

Facility:		NMP1 NRC		Date of Exam:		October 2008											
Tier	Group	RO K/A Category Points											SRO-Only Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total	
1. Emergency & Plant Evolution	1	2	5	2				5	3			3	20	3	4	7	
	2	1	2	1				1	1			1	7	1	2	3	
	Tier Totals	3	7	3				6	4			4	27	4	6	10	
2. Plant Systems	1	4	2	1	3	2	3	2	2	2	2	3	26	3	2	5	
	2	1	1	2	1	2	1	1	1	0	1	1	12	0	1	3	
	Tier Totals	5	3	3	4	4	4	3	3	2	3	4	38	4	4	8	
3. Generic Knowledge & Abilities Categories				1		2		3		4		10	1	2	3	4	7
				3		3		2		2			2	2	1	2	
<p>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).</p> <p>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.</p> <p>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 that are not included on the outline should be added. Refer to section D.1.b of ES-401, for guidance regarding elimination of inappropriate K/A statements.</p> <p>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.</p> <p>5. Absent a plant specific priority, only those KAs 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.</p> <p>6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.</p> <p>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/A's</p> <p>* 8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) 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.</p> <p>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 10CFR55.43</p>																	

NMP1 Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295031 Reactor Low Water Level / 2					X		EA2.02 - Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL : Reactor power	4.2	76
295016 Control Room Abandonment / 7					X		AA2.06 - Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT : Cooldown rate	3.5	77
295028 High Drywell Temperature / 5					X		EA2.04 - Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE : Drywell pressure	4.2	78
295006 SCRAM / 1						X	2.4.31 - Emergency Procedures / Plan: Knowledge of annunciator alarms, indications, or response procedures.	4.1	79
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4						X	2.4.45 - Emergency Procedures / Plan: Ability to prioritize and interpret the significance of each annunciator or alarm.	4.3	80
295003 Partial or Complete Loss of AC / 6						X	2.1.31 - Conduct of Operations: Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.	4.3	81
295038 High Off-site Release Rate / 9						X	2.2.12 - Equipment Control: Knowledge of surveillance procedures.	4.1	82
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1	X						EK1.07 - Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Shutdown margin	3.4	39
295005 Main Turbine Generator Trip / 3		X					AK2.04 - Knowledge of the interrelations between MAIN TURBINE GENERATOR TRIP and the following: Main generator protection	3.3	40
295004 Partial or Total Loss of DC Pwr / 6	X						AK1.05 - Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER Loss of breaker Protection	3.3	41
295024 High Drywell Pressure / 5		X					EK2.18 - Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following: Ventilation.	3.3	42
295003 Partial or Complete Loss of AC / 6		X					AK2.01 - Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF A.C. POWER and the following: Station batteries	3.2	43

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Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295026 Suppression Pool High Water Temp. / 5		X					EK2.06 - Knowledge of the interrelations between SUPPRESSION POOL HIGH WATER TEMPERATURE and the following: Suppression pool level	3.5	44
295006 SCRAM / 1				X			AA1.02 - Ability to operate and/or monitor the following as they apply to SCRAM : Reactor water level control system.	3.9	45
295030 Low Suppression Pool Water Level / 5			X				EK3.01 - Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: Emergency Depressurization	3.8	46
295028 High Drywell Temperature / 5			X				EK3.06 - Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL TEMPERATURE : ADS	3.4	47
295025 High Reactor Pressure / 3				X			EA1.06 - Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: Isolation Condenser: Plant-Specific	4.5	48
295016 Control Room Abandonment / 7				X			AA1.06 - Ability to operate and/or monitor the following as they apply to CONTROL ROOM ABANDONMENT : Reactor water level	4.0	49
295038 High Off-site Release Rate / 9				X			EA1.03 - Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE: Process liquid radiation monitoring system	3.7	50
600000 Plant Fire On-site / 8					X		AA2.06 - Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Need for pressurizing control room (recirculating mode)	2.5	51
700000 Generator Voltage and Electric Grid Disturbances					X		AA2.06 - Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Generator frequency limitations.	3.4	52
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					X		AA2.02 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Neutron monitoring	3.1	53
295021 Loss of Shutdown Cooling / 4						X	2.4.21 - Emergency Procedures / Plan: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.0	54
295031 Reactor Low Water Level / 2						X	2.1.19 - Conduct of Operations: Ability to use plant computers to evaluate	3.9	55

NMP1 Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
							system or component status.		
295019 Partial or Complete Loss of Inst. Air / 8						X	2.4.49 - Emergency Procedures / Plan: Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.6	56
295023 Refueling Acc / 8		X					AK2.03 - Knowledge of the interrelations between REFUELING ACCIDENTS and the following: Radiation monitoring equipment	3.4	57
295018 Partial or Complete Loss of CCW / 8				X			AA1.01 - Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : Backup systems	3.3	58
K/A Category Totals:	2	5	2	5	3/3	3/4	Group Point Total:	20/7	

NMP1 Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295020 Inadvertent Cont. Isolation / 5 & 7					X		AA2.06 - Ability to determine and/or interpret the following as they apply to INADVERTENT CONTAINMENT ISOLATION: Cause of Isolation	3.4	83
295007 High Reactor Pressure / 3						X	2.2.25 - Equipment Control: Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	4.2	84
295010 High Drywell Pressure / 5						X	2.4.50 - Emergency Procedures / Plan: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4.0	85
295015 Incomplete SCRAM / 1	X						AK1.04 - Knowledge of the operational implications of the following concepts as they apply to INCOMPLETE SCRAM : Reactor pressure: Plant-Specific	3.8	59
295008 High Reactor Water Level / 2		X					AK2.09 - Knowledge of the interrelations between HIGH REACTOR WATER LEVEL and the following: Reactor water cleanup system (ability to drain): Plant-Specific	3.1	60
295002 Loss of Main Condenser Vacuum / 3			X				AK3.02 - Knowledge of the reasons for the following responses as they apply to LOSS OF MAIN CONDENSER VACUUM: Turbine Trip	3.4	61
295007 High Reactor Pressure / 3				X			AA1.05 - Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE : Reactor/turbine pressure regulating system	3.7	62
295033 High Secondary Containment Area Radiation Levels / 9		X					EK2.01 - Knowledge of the interrelations between HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS and the following: Area Rad Monitoring System	3.8	63
295032 High Secondary Containment Area Temperature / 5						X	2.4.18 - Emergency Procedures / Plan; Knowledge of the specific bases for EOPs.	3.3	64
500000 High CTMT Hydrogen Conc. / 5					X		EA2.01 - Hydrogen monitoring system availability	3.1	65
K/A Category Totals:	1	2	1	1	1/1	1/2	Group Point Total:	7/3	

NMP1 Written Examination Outline
Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp	Q#
300000 Instrument Air								X				A2.01 - Ability to (a) predict the impacts of the following on the INSTRUMENT AIR SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Air dryer and filter malfunctions	2.8	86
218000 ADS								X				A2.04 - Ability to (a) predict the impacts of the following on the AUTOMATIC DEPRESSURIZATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: ADS failure to initiate	4.2	87
205000 Shutdown Cooling											X	2.4.9 - Emergency Procedures / Plan: Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.	4.6	88
207000 Isolation (Emergency) Condenser											X	2.2.40 - Equipment Control: Ability to apply technical specifications for a system.	4.7	89
263000 DC Electrical Distribution								X				A2.02 - Ability to (a) predict the impacts of the following on the D.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of ventilation during charging	2.9	90
209001 LPCS	X											K1.05 - Knowledge of the physical connections and/or cause- effect relationships between LOW PRESSURE CORE SPRAY SYSTEM and the following: Automatic depressurization system	3.7	1
239002 SRVs	X											K1.07 - Knowledge of the physical connections and/or cause- effect relationships between RELIEF/SAFETY VALVES and the following: Suppression pool	3.6	2

NMP1 Written Examination Outline
Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp .	Q#
259002 Reactor Water Level Control	X											K1.03 - Knowledge of the physical connections and/or cause effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following: Reactor water level	3.8	3
218000 ADS		X										K2.01 - Knowledge of electrical power supplies to the following: ADS logic	3.1	4
261000 SGTS	X											K1.03 - Knowledge of the physical connections and/or relationships between STANDBY GAS TREATMENT SYSTEM and the following: Suppression Pool	2.9	5
215003 IRM			X									K3.02 - Knowledge of the effect that a loss or malfunction of the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM will have on following: Reactor manual control	3.6	6
212000 RPS				X								K4.11 - Knowledge of REACTOR PROTECTION SYSTEM (RPS) design feature(s) and/or interlocks which provide for the following: Operation with shorting links removed: Plant-Specific (switch is used at NMP1)	3.3	7
262001 AC Electrical Distribution				X								K4.02 - Knowledge of A.C. ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following: Circuit breaker automatic trips	2.9	8
205000 Shutdown Cooling					X							K5.03 - Knowledge of the operational implications of the following concepts as they apply to SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) : Heat removal mechanisms	2.8	9
300000 Instrument Air					X							K5.01 - Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Air Compressors	2.5	10

NMP1 Written Examination Outline
Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp .	Q#
262002 UPS (AC/DC)						X						K6.01 - Knowledge of the effect that a loss or malfunction of the following will have on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) : A.C. electrical power	2.7	11
206000 HPCI						X						K6.03 - Knowledge of the effect that a loss or malfunction of the following will have on the HIGH PRESSURE COOLANT INJECTION SYSTEM : AC Power	2.9	12
263000 DC Electrical Distribution							X					A1.01 - Ability to predict and/or monitor changes in parameters associated with operating the D.C. ELECTRICAL DISTRIBUTION controls including: Battery charging/discharging rate	2.5	13
211000 SLC							X					A1.04 - Ability to predict and/or monitor changes in parameters associated with operating the STANDBY LIQUID CONTROL SYSTEM controls including: Valve operations	3.6	14
400000 Component Cooling Water								X				A2.02 - Ability to (a) predict the impacts of the following on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: High/low surge tank level	2.8	15
207000 Isolation (Emergency) Condenser								X				A2.06 - Ability to (a) predict the impacts of the following on the ISOLATION (EMERGENCY) CONDENSER ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Valve openings: BWR-2,3	3.3	16
223002 PCIS/Nuclear Steam Supply Shutoff									X			A3.01 - Ability to monitor automatic operations of the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF including: System indicating lights and alarms	3.4	17

**NMP1 Written Examination Outline
Plant Systems – Tier 2 Group 1**

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp	Q#
262001 AC Electrical Distribution									X			A3.02 - Ability to monitor automatic operations of the AC Electrical Distribution including: Automatic bus Transfer	3.2	18
215004 Source Range Monitor										X		A4.07 - Ability to manually operate and/or monitor in the control room: Verification of proper functioning/ operability	3.4	19
215005 APRM / LPRM										X		A4.03 - Ability to manually operate and/or monitor in the control room: APRM back panel switches, meters and indicating lights	3.2	20
212000 RPS											X	2.4.46 - Emergency Procedures / Plan: Ability to verify that the alarms are consistent with the plant conditions.	4.2	21
264000 EDGs											X	2.1.7 - Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	22
215003 IRM		X										K2.01 - Knowledge of electrical power supplies to the following: IRM channels/detectors	2.5	23
207000 Isolation (Emergency) Condenser											X	2.1.30 - Conduct of Operations: Ability to locate and operate components, including local controls.	4.4	24
400000 Component Cooling Water						X						K6.01 - Knowledge of the effect that a loss or malfunction of the following will have on the CCWS: Valves	2.7	25
223002 PCIS/Nuclear Steam Supply Shutoff				X								K4.04 - Knowledge of PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF design feature(s) and/or interlocks which provide for the following: Automatic bypassing of selected isolations during specified plant conditions	3.2	26
K/A Category Totals:	4	2	1	3	2	3	2	2/3	2	2	3/2	Group Point Total:	26/5	

**NMP1 Written Examination Outline
Plant Systems – Tier 2 Group 2**

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp.	Q #
286000 Fire Protection								X				A2.07 - Ability to (a) predict the impacts of the following on the FIRE PROTECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Inadvertent system initiation	2.9	91
215001 Traversing In-core Probe											X	2.4.41 - Emergency Procedures / Plan: Knowledge of the emergency action level thresholds and classifications.	4.6	92
202001 Recirculation System											X	2.2.22 – Knowledge of limiting conditions for operations and safety limits.	4.7	93
245000 Main Turbine Gen. / Aux.	X											K1.06 - Knowledge of the physical connections and/or cause- effect relationships between MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS and the following: Component cooling water systems	2.6	27
239001 Main and Reheat Steam		X										K2.01 - Knowledge of electrical power supplies to the following: Main steam isolation valve solenoids	3.2	28
286000 Fire Protection			X									K3.03 - Knowledge of the effect that a loss or malfunction of the FIRE PROTECTION SYSTEM will have on following: Plant protection	3.6	29
204000 RWCU				X								K4.07 - Knowledge of REACTOR WATER CLEANUP SYSTEM design feature(s) and/or interlocks which provide for the following: Draining of reactor water to various locations	2.9	30
201001 CRD Hydraulic					X							K5.08 - Knowledge of the operational implications of the following concepts as they apply to CONTROL ROD DRIVE HYDRAULIC SYSTEM : Solenoid operated valves	2.5	31
202001 Recirculation						X						K6.09 - Knowledge of the effect that a loss or malfunction of the following will have on the RECIRCULATION SYSTEM : Reactor water level	3.4	32

**NMP1 Written Examination Outline
Plant Systems – Tier 2 Group 2**

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp.	Q #
271000 Off-gas							X					A1.15 - Ability to predict and/or monitor changes in parameters associated with operating the OFFGAS SYSTEM controls including: Steam supply pressures	2.7	33
288000 Plant Ventilation								X				A2.05 - Ability to (a) predict the impacts of the following on the PLANT VENTILATION SYSTEMS ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Extreme outside weather conditions: Plant-Specific	2.6	34
219000 RHR/LPCI: Torus/Pool Cooling Mode					X							K5.04 - Knowledge of the operational implications of the following concepts as they apply to RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE : Heat exchanger Operation	2.9	35
201001 CRD Hydraulic										X		A4.03 - Ability to manually operate and/or monitor in the control room: CRD System Flow Control valve	2.9	36
201002 RMCS											X	2.1.23 - Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	37
290001 Secondary CTMT			X									K3.01 - Knowledge of the effect that a loss or malfunction of the SECONDARY CONTAINMENT will have on following: Off-site radioactive release rates	4.0	38
K/A Category Totals:	1	1	2	1	2	1	1	1/1	0	1	1/2	Group Point Total:	12/3	

Facility:		NMP1		Date:		October 2008	
Category	K/A #	Topic	RO		SRO-Only		
			IR	Q#	IR	Q#	
1. Conduct of Operations	2.1.13	Knowledge of facility requirements for controlling vital / controlled access.			3.2	94	
	2.1.20	Ability to interpret and execute procedure steps.			4.6	99	
	2.1.40	Knowledge of refueling administrative requirements	2.8	66			
	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	67			
	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	75			
	Subtotal			3		2	
2. Equipment Control	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.			4.6	95	
	2.2.21	Knowledge of pre-and post-maintenance operability requirements.			4.1	100	
	2.2.12	Knowledge of surveillance procedures.	3.7	68			
	2.2.39	Knowledge of less than one hour technical specification action statements for systems.	3.9	69			
	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.6	74			
	Subtotal			3		2	
3. Radiation Control	2.3.13	Knowledge of Radiological Safety Procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc.			3.8	96	
	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5	70			

	2.3.13	Knowledge of Radiological Safety Procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high radiation areas, aligning filters, etc.	3.4	71		
	Subtotal			2		1
4. Emergency Procedures / Plan	2.4.8	<i>Knowledge of how abnormal operating procedures are used in conjunction with EOP's.</i>			4.5	97
	2.4.40	<i>Knowledge of SRO responsibilities in emergency plan implementation.</i>			4.5	98
	2.4.32	Knowledge of operator response to loss of all annunciators.	3.6	72		
	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.	3.8	73		
Subtotal				2		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1 / 1	295005 / AK1.01 Knowledge of the operational implications of the following concepts as they apply to MAIN TURBINE GENERATOR TRIP : Pressure effects on reactor power.	(#40) Topic oversampled (see # 62) Randomly selected AK 2.04
1 / 1	295004 / AK1.01 Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: Automatic load shedding	(#41) Topic does not apply to NMP1. Randomly selected AK1.05
1 / 1	295024 / EK2.17 Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following: Aux Bldg isolation logic	(#42) Topic does not apply to NMP1. Randomly selected EK2.18
1 / 1	295006 / AK3.03 Knowledge of the reasons for the following responses as they apply to SCRAM : Reactor pressure response	(#45) Generic Fundamental Topic. Randomly selected AA1.02
1 / 1	295030 / EK3.02 Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: HPCI operation	(#46) Topic does not apply at NMP1. Randomly selected EK3.01
1 / 1	295025 / EA1.04 Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: HPCI	(#48) Topic does not apply to NMP1. Randomly selected EA1.06
1 / 1	295019 / 2.4.47 Partial or Complete Loss of Inst. Air / Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	(#56) Topic not related to EPE. Randomly selected 2.4.49
1 / 2	295017 / AK2.12 Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: Standby gas treatment/FRVS	(#60) Oversampled (see #38). Randomly selected 295008 AK2.09
1 / 2	295009 / AK3.01 Knowledge of the reasons for the following responses as they apply to LOW REACTOR WATER LEVEL : Recirculation pump run back: Plant-Specific	(#61) Topic does not apply at NMP1. Randomly selected 295002 AK3.02
1 / 2	295033 / EA2.02 Ability to determine and/or	(#63) Topic does not apply at NMP1 for RO. Randomly

	interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS : Equipment operability	selected EK2.01
1 / 2	295032 / 2.4.30 High Secondary Containment Area Temperature / Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.	(#64) Topic not related to APE for RO. Randomly selected 2.4.18
1 / 2	295029 / 2.2.25 High suppression pool water level	(#84) Topic not addressed in TS bases. Randomly selected 295007
1 / 2	295012 / 2.4.50 High Drywell temperature / Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	(#85) Topic tested in operating portion of exam. Randomly selected 295010
1 / 2	295036 / AA2.03 Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: Cause of high water level	(#83) Similar EOP-5 concepts are tested throughout the exam. Randomly selected 295020 AA2.06
1 / 2	500000 / EK3.04 Knowledge of the reasons for the following responses as they apply to HIGH PRIMARY CONTAINMENT HYDROGEN CONCENTRATIONS: Emergency depressurization	(#65) Topic does not apply to NMP 1, due to EOP change. Randomly selected EA2.01
2 / 1	259002 / K2.02 Knowledge of electrical power supplies to the following: Feedwater coolant injection (FWCI) initiation logic: FWCI/HPCI .	(#3) Topic was oversampled (power supplies) Randomly selected K1.03
2 / 1	215003 / K3.05 Knowledge of the effect that a loss or malfunction of the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM will have on following: APRM: Plant-Specific	(#6) Topic does not apply at NMP1. Randomly selected K3.02
2 / 1	300000 / K5.13 Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Filters	(#10) Oversampled (see #86). Randomly selected K5.01
2 / 1	261000 / K3.05 Knowledge of the effect that a loss or malfunction of the STANDBY GAS TREATMENT SYSTEM will	(#5) Oversampled (see #38). Randomly selected K1.03

	have on following: Secondary containment contamination/radiation levels	
2 / 1	217000 / K4.05 Knowledge of REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) design feature(s) and/or interlocks which provide for the following: Prevents radioactivity release to auxiliary/reactor building	(#7) System does not exist at NMP1. Randomly selected 212000 K4.11
2 / 1	206000 / K6.08 Knowledge of the effect that a loss or malfunction of the following will have on the HIGH PRESSURE COOLANT INJECTION SYSTEM : Reactor pressure: BWR-2,3,4	(#12) Topic oversampled. Randomly selected K6.03
2 / 1	203000 / A3.09 Ability to monitor automatic operations of the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) including: Emergency generator load sequencing	(#18) System does not exist at NMP1. Randomly selected 262001 A3.02
2 / 1	205000 / 2.4.41 <i>Shutdown Cooling / Knowledge of the emergency action level thresholds and classifications.</i>	(#88) Topic covered in operating exam. Randomly selected 2.4.9
2 / 2	219000 / A3.01 Ability to monitor automatic operations of the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE including: Valve operation	(#35) Topic does not apply at NMP1. Randomly selected K5.04
2 / 2	201004 / A4.02 Ability to manually operate and/or monitor in the control room: RSCS console switches and indicators: BWR-4,5	(#36) System does not exist at NMP1. Randomly selected 201001 A4.03
2 / 2	201002 / 2.1.27 Reactor manual control system / system purpose	(#37) Topic does not lend itself to a discriminating question (system function) Randomly selected 2.1.23
3	2.4.40 - Knowledge of SRO responsibilities in emergency plan implementation.	(#72) Not an RO level topic. Randomly selected 2.4.32
3	2.2.4 - (multi-unit license) Ability to explain the variations in control board/control room layouts, systems, instrumentation, and procedural actions between units at a facility.	(#74) Not a multi unit license. Randomly selected 2.2.2
3	2.3.15 - Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	(#98) Topic covered in Admin JPM. Randomly selected 2.4.40

2 / 2	245000 Main Turbine and Gen Aux., 2.1.30 - Conduct of Operations: Ability to locate and operate components, including local controls.	(#93) Not an SRO level topic. Reselected per NRC direction, 202001 - 2.2.22

Facility: Nine Mile Point Unit 1
Examination Level: SRO

Date of Examination: October 2008
Operating Test Number: 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N	<p>PERFORM A TIME TO BOIL CALCULATION FOR THE SPENT FUEL POOL</p> <p>Given shutdown conditions perform a time to boil calculation</p> <p>N1-ODP-OPS-0108</p> <p>2.1.37 (4.6) Knowledge of procedures, guidelines, or limitations associated with reactivity management</p>
Conduct of Operations	N	<p>DETERMINE PERSONNEL OVERTIME AVAILABILITY</p> <p>Given a list of personnel and their previous work hours, determine who is available for overtime and why others are not available based on Tech Spec and administrative requirements.</p> <p>GAP-FFD-02</p> <p>2.1.5 (3.9) Ability to use procedures related to shift staffing, such as minimum crew requirements, overtime limitations, etc.</p>
Equipment Control	D	<p>REVIEW SURVEILLANCE DATA INCLUDING ACTIONS FOR UNSATISFACTORY CONDITIONS</p> <p>Review and evaluate surveillance acceptance criteria including TS implication for unsatisfactory conditions.</p> <p>N1-ST-Q19; Technical Specifications</p> <p>2.2.12 (3.4) Knowledge of surveillance procedures. 2.2.24 (3.8) Ability to analyze the effect of maintenance activities on LCO status.</p>
Radiation Control	P	<p>DETERMINE ACTIONS REQUIRED FOR AN INOPERABLE EFFLUENT RADIATION MONITOR</p> <p>Given plant conditions, determine operability of an effluent radiation monitor and apply action statements contained in the station ODCM. (CR NM-2004-976)</p> <p>ARP H1-4-5, ODCM</p> <p>2.3.11 (4.3) Ability to control radiation releases.</p>

Emergency Plan	N	<p>CLASSIFY EMERGENCY EVENTS AND COMPLETE NOTIFICATION FACT SHEET</p> <p>Classify emergency events based on plant conditions and complete the appropriate notification form(s). Given further degraded plant conditions, reclassify the emergency event.</p> <p>EPIP-EPP-01, EPIP-EPP-01-EAL, EPIP-EPP-20</p> <p>2.4.40 (4.5) Knowledge of SRO responsibilities in emergency plan implementation 2.4.41 (4.6) Knowledge of the emergency action level thresholds and classifications</p>
<p>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.</p>		
<p>* Type Codes & Criteria:</p> <p>(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)</p>		

Facility: Nine Mile Point Unit 1Date of Examination: October 2008Examination Level: ROOperating Test Number: 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D	PERFORM CONTROL SWITCH LINEUP VERIFICATION While performing N1-PM-D002 lineup verification, identify system components that are not in the correct lineup N1-PM-D002 2.1.29 (4.1) Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.
Conduct of Operations	N	DETERMINE PERSONNEL OVERTIME AVAILABILITY Given a list of personnel and their previous work hours, determine who is available for overtime and why others are not available based on Tech Spec and administrative requirements GAP-FFD-02 2.1.5 (3.9) Ability to use procedures related to shift staffing, such as minimum crew requirements, overtime limitations, etc.
Equipment Control	N	PERFORM DAILY THERMAL LIMIT SURVEILLANCE Perform the Daily Thermal Limit Surveillance and identify discrepancies N1-RESP-1, 3D Monicore 2.2.12 (3.7) Knowledge of surveillance procedures
Emergency Plan	D	PERFORM ACTIONS FOR A MEDICAL EMERGENCY WITH AN INJURED, CONTAMINATED PERSON Given a report of a medical emergency with an injured, contaminated person, perform the actions of the Chief Shift Operator Medical Emergency Checklist. EPIP-EPP-04 2.4.39 (3.9) Knowledge of RO responsibilities in emergency plan implementation.

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)

Facility:	Nine Mile Point Unit 1	Date of Examination:	October 2008
Exam Level:	RO/SRO-I/SRO-U	Operating Test No.:	1
Control Room Systems® (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF) SRO-U in BOLD - #'s S-1,3,7/P-1,2			
System / JPM Title		Type Code*	Safety Function
S-1	Initiate Liquid Poison Injection, RWCU Fails to Isolate K/A 211000 A1.08 3.7/3.8	D,A,EN,S	1
S-2	Transfer Torus Water to the Waste Collector Tank Using Containment Spray Loop 111 K/A 295029 EA1.03 2.9/3.0	D,S	5
S-3	Transfer Load from #11 and #12 Feedwater Pumps to #13 Feedwater Pump, #13 Feedwater FCV fails closed K/A 259001 A2.07 3.7/3.8	N,A,S	2
S-4	Startup Control Room Ventilation System K/A 290003 A4.01 3.2/3.2	D,P,S	9
S-5	EDG 103 S/D – PB 103 Return to Normal Power K/A 264000 A4.05 3.6/3.7	N,A,S	6
S-6	Perform RWM Diagnostic & Rod Block Tests K/A 201006 A4.01 thru A4.06, 2.9/2.9 to 3.3/3.4	N,S	7
S-7	Remove the Generator from the Grid and Perform Emergency Governor Trip Test K/A 245000 A4.02 (3.1/2.9), A4.06 (2.7/2.6)	N,S	4
S-8 RO ONLY	Alternate RPV Blowdown Through Emergency Condenser Vents to Torus K/A 207000 A1.05 (4.0/4.2), A4.05 (3.5/3.7), A4.07 (4.2/4.3)	D,L,S	3
In-Plant Systems® (3 for RO; 3 or 2 for SRO-U)			
P-1	Air Start the Diesel Fire Pump K/A 286000 A3.01 3.4/3.4	D, E	8
P-2	Initiation of Emergency Condensers from Remote Shutdown Panel 11 K/A 295016 AA1.09 4.0/4.0	D,A,E,L,R	3
P-3	Place UPS 162A in Standby from Shutdown Condition and Transfer to Supply RPS 11 K/A 212000 A1.04 (2.8/3.0), A1.05 (2.6/2.7)	M,R	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
(A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator	4-6 / 4-6 / 2-3 $\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ - / - / ≥ 1 (control room system) $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$ (randomly selected) $\geq 1 / \geq 1 / \geq 1$

**2007 NRC Examination
Summary Description of JPMs**

- S-1 This is an alternate path bank JPM in the Reactivity Control Safety Function area. The applicant will inject Liquid Poison N1-OP-12 and Reactor Water Cleanup will fail to isolate requiring manual actions.
- S-2 This is a bank JPM in the Containment Integrity Safety Function area. The applicant will transfer torus water to the Waste Collector Tank using Containment Spray Loop 111 IAW N1-EOP-1, Att.15.
- S-3 This is a new alternate path JPM in the Rx Water Inventory Control Safety Function area. The applicant will transfer load from #11 and #12 Feedwater Pumps to #13 Feedwater Pump IAW N1-OP-16 and the #13 pump flow control valve will malfunction requiring manual actions to control vessel level.
- S-4 This is a bank JPM in the Radioactivity Release Safety Function area. The applicant will startup Control Room Ventilation IAW N1-OP-49.
- S-5 This is a new alternate path JPM in the Electrical Safety Function area. The applicant will shutdown Emergency Diesel Generator 103 and return Powerboard 103 to Normal Power IAW N1-OP-45, section G.2.0. The Emergency Diesel Generator will fail to stop after a cooldown period, requiring a manual trip to be performed.
- S-6 This is a new JPM in the Instrumentation Safety Function area. The applicant will perform Rod Worth Minimizer Post Maintenance Tests IAW N1-ST-V3, Section 8.2 thru 8.4.
- S-7 This is a new JPM in the Heat Removal Safety Function area. The applicant will perform the Emergency Governor Trip Test and Remove the Generator from the Grid IAW N1-OP-31, Section G.2.0 and N1-PM-V7, Section 8.1.
- S-8 This is a bank JPM in the Reactor Pressure Control Safety Function area. The applicant will perform an Alternate RPV Blowdown Through the Emergency Condenser Vents to Torus IAW N1-EOP-1, Att.14.

- P-1 This is a bank JPM in the Plant Service Systems Safety Function area. The applicant will perform an Air Start of the Diesel Fire Pump IAW N1-OP-21A, Section H.4.4.
- P-2 This is an alternate path bank JPM in the Reactor Pressure Control Safety Function area. The applicant will perform an Initiation of ECs from Remote Shutdown Panel 11 IAW N1-SOP-21.2. Additional actions will be required to control the reactor pressure.
- P-3 This is a modified bank JPM in the Electrical Safety Function area. The applicant will place UPS 162A in Standby from a Shutdown Condition and Transfer the supply to RPS 11 IAW N1-OP-40, Section E.1.0.

Facility: Nine Mile Point 1		Scenario No.: NRC-01		Op-Test No.: October 2008	
Examiners: _____			Operators: _____		
Initial Conditions: Simulator IC 171					
1. Reactor Power approximately 4%					
Turnover:					
1. The crew is directed to shutdown the reactor by inserting control rods					
2. Crew is directed to perform N1-OP-09, N ₂ Inerting and H ₂ -O ₂ Monitoring Systems step G.1 to de-inert the Primary Containment with Rx Coolant Temp >212°F					

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP) N (SRO)	De-inert the containment IAW N1-OP-09, N ₂ Inerting and H ₂ -O ₂ Monitoring Systems
2	Override	C (BOP) C (SRO) TS (SRO)	201-31 DW N2 VENT & PURGE ISOLATION VALVE 12 does NOT fully close
3	N/A	R (RO) R (SRO)	Insert control rods to continue the shutdown
4	RM6V HV04	I (BOP) I (SRO) TS (SRO)	Reactor Building Radiation Monitor 12 fails upscale with a failure of the Reactor Building to isolate (EOP-5)
5	RR06A RR07A	C (BOP) C (SRO) TS (SRO)	Recirc Pump 11 seal failure, Recirc Pump must be shutdown and isolated (SOP-1.2)
6	RX01 (7%)	C (ALL)	Fuel failure causes rising Off-Gas and Main Steam Line Radiation, requires a reactor scram (SOP-25.2)
7	RD33C	C (RO) C (SRO)	Multiple control rods fail to fully insert (SOP-1)
8	EC06A	M (ALL)	Failure of Tubes in Emergency Condenser 11 results in radioactive release to the atmosphere (EOP-6)
9	EC07A EC08A EC08B	C (ALL)	Emergency Condenser will not isolate, requiring an RPV Blowdown (EOP-8)

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

Facility: Nine Mile Point 1		Scenario No.: NRC-01	Op-Test No.: October 2008
TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.5.d)		ACTUAL ATTRIBUTES	
1. Total malfunctions (5-8) Events 2, 4, 5, 6, 7, 9		6	
2. Malfunctions after EOP entry (1-2) Event 9		1	
3. Abnormal events (2-4) Events 4, 5, 6, 7		4	
4. Major transients (1-2) Event 8		1	
5. EOPs entered/requiring substantive actions (1-2) Event 8 (EOP-6)		1	
6. EOP contingencies requiring substantive actions (0-2) Events 9 (EOP-8)		1	
7. Critical tasks (2-3)		2	
CRITICAL TASK DESCRIPTIONS: CT-1.0 Given a fuel failure, the crew will insert a manual reactor scram as Main Steam Line radiation levels rise. CT-2.0 Given unisolable primary system leak, indications of fuel failure and rising off-site release rates approaching the General Emergency level, the crew will perform an RPV Blowdown.			

SCENARIO SUMMARY

Length: 90 minutes

Initial Power Level: 4% with plant shutdown in progress

Mitigating Strategy Code: RR4, fuel leak with a failure of EC tubes and EC fails to isolate, requires RPV Blowdown to stop release

The crew assumes the shift with the plant being shutdown. The crew is directed to de-inert the containment in accordance with N1-OP-9, N₂ Inerting and H₂-O₂ Monitoring Systems. When drywell pressure is lowered to 0 psig, the operator will secure the lineup, but one of the containment isolation valves will fail to fully close. This will require entry into Technical Specifications and ensuring a second valve in the line is isolated. Then the crew will continue the shutdown by inserting control rods.

Next Reactor Building Radiation Monitor 12 will fail upscale causing a trip of RBVS and a start of RBEVS. Additionally there will be a failure of the Reactor Building to isolate. The crew must isolate the Reactor Building to restore Secondary Containment and the SRO must address Technical Specifications. When these actions are complete, both seals on the 11 Recirculation Pump will fail requiring the crew to shutdown and isolate the pump. Following the loss of the Recirculation Pump, a fuel failure will cause offgas and main steam line radiation levels to rise, requiring a reactor scram and vessel isolation. Multiple control rods will fail to fully insert during the scram requiring the crew to enter N1-SOP-1 and take alternate actions to insert the control rods. The rods are inserted using RMCS.

Following the scram, the crew will diagnose an Emergency Condenser tube leak. They will try to isolate the affected EC but the isolation valves will fail to fully close. Rising off site radiation levels will require an RPV blowdown before General Emergency levels are reached.

Major Procedures: N1-SOP-1.2, N1-SOP-25.2, N1-SOP-1.1, N1-SOP-1, N1-EOP-2, N1-EOP-6, and N1-EOP-8

EAL Classification: Site Area Emergency, EALs 3.4.1, 5.1.3 and 5.2.4

Termination Criteria: RPV Blowdown in progress, RPV water level controlled in assigned band

Facility: Nine Mile Point 1		Scenario No.: NRC-02		Op-Test No.: October 2008	
Examiners: _____			Operators: _____		
Initial Conditions: Simulator IC 172					
1. Reactor Power approximately 90% 2. Four Recirculation Loops in service					
Turnover:					
1. Recirc Pump 15 MG set has been repaired and should be returned to service. 2. After starting Recirc Pump 15 MG set operate it for one hour while maintenance takes readings before returning to 100% power.					
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	R (RO) R (SRO)	Lower power to permit returning Recirc Pump 15 to service		
2	N/A	N (BOP) N (SRO)	Restore Recirc Pump 15 to service		
3	EG02	I (RO) I (SRO)	Main Generator Auto Voltage Regulator fails		
4	RD36A	C (BOP) C (SRO) TS (SRO)	Control Rod Drive Flow Control Valve 44-151 fails closed, requiring shifting to the alternate FCV (SOP-5.1)		
5	ED04	C (BOP) C (SRO) TS (SRO)	Loss of Powerboard 11 (SOP-30.1)		
6	CU11	C	Primary to Secondary Containment leak (EOP-5)		
7	CU14	M (ALL)	Reactor Water Cleanup fails to isolate, requiring RPV Blowdown (EOP-5 and EOP-8)		
8	RP05B	C (RO) C (SRO)	Failure of Reactor Mode Switch and RPS Pushbuttons to cause a scram (EOP-3)		

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

Facility: Nine Mile Point 1		Scenario No.: NRC-02	Op-Test No.: October 2008
TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.5.d)		ACTUAL ATTRIBUTES	
1. Total malfunctions (5-8) Events 3, 4, 5, 6, 8		5	
2. Malfunctions after EOP entry (1-2) Event 8		1	
3. Abnormal events (2-4) Events 3, 4, 5, 6		4	
4. Major transients (1-2) Event 7		1	
5. EOPs entered/requiring substantive actions (1-2) Events 6 and 7 (EOP-5)		1	
6. EOP contingencies requiring substantive actions (0-2) Events 7, 8 (EOP-3, EOP-8)		2	
7. Critical tasks (2-3)		3	
CRITICAL TASK DESCRIPTIONS: CT-1.0 Given an un-isolable RWCU leak outside primary containment and one general area temperature above the maximum safe limit, the crew will insert a manual reactor scram. CT-2.0 Given a failure of RPS to de-energize when a scram is required, the crew will insert control rods by initiating manual Alternate Rod Insertion (ARI). CT-3.0 Given an un-isolable RWCU leak outside primary containment and two general area temperatures above the maximum safe limit, the crew will perform an RPV Blowdown.			

SCENARIO SUMMARY

Length: 90 minutes

Initial Power Level: 90%, 4 Loop Operation

Mitigating Strategy Code: SC1, un-isolable primary system leak in the Secondary Containment, RPV Blowdown required

The crew assumes the shift with the plant operating at 90% power and four recirculation loops in service. Immediately after assuming the shift the crew will be directed to restore Recirculation Pump 15 to service and return to full power. The crew will assess plant conditions and lower power with Recirculation Flow until flow is less than 50 Mlbm/hr. They will then return Recirculation Pump 15 to service. After the crew has placed the pump in service, the Main Generator Auto Voltage Regulator will fail. The crew will diagnose the failure and take manual control of generator voltage and restore the correct generator output. When a normal generator output is established, the Control Rod Drive Flow Control Valve fails closed, requiring shifting to the alternate FCV. After CRD flow is returned to normal, a loss of power to Power Board 11 occurs. The SRO will address Technical Specifications.

A Reactor Water Cleanup system line break will occur in the Secondary Containment downstream of the Supply Isolation Valves. Reactor Water Cleanup will fail to isolate on high area temperature. The crew will attempt to isolate the system, but the valves will fail to fully close. This break will require a scram and RPV blowdown due to exceeding the Maximum Safe Value for general area temperatures. When the Mode Switch is placed in SHUTDOWN and/or the Reactor Trip pushbuttons on the E Panel are pushed the reactor will NOT scram. ARI must be manually initiated to scram the control rods.

Major Procedures: N1-SOP-1, N1-SOP-1.1, N1-SOP-1.3, N1-SOP-5.1, N1-SOP-30.1, N1-EOP-2, N1-EOP-3, N1-EOP-5, and N1-EOP-8

EAL Classification: Site Area Emergency, EALs 3.4.1, 4.1.1

Termination Criteria: All control rods are in, RPV Blowdown in progress, RPV water level controlled in assigned band

Facility: Nine Mile Point 1 Scenario No.: NRC-03 Op-Test No.: October 2008 Examiners: _____ Operators: _____ Initial Conditions: Simulator IC 173 1. Reactor Power approximately 100% (CRD Pump 12 must be in service) Turnover: 1. Turbine Surveillance Testing, N1-PM-Q7, to be performed 2. Feed Pump 12 is out of service because of a burned out motor			
Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (BOP) N (SRO)	Perform N1-PM-Q7, Turbine Thrust Bearing Test
2	NM21C	I (RO) I (SRO) TS (SRO)	APRM 13 fails inop
3	ED08 ED21	C (BOP) C (SRO) TS (SRO)	PB 103 and 17B trip on fault, crew must switch to CRD Pump 11 (SOP-5.1)
4	FW02A Override	C (BOP) C (SRO) TS (SRO)	Feedwater Booster Pump 11 Trip with failure of the standby pump to auto start
5	FW14C	I (BOP) I (SRO)	Failure of the Feedwater Master Controller AS-IS, requires manually controlling RPV water level (SOP-16.1)
6	FW03A	R (RO) R (SRO) TS (SRO)	Trip of Feedwater Pump 11 requires Emergency Power Reduction (SOP-16.1, SOP-1.1)
7	CU01	M (ALL)	RPV coolant leak in the Primary Containment (EOP-2, EOP-4)
8	ED26 ED27	C (ALL)	When the turbine trips, PB11 and 12 fail to transfer (SOP-30.1, SOP-30.2)
9	CS01C CS03C	C (ALL)	The inboard IV for Core Spray 111 fails to open and Core Spray 121 fails to start

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

Facility: Nine Mile Point 1		Scenario No.: NRC-03	Op-Test No.: October 2008
TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.5.d)		ACTUAL ATTRIBUTES	
1. Total malfunctions (5-8) Events 2, 3, 4, 5, 6, 8, 9		7	
2. Malfunctions after EOP entry (1-2) Events 8, 9		2	
3. Abnormal events (2-4) Events 2, 3, 4, 5, 6, 8		6	
4. Major transients (1-2) Event 7		1	
5. EOPs entered/requiring substantive actions (1-2) Events 7, 9 (EOP-2, EOP-4)		2	
6. EOP contingencies requiring substantive actions (0-2) Events 7, 9 (EOP-2 Alternate Level Leg, EOP-8)		2	
7. Critical tasks (2-3)		3	
CRITICAL TASK DESCRIPTIONS: CT-1.0 Given a LOCA with a loss of high pressure injection, the crew will execute N1-EOP-8, RPV Blowdown when RPV water level drops below -84 inches. CT-2.0 Given a LOCA with a loss of high pressure injection and Core Spray, the crew will inject to the RPV with Condensate and Feedwater Booster pumps. CT-3.0 Given a LOCA in the Drywell, the crew will initiate Containment Sprays to prevent exceeding PSP.			

SCENARIO SUMMARY

Length: 90 minutes

Initial Power Level: Approximately 100%, above 100% rodline

Mitigating Strategy Code: RL2, Small LOCA, RPV Blowdown required to permit injection with low pressure systems to recover RPV water level above TAF

SUMMARY

The crew assumes the shift with the plant at 100% power with Feedwater Pump 12 under clearance for maintenance. The crew will perform N1-PM-Q7, Turbine Thrust Bearing Test from the Control Room. Next, APRM 13 fails. The crew will bypass the APRM and reset the half scram. Next, Powerboard 103 trips on fault. The crew will take action to secure EDG 103 and attempt to restore Powerboard 17B. Powerboard 103 and Powerboard 17B are both faulted and are not restored. The trip of CRD Pump 12 (PB 17B) will require starting CRD Pump 11 and the SRO must address Technical Specifications.

When the necessary steps for the loss of Powerboard 103 are completed, Feedwater Booster Pump 11 will trip with a failure of the standby pump to start. The standby pump can be manually started. The SRO must again address Technical Specifications. When the standby Feedwater Booster Pump is manually started, the Master Feedwater Controller will fail as-is. RPV water level will slowly deviate from the set level. The crew must diagnose the failure and the BOP operator will be required to take manual control of RPV level. With RPV water level in manual control, Feedwater Pump 11 will trip because of delayed effects from the earlier Feedwater Booster Pump trip. This will require an entry into N1-SOP-1.1, Emergency Power Reduction to lower power to within the capacity of Feedwater Pump 13.

While troubleshooting the electrical faults and troubles with the Feedwater system, the crew recognizes a coolant leak in the containment. Drywell pressure and temperature rise, requiring the crew to insert a manual SCRAM on rising drywell pressure. When the turbine trips, Powerboards 11 and 12 fail to automatically transfer. This results in a loss of feedwater, condensate, circulating water and other loads. Operators are able to restore these power boards. RPV water level continues to drop with only one liquid poison pump and CRD pump 11 available for injection. The crew will determine they cannot maintain level above -109" and enter N1-EOP-8, RPV Blowdown. While blowing down the crew must diagnose that the inboard IV for Core Spray 111 fails to open and Core Spray pump 121 fails to start. With Core Spray unavailable for injection, the crew will inject with the feedwater booster pumps using N1-EOP-1, Att 25 or 26.

Major Procedures: N1-SOP-1, N1-SOP-1.1, N1-SOP-5.1, N1-SOP-16.1, N1-SOP-30.1, N1-SOP-30.2, N1-EOP-1, N1-EOP-2, N1-EOP-4, N1-EOP-8

Termination Criteria: RPV Blowdown in progress, RPV water level above TAF and controlled in assigned band, containment pressure controlled in accordance with N1-EOP-1 Att 17

EAL Classification: Alert, EAL 3.1.1

Facility: Nine Mile Point 1		Scenario No.: NRC-04		Op-Test No.: October 2008	
Examiners: _____			Operators: _____		
Initial Conditions: Simulator IC 174					
1. Reactor Power approximately 90% for a rod pattern adjustment					
Turnover:					
1. Maintenance completed work on TBCLC pump 12					
2. APRM 13 bypassed due to failed power supply					
3. Recirc Pump 14 OOC due to high vibrations					

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (RO) R (SRO)	Control rod pattern adjustment
2	N/A	N (BOP) N (SRO)	Return TBCLC Pump 12 to service and secure TBCLC Pump 11
3	CW16A	C (BOP) C (SRO)	Service Water Discharge Strainer high D/P requires shifting Service Water Pumps
4	RM1A	TS (SRO)	Main Steam Line Radiation Monitor 111 fails
5	RP16B RR92	I (ALL) TS (SRO)	RPS pressure instrument and FWLC pressure instrument (same instrument line) fail low, requires manual FWLC (SOP-16.1)
6	CW12 H2-1-3	C (ALL)	Trip of Intake Traveling Screens resulting in a low level in the Intake Structure and loss of normal heat sinks, emergency power reduction required (SOP-18.1)
7	RD33A, B, C, D, E	M (ALL)	ATWS (EOP-2, EOP-3)
8	RR29	C (ALL)	A coolant leak in the drywell will develop during the ATWS (EOP-4)
9	FW24 FW28 Overrides	C (BOP) C (SRO)	The crew will be unable to re-inject with feedwater/ condensate because the valves they used to terminate and prevent will fail closed (EOP-8)

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

Facility: Nine Mile Point 1		Scenario No.: NRC-04	Op-Test No.: October 2008
TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.5.d)		ACTUAL ATTRIBUTES	
1. Total malfunctions (5-8) Events 3, 4, 5, 6, 8, 9		6	
2. Malfunctions after EOP entry (1-2) Events 8, 9		2	
3. Abnormal events (2-4) Event 3, 4, 5, 6		4	
4. Major transients (1-2) Event 7		1	
5. EOPs entered/requiring substantive actions (1-2) Event 8 (EOP-4)		1	
6. EOP contingencies requiring substantive actions (0-2) Events 7, 9 (EOP-3, EOP-8)		2	
7. Critical tasks (2-3)		3	
CRITICAL TASK DESCRIPTIONS: CT-1.0 Given a failure of the reactor to scram with power above 6% or unknown and RPV water level above -41 inches, the crew will terminate and prevent all injection except boron and CRD. CT-2.0 Given a failure of the reactor to scram with RPV water level unable to be restored and maintained above -109 inches with Condensate/Feedwater and CRD, the crew will perform an RPV Blowdown and re-establish injection with Core Spray. CT-3.0 Given a LOCA in the Drywell, the crew will initiate Containment Sprays to prevent exceeding PSP.			

SCENARIO SUMMARY

Length: 90 minutes

Initial Power Level: Approximately 90%, 4 loop operation

Mitigating Strategy Code: AT3, high power ATWS with small LOCA, Blowdown required, re-inject with Core Spray

The scenario begins with the crew performing a control rod pattern adjustment. Next, the crew will be directed to return TBCLC Pump 12 to service and secure TBCLC Pump 11. Next the crew must respond to high D/P across one of the Service Water Pump Discharge Strainers. This will require placing another Service Water Pump in service. Once the standby Service Water Pump has been started, Main Steam Line Radiation Monitor 111 will become inoperable. The SRO will determine the Technical Specification implications.

When this is complete, an RPS pressure transmitter will fail low, followed closely by the in-service feedwater system pressure transmitter also failing low. The crew will be required to shift to manual feedwater level control. The crew may then shift reactor pressure/level columns and return to automatic feedwater level control. Technical Specifications must be addressed due to the RPS pressure transmitter failure. Next the intake structure traveling screens clog causing high D/Ps. This will eventually result in a low level in the intake structure with the subsequent tripping of the Circulating Water pumps. This will require entering N1-SOP-18.1, Service Water Failure/Low Intake Level. As intake level continues to lower, the crew will insert a manual scram.

When the scram occurs the control rods will not insert. This ATWS is complicated by the total loss of the normal heat sinks. Additionally, following the ATWS, a Recirculation Line break will cause RPV water level to lower, requiring the crew to re-establish injection. When the crew attempts to re-establish Feedwater flow, the Feedwater isolation valves will not re-open. When it is determined that RPV water level cannot be restored and maintained above -109 inches, the crew will perform an RPV Blowdown, and re-inject with Core Spray.

Major Procedures: N1-SOP-1.1, N1-SOP-16.1, N1-SOP-18.1, N1-EOP-1, N1-EOP-2, N1-EOP-3, N1-EOP-3.1, N1-EOP-4, N1-EOP-8

EAL Classification: Site Area Emergency, EAL 2.2.2

Termination Criteria: RPV Blowdown in progress, RPV water level above -109 inches and controlled in assigned band, containment pressure controlled in accordance with N1-EOP-1 Att 1