

Facility:		Oyster Creek		Date of Exam:		05/14/12											
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 Evolutions	1	3	4	3				3	4			3	20	3	4	7	
	2	1	1	1				2	1			1	7	2	1	3	
	Tier Totals	4	5	4				5	5			4	27	5	5	10	
2. Plant Systems	1	2	3	3	2	3	2	2	2	2	3	2	26	2	3	5	
	2	2	1	1	1	1	1	1	1	1	1	1	12	0	2	3	
	Tier Totals	4	4	4	3	4	3	3	3	3	4	3	38	4	4	8	
3. Generic Knowledge & Abilities Categories				1		2		3		4		10	1	2	3	4	7
				3		2		3		2			2	2	2	1	
<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>																	

ILT 11-1 NRC Written Exam
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#
295023 Refueling Acc Cooling Mode / 8					X		AA2.02 - Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS : Entry conditions of emergency plan	4.6	1
295031 Reactor Low Water Level / 2					X		EA2.04 - Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL : Adequate core cooling	4.8	2
295021 Loss of Shutdown Cooling / 4					X		AA2.05 - Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING : Reactor vessel metal temperature	3.5	3
295026 Suppression Pool High Water Temp. / 5						X	2.2.37 - Equipment Control: Ability to determine operability and / or availability of safety related equipment.	4.6	4
295018 Partial or Total Loss of CCW / 8						X	2.2.22 - Equipment Control: Knowledge of limiting conditions for operations and safety limits.	4.7	5
295004 Partial or Total Loss of DC Pwr / 6						X	2.2.38 - Equipment Control: Knowledge of conditions and limitations in the facility license.	4.5	6
600000 Plant Fire On-site / 8						X	2.4.29 - Knowledge of the emergency plan.	4.4	7
295021 Loss of Shutdown Cooling / 4	X						AK1.03 - Knowledge of the operational implications of the following concepts as they apply to LOSS OF SHUTDOWN COOLING : Adequate core cooling	3.9	39
295030 Low Suppression Pool Water Level / 5	X						EK1.02 - Knowledge of the operational implications of the following concepts as they apply to LOW SUPPRESSION POOL WATER LEVEL: Pump NPSH	3.5	40
295023 Refueling Acc Cooling Mode / 8	X						AK1.01 - Knowledge of the operational implications of the following concepts as they apply to REFUELING ACCIDENTS : Radiation exposure hazards	3.6	41
600000 Plant Fire On-site / 8		X					AK2.03 - Knowledge of the interrelations between PLANT FIRE ON SITE and the following: Motors	2.5	42
295025 High Reactor Pressure / 3		X					EK2.04 - Knowledge of the interrelations between HIGH REACTOR PRESSURE and the following: ARI/RPT/ATWS: Plant-Specific	3.9	43
295006 SCRAM / 1		X					AK2.02 - Knowledge of the interrelations between SCRAM and the following: Reactor water level control system	3.8	44
700000 Generator Voltage and Electric Grid Disturbances			X				AK3.01 - Knowledge of the reasons for the following responses as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Reactor and turbine trip criteria	3.9	45
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1			X				EK3.01 - Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : Recirculation pump trip/runback: Plant-Specific	4.1	46
295005 Main Turbine Generator Trip / 3			X				AK3.04 - Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP:	3.2	47

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EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
							Main generator trip		
295016 Control Room Abandonment / 7				X			AA1.03 - Ability to operate and/or monitor the following as they apply to CONTROL ROOM ABANDONMENT : RPIS	3.0	48
295024 High Drywell Pressure / 5				X			EA1.17 - Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: Containment spray: Plant-Specific	3.9	49
295028 High Drywell Temperature / 5				X			EA1.03 - Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE : Drywell cooling system	3.9	50
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					X		AA2.01 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Power/flow map	3.5	51
295004 Partial or Total Loss of DC Pwr / 6					X		AA2.03 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Battery voltage	2.8	52
295031 Reactor Low Water Level / 2					X		EA2.01 - Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL : Reactor water level	4.6	53
295026 Suppression Pool High Water Temp. / 5						X	2.4.18 - Emergency Procedures / Plan: Knowledge of the specific bases for EOPs.	3.3	54
295019 Partial or Total Loss of Inst. Air / 8						X	2.4.50 - Emergency Procedures / Plan: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4.2	55
295018 Partial or Total Loss of CCW / 8						X	2.1.23 – Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.4	56
295003 Partial or Complete Loss of AC / 6					X		AA2.02 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Reactor power, pressure, and level	4.2	57
295038 High Off-site Release Rate / 9		X					EK2.06 - Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: Process liquid radiation monitoring system	3.4	58
K/A Category Totals:	3	4	3	3	4/3	3/4	Group Point Total:	20/7	

ILT 11-1 NRC Written Exam
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#
295009 Low Reactor Water Level / 2					X		AA2.03 - Ability to determine and/or interpret the following as they apply to LOW REACTOR WATER LEVEL : Reactor water cleanup blowdown rate	2.9	8
295036 Secondary Containment High Sump/Area Water Level / 5						X	2.4.47 - Emergency Procedures / Plan: Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	9
295014 Inadvertent Reactivity Addition / 1					X		AA2.04 - Ability to determine and/or interpret the following as they apply to INADVERTENT REACTIVITY ADDITION : Violation of fuel thermal limits	4.4	10
295015 Incomplete SCRAM / 1	X						AK1.03 - Knowledge of the operational implications of the following concepts as they apply to INCOMPLETE SCRAM : Reactivity effects	3.8	59
295020 Inadvertent Cont. Isolation / 5 & 7		X					AK2.08 - Knowledge of the interrelations between INADVERTENT CONTAINMENT ISOLATION and the following: Traversing in-core probes: Plant-Specific	2.5	60
295032 High Secondary Containment Area Temperature / 5			X				EK3.01 - Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE : Emergency/normal depressurization	3.5	61
295012 High Drywell Temperature / 5				X			AA1.02 - Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE : Drywell cooling system	3.8	62
295008 High Reactor Water Level / 2					X		AA2.04 - Ability to determine and/or interpret the following as they apply to HIGH REACTOR WATER LEVEL : Heatup rate: Plant-Specific	3.1	63
295007 High Reactor Pressure / 3						X	2.2.12 - Equipment Control: Knowledge of surveillance procedures.	3.7	64
295017 High Off-site Release Rate / 9				X			AA1.10 - Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE : RPS	3.6	65
K/A Category Totals:	1	1	1	2	1/2	1/1	Group Point Total:	7/3	

ILT 11-1 NRC Written Exam
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#
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262001 AC Electrical Distribution								X					A2.08 - Ability to (a) predict the impacts of the following on the A.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Opening a disconnect under load	3.6	11
212000 RPS								X					A2.09 - Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High containment/drywell pressure	4.3	12
207000 Isolation (Emergency) Condenser											X		2.2.40 - Equipment Control: Ability to apply Technical Specifications for a system.	4.7	13
400000 Component Cooling Water											X		2.4.11 – Knowledge of abnormal condition procedures.	4.2	14
215003 IRM											X		2.4.41 - Emergency Procedures / Plan: Knowledge of the emergency action level thresholds and classifications.	4.6	15
259002 Reactor Water Level Control	X												K1.15 - Knowledge of the physical connections and/or cause- effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following: Recirculation flow control system	3.2	1
205000 Shutdown Cooling	X												K1.05 - Knowledge of the physical connections and/or cause- effect relationships between SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) and the following: Component cooling water systems	3.1	2
262001 AC Electrical Distribution		X											K2.01 - Knowledge of electrical power supplies to the following: Off-site sources of power	3.3	3
215003 IRM		X											K2.01 - Knowledge of electrical power supplies to the following: IRM channels/detectors	2.5	4
212000 RPS			X										K3.03 - Knowledge of the effect that a loss or malfunction of the REACTOR PROTECTION SYSTEM will have on following: Local power range monitoring system: Plant-Specific	3.3	5
300000 Instrument Air			X										K3.01 - Knowledge of the effect that a loss or malfunction of the (INSTRUMENT AIR SYSTEM) will have on the following: Containment air system	2.7	6

ILT 11-1 NRC Written Exam
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#
400000 Component Cooling Water				X									3.4	7
264000 EDGs				X									2.5	8
215004 Source Range Monitor					X								2.6	9
218000 ADS					X								3.8	10
262002 UPS (AC/DC)						X							2.7	11
207000 Isolation (Emergency) Condenser						X							3.0	12
263000 DC Electrical Distribution							X						2.5	13
215005 APRM / LPRM							X						3.3	14
239002 SRVs								X					4.1	15

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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#
223002 PCIS/Nuclear Steam Supply Shutoff								X				A2.06 - Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Containment instrumentation failures	3.0	16
261000 SGTS									X			A3.04 - Ability to monitor automatic operations of the STANDBY GAS TREATMENT SYSTEM including: System temperature	3.0	17
209001 LPCS									X			A3.02 - Ability to monitor automatic operations of the LOW PRESSURE CORE SPRAY SYSTEM including: Pump start	3.8	18
211000 SLC										X		A4.01 - Ability to manually operate and/or monitor in the control room: Tank level	3.9	19
209001 LPCS										X		A4.02 - Ability to manually operate and/or monitor in the control room: Suction valves	3.5	20
205000 Shutdown Cooling											X	2.2.22 - Equipment Control: Knowledge of limiting conditions for operations and safety limits.	4.0	21
239002 SRVs											X	2.1.28 - Conduct of Operations: Knowledge of the purpose and function of major system components and controls.	4.1	22
263000 DC Electrical Distribution						X						K5.01 - Knowledge of the operational implications of the following concepts as they apply to D.C. ELECTRICAL DISTRIBUTION : Hydrogen generation during battery charging.	2.6	23
218000 ADS										X		A4.05 - Ability to manually operate and/or monitor in the control room: ADS timer reset	4.2	24
211000 SLC		X										K2.02 - Knowledge of electrical power supplies to the following: Explosive valves	3.1	25
215005 APRM / LPRM			X									K3.05 - Knowledge of the effect that a loss or malfunction of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM will have on following: Reactor power indication	3.8	26
K/A Category Totals:	2	3	3	2	3	2	2	2/2	2	3	2/3	Group Point Total:	26/5	

ILT 11-1 NRC Written Exam
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 #
223001 Primary CTMT and Aux.								X				A2.10 - Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High drywell temperature	3.8	16
214000 RPIS											X	2.1.36 - Conduct of Operations: Knowledge of procedures and limitations involved in core alterations.	4.1	17
219000 RHR/LPCI: Torus/Pool Cooling Mode								X				A2.13 - Ability to (a) predict the impacts of the following on the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High suppression pool temperature	3.7	18
216000 Nuclear Boiler Inst.	X											K1.15 - Knowledge of the physical connections and/or cause- effect relationships between NUCLEAR BOILER INSTRUMENTATION and the following: Isolation condenser: Plant-Specific	3.9	27
256000 Reactor Condensate		X										K2.01 - Knowledge of electrical power supplies to the following: System pumps	2.7	28
239001 Main and Reheat Steam			X									K3.16 - Knowledge of the effect that a loss or malfunction of the MAIN AND REHEAT STEAM SYSTEM will have on following: Relief/safety valves	3.6	29
272000 Radiation Monitoring				X								K4.01 - Knowledge of RADIATION MONITORING System design feature(s) and/or interlocks which provide for the following: Redundancy	2.7	30
201006 RWM					X							K5.12 - Knowledge of ROD WORTH MINIMIZER SYSTEM (RWM) (PLANT SPECIFIC) design feature(s) and/or interlocks which provide for the following: Withdraw block: P-Spec(Not-BWR6)	3.5	31
286000 Fire Protection						X						K6.04 - Knowledge of the effect that a loss or malfunction of the following will have on the FIRE PROTECTION SYSTEM Diesel fuel transfer system: Plant-Specific	2.8	32
268000 Radwaste							X					A1.02 - Ability to predict and/or monitor changes in parameters associated with operating the RADWASTE controls including: Off-site release	2.6	33

ILT 11-1 NRC Written Exam
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 #
234000 Fuel Handling Equipment								X				A2.03 - Ability to (a) predict the impacts of the following on the FUEL HANDLING EQUIPMENT ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of electrical power	2.8	34
201002 RMCS									X			A3.02 - Ability to monitor automatic operations of the REACTOR MANUAL CONTROL SYSTEM including: Rod movement sequence lights	2.8	35
271000 Off-gas										X		A4.01 - Ability to manually operate and/or monitor in the control room: Reset system isolations	2.8	36
215001 Traversing In-core Probe											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
245000 Main Turbine Gen. / Aux.	X											K1.08 - Knowledge of the physical connections and/or cause- effect relationships between MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS and the following: Reactor/turbine pressure control system: Plant-Specific	3.4	38
K/A Category Totals:	2	1	1	1	1	1	1	1/2	1	1	1/1	Group Point Total:	12/3	

Facility:	ILT 11-1 NRC Written Exam		Date:	05/14/12		
Category	K/A #	Topic	RO		SRO-Only	
			IR	Q#	IR	Q#
1. Conduct of Operations	2.1.42	Knowledge of new and spent fuel movement procedures.			3.4	19
	2.1.14	Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trips, mode changes, etc.			3.1	24
	2.1.1	Knowledge of conduct of operations requirements.	3.8	66		
	2.1.36	Knowledge of procedures and limitations involved in core alterations.	3.0	67		
	2.1.38	Knowledge of the station's requirements for verbal communications when implementing procedures.	3.7	74		
	Subtotal			3		2
2. Equipment Control	2.2.36	Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.			4.2	20
	2.2.19	Knowledge of maintenance work order requirements.			3.4	23
	2.2.13	Knowledge of tagging and clearance procedures.	4.1	68		
	2.2.37	Ability to determine operability and / or availability of safety related equipment.	3.6	69		
	Subtotal			2		2
3. Radiation Control	2.3.11	Ability to control radiation releases.			4.3	21
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.			3.2	25
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	70		
	2.3.5	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personell monitoring equipment, etc.	2.9	71		

	2.3.14	Knowledge of radiation or containment hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4	75		
	Subtotal			3		2
4. Emergency Procedures / Plan	2.4.22	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.			4.4	22
	2.4.9	Knowledge of low power / shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.	3.8	72		
	2.4.42	Knowledge of emergency response facilities.	2.6	73		
Subtotal				2		1
Tier 3 Point Total				10		7

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Facility: Oyster CreekDate of Examination: 5/14/2012Examination Level: RO ☒ SRO ☐Operating Test Number: 11-1 NRC

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R	Calculate Identified Leak Rate IAW 351.2; 2.1.20 (4.6) [NRC RO Admin JPM 1]
Conduct of Operations	P, R	Perform Core Thermal Limit Verification; 2.1.7 (4.4) [NRC RO Admin JPM 2]
Equipment Control	D, R	Determine Vortex and NPSH Impacts on the Core Spray System; 2.2.44 (4.2) [NRC RO Admin JPM 3]
Radiation Control		
Emergency Procedures/Plan	M, R	Review a Completed State/Local Notification Form; 2.4.39 (3.9) [NRC RO Admin JPM 4]
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.		
* Type Codes & Criteria: <ul style="list-style-type: none"> (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: <u>Oyster Creek</u>		Date of Examination: <u>5/14/2012</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Operating Test Number: <u>11-1 NRC</u>

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, R	Review / Approve a Completed Reactor Heat Balance; 2.1.7 (4.7) [NRC SRO Admin JPM 1]
Conduct of Operations	D, R	Review Request to Allow LPRM (input into APRM) Bypass IAW 403; 2.1.9 (4.5) [NRC SRO Admin JPM 2]
Equipment Control	D, R	Review Completed Surveillance Procedure 610.3.105 (Core Spray Sys 1 Inst Cal and Operability); 2.2.12 (4.1) [NRC SRO Admin JPM 3]
Radiation Control	M, R	Authorize Emergency Exposures IAW EP-AA-113; 2.3.4 (3.7) [NRC SRO Admin JPM 4]
Emergency Procedures/Plan	M, R	Determine Primary Containment Water Level IAW EMG- SP28 and Determine Required Action; 2.4.21 (4.6) [NRC SRO Admin JPM 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 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: Oyster CreekDate of Examination: 05/14/2012Exam Level: RO ☒ SRO-I ☐ SRO-U ☐Operating Test Number: 11-1 NRCControl 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. Perform Recirculation Pump Trip Circuitry Test IAW 603.4.001 with Multiple Recirculation Pumps Trip (Alternate Path); 202001 A2.04 (3.7/3.8) [NRC Sim JPM 1]	P, A, S	1
b. Place a second RWCU Pump in service with a high temperature alarm and isolation failure IAW 303 (Alternate Path); 204000 A4.01 (3.1/3.0) [NRC Sim JPM 2]	M, A, S	2
c. Shutdown of the Automatic Depressurization System IAW 308; 218000 A4.03 (4.2/4.2) [NRC Sim JPM 3]	D, EN, S	3
d. Perform Core Spray Surveillance with faulted Core Spray Pump IAW 610.4.002 (Alternate Path); 209001 A4.01 (3.8/3.6) [NRC Sim JPM 4]	P, A, S	4
e. Purging the Primary Containment with Elevated Stack Radiation (Alternate Path); 223001 A4.07 (4.2/4.1) [NRC Sim JPM 5]	P, A, EN, S	5
f. Restore 4160VAC Bus 1C to normal with EDG-1 supplying power (Alternate Path); 264000 A4.04 (3.7/3.7) [NRC Sim JPM 6]	D, A, L, EN, S	6
g. Swap Instrument Air Compressors; 300000 K4.04 (2.8/2.9) [NRC Sim JPM 7]	N, S	8
h. Re-establishing Off-Gas System Flow after an Off-Gas System Explosion; 271000 A2.06 3.5/3.9 [NRC Sim JPM 8]	D, L, S	9

In-Plant Systems[®] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Control CRD in the plant Post-Scram IAW SP-3; 201001 A1.03 (2.9/2.8) [NRC Plant JPM 1]	D, L, R, E	1
j. Line up to vent the Torus through the Hardened Vent IAW SP-35; 295024 EA1.14 (3.4/3.5) [NRC Plant JPM 2]	D, E	5
k. Bypass the Air Dryers and the Pre/Post Filters; 300000 A2.01 (2.9/2.8) [NRC Plant JPM 3]	D, R	8

@ 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	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥ 1 (control room system
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility: Oyster CreekDate of Examination: 05/14/2012Exam Level: RO ☐ SRO-I ☒ SRO-U ☐Operating Test Number: 11-1 NRC

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. Perform Recirculation Pump Trip Circuitry Test IAW 603.4.001 with Multiple Recirculation Pumps Trip (Alternate Path); 202001 A2.04 (3.7/3.8) [NRC Sim JPM 1]	P, A, S	1
b. Place a second RWCU Pump in service with a high temperature alarm and isolation failure IAW 303 (Alternate Path); 204000 A4.01 (3.1/3.0) [NRC Sim JPM 2]	M, A, S	2
c. Shutdown of the Automatic Depressurization System IAW 308; 218000 A4.03 (4.2/4.2) [NRC Sim JPM 3]	D, EN, S	3
d. Perform Core Spray Surveillance with faulted Core Spray Pump IAW 610.4.002 (Alternate Path); 209001 A4.01 (3.8/3.6) [NRC Sim JPM 4]	P, A, S	4
e. Purging the Primary Containment with Elevated Stack Radiation (Alternate Path); 223001 A4.07 (4.2/4.1) [NRC Sim JPM 5]	P, A, EN, S	5
f. Restore 4160VAC Bus 1C to normal with EDG-1 supplying power (Alternate Path); 264000 A4.04 (3.7/3.7) [NRC Sim JPM 6]	D, A, L, EN, S	6
g. Swap Instrument Air Compressors; 300000 K4.04 (2.8/2.9) [NRC Sim JPM 7]	N, S	8
h.		

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

i. Control CRD in the plant Post-Scram IAW SP-3; 201001 A1.03 (2.9/2.8) [NRC Plant JPM 1]	D, L, R, E	1
j. Line up to vent the Torus through the Hardened Vent IAW SP-35; 295024 EA1.14 (3.4/3.5) [NRC Plant JPM 2]	D, E	5
k. Bypass the Air Dryers and the Pre/Post Filters; 300000 A2.01 (2.9/2.8) [NRC Plant JPM 3]	D, R	8

@ 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	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥ 1 (control room system
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility: Oyster CreekDate of Examination: 05/14/2012Exam Level: RO ☐ SRO-I ☐ SRO-U ☒Operating Test Number: 11-1 NRC

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.		
b. Place a second RWCU Pump in service with a high temperature alarm and isolation failure IAW 303 (Alternate Path); 204000 A4.01 (3.1/3.0) [NRC Sim JPM 2]	M, A, S	2
c.		
d.		
e.		
f. Restore 4160VAC Bus 1C to normal with EDG-1 supplying power (Alternate Path); 264000 A4.04 (3.7/3.7) [NRC Sim JPM 6]	D, A, L, EN, S	6
g.		
h.		

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

i. Control CRD in the plant Post-Scram IAW SP-3; 201001 A1.03 (2.9/2.8) [NRC Plant JPM 1]	D, L, R, E	1
j. Line up to vent the Torus through the Hardened Vent IAW SP-35; 295024 EA1.14 (3.4/3.5) [NRC Plant JPM 2]	D, E	5
k. Bypass the Air Dryers and the Pre/Post Filters; 300000 A2.01 (2.9/2.8) [NRC Plant JPM 3]	D, R	8

@ 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	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥ 1 (control room system
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

ILT 11-1 NRC Scenario 1 (NEW)

Scenario Outline

Facility: <u>Oyster Creek</u>	Scenario No.: <u>1</u>	Op Test No.: <u>11-1 NRC</u>
Examiners: _____		Operators: _____
_____		_____
_____		_____
Initial Conditions:		
<ul style="list-style-type: none"> • 15% power with mode switch in RUN (IC 153) • RWM is inoperable and bypassed • Control Room HVAC System A is inoperable 		
Turnover:		
<ul style="list-style-type: none"> • Continue with rod withdrawal. Complete step 24 Group 5-1. When rod pulls are complete wait for further direction from Reactor Engineering. 		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N BOP	Swap Service Water Pumps.
2	N/A	R ATC	Withdraw control rods to raise reactor power.
3	MAL-CRD008_3451	C ATC	Respond to an uncoupled control rod >10% power.
4	MAL-EDS004B	C TS BOP SRO	Respond to the loss of VMCC 1B2.
5	MAL-RCP003D MAL-RCP004D	C TS BOP SRO	Respond to Recirculation Pump D inner seal failure, then outer seal failure.
6	MAL-NSS025E	C ATC	Respond to the E EMRV lifting leading the crew to a manual scram.
7	CAEP ATWS.CAE	M Crew	Respond to an Electric ATWS.
8	PMP-SLC001A PMP-SLC002A	C Crew	Respond to Standby Liquid Control Pump shaft break.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor Transient, (TS) Tech Specs

ILT 11-1 NRC Scenario 1 (NEW)

Simulator Summary

<u>Event</u>	<u>Event Summary</u>
1	The BOP will swap Service Water Pumps to equalize run times. The BOP will start the standby pump, stop the running pump, and then verify expected conditions locally with the EO. (BOP: Normal Evolution)
2	The ATC will withdraw control rods to raise reactor power IAW the pull sheet and 302.2. (ATC: Reactivity Manipulation)
3	The ATC will respond to an uncoupled control rod (rod 34-51) at position 48 and will re-couple the control rod IAW ABN-6, Control Rod Drive System. (ATC: Component Malfunction)
4	The crew will respond to the trip of VMCC 1B2 and enter ABN-51, Loss of VMCC 1B2. The BOP will restore power to PSP-2 and the ATC will reset the ½ scram. The SRO will review TS 3.7 and enter a 30 hr cold shutdown LCO. (BOP: Component Malfunction; SRO: Tech Specs)
5	The BOP will respond to a leak in Recirculation Pump D outer seal, followed by a leak in the inner seal. The SRO will direct entry into ABN-2, Recirculation System Failures, to trip Recirculation Pump D and Isolate the D Recirculation Loop. The SRO will review and apply Tech Specs 3.3.D and 3.3.F for unidentified leak rate and recirculation loop operability. (BOP: Component Malfunction; SRO: Tech Specs)
6	The ATC and BOP will respond to the E EMRV lifting IAW ABN-40, Stuck Open EMRV. The ATC will take manual control of the master feedwater controller. The BOP will cycle the E EMRV then disable it. The ATC will return the master feedwater controller to automatic operation and insert a manual reactor scram. The SRO will review Tech Specs 3.4 for ADS operability and TS 3.5.A for Torus Temperature limits. (ATC: Component Malfunction)
7	The Crew will diagnose an electric ATWS and the SRO will direct entry into RPV Control – with ATWS EOP. The ATC will perform actions to insert control rods and the BOP will perform actions to control Torus water temperature and RPV water level. (Major Evolution) (PRA)

ILT 11-1 NRC Scenario 1 (NEW)

- 8 Due to the Torus water temperature heating up from the E EMRV stuck open, Standby Liquid Control (SLC) injection will be directed. The first SLC pump started will have a broken shaft and the Applicant will start the second SLC pump. (**Component Failure After EOP**)

Critical Task 1 With reactor power > 2% during an ATWS, terminate and prevent injection into the RPV to intentionally lower RPV water level which will lower reactor power.

Critical Task 2 Crew directs the Reactor Building EO to vent the scram air header. (The Lead Examiner will direct the Booth to vent the scram air header at their discretion).

ES-301-4 Target Quantitative Attributes		Actual Attributes	Event Number(s)
1.	Total malfunctions (5-8)	6	3-8
2.	Malfunctions after EOP entry (1-2)	1	8
3.	Abnormal events (2-4)	4	3-6
4.	Major transients (1-2)	1	7
5.	EOPs entered/requiring substantive actions (1-2)	2	7
6.	EOP contingencies requiring substantive actions (0-2)	1	7
7.	Critical tasks (2-3)	2	7

ILT 11-1 NRC Scenario 3 (Modified)

Scenario Outline

Facility: Oyster Creek

Scenario No.: 3

Op Test No.: 11-1 NRC

Examiners: _____ Operators: _____

Initial Conditions:

- 85% power
- 'B' RWCU Pump is OOS

Turnover:

- Lower power to 80% using recirculation flow IAW 1001.22-3, Core Maneuvering Daily Instruction Sheet
- Backwash Main Condenser Half B South

Event No.	Malf. No.	Event Type*		Event Description
1	NA	R	ATC	Lower reactor power to 80% using recirculation flow.
2	NA	N	BOP	Continue backwashing Main Condenser Half B South.
3	MAL-TCS010	I	BOP	Respond to the EPR setpoint failing high.
4	BKR-CRD002	C TS	ATC SRO	Respond to CRD Pump A trip.
5	PSW-TBC001A BKR-TBC003	C	BOP	Respond to the trip of TBCCW Pump 1-3 and auto start failure of TBCCW Pump 1-2.
6	MAL-NSS012E	I TS	ATC SRO	Respond to a reference leg leak in the A & C GEMAC RPV level indicators ID13A and ID13C
7	MAL-CRD006	M	Crew	Respond to a multiple rod drift.
8	MAL-NSS016A	M C	Crew	Respond to a Safety Valve lifting post scram
9	MAL-CNS004A-D	C	Crew	Respond to a trip of the operating Containment Spray Pump

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor Transient, (TS) Tech Specs

Simulator Summary

<u>Event</u>	<u>Event Summary</u>
1	The ATC will lower reactor power to approximately 80% with recirculation flow using the Master Recirc Speed Controller. (ATC: Reactivity Manipulation)
2	The BOP will backwash condenser B South IAW procedure 323.6, Backwashing Condensers. This will require several switch manipulations by the BOP. (BOP: Normal Evolution)
3	The BOP will respond to the EPR setpoint failing high. The crew will enter ABN-9, Electric Pressure Regulator Malfunction. The BOP will secure the EPR and restore reactor pressure to the normal band on the MPR. (BOP: Instrument Malfunction)
4	The ATC will respond to a trip of CRD Pump A IAW RAP H-1-c. The ATC will start CRD Pump B. The SRO will review and apply Tech Spec 3.4.D.2. (ATC: Component Malfunction; SRO: Tech Specs)
5	The BOP will respond to a trip of TBCCW PUMP 3 and a failure of TBCCW PUMP 2 to auto start on low TBCCW header pressure. The BOP will start the standby pump IAW ABN-20, TBCCW Failure Response. (BOP: Component Malfunction)
6	The ATC will diagnose a rising RPV water level. Indications of actual RPV water level will rise on Panel 4F and Panel 5F/6F Yarway indications. The ATC will perform actions to stabilize RPV water level IAW ABN-17, Feedwater System Abnormal Conditions. The ATC will take manual control of RPV water level and swap Feedwater Level Control to the alternate water level instrument ID13B. The increased Primary Containment leakage will result in a rise in unidentified leak rate and the SRO will review and apply Tech Spec 3.3.D.2. (ATC: Instrument Malfunction; SRO: Tech Specs)
7	The ATC will identify/report multiple drifting control rods into the core and IAW ABN-6, Control Rod Malfunctions, manually scram the reactor IAW ABN-1, Reactor Scram. (ATC: Component Malfunction) (PRA)
8	Post scram, the crew will respond to a Safety Valve lifting. This will result in rising drywell pressure and temperature requiring Drywell Sprays IAW the Primary Containment Control EOP. (Major Evolution; Component Failure After EOP)
9	When initiating Containment Spray IAW the Primary Containment

ILT 11-1 NRC Scenario 3 (Modified)

Control EOP, the Containment Spray pump in the system the Crew starts will trip after 30 seconds. The Crew must initiate containment spray using an alternate Containment Spray Pump. (**Component Failure After EOP**)

- Critical Task 1 The ATC will manually scram the reactor following control rods drifting into the core. There is no manual scram associated with this casualty and the core is not analyzed for the resultant abnormal rod configuration.
- Critical Task 2 When Drywell or Torus pressure exceeds 12 psig, **OR** before Drywell bulk temperature is determined it cannot be maintained below 281°F, spray the drywell IAW SP-29, Initiation of the Containment Spray System for Drywell Sprays.

ES-301-4 Target Quantitative Attributes		Actual Attributes	Event Number(s)
1.	Total malfunctions (5-8)	7	3-9
2.	Malfunctions after EOP entry (1-2)	2	8-9
3.	Abnormal events (2-4)	4	3, 5-7
4.	Major transients (1-2)	1	8
5.	EOPs entered/requiring substantive actions (1-2)	2	8
6.	EOP contingencies requiring substantive actions (0-2)	0	N/A
7.	Critical tasks (2-3)	2	7, 9

ILT 11-1 NRC Scenario 4 (NEW)
~~**(Backup Scenario)**~~

Scenario Outline

Facility: Oyster Creek

Scenario No.: 4

Op Test No.: 11-1 NRC

Examiners: _____ **Operators:** _____

Initial Conditions:

- The plant is at 95% power
- Dilution Pump 2 is tagged out of service
- Air Compressor #3 is tagged out of service in PTL
- The RWM is inoperable and bypassed

Turnover:

- Perform Turbine Valve testing IAW 625.4.002

Event No.	Mal. No.	Event Type*		Event Description
1	N/A	N	BOP	Tests MPR IAW 625.4.002
2	MAL-CRD001A	C	ATC	Respond to a CRD Flow Control Valve failed closed.
3	LOA-RPS001 MAL-CRD011_1 415 MAL-CRD014_1 415	C TS	ATC SRO	Respond to trip of RPS MG Set 1 and a single rod scram.
4	SWI-TBS027C ANN-L4f	C TS	BOP SRO	Respond to a trip of Control Room Vent Fan B
5	PSW-CFW015A	R C	ATC BOP	Respond to a major oil leak on 'B' Feed Pump requiring a rapid power reduction.
6	MAL-CFW006C MAL-CRD022	M C	Crew	Respond to a trip of the 'C' Feed Pump requiring a reactor scram and a failure of all control rods to insert.
7	MAL-PCN007	M	Crew	Respond to a Torus Leak requiring entry into Primary Containment Control.
8	VLV-CSS001, 009	C	Crew	Respond to Core Spray system suction valves being mechanically seized when lining up the CST to the Torus.
9	MAL-PCN007	M	Crew	Respond to a Torus leak increase requiring the crew to Emergency Depressurize.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor Transient, (TS) Tech Specs

ILT 11-1 NRC Scenario 4 (NEW)
(Backup Scenario)

Simulator Summary

<u>Event</u>	<u>Event Summary</u>
1	The shift turnover will direct the performance of the Mechanical Pressure Regulator (MPR) test IAW 625.4.002, Main Turbine Surveillances, section 12. The BOP will lower the MPR setpoint, verify the MPR on control, then adjust the setpoint backup to place the EPR back in service. (BOP: Normal Evolution)
2	The ATC will respond to in-service CRD Flow Control Valve failing closed. The ATC will swap Flow Control Valves IAW procedure 302.1, Control Rod Drive System. (ATC: Component Malfunction)
3	The crew will respond to the trip of RPS MG Set 1 and a single control rod (14-15) scram to position 04 (RAP-G2c, ABN-6, CRD Failures). The BOP will re-power the RPS Bus and will reset ½ scram and ½ isolations. The Crew will attempt to manually insert the scrambled control rod from 04-00. When attempted, the rod will not move. The SRO will review TS 3.2.B.4 and 3.2.A. and will declare the control rod inoperable, and valve-out the control rod. (ATC: Component Malfunction; SRO: Tech Specs)
4	The Control Room HVAC Fan B will trip. The SRO will direct the BOP to place Control Room HVAC System A in service IAW 331.1, Control Room and Old Cable Spreading Room Heating, Ventilation, and Air Conditioning System. The SRO will apply Tech Spec 3.17.B. (BOP: Component Malfunction; SRO: Tech Specs)
5	The BOP will respond to a low oil pressure condition on the 'B' Feed Pump. The crew will have the Turbine Building (TB) Operator investigate. The TB Operator will report a large oil leak from the 'B' Feed Pump and that there is no oil in the sight glass, oil is being contained and no oil has gotten into the floor drains. The ATC will perform a rapid power reduction and the BOP will trip the 'B' Feed Pump. (ATC: Reactivity Manipulation; BOP: Component Malfunction)
6	The crew will respond to a trip of the 'C' Reactor Feed Pump requiring a reactor scram. Some control rods will fail to insert (power < 2%) but can be manually inserted using CRD. (Major Evolution; Component Failure After EOP)
7	A leak in the Torus will develop requiring the crew to enter the Primary Containment Control EOP. The crew will commence makeup to the Torus IAW SP-37, Makeup To The Torus Via Core Spray

**ILT 11-1 NRC Scenario 4 (NEW)
(Backup Scenario)**

System. (Major Evolution)

- 8 When the crew attempts to line up Core Spray System to make up to the Torus, Core Spray suction valve for System 1(2) V-20-3(4) and V-20-32(33), Core Spray System 1(2) suction valves will not close. The crew will place the alternate Core Spray Pump System in service.
(Component Failure After EOP)
- 9 After the Crew places Core Spray Pump/System 2 in service to makeup to the Torus, the Torus leak will increase leading the crew to Anticipate Emergency Depressurization and/or Emergency Depressurize the RPV. **(Major Evolution)**
- Critical Task 1 Insert control rods IAW Support Procedure 21 to achieve a shutdown reactor.
- Critical Task 2 Emergency Depressurize the RPV when it is determined Torus level cannot be maintained > 110 inches.

ES-301-4 Target Quantitative Attributes		Actual Attributes	Event Number(s)
1.	Total malfunctions (5-8)	7	2-8
2.	Malfunctions after EOP entry (1-2)	2	7-8
3.	Abnormal events (2-4)	4	2, 3, 5, 6
4.	Major transients (1-2)	2	6-7
5.	EOPs entered/requiring substantive actions (1-2)	2	6-7
6.	EOP contingencies requiring substantive actions (0-2)	1	9
7.	Critical tasks (2-3)	2	6, 9