUES: The CRS has directed you as the ROATC, to respond to a decreasing level in the Spent Fuel Pool in accordance with AOP-123.1 starting with Step 10.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPS-1001**

2015 NRC Sim h RO: Establish Reactor Building Purge Supply and Exhaust

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

088-505-01-04 Perform Line ups of the Reactor Building Ventilation Systems.

TASK STANDARD:

The RB Purge System is in service with both Purge Exhaust Fans and no more than one Purge Supply Fan started.

TERMINATING CUE: The RB purge system is in service.

PREFERRED EVALUATION LOCATION	***PREFERRED EVALUATION METHOD***
SIMULATOR	PERFORM

REFERENCES:

OAP-100.5	GUIDELINES FOR CONFIGURATION CONTROL AND OPERATION OF PLANT EQUIPMENT
HPP-709	Sampling and Release of Radioactive Gaseous Effluents
SOP-114	REACTOR BUILDING VENTILATION SYSTEM

INDEX NO.	***K/A NO.***		***RO***	***SRO***
029000A201	A2.01	Maintenance or other activity taking place inside containment	2.9	3.6

TOOLS:

NJPS-1001 Handout 1; Marked up copy of SOP-114, Reactor Building Ventilation System
NJPS-1001 Handout 2; HPP-709 Attachment VI, Reactor Building Purge Release Permit
Copy of HPP-709, Sampling and Release of Radioactive Gaseous Effluents.
Four yellow plastic Test in progress tags for Plant Status labeling on RM-A2 and RM-A4.

EVALUATION TIME 30 ***TIME CRITICAL*** NO ***10CFR55:*** 45(a)(8)

TIME START: ____________ TIME FINISH: ____________ PERFORMANCE TIME: ____________

PERFORMANCE RATING: SAT: ______ UNSAT: ______

CANDIDATE: ________________________________

EXAMINER: ____________________ ____________________ / ______

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS: None

INITIAL CONDITION: The plant is in Mode 5 with preparations for a refueling outage in progress

The equipment hatch is open.

The RB atmosphere sample analysis has been completed.

The RM-A2 and RM-A4 setpoints have been adjusted for this release and source checks are completed on both channels.

Reactor Building Purge had been in service but was shutdown on the previous shift.

INITIATING CUES: You are being directed to place Reactor Building Purge in service using SOP-114, Reactor Building Ventilation System Section III.C . All applicable procedure Initial Conditions are completed.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Step 2.1; Ensure RMA0004, ATM GASEOUS IODINE-RB PURGE EXHAUST (gas channel) is in service (Rad Monitoring Panel).

STEP STANDARD:

Ensures RMA-4 is in service by checking for power and indication at Rad Monitoring Panel.

CUES:

Evaluator cue: Once the examinee acknowledges the initiating cue provide them the marked copy of SOP-114, Reactor Building Ventilation System (NJPS-1001 Handout 1) and HPP-709, Attachment VI Reactor Building Purge Release Permit (NJPS-1001 Handout 2).

Evaluator cue: Provide yellow plastic "Test in Progress" tags for Examinee to place on RM-A2 and RM-A4 pump switches and Gas channel power supply switches. This activity is described in procedure note 2.0 and tag usage is described in OAP-100.5.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

Step 2.2; If core alterations are in progress, ensure RMA0002, ATM GASEOUS IODINE RB SAMPLE LINE (gas channel), is in service (Rad Monitoring Panel).

STEP STANDARD:

Marks step N/A and proceeds to step 2.3.

CUES:

Evaluator note: Since Unit is NOT in Mode 6 and no core alterations are in progress Steps 2.2 (Check of RMA-2) is N/A. Examinee may mark step complete as RM-A2 is in service and will be required in service once core alterations begin.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 3

Step 2.3; If RB atmosphere sample analysis dictates, place RB Charcoal Cleanup System in service per Section III.

a. XFN-66A, FAN A (RB CHAR CLEANUP).

b. XFN-66B, FAN B (RB CHAR CLEANUP).

STEP STANDARD:

Marks step N/A and proceeds to step 2.4.

CUES:

Evaluator cue: Inform Examinee as HP that RB atmosphere sample analysis does NOT dictate Charcoal Cleanup.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 4

Step 2.4; Align RMA0004 sample point for RB Purge Exhaust Fan operation as follows (AB-485):

a. Open XVA00006-AH, RMA0004 SAMPLE INLET ISOLATION VALVE.

b. Close XVA00005-AH, RMA0004 SAMPLE INLET ISOLATION VALVE.

STEP STANDARD:

Calls Building operator and directs OPEN XVA-6-AH and CLOSE XVA-5-AH.

CUES:

Booth Operator cue: As Building Operator acknowledge request for sample valve alignment or verification and report task completed per the request. Use time compression for response.

Evaluator note: Since Purge had previously been in service the building operator may only be asked to verify sample valve alignment correct.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 5

Step 2.5; Ensure the following radiation monitors high radiation alarm setpoints are adjusted per Reactor Building Purge Release Permit:

a. RMA0002, ATM GASEOUS IODINE RB SAMPLE LINE.

b. RMA0004, RB PURGE EXH GAS ATMOS MONITOR.

STEP STANDARD:

Ensures setpoint on RMA-2 and RMA-4 at Rad monitor panel match the Purge Release Permit values.

CUES:

Evaluator cue: Provide simulated Reactor Building Purge Release Permit, HPP-709, Attachment VI, (NJPS-1001 Handout) if not already done.

Evaluator note: This was provided as complete in the initial conditions. The simulator does not model setpoint changes. Provide following cue if needed.

Evaluator cue: If asked as CRS state that the alarm setpoints have been verified by another RO.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 6

Step 2.6; Prior to placing RB Purge System in operation for the first time during an outage, perform STP-130.005B, AH Valve Operability Testing (Mode 5).

STEP STANDARD:

Marks step N/A and proceeds to step 2.6.

CUES:

Evaluator note: Initiating cue provided information that RB Purge had been in service previously.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 7

Step 2.7; Unlock and open the following:

a. XVB00001A-AV2-AH, IA HDR ISOLATION VLV FOR XVB00001A-AH (FB-479).

b. XVB00001B-AV2-AH, IA HDR ISOLATION VLV FOR XVB00001B-AH (RB-463).

c. XVB00002B-AV2-AH, IA HDR ISOLATION VALVE FOR XVB00002B-AH (RB-463).

d. XVB00002A-AV2-AH, IA HDR ISOLATION VLV FOR XVB00002A-AH (FB-479).

STEP STANDARD:

Calls Building operators and directs opening XVB-1A(B) and XVB-2A(B) air header isolations.

CUES:

Booth Operator cue: As Building Operator acknowledge requests for valve alignment or verification and report task completed per the request. Use time compression for response.

Evaluator note: Since Purge had previously been in service the building operator may only be asked to verify air header isolation valve alignment correct.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 8

Step 2.8; Ensure a Reactor Building Purge Release Permit has been issued per HPP-709.

STEP STANDARD:

Ensures permit is current and less than 24 hours old.

CUES:

Evaluator note: The NJPS-1001 Handout 2 (Release Permit) already indicates a SAT source check.

Evaluator note: Have a Copy of HPP-709 available for Examinee to refer to if they ask for it.

COMMENTS:

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 9

Step 2.9; Start Reactor Building Purge as follows:

a. Open PVB-2A, CNTMT EXH ISOL

STEP STANDARD:

Places control switch to OPEN and holds in OPEN until Red light ON and Green light OFF.

CUES:

Evaluator note: This task is critical in order to ensure that the Reactor Building atmosphere is exchanged with fresh air.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 10

Procedure NOTE 2.9.b; If both trains of RB Purge are to be run, both exhaust fans should be started simultaneously.

Step 2.9 b; Hold PVB-2B, CNTMT EXH ISOL, to OPEN while simultaneously holding one or both of the following fan control switches in the START position:

1) XFN-13A, EXH FAN A.

2) XFN-13B, EXH FAN B.

STEP STANDARD:

Places control switch for PVB-2B to OPEN and Holds in OPEN. Places control switches for both XFN-13A and XFN-13B in START and holds in START until Red light ON and Green light OFF for fans and PVB-2B.

Completes Section II, Actual Release Data on Purge Release Permit:

1. Release Start Date and Time (current date and time)
2. Start Readings on RM-A2 and RM-A4 in cps.

CUES:

Evaluator cue: As CRS direct that both Exh Fan A (XFN-13A) and Exh Fan B (XFN-13B) should be started. Provide surrogate operator to manipulate whichever fan switch the Examinee directs. Examinee should ask for a peer check.

Evaluator note: This task is critical in order to ensure that the Reactor Building atmosphere is exchanged with fresh air. Completion of the Purge Release Permit Data is NOT critical.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 11

Step 2.9 c; Verify the following:

1) XFN-13A(B)-AH inlet damper opens.

2) XFN-13A(B)-AH outlet damper opens.

STEP STANDARD:

Verifies White light ON for the INLET and OUTLET damper for the Fan that was started (XFN-13A or XFN-13B)

CUES:

Evaluator note: Fan inlet and outlet damper indications are on the mimic board above the control switches.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 12

Step 2.9 d; Open XDP-28, INTAKE DMPR.

STEP STANDARD:

Places control Switch for XDP-28 to OPEN and verifies Red light ON and Green light OFF.

CUES:

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 13

Step 2.9 e; Open the following:

1) PVB-1A, CNTMT SPLY ISOL.

2) PVB-1B, CNTMT SPLY ISOL.

STEP STANDARD:

Places control Switch for PVB-1A to OPEN and holds until Red light ON and Green light OFF.

Places control Switch for PVB-1A to OPEN and holds until Red light ON and Green light OFF.

CUES:

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 14

Step 2.9 f; Start one or both of the following, as necessary:

1) XFN-11A, SPLY FAN A.

2) XFN-11B, SPLY FAN B.

STEP STANDARD:

Starts no more than ONE Purge Supply Fan.

CUES:

Evaluator cue: If asked as CRS which supply fan to start, state "Operate supply fans as required by SOP-114".

Evaluator note: There is a procedure note prior to the step which starts the Purge Supply Fans. The note informs the Operator that in order to maintain a negative pressure on the RB with the Equipment Hatch open, fewer Supply Fans than Exhaust Fans should be operated. In this case no supply fans or one supply fan should be started.

Evaluator note: Since the equipment hatch is open no more than ONE supply fan should be started. This step is critical because the Examinee must maintain negative pressure on the RB.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPS-1001

DESCRIPTION: 2015 NRC Sim h RO: Establish Reactor Building Purge Supply and Exhaust

IC SET: 317

INSTRUCTIONS:

If IC 317 is designated for this JPM then reset to IC-317 leaving the simulator in FREEZE.

1. When Examinee is ready (on Evaluaor cue) go to RUN.

If IC 317 is not designated for this JPM then initial conditions may be established by reseting to IC 3 and following the below directions:

1. RUN

2. Perform the following at the HVAC Control Panel, XCP-6210:

   Place 101 switch for RB Purge Supply Fan A in STOP

   Place 101 switch for RB Purge Supply Fan B in STOP

   Place 101 switch for RB Purge Exhaust Fan A in STOP

   Place 101 switch for RB Purge Exhaust Fan B in STOP

   Place 101 switch for XDP-28, Intake Damper to CLOSE

3. FREEZE

4. When examinee is ready: RUN

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS: None

INITIAL CONDITION: The plant is in Mode 5 with preparations for a refueling outage in progress

The equipment hatch is open.

The RB atmosphere sample analysis has been completed.

The RM-A2 and RM-A4 setpoints have been adjusted for this release and source checks are completed on both channels.

Reactor Building Purge had been in service but was shutdown on the previous shift.

INITIATING CUES: You are being directed to place Reactor Building Purge in service using SOP-114, Reactor Building Ventilation System Section III.C . All applicable procedure Initial Conditions are completed.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

NJPS-1001 Handout 2

GWRP No.	15-0009

REACTOR BUILDING PURGE RELEASE PERMIT

☐ **6-INCH (any mode)** ☒ **36-INCH (modes 5, 6 or defueled)**

I. RELEASE AUTHORIZATION (Count Room)

Estimated release Duration, (date/time)	From: Today/now	To: Next Week at this time
Maximum release rate, (cfm)	15,000 cfm	
RM-A2 gas channel, (cpm)	BKG. 300	*Alarm Setpoint 3,000
RM-A4 gas channel, (cpm)	BKG. 400	Alarm Setpoint 3,000

* Do not adjust when in modes 1-4. RMA-2 is part of the Leak Detection System.

Comments:____

____

Count Room: HP Technician Date/Time: Today/ an hour ago

II. ACTUAL RELEASE DATA (Operations)

Release Approved, SS/CRS: Shift Supervisor Date/Time: Today/ 45 minutes ago

Release START, Date/Time:__________________________

	RM-A2 (cpm)	RM-A4 (cpm)	INITIALS
Alarm Set Point (cpm)	3,000	3,000	RO
Source Check		Sat/Unsat	RO
Reading @ Release Start (cpm)			
Reading @ End of Release (cpm)			
Alarm Set Point returned to 2 x ni			

Daily Verification of High Radiation Alarm Setpoint:

Date/Time							
RM-A2 gas channel (cpm)							
RM-A4 gas channel (cpm)							
Release Rate, (cfm)							

Comment:____

Release TERMINATED, Date/Time:__________________________

Reason: ☐Release Completed ☐Authorization Expired

☐RM-A4 High Radiation Alarm, (cpm):__________________________

☐ Release Continued on New Permit __________________________

☐Other__________________________

Operations Review:__________________________ Date/Time:__________________

Updated by:__________________________ Date/Time:__________________

Count Room

NJPS-1001 Handout 1

SOUTH CAROLINA ELECTRIC & GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

NUCLEAR OPERATIONS
COPY NO.____________

SYSTEM OPERATING PROCEDURE

SOP-114

REACTOR BUILDING VENTILATION SYSTEM

REVISION 21

SAFETY RELATED

RECORD OF CHANGES

CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE	CHANGE LETTER	TYPE CHANGE	APPROVAL DATE	CANCELLATION DATE
A	P	02/25/14					
B	P	07/27/14					

CONTINUOUS USE

Continuous Use of Procedure Required.
Read Each Step Prior to Performing.

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TABLE OF CONTENTS (cont.)

TABLE OF CONTENTS (cont.)

I. PURPOSE/SCOPE

1. This procedure outlines the steps involved in operating the Reactor Building Ventilation System.

2. 10CFR50 Appendix B, 10CFR50.59, SAP-630 and the ODCM apply to this procedure.

3. 10CFR50.65a(4) applies to Section IV.C.

II. PRECAUTIONS

1. The following valves must be open for PI-8254, RB NR PRESS PSI, to accurately indicate Reactor Building (RB) pressure:

    a. SVX-6054, RB NR PRESS CNTMT ISOL.

    b. SVX-6050A, POST ACCID H2 LOOP A (IRB).

2. RB cooling fans must be operated during plant heatup. This is to limit concrete temperature around Reactor Vessel supports and nozzles to less than 150°F.

3. RBCU fan starting duties for Normal Speed Fan motors are as follows:

    a. Cold, two immediate restarts are allowed.

    b. Hot, one immediate restart allowed.

    c. Subsequent restart is allowed after 30 minutes minimum run time.

    d. Subsequent restart is allowed after 60 minutes minimum with motor standing idle.

    e. Two bump starts are considered 1 normal start.

4. CRDM Shroud Ventilation Cooling Fans must be operated to limit temperature in vicinity of CRDMs to less than 170°F. In order to accomplish this, the fans must be operated if Control Rod Drive Mechanisms are energized, or if RCS temperature is greater than 170°F.

5. DRPI Data Cabinet Cooling System should be operated continuously to limit space temperature in the cabinet area to less than 95°F to prevent acceleration in the aging process of the system electronic components. Operation during excursions above this temperature will diminish the life expectancy of the system electronic components.

6. CRDM Cooling Water System is normally operating to cool the exhaust air from the CRDM's and reduce RB heat load.

7. When running RB Purge System, if only one RB Purge Supply Fan is running, then only one RB Purge Exhaust Fan should be running, unless RB Equipment Hatch is open, then two RB Purge Exhaust Fans may be run.

8. To prevent overflow into Refueling Cavity ventilation ductwork due to manometer effect when fuel transfer tube is open, level in Spent Fuel Pool and Refueling Cavity must be monitored closely when shifting Reactor Building Ventilation.

OA 9218

9. Chemistry should be contacted prior to draining from any of the following locations (YD-125'E):

   a. XVT07514A-AC, HIGH ROOT TO IPX05576.

   b. XVT07514B-AC, HIGH ROOT TO IPX05578.

   c. XVT07514C-AC, HIGH ROOT TO IPX05582.

   d. XVT07514D-AC, HIGH ROOT TO IPX05584.

   e. XVT07515A-AC, HIGH ROOT TO IPX05577.

   f. XVT07515B-AC, HIGH ROOT TO IPX05579.

   g. XVT07515C-AC, HIGH ROOT TO IPX05583.

   h. XVT07515D-AC, HIGH ROOT TO IPX05585.

   i. East Manway cover.

   j. West Manway cover.

10. XSW1A3 – 1C3 Tie Breaker closure affects CRDM Shroud Exhaust fan operation as follows:

   a. If both XFN0067A and XFN0067B are available, then regardless of operating fan combination, XFN0067C and XFN0067D will be tripped and XFN0067A and XFN0067B will start when tie breaker is closed.

   b. If either XFN0067A or XFN0067B is not available, then regardless of operating fan combination, neither XFN0067C nor XFN0067D will be tripped and XFN0067A and XFN0067B will not be started when tie breaker is closed.

III. NORMAL OPERATIONS

Z063→ **A. OPERATING REACTOR BUILDING COOLING UNITS**

1.0 INITIAL CONDITIONS

☐ 1.1 Electrical lineup is complete per Attachment IIA.

☐ 1.2 Control Panel lineup is complete per Attachment IV.

2.0 INSTRUCTIONS CHG B

☐ 2.1 Ensure one of the following is in-service and aligned to provide cooling water to the RBCUs:

Z250→ a. Industrial Cooling Water per SOP-125, Section III.A, “Startup and Operation of the Industrial Cooling Water System.” CHG B

Z251→ b. Service Water per SOP-117. Section IV.E, “Supplying Service Water to the Train A Reactor Building Cooling Units,” or Section IV.F, “Supplying Service Water to the Train B Reactor Building Cooling Units.”

NOTE 2.2

a. Due to eddy current brakes, RBCU control switches must be held in START position until the red breaker closed light is lit and starting current is indicated on appropriate meter.

b. Normal and preferred lineup is three RBCUs running in NORM (fast speed).

c. To increase stay times for teams entering containment, four RBCUs may be placed in service in NORM (fast speed).

2.2 Place RBCUs in service by starting three or four RBCUs in SLOW or NORM as follows:

☐ a. For XFN0064A-AH, REACTOR BLDG COOLING UNIT 1A EMERG FAN, start one of the following:

1) XFN 0064A-AH, 1A NORM.

2) XFN 0064A-AH, 1A SLOW.

Step 2.2 continued

☐ b. For XFN0064B-AH, REACTOR BLDG COOLING UNIT 1B EMERG FAN, start one of the following:

1) XFN 0064B-AH, 1B NORM.

2) XFN 0064B-AH, 1B SLOW.

☐ c. For XFN0065A-AH, REACTOR BLDG COOLING UNIT 2A EMERG FAN, start one of the following:

1) XFN 0065A-AH, 2A NORM.

2) XFN 0065A-AH, 2A SLOW.

☐ d. For XFN0065B-AH, REACTOR BLDG COOLING UNIT 2B EMERG FAN, start one of the following:

1) XFN 0065B-AH, 2B NORM.

2) XFN 0065B-AH, 2B SLOW.

NOTE 2.2.e

If RBCU fan motor amps exceed the values given, PSE should be contacted to evaluate.

☐ e. Verify RBCU Fan motor amps return to normal operating range:

1) For fast speed operation, 250 amps to 280 amps. CHG B

2) For slow speed operation, 55 amps to 70 amps.

Step 2.2 continued

NOTE 2.2.f
The RBCU TRAIN A (B) EMERG switch must be selected to an operable RBCU.

f. Verify the following switches are in the desired position:

☐ 1) XFN-64A/XFN 65A - RBCU TRAIN A EMERG.

☐ 2) XFN-64B/XFN 65B - RBCU TRAIN B EMERG.

☐ 2.3 Shut down RBCUs by placing appropriate switch(es) in STOP:

a. XFN 0064A-AH, 1A NORM.

b. XFN 0064A-AH, 1A SLOW.

c. XFN 0064B-AH, 1B NORM.

d. XFN 0064B-AH, 1B SLOW.

e. XFN 0065A-AH, 2A NORM.

f. XFN 0065A-AH, 2A SLOW.

g. XFN 0065B-AH, 2B NORM.

h. XFN 0065B-AH, 2B SLOW.

END OF SECTION

B. OPERATING REACTOR BUILDING CHARCOAL CLEANUP UNITS

1.0 INITIAL CONDITIONS

☐ 1.1 Electrical lineup is complete per Attachment IIA.

☐ 1.2 Control Panel lineup is complete per Attachment IV.

☐ 1.3 Fire Service System is in service per SOP-509.

NOTE 2.0
All operations are performed at HVAC Control Panel, XCP-6210.

2.0 INSTRUCTIONS

☐ 2.1 Place RB Charcoal Cleanup Units in service by placing one or both of the following in START:

a. XFN-66A, FAN A (RB CHAR CLEANUP).

b. XFN-66B, FAN B (RB CHAR CLEANUP).

☐ 2.2 Shut down running RB Charcoal Cleanup Units by placing the following in STOP:

a. XFN-66A, FAN A (RB CHAR CLEANUP).

b. XFN-66B, FAN B (RB CHAR CLEANUP).

END OF SECTION

C. STARTUP REACTOR BUILDING PURGE SUPPLY AND EXHAUST

1.0 INITIAL CONDITIONS

☐ 1.1 The Plant is in Mode 5, Mode 6, or defueled.

☐ 1.2 Valve lineup is complete per Attachment IA.

☐ 1.3 Electrical lineup is complete per Attachment IIA.

☐ 1.4 Control Panel lineup is complete per Attachment IV.

☐ 1.5 Fire Service System is in service per SOP-509.

NOTE 2.0

a. Unless otherwise noted, all operations are performed at HVAC Control Panel, XCP-6210.

b. Plant Status Labels should be placed on radiation monitor equipment required for RB ventilation operability.

2.0 INSTRUCTIONS

☐ 2.1 Ensure RMA0004, ATM GASEOUS IODINE-RB PURGE EXHAUST (gas channel) is in service (Rad Monitoring Panel). CHG B

☐ 2.2 If core alterations are in progress, ensure RMA0002, ATM GASEOUS IODINE RB SAMPLE LINE (gas channel), is in service (Rad Monitoring Panel).

☐ 2.3 If RB atmosphere sample analysis dictates, place RB Charcoal Cleanup System in service per Section III.

2.4 Align RMA0004 sample point for RB Purge Exhaust Fan operation as follows (AB-485):

☐ a. Open XVA00006-AH, RMA0004 SAMPLE INLET ISOLATION VALVE.

☐ b. Close XVA00005-AH, RMA0004 SAMPLE INLET ISOLATION VALVE.

2.5 Ensure the following radiation monitors high radiation alarm setpoints are adjusted per Reactor Building Purge Release Permit:

☐ a. RMA0002, ATM GASEOUS IODINE RB SAMPLE LINE.

☐ b. RMA0004, RB PURGE EXH GAS ATMOS MONITOR.

☐ 2.6 Prior to placing RB Purge System in operation for the first time during an outage, perform STP-130.005B, AH Valve Operability Testing (Mode 5).

NOTE 2.7

RB Purge Supply and Exhaust Isolation Valves may only be opened in Mode 5 or Mode 6 per Technical Specifications 3.6.1.7.

2.7 Unlock and open the following:

☐ a. XVB00001A-AV2-AH, IA HDR ISOLATION VLV FOR XVB00001A-AH (FB-479).

☐ b. XVB00001B-AV2-AH, IA HDR ISOLATION VLV FOR XVB00001B-AH (RB-463-300-62).

☐ c. XVB00002B-AV2-AH, IA HDR ISOLATION VALVE FOR XVB00002B-AH (RB-463-015-62).

☐ d. XVB00002A-AV2-AH, IA HDR ISOLATION VLV FOR XVB00002A-AH (FB-479).

☐ 2.8 Ensure a Reactor Building Purge Release Permit has been issued per HPP-709.

2.9 Start Reactor Building Purge as follows:

☐ a. Open PVB-2A, CNTMT EXH ISOL.

N01→

NOTE 2.9.b

If both trains of RB Purge are to be run, both exhaust fans should be started simultaneously.

☐ b. Hold PVB-2B, CNTMT EXH ISOL, to OPEN while simultaneously holding one or both of the following fan control switches in the START position: **(Peer ✓)**

1) XFN-13A, EXH FAN A.

2) XFN-13B, EXH FAN B.

c. Verify the following:

☐ 1) XFN-13A(B)-AH inlet damper opens.

☐ 2) XFN-13A(B)-AH outlet damper opens.

☐ d. Open XDP-28, INTAKE DMPR.

e. Open the following:

☐ 1) PVB-1A, CNTMT SPLY ISOL.

☐ 2) PVB-1B, CNTMT SPLY ISOL.

N01→ NOTE 2.9.f

1) If both trains of RB Purge are to be run, both supply fans should be started simultaneously.

2) When the Reactor Building Equipment Hatch is open, only one RB Purge supply fan should be in operation.

3) When equipment hatch is open, negative pressure will be maintained in the RB by operating fewer supply fans than exhaust fans.

4) Both supply fans may be secured with the equipment hatch open and two exhaust fans running to control radiological conditions.

☐ f. Start one or both of the following, as necessary:

1) XFN-11A, SPLY FAN A.

2) XFN-11B, SPLY FAN B.

g. Verify the following:

☐ 1) XFN-11A(B)-AH inlet damper opens fully.

☐ 2) XFN-11A(B)-AH outlet damper opens fully.

☐ 3) The following selected fan(s) starts:

a) XFN-11A, SPLY FAN A.

b) XFN-11B, SPLY FAN B.

☐ 2.10 Perform STP-118.006 REACTOR BUILDING PURGE SUPPLY AND EXHAUST VALVE TEST if this is the first time RB Purge is started for the current Refueling Outage.

☐ 2.11 When RB atmosphere sample analysis allows, remove the RB Charcoal Cleanup System from service per Section III.

END OF SECTION

D. SHUTDOWN REACTOR BUILDING PURGE SUPPLY AND EXHAUST

1.0 INITIAL CONDITIONS

☐ 1.1 The RB Purge Supply and Exhaust System is in operation per Section III.

NOTE 2.0
Unless otherwise noted, all operations are performed at HVAC Control Panel, XCP-6210.

2.0 INSTRUCTIONS

☐ 2.1 Stop one of the following:

a. XFN-11A, SPLY FAN A.

b. XFN-11B, SPLY FAN B.

2.2 Verify the following:

☐ a. XFN-11A(B)-AH inlet damper is closed.

☐ b. XFN-11A(B)-AH outlet damper is closed.

☐ 2.3 Remove the remaining supply fan from service per Steps 2.1 and 2.2, if required.

2.4 Close the following:

☐ a. PVB-1A, CNTMT SPLY ISOL.

☐ b. PVB-1B, CNTMT SPLY ISOL.

☐ 2.5 Close XDP-28, INTAKE DMPR.

☐ 2.6 Stop the following running exhaust fans:

a. XFN-13A, EXH FAN A.

b. XFN-13B, EXH FAN B.

2.7 Verify the following:

☐ a. XFN-13A(B)-AH inlet damper is closed.

☐ b. XFN-13A(B)-AH outlet damper is closed.

☐ 2.8 Remove the remaining exhaust fan from service per Steps 2.6 and 2.7, if required.

2.9 Close the following:

☐ a. PVB-2A, CNTMT EXH ISOL.

☐ b. PVB-2B, CNTMT EXH ISOL.

2.10 Align RMA0004 sample point for RB Alternate Purge operation as follows (AB-485):

☐ a. Open XVA00005-AH, RMA0004 SAMPLE INLET ISOLATION VALVE.

☐ b. Close XVA00006-AH, RMA0004 SAMPLE INLET ISOLATION VALVE.

2.11 Close the following instrument air isolation valves for the purge exhaust valves:

☐ a. XVB00001A-AV2-AH, IA HDR ISOLATION VLV FOR XVB00001A-AH (FB-479).

☐ b. XVB00002A-AV2-AH, IA HDR ISOLATION VLV FOR XVB00002A-AH (FB-479).

☐ c. XVB00001B-AV2-AH, IA HDR ISOLATION VLV FOR XVB00001B-AH (RB-463-300-62).

☐ d. XVB00002B-AV2-AH, IA HDR ISOLATION VALVE FOR XVB00002B-AH (RB-463-015-62).

NOTE 2.12

Performance of STP-118.004 is not required for temporary shutdowns of Reactor Building Purge Supply and Exhaust during Mode 5.

☐ 2.12 Perform STP-118.004, Reactor Building Purge Isolation Verification, prior to entry into Mode 4.

END OF SECTION

E. SWAPPING REACTOR BUILDING PURGE SUPPLY AND EXHAUST FANS
OR
STARTING A SECOND REACTOR BUILDING PURGE SUPPLY OR EXHAUST FAN

1.0 INITIAL CONDITIONS

☐ 1.1 One train of RB Purge is in operation per Section III.

2.0 INSTRUCTIONS

N01↓ ☐ 2.1 Shut down RB Purge Fan(s) as required per Section III.

N01↑ ☐ 2.2 Start up RB Purge Fan(s) as required per Section III.

END OF SECTION

F. STARTUP AND SHUTDOWN REACTOR BUILDING REFUELING WATER SURFACE VENTILATION

1.0 INITIAL CONDITIONS

☐ 1.1 One of the following is in service per Section III:

a. XFN-13A, EXH FAN A.

b. XFN-13B, EXH FAN B.

☐ 1.2 Electrical lineup is complete per Attachment IIA.

☐ 1.3 Control Panel lineup is complete per Attachment IV.

NOTE 2.0

All operations are performed at local control panel XPN-5170 (RB-463-340-48).

2.0 INSTRUCTIONS

2.1 Start up RB Refueling Water Surface Ventilation Fans as follows:

☐ a. Place the control switch for RB REFUELING WTR SURFACE FANS in ON.

b. Verify the following fans start:

☐ 1) XFN0007A-AH, RB REFUELING WTR SURFACE SUPPLY FAN A.

☐ 2) XFN0007B-AH, RB REFUELING WTR SURFACE SUPPLY FAN B.

☐ 3) XFN0008-AH, RB REFUELING WTR SURFACE EXH FAN.

2.2 Shut down RB Refueling Water Surface Ventilation Fans as follows:

☐ a. Place the control switch for RB REFUELING WTR SURFACE FANS in OFF.

b. Verify the following fans stop:

☐ 1) XFN0007A-AH, RB REFUELING WTR SURFACE SUPPLY FAN A.

☐ 2) XFN0007B-AH, RB REFUELING WTR SURFACE SUPPLY FAN B.

☐ 3) XFN0008-AH, RB REFUELING WTR SURFACE EXH FAN.

END OF SECTION

Z066→ **G. STARTUP AND SHUTDOWN REACTOR COMPARTMENT COOLING FANS**

1.0 INITIAL CONDITIONS

☐ 1.1 Electrical lineup is complete per Attachment IIA.

☐ 1.2 Control Panel lineup is complete per Attachment IV.

N01→

CAUTION 2.0

To minimize starting current, running fan should be shutdown for a minimum of 30 seconds prior to starting an idle fan.

NOTE 2.0

a. All operations are performed at HVAC Control Panel, XCP-6210.

b. Each fan can supply 100% of required flow.

2.0 INSTRUCTIONS

☐ 2.1 Start up Reactor Compartment Cooling Fan by placing one of the following in START:

a. XFN-9A, FAN A.

b. XFN-9B, FAN B.

CAUTION 2.2 and 2.3
During Modes 1 through 3 maintaining at least one Reactor Compartment Cooling Fan in operation limits the temperature of the concrete around the Reactor Vessel support and nozzles to less than 150˚F.

☐ 2.2 Shut down running Reactor Compartment Cooling Fan by placing the following in STOP:

a. XFN-9A, FAN A.

b. XFN-9B, FAN B.

2.3 If directed by the Shift Supervisor to secure Reactor Compartment Cooling when RCS temperature is greater than 350˚F (Mode 1 through Mode 3), establish the following conditions within sixteen hours of securing Reactor Compartment cooling flow:

☐ a. Establish natural circulation flow by blocking the Incore Pit door (RB-101) fully open with an Engineering approved device within sixteen hours securing Reactor Compartment Cooling flow.

☐ b. Monitor performance of Excore Detectors to ensure that increasing temperature in the Incore area will not affect Excore Detectors.

c. Monitor Incore Instrument Chase temperature:

☐ 1) T9332, RB INCORE INSTRUMENT CHASE TEMP.

☐ 2) T9336, RB INCORE INSTRUMENT CHASE TEMP.

☐ d. If conditions do not allow opening door to Incore Pit (RB-101), Power Operations may continue for up to twelve hours, after which a shutdown must commence to place the plant in Mode 4 within the next twenty hours.

END OF SECTION

Z065→ **H. STARTUP SECONDARY COMPARTMENT COOLING FANS**

1.0 INITIAL CONDITIONS

☐ 1.1 Electrical lineup is complete per Attachment IIA.

☐ 1.2 Control Panel lineup is complete per Attachment IV.

N01→ CAUTION 2.0

To minimize starting current, running fans in each compartment should be shut down for a minimum of 30 seconds prior to starting an idle fan for that compartment.

NOTE 2.0

All operations are performed at HVAC Control Panel, XCP-6210.

2.0 INSTRUCTIONS

☐ 2.1 Start up Steam Generator Compartment A Cooling Fans by simultaneously placing two of the following in START:

a. XFN-68A, SG A FAN A.

b. XFN-68B, SG A FAN B.

c. XFN-68C, SG A FAN C.

☐ 2.2 Start up Steam Generator Compartment B Cooling Fans by simultaneously placing two of the following in START:

a. XFN-69A, SG B FAN A.

b. XFN-69B, SG B FAN B.

c. XFN-69C, SG B FAN C.

☐ 2.3 Start up Steam Generator Compartment C Cooling Fans by simultaneously placing two of the following in START:

a. XFN-70A, SG C FAN A.

b. XFN-70B, SG C FAN B.

c. XFN-70C, SG C FAN C.

END OF SECTION

I. SHUTDOWN SECONDARY COMPARTMENT COOLING FANS

1.0 INITIAL CONDITIONS

☐ 1.1 The Secondary Compartment Cooling Fans are in service per Section III.

NOTE 2.0

a. All operations are performed at HVAC Control Panel, XCP-6210.

b. Two Secondary Compartment Cooling Fans are required for each loop during normal operation.

2.0 INSTRUCTIONS

☐ 2.1 Shut down Steam Generator Compartment A Cooling Fans by placing the following in STOP as necessary:

a. XFN-68A, SG A FAN A.

b. XFN-68B, SG A FAN B.

c. XFN-68C, SG A FAN C.

☐ 2.2 Shut down Steam Generator Compartment B Cooling Fans by placing the following in STOP as necessary:

a. XFN-69A, SG B FAN A.

b. XFN-69B, SG B FAN B.

c. XFN-69C, SG B FAN C.

☐ 2.3 Shut down Steam Generator Compartment C Cooling Fans by placing the following in STOP as necessary:

a. XFN-70A, SG C FAN A.

b. XFN-70B, SG C FAN B.

c. XFN-70C, SG C FAN C.

END OF SECTION

J. FILL AND VENT CONTROL ROD DRIVE MECHANISM COOLING WATER SYSTEM

1.0 INITIAL CONDITIONS

☐ 1.1 System is shutdown and fully or partially drained.

2.0 INSTRUCTIONS

☐ 2.1 Perform system lineup per Attachment IB.

2.2 Energize and open the following Containment Isolation valves (MCB):

☐ a. MVG-7501, TO CRDM CLR ISOL (ORB). (XMC1DA2X 06AD).

☐ b. MVG-7502, TO CRDM CLR ISOL (IRB). (XMC1DB2X 07IM).

☐ c. MVG-7503, FR CRDM CLR ISOL (IRB). (XMC1DA2X 11IM).

☐ d. MVG-7504, FR CRDM CLR ISOL (ORB). (XMC1DB2X 07AD).

> CAUTION 2.3 through 2.6
>
> CRDM Cooling Water System pressure should be monitored continuously when XVG07520-AC, CRDM COOLING WATER RETURN HDR FILL VLV, is open to prevent lifting system relief valves inside containment.

☐ 2.3 Throttle open XVG07520-AC, CRDM COOLING WATER RETURN HDR FILL VLV (YD-125'E), to raise system pressure to a maximum of 25 psig as indicated on any of the following (YD-125'E):

a. IPI05590-AC, AC SYS INDUSTRIAL CLR OUTLET PRESS IND.

b. IPI05592-AC, AC SYS INDUSTRIAL CLR INLET PRESS IND.

c. IPI05569-AC, AC SYS INDUSTRIAL CLR INLET PRESS IND.

d. IPI05570-AC, AC SYS INDUSTRIAL CLR OUTLET PRESS IND.

2.4 Vent XCI0004-AC, CRDM COOLING WATER INDUSTRIAL COOLER, at the following points.

☐ a. XVT07514A-AC, HIGH ROOT TO IPX05576 (YD-125'E).

☐ b. XVT07514B-AC, HIGH ROOT TO IPX05578 (YD-125'E).

☐ c. XVT07514C-AC, HIGH ROOT TO IPX05582 (YD-125'E).

☐ d. XVT07514D-AC, HIGH ROOT TO IPX05584 (YD-125'E).

☐ e. XVT07515A-AC, HIGH ROOT TO IPX05577 (YD-125'E).

☐ f. XVT07515B-AC, HIGH ROOT TO IPX05579 (YD-125'E).

☐ g. XVT07515C-AC, HIGH ROOT TO IPX05583 (YD-125'E).

☐ h. XVT07515D-AC, HIGH ROOT TO IPX05585 (YD-125'E).

☐ i. XVT07547-AC, CRDM COOLER AC SUPPLY HEADER VENT VALVE (IB-436).

2.5 Vent Spray Pump B and D casings from the following vents (YD-125'E):

☐ a. XVM07570B-AC, XPP0156B PUMP CASING VENT VALVE.

☐ b. XVM07570D-AC, XPP0156D PUMP CASING VENT VALVE.

2.6 Vent XTK0151-AC, CRDM COOLING WATER EXPANSION TANK (IB-436), as follows:

☐ a. Open XVG17513-AC, AC SYSTEM VENT ISOLATION VALVE (IB-436).

☐ b. As water appears in lower portion of ILI05552, CRDM COOLING WATER EXP TANK LEVEL IND, close XVG17513-AC, AC SYSTEM VENT ISOLATION VALVE (IB-436).

☐ c. When expansion tank is ½ full, close XVG07520-AC, CRDM COOLING WATER RETURN HDR FILL VLV (YD-125'E).

☐ 2.7 For remainder of venting process, open XVG07520-AC, CRDM COOLING WATER RETURN HDR FILL VLV (YD-125'E), as necessary to maintain expansion tank level between ¼ full and ½ full.

2.8 Vent CRDM supply and return headers at the following points:

☐ a. XVT07543-AC, INDUSTRIAL CLR AC RETURN HDR TEST CONN (RB-436-120-60).

☐ b. XVT07540-AC, CRDM COOLER AC SUPPLY HEADER TEST CONN (RB-436-135-60).

2.9 Vent XCE0021-AH, CONTROL ROD DRIVE MECHANISM COOLER, at the following points:

☐ a. XVT07508A-AC, HIGH ROOT TO IPX05561 (RB-436-120-40).

☐ b. XVT07508B-AC, HIGH ROOT TO IPX05560 (RB-436-120-40).

☐ c. XVT07508C-AC, HIGH ROOT TO IPX05563 (RB-436-110-45).

☐ d. XVT07508D-AC, HIGH ROOT TO IPX05562 (RB-436-110-45).

2.10 Upon completion of venting, establish normal expansion tank pressure and level as follows (IB-436):

☐ a. Throttle open XVG17513-AC, AC SYSTEM VENT ISOLATION VALVE, until IPI05553-AC, AC PUMPS SUCTION HEADER PRESSURE IND, indicates 6 psig to 8 psig.

☐ b. Open XVT17514-AC, AC SYSTEM EXPANSION TANK DRAIN ISOLATION VALVE, as necessary to maintain expansion tank level between ¼ full and ½ full.

☐ 2.11 Perform the electrical lineup per Attachment IIB.

<u>CAUTION 2.12</u>

If the operating pump cavitates or loses suction pressure, the pump should be stopped immediately to prevent internal damage.

☐ 2.12 Select a pump by placing XPP157A AND B, CRDM COOLING WATER PUMP, in A or B position.

☐ 2.13 Run selected pump for one minute.

☐ 2.14 Place XPP157A AND B, CRDM COOLING WATER PUMP, in OFF.

NOTE 2.15

If no air is vented while performing Steps 2.3 through 2.14, then Step 2.15 may be omitted.

☐ 2.15 Repeat Steps 2.4 through 2.14 until all air has been vented from system.

2.16 Verify the following (IB-436):

☐ a. IPI05553-AC, AC PUMPS SUCTION HEADER PRESSURE IND, indicates 6 psig to 8 psig.

☐ b. Expansion Tank is between ¼ full and ½ full.

CAUTION 2.17

If the operating pump cavitates or loses suction pressure, the pump should be stopped immediately to prevent internal damage.

☐ 2.17 Select the other pump by placing XPP157A AND B, CRDM COOLING WATER PUMP, in A or B position.

☐ 2.18 Monitor selected pump for signs of cavitation.

☐ 2.19 If it appears air is still present, shut down pump and perform Steps 2.3 through 2.14, as necessary.

☐ 2.20 Ensure the valves identified on Attachment IB, NOTE 1 are closed and capped.

☐ 2.21 Contact I&C to align IFI05575-AC, INDUSTRIAL CLR AC RETURN HDR FLOW IND, per Attachment III.

END OF SECTION

Z064→ **K. STARTUP OF THE CONTROL ROD DRIVE MECHANISM SHROUD VENTILATION COOLING FANS**

1.0 INITIAL CONDITIONS

☐ 1.1 Control Panel lineup is complete per Attachment IV.

CAUTION 2.0

CRDM Shroud Ventilation Cooling Fans must be operated to limit temperature in vicinity of CRDMs to less than 170°F.

2.0 INSTRUCTIONS

CAUTION 2.1

a. XFN-67A, FAN A, and XFN-67B, FAN B should **NOT** be paired together as this causes unacceptably high vibration levels in XFN-67A, FAN A.

b. XFN-67C, FAN C, and XFN-67D, FAN D should **NOT** be paired together as this causes unacceptably high vibration levels in XFN-67C, FAN C.

NOTE 2.1

For each fan started, the switch must be held in START for five seconds or until the associated RUN light is energized.

☐ 2.1 At XCP-6210, HVAC Control Panel, start one of the following pairs of CRDM Shroud Exhaust fans:

a. XFN-67A, FAN A, and XFN-67D, FAN D (preferred combination).

b. XFN-67B, FAN B, and XFN-67C, FAN C (preferred combination).

c. XFN-67A, FAN A, and XFN-67C, FAN C.

d. XFN-67B, FAN B, and XFN-67D, FAN D.

e. XFN-67A, FAN A, and XFN-67B, FAN B (non-preferred combination).

f. XFN-67C, FAN C, and XFN-67D, FAN D (non-preferred combination).

2.2 After starting above fan units verify the following (HVAC Panel):

☐ a. HIGH TEMP (LCB1 Point 9-9) is clear.

☐ b. CRDM COOLING WATER TROUBLE (LCB1 Point 9-11) is clear.

☐ c. TI-9341, CRDM SHROUD OUT TEMP °F, indicates between 70°F and 117°F.

END OF SECTION

Z022→ **L. STARTUP CONTROL ROD DRIVE MECHANISM COOLING WATER SYSTEM** CHG A

1.0 INITIAL CONDITIONS

☐ 1.1 CRDM Cooling Water System is filled and vented per Section III.

☐ 1.2 Control Panel lineup is complete per Attachment IV.

2.0 INSTRUCTIONS

2.1 Verify the following Containment Isolation valves are open (MCB):

☐ a. MVG-7501, TO CRDM CLR ISOL (ORB).

☐ b. MVG-7502, TO CRDM CLR ISOL (IRB).

☐ c. MVG-7503, FR CRDM CLR ISOL (IRB).

☐ d. MVG-7504, FR CRDM CLR ISOL (ORB).

NOTE 2.2 through 2.6
Operations are performed at XPN5409, LOC CONT INDUST COOLER CRDM UNIT (YD-125'E).

2.2 Place the following in ON position:

☐ a. XFN-145A, INDUSTRIAL COOLER CRDM COIL FAN.

☐ b. XFN-145B, INDUSTRIAL COOLER CRDM COIL FAN.

☐ c. XFN-145C, INDUSTRIAL COOLER CRDM COIL FAN.

☐ d. XFN-145D, INDUSTRIAL COOLER CRDM COIL FAN.

2.3 Place the following in ON position:

☐ a. XPP-156A, AC SYS INDUSTRIAL COOLER SPRAY PUMP A.

☐ b. XPP-156B, AC SYS INDUSTRIAL COOLER SPRAY PUMP B.

☐ c. XPP-156C, AC SYS INDUSTRIAL COOLER SPRAY PUMP C.

☐ d. XPP-156D, AC SYS INDUSTRIAL COOLER SPRAY PUMP D.

2.4 Ensure proper operation of CRDM Industrial Cooler as follows:

☐ a. Monitor shutdown spray pumps for reverse rotation.

☐ b. Verify adequate spray flow.

☐ c. Observe fan damper indication for proper operation.

☐ d. Adjust blow down as necessary by throttling (YD-425’E):

1) XVA17524A-AC, AC SYSTEM INDUSTRIAL COOLER BLOW DOWN VALVE.

2) XVA17524B-AC, AC SYSTEM INDUSTRIAL COOLER BLOW DOWN VALVE.

☐ e. Check discharge pipe for normal blow down flow.

NOTE 2.5

Depressing PB–AC 14, ITS05573 OVER-RIDE, will bypass the high temperature trip for five minutes to allow mixing of expected hot water slug.

☐ 2.5 Depress and release PB-AC 14, ITS05573 OVER-RIDE, pushbutton.

☐ 2.6 Place XPP157A AND B, CRDM COOLING WATER PUMP, in A or B position.

END OF SECTION

M. SHUTDOWN (AND DRAIN IF LONG TERM) CONTROL ROD DRIVE MECHANISM COOLING SYSTEM

1.0 INITIAL CONDITIONS

☐ 1.1 Plant is in Mode 5 or Containment Integrity is relaxed, prior to draining.

NOTE 2.0

Unless otherwise noted, all operations are performed at XPN5409, LOC CONT INDUST COOLER CRDM UNIT (YD-125'E).

2.0 INSTRUCTIONS

☐ 2.1 Place XPP157A AND B, CRDM COOLING WATER PUMP, in OFF position.

2.2 Place the following in OFF position:

☐ a. XFN-145A, INDUSTRIAL COOLER CRDM COIL FAN.

☐ b. XFN-145B, INDUSTRIAL COOLER CRDM COIL FAN.

☐ c. XFN-145C, INDUSTRIAL COOLER CRDM COIL FAN.

☐ d. XFN-145D, INDUSTRIAL COOLER CRDM COIL FAN.

2.3 Place the following in OFF position:

☐ a. XPP-156A, AC SYS INDUSTRIAL COOLER SPRAY PUMP A.

☐ b. XPP-156B, AC SYS INDUSTRIAL COOLER SPRAY PUMP B.

☐ c. XPP-156C, AC SYS INDUSTRIAL COOLER SPRAY PUMP C.

☐ d. XPP-156D, AC SYS INDUSTRIAL COOLER SPRAY PUMP D.

NOTE 2.4

a. If XSW1A3-1C3 Tie Breaker is closed and XFN-67A and XFN-67B are available, XFN-67C and XFN-67D will be locked out and XFN-67A and XFN-67B will have a locked in Auto-Start signal.

b. Prior to shutdown of CRDM shroud exhaust fans, the CRDMs must be deenergized and RCS temperature must be less than 170°F.

☐ 2.4 At HVAC Control Panel, XCP-6210, shut down running CRDM Shroud Exhaust fans by placing the following in STOP position:

a. XFN-67A, FAN A.

b. XFN-67B, FAN B.

c. XFN-67C, FAN C.

d. XFN-67D, FAN D.

☐ 2.5 If the CRDM Cooling System is being shutdown for an extended period of time (i.e. an outage) perform Attachment V.

2.6 Perform the following steps to place the CRDM Cooling System in long term shutdown for freeze protection or Maintenance purposes:

OA 9218 ☐ a. Inform Chemistry of the intent to drain CRDM Cooling Water System to the IB sumps. The IB sump discharge will be required to be aligned to Pond 008.

b. Ensure the following valves are open:

☐ 1) MVG-7501, TO CRDM CLR ISOL (ORB).

☐ 2) MVG-7502, TO CRDM CLR ISOL (IRB).

☐ 3) MVG-7503, FR CRDM CLR ISOL (IRB).

☐ 4) MVG-7504, FR CRDM CLR ISOL (ORB).

Step 2.6 continued

c. Ensure closed (or Tag if applicable) the following make up valves:

☐ 1) XVG07520-AC, CRDM COOLING WATER RETURN HDR FILL VLV (YD-125'E).

☐ 2) XVT28762-DN, MAKEUP TO CRDM COOLING SYSTEM FILL VALVE (IB-436, E PEN).

CAUTION 2.6.d

Draining the CRDM Cooling Water to the East Penetration Access Area Sump will result in Sodium Meta Silicate intrusion of Liquid Waste. Draining CRDM Cooling to the IB sump will require Chemistry to swap the IB sump discharge alignment to Pond 008.

☐ d. Drain CRDM Cooling Water to the IB sumps as follows:

1) Attach drain hoses to the following valves (412 E Pen in overhead, Northeast corner):

☐ a) XVT07548-AC, AC SYS INDUSTRIAL CLR OUT HDR DRAIN VLV.

☐ b) XVT07549-AC, INDUSTRIAL CLR AC RETURN HDR DRAIN VLV.

☐ 2) Direct the attached drain hoses from the 412 East Penetration area, through the door (DRPA/103), to the 412 IB sump.

3) Open the following valves to begin draining (412 E Pen overhead of Northeast corner):

☐ a) XVT07548-AC, AC SYS INDUSTRIAL CLR OUT HDR DRAIN VLV.

☐ b) XVT07549-AC, INDUSTRIAL CLR AC RETURN HDR DRAIN VLV.

Step 2.6 continued

e. Uncap and open the following (YD-125'E):

☐ 1) XVT07514A-AC, HIGH ROOT TO IPX05576.

☐ 2) XVT07514B-AC, HIGH ROOT TO IPX05578.

☐ 3) XVT07514C-AC, HIGH ROOT TO IPX05582.

☐ 4) XVT07514D-AC, HIGH ROOT TO IPX05584.

☐ 5) XVT07515A-AC, HIGH ROOT TO IPX05577.

☐ 6) XVT07515B-AC, HIGH ROOT TO IPX05579.

☐ 7) XVT07515C-AC, HIGH ROOT TO IPX05583.

☐ 8) XVT07515D-AC, HIGH ROOT TO IPX05585.

Step 2.6 continued

CAUTION 2.6.f

Opening vent valves when water is being drained to the RB and Containment Integrity is required will result in a loss of Containment Integrity.

NOTE 2.6.f

It may be necessary to drain more to the 412 IB until no water comes out in the RB. Valves are only open to provide a vent path for draining the system to the IB-412.

f. When the system drain rate decreases, open the following vent valves (RB 436):

☐ 1) XVT07508A-AC, HIGH ROOT TO IPX05561.

☐ 2) XVT07509A-AC, HIGH ROOT TO IPX05557.

☐ 3) XVT07508B-AC, HIGH ROOT TO IPX05560.

☐ 4) XVT07509B-AC, HIGH ROOT TO IPX05556.

☐ 5) XVT07508C-AC, HIGH ROOT TO IPX05563.

☐ 6) XVT07509C-AC, HIGH ROOT TO IPX05567.

☐ 7) XVT07508D-AC, HIGH ROOT TO IPX05562.

☐ 8) XVT07509D-AC, HIGH ROOT TO IPX05566.

g. Ensure the following:

☐ 1) Draining is complete to the 412 IB and report it to the Duty Shift Supervisor or Tagging Desk.

☐ 2) Remove the drain hoses and close door DRPA/103.

☐ 3) Notify Chemistry the CRDM draining is complete.

Step 2.6 continued

h. Protect Containment Integrity by closing and de-energizing one of the following sets of valves:

1) For A TRAIN:

☐ a) MVG-7501, TO CRDM CLR ISOL (ORB). (XMC1DA2X 06AD).

☐ b) MVG-7503, FR CRDM CLR ISOL (IRB). (XMC1DA2X 11IM).

OR

2) For B TRAIN:

☐ a) MVG-7502, TO CRDM CLR ISOL (IRB). (XMC1DB2X 07IM).

☐ b) MVG-7504, FR CRDM CLR ISOL (ORB). (XMC1DB2X 07AD).

END OF SECTION

N. SWAPPING CRDM SHROUD EXHAUST FANS

1.0 INITIAL CONDITIONS

☐ 1.1 CRDM Cooling System is in operation per Section III.

NOTE 2.0
All operations are performed at the HVAC Control Panel, XCP-6210.

2.0 INSTRUCTIONS

☐ 2.1 Shut down running CRDM Shroud Exhaust fans by placing the following in STOP position:

a. XFN-67A, FAN A.

b. XFN-67B, FAN B.

c. XFN-67C, FAN C.

d. XFN-67D, FAN D.

CAUTION 2.2

N01→

a. To minimize starting current, running fans should be shutdown for a minimum of 30 seconds prior to starting idle fans.

b. XFN-67A, FAN A, and XFN-67B, FAN B should **NOT** be paired together as this causes unacceptably high vibration levels in XFN-67A, FAN A.

c. XFN-67C, FAN C, and XFN-67D, FAN D should **NOT** be paired together as this causes unacceptably high vibration levels in XFN-67C, FAN C.

NOTE 2.2

a. For each fan started, the switch must be held in START for five seconds or until the associated RUN light is energized.

b. If XSW1A3-1C3 Tie Breaker is closed and XFN-67A and XFN-67B are available, XFN-67C and XFN-67D will be locked out and XFN-67A and XFN-67B will have a locked in Auto-Start signal.

☐ 2.2 Start one of the following pairs of CRDM Shroud Exhaust fans:

a. XFN-67A, FAN A, and XFN-67D, FAN D (preferred combination).

b. XFN-67B, FAN B, and XFN-67C, FAN C (preferred combination).

c. XFN-67A, FAN A, and XFN-67C, FAN C.

d. XFN-67B, FAN B, and XFN-67D, FAN D.

e. XFN-67A, FAN A, and XFN-67B, FAN B (non-preferred combination).

f. XFN-67C, FAN C, and XFN-67D, FAN D (non-preferred combination).

2.3 After operating fans have been swapped, verify the following (HVAC Panel):

☐ a. HIGH TEMP (LCB1 Point 9-9) is clear.

☐ b. CRDM COOLING WATER TROUBLE (LCB1 Point 9-11) is clear.

☐ c. TI-9341, CRDM SHROUD OUT TEMP °F, indicates less than 170 °F.

END OF SECTION

O. RAISING REACTOR BUILDING PRESSURE USING NORMAL PRESSURE CONTROL

1.0 INITIAL CONDITIONS

☐ 1.1 Raising Reactor Building pressure is required/desired.

NOTE 2.0

Unless otherwise noted, all operations are performed at HVAC Control Panel, XCP-6210.

2.0 INSTRUCTIONS

☐ 2.1 Ensure RMA0002, RB SAMPLE LINE GAS ATMOS MONITOR is in service (Rad Monitoring Panel).

2.2 At the Main Control Board, ensure the following valves are open to indicate pressure on PI-8254, RB NR PRESS PSI:

☐ a. SVX-6054, RB NR PRESS CNTMT ISOL.

☐ b. SVX-6050A, POST ACCID H2 LOOP A (IRB).

2.3 Raise RB pressure as follows:

☐ a. Ensure MVB-6063, H2 REMOVAL ALT PUR THROT, is closed.

CAUTION 2.3.b

To prevent damage to Alternate Purge System ducting, Alternate Purge must not be placed in service if RB pressure is greater than 3 psi.

b. Open the following:

☐ 1) PVG-6056, ALT PUR SPLY ISOL VLV.

☐ 2) PVG-6057, ALT PUR SPLY ISOL VLV.

Step 2.3 continued

CAUTION 2.3.c
If flow is noted on FI-8251, H_2 PURGE FLOW CFM, then XFN-95, 6 INCH RB PUR INTAKE FAN, should be tripped and MVB-6063, H2 REMOVAL ALT PUR THROT, should be checked for leakage.

☐ c. Start XFN-95, 6 INCH RB PUR INTAKE FAN.

2.4 If RB pressure is being raised to support door maintenance, simultaneous opening of both personnel hatch doors or opening of equipment hatch door, perform the following:

☐ a. Monitor PI-8254, RB NR PRESS PSI.

☐ b. When RB pressure is between negative 0.05 psi and positive 0.05 psi, stop XFN-95, 6 INCH RB PUR INTAKE FAN.

2.5 If RB pressure is being raised for any other reason, perform the following:

☐ a. Monitor PI-8254, RB NR PRESS PSI.

☐ b. When RB pressure is between 0.2 psi and 1.0 psi, stop XFN-95, 6 INCH RB PUR INTAKE FAN.

2.6 Close the following:

☐ a. PVG-6056, ALT PUR SPLY ISOL VLV.

☐ b. PVG-6057, ALT PUR SPLY ISOL VLV.

END OF SECTION

P. LOWERING REACTOR BUILDING PRESSURE USING NORMAL PRESSURE CONTROL

1.0 INITIAL CONDITIONS

☐ 1.1 Lowering Reactor Building pressure is required/desired.

NOTE 2.0
Unless otherwise noted, all operations are performed at HVAC Control Panel, XCP-6210.

2.0 INSTRUCTIONS

OA 9843 ☐ 2.1 Ensure a Reactor Building Purge Release Permit has been issued per HPP-709.

2.2 Ensure the following Radiation Monitors are in service (Rad Monitoring Panel):

☐ a. RMA0004, RB PURGE EXH GAS ATMOS MONITOR.

☐ b. RMA0002, RB SAMPLE LINE GAS ATMOS MONITOR.

2.3 On Main Control Board, ensure the following valves are open to indicate pressure on PI-8254, RB NR PRESS PSI:

☐ a. SVX-6054, RB NR PRESS CNTMT ISOL.

☐ b. SVX-6050A, POST ACCID H2 LOOP A (IRB).

☐ 2.4 Ensure RMA0004, RB PURGE EXH GAS ATMOS MONITOR, high radiation alarm setpoint is adjusted per Reactor Building Release Permit.

2.5 Reduce RB pressure as follows:

CAUTION 2.5.a

To prevent damage to Alternate Purge System ducting, Alternate Purge must not be placed in service if RB pressure is greater than 3 psi.

a. Open the following:

☐ 1) PVG-6066, CNTMT PUR EXH ISOL VLV.

☐ 2) PVG-6067, CNTMT PUR EXH ISOL VLV.

☐ b. Start XFN-96, ALT PUR EXH FAN. **(Peer ✓)**

c. Record time release was started and flow rate as indicated on FI-8252, H2 PURGE FLOW CFM, in the following places:

☐ 1) Reactor Building Purge Release Permit.

☐ 2) Station Log Book.

2.6 If RB pressure is being lowered to support door maintenance, simultaneous opening of both personnel hatch doors or opening of equipment hatch door, perform the following:

☐ a. Monitor PI-8254, RB NR PRESS PSI.

☐ b. When RB pressure is between negative 0.05 psi and positive 0.05 psi, stop XFN-96, ALT PUR EXH FAN.

2.7 If RB pressure is being lowered for any other reason, perform the following:

☐ a. Monitor PI-8254, RB NR PRESS PSI.

☐ b. When RB pressure is between 0.2 psi and 1.0 psi, stop XFN-96, ALT PUR EXH FAN.

2.8 Close the following:

☐ a. PVG-6066, CNTMT PUR EXH ISOL VLV.

☐ b. PVG-6067, CNTMT PUR EXH ISOL VLV.

2.9 Record time release was stopped in the following places:

☐ a. Reactor Building Purge Release Permit.

☐ b. Station Log Book.

END OF SECTION

Q. STARTUP REACTOR BUILDING ALTERNATE PURGE SUPPLY AND EXHAUST

1.0 INITIAL CONDITIONS

☐ 1.1 Valve lineup is complete per Attachment IA.

☐ 1.2 Electrical lineup is complete per Attachment IIA.

☐ 1.3 Control Panel lineup is complete per Attachment IV.

NOTE 2.0
Unless otherwise noted, all operations are performed at HVAC Control Panel, XCP-6210.

2.0 INSTRUCTIONS

OA 9843 ☐ 2.1 Ensure a Reactor Building Purge Release Permit has been issued per HPP-709.

2.2 Ensure the following Radiation Monitors are in service (Rad Monitoring Panel):

☐ a. RMA0004, RB PURGE EXH GAS ATMOS MONITOR.

☐ b. RMA0002, RB SAMPLE LINE GAS ATMOS MONITOR.

☐ c. Hang Main Control Board Status Indicators, per OAP-100.5, on RMA0002 Sample Pump controls and Channel Modules identifying that Purge is in progress.

☐ d. Hang Main Control Board Status Indicators, per OAP-100.5, on RMA0004 Sample Pump controls and Channel Modules identifying that Purge is in progress.

2.3 On Main Control Board, ensure the following valves are open to indicate pressure on PI-8254, RB NR PRESS PSI:

☐ a. SVX-6054, RB NR PRESS CNTMT ISOL.

☐ b. SVX-6050A, POST ACCID H2 LOOP A (IRB).

☐ 2.4 Ensure RMA0004, RB PURGE EXH GAS ATMOS MONITOR high radiation alarm setpoint is adjusted per Reactor Building Purge Release Permit.

CAUTION 2.5
To prevent damage to Alternate Purge System ducting, Alternate Purge must not be placed in service if RB pressure is greater than 3 psi.

2.5 Initiate Reactor Building Alternate Purge as follows:

NOTE 2.5.a and 2.5.b
If RB pressure is near the upper limit, Steps 2.5.a and 2.5.b may be reversed to prevent exceeding Technical Specifications limit.

a. Start up Alternate Purge Supply System as follows:

☐ 1) Ensure MVB-6063, H2 REMOVAL ALT PUR THROT, is closed.

☐ 2) Open PVG-6056, ALT PUR SPLY ISOL VLV.

☐ 3) Open PVG-6057, ALT PUR SPLY ISOL VLV.

☐ 4) Start XFN-95, 6 INCH RB PUR INTAKE FAN.

b. Start up Alternate Purge Exhaust System as follows:

☐ 1) Open PVG-6066, CNTMT PUR EXH ISOL VLV.

☐ 2) Open PVG-6067, CNTMT PUR EXH ISOL VLV.

☐ 3) Start XFN-96, ALT PUR EXH FAN. **(Peer ✓)**

☐ c. Verify flow on FI-8252, H2 PURGE FLOW CFM.

☐ 2.6 Record purge start time.

☐ 2.7 Establish RB pressure in one of the following pressure bands:

a. Adjust MVB-6063, H2 REMOVAL ALT PUR THROT, to maintain RB pressure between 0.2 psi and 1.0 psi, as indicated on PI-8254, RB NR PRESS PSI.

b. To support door maintenance, simultaneous opening of both personnel hatch doors or opening of equipment hatch door, adjust MVB-6063, H2 REMOVAL ALT PUR THROT, to maintain RB pressure between negative 0.05 psi and positive 0.05 psi, as indicated on PI-8254, RB NR PRESS PSI.

NOTE 2.8

Flow, as read on FI-8251, H2 PURGE FLOW CFM, shall be maintained less than or equal to 100 cfm, while throttling MVB-6063, H2 REMOVAL ALT PUR THROT.

☐ 2.8 If required, adjust MVB-6063, H2 REMOVAL ALT PUR THROT, to maintain RB pressure in desired pressure band, as indicated on PI-8254, RB NR PRESS PSI, as follows:

a. As pressure increases, throttle MVB-6063, H2 REMOVAL ALT PUR THROT, open, as necessary, to lower pressure.

b. As pressure decreases, throttle MVB-6063, H2 REMOVAL ALT PUR THROT, closed, as necessary, to raise pressure.

☐ 2.9 If MVB-6063, H2 REMOVAL ALT PUR THROT, is fully closed and pressure continues to decrease, stop and start XFN-96, ALT PUR EXH FAN, as necessary, to maintain pressure in desired pressure band, as indicated on PI-8254, RB NR PRESS PSI.

END OF SECTION

R. SHUTDOWN REACTOR BUILDING ALTERNATE PURGE SUPPLY AND EXHAUST

1.0 INITIAL CONDITIONS

☐ 1.1 RB Alternate Purge Supply and Exhaust System is in operation per Section III.

NOTE 2.0

Unless otherwise noted, all operations are performed at HVAC Control Panel, XCP-6210.

2.0 INSTRUCTIONS

☐ 2.1 Monitor PI-8254, RB NR PRESS PSI, to ensure pressure is between 0.2 psi and 1.0 psi.

NOTE 2.2 and 2.3

If RB pressure is near the upper limit, Steps 2.2 and 2.3 may be reversed to prevent exceeding Technical Specifications limit.

2.2 Shut down Alternate Purge Exhaust System as follows:

☐ a. Stop XFN-96, ALT PUR EXH FAN.

☐ b. Close PVG-6066, CNTMT PUR EXH ISOL VLV.

☐ c. Close PVG-6067, CNTMT PUR EXH ISOL VLV.

2.3 Shut down Alternate Purge Supply System as follows:

☐ a. Close MVB-6063, H_2 REMOVAL ALT PUR THROT.

☐ b. Stop XFN-95, 6 INCH RB PUR INTAKE FAN.

☐ c. Close PVG-6056, ALT PUR SPLY ISOL VLV.

☐ d. Close PVG-6057, ALT PUR SPLY ISOL VLV.

☐ 2.4 Record purge stop time.

☐ 2.5 Remove Main Control Board Status Indicators on RMA0002 and RMA0004 Sample Pump controls and Channel Modules identifying that Purge is in progress.

END OF SECTION

S. OPERATING DIGITAL ROD POSITION INDICATION CABINET COOLING SYSTEM

1.0 INITIAL CONDITIONS

☐ 1.1 Electrical lineup is complete per Attachment IIA.

☐ 1.2 Control Panel lineup is complete per Attachment IV.

☐ 1.3 Industrial Cooling Water is in service per SOP-125.

☐ 1.4 Service Water System is aligned and in service per SOP-117.

NOTE 2.0
All operations are performed at HVAC Control Panel, XCP-6210.

2.0 INSTRUCTIONS

2.1 Open the following:

☐ a. PVT-3164, DRPI CLG UNIT COIL ISOL.

☐ b. PVT-3169/PVT-3165, DRPI CLG UNIT COIL ISOL.

☐ 2.2 If available, start XPP-149, DRPI CLG UNIT BSTR PP.

☐ 2.3 Start XFN-107, RPI CABINET CLG FAN.

2.4 If the DRPI Booster pump is available, verify the following annunciators have cleared:

☐ a. FAN PUMP TRIP (LCB2 Point 10-25).

☐ b. HIGH TEMP (LCB2 Point 11-25).

2.5 Return system to standby when DRPI Cooling System operation is no longer required, as follows:

☐ a. If desired, stop XFN-107, RPI CABINET CLG FAN.

☐ b. If previously started, stop XPP-149, DRPI CLG UNIT BSTR PP.

c. Close the following:

☐ 1) PVT-3169/PVT-3165, DRPI CLG UNIT COIL ISOL.

☐ 2) PVT-3164, DRPI CLG UNIT COIL ISOL.

END OF SECTION

T. SWAPPING INSERVICE CRDM COOLING SPRAY AND COOLING WATER PUMPS

1.0 INITIAL CONDITIONS

☐ 1.1 CRDM Cooling System is in service per Section III.

> NOTE 2.0
>
> All operations are performed at XCI0004-AC, CRDM COOLING WATER INDUSTRIAL COOLER, (YD-125'E) unless otherwise noted.

2.0 INSTRUCTIONS

2.1 Swap in-service CRDM Spray Pumps as follows:

☐ a. At XPN5409, LOC CONT INDUST COOLER CRDM UNIT, position XPP-156A, B, C AND D, INDUSTRIAL COOLER CRDM COIL NORMAL AND STANDBY PUMPS, Switch to A-C (B-D).

b. Vent off any entrapped air from the casing of the running CRDM Spray Pumps by performing the following:

☐ 1) Throttle the appropriate discharge valves closed for the running spray pumps:

a) XVB17502, AC IND CLR SPRAY PUMP A DISCH VALVE.

b) XVB17508, AC IND CLR SPRAY PUMP C DISCH VALVE.

c) XVB17505, AC IND CLR SPRAY PUMP B DISCH VALVE.

d) XVB17511, AC IND CLR SPRAY PUMP D DISCH VALVE.

☐ 2) Vent each running spray pump casing until a steady stream of water is discharged.

☐ 3) Open the discharge valves that were throttled in Step 2.1.b.1).

☐ 4) Verify that observed spray flow is adequate.

CHG B

Step 2.1 continued

c. Ensure proper operation of CRDM Industrial Cooler as follows:

☐ 1) Monitor shutdown spray pumps for reverse rotation.

CHG B

☐ 2) Observe fan damper indication for proper operation.

☐ 3) Adjust blow down as necessary by throttling:

a) XVA17524A-AC, AC SYSTEM INDUSTRIAL COOLER BLOW DOWN VALVE.

b) XVA17524B-AC, AC SYSTEM INDUSTRIAL COOLER BLOW DOWN VALVE.

☐ 4) Check discharge pipe for normal blow down flow.

CHG B

☐ 2.2 Swap CRDM Cooling Water Pumps by placing XPP157A AND B, CRDM COOLING WATER PUMP, in the A or B position, as desired.

END OF SECTION

IV. INFREQUENT OPERATIONS

A. FILLING CONTROL ROD DRIVE MECHANISM COOLING SYSTEM EXPANSION TANK FROM DEMINERALIZED WATER

1.0 INITIAL CONDITIONS

☐ 1.1 CRDM Cooling Water System has been filled and vented per Section III.

☐ 1.2 Filling of CRDM Cooling Water System Expansion Tank is required/desired.

> NOTE 2.0
>
> All operations are performed in the IB-436 East Penetration Area.

2.0 INSTRUCTIONS

☐ 2.1 Remove cap from XVG17513-AC, AC SYSTEM VENT ISOLATION VALVE.

☐ 2.2 Throttle open XVT28762-DN, DN MAKEUP TO CRDM COOLING SYSTEM FILL VALVE, to begin filling expansion tank.

☐ 2.3 Throttle open XVG17513-AC, AC SYSTEM VENT ISOLATION VALVE, as necessary to maintain CRDM Cooling Water System suction header pressure between 3 psig and 8 psig as indicated on IPI05553-AC, AC PUMPS SUCTION HEADER PRESSURE IND.

☐ 2.4 Close XVT28762-DN, DN MAKEUP TO CRDM COOLING SYSTEM FILL VALVE when expansion tank is at desired level, between ¼ full and ¾ full.

☐ 2.5 Close and cap XVG17513-AC, AC SYSTEM VENT ISOLATION VALVE.

END OF SECTION

B. FILLING CONTROL ROD DRIVE MECHANISM COOLING SYSTEM EXPANSION TANK FROM FILTERED WATER

1.0 INITIAL CONDITIONS

- ☐ 1.1 CRDM Cooling Water System has been filled and vented per Section III.
- ☐ 1.2 CRDM Cooling Tower Spray Sump is at normal level with no makeup in progress.
- ☐ 1.3 Filling of CRDM Cooling Water System Expansion Tank is required/desired.

2.0 INSTRUCTIONS

- ☐ 2.1 Notify Control Room prior to filling expansion tank.

NOTE 2.2

Maintaining IPI05592-AC, AC SYS INDUSTRIAL CLR INLET PRESS IND (YD-125'E), less than 20 psig prevents lifting of XVR07510A,B,C,D, CRDM COOLER AC RETURN HEADER RELIEF VLV (RB-436), at 50 psig.

- ☐ 2.2 Throttle open XVG07520-AC, CRDM COOLING WATER RETURN HDR FILL VLV (YD-125'E), to begin filling expansion tank while maintaining less than 20 psig on IPI05592-AC, AC SYS INDUSTRIAL CLR INLET PRESS IND.
- ☐ 2.3 Remove cap from XVG17513-AC, AC SYSTEM VENT ISOLATION VALVE.
- ☐ 2.4 Throttle open XVG17513-AC, AC SYSTEM VENT ISOLATION VALVE, as necessary to maintain CRDM Cooling Water System suction header pressure between 3 psig and 8 psig as indicated on IPI05553-AC, AC PUMPS SUCTION HEADER PRESSURE IND.
- ☐ 2.5 Close XVG07520-AC, CRDM COOLING WATER RETURN HDR FILL VLV (YD-125'E), when expansion tank is at desired level, between ¼ full and ¾ full.
- ☐ 2.6 Notify Control Room after filling expansion tank.

END OF SECTION

C. SUPPLYING NITROGEN TO OPERATE REACTOR BUILDING PURGE SUPPLY AND EXHAUST VALVES

1.0 INITIAL CONDITIONS

☐ 1.1 The Plant is Defueled.

☐ 1.2 Reactor Building Purge and Exhaust is secured.

☐ 1.3 Valve lineup is complete per Attachment IA.

☐ 1.4 Electrical lineup is complete per Attachment IIA.

☐ 1.5 Control Panel lineup is complete per Attachment IV.

☐ 1.6 Fire Service System is in service per SOP-509.

☐ 1.7 Nitrogen bottles with regulators are staged in the RB.

NOTE2.0
Installation of Nitrogen to operate the RB Purge and Exhaust valves makes the RB Purge system inoperable.

2.0 INSTRUCTIONS

☐ 2.1 Initiate an MWR, per EIR 81067, to direct I&C to connect nitrogen bottles to:

a. XVB00001B-AH, RB PURGE SUPPLY ISOLATION VALVE (IRC).

b. XVB00002B-AH, RB PURGE EXHAUST ISOLATION VALVE (IRC).

2.2 When I&C completes installation of the nitrogen bottles, then start Reactor Building Purge as follows:

☐ a. Open PVB-2A, CNTMT EXH ISOL.

N01→

NOTE 2.2.b
If both trains of RB Purge are to be run, both exhaust fans should be started simultaneously.

☐ b. Hold PVB-2B, CNTMT EXH ISOL, to OPEN while simultaneously holding one or both of the following fan control switches in the START position: **(Peer ✓)**

1) XFN-13A, EXH FAN A.

2) XFN-13B, EXH FAN B.

c. Verify the following:

☐ 1) XFN-13A(B)-AH inlet damper opens.

☐ 2) XFN-13A(B)-AH outlet damper opens.

☐ d. Open XDP-28, INTAKE DMPR.

e. Open the following:

☐ 1) PVB-1A, CNTMT SPLY ISOL.

☐ 2) PVB-1B, CNTMT SPLY ISOL.

Step 2.2 continued

N01→ NOTE 2.2.f

1) If both trains of RB Purge are to be run, both supply fans should be started simultaneously.

2) When the Reactor Building Equipment Hatch is open, only one RB Purge supply fan should be in operation.

3) When equipment hatch is open, negative pressure will be maintained in the RB by operating fewer supply fans than exhaust fans.

4) Both supply fans may be secured with the equipment hatch open and two exhaust fans running to control radiological conditions.

☐ f. Start one or both of the following, as necessary:

1) XFN-11A, SPLY FAN A.

2) XFN-11B, SPLY FAN B.

g. Verify the following:

☐ 1) XFN-11A(B)-AH inlet damper opens fully.

☐ 2) XFN-11A(B)-AH outlet damper opens fully.

☐ 3) The following selected fan(s) starts:

a) XFN-11A, SPLY FAN A.

b) XFN-11B, SPLY FAN B.

☐ 2.3 When it is desired for I&C to restore Instrument Air to the Reactor Building Purge and Exhaust Valves, proceed to shut down the Reactor Building Purge and Exhaust per Steps 2.4 through 2.12.

☐ 2.4 Stop one of the following:

a. XFN-11A, SPLY FAN A.

b. XFN-11B, SPLY FAN B.

2.5 Verify the following:

☐ a. XFN-11A(B)-AH inlet damper is closed.

☐ b. XFN-11A(B)-AH outlet damper is closed.

☐ 2.6 Remove remaining supply fan from service per Steps 2.4 and 2.5, if required.

2.7 Close the following:

☐ a. PVB-1A, CNTMT SPLY ISOL.

☐ b. PVB-1B, CNTMT SPLY ISOL.

☐ 2.8 Close XDP-28, INTAKE DMPR.

☐ 2.9 Stop the following running exhaust fans:

a. XFN-13A, EXH FAN A.

b. XFN-13B, EXH FAN B.

2.10 Verify the following:

☐ a. XFN-13A(B)-AH inlet damper is closed.

☐ b. XFN-13A(B)-AH outlet damper is closed.

☐ 2.11 Remove remaining exhaust fan from service per Steps 2.9 and 2.10, if required.

2.12 Close the following:

☐ a. PVB-2A, CNTMT EXH ISOL.

☐ b. PVB-2B, CNTMT EXH ISOL.

☐ 2.13 Direct I&C (per EIR 81067/MWR step), to reconnect instrument air to:

a. XVB00001B-AH, RB PURGE SUPPLY ISOLATION VALVE (IRC).

b. XVB00002B-AH, RB PURGE EXHAUST ISOLATION VALVE (IRC).

☐ 2.14 Perform STP-130.005B to verify Reactor Building Purge and Exhaust Valve operability.

2.15 Start Reactor Building Purge as follows:

☐ a. Open PVB-2A, CNTMT EXH ISOL.

N01→

NOTE 2.15.b

If both trains of RB Purge are to be run, both exhaust fans should be started simultaneously.

☐ b. Hold PVB-2B, CNTMT EXH ISOL, to OPEN while simultaneously holding one or both of the following fan control switches in the START position: **(Peer ✓)**

1) XFN-13A, EXH FAN A.

2) XFN-13B, EXH FAN B.

c. Verify the following:

☐ 1) XFN-13A(B)-AH inlet damper opens.

☐ 2) XFN-13A(B)-AH outlet damper opens.

☐ d. Open XDP-28, INTAKE DMPR.

e. Open the following:

☐ 1) PVB-1A, CNTMT SPLY ISOL.

☐ 2) PVB-1B, CNTMT SPLY ISOL.

Step 2.15 continued

N01→ NOTE 2.15.f

1) If both trains of RB Purge are to be run, both supply fans should be started simultaneously.

2) When the Reactor Building Equipment Hatch is open, only one RB Purge supply fan should be in operation.

3) When equipment hatch is open, negative pressure will be maintained in the RB by operating fewer supply fans than exhaust fans.

4) Both supply fans may be secured with the equipment hatch open and two exhaust fans running to control radiological conditions.

☐ f. Start one or both of the following, as necessary:

1) XFN-11A, SPLY FAN A.

2) XFN-11B, SPLY FAN B.

g. Verify the following:

☐ 1) XFN-11A(B)-AH inlet damper opens fully.

☐ 2) XFN-11A(B)-AH outlet damper opens fully.

☐ 3) The following selected fan(s) starts:

a) XFN-11A, SPLY FAN A.

b) XFN-11B, SPLY FAN B.

END OF SECTION

Z023→ **D. SHIFTING REACTOR BUILDING COOLING UNITS FAN SPEED** CHG A

1.0 INITIAL CONDITIONS

☐ 1.1 None.

2.0 INSTRUCTIONS

2.1 Shutdown RBCUs by placing appropriate switch(es) in STOP:

☐ a. XFN 0064A-AH, 1A NORM.

☐ b. XFN 0064A-AH, 1A SLOW.

☐ c. XFN 0064B-AH, 1B NORM.

☐ d. XFN 0064B-AH, 1B SLOW.

☐ e. XFN 0065A-AH, 2A NORM.

☐ f. XFN 0065A-AH, 2A SLOW.

☐ g. XFN 0065B-AH, 2B NORM.

☐ h. XFN 0065B-AH, 2B SLOW.

2.2 Ensure the RBCU dampers are in BYP:

☐ a. XDP-110A, RBCU 64A HEPA FLTR BYP DMPR.

☐ b. XDP-111A, RBCU 65A HEPA FLTR BYP DMPR.

☐ c. XDP-110B, RBCU 64B HEPA FLTR BYP DMPR

☐ d. XDP-111B, RBCU 65B HEPA FLTR BYP DMPR.

NOTE 2.3

a. Due to eddy current brakes, RBCU control switches must be held in START position until the red breaker closed light is lit and starting current is indicated on appropriate meter.

b. Normal and preferred lineup is three RBCUs running in NORM (fast speed).

c. To increase stay times for teams entering containment, four RBCUs may be placed in service in NORM (fast speed).

2.3 Place RBCUs in service by starting desired number of RBCUs in SLOW or NORM as follows:

☐ a. For XFN0064A-AH, REACTOR BLDG COOLING UNIT 1A EMERG FAN, start one of the following:

1) XFN 0064A-AH, 1A NORM.

2) XFN 0064A-AH, 1A SLOW.

☐ b. For XFN0064B-AH, REACTOR BLDG COOLING UNIT 1B EMERG FAN, start one of the following:

1) XFN 0064B-AH, 1B NORM.

2) XFN 0064B-AH, 1B SLOW.

☐ c. For XFN0065A-AH, REACTOR BLDG COOLING UNIT 2A EMERG FAN, start one of the following:

1) XFN 0065A-AH, 2A NORM.

2) XFN 0065A-AH, 2A SLOW.

☐ d. For XFN0065B-AH, REACTOR BLDG COOLING UNIT 2B EMERG FAN, start one of the following:

1) XFN 0065B-AH, 2B NORM.

2) XFN 0065B-AH, 2B SLOW.

NOTE 2.4

If RBCU fan motor amps exceed the values given, PSE should be contacted to evaluate.

☐ 2.4 Verify RBCU Fan motor amps return to normal operating range:

a. For fast speed operation: 275 amps to 300 amps.

b. For slow speed operation: 55 amps to 70 amps.

NOTE 2.5

The RBCU TRAIN A (B) EMERG switch must be selected to an operable RBCU.

2.5 Verify the following switches are in the desired position:

☐ a. XFN-64A/XFN 65A - RBCU TRAIN A EMERG.

☐ b. XFN-64B/XFN 65B - RBCU TRAIN B EMERG.

END OF SECTION

V. OFF NORMAL CONDITIONS

A. LOSS OF ANY REACTOR BUILDING VENTILATION FAN

1.0 ENTRY CONDITIONS

☐ 1.1 High vibration, high temperature, high smoke, or fan trip alarm on any RB ventilation fan (HVAC Control Panel or MCB).

☐ 1.2 One of the following has tripped on a high vibration:

a. Reactor Compartment Cooling Fan.

b. Secondary Compartment Cooling Fan.

> NOTE 2.0
>
> XSW1A3 – 1C3 Tie Breaker closure affects CRDM Shroud Exhaust fan operation as follows:
>
> a. If both XFN0067A and XFN0067B are available, then regardless of operating fan combination, XFN0067C and XFN0067D will be tripped and XFN0067A and XFN0067B will start when tie breaker is closed.
>
> b. If either XFN0067A or XFN0067B is not available, then regardless of operating fan combination, neither XFN0067C nor XFN0067D will be tripped and XFN0067A and XFN0067B will not be started when tie breaker is closed.

2.0 CORRECTIVE ACTIONS

☐ 2.1 If cause is high temperature or high smoke, stop affected fan.

> CAUTION 2.2
>
> A fan that has tripped due to high vibration, high temperature, or high smoke alarm should **NOT** be restarted.

☐ 2.2 If permissible, restart tripped fan per applicable subsection of Section III.

☐ 2.3 Realign remaining fans in affected compartment per applicable subsection of Section III.

☐ 2.4 Refer to Technical Specifications, if applicable, for LCO and Surveillance Requirements.

2.5 If no Reactor Compartment Cooling fans are available, proceed as follows:

a. To continue Power Operations indefinitely, perform the following:

☐ 1) Block door to Incore Pit (RB-101) fully open with an Engineering approved device within 16 hours of loss of Reactor Compartment Cooling.

☐ 2) Operations will monitor performance of Excore Detectors in support of the evaluation to ensure that increasing temperature in the Incore area will not affect Excore Detectors.

☐ b. If conditions do not allow opening door to Incore Pit (RB-101), Power Operations may continue for up to 12 hours, after which a shutdown must commence to place the plant in Mode 4 within the next 20 hours.

END OF SECTION

B. HIGH TEMPERATURE IN DIGITAL ROD POSITION INDICATION CABINET

1.0 ENTRY CONDITIONS

☐ 1.1 HIGH TEMP (LCB2 Point 11-25) alarm on XCP6210, HVAC Control Board.

> **NOTE 2.0**
>
> All operations are performed at HVAC Control Panel, XCP-6210.

2.0 CORRECTIVE ACTIONS

☐ 2.1 Open PVT-3164, DRPI CLG UNIT COIL ISOL.

☐ 2.2 Open PVT-3169/PVT-3165, DRPI CLG UNIT COIL ISOL.

☐ 2.3 If available, start XPP-149, DRPI CLG UNIT BSTR PP.

☐ 2.4 Start XFN-107, RPI CABINET CLG FAN.

2.5 Verify the following annunciators have cleared:

☐ a. FAN PUMP TRIP (LCB2 Point 10-25).

☐ b. HIGH TEMP (LCB2 Point 11-25).

2.6 Correct cause of high temperature condition and restore DRPI Cooling System to a standby condition, if allowed, as follows:

☐ a. Stop XFN-107, RPI CABINET CLG FAN.

☐ b. Stop XPP-149, DRPI CLG UNIT BSTR PP.

☐ c. Close PVT-3169/PVT-3165, DRPI CLG UNIT COIL ISOL.

☐ d. Close PVT-3164, DRPI CLG UNIT COIL ISOL.

END OF SECTION

C. HIGH TEMPERATURE ON REACTOR BUILDING CHARCOAL CLEANUP FILTER PLENUM OR REACTOR BUILDING PURGE EXHAUST FILTER PLENUM

1.0 ENTRY CONDITIONS

☐ 1.1 HI/HI-HI BED TEMP alarms on RB Charcoal Cleanup System Filter Plenum, on XCP6210, HVAC Control Board.

☐ 1.2 HI/HI-HI BED TEMP alarms on RB Purge Exhaust System Filter Plenum, on XCP6210, HVAC Control Board.

NOTE 2.0
Unless otherwise noted, all operations are performed at HVAC Control Panel, XCP-6210.

2.0 CORRECTIVE ACTIONS

☐ 2.1 Ensure MVG-6797, FIRE SERV CNTMT ISOL, is open (MCB).

☐ 2.2 Shut down operating fan(s) for RB Charcoal Cleanup System, if affected:

a. XFN-66A, FAN A:

b. XFN-66B, FAN B.

☐ 2.3 Shut down operating fan(s) for RB Purge Exhaust System, if affected:

a. XFN-13A, EXH FAN A.

b. XFN-13B, EXH FAN B.

☐ 2.4 Open XVM-6795, PLEN DELUGE to Initiate deluge spray to RB Charcoal Cleanup Plenum if affected.

2.5 Open the following to initiate deluge spray to RB Purge Exhaust Plenum if affected:

☐ a. XVM-6760, EXH PLEN DELUGE.

CAUTION 2.5.b
XVG06759-FS, RB PURGE EXH PLENUM SPR DELUGE VLV IN (AB-463), is closed to prevent inadvertent flooding of RB Charcoal Plenum. This valve must be manually opened to initiate deluge spray, but only in case of fire involving this plenum.

☐ b. XVG06759-FS, RB PURGE EXH PLENUM SPR DELUGE VLV IN (AB-463).

☐ 2.6 Verify high temperature alarm clears for affected filter plenum.

2.7 Close deluge valve(s) to affected plenum when temperature alarm clears as follows:

☐ a. Close XVM-6795, PLEN DELUGE to RB Charcoal Cleanup Plenum.

b. Close the following to RB Purge Exhaust Plenum:

☐ 1) XVM-6760, EXH PLEN DELUGE.

☐ 2) XVG06759-FS, RB PURGE EXH PLENUM SPR DELUGE VLV IN (AB-463).

☐ 2.8 Notify Maintenance to inspect filter.

END OF SECTION

VI. REFERENCES

1. G/C Final System Description.

2. FSAR Section 3.8.1.5.1.2, 6.2.2, and 9.4.8.

3. D-912-102, RB Cooling System.

4. D-912-103, RB Purge Supply and Exhaust.

5. D-912-104, RB Charcoal Clean-up, Secondary, Compt Cooling and Reactor Compt Cooling.

6. D-912-105, RB Refueling Water Surface System.

7. D-912-106, RB CRDM Shroud Ventilation System.

8. D-302-861, Post Accident H_2 Removal and Alternate Purge System.

9. D-302-222, Service Water Cooling.

10. D-302-852, CRDM Cooling Water.

11. V.C. Summer Tech Specs 3.6.1.4, 3.6.1.5, 3.6.1.7, and 3.6.2.3.

12. Design Basis Document for HVAC.

13. CGSS-03-2840-NO.

14. EIR-80375.

15. Offsite Dose Calculation Manual.

16. HPP-709, Sampling and Release of Radioactive Gaseous Effluents.

17. MMP-500.002, Reactor Building Personnel Airlock Maintenance And Operation.

18. B-208-004, AH-216 through AH-298.

19. B-208-016, AC-1 through 15 and AC-50.

20. B-208-108 VL-53, Reactor Building Elevator Machine Room Exhaust Fan (XFN-135).

21. STP-130.005B, AH Valve Operability Testing.

SYSTEM INFORMATION

1. CRDM cooling pumps will trip on high temperature (120°F) from Reactor Building cooling coils. This trip is intended to prevent degradation of concrete around the RB penetration. If pumps trip, they can be restarted but will only run for five minutes while temperature remains above 120°F. When the temperature is below 120°F, the pumps will run normally.

   The CRDM Industrial Cooler (XCI-4) spray pumps, and spray fans are manually actuated by control switches on XPN-5409. Cooling tower outlet temperature as measured by ITE5555, provides a variable resistance output proportional to process fluid temperature to the primary damper controller, XDP5022D, which in turn modulates cooling tower dampers (XDP5022A, XDP5022B, and XDP5022C) to control industrial cooler (XCI-4) discharge temperature between 65˚F and 75˚F.

2. Reactor Building Cooling Units (each)

		Normal	Accident
a.	Air Flow (cfm)	123,000	60,270
b.	Fan Motor Horsepower	275	100
c.	Heat Removal Rate ($\times 10^6$ BTU/hr)	4.16	117.5
d.	Water Flow (gpm)	665	2000

3. Reactor Building Charcoal Clean-up Units (each)

a.	Air Flow (cfm)	12,000
b.	Fan Motor Horsepower	40
c.	Roughing Filters	9
d.	HEPA Filters	18(9 per bank)
e.	Charcoal Filters	6

4. Purge Supply System (each)

a.	Max Filter Plenum Capacity (cfm)	12,000
b.	Fan Capacity (cfm)	10,000
c.	Fan Motor Horsepower	20
d.	Roughing Filters	6
e.	Heating Coil (KW)	95

SYSTEM INFORMATION (Cont'd)

5. Purge Exhaust System

a.	Max Filter Plenum Capacity (cfm)	21,000
b.	Roughing Filters	15
c.	HEPA Filters	30(15 per bank)
d.	Charcoal Filters	11
e.	Fan Capacity (cfm each)	10,000
f.	Fan Motor Horsepower	25

6. Reactor Compartment Cooling Fans (each)

a.	Air Flow (cfm)	35,000
b.	Fan Motor Horsepower	75

7. Secondary Compartment Cooling Fans (each)

a.	Air Flow (cfm)	45,000
b.	Fan Motor Horsepower	25
	1) XFN-68C	40

8. CRDM Cooling Fans (each)

a.	Air Flow (cfm)	33,000
b.	Fan Motor Horsepower	125

9. DRPI Data Cabinet Cooling

a.	Air Flow (cfm)	7,000
b.	Fan Motor Horsepower	10

10. XSW1A3 – 1C3 Tie Breaker closure affects CRDM Shroud Exhaust fan operation as follows:

    a. If both XFN0067A and XFN0067B are available, then regardless of operating fan combination, XFN0067C and XFN0067D will be tripped and XFN0067A and XFN0067B will start when tie breaker is closed.

    b. If either XFN0067A or XFN0067B is not available, then regardless of operating fan combination, neither XFN0067C nor XFN0067D will be tripped and XFN0067A and XFN0067B will not be started when tie breaker is closed.

Persons completing checklist (print)	Initials	REACTOR BUILDING VENTILATION SYSTEM VALVE LINEUP
______________________	____________	
______________________	____________	
______________________	____________	
______________________	____________	

Reviewed by SS/CRS	Date/Time	
		Date/Time started____________/__________
________________________	________/________	Date/Time completed_________/__________

Valve Lineup Initial Conditions

Positioning the following components to the REQUIRED POSITION aligns the system as follows:

a. RB Purge Supply and Exhaust is secured and isolated.

b. RB Alternate Purge Supply and Exhaust is aligned ready for startup.

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
485' AUXILIARY BUILDING					
XDP0029A-AV1	IA ISOLATION VLV FOR XDP0029A&XDP0030A	OPEN			
XDP0029B-AV1	IA ISOLATION VLV FOR XDP0029B&XDP0030B	OPEN			
XVB06068-HR	ALTERNATE PURGE EXHAUST FAN DISCH VALVE	OPEN			
XVD06093B-HR	ALT PURGE VENTL EXH FAN DISCH HEADER TC	CLOSED			
XVA00005-AH	RMA0004 SAMPLE INLET ISOLATION VALVE	OPEN			
XVA00006-AH	RMA0004 SAMPLE INLET ISOLATION VALVE	CLOSED			
XDP0028-AV1	IA ISOLATION VALVE FOR XDP0028	OPEN			
XDP0031A-AV1	IA ISOLATION VLV FOR XDP0031A&XDP0032A	OPEN			
XDP0031B-AV1	IA ISOLATION VLV FOR XDP0031B&XDP0032B	OPEN			
ITC09261-AV1-AH	IA ISOLATION VALVE FOR ITC9261	OPEN			

Valve Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
463' AUXILIARY BUILDING					
XVD16051-HR	ALTERNATE PURGE HEADER TEST CONNECTION	CLOSED			
XVG06067-AV1-HR	IA ISOLATION VALVE FOR XVG06067-HR	OPEN			
463' FUEL HANDLING BUILDING					
XVB00002A-AV1-AH	IA ISOLATION VALVE FOR XVB00002A-AH	OPEN			
XVB00002A-AV2-AH (INSIDE BOX) NOTE 1	IA HDR ISOLATION VLV FOR XVB00002A-AH	VALVE CLOSED (LVP)			
XVB00001A-AV2-AH (INSIDE BOX) NOTE 1	IA HDR ISOLATION VLV FOR XVB00001A-AH	VALVE CLOSED (LVP)			
XVB00001A-AV1-AH	IA ISOLATION VALVE FOR XVB00001A-AH	OPEN			
XVD16050-HR	BACK-UP PURGE HEADER TEST CONNECTION	CLOSED			
XVB06092-HR	ALTERNATE PURGE VENT FAN DISCHARGE VLV	THROTTLED (LVP) NOTE 2			
XVD06093A-HR	ALT PURGE VENT FAN DISCH HDR TEST CONN	CLOSED			
XVT06069-HR	RB PURGE EXH PLENUM SUCT HDR TEST CONN	CLOSED/ CAPPED			
XVT06070-HR	RB PURGE FANS DISCH HEADER TEST CONN	CLOSED/ CAPPED			
XVG06057-AV1-HR	IA ISOLATION VALVE FOR XVG06057-HR	OPEN			
REACTOR BUILDING					
XVG06056-AV1-HR (RB-463-015-62)	IA ISOLATION VALVE FOR XVG06056-HR	OPEN			
XVB00002B-AV1-AH (RB-463-015-62)	IA ISOLATION VALVE FOR XVB00002B-AH	OPEN			
XVB00002B-AV2-AH (RB-463-015-62) (INSIDE BOX)	IA HDR ISOLATION VALVE FOR XVB00002B-AH	VALVE CLOSED (LVP)			
XVB00001B-AV1-AH (RB-463-300-62)	IA ISOLATION VALVE FOR XVB00001B-AH	OPEN			
XVB00001B-AV2-AH (RB-463-300-62) (INSIDE BOX)	IA HDR ISOLATION VLV FOR XVB00001B-AH	VALVE CLOSED (LVP)			

NOTE 1: XVB00001A-AV2-AH and XVB00002A-AV2-AH are located in a common locked box.

NOTE 2: Adjusted by HVAC Department to maintain 600 to 800 CFM.

Valve Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
REACTOR BUILDING (Cont'd)					
IFS01900A-TV1-LD (RB-463-150-47)	TEST VALVE FOR IFS1900A	OPEN (LVP)			
IFS01900A-TV2-LD (RB-463-150-47)	TEST VALVE FOR IFS1900A	CLOSED			
IFS01900B-TV1-LD (RB-463-335-56)	TEST VALVE FOR IFS1900B	OPEN (LVP)			
IFS01900B-TV2-LD (RB-463-335-56)	TEST VALVE FOR IFS1900B	CLOSED			
XVG06066-AV1-HR (RB-463-256-62)	IA ISOLATION VALVE FOR XVG06066-HR	OPEN			
IFT75025-HR-LD (RB-436-90-35)	IFT75025 INLET ISOLATION VALVE	OPEN			
IFT75025-LR-LD (RB-436-90-35)	IFT75025 OUTLET ISOLATION VALVE	OPEN			
IFT75025-HT-LD (RB-436-90-35)	IFT75025 TEST CONNECTION VALVE	CLOSED/ CAPPED			
IFT75025-HD-LD (RB-436-90-35)	IFT75025 SAMPLE/DRAIN VALVE	CLOSED/ CAPPED			
IFT75025-LD-LD (RB-436-90-35)	IFT75025 DISCHARGE DRAIN VALVE	CLOSED/ CAPPED			
REACTOR BUILDING (At RBCU Cooling Units)					
XDP0110A-AV1 (RB-514-144-58)	IA ISOLATION VALVE FOR XDP0110A	OPEN			
XDP0110B-AV1 (RB-514-019-58)	IA ISOLATION VALVE FOR XDP0110B	OPEN			
XDP0111A-AV1 (RB-514-144-50)	IA ISOLATION VALVE FOR XDP0111A	OPEN			
XDP0111B-AV1 (RB-514-341-58)	IA ISOLATION VALVE FOR XDP0111B	OPEN			

Persons completing checklist (print)	Initials	CRDM COOLING WATER SYSTEM VALVE LINEUP
____________________	__________	
____________________	__________	
____________________	__________	
____________________	__________	

Reviewed by SS/CRS	Date/Time	
		Date/Time started__________/__________
______________________	________/________	Date/Time completed__________/__________

Valve Lineup Initial Conditions

Positioning the following components to the REQUIRED POSITION aligns the system for operation.

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
436' INTERMEDIATE BUILDING (East Pen)					
XVT07522-AC	INDUSTRIAL CLR AC RETURN HDR DRAIN VLV	CLOSED/ CAPPED			
XVT07516-AC	CRDM COOLER AC SUPPLY HEADER DRAIN VLV	CLOSED/ CAPPED			
XVT07547-AC	CRDM COOLER AC SUPPLY HEADER VENT VALVE	CLOSED/ CAPPED NOTE 1			
XVB07500A-AC	CRDM COOLING WATER PUMP A DISCH VALVE	OPEN			
XVT07532A-AC	HIGH ROOT TO IPS05572	CLOSED			
XVT07531A-AC	HIGH ROOT TO IPI05554	OPEN			
XVB07513A-AC	CRDM COOLING WATER PUMP A SUCTION VALVE	OPEN			
XVB07500B-AC	CRDM COOLING WATER PUMP B DISCH VALVE	OPEN			
XVT07532B-AC	HIGH ROOT TO IPS05588	CLOSED			
XVT07531B-AC	HIGH ROOT TO IPI05589	OPEN			

NOTE 1 - The indicated valves should remain uncapped prior to filling and venting the system. Upon completion of fill and vent the procedure directs capping the vent points.

Valve Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
436' INTERMEDIATE BUILDING (East Pen) (Cont'd)					
XVB07513B-AC	CRDM COOLING WATER PUMP B SUCTION VALVE	OPEN			
XVT28762-DN	DN MAKEUP TO CRDM COOLING SYSTEM FILL VALVE	CLOSED			
XVG07525-AC	CHEMICAL FEED TANK AC OUTLET VALVE	CLOSED			
XVG07524-AC	CHEMICAL FEED TANK AC INLET VALVE	CLOSED			
XVT07527-AC	CHEMICAL FEED TANK CHEMICAL FILL VALVE	CLOSED			
XVT07526-AC	CHEMICAL FEED TANK DRAIN VALVE	CLOSED			
XVG07550-AC	CHEM FEED TK VENT VALVE	CLOSED			
XVT07537-AC	HIGH ROOT TO IPI05553	OPEN			
XVT07528-AC	AC EXPANSION TANK SURGE ISOL VALVE	OPEN			
XVT17514-AC	AC SYSTEM EXPANSION TANK DRAIN ISOLATION VALVE	CLOSED/ CAPPED NOTE 1			
XVT07529-AC	AC SYSTEM EXPANSION TANK ISOLATION VALVE	OPEN			
XVT07530-AC	AC SYSTEM EXPANSION TANK VENT VALVE	OPEN			
ILI05552-HR-AC	HIGH ROOT TO ILT05552	OPEN			
ILI05552-LR-AC	LOW ROOT TO ILT05552	OPEN			
XVT07539-AC	AC SYS EXP TANK INST RACK HIGH ISOL VLV	OPEN			
XVT07538-AC	AC SYS EXP TANK INST RACK LOW ISOL VLV	OPEN			
XVG17513-AC	AC SYSTEM VENT ISOLATION VALVE	CLOSED/ CAPPED NOTE 1			
412' INTERMEDIATE BUILDING (East Pen)					
XVT07533-AC	HIGH ROOT TO IFI05575	OPEN			
XVT07534-AC	LOW ROOT TO IFI05575	OPEN			
XVT07549-AC	INDUSTRIAL CLR AC RETURN HDR DRAIN VLV	CLOSED/ CAPPED			
XVT07548-AC	AC SYS INDUSTRIAL CLR OUT HDR DRAIN VLV	CLOSED/ CAPPED			

NOTE 1 - The indicated valves should remain uncapped prior to filling and venting the system. Upon completion of fill and vent the procedure directs capping the vent points.

Valve Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
YD-125'E (CRDM Cooling Tower)					
XVG07517-AC	AC SYSTEM FI SUPPLY HEADER ISOL VALVE	OPEN			
XVG07520-AC	CRDM COOLING WATER RETURN HDR FILL VLV	CLOSED			
XVT07546-AC	AC SYSTEM INDUSTRIAL COOLER DRAIN VALVE	CLOSED			
XVA17517-AC	ISOLATION VLV FOR TEMP CRDM COOLER INSTALL	CLOSED/ FLANGED			
XVA17518-AC	ISOLATION VLV FOR TEMP CRDM COOLER INSTALL	OPEN			
XVA17519-AC	RETURN ISOLATION VLV FOR TEMP CRDM COOLER	CLOSED/ FLANGED			
XVA17520-AC	ISOLATION VLV FOR TEMP CRDM COOLER INSTALL	OPEN			
XVB17506-AC	AC IND CLR SPRAY PUMP C SUCTION VALVE	OPEN			
XVB17508-AC	AC IND CLR SPRAY PUMP C DISCH VALVE	OPEN			
XVA17524A-AC	AC SYSTEM INDUSTRIAL COOLER BLOW DOWN VALVE	CLOSED NOTE 2			
XVB17511-AC	AC IND CLR SPRAY PUMP D DISCH VALVE	OPEN			
XVB17509-AC	AC IND CLR SPRAY PUMP D SUCTION VALVE	OPEN			
XVT07535A-AC	HIGH ROOT TO IPI05569	OPEN			
XVG07511A-AC	AC SYS INDUSTRIAL CLR INLET ISOL VALVE	OPEN			
XVT07514A-AC	HIGH ROOT TO IPX05576	CLOSED/ CAPPED NOTE 1			
XVT07512A-AC	AC SYS INDUSTRIAL CLR OUTLET ISOL VALVE	OPEN			
XVT07515A-AC	HIGH ROOT TO IPX05577	CLOSED/ CAPPED NOTE 1			
XVG07511B-AC	AC SYS INDUSTRIAL CLR INLET ISOL VALVE	OPEN			
XVT07514B-AC	HIGH ROOT TO IPX05578	CLOSED/ CAPPED NOTE 1			

NOTE 1 - The indicated valves should remain uncapped prior to filling and venting the system. Upon completion of fill and vent the procedure directs capping the vent points.

NOTE 2 – This valve will be throttled open per the procedure after system startup.

Valve Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
YD-125'E (CRDM Cooling Tower) (Cont'd)					
XVB17502-AC	AC IND CLR SPRAY PUMP A DISCH VALVE	OPEN			
XVA17524B-AC	AC SYSTEM INDUSTRIAL COOLER BLOW DOWN VALVE	CLOSED NOTE 2			
XVB17500-AC	AC IND CLR SPRAY PUMP A SUCTION VALVE	OPEN			
XVA17522-AC	ISOLATION VLV FOR TEMP CRDM COOLER INSTALL	OPEN			
XVA17521-AC	ISOLATION VLV FOR TEMP CRDM COOLER INSTALL	OPEN			
XVB17505-AC	AC IND CLR SPRAY PUMP B DISCH VALVE	OPEN			
XVB17503-AC	AC IND CLR SPRAY PUMP B SUCTION VALVE	OPEN			
XVA17525-AC	AC SYSTEM INDUSTRIAL COOLER FI MAKE-UP VALVE TO CHEMICAL ADDITION	CLOSED/ CAPPED			
XVT07512B-AC	AC SYS INDUSTRIAL CLR OUTLET ISOL VALVE	OPEN			
XVT07515B-AC	HIGH ROOT TO IPX05579	CLOSED/ CAPPED NOTE 1			
XVT07536A-AC	HIGH ROOT TO IPI05570	OPEN			
XVT07536B-AC	HIGH ROOT TO IPI05590	OPEN			
XVT07512D-AC	AC SYS INDUSTRIAL CLR OUTLET ISOL VALVE	OPEN			
XVT07515D-AC	HIGH ROOT TO IPX05585	CLOSED/ CAPPED NOTE 1			
XVG07511D-AC	AC SYS INDUSTRIAL CLR INLET ISOL VALVE	OPEN			
XVT07514D-AC	HIGH ROOT TO IPX05584	CLOSED/ CAPPED NOTE 1			

NOTE 1 - The indicated valves should remain uncapped prior to filling and venting the system. Upon completion of fill and vent the procedure directs capping the vent points.

NOTE 2 – This valve will be throttled open per the procedure after system startup.

Valve Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
YD-125'E (CRDM Cooling Tower) (Cont'd)					
XVT07512C-AC	AC SYS INDUSTRIAL CLR OUTLET ISOL VALVE	OPEN			
XVT07515C-AC	HIGH ROOT TO IPX05583	CLOSED/ CAPPED NOTE 1			
XVG07511C-AC	AC SYS INDUSTRIAL CLR INLET ISOL VALVE	OPEN			
XVT07514C-AC	HIGH ROOT TO IPX05582	CLOSED/ CAPPED NOTE 1			
XVT07535B-AC	HIGH ROOT TO IPI05592	OPEN			
XVM07570B-AC	XPP0156B PUMP CASING VENT VALVE	CLOSED			
XVM07570D-AC	XPP0156D PUMP CASING VENT VALVE	CLOSED			

NOTE 1 - The indicated valves should remain uncapped prior to filling and venting the system. Upon completion of fill and vent the procedure directs capping the vent points.

Valve Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
REACTOR BUILDING					
XVG07507D-AC (RB-436-110-45)	CRDM COOLER AC SUPPLY HEADER ISOL VALVE	OPEN			
XVT07509D-AC (RB-436-110-45)	HIGH ROOT TO IPX05566	CLOSED/ CAPPED			
XVT07506D-AC (RB-436-110-45)	CRDM COOLER AC RETURN HEADER ISOL VLV	OPEN			
XVG07507C-AC (RB-436-110-45)	CRDM COOLER AC SUPPLY HEADER ISOL VALVE	OPEN			
XVT07508D-AC (RB-436-110-45)	HIGH ROOT TO IPX05562	CLOSED/ CAPPED NOTE 1			
XVT07509C-AC (RB-436-110-45)	HIGH ROOT TO IPX05567	CLOSED/ CAPPED			
XVT07506C-AC (RB-436-110-45)	CRDM COOLER AC RETURN HEADER ISOL VLV	OPEN			
XVT07508C-AC (RB-436-110-45)	HIGH ROOT TO IPX05563	CLOSED/ CAPPED NOTE 1			
XVG07507B-AC (RB-436-120-40)	CRDM COOLER AC SUPPLY HEADER ISOL VALVE	OPEN			
XVT07509B-AC (RB-436-120-40)	HIGH ROOT TO IPX05556	CLOSED/ CAPPED			
XVT07506B-AC (RB-436-120-40)	CRDM COOLER AC RETURN HEADER ISOL VLV	OPEN			
XVT07508B-AC (RB-436-120-40)	HIGH ROOT TO IPX05560	CLOSED/ CAPPED NOTE 1			
XVG07507A-AC (RB-436-120-40)	CRDM COOLER AC SUPPLY HEADER ISOL VALVE	OPEN			
XVT07509A-AC (RB-436-120-40)	HIGH ROOT TO IPX05557	CLOSED/ CAPPED			
XVT07506A-AC (RB-436-120-40)	CRDM COOLER AC RETURN HEADER ISOL VLV	OPEN			
XVT07508A-AC (RB-436-120-40)	HIGH ROOT TO IPX05561	CLOSED/ CAPPED NOTE 1			
XVT07545-AC (RB-436-120-60)	INDUSTRIAL CLR AC RETURN HDR DRAIN VLV	CLOSED/ CAPPED			
XVT07543-AC (RB-436-120-60)	INDUSTRIAL CLR AC RETURN HDR TEST CONN	CLOSED/ CAPPED NOTE 1			
XVT07542-AC (RB-436-135-60)	CRDM COOLER AC SUPPLY HEADER DRAIN VLV	CLOSED/ CAPPED			
XVT07540-AC (RB-436-135-60)	CRDM COOLER AC SUPPLY HEADER TEST CONN	CLOSED/ CAPPED NOTE 1			

NOTE 1 - The indicated valves should remain uncapped prior to filling and venting the system. Upon completion of fill and vent the procedure directs capping the vent points.

Persons completing checklist (print)	Initials	
______________________	____________	REACTOR BUILDING VENTILATION SYSTEM ELECTRICAL LINEUP
______________________	____________	
______________________	____________	
______________________	____________	
Reviewed by SS/CRS ________________________	Date/Time _________/_________	Date/Time started____________/__________ Date/Time completed_________/__________

Electrical Lineup Initial Conditions

Positioning the following components to the REQUIRED POSITION aligns the system for operation with electrical power available to essential components.

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
XMC1A3X 463' AUXILIARY BUILDING					
XMC1A3X 02EF	POST ACCIDENT H_2 REMOVAL PURGE EXHAUST FAN XFN0096-HR	ON			
XMC1A3X 09AD	SECONDARY COMPT LOOP C COOLING FAN A XFN0070A-AH	ON			
XMC1A3X 10CF	SECONDARY CMPT LOOP B COOLING FAN A XFN0069A-AH	ON			
XMC1A3X 10GK	RB CHARCOAL CLEAN-UP UNIT A XFN0066A-AH	ON			
XMC1A3X 11AD	DRPI CLG UNIT BOOSTER PUMP XPP0149-SW	ON			
XMC1A3X 11EH	SECONDARY CMPT LOOP A COOLING FAN A XFN0068A-AH	ON			
XMC1B3X 463' AUXILIARY BUILDING					
XMC1B3X 03ABL	EDDY CURRENT BRAKE FOR XFN64A & 65A	ON			
XMC1B3X 03ABR	EDDY CURRENT BRAKE FOR XFN64B & 65B	ON			
XMC1B3X 09AD	REFUELING WATER SURFACE SUPPLY FAN B XFN0007B-AH	ON			
XMC1B3X 10FJ	RB CHARCOAL CLN-UP UNIT FAN B XFN0066B-AH	ON			

Electrical Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
XMC1C3X 463' AUXILIARY BUILDING					
XMC1C3X 02AD	CONTR ROD POSITION DATA CAB CLG FAN XFN0107-VL	ON			
XMC1C3X 02EH	SEC COMPT LOOP B COOLING FAN C XFN0069C-AH	ON			
XMC1C3X 02IL	SEC COMPT LOOP C COOLING FAN C XFN0070C-AH	ON			
XMC1C3X 03EH	REFUELING WATER SURFACE SUPPLY FAN A XFN0007A-AH	ON			
XMC1C3X 03IL	REFUELING WATER SURFACE EXHAUST FAN XFN0008-AH	ON			
XMC1C3X 08AE	SEC COMPT LOOP A COOLING FAN C XFN0068C-AH	ON			
XMC1B3Y 463' FUEL HANDLING BUILDING					
XMC1B3Y 02IL	REACTOR BLDG PURGE EXH FAN B XFN0013B-AH	ON			
XMC1B3Y 03AD	SECONDARY COMPARTMENT LOOP A COOLING FAN B XFN0068B-AH	ON			
XMC1B3Y 03EH	SECONDARY COMPARTMENT LOOP B COOLING FAN B XFN0069B-AH	ON			
XMC1B3Y 03IL	SECONDARY COMPARTMENT LOOP C COOLING FAN B XFN0070B-AH	ON			
XMC1B3Y 09CD	REACTOR BLDG PURGE SUPPLY FAN B XFN0011B-AH	ON			
XMC1A2X 485' AUXILIARY BUILDING					
XMC1A2X 01FG	RB PURGE SUPPLY FAN A XFN0011A-AH	ON			
XMC1A2X 01HI	RB PURGE EXHAUST FAN A XFN0013A-AH	ON			
XSW1A2 485' AUXILIARY BUILDING					
XSW1A2 05C	RB PURGE SUPPLY HTG COIL A XHC0012A-AH	CLOSED			
XSW1B2 485' AUXILIARY BUILDING					
XSW1B2 02C	RB PURGE SUPPLY HTG COIL B XHC0012B-AH	CLOSED			

Electrical Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
XSW1DB1 463' AUXILIARY BUILDING					
XSW1DB1 06C	RBCU MFN0097D XFN0065B SLOW SPEED MOTOR	RACKED IN			
XSW1DB1 06C CCP	CLOSING CNTRL PWR MFN 97D XFN 65B	ON			
XSW1DB1 06C TCP	TRIPPING CNTRL PWR MFN 97D XFN 65B	ON			
XSW1DB1 06C	CHARGING POWER	ON			
XSW1DB1 06D	RBCU MFN0097B XFN0064B SLOW SPEED MOTOR	RACKED IN			
XSW1DB1 06D CCP	CLOSING CNTRL PWR MFN 97B XFN 64B	ON			
XSW1DB1 06D TCP	TRIPPING CNTRL PWR MFN 97B XFN 64B	ON			
XSW1DB1 06D	CHARGING POWER	ON			
XSW1DB1 07B	RBCU MFN0096B XFN0064B FAST SPEED MOTOR	RACKED IN			
XSW1DB1 07B CCP	CLOSING CNTRL PWR MFN 96B XFN 64B	ON			
XSW1DB1 07B TCP	TRIPPING CNTRL PWR MFN 96B XFN 64B	ON			
XSW1DB1 07B	CHARGING POWER	ON			
XSW1DB1 07C	RBCU MFN0096D XFN0065B FAST SPEED MOTOR	RACKED IN			
XSW1DB1 07C CCP	CLOSING CNTRL PWR MFN 96D XFN 65B	ON			
XSW1DB1 07C TCP	TRIPPING CNTRL PWR MFN 96D XFN 65B	ON			
XSW1DB1 07C	CHARGING POWER	ON			
APN01DB1 463' AUXILIARY BUILDING					
APN01DB1 09	XFN0064B/65B EDDY CURRENT BRAKE	ON			
XSW1A3 436' AUXILIARY BUILDING					
XSW1A3 02A	REACTOR COMP COOLING FAN A XFN0009A-AH	RACKED IN			
XSW1A3 02A CCP	CLOSING CNTRL PWR XFN0009A-AH	ON			
XSW1A3 02A TCP	TRIPPING CNTRL PWR XFN0009A-AH	ON			
XSW1A3 02A	CHARGING POWER	ON			

Electrical Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
XSW1B3 436' AUXILIARY BUILDING					
XSW1B3 03A	RB REACTOR COMPT CLG FAN B XFN0009B-AH	RACKED IN			
XSW1B3 03A CCP	CLOSING CNTRL PWR XFN0009B-AH	ON			
XSW1B3 03A TCP	TRIPPING CNTRL PWR XFN0009B-AH	ON			
XSW1B3 03A	CHARGING POWER	ON			
XSW1DA1 463' INTERMEDIATE BUILDING					
XSW1DA1 05B	RBCU MFN0096C XFN0065A FAST SPEED MOTOR	RACKED IN			
XSW1DA1 05B CCP	CLOSING CNTRL PWR XFN 65A MFN 96C	ON			
XSW1DA1 05B TCP	TRIPPING CNTRL PWR XFN 65A MFN 96C	ON			
XSW1DA1 05B	CHARGING POWER	ON			
XSW1DA1 05C	RBCU MFN0097A XFN0064A SLOW SPEED MOTOR	RACKED IN			
XSW1DA1 05C CCP	CLOSING CNTRL PWR XFN 64A MFN 97A	ON			
XSW1DA1 05C TCP	TRIPPING CNTRL PWR XFN 64A MFN 97A	ON			
XSW1DA1 05C	CHARGING POWER	ON			
XSW1DA1 06B	RBCU MFN0096A XFN0064A FAST SPEED MOTOR	RACKED IN			
XSW1DA1 06B CCP	CLOSING CNTRL PWR XFN 64A MFN 96A	ON			
XSW1DA1 06B TCP	TRIPPING CNTRL PWR XFN 64A MFN 96A	ON			
XSW1DA1 06B	CHARGING POWER	ON			
XSW1DA1 06C	RBCU MFN0097C XFN0065A SLOW SPEED MOTOR	RACKED IN			
XSW1DA1 06C CCP	CLOSING CNTRL PWR XFN 65A MFN 97C	ON			
XSW1DA1 06C TCP	TRIPPING CNTRL PWR XFN 65A MFN 97C	ON			
XSW1DA1 06C	CHARGING POWER	ON			
APN01DA1 463' INTERMEDIATE BUILDING					
APN01DA1 09	EDDY CURR BRAKES – RBCU FANS XFN64A & 65A	ON			

Electrical Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
XMC1A1X 412' TURBINE BUILDING					
XMC1A1X 09KL	POST ACC H2 REMOVAL EXH PUR FAN XFN0095-HR	ON			
APN-4005 REACTOR BUILDING-463-325-52					
APN-4005 26, 28, 30	SPACE HEATERS FOR FANS XFN68C, 9A & 9B	ON			
APN-4005 31, 33, 35	SPACE HEATERS FOR FANS XFN66A & 66B	ON			
APN-5005 REACTOR BUILDING-463-325-52					
APN-5005 05	SPACE HTR FOR XFN0064A-AH (MFN0096A-AH)	ON			
APN-5005 06	SPACE HTR FOR XFN0064B-AH (MFN0097B-AH)	ON			
APN-5005 07	SPACE HTR FOR XFN0064A-AH (MFN0097A-AH)	ON			
APN-5005 08	SPACE HTR FOR XFN0064B-AH (MFN0096B-AH)	ON			
APN-5005 09	SPACE HTR FOR XFN0065A-AH (MFN0096C-AH)	ON			
APN-5005 10	SPACE HTR FOR XFN0065B-AH (MFN0096D-AH)	ON			
APN-5005 11	SPACE HTR FOR XFN0065A-AH (MFN0097C-AH)	ON			
APN-5005 12	SPACE HTR FOR XFN0065B-AH (MFN0097D-AH)	ON			
APN-5005 15	XFN0135-ELEVATOR MACHINE ROOM EXHAUST FAN	ON			

Persons completing checklist (print)	Initials	CRDM COOLING WATER SYSTEM ELECTRICAL LINEUP
____________________	__________	
____________________	__________	
____________________	__________	
____________________	__________	

Reviewed by SS/CRS	Date/Time	
______________________	______/______	Date/Time started__________/________
		Date/Time completed________/________

Electrical Lineup Initial Conditions

Positioning the following components to the REQUIRED POSITION aligns the system for operation with electrical power available to essential components.

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
XSW1C3 436' AUXILIARY BUILDING					
XSW1C3 02D	CRDM COOLING SYS FAN C XFN0067C-AH	RACKED IN			
XSW1C3 02D CCP	CLOSING CNTRL PWR XFN0067C-AH	ON			
XSW1C3 02D TCP	TRIPPING CNTRL PWR XFN0067C-AH	ON			
XSW1C3 02D	CHARGING POWER	ON			
XSW1A3 436' AUXILIARY BUILDING					
XSW1A3 01C	CRDM COOLING SYS FAN A XFN0067A-AH	RACKED IN			
XSW1A3 01C CCP	CLOSING CNTRL PWR XFN0067A-AH	ON			
XSW1A3 01C TCP	TRIPPING CNTRL PWR XFN0067A-AH	ON			
XSW1A3 01C	CHARGING POWER	ON			
XSW1A3 03A	CRDM COOLING SYS FAN D XFN0067D-AH	RACKED IN			
XSW1A3 03A CCP	CLOSING CNTRL PWR XFN0067D-AH	ON			
XSW1A3 03A TCP	TRIPPING CNTRL PWR XFN0067D-AH	ON			
XSW1A3 03A	CHARGING POWER	ON			

Electrical Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
XSW1B3 436' AUXILIARY BUILDING					
XSW1B3 02D	CRDM COOLING SYS FAN B XFN0067B-AH	RACKED IN			
XSW1B3 02D CCP	CLOSING CNTRL PWR XFN0067B-AH	ON			
XSW1B3 02D TCP	TRIPPING CNTRL PWR XFN0067B-AH	ON			
XSW1B3 02D	CHARGING POWER	ON			
APN01C3 436' AUXILIARY BUILDING					
APN01C3 05, 07	CRDM COOLING FAN BRAKE POWER SUPPLY	ON			
XMC1A2X 485' AUXILIARY BUILDING					
XMC1A2X 01LM	IND CLG WTR HT TRACE CONTR PNL XPN2015	ON			
XPN 5533 436' AUXILIARY BUILDING (ACROSS FROM XSW1A3)					
XPN 5533 DSW-A		ON			
XPN 5533 DSW-B		ON			
XPN 5533 DSW-C		ON			
XPN 5533 DSW-D		ON			
APN4005 REACTOR BUILDING-463-325-52					
APN4005 19, 21, 23	SPACE HEATERS FOR FANS XFN-67A-67D	ON			
XMC1DA2X 463' INTERMEDIATE BUILDING					
XMC1DA2X 06AD	CRDM COOLING WATER INLET VALVE XVG7501-AC	ON			
XMC1DA2X 11IM	CRDM COOLING WATER OUTLET XVG7503-AC	ON			
XMC1DB2X 436' INTERMEDIATE BUILDING					
XMC1DB2X 07AD	CRDM CLG WTR OUTLET VLV XVG7504-AC	ON			
XMC1DB2X 07IM	CRDM CLG WTR INLET VLV XVG7502-AC	ON			

CHG A

CHG B

Electrical Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
XMC1B1X 436' TURBINE BUILDING					
XMC1B1X 05CD	IND COOLER CRDM COIL FAN D XFN0145D-AC	ON			
XMC1B1X 06AC	IND CLR IMMERSION HEATERS A&B XHC0112-AC	ON			
XMC1B1X 09IJ	INDUST COOLER CRDM COIL FAN XFN0145B-AC	ON			
XMC1B1X 09KL	INDUST COOLER CRDM COIL FAN XFN0145C-AC	ON			
XMC1B1X 10CD	IND CLR CRDM COIL SPR NORM PP XPP0156A-AC	ON			
XMC1B1X 11GH	IC CRDM COIL SPRAY STNDBY PP XPP0156B-AC	ON			
XMC1B1X 11KL	IND CLR CRDM COILS SPR NORM PP XPP0156C-AC	ON			
XMC1B1X 13CD	IND COOLER CRDM COIL FAN XFN0145A-AC	ON			
XMC1B1X 15LM	IC CRDM COIL SPR STNDBY PP XPP0156D-AC	ON			
APN 5016 436' TURBINE BUILDING					
APN 5016 17	XTF 0146	ON			
XMC1A1X 412' TURBINE BUILDING					
XMC1A1X 04EG	CRDM COOLING WATER PUMP B XPP0157B-AC	ON			
XMC1A1X 12IK	CRDM COOLING WTR PP A XPP0157A-AC	ON			
YD-125'E (CRDM Cooling Tower)					
XDS0037-AC	CRDM CLG TWR LVL CNTRL DISC SWTCH	CLOSED			
XDS0225-AC	IND COOLER IMMERSION HTR A DISC SW	CLOSED			
XDS0226-AC	IND COOLER IMMERSION HTR B DISC SW	CLOSED			

CHG B

REACTOR BUILDING VENTILATION SYSTEM INSTRUMENT LINEUP

Instrument Lineup Initial Conditions

Aligning the following components ensures the Reactor Building Ventilation System Instrumentation is filled, vented and aligned for service. SS/CRS may authorize alignment of more than one instrument.

COMPONENT: **IFI05575** INDUSTRIAL CLR AC RETURN HDR FLOW IND
LOCATION: IB-436 (East Penetration by back door) **SS/CRS AUTHR**:________
EQUIPMENT AFFECTED: Local indicator Initials

Control Room contacted: ___________
Initials

Ensure valved in & vent: ________________________ Verified by: ________________________
Name Name

Time/Date completed: ______________/______________

Persons completing checklist (print)	Initials	REACTOR BUILDING VENTILATION SYSTEM CONTROL PANEL LINEUP
______________________	__________	
______________________	__________	
______________________	__________	

Reviewed by SS/CRS	Date/Time	
______________________	_______________	Date/Time Started _________________/_______ Date/Time Completed ______________/_______

Control Panel Lineup Initial Conditions

Positioning the following components to the REQUIRED POSITION aligns the Reactor Building Ventilation System ready for startup or for automatic initiation if required.

COMPONENT	DESCRIPTION	POWER AVAILABLE		REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
		YES	NO				
MAIN CONTROL BOARD							
XFN0064A-AH	1A NORM			AFTER STOP			
XFN0064A-AH	1A SLOW			AFTER STOP			
XFN0065A-AH	2A NORM			AFTER STOP			
XFN0065A-AH	2A SLOW			AFTER STOP			
XFN0064B-AH	1B NORM			AFTER STOP			
XFN0064B-AH	1B SLOW			AFTER STOP			
XFN0065B-AH	2B NORM			AFTER STOP			
XFN0065B-AH	2B SLOW			AFTER STOP			
	RBCU TRAIN A EMERG			XFN64A XFN65A NOTE 1			
XDP-110A	RBCU 64A HEPA FLTR BYP DMPR			AUTO/ BYP			
XDP-111A	RBCU 65A HEPA FLTR BYP DMPR			AUTO/ BYP			

NOTE 1: The RBCU TRAIN A(B) EMERG Switch must be selected to an operable RBCU.

Control Panel Lineup (Cont'd)

COMPONENT	DESCRIPTION	POWER AVAILABLE		REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
		YES	NO				
MAIN CONTROL BOARD (Cont'd)							
	RBCU TRAIN B EMERG			XFN64B XFN65B NOTE 1			
XDP-110B	RBCU 64B HEPA FLTR BYP DMPR			AUTO/ BYP			
XDP-111B	RBCU 65B HEPA FLTR BYP DMPR			AUTO/ BYP			
MVG-7501	TO CRDM CLR ISOL (ORB)			AUTO/ OPEN			
MVG-7502	TO CRDM CLR ISOL (IRB)			AUTO/ OPEN			
MVG-7503	FR CRDM CLR ISOL (IRB)			AUTO/ OPEN			
MVG-7504	FR CRDM CLR ISOL (ORB)			AUTO/ OPEN			
HVAC CONTROL PANEL							
XVM-6795	PLEN DELUGE (RB Char Cleanup)			STOP			
XFN-66A	FAN A (RB Char Cleanup)			STOP			
XFN-66B	FAN B (RB Char Cleanup)			STOP			
XFN-67A	FAN A (CRDM Shroud Exhaust)			AFTER STOP			
XFN-67B	FAN B (CRDM Shroud Exhaust)			AFTER STOP			
XFN-67C	FAN C (CRDM Shroud Exhaust)			AFTER STOP			
XFN-67D	FAN D (CRDM Shroud Exhaust)			AFTER STOP			
XFN-68A	SG A FAN A (SG Compart Cooling)			STOP			
XFN-68B	SG A FAN B (SG Compart Cooling)			STOP			
XFN-68C	SG A FAN C (SG Compart Cooling)			STOP			
XFN-69A	SG B FAN A (SG Conpart Cooling)			STOP			
XFN-69B	SG B FAN B (SG Compart Cooling)			STOP			
XFN-69C	SG B FAN C (SG Compart Cooling)			STOP			
XFN-70A	SG C FAN A (SG Compart Cooling)			STOP			
XFN-70B	SG C FAN B (SG Compart Cooling)			STOP			

NOTE 1: The RBCU TRAIN A(B) EMERG Switch must be selected to an operable RBCU.

Control Panel Lineup (Cont'd)

COMPONENT	DESCRIPTION	POWER AVAILABLE		REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
		YES	NO				
HVAC CONTROL PANEL (Cont'd)							
XFN-70C	SG C FAN C (SG Compart Cooling)			STOP			
XFN-95	6 INCH RB PUR INTAKE FAN			STOP			
MVB-6063	H2 REMOVAL ALT PUR THROT			CLOSED			
XFN-96	ALT PUR EXH FAN			STOP			
PVG-6066	CNTMT PUR EXH ISOL VLV			AUTO/ CLOSED			
PVG-6067	CNTMT PUR EXH ISOL VLV			AUTO/ CLOSED			
PVG-6056	ALT PUR SPLY ISOL VLV			AUTO/ CLOSED			
PVG-6057	ALT PUR SPLY ISOL VLV			AUTO/ CLOSED			
PVT-3164	DRPI CLG UNIT COIL ISOL			AUTO/ CLOSED			
PVT-3165 PVT-3169	DRPI CLG UNIT COIL ISOL			AUTO/ CLOSED			
XFN-107	RPI CABINETS CLG FAN			STOP			
XPP-149	DRPI CLG UNIT BSTR PP			STOP			
XFN-9A	FAN A (RB Cooling)			AFTER STOP			
XFN-9B	FAN B (RB Cooling)			AFTER STOP			
XFN-11A	SPLY FAN A (RB Purge)			STOP			
XFN-13A	EXH FAN A (RB Purge)			STOP			
XFN-11B	SPLY FAN B (RB Purge)			STOP			
XFN-13B	EXH FAN B (RB Purge)			STOP			
PVB-1A	CNTMT SPLY ISOL			AUTO/ CLOSED			
PVB-2A	CNTMT EXH ISOL			AUTO/ CLOSED			
PVB-1B	CNTMT SPLY ISOL			AUTO/ CLOSED			
PVB-2B	CNTMT EXH ISOL			AUTO/ CLOSED			
XDP-28	INTAKE DMPR (RB Purge)			CLOSE			
XVM-6760	EXH PLEN DELUGE			OFF			

Control Panel Lineup (Cont'd)

COMPONENT	DESCRIPTION	POWER AVAILABLE		REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
		YES	NO				
CRDM COOLING TOWER CONTROL PANEL (YD-125'E)							
XPP0156A	AC SYS INDUSTRIAL COOLER SPRAY PUMP A			OFF			
XPP0156B	AC SYS INDUSTRIAL COOLER SPRAY PUMP B			OFF			
XPP0156C	AC SYS INDUSTRIAL COOLER SPRAY PUMP C			OFF			
XPP0156D	AC SYS INDUSTRIAL COOLER SPRAY PUMP D			OFF			
XPP0156A, B, C, AND D	INDUSTRIAL COOLER CRDM COIL NORMAL AND STANDBY PUMP'S	N/A	N/A	NOTE 2			
XFN-145A	INDUSTRIAL COOLER CRDM COIL FAN			OFF			
XFN-145B	INDUSTRIAL COOLER CRDM COIL FAN			OFF			
XFN-145C	INDUSTRIAL COOLER CRDM COIL FAN			OFF			
XFN-145D	INDUSTRIAL COOLER CRDM COIL FAN			OFF			
XPP-157A AND B	CRDM COOLING WATER PUMP			OFF			
XDS0027 (412' Reactor Building)							
SWITCH	SPACE HEATER CONT FOR XFN-68C	N/A	N/A	ON			
XDS0028 (412' Reactor Building)							
SWITCH	SPACE HEATER CONT FOR XFN-9A & B	N/A	N/A	ON			
XDS0034 (436' Reactor Building) (Under C MS Line)							
SWITCH	SPACE HEATER CONT FOR XFN-67A & B	N/A	N/A	ON			
XDS0035 (436' Reactor Building)							
SWITCH	SPACE HEATER CONT FOR XFN-67C & D	N/A	N/A	ON			
XDS0026 (RB-515-300-50) (At XFN0066B)							
SWITCH	XFN0066A&B SPACE HTR DISCONNECT SW	N/A	N/A	ON			
RB-463-340-48							
XPN-5170-AH	RB REFUELING WTR SURFACE FANS	N/A	N/A	OFF			
XPN5236-VL (RB-463-350-40) (Above elevator/requires GGMK Key)							
XFN0135-VL	RB ELEVATOR MACH ROOM EXHAUST FAN	N/A	N/A	AUTO			

CHG B

NOTE 2: Positioned to A-C or B-D position.

Persons completing checklist (print)	Initials	CRDM SHUTDOWN AND COOLING DRAIN ELECTRICAL LINEUP
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____________________	__________	
____________________	__________	

Reviewed by SS/CRS	Date/Time	
		Date/Time started__________/__________
____________________	________/________	Date/Time completed________/__________

Electrical Lineup Initial Conditions

Positioning the following components to the REQUIRED POSITION aligns the system for shutdown and draining.

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
XSW1C3 436' AUXILIARY BUILDING					
XSW1C3 02D	CRDM COOLING SYS FAN C XFN0067C-AH	RACKED OUT			
XSW1C3 02D CCP	CLOSING CNTRL PWR XFN0067C-AH	OFF			
XSW1C3 02D TCP	TRIPPING CNTRL PWR XFN0067C-AH	OFF			
XSW1C3 02D	CHARGING POWER	OFF			
XSW1A3 436' AUXILIARY BUILDING					
XSW1A3 01C	CRDM COOLING SYS FAN A XFN0067A-AH	RACKED OUT			
XSW1A3 01C CCP	CLOSING CNTRL PWR XFN0067A-AH	OFF			
XSW1A3 01C TCP	TRIPPING CNTRL PWR XFN0067A-AH	OFF			
XSW1A3 01C	CHARGING POWER	OFF			
XSW1A3 03A	CRDM COOLING SYS FAN D XFN0067D-AH	RACKED OUT			
XSW1A3 03A CCP	CLOSING CNTRL PWR XFN0067D-AH	OFF			
XSW1A3 03A TCP	TRIPPING CNTRL PWR XFN0067D-AH	OFF			
XSW1A3 03A	CHARGING POWER	OFF			

Electrical Lineup (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
XSW1B3 436' AUXILIARY BUILDING					
XSW1B3 02D	CRDM COOLING SYS FAN B XFN0067B-AH	RACKED OUT			
XSW1B3 02D CCP	CLOSING CNTRL PWR XFN0067B-AH	OFF			
XSW1B3 02D TCP	TRIPPING CNTRL PWR XFN0067B-AH	OFF			
XSW1B3 02D	CHARGING POWER	OFF			
APN01C3 436' AUXILIARY BUILDING					
APN01C3 05, 07	CRDM COOLING FAN BRAKE POWER SUPPLY	OFF			
XPN 5533 436' AUXILIARY BUILDING					
XPN 5533 DSW-A		OFF			
XPN 5533 DSW-B		OFF			
XPN 5533 DSW-C		OFF			
XPN 5533 DSW-D		OFF			
APN4005 REACTOR BUILDING-463-325-52					
APN4005 19, 21, 23	SPACE HEATERS FOR FANS XFN-67A-67D	OFF			
XMC1B1X 436' TURBINE BUILDING					
XMC1B1X 05CD	IND COOLER CRDM COIL FAN D XFN0145D-AC	OFF			
XMC1B1X 06AC	IND CLR IMMERSION HEATERS A&B XHC0112-AC	OFF			
XMC1B1X 09IJ	INDUST COOLER CRDM COIL FAN XFN0145B-AC	OFF			
XMC1B1X 09KL	INDUST COOLER CRDM COIL FAN XFN0145C-AC	OFF			
XMC1B1X 10CD	IND CLR CRDM COIL SPR NORM PP XPP0156A-AC	OFF			
XMC1B1X 11GH	IC CRDM COIL SPRAY STNDBY PP XPP0156B-AC	OFF			
XMC1B1X 11KL	IND CLR CRDM COILS SPR NORM PP XPP0156C-AC	OFF			
XMC1B1X 13CD	IND COOLER CRDM COIL FAN XFN0145A-AC	OFF			
XMC1B1X 15LM	IC CRDM COIL SPR STNDBY PP XPP0156D-AC	OFF			

<u>Electrical Lineup</u> (Cont'd)

COMPONENT	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	INITIALS	VERIFIERS INITIALS
APN 5016 436' TURBINE BUILDING					
APN 5016 17	XTF 0146	OFF			
XMC1A1X 412' TURBINE BUILDING					
XMC1A1X 04EG	CRDM COOLING WATER PUMP B XPP0157B-AC	OFF			
XMC1A1X 12IK	CRDM COOLING WTR PP A XPP0157A-AC	OFF			

Document Review Form (DRF)

2, WC 7/26/14

Document Identification	**Page 1 of ~~3~~**
Preparer Name: Bobby Kunkle	**Ext:** 89559 **Mail Code** 410
Date: 6/17/14 **Document #:** SOP-114	**Revision:** 21 **Change** B
Title: Reactor Building Ventilation System	☒ **SR** ☐ **QR** ☐ **NNS**

A

Development Process: ☐ New ☒ Revision/Change ☐ Editorial Correction ☐ Temporary Approval

Description: see attached.

Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: see attached.

Temporary Approval – if final approval is not completed within 30 days; initiate CR #______________

Qualified Reviewer	**DCRM person notified**	**Shift Supervisor**	**Date**

List Required Reviewers including All Impacted Groups
Additional Reviewers – identify with an *

Position	**Type/Print Name**	**Comments**	**Position**	**Type/Print Name**	**Comments**
RO/SRO QR	BRANDON BLUE	☐ Yes ☒ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

[signature] 7/16/14
Designated Supervisor Concurrence **Date**

Comment Due Date 8/6/14
GM concurrence________for expedited review

Pre- implementation Actions

All Comments Resolved? ☒ NA ☐ YES [signature] 7-22-14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☐ NA ☒ YES	Attached? YES ☒ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	Attached? YES ☐ No ☐
Commitments Addressed?	☒ NA ☐ YES	PCAP #_____MSLA_______
QR Qualification Verified?	☒ YES	
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	
Training required after implementation?	☒ NA ☐ YES	CR#____________
PSRC Review Completed?	☒ NA ☐ YES	Mtg. #____________
NSRC Review Completed?	☒ NA ☐ YES	Mtg. #____________
CMMS Update Required? [Unit 1]	☒ NA ☐ YES	Planner Notified YES ☐

[signature] 7/23/14
Designated Supervisor Approval **Date**

[signature] 7/27/14
Approval Authority Approval **Date**
Effective Date:______________

DRF Form (Continued)

DOCUMENT # SOP-114 Rev. 21 Chg. B

DESCRIPTION CONTINUED:

1. Page 3, Added z-link to III.A.
2. Page 3, deleted Initial Condition 1.3, "Industrial Cooling Water System is in-service per SOP-125" and added action step 2.1 to ensure that either Industrial Cooling Water or Service Water is in-service and aligned to provide cooling water to RBCUs. Also added the appropriate z-links.
3. Page 4, changed the referenced operating band for RBCU Fan motor amps (fast speed) in Step 2.2.e.1) from "275 amps to 300 amps" to "250 amps to 280 amps."
4. Page 7, removed Step 2.2, which directed the operator (if in Mode 6) to ensure that either RMG0017A or RMG0017B is in service.
5. Pages 17, 19, and 26, added z-links where appropriate.
6. Pages 50-51, Added procedure step 2.1.b to vent off entrapped air from the casing of the running CRDM Spray Pumps, and renumbered subsequent steps as needed.
7. Attachment IIB, page 2, added amplifying location info to panel ID "XPN 5533" to help the operator locate the panel.
8. Attachment IIB, page 3, changed the description for component XDS0037-AC, from "DISCONNECT SWITCH FOR ILC5598A & ILC5598B" to CRDM CLG TWR LVL CNTRL DISC SWTCH."
9. Attachment IV, page 4, changed the control panel lineup header to "CRDM COOLING TOWER CONTROL PANEL."

REASON/BASIS CONTINUED:

1. PF140102. Editorial.
2. PF130444 (Perrill). Determine if the RBCUs require Industrial Cooling Water to be in service supplying RBCUs prior to starting RBCUs.
3. CR-14-02692-001. Change the operating band for RBCU motor amps in fast speed to encompass historical data obtained from PSE evaluation (reference EMP-295.004).
4. PF140240 (Ja. Galloway). Step 2.2, Section III.C of SOP-114 no longer applies due to T.S. Amendment 183.
5. PF140104, PF140101, PF140103. Editorial.
6. CR-13-00960-001. Change SOP-114 to allow throttling the discharge valve and venting of entrapped air in the procedure section for swapping CRDM Spray Pumps.
7. PF140488 (Snipes). Editorial.
8. PF140499 (Smithwick). Editorial.
9. PF140497 (Lucas). Editorial.

DOCUMENT REVIEW FORM

Document Identification

Originators Name: MD Johnson **Ext:** 54300 **Mail Code:** 410

Date: 1/21/2014 **Document No.:** SOP-114 **Revision No.:** 21 **Change Letter:** A

Title: REACTOR BUILDING VENTILATION SYSTEM ☒ **SR** ☐ **QR** ☐ **NNS**

Development Process:
Permanent: (check one) ☐ Normal Rev/Chg or ☒ Editorial Correction ☐ Temporary Approval

Description: See page 2.

Reason/Basis for Change: See page 2.

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval **Final approval required by: (30 days)**

QR	**DC&R** (Person Notified)	**SS**	**Date**
		/	

Document Reviewers (Enclosure C)

Required Position	Type/Print Name	Comments Yes/No	*Additional Position	Type/Print Name	Comments Yes/No
QR	SEO	☐ ☑			☐ ☐
		☐ ☐			☐ ☐
		☐ ☐			☐ ☐
		☐ ☐			☐ ☐

Concurrence by Designated Supervisor: 2/19/14
Supervisor/Date **or** enter CR # ________ (per 6.4.8.C)

3/12/14 Comment Due Date
Standard review period is 21 days
GM concurrence ________ for expedited review period

Pre- implementation Actions

All Comments Resolved	☑ None Received	☐ Yes 2/17/14 Originator/Date	
Commitments Addressed per SAP-0630	☒ NA	☐ Yes P/CAP # ______ ☐ MLSA	______ Initial/Date
QR Qualification Verified?		☒ Yes	
50.59 Applicability/Review Completed (SAP-0107)	☒ NA	☐ Yes, Attached	
Security Compliance Review Completed (SAP-0163)	☒ NA	☐ Yes (Security review required)	
Pre-implementation Training Completed	☒ NA	☐ Yes	
Training required after implementation	☒ NA	☐ Yes, CR # ________	
PSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______	
NSRC Review Completed	☒ NA	☐ Yes, Mtg. No. ______	
CMMS Update Required	☒ NA	☐ Yes Planner Notified ______	Initial/Date

2/19/14
Supervisor/Date

2/25/14
Approval Authority/Date

Effective Date________________

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

DOCUMENT REVIEW FORM

Document No.: SOP-114 Rev. No. 21 Chg. Ltr. A

DESCRIPTION CONTINUED:

1. Pages 28 and 59, added ZCAPs to sections III.L and IV.D
2. Attachment IIB, Page 2, corrected breaker description.

REASON/BASIS FOR CHANGE CONTINUED:

1. OPU tracking mechanism to link different sections in different procedures.
2. Crumlin e-mail noting discrepancy between CHAMPs and Att II.

DOCUMENT REVIEWERS CONTINUED:

	Position	Type/Print Name	Comments Yes/No		Position	Type/Print Name	Comments Yes/No
Required			☐ ☐	*Additional			☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐
			☐ ☐				☐ ☐

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

DOCUMENT REVIEW FORM

Document Identification

Originators Name: R. Perrill **Ext:** 55524 **Mail Code:** 410

Date: 08/01/13 **Document No.:** SOP-114 **Revision No.:** 21 **Change Letter:**

Title: Reactor Building Ventilation ~~Building~~ SYSTEM 08/13/13 ☒ SR ☐ QR ☐ NNS

Development Process:
Permanent: (check one) ☒ Normal Rev/Chg or ☐ Editorial Correction ☐ Temporary Approval

Description: See attached.

Reason/Basis for Change: See attached.

Is the SCOPE of the procedure affected by this change? NO ☒ YES ☐

Temporary Approval — **Final approval required by: (30 days)**

QR	DC&R (Person Notified)	SS	Date
		/	

Document Reviewers (Enclosure C)

Required Position	Type/Print Name	Comments Yes/No	*Additional Position	Type/Print Name	Comments Yes/No
QR	C. Cump	☒ Yes ☐ No			☐ ☐
DE	Scott Bender	☐ Yes ☒ No			☐ ☐
		☐ ☐			☐ ☐
		☐ ☐			☐ ☐

Concurrence by Designated Supervisor: 8-15-13
Supervisor/Date **or** enter CR # __________ (per 6.4.8.C)

Comment Due Date 9-5-13
Standard review period is 21 days
GM concurrence ________ for expedited review period

Pre- implementation Actions

All Comments Resolved ☐ None Received ☒ Yes R Perrill 08/21/13
Originator/Date

Commitments Addressed per SAP-0630 ☒ NA ☐ Yes P/CAP # ______ ☐ MLSA ______ Initial/Date

QR Qualification Verified? ☒ Yes
50.59 Applicability/Review Completed (SAP-0107) ☐ NA ☒ Yes, Attached
Security Compliance Review Completed (SAP-0163) ☒ NA ☐ Yes (Security review required)
Pre-implementation Training Completed ☒ NA ☐ Yes
Training required after implementation ☒ NA ☐ Yes, CR # ________
PSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______
NSRC Review Completed ☒ NA ☐ Yes, Mtg. No. ______
CMMS Update Required ☒ NA ☐ Yes Planner Notified ______ Initial/Date

12/9/13
Supervisor/Date

12/17/13
Approval Authority/Date

Effective Date______________________

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

DOCUMENT REVIEW FORM

Document No.: SOP-114 Rev. No. 21 Chg. Ltr. ______

DESCRIPTION CONTINUED:

a. Incorporated Changes A through J.

b. In Section III.J, Fill And Vent Control Rod Drive Mechanism Cooling Water System, created new Step 2.5 to provide for the venting of Spray Pumps B and D using new valves XVM07570B-AC and XVM07570D-AC.

c. To Attachment IB, CRDM Cooling Water System Valve Lineup, added new valves XVM07570B-AC and XVM07570D-AC.

d. To Attachment IIB, CRDM Cooling Water System Electrical Lineup, added XMC1A2X 01LM, IND CLG WTR HT TRACE CONTR PNL XPN2025.

REASON/BASIS FOR CHANGE CONTINUED:

a. General Revision.

b. New valves added by ECR50682, CRDM Cooling Tower XCI0004 Replacement (Bender).

c. New valves added by ECR50682, CRDM Cooling Tower XCI0004 Replacement (Bender).

d. Procedure feedback #130003 (Perrill):

"Procedure electrical attachments do not address XMC1A2X 01LM, IND CLG WTR HT TRACE CONTR PNL XPN2025. The closure of this breaker ensures power to system heat tracing and, thereby, prevention of unwanted LOW TEMP. alarms on XPN0094 which serves the Industrial Cooling Water System. ECR50537 which is changing out heat trace system panels has not yet identified XPN0094 for change out. Therefore, ARP-038, Annunciator Response Procedure, may also be affected by this feedback."

* Failure by the "Additional Reviewers" to provide comments within 5 working days following the comment due date may be considered as "No Comment".

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPP-402**

2015 NRC In Plant i RO & SRO-U: Locally Dilute the Boric Acid Tanks

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

000-055-05-01 RESPOND TO LOSS OF OFF SITE AND ON SITE POWER

TASK STANDARD:

The 'A' BAT has been drained to 50%, then refilled to 90-95%. XVD08324A-CS is closed and both the drain rig and fill rig have been removed.

TERMINATING CUE: The "A" BAT has been diluted.

PREFERRED EVALUATION LOCATION	***PREFERRED EVALUATION METHOD***
PLANT	SIMULATE

REFERENCES:

EOP-6.0 LOSS OF ALL ESF AC POWER

INDEX NO.	***K/A NO.***		***RO***	***SRO***
000024K302	AK3.02	Actions contained in EOP for emergency boration	4.2	4.4

TOOLS: NJPP-402 Handout - EOP-6.0, Attachment 6
Key KA1 from a set of Rover keys from the SS key box or key G1A from a ring on hook 45 of the CR key box.

EVALUATION TIME 15 ***TIME CRITICAL*** NO ***10CFR55:*** 45(a)(6)

TIME START: ________ TIME FINISH: ________ PERFORMANCE TIME: ________

PERFORMANCE RATING: SAT: ____ UNSAT: ____

CANDIDATE: ________________

EXAMINER: ________________ ________________ / ________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The plant has experienced an ESF Bus Blackout with the CRS implementing EOP-6.0. Annunciator "BAT A TEMP HI/LO" has been received and local verification indicates that temperature is 68°F in 'A' BAT room.

INITIATING CUES: CRS directs diluting the "A" BAT per EOP-6.0, Attachment 6.

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

FOR ELECTRICAL MANIPULATIONS, AT NO TIME ARE YOU TO BREAK THE PLANE OF THE ELECTRICAL PANEL!

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 1

Step 1a. Connects the drain rig stored in the BAT room to XVD08324A-CS, BORIC ACID TANK A DRAIN ISOL VALVE, and to the 2-inch capped pipe which penetrates the floor.

STEP STANDARD:

Shows location of drain rig and XVD08324A and the floor penetration. Identifies necessary tools and equipment and explains how to make the connection.

CUES:

Evaluator cue: Provide a copy of NJPP-402 Handout (EOP-6.0 Attachment 6)

Evaluator cue: Provide key to Examinee once they explain where they would obtain it.

Evaluator note: Requires obtaining Key G1A from the control room key box hook 45 or key KA1 on a set of rover keys from the SS key box. The tool box has a lock on either side and can be difficult to open due to the nature of the lock mechanism.

Evaluator note: Examinee must identify hoses and fittings and demonstrate where each should be installed and actual layouts. Does not require removal of components from locker. Following is a description of fittings and connection points:

1. Using a pipe wrench remove the 2" stainless steel pipe cap from the nipple downstream of XVD08324A-CS
2. Thread on the Male Quick disconnect fitting labeled "Hook to Tank Drain" at the 8324A nipple. Tighten with wrench. Fitting has 2" threads and a 1.5" quick connect for a cam lock connector.
3. Using a pipe wrench remove the 2" stainless steel pipe cap from the vertical pipe stub rising from the floor next to valve 8323A.
4. Thread on the Male Quick disconnect fitting labeled "Hook to Floor Drain" at the vertical pipe stub rising from the floor next to valve 8323A. Tighten with wrench. Fitting has 2" threads and a 1.5" male quick connect for a cam lock connector.
5. Connect the red rubber hose labeled "Drain Rig" to the male fittings just installed. Place one female quick connect cam lock on the tank drain and the other one on the floor drain connection. Connections are made by placing the male fitting inside the female fitting with the tabs on the female fitting perpendicular to the fitting then locking it on by moving the tabs 90° to parallel to the fitting.

Evaluator cue: Once demonstration by Examinee is complete state: "The drain rig is connected."

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

Step 1b. Opens XVD08324A-CS, BORIC ACID TANK A DRAIN ISOL VALVE.

STEP STANDARD:

Simulates opening XVD08324A, by operating handwheel counter clockwise a few turns until resistance is felt.

CUES:

Evaluator cue: State, "Handwheel rotated CCW and stem is out".

Evaluator note: This step is critical because a sufficient volume of the tank contents must be removed to accomplish the desired outcome.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 3

Step 1c. Coordinate with the Control Room and drain the BAT to 50% level.

STEP STANDARD:

Contacts the CR by radio or the plant page system.

CUES:

Evaluator cue: As the NROATC, report that BAT level is 49%.

Evaluator note: This step is critical because a sufficient volume of the tank contents must be removed to accomplish the desired outcome.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 4

Step 1d. Close XVD08324A-CS, BORIC ACID TANK A DRAIN ISOL VALVE.

STEP STANDARD:

Simulates closing XVD08324A by operating the handwheel a few turns in the clockwise direction until it stops turning.

CUES:

Evaluator cue: State, "Handwheel rotated CW and stem is in".

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 5

Step 1e. Remove the drain rig.

STEP STANDARD:

Describes how to disconnect the rig from XVD08324A and the penetration from the floor.

CUES:

Evaluator note: Following is a description of necessary steps to disconnect the rig:

Disconnect the red rubber hose labeled "Drain Rig" from the male fittings at the tank drain and the floor drain. Disconnect is accomplished by raising the tabs on the female fittings 90° to the perpendicular position and then pulling off the quick connect. Does not remove male side of the connector which is threaded on.

Evaluator cue: Once Examinee completes the description of rig removal state: "Drain rig is removed."

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 6

Step 2a. Open the nearest Fire Hose Reel Isolation Valve and flush the fire hose to the floor drain until the water is clear.

STEP STANDARD:

Simulates operating the reel isolation valve counter clockwise until in line with pipe. Simulates operating the nozzle counter clockwise.

CUES:

Evaluator cue: When valve is open and the nozzle is rotated CCW, state: "The water is clear."

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 7

Step 2b. Close the Fire Hose Reel Isolation Valve.

STEP STANDARD:

Simulates operating the reel isolation valve in the clockwise direction until perpendicular with pipe

CUES:

Evaluator cue: State, "Handle is perpendicular to pipe."

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 8

Step 2c. Connect the fill rig to XVD08324A-CS BORIC ACID TANK A DRAIN ISOL VALVE, and to the fire hose from the hose reel.

STEP STANDARD:

Explains how to make the connection.

CUES:

Evaluator cue: State, "Fill rig is connected".

Evaluator note: Following is a description of necessary steps to connect the rig:

1. Take the red 1.5" fire hose labeled "fill rig" and connect the 1.5" female fire hose coupling labeled "Hook to Hose Reel" to the male threaded coupling on the fire hose from the reel station.
2. Connect the female cam lock connection labeled "To Boric Acid Tank" on the opposite end of the fill rig to the previously installed male fitting at the tank drain (valve 8324A). Connection is made by placing the male fitting inside the female fitting with the tabs on the female fitting perpendicular to the fitting then locking it on by moving the tabs 90° to parallel to the fitting.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 9

Step 2d. Opens XVD08324A-CS, BORIC ACID TANK A DRAIN ISOL VALVE.

STEP STANDARD:

Simulates opening XVD08324A, by operating handwheel counter-clockwise a few turns until resistance is felt.

CUES:

Evaluator cue: State, "Handwheel rotated CCW and stem is out".

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 10

Step 2e. Open the Fire Hose Reel Isolation Valve to fill the BAT.

STEP STANDARD:

Operates the hose reel isolation valve counter-clockwise until in-line with pipe.

CUES:

Evaluator cue: State, "Handle is in-line with pipe".

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 11

Step 2f. WHEN BAT level is between 90% and 95%, THEN close the Fire Hose Reel Isolation Valve.

STEP STANDARD:

Operates the reel isolation valve 90° clockwise to shut.

CUES:

Evaluator cue: As NROATC, report that 'A' BAT level is 92%.

Evaluator cue: State handle is perpendicular with pipe.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 12

Step 2g. Close XVD08324A-CS, BORIC ACID TANK A(B) DRAIN ISOL VALVE.

STEP STANDARD:

Operates XVD08324A in the clockwise direction a few turns until resistance is felt.

CUES:

Evaluator cue: State handwheel rotated CW and stem is in.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 13

Step 2h. Remove the fill rig.

STEP STANDARD:

Disconnects the rig from the fire hose and from XVD08324A. Stores the rig.

CUES:

Evaluator cue: State fill rig is removed.

Evaluator note: Following is a description of fill rig removal:

1. Removes cam lock female quick connect at tank drain by moving tabs 90° to perpendicular to fitting and lifts off coupling.
2. Removes fire hose coupling connecting fill rig to hose reel hose.
2. Removes male quick disconnects from tank drain and floor drain with wrench.
3. Reinstalls pipe caps on tank drain and floor drain.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPP-402

DESCRIPTION: 2015 NRC InPlant i RO & SRO-U: Locally Dilute the Boric Acid Tanks

IC SET: NA

INSTRUCTIONS:

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The plant has experienced an ESF Bus Blackout with the CRS implementing EOP-6.0. Annunciator "BAT A TEMP HI/LO" has been received and local verification indicates that temperature is 68°F in 'A' BAT room.

INITIATING CUES: CRS directs diluting the "A" BAT per EOP-6.0, Attachment 6.

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

LOCALLY DILUTING THE BORIC ACID TANKS

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
1 **Locally drain the BAT to 50% level (AB–463):** a. Connect the drain rig stored in the BAT room to XVD08324A(B)–CS, BORIC ACID TANK A(B) DRAIN ISOL VALVE, and to the 2–inch capped pipe which penetrates the floor. ☐ b. Open XVD08324A(B)–CS, BORIC ACID TANK A(B) DRAIN ISOL VALVE. ☐ c. Coordinate with the Control Room, and drain the BAT to 50% level. ☐ d. Close XVD08324A(B)–CS, BORIC ACID TANK A(B) DRAIN ISOL VALVE. ☐ e. Remove the drain rig. ☐	

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
2 **Locally fill the BAT using the Fire Service System (AB-463):** a. Open the nearest Fire Hose Reel Isolation Valve, and flush the fire hose to the floor drain until the water is clear. ☐ b. Close the Fire Hose Reel Isolation Valve. ☐ c. Connect the fill rig to XVD08324A(B)-CS, BORIC ACID TANK A(B) DRAIN ISOL VALVE, and to the fire hose from the hose reel. ☐ d. Open XVD08324A(B)-CS, BORIC ACID TANK A(B) DRAIN ISOL VALVE. ☐ e. Open the Fire Hose Reel Isolation Valve to fill the BAT. ☐ f. <u>WHEN</u> BAT level is between 90% and 95%, <u>THEN</u> close the Fire Hose Reel Isolation Valve. ☐ g. Close XVD08324A(B)-CS, BORIC ACID TANK A(B) DRAIN ISOL VALVE. ☐ h. Remove the fill rig. ☐	

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPPF-049**

2011 In Plant i and 2015 In Plant j NRC RO &SRO-U: Control Room Evacuation
(Duties of BOP Operator)

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

000-068-05-01 PERFORM CONTROL ROOM EVACUATION PER AOP-600.1.

TASK STANDARD:

AOP-600.1 Attachment 2 performed with the following complete:
1. All MFPs have been tripped
2. Rod Drive MG set "B" feeder breaker has been tripped
3. RCP "B" is left running ('A' and 'C' RCP are tripped already).
4. Two condensate pumps have been tripped
5. Three FWBP's have been tripped.

The use of applicable Human Performance Tools (3-way communications, self checking, peer checking, phonetic alphabet, etc) and industrial safety practices meets expectations.

TERMINATING CUE: Step 12 of Attachment 2 is complete or when examinee returns procedure to examiner.

PREFERRED EVALUATION LOCATION	***PREFERRED EVALUATION METHOL***
PLANT	SIMULATE

REFERENCES:

SOP-313	LOCAL SWITCHGEAR BREAKER OPERATIONS
ISP-027	ELECTRICAL SAFETY
AOP-600.1	CONTROL ROOM EVACUATION

INDEX NO.	***K/A NO.***		***RO***	***SRO***
0000682130	2.1.30	Ability to locate and operate components, including local controls.	4.4	4.0

TOOLS:

NJPPF-049 Handout 1; AOP-600.1, Attachment 2
NJPPF-049 Handout 2; Picture of the inside of a 7.2 KV breaker.
NJPPF Handout 3; SOP-313 Section IV.C, Local Operation of a Reactor Trip Breaker
NJPPF Handout 4; SOP-313 Section IV.J, Local Operation of a 7.2KV Breaker.

EVALUATION TIME 14 ***TIME CRITICAL*** No ***10CFR55:*** 45(a)13

TIME START: ______________ TIME FINISH: ______________ PERFORMANCE TIME: ____________

PERFORMANCE RATING: SAT: ______ UNSAT: ______

CANDIDATE: ____

EXAMINER: ______________________________ ______________________________ / ____________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The plant is operating at 100% power, with all controls in automatic. A call has been received that a bomb has been placed in the control room. The SS has directed a control room evacuation. AC power is available to both ESF Buses. The reactor has been tripped by the Reactor Operator.

INITIATING CUES: The Control Room Supervisor directs you as the BOP Operator to perform Attachment 2 of AOP-600.1, Steps 10 through 12.

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

FOR ELECTRICAL MANIPULATIONS, AT NO TIME ARE YOU TO BREAK THE PLANE OF THE ELECTRICAL PANEL!

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 1

Procedure CAUTION - Step 10 "Reactor Trip should be verified with the Reactor Operator prior to securing the Main Feedwater Pumps."

Verifies reactor has been tripped.

STEP STANDARD:

Calls the Reactor Operator and verifies reactor has been tripped.

CUES:

Evaluator note: Initial conditions have indicated that the RO has already tripped the reactor.

Evaluator cue: If the Examinee calls the Reactor Operator to verify the reactor trip, respond as the Reactor Operator that the reactor has been tripped.

COMMENTS:

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 2

Step 10. Locally trip all Main Feedwater Pumps (436' TB).

STEP STANDARD:

Pulls MFP "PULL TO TRIP" handle on front standard for MFP's "A" "B" & "C". Verifies trip by noting RPM decrease locally OR trips MFPs from local DCS station.

CUES:

Evaluator cue: State that the handle withdraws and that the frequency of the sound from the pump is lowering.

Evaluator note: Tripping MFPs is critical because leaving them in service would result in excessive RCS cooldown and positive reactivity addition.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 3

Step 11 a. Locally at XSW1A Switchgear Room (TB-436): Trips XSW-1B1 06C - ROD DRIVE M/G SET "B".

STEP STANDARD:

Trips rod drive MG set "B" bkr 06C at XSW-1B1 by pushing on red TRIP pushbutton on left side on front of breaker. Verifies a Green "OPEN" flag results and Red light OFF, Green light ON.

CUES:

Evaluator cue: If asked as the Shift Supervisor if ISP-027, ELECTRICAL SAFETY INDUSTRIAL SAFETY PROCEDURE, requirements can be waived respond that the requirements can be waived. This waiver will be applied to the rest of the task. If Examinee does not wish to waive ISP-027 requirements then the following are required: Hard hat; safety glasses, hearing protection; Fire Retardant Pants and shirt or Fire Retardant coveralls.

Evaluator note: A copy of the applicable procedure is shown in NJPPF-049 Handout 3 (SOP-313 Section IV.C). If examinee describes the correct procedure and states they would obtain a copy then provide Handout 3.

Evaluator cue: Inform Examinee that MG Set "B" breaker cubicle has a Green "OPEN" flag with Red light OFF and Green light ON.

Evaluator cue: If the TRIP pushbutton on the right side of the breaker is used this is incorrect. Provide cue that there is no change in status (This pushbutton only works when the breaker is racked to test).

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 4

Step 11 b. Check status of XSW1A 06 FD WTR BOOSTER PUMP "A" breaker. (TB-436)

STEP STANDARD:

Verifies that the "A" FWBP, bkr 06 is closed by observing red light on outside of cubicle door.

CUES:

Evaluator cue: Inform Examinee that "A" FWBP, breaker cubicle has the Red light ON.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 5

Step 11 c. Checks status of XSW1A 09, RX COOLANT PUMP "A" breaker.(TB-436)

STEP STANDARD:

Checks RCP "A" breaker at XSW1A 09. Verifies breaker cubicle door has Green light ON.

CUES:

Evaluator cue: Inform Examinee that RCP "A" breaker cubicle has the Green light ON.

Evaluator note: This will "setup" alternate path portion of this JPM. Examinee will have to leave 'B' RCP running in Step 12.c.)

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 6

Step 11 d. Check status of XSW1A 07, COND PUMP "A"   breaker. (TB-436)

STEP STANDARD:

Verifies that the "A" condensate pump bkr 07 is closed by observing Red light ON outside of cubicle door.

CUES:

Evaluator cue: Inform Examinee that "A" condensate pump breaker cubicle has the Red light ON.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 7

Step 12 Locally at XSW1B and XSW1C Switchgear Room (TB-412):

Step 12 a. If Condensate Pump "A" is running THEN trip both of the following:

Trip XSW1B 09, COND PUMP "B" breaker.(TB-412)

STEP STANDARD:

Trips breaker XSW1B 09 for Cond Pump "B" by pushing the "MANUAL TRIP" lever on front of breaker (inside cubicle door). Verifies breaker cubicle door has the Green light ON.

CUES:

Evaluator cue: If asked as the Shift Supervisor if ISP-027, ELECTRICAL SAFETY INDUSTRIAL SAFETY PROCEDURE, requirements can be waived respond that the requirements can be waived. If Examinee does NOT wish to waive ISP-027 requirements then the following are required: 25 Cal/cm2, arc flash suit and hood (use of an arc flash hood without a hard hat in an area with overhead work in progress will require manager approval. Otherwise no hard had is required when in an arc flash hood). Short sleeve natural fiber shirt, voltage rated gloves with leather, safety glasses, earmuffs are the preferred hearing protection when an arc flash suit is being worn, however earplugs may be used. Fire Retardant coveralls or Fire Retardant Shirt (tucked in) & Pants. A 10' flash protection boundary is established.

Evaluator Note: Do not let Examinee open the breaker door. A picture has been included of the inside of a 7.2 breaker (NJPPF-049 Handout 2).

Evaluator note: A copy of the applicable procedure is shown in NJPPF-049 Handout 4 (SOP-313 Section IV.J). If examinee describes the correct procedure and states they would obtain a copy then provide Handout 4. This handout is applicable to all of the 7.2 KV breaker local operations.

Evaluator cue: IF correct action is described inform the Examinee Condensate Pump "B" breaker cubicle door has the Green light ON. IF correct actions are NOT described inform the Examinee that the Red light is ON.

Evaluator note: Tripping Condensate Pumps is critical because leaving them in service would result in excessive RCS cooldown and positive reactivity addition.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 8

Step 12 a. Checks status of XSW1C 06, COND PUMP "C" breaker. (TB-412)

STEP STANDARD:

Checks COND PUMP "C" Breaker, XSW01C 06. Verifies breaker cubicle door has the Green light ON.

CUES:

Evaluator cue: Inform Examinee that COND PUMP "C" breaker cubicle has the Green light ON.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 9

Step 12 b. If Feedwater Booster Pump "A" is running, THEN trip all of the following:

Trips XSW1B 06, FD WTR BOOSTER PUMP "B" breaker. (TB-412)

STEP STANDARD:

Trips the FWBP "B" bkr 06 manually at XSW-1B by pushing the "MANUAL TRIP" lever on front of breaker (inside cubicle door). Verifies a green light on outside of cubicle door results.

CUES:

Evaluator note: Same ISP-027, ELECTRICAL SAFETY INDUSTRIAL SAFETY PROCEDURE, requirements as for the Condensate pumps.

Evaluator Note: Do not let Examinee open the breaker door. A picture has been included of the inside of a 7.2 breaker (NJPPF-049 Handout 2).

Evaluator cue: IF correct action is described inform the Examinee that Feed Water Booster Pump "B" breaker cubicle door has the Green light ON. IF correct actions are NOT described inform the Examinee that the Red light is ON.

Evaluator note: Tripping FW Booster Pumps is critical because leaving them in service would result in excessive RCS cooldown and positive reactivity addition.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 10

Step 12 b. Trips XSW1B 13, FD WTR BOOSTER PUMP "D" breaker. (TB-412)

STEP STANDARD:

Trips the FWBP "D" bkr 13 manually at XSW-1B by pushing the "MANUAL TRIP" lever on front of breaker (inside cubicle door). Verifies breaker cubicle door has the Green light ON.

CUES:

Evaluator note: Same ISP-027, ELECTRICAL SAFETY INDUSTRIAL SAFETY PROCEDURE, requirements as for the Condensate pumps.

Evaluator cue: IF correct action is described inform the Examinee that Feed Water Booster Pump "D" breaker cubicle door has the Green light ON. IF correct actions are NOT described inform the Examinee that the Red light is ON

Evaluator Note: Do not let Examinee open the breaker door. A picture has been included of the inside of a 7.2 breaker (NJPPF-049 Handout 2).

Evaluator note: Tripping FW Booster Pumps is critical because leaving them in service would result in excessive RCS cooldown and positive reactivity addition.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 11

Step 12 b. Trips XSW1C 08, FD WTR BOOSTER PUMP "C" XPP0028C-FW breaker. (TB-412)

STEP STANDARD:

Trips the FWBP "C" bkr 08 manually at XSW-1C by pushing the "MANUAL TRIP" lever on front of breaker (inside cubicle door). Verifies breaker cubicle door has the Green light ON.

CUES:

Evaluator note: Same ISP-027, ELECTRICAL SAFETY INDUSTRIAL SAFETY PROCEDURE, requirements as for the Condensate pumps.

Evaluator Note: Do not let Examinee open the breaker door. A picture has been included of the inside of a 7.2 breaker (NJPPF-049 Handout 2).

Evaluator cue: IF correct action is described inform the Examinee that Feed Water Booster Pump "C" breaker cubicle door has the Green light ON. IF correct actions are NOT described inform the Examinee that the Red light is ON

Evaluator note: Tripping FW Booster Pumps is critical because leaving them in service would result in excessive RCS cooldown and positive reactivity addition.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 12

Step 12 c. If RCP A is running (NO), goes to RNO.

Ensure one of the following is open:

XSW1B 07, RX COOLANT PUMP "B" breaker

OR

XSW1C 03, RX COOLANT PUMP "C" breaker.

STEP STANDARD:

Does NOT trip the RCP "B" bkr 07 at XSW-1B (because RCP "C" bkr 03 at XSW-1C is already open).

CUES:

Evaluator cue: Inform Examinee, when looking at breaker positions, that XSW1B 07, RX COOLANT PUMP B breaker cubicle has the Red light ON and that XSW1C 03, RX COOLANT PUMP C breaker cubicle has the Green light ON.

Evaluator note: This is the alternative path portion of this JPM. It is critical that the "B" RCP be left running since both the "A" and "C" pumps are already tripped in this JPM.

Evaluator note: Same ISP-027, ELECTRICAL SAFETY INDUSTRIAL SAFETY PROCEDURE, requirements as the Condensate pumps.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 13

Step 12 d. Ensure XSW 1C 02 Press Heater Transformer breaker is closed.

STEP STANDARD:

Verifies that the PZR Heater Transformer Breaker 02 at XSW-1C is closed by observing red light on outside of cubicle door or a red "closed" flag on front of breaker.

CUES:

Evaluator cue: Inform Examinee that PZR Heater Transformer breaker cubicle door has the Red light ON, Green light OFF.

Evaluator note: Same ISP-027 considerations as Condensate pumps if it was to be operated but since only verifying proper position there are no ISP-027 requirements.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPPF-049

DESCRIPTION: 2011 InPlant i and 2015 InPlant j NRC RO &SRO-U: Control Room Evacuation (Duties of BOP Operator)

IC SET:

INSTRUCTIONS:

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The plant is operating at 100% power, with all controls in automatic. A call has been received that a bomb has been placed in the control room. The SS has directed a control room evacuation. AC power is available to both ESF Buses. The reactor has been tripped by the Reactor Operator.

INITIATING CUES: The Control Room Supervisor directs you as the BOP Operator to perform Attachment 2 of AOP-600.1, Steps 10 through 12.

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

NJPPF-049 Handout 1

DUTIES OF THE BOP OPERATOR

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
1 **Verify AC power is available to <u>both</u> ESF Buses.** ☐	1 **COMPLETE Attachment 2.** <u>WHEN</u> Attachment 2 is complete, <u>THEN</u> **COMPLETE Attachment 3.** ☐
2 **Check if time is available to perform additional Control Room actions.** ☐	2 **GO TO Step 10.** Observe the **CAUTION** prior to **Step 10.** ☐

> <u>CAUTION - Step 3</u>
>
> Reactor Trip should be verified prior to securing the Main Feedwater Pumps.

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
3 **Trip <u>all</u> Main Feedwater Pumps.** ☐	
4 **Ensure only <u>one</u> Feedwater Booster Pump is running.** ☐	
5 **Ensure only <u>one</u> Condensate Pump is running.** ☐	
6 **Verify RCP A is running.** ☐	6 Locally at the 7.2KV Switchgear on the TB-412, ensure the following: a) XSW1B 07, RX COOLANT PUMP B XPP0030B-RC, is open. ☐ b) XSW1C 02, PRESSURIZER HEATER TRANSFORMER XTF4103, is closed. ☐ c) **GO TO Step 8.** ☐
7 **Locally at the 7.2KV Switchgear on the TB-412, ensure the following:** a. XSW1B 07, RX COOLANT PUMP B XPP0030B-RC, is open. ☐ b. XSW1C 03, RX COOLANT PUMP C XPP0030C-RC, is open. ☐ c. XSW1C 02, PRESSURIZER HEATER TRANSFORMER XTF4103, is closed. ☐	

ACTION/EXPECTED RESPONSE		ALTERNATIVE ACTION
8 **Locally verify <u>all</u> Main Feedwater Pumps are on their Turning Gears (TB-436).**	☐	
9 **GO TO Step 15.**	☐	

CAUTION - Step 10

Reactor Trip should be verified with the Reactor Operator prior to securing the Main Feedwater Pumps.

ACTION/EXPECTED RESPONSE		ALTERNATIVE ACTION
10 **Locally trip <u>all</u> Main Feedwater Pumps (TB-436).**	☐	
11 **Locally at XSW1A Switchgear Room (TB-436), perform the following:**		
a. Trip XSW1B1 06C, ROD DRIVE MG SET B XMG0001B-CR.	☐	
b. Check the status of XSW1A 06, FD WTR BOOSTER PUMP A XPP0028A-FW.	☐	
c. Check the status of XSW1A 09, RX COOLANT PUMP A XPP0030A-RC.	☐	
d. Check the status of XSW1A 07, COND PUMP A XPP0042A-CO.	☐	

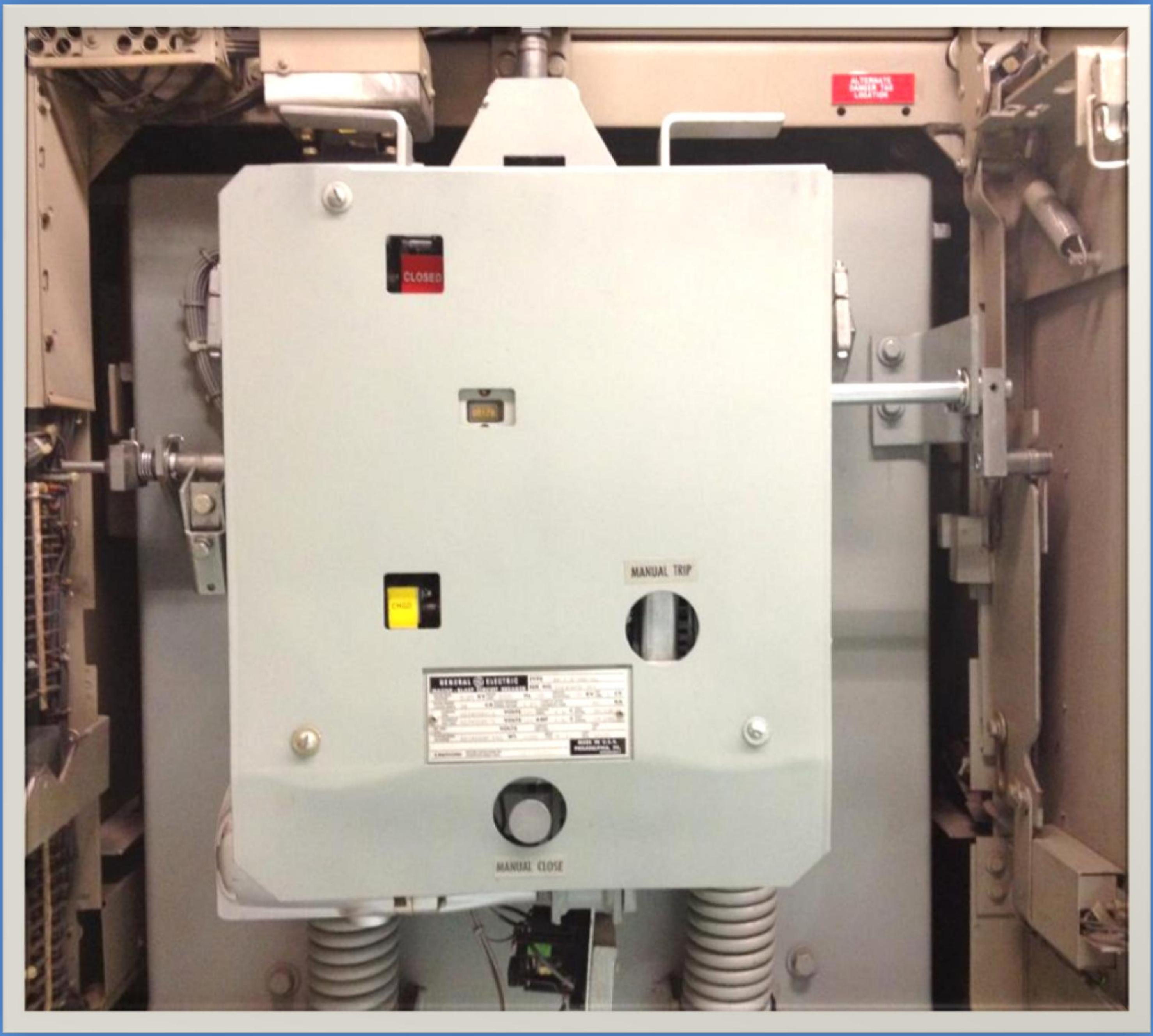
DUTIES OF THE BOP OPERATOR

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
12 **Locally at XSW1B and XSW1C Switchgear Room (TB-412), perform the following:**	
a. IF Condensate Pump A is running, THEN trip both of the following : • XSW1B 09, COND PUMP B XPP0042B-CO. ☐ • XSW1C 06, COND PUMP C XPP0042C-CO. ☐	a. Ensure one of the following is open: • XSW1B 09, COND PUMP B XPP0042B-CO. ☐ OR • XSW1C 06, COND PUMP C XPP0042C-CO. ☐
b. IF Feedwater Booster Pump A is running, THEN trip all of the following : • XSW1B 06, FD WTR BOOSTER PUMP B XPP0028B-FW. ☐ • XSW1B 13, FD WTR BOOSTER PUMP D XPP0028D-FW. ☐ • XSW1C 08, FDWTR BOOSTER PUMP C XPP0028C-FW. ☐	b. Ensure two of the following are open: • XSW1B 06, FD WTR BOOSTER PUMP B XPP0028B-FW. ☐ • XSW1B 13, FD WTR BOOSTER PUMP D XPP0028D-FW. ☐ • XSW1C 08, FDWTR BOOSTER PUMP C XPP0028C-FW. ☐
c. IF RCP A is running, THEN trip both of the following : • XSW1B 07, RX COOLANT PUMP B XPP0030B-RC. ☐ • XSW1C 03, RX COOLANT PUMP C XPP0030C-RC. ☐	c. Ensure one of the following is open: • XSW1B 07, RX COOLANT PUMP B XPP0030B-RC. ☐ OR • XSW1C 03, RX COOLANT PUMP C XPP0030C-RC. ☐
d. Ensure XSW1C 02, PRESSURIZER HEATER TRANSFORMER XTF4103, is closed. ☐	
13 **Locally trip XSW1C1 05D, ROD DRIVE MG SET A XMG0001A-CR (TB-412).** ☐	
14 **Locally verify all Main Feedwater Pumps are on their Turning Gears (TB-436).** ☐	

DUTIES OF THE BOP OPERATOR

ACTION/EXPECTED RESPONSE	ALTERNATIVE ACTION
15 **Report to CREP Room B.** ☐	

NJPPF- 049 Handout 2



C. LOCAL OPERATION OF A REACTOR TRIP BREAKER

1.0 INITIAL CONDITIONS

☐ 1.1 The Control Room has been informed of the local operations to be performed.

NOTE 2.0
These steps shall only be performed when directed by the Shift Supervisor.

2.0 INSTRUCTIONS

☐ 2.1 Verify proper Personal Protective Equipment and Approach Boundaries per ISP-027, Enclosures 8.4 and 8.2. CHG C

☐ 2.2 To locally close a Reactor Trip Breaker, depress the PUSH TO CLOSE button.

☐ 2.3 To locally open a Reactor Trip Breaker, depress the red TRIP button on the front of the breaker face.

END OF SECTION

J. LOCAL OPERATION OF A 7.2 KV BREAKER

1.0 INITIAL CONDITIONS

☐ 1.1 The Control Room has been informed of all local operations to be performed.

1.2 One of the following conditions have been met:

☐ a. The SS/CRS has entered the cubicle number and nomenclature for the breaker to be operated in Step 2.1.a, below. CHG A

☐ b. Personnel racking the breaker have a controlling document in the field (i.e. LOTO or SOP lineup) that identifies the correct component by listing both the breaker cubicle number and nomenclature.

NOTE 2.0
These steps shall only be performed when directed by the Shift Supervisor.

2.0 INSTRUCTIONS

2.1 Ensure you are at the correct breaker by one of the following:

☐ a. Per SS/CRS:____ CHG A

____

☐ b. Per controlling document in accordance with Step 1.2.b.

☐ 2.2 Verify proper Personal Protective Equipment and Approach Boundaries per ISP-027, Enclosures 8.4 and 8.2. CHG C

N01→ ☐ 2.3 Inform the Control Room of the component affected, by the breaker to be operated.

☐ 2.4 Locally close the breaker by performing one of the following:

a. For breakers that allow manual operation from inside the cubicle:

☐ 1) Depress the MANUAL CLOSE button on the lower, center portion of the breaker face.

☐ 2) Verify the breaker is closed, as indicated by the CLOSED flag being visible. CHG D

b. For breakers that are cannot be operated inside the cubicle and local use of the pistol grip switch is desired:

☐ 1) Place the pistol grip handle to the CLOSED position with a crisp hand motion.

☐ 2) Verify the breaker is closed, as indicated by the CLOSED flag being visible.

CAUTION 2.5
When possible, the breaker should be opened locally under minimal load.

☐ 2.5 Locally open the breaker by performing one of the following:

a. For breakers that allow manual operation from inside the cubicle:

☐ 1) Depress the MANUAL TRIP lever through the opening on the lower, right hand corner of the breaker face.

☐ 2) Verify the breaker is open, as indicated by the OPEN flag being visible. CHG D

b. For breakers that are cannot be operated inside the cubicle and local use of the pistol grip switch is desired:

☐ 1) Place the pistol grip handle to the TRIP position with a crisp hand motion.

☐ 2) Verify the breaker is open, as indicated by the CLOSED flag being visible.

END OF SECTION

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPP-040**

2015 NRC In-Plant k RO: Transfer a Vital 120 Volt Instrument Power Supply

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

062-010-01-04 REMOVE ENGINEERING SAFETY FEATURES VITAL INVERTER FROM SERVICE

TASK STANDARD:

XIT-5901 is shutdown with APN-5901 supplied by alternate power from 1FA via manual bypass switch. The use of applicable Human Performance Tools (3-way communications, self checking, peer checking, phonetic alphabet, etc) and industrial safety practices meets expectations.

TERMINATING CUE: Examinee returns SOP-310 to examiner.

PREFERRED EVALUATION LOCATION ***PREFERRED EVALUATION METHOD***

PLANT SIMULATE

REFERENCES:

SOP-310 ENGINEERED SAFETY FEATURES 120 VAC INSTRUMENT AND CONTROL SYSTEM

INDEX NO.	***K/A NO.***		***RO***	***SRO***
062000A203	A2.03	Consequences of improper sequencing when transferring to or from an inverter	2.9	3.4

TOOLS: NJPP-040 Handout; SOP-310 Section IV.E Placing Inverter XIT5901 in an Alternate AC Lineup, marked through step 1.4 with steps 2.10 and 2.11 marked N/A.

EVALUATION TIME 10 ***TIME CRITICAL*** No ***10CFR55:*** 45(a)6

TIME START: ____________ TIME FINISH: ____________ PERFORMANCE TIME: ____________

PERFORMANCE RATING: SAT: ______ UNSAT: ______

CANDIDATE: ________________________________

EXAMINER: ____________________ ____________________ / __________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: Plant is at 100% power. 'A1' Train maintenance work. XIT-5901 is scheduled for preventive maintenance.

INITIATING CUES: Shift Supervisor directs that XIT-5901 be removed from service and APN-5901 be placed on alternate power in accordance with SOP-310, Section IV.E for inverter PMs. Initial conditions are completed through step 1.4.

STP-506.005, DEENERGIZATION OF THE ESF LOAD SEQUENCER LOSS OF VOLTAGE AND DEGRADED VOLTAGE RELAYS has been completed.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

FOR ELECTRICAL MANIPULATIONS, AT NO TIME ARE YOU TO BREAK THE PLANE OF THE ELECTRICAL PANEL!

STEPS

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 1

Step 1.5 On XIT5901 the following breakers are closed:

a. ALT. AC SOURCE.

b. BACKUP SOURCE.

c. NORMAL AC SOURCE.

STEP STANDARD:

Alternate source, Backup Source and Normal AC source breakers are all closed.

CUES:

Evaluator cue: Provide a copy of NJPP-040 Handout, SOP-310 Section IV.E

Evaluator note: All 3 breakers should be closed during normal full power operation.

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 2

Step 1.6 The MAN BYPASS Switch is in NORMAL.

STEP STANDARD:

Manual Bypass switch is in NORMAL

CUES:

Evaluator note: Manual Bypass should be in NORMAL during normal full power operation.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 3

1.7 The TEST TRANSFER Switch is in the CENTER Position.

STEP STANDARD:

The TEST TRANSFER Switch is in the CENTER Position.

CUES:

Evaluator note: Test Transfer switch should be in the CENTER position during normal full power operation.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 4

1.8 The SYNC MONITOR light is NOT lit.

STEP STANDARD:

Visually observes SYNC MONITOR Light OFF. (CB-436). (center of panel)

CUES:

COMMENTS:

CRITICAL: No **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 5

Procedure CAUTION 2.0

STP-506.005, De-Energization Of The ESF Load Sequencer Loss Of Voltage And Degraded Voltage Relays A Train, XEG0001A, should be completed on Train A prior to removing Inverter XIT5901 from service. This should be tracked on the Diesel Generator A R&R.

Procedure NOTE 2.0

a. All steps are performed in the Relay Room (CB-436) unless otherwise stated.

b. XCP-636 1-5 (INV 1/2 TROUBLE) and XCP-636 1-6 (INV 1/2 AC INPUT LOSS) will be locked in alarm at the completion of this procedure.

Step 2.1 Ensure Alternate Source voltage is acceptable for transfer:

a. Place the SOURCE SELECTOR Switch in LINE.

b. Verify the Alternate AC Source voltage is acceptable as indicated by an AC OUTPUT voltage indication between 115 VAC and 125 VAC.

c. Place the SOURCE SELECTOR Switch in OUTPUT.

STEP STANDARD:

Simulates placing Source Selector to line, verifies AC Source Voltage and returns Source Selector switch to Output.

CUES:

Evaluator cue: When Examinee selects line point to AC Output voltage meter indicating 120 Volts.

COMMENTS:

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 6

Procedure NOTE 2.2

Placing the TEST TRANSFER Switch in the ALT Position forces the Static Switch to receive power from the Alternate Source and deliver it to APN5901. This will also cause the following:

a) XCP-636 1-5 (INV 1/2 TROUBLE) annunciates (MCB).

b) ON ALTERNATE light illuminates.

c) ON INVERTER light is extinguishes.

Step 2.2; Place the TEST TRANSFER Switch to the ALT Position.

STEP STANDARD:

Simulates placing the TEST TRANSFER Switch to the ALT position. (right).

CUES:

Evaluator cue: Inform Examinee that the TEST TRANSFER Switch is in ALT position and the "ON ALTERNATE" light illuminates and the "ON INVERTER" light is extinguishes.

Evaluator cue: If Examinee contacts the control room respond that annunciator XCP-636 1-5 (INV 1/2 TROUBLE) did annunciate at the Main Control Board.

Evaluator note: Step 6 is critical is critical as the alternate source must be placed in service to accomplish the task standard.

COMMENTS:

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 7

Step 2.3; Verify the ON ALTERNATE light is lit.

STEP STANDARD:

Verifies the ON ALTERNATE light illuminated.

CUES:

Evaluator cue: Inform Examinee that the "ON ALTERNATE" Light is ON.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 8

Procedure CAUTION Step 2.4
If the ON ALTERNATE light is not illuminated, then it cannot be verified that the Static Switch has aligned itself to receive power from the Alternate Source. Proceeding with this procedure may result in a loss of APN5901.

Procedure NOTE 2.4 and 2.5:
The SYNC MONITOR Light should illuminate when the INVERTER STOP Pushbutton is pressed.

Step 2.4; Momentarily depress the INVERTER STOP Pushbutton and verify the SYNC MONITOR Light is lit.

STEP STANDARD:

Simulates momentarily depressing INVERTER STOP Pushbutton and verifies the SYNC MONITOR Light illuminates.

CUES:

Evaluator cue: Inform Examinee that the SYNC MONITOR Light is ON after the INVERTER STOP Pushbutton is depressed.

Evaluator note: Examinee should proceed to step 2.6.

Evaluator note: Step 8 is critical as the inverter is to be removed from service and this step accomplishes that.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 9

Procedure NOTE 2.6

The transfer performed with the MAN BYPASS switch is a Make-Before-Break operation which provides a momentary paralleling of power sources.

Step 2.6; Align Alternate AC power through the Static Switch to APN5901 by rotating the MAN BYPASS switch clockwise to the BYP TO ALT Position.

STEP STANDARD:

Simulates rotating the MAN BYPASS Switch to the BYP TO ALT position. (turn right)

CUES:

Evaluator note: Step 9 is critical to align the alternate source to 1FA.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 10

Step 2.7; Open the BACKUP SOURCE Breaker on the Inverter front.

STEP STANDARD:

Simulates manually positioning the BACKUP SOURCE breaker on the inverter front to OFF, (TO THE RIGHT OF THE MAIN PANEL).

CUES:

Evaluator note: Step 10 is critical to isolate inverter power per task standard

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 11

Step 2.8; Open the NORMAL AC SOURCE Breaker on the Inverter front.

STEP STANDARD:

Simulates manually positioning the NORMAL AC SOURCE Breaker on the inverter front to OFF, (Down).

CUES:

Evaluator note: Step 11 is critical to isolate inverter power per task standard

COMMENTS:

CRITICAL: No ***SEQUENCED:*** No ***SAT*** ☐ ***UNSAT*** ☐

STEP: 12

Step 2.9: Verify XCP-636 1-6 (INV 1/2 AC INPUT LOSS) is in alarm (MCB).

STEP STANDARD:

Calls control room to verify XCP-636 1-6 is in alarm.

CUES:

Evaluator cue: Respond as control room that XCP-636 1-6 did alarm.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPP-040

DESCRIPTION: 2015 NRC In-Plant k RO: Transfer a Vital 120 Volt Instrument Power Supply

IC SET: NA

INSTRUCTIONS:

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS:

INITIAL CONDITION: Plant is at 100% power. 'A1' Train maintenance work. XIT-5901 is scheduled for preventive maintenance.

INITIATING CUES: Shift Supervisor directs that XIT-5901 be removed from service and APN-5901 be placed on alternate power in accordance with SOP-310, Section IV.E for inverter PMs. Initial conditions are completed through step 1.4.

STP-506.005, DEENERGIZATION OF THE ESF LOAD SEQUENCER LOSS OF VOLTAGE AND DEGRADED VOLTAGE RELAYS has been completed.

AT NO TIME ARE YOU TO OPERATE ANY PLANT EQUIPMENT!

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

CAUTION

Placing APN5901, 120VOLT VITAL AC DISTR PANEL 1 NSSS on ALT SOURCE, from APN1FA, 120 VOLT AC INST MAIN DISTR PANEL 1FA, will prevent the Train A Engineered Safety Features Load Sequencer from operating during a Blackout condition.

NOTE

This procedure removes the Normal AC Source and the Backup DC Source from Inverter 5901 while providing a regulated AC power to APN5901 and APN5907 via APN1FA through Inverter XIT5901 operating in Bypass.

E. PLACING INVERTER XIT5901 IN AN ALTERNATE AC LINEUP

1.0 INITIAL CONDITIONS

☐ 1.1 A **Pre-Job Brief** has been conducted per OAP-100.3, Human Performance Tools. CHG D

☐ 1.2 APN5901, 120 VOLT VITAL AC DISTR PANEL 1 NSSS, must remain energized.

☐ 1.3 APN1FA, 120 VOLT AC INST MAIN DISTR PANEL 1FA, is energized.

☐ 1.4 APN1FA 19, ALT SOURCE FOR APN5901 VIA XIT5901, is closed (CB-436).

1.5 On XIT5901 the following breakers are closed:

☐ a. ALT AC SOURCE.

☐ b. BACKUP SOURCE.

☐ c. NORMAL AC SOURCE.

☐ 1.6 The MAN BYPASS switch is in NORMAL.

☐ 1.7 The TEST TRANSFER switch is in the CENTER Position.

☐ 1.8 The SYNC MONITOR light is NOT lit.

CAUTION 2.0

STP-506.005, De-Energization Of The ESF Load Sequencer Loss Of Voltage And Degraded Voltage Relays A Train, XEG0001A, should be completed on Train A prior to removing Inverter XIT5901 from service. This should be tracked on the Diesel Generator A R&R.

NOTE 2.0

a. All steps are performed in the Relay Room (CB-436) unless otherwise stated.

b. XCP-636 1-5 (INV 1/2 TROUBLE) and XCP-636 1-6 (INV 1/2 AC INPUT LOSS) will be locked in alarm at the completion of this procedure.

2.0 INSTRUCTIONS

N01→ 2.1 Ensure Alternate Source voltage is acceptable for transfer:

☐ a. Place the SOURCE SELECTOR switch in LINE. CHG D

☐ b. Verify the Alternate AC Source voltage is acceptable as indicated by an AC OUTPUT voltage indication between 115 VAC and 125 VAC.

☐ c. Place the SOURCE SELECTOR switch in OUTPUT.

NOTE 2.2

Placing the TEST TRANSFER Switch in the ALT Position forces the Static Switch to receive power from the Alternate Source and deliver it to APN5901. This will also cause the following:

a) XCP-636 1-5 (INV 1/2 TROUBLE) annunciates (MCB).

b) ON ALTERNATE light illuminates.

c) ON INVERTER light is extinguishes.

☐ 2.2 Place the TEST TRANSFER switch in the ALT position.

☐ 2.3 Verify that the ON ALTERNATE light is lit.

CAUTION Step 2.4

If the ON ALTERNATE light is not illuminated, then it cannot be verified that the Static Switch has aligned itself to receive power from the Alternate Source. Proceeding with this procedure may result in a loss of APN5901.

NOTE 2.4 and 2.5

The SYNC MONITOR light should illuminate when the INVERTER STOP pushbutton is pressed.

☐ 2.4 Momentarily depress the INVERTER STOP pushbutton and verify the SYNC MONITOR light is lit. CHG D

2.5 If the INVERTER STOP pushbutton fails to stop the inverter, then complete the following:

☐ a. Simulate depressing the pushbutton by directing the Electricians to install a switchable jumper device for the INVERTER STOP Pushbutton (S103) at terminal wires 142 and 143.

☐ b. Actuate the switchable jumper device.

☐ c. Verify the SYNC MONITOR light is lit.

☐ d. Remove the switchable jumper device.

NOTE 2.6

The transfer performed with the MAN BYPASS switch is a Make-Before-Break operation which provides a momentary paralleling of power sources.

☐ 2.6 Align Alternate AC power through the Static Switch to APN5901 by rotating the MAN BYPASS switch clockwise to the BYP TO ALT Position.

☐ 2.7 Open the BACKUP SOURCE breaker on the Inverter front.

☐ 2.8 Open the NORMAL AC SOURCE breaker on the Inverter front.

☐ 2.9 Verify XCP-636 1-6 (INV 1/2 AC INPUT LOSS) is in alarm (MCB).

NA
R01
Today

CHG
D

NOTE 2.10

Bypass around the Static Switch fully isolates the Static Switch and the Inverter output from the Alternate Source and will cause the following:

1) XCP-636 1-5 (INV 1/2 TROUBLE) annunciates (MCB).

2) AC OUTPUT FAIL lights.

3) ALTERNATE AC FAIL lights.

☐ 2.10 If desired, rotate the MAN. BYPASS switch clockwise to the BYP TO ALT ISOLATE position to align Alternate AC power around the Static Switch to APN5901.

NA
R01
Today

NOTE 2.11

If the electricians are to perform inverter PMs and breakers are **NOT** red tagged, Step 2.10 may be omitted.

CHG D

2.11 Open the following feeder breakers:

☐ a. XMC1DA2Y 06ABL, INVERTER 1 NSSS FEED XIT5901-EV (AB-412).

☐ b. DPN1HA 22, INVERTER XIT5901 (IB-412).

END OF SECTION

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPA-021A**

2015 NRC RO/SRO Common A1-a:

Perform Boric Acid Dilution Volume Determination

CANDIDATE: ____________________

EXAMINER: ____________________

TASK:

004-006-01-01 PERFORM BORIC ACID CONCENTRATION CHANGE CALCULATIONS

TASK STANDARD:

Examinee determines that about 9359 gals (interpolated value) will be required for dilution. A range of 9250 to 9450 (~ +/- 100 gal or ~ 1%) would be acceptable. If the examinee elects to calculate vice interpolate, the calculated value is the same range.

TERMINATING CUE:

PREFERRED EVALUATION LOCATION	***PREFERRED EVALUATION METHOD***
CLASSROOM	PERFORM

REFERENCES:

SOP-106 REACTOR MAKEUP WATER SYSTEM

INDEX NO.	***K/A NO.***		***RO***	***SRO***
1940012125	2.1.25	Ability to interpret reference materials such as graphs, curves, tables, etc.	3.9	4.2
1940012137	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management.	4.3	4.6

TOOLS: Curve Book (Accessible via Desk Top Computers)
Calculator
NJPA-021A Dilution Calculation hand out.

EVALUATION TIME 10 ***TIME CRITICAL*** NO ***10CFR55:*** 45(a)(12)

TIME START: ______ TIME FINISH: ______ PERFORMANCE TIME: ______

PERFORMANCE RATING: SAT: ____ UNSAT: ____

CANDIDATE: ______________________

EXAMINER: ______________________ ______________________ / ________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The plant is in MODE 3 preparing for reactor startup in accordance with GOP-3.

INITIATING CUES: The SS directs you to determine the dilution volume to establish the estimated critical boron concentration of 1688 ppm. The latest RCS sample indicated boron concentration was 2038 ppm. Show all work on the NJPA-021A Dilution Calculation hand out provided.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Examinee determines that the amount of dilution required.

STEP STANDARD:

Determines Ci - Cf = 350 ppm dilution required.

CUES:

Evaluator note: Ci and Cf values are given in the initiating cue.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

Selects correct curve from curve book.

STEP STANDARD:

The examinee refers to Figure III-3, RCS Dilution Gallons (Vw) of Dilution Water Required, in the Curve Book.

CUES:

Evaluator note: Do NOT prompt Examinee on location of the dilution tables.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 3

Examinee interpolates or calculates the volume of water required and reports the dilution volume required to the CRS.

STEP STANDARD:

Examinee determines that 9359 gals (interpolated value) will be required for dilution.

CUES:

Evaluator note: The volume reported to the CRS should be the interpolated value or greater. A range of 9250 to 9450 (~+/- 100 gal) would be acceptable. If the examinee elects to calculate vice interpolate the same range applies. See JPA-021A Key for calculations.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPA-021A

DESCRIPTION: 2015 NRC RO/SRO Common A1-a: Perform Boric Acid Dilution Volume Determination

IC SET: NA

INSTRUCTIONS:

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS:

INITIAL CONDITION: The plant is in MODE 3 preparing for reactor startup in accordance with GOP-3.

INITIATING CUES: The SS directs you to determine the dilution volume to establish the estimated critical boron concentration of 1688 ppm. The latest RCS sample indicated boron concentration was 2038 ppm. Show all work on the NJPA-021A Dilution Calculation hand out provided.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPA-1000**

2015 NRC RO/SRO Common A1-b:

Calculate Work hour limitations.

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

341-038-03-02 INTERPRET AND ENSURE COMPLIANCE WITH PLANT ADMINISTRATIVE PROCEDURES DURING NORMAL AND OFF NORMAL PLANT OPERATIONS

TASK STANDARD:

Determines that work hours would be exceeded by RO-1, due to not having a 34 hour break in the 9 calendar days from 1/29 through 2/6 and by RO-2 due to not having an average of 2.5 days off in the 5 week fixed cycle.

TERMINATING CUE: Reviews work history and determines that RO-3 is eligible while RO-1 and RO-2 are NOT eligible to work the requested overtime shift without a waiver.

PREFERRED EVALUATION LOCATION ***PREFERRED EVALUATION METHOD***

CLASSROOM PERFORM

REFERENCES:

SAP-152 FATIGUE MANAGEMENT AND WORK HOUR LIMITS

INDEX NO.	***K/A NO.***		***RO***	***SRO***
1940012105	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.	2.9	3.9

TOOLS: NJPA-1000 Handout.
NJPA-1000 Schedules.
SAP-152 (Available on Desk Top Computer)
Calculator

EVALUATION TIME 40 ***TIME CRITICAL*** NO ***10CFR55:*** 41(b) (10)

TIME START: ______ TIME FINISH: ______ PERFORMANCE TIME: ______

PERFORMANCE RATING: SAT: ____ UNSAT: ____

CANDIDATE: ______

EXAMINER: ______ ______ / ______

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS: None.

INITIAL CONDITION: The Unit is at 100% power currently and has been at power continuously for the last 3 months.

The regular on-line 5 shift rotation is in effect.

The Control Room has been informed on February 5 night shift that an RO scheduled for the February 6 day shift cannot work due to illness.

You are asked to identify if any of three available individuals are eligible to work as an RO for Thursday February 6 day shift.

INITIATING CUES: Given the work schedules provided (NJPA-1000 Schedules) determine if any of three available ROs (RO-1, RO-2 or RO-3) are eligible to work the day shift beginning at 0700 on February 6 without reliance on a waiver or change to the scheduled OT.

NJPA-1000 Schedules includes all hours actually worked by all three ROs after December 31 AND all hours projected to be worked through February 28.

If any of the ROs is NOT eligible, identify the criteria that supports your determination.

Use the VCS fixed shift cycle method which begins on the first night of the 3 night portion of the schedule.

Assume RO-1, RO-2 and RO-3 are fully qualified. Show all work on NJPA-1000 Handout provided.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: Yes **SEQUENCED:** Yes **SAT** ☐ **UNSAT** ☐

STEP: 1

Reviews RO-1 work history to determine if RO-1 is eligible to work the day shift on February 6.

STEP STANDARD:

Compares work history for RO-1 to SAP-152 criteria and notes that RO-1 is not eligible to work without reliance on a waiver.

Identifies that RO-1 would not have had the required 34 hour break within the previous 9 calendar days. He would have had only a single 24 hour break (0700 on 2/4 to 0700 on 2/5) in the 9 days from 1/29 through 2/6.

CUES:

Evaluator cue: Provide a copy of NJPA-1000 Handout and NJPA-1000 Schedules to the examinee. Instruct examinee to put their name and the date on NJPA-1000 Handout and to return it to you when they are finished. Instruct Examinee to show all work on the Handout.

Evaluator note: SAP-152, Fatigue Management and Work Hour Limits should be referenced while reviewing NJPA-1000 Schedules.

Evaluator note: The cycle for RO-1 runs from Jan 7 through Feb 10 (fixed five weeks).

Evaluator note: Refer to NJPA-1000 Key.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

Reviews RO-2 work history to determine if RO-2 is eligible to work the day shift on February 6.

STEP STANDARD:

Compares work history for RO-2 to SAP-152 criteria and notes that RO-2 is NOT eligible to work without reliance on a waiver.

Identifies that RO-2 would not have had an average 2.5 days off per week averaged over the shift cycle. If RO-2 works 2/6 he would have had 12 days off in the 5 week cycle, an average of 2.4 days per week

CUES:

Evaluator note: The cycle for RO-2 runs from Jan 14 through Feb 17 (fixed five weeks).

Evaluator note: Refer to NJPA-1000 Key.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 3

Reviews RO-3 work history to determine if RO-3 is eligible to work the day shift on February 6.

STEP STANDARD:

Compares work history for RO-3 to SAP-152 criteria and notes that RO-3 is eligible to work without reliance on a waiver.

CUES:

Evaluator cue: Inform the examinee that the JPM has ended when they return NJPA-1000 Handout to you.

Evaluator note: Refer to NJPA-1000 Key.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPA-1000

DESCRIPTION: 2015 NRC RO/SRO Common A1-b: Calculate Work hour limitations.

IC SET: NA

INSTRUCTIONS:

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS: None.

INITIAL CONDITION: The Unit is at 100% power currently and has been at power continuously for the last 3 months.

The regular on-line 5 shift rotation is in effect.

The Control Room has been informed on February 5 night shift that an RO scheduled for the February 6 day shift cannot work due to illness.

You are asked to identify if any of three available individuals are eligible to work as an RO for Thursday February 6 day shift.

INITIATING CUES: Given the work schedules provided (NJPA-1000 Schedules) determine if any of three available ROs (RO-1, RO-2 or RO-3) are eligible to work the day shift beginning at 0700 on February 6 without reliance on a waiver or change to the scheduled OT.

NJPA-1000 Schedules includes all hours actually worked by all three ROs after December 31 AND all hours projected to be worked through February 28.

If any of the ROs is NOT eligible, identify the criteria that supports your determination.

Use the VCS fixed shift cycle method which begins on the first night of the 3 night portion of the schedule.

Assume RO-1, RO-2 and RO-3 are fully qualified. Show all work on NJPA-1000 Handout provided.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

NJPA-1000
Schedules Handout

Jan-14

	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F
Shift	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
RO1	**OTN**						N	N	N					D	D	D	D			T	T	T	T		D	D	D		**OTN**	**OTN**	N
RO2		**OTN**	N	N	N	N	**OTN**						**OTN**	N	N	N	**OTN**				D	D	D	D		**OTD**	T	T	T	T	
RO3						**OTN**	N	N	N				**OTD**	D	D	D	D			T	T	T	T		D	D	D	**OTD**		**OTN**	N

Feb-14

	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F	S	S	M	T	W	Th	F
Shift	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
RO1	N	N	N		**OTD**	**OTD**					N	N	N				**OTD**	D	D	D	D			T	T	T	T	
RO2	D	D	D			**OTD**	N	N	N	N	**OTN**					**OTN**		N	N	N					D	D	D	D
RO3	N	N	N			**OTD**					N	N	N	**OTN**				D	D	D	D			T	T	T	T	

Proposed overtime shift

Note:

1. OTD = Overtime Days
2. OTN = Overtime nights
1. N and OTN = 1900 to 0700; 12 hours worked
2. D and OTD = 0700 to 1900; 12 hours worked
3. T = training; 0730 to 1730; 10 hours worked

NJPA-1000 Handout
JPM A1-b RO and SRO-U - 2015

Examinee Name: ______________________________ Date: ________________

Note:

1. NJPA-1000 Schedules includes all hours actually worked by RO-1, RO-2 and RO-3 after December 31 AND all hours projected to be worked through Feb 28.
2. Day shift is 12 hours; 0700 to 1900 and Night shift is 12 hours 1900 to 0700 and Training is 10 hours 0730 to 1730.

1. Place a check mark in the appropriate box for RO-1, RO-2 and RO-3.

2. Provide basis if a worker is NOT eligible

☐ RO-1 is eligible to work 0700-1900 on 2/6.

☐ RO-1 is NOT eligible to work 0700-1900 on 2/6.

IF RO-1 is NOT eligible to work the overtime STATE the basis:

☐ RO-2 is eligible to work 0700-1900 on 2/6.

☐ RO-2 is NOT eligible to work 0700-1900 on 2/6.

IF RO-2 is NOT eligible to work the overtime STATE the basis:

☐ RO-3 is eligible to work 0700-1900 on 2/6.

☐ RO-3 is NOT eligible to work 0700-1900 on 2/6.

IF RO-3 is NOT eligible to work the overtime STATE the basis:

Additional work:

NJPA-1000 Handout
JPM A1-b RO and SRO-U - 2015

Examinee Name: ______________________________ Date: ________________

Note:

1. NJPA-1000 Schedules includes all hours actually worked by RO-1, RO-2 and RO-3 after December 31 AND all hours projected to be worked through Feb 28.
2. Day shift is 12 hours; 0700 to 1900 and Night shift is 12 hours 1900 to 0700 and Training is 10 hours 0730 to 1730.

1. Place a check mark in the appropriate box for RO-1, RO-2 and RO-3.

2. Provide basis if a worker is NOT eligible

☐ RO-1 is eligible to work 0700-1900 on 2/6.

☒ RO-1 is NOT eligible to work 0700-1900 on 2/6.

IF RO-1 is NOT eligible to work the overtime STATE the basis:

Per SAP-152 6.1.1 E. an individual must have at least one 34 hour break in any 9 calendar days. If RO-1 works 2/6 he would have had only a single 24 hour break (0700 on 2/4 to 0700 on 2/5) in the 9 days from 1/29 through 2/6. The cycle for RO-1 runs from Jan 7 through Feb 10 (fixed five weeks)

☐ RO-2 is eligible to work 0700-1900 on 2/6.

☒ RO-2 is NOT eligible to work 0700-1900 on 2/6.

IF RO-2 is NOT eligible to work the overtime STATE the basis:

Per SAP-152 6.1.2 A. an individual must have on average 2.5 days off per week averaged over the shift cycle. If RO-2 works 2/6 he would have had 12 days off in the 5 week cycle an average of 2.4 days per week. The cycle for RO-2 runs from Jan 14 through Feb 17 (fixed five weeks)

☒ RO-3 is eligible to work 0700-1900 on 2/6.

☐ RO-3 is NOT eligible to work 0700-1900 on 2/6.

IF RO-3 is NOT eligible to work the overtime STATE the basis:

The cycle for RO-3 runs from Jan 7 through Feb 10 (fixed five weeks)

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPA-1006**

2015 NRC RO A2:
Determine Surveillance Requirements due to loss of Main Control Board Annunciators

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

000-170-05-01 Respond to loss of Main Control Board annunciators per AOP-100.5.

TASK STANDARD:

Identifies the following surveillance requirements from Attachment 3:

XCP-615, 2-5; GTP-702 Att IV.G
XCP-615, 3-3; GTP-702 Att VI.V-3
XCP-615, 3-6; OAP-106.1, RB Sump Level and STP-114.002
XCP-620, 1-5; GTP-702, Att IV.E
XCP-620, 1-6; GTP-702, Att IV.E
XCP-620, 2-4; GTP-702, Att IV.D
XCP-620, 2-5; GTP-702, Att IV.B
XCP-620, 4-2; GTP-702, Att VI.L-2
XCP-620, 4-3; GTP-702, Att VI.L-2
XCP-621, 1-1; GTP-702, Att IV.C

TERMINATING CUE: Identifies required Surveillance Attachments associated with XCP-615, XCP-620 and XCP-621 from AOP 100.5 Attachment 3.

PREFERRED EVALUATION LOCATION	***PREFERRED EVALUATION METHOL***
CLASSROOM	PERFORM

REFERENCES:

AOP-100.5 Loss of Main Control Board Annunciators

INDEX NO.	***K/A NO.***		***RO***	***SRO***
1940012214	2.2.14	Knowledge of the process for controlling equipment configuration or status.	3.9	4.3

TOOLS: NJPA-1006 Handout 1; AOP-100.5, Att 2
NJPA-1006 Handout 2; AOP-100.5, Att 3.

EVALUATION TIME 5 ***TIME CRITICAL*** NO ***10CFR55:*** 45(a)(3)

TIME START: ______ TIME FINISH: ______ PERFORMANCE TIME: ______

PERFORMANCE RATING: SAT: ____ UNSAT: ____

CANDIDATE: ____________________

EXAMINER: ____________________ ____________________ / ________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS: NA

INITIAL CONDITION: The plant is at 100% power. A loss of multiple Main Control Board annunciators has been experienced due to a loss of power.

INITIATING CUES: I&C has verified that breaker DPN 1HX1 01 has tripped. The CRS has directed you to identify any surveillance requirements associated with Main Control Board Annunciators that have lost power. Indicate any required surveillances by highlighting the NJPA-1006 Handout 2 to show the applicable surveillances and attachments.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Refers to AOP-100.5 Attachment 2 to determine which Annunciator panels are associated with DPN 1HX1 01

STEP STANDARD:

Identifies that the following Annunciator panels are affected:

XCP-610, XCP-610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 624 and 626

CUES:

Evaluator cue: Hand examinee a copy of NJPA-1006 Handout 1 and Handout 2 (AOP-100.5, Att 2 and Att 3). Tell examinee to put their name on Handout 2 and mark which surveillances will be required.

Evaluator note: Examinee will identify applicable panels using AOP-100.5 Attachment 2 and the initiating cue of "panel DPN 1HX1 circuit 01 has tripped".

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

REFER TO ATTACHMENT 3, SURVEILLANCE ANNUNCIATORS, for annunciators that have surveillance requirements.

STEP STANDARD:

Identifies the following surveillance requirements from Attachment 3:

XCP-615, 2-5; GTP-702 Att IV.G
XCP-615, 3-3; GTP-702 Att VI.V-3
XCP-615, 3-6; OAP-106.1, RB Sump Level and STP-114.002
XCP-620, 1-5; GTP-702, Att IV.E
XCP-620, 1-6; GTP-702, Att IV.E
XCP-620, 2-4; GTP-702, Att IV.D
XCP-620, 2-5; GTP-702, Att IV.B
XCP-620, 4-2; GTP-702, Att VI.L-2
XCP-620, 4-3; GTP-702, Att VI.L-2
XCP-621, 1-1; GTP-702, Att IV.C

CUES:

Evaluator note: refer to NJPA-1006 Key for expected response.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPA-1006

DESCRIPTION: 2015 NRC RO A2: Determine Surveillance Requirements due to loss of Main Control Board Annunciators

IC SET: NA

INSTRUCTIONS:

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS: NA

INITIAL CONDITION: The plant is at 100% power. A loss of multiple Main Control Board annunciators has been experienced due to a loss of power.

INITIATING CUES: I&C has verified that breaker DPN 1HX1 01 has tripped. The CRS has directed you to identify any surveillance requirements associated with Main Control Board Annunciators that have lost power. Indicate any required surveillances by highlighting the NJPA-1006 Handout 2 to show the applicable surveillances and attachments.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

A. Make a list of the annunciator panels lost.

B. Contact I&C to verify the source of power to the annunciator panel per the following table.

DPN 1HA2 04		
XPN6091	XCP-601, 604, 606, 608, 622, 629, 636	13.7% MCB ANNUNCIATORS
13.7% MCB ANNUNCIATORS TOTAL		

DPN 1HX1 02		
XPN6092	XCP-603, 628, 630, 631, 632, 633	20.3% MCB ANNUNCIATORS
XPN6093	XCP-625, 627, 634, 635, 638	18.3% MCB ANNUNCIATORS
38.6% MCB ANNUNCIATORS TOTAL		

DPN 1HB 02		
XPN6094	XCP-602, 605, 607, 609, 623, 637	12.4% MCB ANNUNCIATORS
12.4% MCB ANNUNCIATORS TOTAL		

DPN 1HX1 01		
XPN6095	XCP-610, 611, 612, 613, 614, 615, 616	18.3% MCB ANNUNCIATORS
XPN6096	XCP-617, 618, 619, 620, 621, 624, 626	17.0% MCB ANNUNCIATORS
35.3% MCB ANNUNCIATORS TOTAL		

C. Determine if the actions taken in response to a failed annunciator are subject to OAP-113.1, Operator Workaround and Dark Board Program.

NJPA-1006 Handout 2

SURVEILLANCE ANNUNCIATORS

NOTE

This matrix is to aid in identifying failed annunciators which have surveillance requirements.
The applicable ARP shoud be utilized when performing the surveillance.

PANEL	WINDOW	SURVEILLANCE	ATTACHMENT
XCP-615	2-5	GTP-702	IV.G
XCP-615	3-3	GTP-702	VI.V-3
XCP-615	3-6	OAP-106.1 STP-114.002	RB SUMP LEVEL N/A
XCP-620	1-5	GTP-702	IV.E
XCP-620	1-6	GTP-702	IV.E
XCP-620	2-4	GTP-702	IV.D
XCP-620	2-5	GTP-702	IV.B
XCP-620	4-2	GTP-702	VI.L-2
XCP-620	4-3	GTP-702	VI.L-2
XCP-621	1-1	GTP-702	IV.C
XCP-632	6-5	GTP-702 OAP-106.1 OAP-100.6 OAP-107.1	IV.B, IV.D, IV.E, VI.KK, VI.NN RB TEMPS RB SUMP LEVEL MW/KV/MVARS GENERIC LOG SR NI OPERATION AT LICENSED LIMIT RESTORATION OF IPCS FUNCTIONS
XCP-638	1-4	OAP-106.1	MW/KV/MVARS
XCP-638	2-4	OAP-106.1	MW/KV/MVARS

Examinee : ______________________________

Date : ________________

NJPA-1006, Answer Key

SURVEILLANCE ANNUNCIATORS

NOTE

This matrix is to aid in identifying f

Identifies these Surveillance Attachments as required

The applicable ARP shoud be utilized when performing the surveillance.

PANEL	WINDOW	SURVEILLANCE	ATTACHMENT
XCP-615	2-5	GTP-702	IV.G
XCP-615	3-3	GTP-702	VI.V-3
XCP-615	3-6	OAP-106.1 STP-114.002	RB SUMP LEVEL N/A
XCP-620	1-5	GTP-702	IV.E
XCP-620	1-6	GTP-702	IV.E
XCP-620	2-4	GTP-702	IV.D
XCP-620	2-5	GTP-702	IV.B
XCP-620	4-2	GTP-702	VI.L-2
XCP-620	4-3	GTP-702	VI.L-2
XCP-621	1-1	GTP-702	IV.C
XCP-632	6-5	GTP-702 OAP-106.1 OAP-100.6 OAP-107.1	IV.B, IV.D, IV.E, VI.KK, VI.NN RB TEMPS RB SUMP LEVEL MW/KV/MVARS GENERIC LOG SR NI OPERATION AT LICENSED LIMIT RESTORATION OF IPCS FUNCTIONS
XCP-638	1-4	OAP-106.1	MW/KV/MVARS
XCP-638	2-4	OAP-106.1	MW/KV/MVARS

Identifies Panels XCP-615, - 620 and - 621 as affected

Examinee : Examinee Name

Date : Today

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPA-210A**

2015 NRC SRO A2: Determine Administrative Actions to Place 1DB on Alternate Feed.

CANDIDATE: ______________________________

EXAMINER: ______________________________

SRO ONLY

TASK:

341-038-03-02	INTERPRET AND ENSURE COMPLIANCE WITH PLANT ADMINISTRATIVE PROCEDURES DURING NORMAL AND OFF NORMAL PLANT OPERATIONS

TASK STANDARD:

Section 1 and 2 of the Removal and Restoration Checklist is completed satisfactorily (see Key for NJPA-210A). It is critical to identify as an action R&R, that the Train is "B", the Equipment ID is XSW1DB 16, Equipment name is Bus 1DB Normal Incoming Breaker, to indicate that the TS is 3.8.1.1.a (the a is optional), that 3.0.4 does apply, that the restraining mode is 4 and that the mode discovered is 1, Compensatory Requirements are GTP-702, Att. VI.Y-1 and "Other" with some statement about recording bus voltage readings hourly.

TERMINATING CUE: After the Removal and Restoration Checksheet is provided to the Evaluator this JPM is complete.

PREFERRED EVALUATION LOCATION	***PREFERRED EVALUATION METHOD***
CLASSROOM	PERFORM

REFERENCES:

OAP-106.1	Operating Rounds
STP-125.001	Electric Power Systems Weekly Test
SAP-205	STATUS CONTROL AND REMOVAL AND RESTORATION
SOP-304	115KV/7.2KV OPERATIONS
T.S.	Technical Specifications

INDEX NO.	***K/A NO.***		***RO***	***SRO***
1940012214	2.2.14	Knowledge of the process for controlling equipment configuration or status.	3.9	4.3

TOOLS:

NJPA-210A handout (hardcopy of SAP-205, Attachment I, REMOVAL AND RESTORATION CHECKSHEET.)

Electronic access to the following:

SOP-304, 115KV/7.2KV OPERATIONS

Technical Specification 3.8.1.

GTP-702, SURVEILLANCE ACTIVITY TRACKING AND TRIGGERING

SAP-205, STATUS CONTROL AND REMOVAL AND RESTORATION

OAP-106.1, OPERATING ROUNDS

EVALUATION TIME 20 ***TIME CRITICAL*** NO ***10CFR55:*** 45(a)(13)

TIME START: ______ TIME FINISH: ______ PERFORMANCE TIME: ______

PERFORMANCE RATING: SAT: ____ UNSAT: ____

CANDIDATE: ____________________

EXAMINER: ____________________ ____________________ / ________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS: None.

INITIAL CONDITION: 100% power.
B1 Maintenance Week is in progress.
ESF Bus 1DB must be transferred to XTF-4/6 to allow XSW1DB 16, BUS 1DB NORMAL INCOMING BKR to be replaced.

The Integrated Fire Computer is being fed from Train "A".
XAC-12-IA, SUPP INST AIR COMPRESSOR is NOT running.

The work is expected to take approximately two hours. ESF Bus 1DA will remain on the normal source during the work and alarm setpoints will NOT be adjusted since the alignment will only be in effect for approximately two hours.

The BOP operator is preparing a pre-job brief for the evolution.

INITIATING CUES: As the CRS, complete Section 1 and Section 2 of a Removal and Restoration Checksheet against XSW1DB 16, BUS 1DB NORMAL INCOMING BKR to track all the requirements associated with transferring Bus 1DB to XTF-4/6 including any necessary compensatory actions.

The R&R number 150333 has been assigned.

Record your answers in section 1 and section 2 of the provided SAP-205, Attachment I, REMOVAL AND RESTORATION CHECKSHEET (NJPA-210A handout).

Note: The required by date and time for compensatory requirements if necessary will be filled in when the breaker is declared inoperable. You are to leave that field blank for this JPM.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Complete section 1 of SAP-205, STATUS CONTROL AND REMOVAL AND RESTORATION, Attachment I, REMOVAL AND RESTORATION CHECKSHEET.

STEP STANDARD:

The section 1 data are:

Type: Action (critical)
Service Impact: Removed From Service (NOT critical)
Train: 'B' Train (critical)
R&R Number: 130333 (NOT critical)
System: ES (NOT critical)
Equipment ID: XSW1DB 16 (critical)
Equipment Name: Bus 1DB Normal Incoming Bkr (critical)
Reason Inoperable: Something to the effect of breaker replacement (NOT critical).

CUES:

Evaluator Note: Refer to NJPA-210A Key.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

Complete section 2 of SAP-205, STATUS CONTROL AND REMOVAL AND RESTORATION, Attachment I, REMOVAL AND RESTORATION CHECKSHEET.

STEP STANDARD:

The section 2 data are:

Compensatory Requirements: GTP-702, Att. VI.Y-1 and "Other" and some statement about recording bus voltage readings hourly. (critical.)
Technical Specifications: TS 3.8.1.1.a (critical). ("a" may be left off)
Tech Spec 3.0.4 applies: Yes (critical)
Restraining Mode: 4 (critical)
Mode Discovered: 1 (critical)
Redundant Equipment Operable: Yes or No (not critical)

CUES:

Evaluator note: Refer to NJPA-210A key.

Evaluator Note: Redundant Equipment Operable is typically used for things like charging pumps that have a swing component, but in this case there is an alternate feed.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPA-210A

DESCRIPTION: 2015 NRC SRO A2: Determine Administrative Actions to Place 1DB on Alternate Feed.

IC SET: NA

INSTRUCTIONS:

COMMENTS:

NJPA-210A folder in the Exam Data folder contains answer key

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS: None.

INITIAL CONDITION: 100% power.
B1 Maintenance Week is in progress.
ESF Bus 1DB must be transferred to XTF-4/6 to allow XSW1DB 16, BUS 1DB NORMAL INCOMING BKR to be replaced.

The Integrated Fire Computer is being fed from Train "A".
XAC-12-IA, SUPP INST AIR COMPRESSOR is NOT running.

The work is expected to take approximately two hours. ESF Bus 1DA will remain on the normal source during the work and alarm setpoints will NOT be adjusted since the alignment will only be in effect for approximately two hours.

The BOP operator is preparing a pre-job brief for the evolution.

INITIATING CUES: As the CRS, complete Section 1 and Section 2 of a Removal and Restoration Checksheet against XSW1DB 16, BUS 1DB NORMAL INCOMING BKR to track all the requirements associated with transferring Bus 1DB to XTF-4/6 including any necessary compensatory actions.

The R&R number 150333 has been assigned.

Record your answers in section 1 and section 2 of the provided SAP-205, Attachment I, REMOVAL AND RESTORATION CHECKSHEET (NJPA-210A handout).

Note: The required by date and time for compensatory requirements if necessary will be filled in when the breaker is declared inoperable. You are to leave that field blank for this JPM.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

NJPA-210A handout

Examinee ________________________________

Date____________

REMOVAL AND RESTORATION CHECKSHEET

Section 1-Summary Data

TYPE:	SERVICE IMPACT:	TRAIN:	R&R NUMBER:
☐Action ☐Tracking	☐Removed From Service ☐Restricted Service	☐'A' Train ☐'X' Train ☐'B' Train ☐N/A	150333
SYSTEM:	EQUIPMENT ID:	EQUIPMENT NAME:	
REASON INOPERABLE:			

Section 2-Removal Requirements

COMPENSATORY REQUIREMENTS:	Required By Date/Time	Completed Date/Time
☐**None**		
☐Trip/Bypass Bistables?	/	/
☐Backup Fire Suppression?	/	/
☐Roving Fire Watch?	/	/
☐Continuous Fire Watch?	/	/
☐Alternate Radiation Monitoring?	/	/
☐Smoke Detectors Operable?	/	/
☐GTP-702 Att. ____________	/	/
☐Other:	/	/

TECHNICAL SPECIFICATIONS:

TECH. SPEC. 3.0.4 APPLIES:	REDUNDANT EQUIPMENT OPERABLE:
☐Yes ☐No Restraining Mode:___ Mode Discovered:___	☐Yes ☐No ☐N/A

SUPPORTING DOCUMENTATION:

REMOVAL COMMENTS:

Section 3-Restoration Req./Related Documents

RESTORATION REQUIREMENTS:

Operable STP	STTS #	Completed Date/Time
		/
		/
		/
		/

All compensatory requirements restored or terminated?	ECR Operability Form?
☐Yes ☐No ☐N/A	☐Yes ☐No ☐N/A

RELATED DOCUMENTS:

Document Type*	Document #	Completed Initials/Date	Comments
		/	
		/	
		/	
		/	
		/	
		/	

☐Continued on Attachment VII.
*ECR, MWR, NCN, PMTS, RTO, STTS, WPO, etc.

RESTORATION COMMENTS:

Section 4-Removal/Restoration Status

REMOVAL/RESTORATION STATUS:		SS Authorization	OATC Concurrence	Date/Time	Updated MCB	Updated BISI	Updated EOOS
Declared Inoperable				/	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Time Limit to Declare Operable							
Restoration Required By				/			
Downgraded to:	☐Tracking			/			
	☐Restricted Service			/			☐Yes ☐No
Declared Operable				/	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Total Time:	Inoperable						
	Non-Functional						

COMMENTS:

Examinee *Examinee Name*

Date *Today*

(*) Indicates Critical Items

REMOVAL AND RESTORATION CHECKSHEET

Section 1-Summary Data

TYPE:	SERVICE IMPACT:	TRAIN:	R&R NUMBER:
☒ Action (*) ☐ Tracking	☒ Removed From Service ☐ Restricted Service	☐ 'A' Train ☐ 'X' Train ☒ 'B' Train (*) ☐ N/A	*150333*

SYSTEM:	EQUIPMENT ID:	EQUIPMENT NAME:
ES	XSW1DB 16 (*)	Bus 1DB Normal Incoming Breaker (*)

REASON INOPERABLE:

Breaker Replacement

Section 2-Removal Requirements

COMPENSATORY REQUIREMENTS:	Required By Date/Time	Completed Date/Time
☐ **None**		
☐ Trip/Bypass Bistables?	/	/
☐ Backup Fire Suppression?	/	/
☐ Roving Fire Watch?	/	/
☐ Continuous Fire Watch?	/	/
☐ Alternate Radiation Monitoring?	/	/
☐ Smoke Detectors Operable?	/	/
☒ GTP-702 Att. VI.Y-1 (*)	/	/
☒ Other:	/	/

TECHNICAL SPECIFICATIONS:

3.8.1.1.a (*)

TECH. SPEC. 3.0.4 APPLIES: ☒ Yes ☐ No
Restraining Mode: 4 (*)
Mode Discovered: 1 (*)

REDUNDANT EQUIPMENT OPERABLE: ☒ Yes ☐ No ☐ N/A

SUPPORTING DOCUMENTATION:

SOP-304, Technical Specification, OAP-106.1

REMOVAL COMMENTS: (*)

SOP-304 Precaution II.1 requires hourly logs of bus voltages until the alarm setpoint is changed.

Section 3-Restoration Req./Related Documents

RESTORATION REQUIREMENTS:

Operable STP	STTS #	Completed Date/Time
		/

RELATED DOCUMENTS:

Document Type*	Document #	Completed Initials/Date	Comments
		/	

OAP-106.1 (step 6.12.b 2) requires hourly logging regardless of setpoint change, either reference is acceptable, need to mention voltage logging as well as GTP-702

All compens... restored or ...
☐ Yes
☐ No
☐ N/A

☐ Yes
☐ No
☐ N/A

☐ Continued on Attachment VII.
*ECR, MWR, NCN, PMTS, RTO, STTS, WPO, etc.

RESTORATION COMMENTS:

Section 4-Removal/Restoration Status

REMOVAL/RESTORATION STATUS:		SS Authorization	OATC Concurrence	Date/Time	Updated MCB	Updated BISI	Updated EOOS
Declared Inoperable				/	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Time Limit to Declare Operable							
Restoration Required By				/			
Downgraded to:	☐ Tracking			/			
	☐ Restricted Service			/			☐ Yes ☐ No
Declared Operable				/	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Total Time:	Inoperable						
	Non-Functional						

COMMENTS:

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPA-083A(R1)**

2011 and 2015 NRC Admin A3 RO & SRO:
Apply Facility ALARA Principles to a Specific Task and Determine Overall Dose

CANDIDATE: ______________________________

EXAMINER: ______________________________

TASK:

000-061-05-02 RESPOND TO AREA RADIATION MONITORING SYSTEM ALARMS

TASK STANDARD:

Calculate dose for each case. Determines exposure as 590 to 670 mR with a respirator and 537 to 538 mR without a respirator. Determines that working WITHOUT respirator is the best option.

TERMINATING CUE: Options have been prioritized and provided to the Evaluator.

PREFERRED EVALUATION LOCATION ***PREFERRED EVALUATION METHOD***

CLASSROOM PERFORM

REFERENCES:

HPP-0155 Control of Airborne Radiation Exposure (DAC-HRS)

HPP-0153 Administrative Exposure Limits

INDEX NO.	***K/A NO.***		***RO***	***SRO***
1940012312	2.3.12	Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.2	3.7

TOOLS: HPP-0153 and HPP-0155 (Available via desk top computer)
Calculator
NJPA-083A(R1) Handout 1 (Worksheet)
NJPA-083A(R1) Handout 2 (Hardcopy of HPP-155)

EVALUATION TIME 15 ***TIME CRITICAL*** NO ***10CFR55:*** 45(a)(10)

TIME START: ____________ TIME FINISH: ____________ PERFORMANCE TIME: ____________

PERFORMANCE RATING: SAT: ______ UNSAT: ______

CANDIDATE: ______________________________

EXAMINER: ______________________________ ______________________ / __________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS:

INITIAL CONDITION: A hydrogen explosion in the waste gas system has resulted in a radioactive leak. The crew is performing actions of ARP-019 XCP- 644; 2-1, GAS DECAY TK AREA RM-G10 HI RAD.

The leak will continue until several manual valves are manipulated to isolate the leak.

Access to the valves requires climbing a ladder in a tight space which has an ambient temperature of 100°F.

The general area radiation level where the work will be performed is 1000 mR/hour.

Airborne activity in the work area is estimated at a Weighted Derived Air Concentration of 30 DAC.

There are two options for performing the work:

- One person without a respirator = 30 minutes

or

- One person with an SCBA = 36 minutes.

INITIATING CUES: You have been assigned to calculate the expected dose for the two options and to identify the best option between them according to the VC Summer ALARA philosophy. For the purposes of the JPM, assume that no dose is received in transit and there is no additional external exposure due to respiratory equipment setup. Place your name on the NJPA-083A(R1) handout 1 and write your answer in the space provided. Show all work.

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: No ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Access necessary reference material.

STEP STANDARD:

Reviews conditions and refers to procedures for respirator factors and DAC conversion.

CUES:

Evaluator cue: Provide a copy of NJPA-083A (R1) Handout 1 (worksheet) and NJPA-083A(R1) Handout 2 (copy of HPP-155)

Evaluator note: Procedures that are applicable are HPP-0153, Administrative Exposure Limits and HPP-0155, Control of Airborne Radiation Exposures (DAC-HRS). These are available via the desktop computers.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

Calculate dose for each option - One person without respirator.

STEP STANDARD:

External exposure = (1000 mr/hr) (1 hr/60 minutes) (30 minutes)

Internal exposure = (30 DAC) (30 minutes) (1 hr/60 minutes) (2.5 mr/DAC-hr) = 37.5 mR.

Total Exposure without respirator = 537.5 mR.

CUES:

Evaluator note: Acceptable range is 537 to 538 mR. Step is critical since an accurate calculation is required in order to make correct ALARA decision.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 3

Calculate dose for each option - One person with a respirator.

STEP STANDARD:

External dose = (1000 mr/hr) (1 hr/60 minutes) (36 minutes) (1.1) = 660 mR

Internal Dose = (30 DAC) (36 min) (1 hr/60 min) (2.5 mr/DAC-hr) (1.1) / (1000 protection factor)= 0495 mR.

Total Exposure with respirator = 660.05 mR.

CUES:

Evaluator note: Acceptable range is 590 - 670 mR. The acceptable range allows for failure to apply the respirator inefficiency factor of 1.1. This factor is not common knowledge. Step is critical since an accurate calculation is required in order to make correct ALARA decision.

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 4

Determines best option IAW the lowest total dose.

STEP STANDARD:

Best option is: One person WITHOUT respirator.

CUES:

Evaluator note: Step is critical since the correct comparison must be made in order to make correct ALARA decision.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPA-083A(R1

DESCRIPTION: 2011 and 2015 NRC Admin A3 RO & SRO: Apply Facility ALARA Principles to a Specific Task and Determine Overall Dose

IC SET: N/A

INSTRUCTIONS:

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS:

INITIAL CONDITION: A hydrogen explosion in the waste gas system has resulted in a radioactive leak. The crew is performing actions of ARP-019 XCP- 644; 2-1, GAS DECAY TK AREA RM-G10 HI RAD.

The leak will continue until several manual valves are manipulated to isolate the leak.

Access to the valves requires climbing a ladder in a tight space which has an ambient temperature of 100°F.

The general area radiation level where the work will be performed is 1000 mR/hour.

Airborne activity in the work area is estimated at a Weighted Derived Air Concentration of 30 DAC.

There are two options for performing the work:

- One person without a respirator = 30 minutes

or

- One person with an SCBA = 36 minutes.

INITIATING CUES: You have been assigned to calculate the expected dose for the two options and to identify the best option between them according to the VC Summer ALARA philosophy. For the purposes of the JPM, assume that no dose is received in transit and there is no additional external exposure due to respiratory equipment setup. Place your name on the NJPA-083A(R1) handout 1 and write your answer in the space provided. Show all work.

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

NJPA-083A(R1) Application of ALARA Principles - Handout - 1

Examinee Name ______________________________

Dose Calculation – One Person without a respirator:

Dose Calculation – One Person with a respirator:

Best Option for ALARA: ____

NJPA-083A(R1) Handout 2

HPP-0155

CONTROL OF AIRBORNE RADIATION EXPOSURE (DAC-HRS)

Revision 13

SAFETY RELATED

INFORMATION USE

Procedure May Be Performed from Memory.
User retains Accountability For Proper Performance.

South Carolina Electric and Gas Company
Virgil C. Summer Nuclear Station

NUCLEAR OPERATIONS

COPY NO.____________

TABLE OF CONTENTS

1.0 PURPOSE/SCOPE

1.1 This procedure provides the requirements and methodology for:

1.1.1 Entry into Airborne Radioactivity Areas,

1.1.2 Tracking the accumulation of DAC-hours,

1.1.3 Assigning the skin dose equivalent due to noble gases, and

1.1.4 Performing ALARA assessment of airborne radioactivity protection methods.

1.2 This procedure implements portions of 10CFR20 and meets the intent of FSAR sections 12.3.1.2 and 12.3.2.3 for maintaining airborne activity monitoring and controlling personnel airborne radioactivity exposure. This procedure implements the intent of managerial or administrative procedures governing the conduct of facility operations (subject to the control of 10CFR50, Appendix B). The PCAP'ed sections of this procedure are governed by SAP-630. A 10CFR50.59 review is not required for this procedure.

2.0 REFERENCES

2.1 10 CFR Part 20, "Standards for Protection Against Radiation"

2.2 FSAR, "Final Safety Analysis Report", Section 12.3

2.3 HPP-0151, "Use of the Radiation Work Permit"

2.4 HPP-0152, "Radiation Control Area Access Control"

2.5 HPP-0515, "Interpretation of Bioassay Analyses"

2.6 SAP-500, "Health Physics Manual"

2.7 NUREG-0041, "Manual of Respiratory Protection Against Airborne Radioactive Materials"

2.8 Technical Work Record 98-008, "Skin Dose From Noble Gas Revisited", October 7, 1989

2.9 HPP-0825, "Weighted DAC Determination for Airborne Alpha Radioactivity"

2.10 Sentinel User's Manual

2.11 Regulatory Guide 8.15, “Acceptable Programs for Respiratory Protection”

2.12 SAP-999, “Corrective Action Program”

2.13 EPRI Alpha Monitoring Guidelines for Operating Nuclear Power Plants, Report # 3002000409 August 2013

3.0 RESPONSIBILITY

3.1 It is the responsibility of all Managers and Supervisors to ensure that each individual within their organization complies with the requirements outlined in this procedure.

3.2 It is the responsibility of each individual entering a known Airborne Radioactivity Area to record his/her name, HPID number, work location, time in, and time out on Attachment IV or on the computerized access control system.

3.3 It is the responsibility of Health Physics to:

3.3.1 Control access into Airborne Radioactivity Areas,

3.3.2 Provide primary radiological coverage for entries into areas where the DAC, due to airborne particulate, radioiodine and tritium, is greater than or equal to 1.0,

C01→ 3.3.3 Record the DAC-hours received in a timely manner to ensure compliance with Reference 2.1, (10CFR20, Section 20.1202),

3.3.4 Schedule whole body counts when required,

3.3.5 Ensure skin dose is assigned properly when the noble gas concentration due to Xe-133 is $\geq$ 1 DAC.

3.4 TEDE ALARA assessments require some degree of professional judgment and should therefore be performed by a Health Physics representative qualified to provide primary radiological coverage.

4.0 LIMITS AND PRECAUTIONS

4.1 Noble gases are considered to be an external radiation hazard and the deep dose equivalent is measured by the TLD. Reference 2.8 documents that the TLD does not detect Xe-133 betas. Xe-133 skin exposure should be evaluated in accordance with this procedure.

4.2 DAC-hours are calculated and documented for individuals exposed to airborne particulate, radioiodine, gas, and tritium exceeding 0.25 WDAC using Attachments IV and V. DAC-hours due to gas do not need to be tracked in the SENTINEL database. Skin dose is calculated and documented for individuals exposed to Xe-133 at levels equal to or greater than 1 WDAC using Attachments IV and VIII.

4.3 Health Physics shall be notified prior to:

4.3.1 Entry into any posted Airborne Radioactivity Area, or

4.3.2 Entry into any area where airborne radioactivity, in excess of 0.25 DAC, is suspected.

4.4 Whole body counts should be performed under the following conditions:

4.4.1 When a worker has accumulated 40 DAC-hrs beta/gamma (excluding Noble Gas) since their last whole body count, within the current year.

4.4.2 Any worker receiving 4 DAC-hrs Alpha plus Beta/Gamma in 7 consecutive days (corresponding to CEDE internal dose of 10 mrem, planned or unplanned).

C01→ 4.5 Personnel with positive whole body counts should receive timely assessment of internal dose for appropriate exposure record update.

4.6 Process and engineering controls, such as ventilation, containment devices, and decontamination shall be used, as practical, to minimize exposure of personnel to airborne radioactivity.

4.7 When personnel are exposed to airborne radioactivity, increased monitoring is required and TEDE is to be maintained ALARA. Respiratory protection may be used when the total risk to the worker is reduced. In some cases, use of respiratory protection may increase worker risk (either radiological or industrial risk). In these cases, the lower risks associated with not using respiratory protection may be acceptable. When ALARA assessments indicate that the lowest risks are obtained by allowing unprotected exposure to airborne radioactivity, document this decision on the RWP and inform the Manager, Health Physics and Safety Services/Designee.

4.8 Individuals likely to receive internal dose will have an administrative internal dose guideline based on the individual administrative threshold value in Enclosure C or the estimate calculated on Attachment IX (without respiratory equipment), depending on the TEDE ALARA evaluation method used. A Condition Report will be initiated if an individual receives an internal dose in excess of the administrative *internal* dose guideline.

4.9 A High Significance CR will be initiated if an individual's TEDE dose (external and internal dose) exceeds the administrative (external and internal) dose guidelines by 100 mrem.

4.10 Attachment V may be computer generated provided it contains, at a minimum, the information required by the attachment in this procedure.

4.11 In vitro bioassay analysis may be required, if an alpha uptake is suspected. These samples will be collected in accordance with the requirements of Reference 2.5 (HPP-0515).

5.0 PROCEDURE

5.1 Manual logging of personnel entry/exit in Airborne Radioactivity Areas using Attachment IV.

5.1.1 Complete the information as required on Attachment IV.

5.1.2 This information is used to determine entry duration.

5.1.3 After all the information is input into the SENTINEL system the attachment can be discarded.

5.2 Manual calculation and tracking of WDAC-hrs Using Attachment V

5.2.1 Transfer RWP, HPID, name, and entry and exit times to Attachment V.

5.2.2 Calculate elapsed time to the nearest tenth of an hour and record.

5.2.3 Record respirator type, protection factor and sample ID number.

5.2.4 Calculate and record weighted DAC-hr as follows:

$$\text{WDAC-hr} = \Sigma \frac{(\text{Activity}_i)}{\text{DAC}_i} \times \text{Elapsed Time}$$

5.2.5 Calculate and record effective DAC-hr as follows:

$$\text{EDAC-hr} = \frac{\text{WDAC-hr}}{\text{Protection factor}}$$

5.2.6 Calculate and record the dose received as follows:

Dose (mrem) = EDAC-hr x 2.5 mrem per EDAC-hr

5.3 Manual calculation and tracking of Xe-133 skin exposure Using Attachment VIII

5.3.1 Transfer RWP, HPID and name, to Attachment VIII from Attachment IV.

5.3.2 Referring to Attachment IV calculate elapsed time to the nearest tenth of an hour and record on Attachment VIII.

5.3.3 Record sample ID number and activity on Attachment VIII.

5.3.4 Calculate and record DAC-hr as follows:

$$\text{DAC-hr}_{\text{Xe-133}} = \frac{\text{Sample Activity}_{\text{Xe-133}} \text{ X Elapsed Time}}{\text{DAC}_{\text{Xe-133}}}$$

5.3.5 Calculate skin dose as follows:

Xe-133 Skin Dose = Total $\text{DAC-hr}_{\text{Xe-133}}$ x 3.5 mrem per $\text{DAC-hr}_{\text{Xe-133}}$

5.3.6 Complete Attachment VIII and forward to Dosimetry for update of the affected individual’s exposure record.

5.4 To add or review Xe-133 Skin Dose records in Sentinel, open the Dose Analysis module.

5.4.1 Open the desired worker and select the External Dose tab.

5.4.2 Select File, then New to initiate the dose analysis.

5.4.3 Ensure that Whole Body Dose is selected as the Type of dose analysis.

5.4.4 The default date may be accepted for the Date Initiated field.

5.4.5 Complete the Initiator’s HPID field.

5.4.6 Select ‘EXT – XE-133 SKIN DOSE’ as the Dose Analysis Reason.

5.4.7 The RWP Number, Task Number, and Comment fields should be completed for reference purposes.

5.4.8 The entry and exit dates & times from Attachment IV should be entered for the dose analysis Begin and End fields.

5.4.9 Enter the serial number of the TLD assigned to the worker during the time of the airborne area entry.

5.4.10 Select ‘Adding’ in the dropdown field next to the TLD No. field.

5.4.11 Enter a zero into the DDE and Lens dose fields.

5.4.12 Enter the dose calculated on Attachment VIII into the Shallow dose field.

5.4.13 Save the dose analysis to assign the dose to the worker as estimated dose.

5.4.14 The record will remain as estimated dose until the dose analysis has been approved by someone other than the Initiator.

5.4.15 Use the User Utilities function to generate a printout of the dose analysis.

5.4.16 Once signed by the Initiator and the Approver, the dose analysis will be placed in the worker’s exposure file.

5.5 To add or review DAC-hr records in Sentinel, open the Dose Analysis module.

5.5.1 Open the desired worker and select the DAC Hours tab.

NOTE: 5.5.2
DAC-hrs due to noble gas (other than Xe-133) do not need to be tracked in SENTINEL. Skin dose assessment from exposure to Xe-133 will be done per section 5.3.

5.5.2 Select File New to enable the fields and add all required data.

5.5.3 The Air Sample ID field is a reference field where you may enter an air sample ID number for later reference.

5.5.4 Enter the Performer’s HPID and date initiated (or accept the default date).

5.5.5 Select ‘DAC – AIRBORNE AREA ENTRY’ as the Dose Analysis Reason

5.5.6 You may enter RWP and Task numbers for reference purposes.

5.5.7 The Comment field may be completed for reference purposes.

5.5.8 Enter the required begin and end dates and times.

5.5.9 The dose block contains fields for DAC-hr Values, estimated dose and resolution dose.

5.5.10 The DAC-hrs Value is multiplied by 2.5 (2.5 mrem per DAC-hr) and displayed in the estimated dose field.

5.5.11 Save the dose analysis to assign the dose to the selected worker as estimated dose.

NOTE: 5.5.12
External dose due to exposure to airborne radioactivity (other than Xe-133) is accounted for when the worker's TLD is processed. .

5.5.12 The record will remain as estimated dose until a resolution dose is assigned and approved.

5.5.13 When the estimated dose is equal to or greater than 10 millirem the estimated dose shall be assigned as the Resolution Dose. The resolution Dose shall be assigned as zero millirem when the estimated dose is less than 10 millirem.

5.5.14 The Approval Information sub tab must be completed and saved by someone other than the Initiator, for the resolution dose to be assigned.

5.6 The attachment sub tab is used to link any supporting file.

5.6.1 **The attachment is a link to the actual file and if the file is moved, the link will be broken.**

5.6.2 Select “attach file” and browse to the desired file, double click or choose “open to attach.”

5.6.3 A file may be removed by selecting “detach” and “yes” at the prompt.

5.7 TEDE ALARA Evaluations

5.7.1 TEDE ALARA evaluations of airborne radioactivity protection methods shall be performed and documented, using the guidance in Enclosure A and the calculations in Attachment IX, if the following deep-dose equivalent thresholds are expected to be exceeded:

	Administrative Threshold Values
For an individual per entry	10 DAC-hrs or 25 mrem DDE
Collective dose for a task	20 DAC-hrs or 50 mrem DDE

5.7.2 TEDE ALARA evaluations do <u>not</u> have to be performed or documented if:

A. The administrative threshold values are not expected to be exceeded, or

B. The degree of uncertainty, regarding the assumptions used for the calculations in Attachment IX, is sufficient enough that the estimates can not be calculated. (For example, there is no historical data from a previous/similar job, or there is no data due to the job being new to the station.)

5.7.3 Health Physics may perform a *qualitative assessment* using a mental process and professional judgment for jobs that are not expected to exceed the administrative threshold values but that may require respiratory protection. The guidance in Enclosure C should be used.

5.7.4 TEDE ALARA assessments should show that TEDE dose for the job will be ALARA. That is, the internal dose avoided by using respiratory protection would be greater than any additional external dose that may result from factors like respirator-induced worker inefficiency.

5.7.5 When assessment results do not show a clear dose savings or obvious indication to use or not use respiratory protection, the evaluator will make the determination using professional judgment.

5.7.6 Industrial safety considerations may outweigh radiological (ALARA) considerations and must be included in any evaluation.

5.7.7 When changes to the original assessment occur, the reasons should be documented within the applicable RWP. (See step 4.7)

6.0 ENCLOSURES

6.1 Enclosure A - Total Risk Assessment Guide for Use of Respiratory Equipment

6.2 Enclosure B - Respiratory Protection Factors

6.3 Enclosure C - Qualitative Assessment Guide

7.0 RECORDS

7.1 Attachment V will be stored in the Dosimetry records office until it is transmitted to Nuclear Records for permanent retention.

7.2 Attachment VIII will be placed in the affected individual's Dosimetry file.

7.3 Attachment IX will be placed into the associated RWP Package.

8.0 REVISION SUMMARY

8.1 Revision 13 implements all changes to Revision 12; deletes old Reference 2.13; and adds new 2.13; deletes original 4.4.2 and makes 4.4.3 new 4.4.2; adds 4.11 to implement new EPRI Alpha Guideline and delete HPP-031; deletes "may" adds "should" in 5.4.7; deletes last sentence in Note 5.5.12; adds new 5.5.13 and renumbers old to 5.5.14 to implement new Sentinel.

TOTAL RISK ASSESSMENT GUIDE FOR USE OF RESPIRATORY EQUIPMENT

1. Determine if Engineering Controls can be utilized to reduce or eliminate airborne radioactivity. (Engineering Controls are preferred over use of respiratory equipment).

2. If Engineering Controls cannot be utilized, Determine what other controls may be used to limit exposure; like restricting access, limiting stay times, etc.

3. A Task Evaluation (using available historical data or reliable estimates) is done to determine:

   - who is performing the work,
   - what work activity is to be performed,
   - where work activity will be performed,
   - when the work activity will be performed,
   - expected duration of job,
   - work area radiological conditions (loose and/or fixed contamination levels, general area dose rates, potential alpha contamination, expected DAC),
   - what protective clothing/gear is required and how it will affect worker comfort/efficiency,
   - will the respiratory equipment increase the worker's industrial safety risk thus outweighing the benefit in TEDE reduction? (increase heat stress, limit vision range while climbing, etc.)
   - will the respiratory equipment decrease the worker's industrial safety risk? (decrease heat stress, etc.)
   - is the respiratory equipment needed for industrial hazards?
   - are there post job negative impacts to the worker? (personnel contamination, unplanned intake, etc.)

NOTE: 4.5.6
If large uncertainties are present in the radioactive concentration determination or estimation due to a new job or no historical data, the calculations in Attachment IX do not need to be performed. Instead, a *qualitative assessment* based on professional judgment will be made using Enclosure C

4. Determine if the use of respiratory equipment will be TEDE ALARA using the information gathered above and the calcualtions in Attachment IX.

5. Attachment IX of this procedure will be used to document TEDE-ALARA evaluations and calculated estimates. The following factors are used in the calculations:

   - 2.5 mrem/DAC-hr (Conversion Factor for DAC-hr to mrem)
   - 1.10 (Respirator-induced worker inefficiency factor, represents the expected lengthening of a work activity due to wearing a respirator)
   - Any exposure from setting up breathing air equipment should be added to the External exposure total.
   - Respirator Protection Factors are found in Enclosure B.

6. Compare total exposure with and without a respirator. Respirator use is indicated when TEDE is lower with a respirator than without one. Note that industrial safety considerations may outweigh ALARA considerations and must be included in any evaluation. Continue with step 8.

7. Evaluation results will be documented in the applicable RWP.

8. When a change occurs from the initial evaluation or protective requirement, the change should also be documented in the applicable RWP. Examples of changes include:

   - Respiratory equipment needs to be worn for industrial safety reasons,
   - Respiratory protection will not be worn because TEDE is expected to increase due to the use of respiratory protection,
   - Respiratory protection will be worn to reduce risk of an intake because peak airborne concentration cannot be reasonably determined, and is potentially very high,
   - Respiratory protection will be worn due to a worker's perceived need for respiratory protection,
   - Respiratory equipment is not worn due to safety concerns and an intake is possible, or due to high dose rates when an intake is possible.

RESPIRATORY PROTECTION FACTORS

DEVICE	PARTICULATE	IODINE	TRITIUM	NOBLE GAS
MSA FULL FACE NEG. PRESSURE	50	1	1	1
MSA FULL FACE DUO-FLOW	50	1	1	1
MSA FULL FACE PRESSURE DEMAND	1000	1	1	1
MSA FULL FACE CONTINUOUS FLOW	1000	1	1	1
SCBA	1000	1000	1	1
HOOD	1000	1000	1	1
MURUROA V4 F1 BUBBLE SUIT	5000	5000	0	1

QUALITATIVE ASSESSMENT GUIDE

A qualitative assessment using a mental process and professional judgment should be used for jobs that are not expected to exceed the administrative threshold values.

	AdministrativeThreshold Values
For an individual per entry	10 DAC-hrs or 25 mrem DDE
Collective dose for a task	20 DAC-hrs or 50 mrem DDE

The following key points should be considered:

- Who is performing the work (do they have previous experience)
- What work acitivity is to be performed (does the activity have the potential to generate airborne radioactivity)
- Where the work will be performed (what are the environmental conditions)
- When the work will be performed (what other factors can affect the job)
- Expected duration of the job
- Radiological conditions (loose surface and fixed contamination levels, dose rates, potential alpha contamination levels, potential DAC)
- What process or engineering controls can be used (filtered ventilation, filtered vacuum, decontamination)

Will the probability of occurrence (based on the work activity)/potential radioactive airborne concentration (based on contamination levels) be Low/Low, High/Low, Low/High, or High/High?

A. Rate the work as having a “High” or “Low” probability for creating airborne radioactivity.
B. Rate the potential radioactive airborne concentration as “High” or “Low” based on the work area contamination levels and the work activity.
C. Combine the assessments from A and B to determine, in addition to other factors listed in this enclosure, the need for respiratory protection.

- Examples of Low/Low conditions include non-abrasive work, minor valve work, hand tool use, or deconatamination in an area with loose surface contamination levels <100,000 dpm/100 cm^2. Low/Low conditions do not normally require respiratory protection.
- Examples of High/Low conditions include abrasive work, welding, cutting, or machining in an area with loose surface contamination levels <100,000 dpm/100 cm^2. High/Low conditions may require respiratory protection and will be at the professional judgment of the evaluator.
- Examples of Low/High conditions include non-abrasive work, hand tool use, or wiring in an area with loose surface contamination levels >100,000 dpm/100 cm^2. Low/High conditions may require respiratory protection and will be at the professional judgment of the evaluator.
- Examples of High/High conditions include abrasive work, cutting, machining, or decontamination in an area with loose surface contamination levels >100,000 dpm/100 cm^2. High/High conditions will normally require respiratory protection.

The qualitative assessment results should be noted in the applicable RWP using a simple statement regarding the probability of occurrence/potential radioactive concentration.

AIRBORNE AREA ENTRY TRACKING LOG

DATE:________________

HPID	LAST NAME	WORK STATION	RESP TYPE	ENTRY TIME	EXIT TIME	AIR SAMPLE NUMBER	RWP

RESP TYPE: N - NONE F- FULL FACE A-AIRLINE S-SCBA H-HOOD

SOUTH CAROLINA ELECTRIC & GAS CO. - V.C. SUMMER NUCLEAR STATION

DAC-HR TRACKING AND CALCULATIONS

RWP NUMBER	HPID	LAST NAME	ENTRY DATE / TIME	EXIT DATE / TIME	ELAPSED HOURS	RESP. TYPE	PROT. FACT.	ISO TYPE	SAMPLE ID	ISO TYPE WDAC*	WDAC HOURS	EDAC HOURS	DOSE mrem **

CALCULATED BY ______________________ DATE __________

INPUT BY ______________________ DATE __________

REVIEWED BY ______________________ DATE __________

* FROM HPP 0303 attachment III

** EDAC HOURS x 2.5 mrem/EDAC hr

Xe-133 SKIN DOSE CALCULATION

NAME: ______________________________________

HPID: ___________

RWP: ________________

Exposure Date / Time	Elapsed Time	Sample ID	Sample Activity	DAC-hr$_{Xe-133}$

Total DAC-hr$_{Xe-133}$ ____________

$$\text{DAC-hr}_{Xe-133} = \frac{\text{Sample Activity}_{Xe-133} \times \text{Elapsed Time}}{\text{DAC}_{Xe-133}}$$

Xe-133 Skin Dose = Total DAC-hr$_{Xe-133}$ X 3.5 mrem / DAC-hr$_{Xe-133}$

= ________________ mrem

Performed by: ____
Name Date

Reviewed by: ____
Name Date

*Records Updated by: ____
Name Date

*Forward to Dosimetry for update and inclusion into individual's exposure records.

TEDE ALARA Respirator Evaluation

RWP #: ____________________________

Task Evaluated: ____
____.

1. Radiological Considerations for Respirator Use

Average Expected Dose Rate in Work Area	____________	mrem/hr	(A)
Job Duration Expected	____________	hours	(B)
Weighted DAC (WDAC) in Work Area	____________	DAC	(C)

$$\text{WDAC-hr} = \Sigma \frac{(\text{Activity}_i)}{\text{DAC}_i} \times \text{Elapsed Time}$$

Respirator Protection Factor (Enclosure B)*	____________		(D)
Respirator-induced Inefficiency Factor (Enclosure A)	1.10		(E)
Conversion Factor (Enclosure A)	2.5	mrem/DAC-hr	(F)

TEDE = Total Exposure = External Exposure + Internal Exposure

a. Without Respiratory Equipment:

External = A x B = ____________ x ____________ = ____________ mrem (G)

Internal = C x B x F = ____________ x ____________ x 2.5 = ____________mrem (H)

TEDE = G + H = ____________ + ____________ = ____________mrem‡

b. With Respiratory Equipment:

External = A x B x E + Resp_{ext}*
= ____________ x ____________ x ____________ + ____________ = ____________ mrem (I)

Internal = (C / D) x B x 1.10 x 2.5
= (____________ / ____________) x ____________ x 1.10 x 2.5 = ____________ mrem (J)

TEDE = I + J = ____________ + ____________ = ____________mrem‡

*Resp_{ext} = External exposure due to respiratory equipment set-up, if applicable. Contact Respiratory Services if assistance is needed to estimate equipment set-up time or to choose appropriate equipment for task.

‡ These values are to be used to determine whether the use of respiratory protection will be detrimental to maintaining the work process ALARA.

2. Will wearing respiratory equipment increase the worker's industrial safety risk? ☐
or decrease the worker's industrial safety risk? ☐

Comments:

____
____

3. Would <u>not</u> wearing respiratory protection lead to post job negative implications?
   a. Personnel decontamination ☐
   b. Skin dose assessment ☐
   c. Portal monitor alarms ☐
   d. Extensive bioassay evaluation ☐

   Comments:

   ____
   ____
   ____

4. Other considerations: ____
   ____
   ____
   ____

5. Overall Evaluation

   Respirator use <u>is</u> indicated ☐

   Respirator use <u>is not</u> indicated ☐

   Evaluator __________________________________ Date ______________________

Document Review Form (DRF)

Document Identification **Page 1 of 1**

Preparer Name: Bill Smith **Ext:** 89969 **Mail Code** P40

Date: 2/3/14 **Document #:** HPP-0155 **Revision:** 13 **Change**

Title: CONTROL OF AIRBORNE RADIATION EXPOSURE (DAC-HRS) ☒ **SR** ☐ **QR** ☐ **NS**

Development Process: ☐ New ☒ Revision/Change ☐ Editorial Correction ☐ Temporary Approval

Description: Revision 13 implements all changes to Revision 12 ; deletes Reference 2.13; adds 3.3.6; deletes original 4.4.2 and makes 4.4.3 new 4.4.2; adds 4.11
Has scope changed? ☐ Yes ☒ No [If YES, attached 50.59 documentation]

Reason/Basis for Revision/Change: To implement new EPRI Alpha Guideline and delete HPP-0311.

Temporary Approval – if final approval is not completed within 30 days; initiate CR # ______________

Qualified Reviewer ______ **DCRM person notified** ______ **Shift Supervisor** ______ **Date** ______

List Required Reviewers including All Impacted Groups
Additional Reviewers – identify with an *

Position	Type/Print Name	Comments	Position	Type/Print Name	Comments
QR	M. Westbury	☒ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No
		☐ Yes ☐ No			☐ Yes ☐ No

[signature] 2/3/14
Designated Supervisor Concurrence **Date**

Comment Due Date 2/26/14
GM concurrence ________ for expedited review

Pre- implementation Actions

All Comments Resolved? ☐ **NA** ☒ **YES** William R Smith 2/4/14
Preparer Sign **Date**

50.59 Review Requirements Addressed?	☒ NA ☐ YES	AD Attached? YES ☐ No ☐
50.59/Part 52 Review Requirements Addressed?	☒ NA ☐ YES	AD Attached? YES ☐ No ☐
Commitments Addressed?	☒ NA ☐ YES	PCAP # ________ MSLA ________
QR Qualification Verified?	☒ YES	
Security Compliance Review Completed?	☒ NA ☐ YES	
Pre-Implementation Training Completed?	☒ NA ☐ YES	CR# ____________
Training required after implementation?	☒ NA ☐ YES	Mtg. # ____________
PSRC Review Completed?	☒ NA ☐ YES	Mtg. # ____________
NSRC Review Completed?	☒ NA ☐ YES	Planner Notified YES ☐
CMMS Update Required? [Unit 1]	☒ NA ☐ YES	

[signature] 3/20/14
Designated Supervisor Approval **Date**

[signature] 3/24/14
Approval Authority Approval **Date**
Effective Date: ____________

NJPA-083A(R1) Application of ALARA Principles - Handout -1

Examinee Name Examinee

Dose Calculation – One Person without a respirator:

Dose from General Area field = (1000 mR/hr) (1 hr/60 minutes) (30 minutes) = 500 mR

Dose from Airborne = 30 DAC (30 minutes) (1 hr/60 minutes) (2.5 mRr/DAC-hr) = 37.5 mR.

Total exposure w/o Respirator = (500 + 37.5) mR = 537.5 mR

(Accept 537-538 mR)

Dose Calculation – One Person with a respirator:

Dose from General Area field = (1000 mr/hr) (1 hr/60 minutes) (36 minutes) (1.1) = 660 mR

Note, if Examinee does not apply non-efficiency factor, following is the external dose:
Dose from General Area field = (1000 mr/hr) (1 hr/60 minutes) (36 minutes)= 600 mR

$$\text{Dose from Airborne} = \frac{(30\ \text{DAC})\ (36\ \text{min})\ (1\ \text{hr}/60\ \text{min})\ (2.5\ \text{mr/DAC-hr})\ (1.1)}{1000\ \text{protection factor}} = 0.0495\text{mR}$$

Total exposure w/ Respirator = (660 + 0.05) mR = 660.05 mR

(Accept 590-670 mR)

Best Option for ALARA: One Person WITHOUT respirator

V.C. SUMMER NUCLEAR STATION
JOB PERFORMANCE MEASURE

JPM NO: **NJPA-1003**

2015 NRC SRO A4: Classify Emergency (Simulator - SAE - Inadequate Core Cooling) (ENF)

CANDIDATE: ______________________________

EXAMINER: ______________________________

SRO ONLY

TIME CRITICAL JPM

TASK:

344-019-03-02 CLASSIFY EMERGENCY EVENTS REQUIRING EMERGENCY PLAN IMPLEMENTATION

TASK STANDARD:

Emergency classification evaluated as a SITE AREA EMERGENCY per Fission Product Barriers EAL number FS1.1. Classification based on Potential Loss of Fuel Clad Barrier (Item B-2 - Core Exit TCs > 700°F) and Loss of Reactor Coolant System Barrier (Item D.2 - RCS leak rate > available make up capacity as indicated by a loss of RCS subcooling). This is a time critical JPM and the declaration must be made within 15 minutes after the emergency condition exists, and successful completion of EPP-002, Communication and Notification, Attachment I, Nuclear Powe Plant Notification Form, must be made within 15 minutes after the emergency declaration (see key for this JPM).

TERMINATING CUE: Successful completion of EPP-002, Communication and Notification, Attachment I, Nuclear Power Plant Notification Form.

PREFERRED EVALUATION LOCATION	***PREFERRED EVALUATION METHOD***
SIMULATOR	PERFORM

REFERENCES:

EPP-106	EMERGENCY PREPAREDNESS PERFORMANCE INDICATOR PROCEDURE
EOP-12.0	MONITORING OF CRITICAL SAFETY FUNCTIONS
EPP-001	ACTIVATION AND IMPLEMENTATION OF THE EMERGENCY PLAN
EPP-002	COMMUNICATION AND NOTIFICATION

INDEX NO.	***K/A NO.***		***RO***	***SRO***
1940012441	2.4.41	Knowledge of the emergency action level thresholds and classifications.	2.9	4.6
1940012440	2.4.40	Knowledge of the SRO's responsibilities in emergency plan implementation.	2.7	4.5

TOOLS:

EPP-002, Communication and Notification, Attachment I, Nuclear Power Plant Notification Form (NJPA-1003 Handout)
Stopwatch or other suitable timepiece
EPP-001, Attachment 1 EAL Classification Matrix (available via desk top computer or as big board)
Copy of EOP-1.0 Marked up per event conditions (Including completed Attachment 3).
Copy of EOP-2.0 Marked up through step 12.

EVALUATION TIME 20 ***TIME CRITICAL*** YES ***10CFR55:*** 45(a)(11)

TIME START: ____________ TIME FINISH: ____________ PERFORMANCE TIME: ____________

PERFORMANCE RATING: SAT: ______ UNSAT: ______

CANDIDATE: ______________________________

EXAMINER: ______________________ ______________________ / __________

SIGNATURE DATE

INSTRUCTIONS TO OPERATOR

READ TO OPERATOR:

WHEN I TELL YOU TO BEGIN, YOU ARE TO PERFORM THE ACTIONS AS DIRECTED IN THE INITIATING CUES. I WILL DESCRIBE THE GENERAL CONDITIONS UNDER WHICH THIS TASK IS TO BE PERFORMED AND PROVIDE THE NECESSARY TOOLS WITH WHICH TO PERFORM THIS TASK. BEFORE STARTING, I WILL EXPLAIN THE INITIAL CONDITIONS, WHICH STEPS TO SIMULATE OR DISCUSS, AND PROVIDE INITIATING CUES. WHEN YOU COMPLETE THE TASK SUCCESSFULLY, THIS JOB PERFORMANCE MEASURE WILL BE SATISFIED.

SAFETY CONSIDERATIONS: None

INITIAL CONDITION:

THIS IS A DRILL

1. The plant was in MODE 1.
2. Weekend night shift, only routine evolutions in progress.
3. The 'C' Charging pump was tagged out for maintenance on the previous shift. No other equipment is out of service.
4. An event occurred resulting in an automatic Reactor Trip and Safety Injection
5. The crew entered EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION
6. The CRS has received the following reports from the crew.
   a. "Reactor Trip."
   b. "Turbine Trip."
   c. "Safety Injection"
   d. "ESFLS complete on Train A and Train B"
   e. "The ' B' Charging pump failed to start"
   f. "RCS pressure is less than 1418 psig with flow on FI-943, Stopping RCPs"
7. The crew transitioned from EOP-1.0 to "EOP-2.0, LOSS OF REACTOR OR SECONDARY COOLANT"
8. The CRS was subsequently notified that the 'A' Charging pump has tripped.
9. The crew is taking action using EOP-2.0, at step 13.
10. The simulator was frozen at this point.

INITIATING CUES:

1. Your task is to perform the following:
   a. Classify the event.
   b. Complete the required INITIAL NOTIFICATION FORM.
2. Do not use SS Judgment as the basis for your classification.
3. The simulator will remain in freeze during the JPM.
4. There are two Time Critical elements for this JPM; Time of Event Classification and completion of the Notification Form. Inform the Evaluator at the completion of each Time Critical element.
5. For the purposes of this JPM, initial event time zero and the start time for classification will begin when the Evaluator tells you to begin.
6. Reactor Trip time will be 30 minutes prior to T-0 announced by the Evaluator.

Record all work on the NJPA-1003 Handout

THIS IS A TIME CRITICAL JPM!

HAND JPM BRIEFING SHEET TO OPERATOR AT THIS TIME!

STEPS

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 1

Determine that conditions require classification as SITE AREA EMERGENCY

STEP STANDARD:

Classifies event as a SITE AREA EMERGENCY based on:

EAL FS1.1 Loss or Potential Loss of any two barriers (Table F-1)

CUES:

Evaluator cue: Announce the Initial Event time (T-0) based on Simulator Clock. Record time T-0 for future reference. Announce that reactor trip was 30 minutes prior to T-0.

Evaluator note: Examinee has 15 minutes from the end of the plant conditions brief (end of brief = T-0) to arrive at event classification. Record the simulator time when Examinee classifies as the classification time (Line 10) on EPP-002 Attachment 1 (NJPA-1003 Handout). Hand Examinee the EPP-002 Attachment 1 (NJPA-1003 Handout).

COMMENTS:

CRITICAL: Yes ***SEQUENCED:*** Yes ***SAT*** ☐ ***UNSAT*** ☐

STEP: 2

Complete EPP-002, Attachment 1, Nuclear Power Plant Emergency Notification Form and provide basis for classification.

STEP STANDARD:

Correctly completes EPP-002 Attachment 1 within 15 minutes of declaring event classification. See key for correct manner of completing the attachment.
Classification Basis:

1. Core exit TCs>700°F - Potential Loss of Fuel Clad Barrier, Item B.2.
2. RCS leak rate > available make up capacity as indicated by a loss of RCS subcooling - Loss of Reactor Coolant System Barrier, Item D.2.

CUES:

Evaluator cue: If Examinee appears to be using SIPCS for Rx trip time repeat initiating cue that trip was 30 minutes prior to T-0 for the JPM.

Evaluator cue: If asked provide 803-334-1234 as the confirmation phone number.

Evaluator cue: Examinee must explain basis for classification. Ask Examinee for basis if it is not offered. If the basis is not correct, this constitutes failure even if the classification was correct and within 15 minutes. Step is critical since proper classification must be made within 15 minutes.

Evaluator note: Record Simulator time when Examinee hands you the EPP-002 Attachment as the Approved by time (line 17 on the EPP-002 Attachment 1). Must be within 15 minutes of time when their classification had been completed. Refer to NJPA-1003 Key.

COMMENTS:

Examiner ends JPM at this point.

JPM SETUP SHEET

JPM NO: NJPA-1003

DESCRIPTION: 2015 NRC SRO A4: Classify Emergency (Simulator - SAE - Inadequate Core Cooling) (ENF)

IC SET: 318

INSTRUCTIONS:

If IC-318 is designated for this JPM then reset to IC-318 leaving the simulator in FREEZE.

1. Place Danger Tag on 'C' Charging pump for Maintenance.

If IC-318 is not designated for this JPM then initial conditions may be established by reseting to IC-10 and following the below directions:

1. Place Danger Tag on 'C' Charging pump for Maintenance.

2. Insert:

MAL-RCS006A	Final Value = 10000	Delay =10	(RCS loop 'A' LOCA)
MAL-CVC017A		Delay = 120	('A' Charging Pump Trip)
PMP-CS006F			(Charging Pump 'B' fail to start)
XMT-MI016F			10 Meter Wind Direction Fail As Is
XMT-MI008F			10 Meter Wind speed Fail As Is
XMT-MI015F			61 Meter Wind Direction Fail As Is
XMT-MI007F			61 Meter Wind speed Fail As Is

3. RUN

4. Manually trip RCPs when RCS pressure <1400 psig.

5. Perform the following actions >1 minute after SI is initiated:

   Reset SI
   Reset Phase A
   Reset Phase B
   Reset the ESFLS
   Establish IA to the RB

6. Place 'A' and 'B' Charging pumps in pull to lock once they have stopped.

7. Ensure steps of EOP-1.0 and in particular EOP-1.0 attachment 3 have been fully and correctly implemented.

8. Align EFW for normal operation and throttle to approximatly 200 gpm per Steam Generator.

9. When RVLIS NR Level is <45%, reduce RCS leak to 500 GPM.

10. When Core Exit Thermocouples >715°F and <725°F with RVLIS >40%: FREEZE

11. If necessary adjust RVLIS NR to approximately 45% using:

XMT-MI002O	Final Value = 44	(RV NR Level LI-1311 Fail to Position)
XMT-MI005O	Final Value = 45	(RV NR Level LI-1321 Fail to Position)

12. Record met data from SIPCS, need Wind Direction, Wind Speed and Stability Class for the answer key

COMMENTS:

JPM BRIEFING SHEET

OPERATOR INSTRUCTIONS:

SAFETY CONSIDERATIONS: None

INITIAL CONDITION:

THIS IS A DRILL

1. The plant was in MODE 1.
2. Weekend night shift, only routine evolutions in progress.
3. The 'C' Charging pump was tagged out for maintenance on the previous shift. No other equipment is out of service.
4. An event occurred resulting in an automatic Reactor Trip and Safety Injection.
5. The crew entered EOP-1.0, E-0, REACTOR TRIP OR SAFETY INJECTION
6. The CRS has received the following reports from the crew.
   a. "Reactor Trip."
   b. "Turbine Trip."
   c. "Safety Injection"
   d. "ESFLS complete on Train A and Train B"
   e. "The ' B' Charging pump failed to start"
   f. "RCS pressure is less than 1418 psig with flow on FI-943, Stopping RCPs"
7. The crew transitioned from EOP-1.0 to "EOP-2.0, LOSS OFREACTOR OR SECONDARY COOLANT"
8. The CRS was subsequently notified that the 'A' Charging pump has tripped
9. The crew is taking action using EOP-2.0, at step 13.
10. The simulator was frozen at this point.

INITIATING CUES:

1. Your task is to perform the following:
   a. Classify the event.
   b. Complete the required INITIAL NOTIFICATION FORM.
2. Do not use SS Judgment as the basis for your classification.
3. The simulator will remain in freeze during the JPM.
4. There are two Time Critical elements for this JPM; Time of Event Classification and completion of the Notification Form. Inform the Evaluator at the completion of each Time Critical element.
5. For the purposes of this JPM, initial event time zero and the start time for classification will begin when the Evaluator tells you to begin.
6. Reactor Trip time will be 30 minutes prior to T-0 announced by the Evaluator

Record all work on the NJPA-1003 Handout

HAND THIS PAPER BACK TO YOUR EVALUATOR WHEN YOU FEEL THAT YOU HAVE SATISFACTORILY COMPLETED THE ASSIGNED TASK.

Examinee: ____________________

NJPA-1003 Handout

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

1. A DRILL B ACTUAL EVENT MESSAGE # _______

2. A INITIAL B FOLLOW-UP NOTIFICATION: TIME__________ DATE____/____/____ AUTHENTICATION # ________

3. SITE: V. C. Summer Confirmation Phone # (___)_______________

4. **EMERGENCY CLASSIFICATION:** A UNUSUAL EVENT B ALERT C SITE AREA EMERGENCY D GENERAL EMERGENCY

BASED ON EAL #____________ EAL DESCRIPTION: ______________________________________

5. **PROTECTIVE ACTION RECOMMENDATIONS:** A NONE

B EVACUATE ______________________________

C SHELTER ______________________________

D CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH STATE PLANS AND POLICY.

E OTHER______________________________

6. **EMERGENCY RELEASE**: A None B Is Occurring C Has Occurred

7. RELEASE SIGNIFICANCE: A Not applicable B Within normal operating limits C Above normal operating limits D Under evaluation

8. EVENT PROGNOSIS: A Improving B Stable C Degrading

9. METEOROLOGICAL DATA: Wind Direction* from ______ degrees Wind Speed* ______mph

(*May not be available for Initial Notifications) Precipitation* ______ Stability Class* A B C D E F G

10. A DECLARATION B TERMINATION Time ______________ Date ____/_____/______

11. AFFECTED UNIT(S): ~~1~~ 2 3 All

12. UNIT STATUS:
(Unaffected Unit(s) Status Not Required for Initial Notifications)

~~A~~ U1 ____% Power Shutdown at Time ____________ Date ___/____/___

B U2 ____% Power Shutdown at Time ____________ Date ___/____/___

C U3 ____% Power Shutdown at Time ____________ Date ___/____/___

13. REMARKS: ______________________________________

FOLLOW-UP INFORMATION (Lines 14 through 16 Not Required for Initial Notifications)

EMERGENCY RELEASE DATA. NOT REQUIRED IF LINE 6 A IS SELECTED.

14. RELEASE CHARACTERIZATION: TYPE: A Elevated B Mixed C Ground UNITS: A Ci B Ci/sec C µCi/sec

MAGNITUDE: Noble Gases:_________ Iodines:__________ Particulates:_________ Other: ___________

FORM: A Airborne Start Time _________ Date ___/____/___Stop Time _________ Date ___/____/___

B Liquid Start Time _________ Date ___/____/___Stop Time _________ Date ___/____/___

15. PROJECTION PARAMETERS: Projection period: _______Hours Estimated Release Duration _______Hours

Projection performed: Time _________ Date ___/____/___

16. PROJECTED DOSE:

DISTANCE	TEDE (mrem)	Adult Thyroid CDE (mrem)
Site boundary		
2 Miles		
5 Miles		
10 Miles		

17. APPROVED BY: _______________________ Title _________________ Time ________ Date___/____/___

NOTIFIED BY:_____________________ RECEIVED BY: _______________________ Time ________ Date ___/____/___

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

1. [X] DRILL B ACTUAL EVENT MESSAGE # 1

2. [X] INITIAL B FOLLOW-UP NOTIFICATION: TIME ______ DATE __/__/__ AUTHENTICATION #______

3. SITE: **V. C. Summer** Confirmation Phone # (803) 334-1234

4. **EMERGENCY CLASSIFICATION:** A UNUSUAL EVENT B ALERT [X] SITE AREA EMERGENCY D GENERAL EMERGENCY

BASED ON EAL # **FS1.1** EAL DESCRIPTION: **Loss or Potential Loss of any two Barriers**

5. **PROTECTIVE ACTION RECOMMENDATIONS:** [X] NONE

B EVACUATE ______

C SHELTER ______

D CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH STATE PLANS AND POLICY.

E OTHER ______

Accept values as displayed; 40.2°and 5.5 mph

6. **EMERGENCY RELEASE**: [X] None B Is Occurring C Has Occurred

7. RELEASE SIGNIFICANCE: [X] Not applicable B Within normal operating limits C Above normal operating limits D Under evaluation

8. EVENT PROGNOSIS: A Improving B Stable [X] Degrading

9. METEOROLOGICAL DATA: Wind Direction* from **40** degrees Wind Speed* **6.0** mph

(*May not be available for Initial Notifications) Precipitation* **None** Stability Class* A B C D [X] F G

10. [X] DECLARATION B TERMINATION Time **Record Time Classified** Date __/__/__

11. AFFECTED UNIT(S): [X] 2 3 All

12. UNIT STATUS: (Unaffected Unit(s) Status Not Required for Initial Notifications)

[X] U1 **0** % Power Shutdown at Time **30 min prior to T-0** Date **Today**

B U2 ___% Power Shutdown at Time ______ Date __/__/__

C U3 ___% Power Shutdown at Time ______ Date __/__/__

13. REMARKS: Turbine Driven Emergency Feedwater pump is running

FOLLOW-UP INFORMATION (Lines 14 through 16 Not Required for Initial Notifications)

EMERGENCY RELEASE DATA. NOT REQUIRED IF LINE 6 A IS SELECTED.

14. RELEASE CHARACTERIZATION: TYPE: A Elevated B Mixed C Gr

MAGNITUDE: Noble Gases:______ Iodines:______ Particu

Data from 8/9/14 IC-318 Build:

CETC = 718.3°F

RVLIS NR = 44.5%

10 Meter Preferred 15 min Wind Speed = 5.5 mph

10 Meter Preferred 15 min Wind direction = 40.2°

Stability Class = E

Subcooling = -161.1°F

Items circled as [cloud] are critical ~ must be as shown for pass rating.

urs

TEDE (mrem) Adult Thyroid CDE (mrem)

Within 15 minutes of clasification

10 Miles

17. APPROVED BY: *Examinee* Title *Interiem Emergency Director* Time ______ Date __/__/__

NOTIFIED BY: ______ RECEIVED BY: ______ Time ______ Date __/__/__