

Facility: VERMONT YANKEE														Date of Exam: NOVEMBER 29, 2010				
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 & Abnormal Plant Evolutions	1	2	3	4	N/A			5	4				2	20	4	3	7	
	2	1	1	1				1	1				2	7	2	1	3	
	Tier Totals	3	4	5				6	5				4	27	6	4	10	
2. Plant Systems	1	2	2	1	4	3	1	2	3	3	3	2	26	3	2	5		
	2	2	1	2	1	2	1	2	0	1	0	0	12	0	1	3		
	Tier Totals	4	3	3	5	5	2	4	3	4	3	2	38	4	4	8		
3. Generic Knowledge and Abilities Categories					1		2		3		4		10	1	2	3	4	7
					2		3		3		2			2	2	1	2	

Note:

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

Vermont Yankee NRC
BWR SRO/RO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4	X						2.4.50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual	4.0	81
295004 Partial or Total Loss of DC Pwr / 6						X	AA2.04	Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: System lineups	3.3	77
295005 Main Turbine Generator Trip / 3	X						2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm	4.3	79
295018 Partial or Total Loss of CCW / 8	X						2.2.44	Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions	4.4	82
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
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1						X	EA 2.02	Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Reactor water level	4.2	78
295038 High Off-site Release Rate / 9						X	EA2.04	Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: Source of off-site release	4.5	80
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4						X	AA2.05	Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Jet pump operability: Not BWR-1&2	3.1	20
295003 Partial or Complete Loss of AC / 6	X						2.1.20	Ability to interpret and execute procedure steps	4.6	4
295004 Partial or Total Loss of DC Pwr / 6				X			AK3.01	Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: load shedding: Plant specific	3.4	15
295005 Main Turbine Generator Trip / 3					X		AA1.04	Ability to operate and/or monitor the following as they apply to MAIN TURBINE GENERATOR TRIP: Main generator controls	2.7	18
295006 SCRAM / 1					X		AA1.06	Ability to operate and/or monitor the following as they apply to SCRAM: CRD hydraulic system	3.5	8
295016 Control Room Abandonment / 7					X		AA1.08	Ability to operate and/or monitor the following as they apply to CONTROL ROOM ABANDONMENT: Reactor pressure	4.0	2

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295018 Partial or Total Loss of CCW / 8				X			AK3.03	Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Securing individual components (prevent equipment damage)	3.1	5
295019 Partial or Total Loss of Inst. Air / 8			X				AK2.05	Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR and the following: Main steam system	3.4	12
295021 Loss of Shutdown Cooling / 4			X				AK2.07	Knowledge of the interrelations between LOSS OF SHUTDOWN COOLING and the following: Reactor recirculation	3.1	17
295023 Refueling Acc / 8			X				AK2.04	Knowledge of the interrelations between REFUELING ACCIDENTS and the following: RMCS/Rod Control and information system	3.2	9
295024 High Drywell Pressure / 5	X						2.2.44	Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions	4.2	19
295025 High Reactor Pressure / 3					X		EA1.03	Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: Safety/relief valve: Plant specific	4.4	10
295026 Suppression Pool High Water Temp. / 5				X			EK3.01	Knowledge of the reasons for the following responses as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Emergency/normal depressurization	3.8	6
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	1
295030 Low Suppression Pool Wtr Lvl / 5				X			EK3.03	Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: RCIC operation	3.6	11
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	4.6	13
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1		X					EK1.01	Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Reactor pressure effects on reactor power	4.1	3
295038 High Off-site Release Rate / 9		X					EK1.02	Knowledge of the operational implications of the following concepts as they apply to HIGH OFF-SITE RELEASE RATE: Protection of the general public	4.2	7

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Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
600000 Plant Fire On Site / 8						X	AA2.16	Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Vital equipment and control systems to be maintained and operated during a fire	3.0	16
700000 Generator Voltage and Electric Grid Disturbances / 6						X	AA2.03	Ability to determine and/or interpret the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Generator current outside the capability curve	3.5	14
K/A Category Point Totals:	2/3	2	3	4	5	4/4	Group Point Total:			20/7

Vermont Yankee NRC
BWR SRO/RO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
295008 High Reactor Water Level / 2						X	AA2.01	Ability to determine and/or interpret the following as they apply to HIGH REACTOR WATER LEVEL: Reactor water level	3.9	85
295029 High Suppression Pool Wtr Lvl / 5						X	EA2.03	Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL: Drywell/containment water level	3.5	83
295033 High Secondary Containment Area Radiation Levels / 9	X						2.4.6	Knowledge of EOP mitigation strategies	4.7	84
295007 High Reactor Pressure / 3		X					AK1.03	Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE: Pressure effects on reactor power	3.8	27
295012 High Drywell Temperature / 5			X				AK2.01	Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: Drywell ventilation	3.4	24
295013 High Suppression Pool Temp. / 5	X						2.1.31	Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup	4.6	22
295014 Inadvertent Reactivity Addition / 1	X						2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation	4.3	26
295015 Incomplete SCRAM / 1						X	AA2.02	Ability to determine and/or interpret the following as they apply to INCOMPLETE SCRAM: Control rod position	4.1	23
295022 Loss of CRD Pumps / 1					X		AA1.02	Ability to operate and/or monitor the following as they apply to LOSS OF CRD PUMPS: RPS	3.6	21
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	25
K/A Category Point Total:	2/1	1	1	1	1	1/2	Group Point Total:			7/3

ES-401	Vermont Yankee NRC BWR SRO/RO Written Examination Outline Plant Systems – Tier 2 Group 1												Form. LS-401-1
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System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp	Q#
206000 HPCI	X											2.1.32	Ability to explain and apply system limits and precautions	4.0	90
215004 Source Range Monitor									X			A2.05	Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR (SRM) SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Faulty or erratic operation of detectors/system	3.5	89
218000 ADS	X											2.4.23	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations	4.4	87
261000 SGTS									X			A2.10	Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low reactor water level: Plant specific	3.2	88
262002 UPS (AC/DC)									X			A2.01	Ability to (a) predict the impacts of the following on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Under voltage	2.8	86
203000 RHR/LPCI: Injection Mode			X									K2.01	Knowledge of electrical power supplies to the following: Pumps.	3.5	49
203000 RHR/LPCI: Injection Mode	X											2.2.25	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.	3.2	45
205000 Shutdown Cooling						X						K5.02	Knowledge of the operational implications of the following concepts as they apply to SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE): Valve operation	2.8	32
206000 HPCI			X									K2.01	Knowledge of electrical power supplies to the following: System valves BWR-2,3,4	3.2	46
206000 HPCI								X				A1.03	Ability to predict and/or monitor changes in parameters associated with operating the HIGH PRESSURE COLLANT INJECTION SYSTEM controls including: Condensate storage tank level: BWR-2,3,4	3.5	48
209001 LPCS										X		A3.06	Ability to monitor automatic operations of the LOW PRESSURE CORE SPRAY SYSTEM including: Lights and alarms	3.6	28
211000 SLC	X											2.4.11	Knowledge of abnormal condition procedures	4.0	30

ES-401		Vermont Yankee NRC BWR SRO/RO Written Examination Outline Plant Systems – Tier 2 Group 1											Form. ES-401-1		
System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp	Q#
211000 SLC										X		A3.05	Ability to monitor automatic operations of the STANDBY LIQUID CONTROL SYSTEM including: Flow indication.	4.1	52
212000 RPS					X							K4.10	Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: Individual rod SCRAM testing	3.3	37
212000 RPS						X						K5.02	Knowledge of the operational implications of the following concepts as they apply to REACTOR PROTECTION SYSTEM: Specific logic arrangements.	3.3	44
215003 IRM					X							K4.01	Knowledge of INTERMEDIATE RANGE MONITOR (IRM) SYSTEM design feature(s) and/or interlocks which provide for the following: Rod withdrawal blocks:	3.7	41
215004 Source Range Monitor										X		A3.02	Ability to monitor automatic operations of the SOURCE RANGE MONITOR (SRM) SYSTEM including: Annunciator and alarm signals.	3.4	38
215005 APRM / LPRM							X					K6.01	Knowledge of the effect that a loss or malfunction of the following will have on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM: RPS	3.7	40
217000 RCIC								X				A1.05	Ability to predict and/or monitor changes in parameters associated with operating the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) controls including: RCIC turbine speed	3.7	29
217000 RCIC		X										K1.02	Knowledge of the physical connections and/or cause/effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and the following: Nuclear boiler system.	3.5	50
218000 ADS											X	A4.02	Ability to manually operate and/or monitor in the control room: ADS logic initiation	4.2	42
223002 PCIS/Nuclear Steam Supply Shutoff									X			A2.01	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: AC electrical distribution failures.	3.2	47
239002 SRVs				X								K3.03	Knowledge of the effect that a loss or malfunction of the RELIEF/SAFETY VALVES will have on following: Ability to rapidly depressurize the reactor.	4.3	51

ES-4U1	Vermont Yankee NRC BWR SRO/RO Written Examination Outline Plant Systems – Tier 2 Group 1													Form. ES-401-1	
System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp	Q#
259002 Reactor Water Level Control											X	A4.02	Ability to manually operate and/or monitor in the control room: All individual component controllers in the automatic mode	3.8	36
261000 SGTS									X			A2.15	Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High area radiation by refuel bridge.	2.9	33
262001 AC Electrical Distribution									X			A2.11	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: Degraded system voltages	3.2	34
262002 UPS (AC/DC)		X										K1.01	Knowledge of the physical connections and/or cause/effect relationships between UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) and the following: Feedwater level control: Plant specific	2.8	53
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	39
264000 EDGs					X							K4.08	Knowledge of EMERGENCY GENERATORS (DIESEL/JET) design feature(s) and/or interlocks which provide for the following: Automatic startup	3.8	43
300000 Instrument Air											X	A4.01	Ability to manually operate and / or monitor in the control room: Pressure gages	2.6	35
400000 Component Cooling Water					X							K4.01	Knowledge of CCWS design feature(s) and or interlocks which provide for the following: Automatic start of standby pump.	3.4	31
K/A Category Point Totals:	2/2	2	2	1	4	3	1	2	3/3	3	3	Group Point Total:			26/5

ES-401	Vermont Yankee NRC BWR SRO/RO Written Examination Outline Plant Systems – Tier 2 Group 2												Form LS-401-1
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System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp	Q#
216000 Nuclear Boiler Inst.	X											2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation	4.4	93
233000 Fuel Pool Cooling/Cleanup	X											2.2.25	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.	4.2	91
286000 Fire Protection									X			A2.11	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: Pump trips: Plant specific	3.2	92
201001 CRD Hydraulic							X					K6.03	Knowledge of the effect that a loss or malfunction of the following will have on the CONTROL ROD DRIVE HYDRAULIC System: Plant air systems	3.0	59
201003 Control Rod and Drive Mechanism								X				A1.02	Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROD AND DRIVE MECHANISM controls including: CRD Drive Pressure.	2.8	60
201006 RWM								X				A1.02	Ability to predict and/or monitor changes in parameters associated with operating the ROD WORTH MINIMIZER SYSTEM (RWM) (PLANT SPECIFIC) controls Including: Status of control rod movement blocks: Plant specific (not BWR-6)	3.4	65
202002 Recirculation Flow Control				X								K3.04	Knowledge of the effect that a loss or malfunction of the RECIRCULATION FLOW CONTROL SYSTEM will have on following: Reactor/Turbine pressure regulation system.	2.9	56
215002 RBM										X		A3.01	Ability to monitor automatic operations of the ROD BLOCK MONITOR SYSTEM including: Four rod display	3.1	55
219000 RHR/LPCI: Torus/Pool Cooling Mode		X										K1.01	Knowledge of the physical connections and/or cause/effect relationships between RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE and the following: Suppression Pool.	3.9	57
223001 Primary CTMT and Aux.						X						K5.01	Knowledge of the operational implications of the following concepts as they apply to PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES: Vacuum breaker/relief valve operation	3.1	64
239001 Main and Reheat Steam				X								K3.15	Knowledge of the effect that a loss or malfunction of the MAIN AND REHEAT STEAM SYSTEM will have on following: Reactor water level control	3.5	61
259001 Reactor Feedwater			X									K2.01	Knowledge of electrical power supplies to the following: Reactor feedwater pump(s): Motor-driven-only	3.3	63

ES-4U1	Vermont Yankee NRC BWR SRO/RO Written Examination Outline Plant Systems – Tier 2 Group 2												Form LS-401-1		
System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp	Q#
271000 Offgas					X							K4.09	Knowledge of OFFGAS SYSTEM design feature(s) and/or interlocks which provide for the following: Filtration of radioactive particulate	2.8	54
272000 Radiation Monitoring						X						K5.01	Knowledge of the operational implications of the following concepts as they apply to RADIATION MONITORING SYSTEM: Hydrogen injection operation's effect on process radiation indications	3.2	62
290001 Secondary CTMT		X										K1.09	Knowledge of the physical connections and/or cause/effect relationships between SECONDARY CONTAINMENT and the following: Plant air systems	2.9	58
K/A Category Point Totals:	0/2	2	1	2	1	2	1	2	0/1	1	0	Group Point Total:			12/3

Facility: VERMONT YANKEE			Date of Exam: NOVEMBER 29, 2010			
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.40	Knowledge of refueling administrative requirements.			3.9	98
	2.1.43	Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.			4.3	94
	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation	4.3	74		
	2.1.45	Ability to identify and interpret diverse indications to validate the response of another indication	4.3	69		
	Subtotal			2		2
2. Equipment Control	2.2.37	Ability to determine operability and/or availability of safety related equipment.			4.6	96
	2.2.40	Ability to apply Technical Specifications for a system.			4.7	97
	2.2.21	Knowledge of pre- and post-maintenance operability requirements	2.9	73		
	2.2.35	Ability to determine Technical Specification Mode of Operation	3.6	75		
	2.2.38	Knowledge of conditions and limitations in the facility license	3.6	67		
	Subtotal			3		2
3. Radiation Control	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.			3.8	95
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions	3.2	66		
	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions	3.5	68		
	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			3		1
4. Emergency Procedures / Plan	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.			4.2	99
	2.4.49	Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.			4.4	100
	2.4.31	Knowledge of annunciator alarms, indications, or response procedures	4.2	70		
	2.4.34	Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects	4.2	72		
	Subtotal			2		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/2	295033/2.2.12	An operationally valid SRO question could not be written for original selection; re-selected K/A from same category (2.4.6)
2/2	233000/2.4.8	An operationally valid SRO question could not be written for original selection- there is no interrelation between the system and the EOPs; re-selected K/A from same category (2.2.25)
3	2.1.14	An operationally valid SRO question could not be written for original selection; re-selected K/A from same category (2.1.40)
3	2.2.7	An operationally valid SRO question could not be written for original selection; re-selected K/A from same category (2.2.37)
1/1	295026/EK3.03	K/A is not applicable to this facility. Randomly re-selected K/A from EK3 category (EK3.01)
1/1	295023/AK2.07	An operationally valid RO question could not be written for original selection; re-selected K/A from same category (AK2.04) (Discussed with NRC since redraw came after initial outline submittal)
2/1	205000/K5.04	K/A was less than 2.5 with no plant specific priority. K5 category randomly re-selected (K5.02)
2/1	211000/K4.07	One of two systems randomly selected to remove the K4 K/A due to the K6 and General categories in tier 2 not meeting the "at least two" sample frequency. K/A was randomly re-selected (2.4.11)
2/1	215005/K4.07	One of two systems randomly selected to remove the K4 K/A due to the K6 and General categories in tier 2 not meeting the "at least two" sample frequency. K/A was randomly re-selected (K6.01)
2/1	259002/A4.05	K/A is not applicable to this facility. Randomly re-selected K/A from A4 category (A4.02)
2/1	262002/K1.07	K/A is not applicable to this facility. Randomly re-selected K/A from K1 category (K1.01)
2/1	205000/A4.07	K/A is very similar to Tier 1 Group 1 K/A for Loss of Shutdown Cooling; redrew K/A system as 206000 with a redrawn K/A of A1.03. (Discussed with NRC since redraw came after initial outline submittal)
2/1	261000/A2.03	An operationally valid RO question could not be written to match K/A. Discussed a K/A replacement with NRC during the exam prep week. A2.15 was randomly redrawn to replace A2.03. (Discussed with NRC since redraw came after initial outline submittal)
2/2	201001/K6.04	K/A was the same concept as the K/A drawn in Tier 1/Group 1 (295006 Scram as it relates to the CRD Hydraulic System). Randomly re-selected K/A from K6 category (K6.03)
2/2	201006/K2.01	The only K/A in category K2 was less than 2.5 with no plant specific priority. Randomly re-selected K/A (A1.02)
2/2	202002/K3.06	K/A is not applicable to this facility. Randomly re-selected K/A from K3 category (K3.04)
3	2.2.3	K/A not applicable- not a multi-facility site. K/A randomly re-selected (2.2.35)
3	2.2.5	K/A was less than 2.5 with no plant specific priority. General category randomly re-selected (2.2.38)

Facility: VERMONT YANKEEDate of Examination: 11/29/10Examination Level: **RO** ☐ SRO ☐Operating Test Number: VY 2010

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	S, M	2.1.31 Ability to locate control room switches, controls, and indications and to determine that they correctly reflect the desired plant lineup (RO 4.6, SRO 4.3) <ul style="list-style-type: none"> ➤ Control Room Panel Walkdowns IAW OP 0150, Section "F"
Conduct of Operations	S, N	2.1.20 Ability to interpret and execute procedure steps (RO 4.6, SRO 4.6) <ul style="list-style-type: none"> ➤ OP 0105 Phase 1A, step 28 (record parameters and calculate stable period on VYOPF 0105.03)
Equipment Control	R, N	2.2.41 Ability to obtain and interpret station electrical and mechanical drawings (RO 3.5, SRO 3.9) <ul style="list-style-type: none"> ➤ Operator identifies the required components, position and recommended sequence needed to tagout the "A" RBCCW pump using P&IDs G-191159 Sheet 3 (mechanical) and G-191301 Sheet 1 (electrical)/CWD Sheet 442. EN-OP-102, "Protective and Caution Tagging", Attachment 9.2 will be used as a guide.
Radiation Control		
Emergency Procedures/Plan	S, D	2.4.27 Knowledge of the "Fire in the Plant" procedures (RO 3.4, SRO 3.9) <ul style="list-style-type: none"> ➤ Making the required plant announcements for a fire in the Switchgear room IAW OP 3020, Figure 1.
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)		

RO Administrative Job Performance Measure Summary

- **A1a:** Control Room Panel Walkdowns
 - Operator performs the required daily panel walkdowns
 - Operator determines there are 4 abnormalities associated with the walkdowns and takes the required actions. These discrepancies are:
 - CRP 9-3, Danger tag hanging on CS pump "A" with the switch in PTL
 - CRP 9-3, MCC-89A source transfer switch not in NORM/UPS-1A position
 - CRP 9-3, RHR-25A not open
 - CRP 9-3, RHR-27A not closed
- **A1b:** Operator records critical data
 - IAW OP 0105 Phase 1A, step 28, record parameters and calculate stable period on VYOPF 0105.03
- **A2:** Operator identifies the required components, position and sequence needed to tagout the "A" RBCCW pump using P&IDs G-191159 Sheet 3 (mechanical) and G-191301 Sheet 1 (electrical)/CWD Sheet 442.
 - Operator determines the following components and sequence:
 - "A" RBCCW pump control switch on CRP 9-6 (SW-9-6-19) PTL
 - Bus 9, cubicle 5B (P59-1A pump breaker) OPEN
 - V70-94A (pump discharge valve) CLOSED
 - V70-96A (pump suction valve) CLOSED
 - V70-923 (PI-2A isolation valve on pump discharge line) OPEN
 - V70-600 (pump casing vent valve) OPEN
 - V70-924 (PI-2A drain valve on pump discharge line) OPEN
- **A4:** Making the required plant announcements for a plant fire
 - The operator demonstrates familiarity with the site paging system
 - The operator makes the required announcements based on the location of the fire (the Switchgear room) IAW OP 3020, Figure 1.

Facility: <u>VERMONT YANKEE</u>		Date of Examination: <u>11/29/10</u>
Examination Level: RO <input type="checkbox"/>	SRO <input type="checkbox"/>	Operating Test Number: <u>VY 2010</u>

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, N	2.1.1 Knowledge of conduct of operations (RO 3.8/SRO 4.2) ➤ License Reactivation Requirements
Conduct of Operations	R, N	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (RO 3.9, SRO 4.2) ➤ Evaluate H ₂ /O ₂ concentrations in the Torus and Drywell to determine what course of action is taken.
Equipment Control	R, N	2.2.12 Knowledge of surveillance procedures (RO 3.7, SRO 4.1) ➤ Review a completed surveillance form and determine that there are deficiencies with the paperwork.
Radiation Control	R, N	2.3.7 Ability to comply with radiation work permit requirements during normal or abnormal conditions (RO 3.5, SRO 3.6) ➤ Determine the radiological requirements to enter a Locked High Radiation Area to reposition 2 valves IAW ON 3157, "Loss of Fuel Pool Level".
Emergency Procedures/Plan	R, N	2.4.41 Knowledge of the emergency action level thresholds and classifications (RO 2.9, SRO 4.6) ➤ Determine the correct Emergency Action Level IAW AP 3125, "Emergency Plan Classification and Action Level Scheme" for given plant conditions (FG 1.1) 2.4.44 Knowledge of the emergency plan protective action recommendations. (RO 2.4, SRO 4.4) ➤ Determine that shelter requirements are required for the applicable surrounding towns based on given initial conditions.

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)

SRO Administrative Job Performance Measure Summary

- **A1a: License Reactivation Requirements**
 - Operator determines from a list which individuals meet the requirements for reactivating their license.
 - From the initial conditions including a list of under instruction watches stood, the operator determines the requalification, under instruction, and documentation requirements associated with reactivating a license.
 - Candidate notices that one individual does not have the required number of hours under instruction.
- **A1b: The SAGs have been entered. Evaluate H₂/O₂ concentrations in the Torus and Drywell to determine what course of action is taken.**
 - Given an initial Drywell and Torus Oxygen and hydrogen concentrations, answer the following:
 - Can high radiation isolations be defeated?
 - What is/are the procedures(s) that can be used to vent containment?
 - What is the criterion for securing venting?
 - Can release rate limits be exceeded?
 - To answer these questions, the Operator must be able to interpret the tables in the Severe Accident Guidelines.
 - In addition to the SAGs, the Operator must be able to interpret the Emergency Action Level table to determine what Off Site release rate limits are for a General Emergency.
- **A2: Review a completed surveillance form and determine that there is an out of specification condition which has made that system inoperable (OPST-CS-4123-02A, Section 12.4: SRO Review).**
 - OPST-CS-4123-02A, Section 12.4: SRO Review
 - Upon performing this review, the SRO notices the following discrepancies:
 - not all data is entered (missing Torus water volume)
 - not all steps are initialed for (missing performer initials for a step)
 - there is an out of specification for CS-12A not documented
- **A3: IAW ON 3157, "Loss of Fuel Pool Level", the operator has been directed to reposition two Fuel Pool Cooling valves in order to restore Fuel Pool level (FPC-53 and FPC-28)..**

The sequence the operator must follow to complete the JPM is:

 - which valves are operated
 - the type of Radiologically controlled area the valves are located in
 - which RWP to enter under
 - the dose and rate alarm setpoints for the selected RWP
- **A4: Operator determines that there is an Emergency Action Level classification of a General Emergency IAW AP 3125, Appendix "A" (Hot) based on FG 1.1 (Loss or potential loss of **any** two barriers with potential loss of third (Table F-1). Additionally, the candidate will make a PAR based on plant conditions and determine the surrounding towns that are required to be sheltered given the initial conditions.**

ES-301 Control Room/In-Plant Systems Outline Form ES-301-2Facility: **VERMONT YANKEE**Date of Examination: **11/29/10**Exam Level: **RO** ☐ SRO-I ☐ SRO-U ☐Operating Test No.: **VY 2010****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
S-1	Average Power Range Monitor System (215005)/ Transfer Mode Switch to Run (A4.01 3.2/3.1)	N, L, S	7
S-2	Reactor/Turbine Pressure Regulating System (241000)/Respond to failed EPR and MPR (A4.19 3.5/3.4)	M, A, S	3
S-3	Primary Containment Isolation System (Main Steam) 223002/ MSIV Full Closure Timing Test (Valve fails its timing test) (A2.08 2.7/3.1)	M, A, EN, S	5
S-4	Control Rod Drive Hydraulic System (201001)/ Respond to a trip of a CRD Pump (A2.01 3.2/3.3)	N, S	1
S-5	Main Turbine Generator and Auxiliary System (245000)/ Testing of the Emergency Governor (Governor fails to reset) (A4.02 3.1/2.9)	D, A, S	4
S-6	Radiation Monitoring System (272000)/ Respond to Hi Reactor Building Ventilation Radiation Alarm (failure of RB ventilation to isolate) (A2.11 3.4/3.7)	N, A, EN, S	9
S-7	Reactor Feedwater System (259001)/ Transfer Feedwater Pumps at Power (A4.02 3.9/3.7)	D, A, S	2
S-8	AC Electrical Distribution (262001)/ Cross Tie Buses eight and nine (A4.01 3.4/3.7)	D, S	6

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

P-1	Emergency Generators (Diesel/Jet)/Shutdown the "A" Emergency Diesel Generator locally (A2.02 RO 3.1/SRO 3.1)	D, R	6
P-2	Control Rod Drive Hydraulic System (295037) Isolate and Vent the Scram Air Header (EA1.05 3.9/4.0)	D, E, R	1
P-3	Reactor Protection System (212000)/ Reset RPS Power Protection Panel Trip (A2.02 3.7/3.9)	D, E	7

Facility: VERMONT YANKEEDate of Examination: 11/29/10Exam Level: RO ☐ **SRO-I** ☐ **SRO-U** ☐Operating Test No.: VY 2010Control 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
S-1	Average Power Range Monitor System (215005)/ Transfer Mode Switch to Run (A4.01 3.2/3.1)	N, L, S	7
S-2	Reactor/Turbine Pressure Regulating System (241000)/Respond to failed EPR and MPR (A4.19 3.5/3.4)	M, A, S	3
S-3	Primary Containment Isolation System (Main Steam) 223002/ MSIV Full Closure Timing Test (Valve fails its timing test) (A2.08 2.7/3.1)	M, A, EN, S	5
S-4	Control Rod Drive Hydraulic System (201001)/ Respond to a trip of a CRD Pump (A2.01 3.2/3.3)	N, S	1
S-5	Main Turbine Generator and Auxiliary System (245000)/ Testing of the Emergency Governor (Governor fails to reset) (A4.02 3.1/2.9)	D, A, S	4
S-6	Radiation Monitoring System (272000)/ Respond to Hi Reactor Building Ventilation Radiation Alarm (failure of RB ventilation to isolate) (A2.11 3.4/3.7)	N, A, EN, S	9
S-7	Reactor Feedwater System (259001)/ Transfer Feedwater Pumps at Power (A4.02 3.9/3.7)	D, A, S	2

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

P-1	Emergency Generators (Diesel/Jet) (295016)/Shutdown the "A" Emergency Diesel Generator locally (AA1.04 3.1/3.2)	D, R	6
P-2	Control Rod Drive Hydraulic System (295037) Isolate and Vent the Scram Air Header (EA1.05 3.9/4.0)	D, E, R	1
P-3	Reactor Protection System (212000)/ Reset RPS Power Protection Panel Trip (A2.02 3.7/3.9)	D, E	7

Facility: VERMONT YANKEE

Date of Examination: 11/29/10

Exam Level: RO ☐ SRO-I ☐ **SRO-U** ☐

Operating Test No.: VY 2010

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
S-1	Average Power Range Monitor System (215005)/ Transfer Mode Switch to Run (A4.01 3.2/3.1)	N, L, S	7
S-3	Primary Containment Isolation System (Main Steam) 223002/ MSIV Full Closure Timing Test (Valve fails its timing test) (A2.08 2.7/3.1)	M, A, EN, S	5
S-6	Radiation Monitoring System (272000)/ Respond to Hi Reactor Building Ventilation Radiation Alarm (failure of RB ventilation to isolate) (A2.11 3.4/3.7)	N, A, EN, S	9

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

P-2	Control Rod Drive Hydraulic System (295037) Isolate and Vent the Scram Air Header (EA1.05 3.9/4.0)	D, E, R	1
P-3	Reactor Protection System (212000)/Reset RPS Power Protection Panel Trip (A2.02 3.7/3.9)	D, E	7

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 (5) / 4-6 (5) / 2-3 (2)
(C)ontrol room	
(D)irect from bank	≤ 9 (6) / ≤ 8 (5) / ≤ 4 (2)
(E)mergency or abnormal in-plant	≥ 1 (2) / ≥ 1 (2) / ≥ 1 (2)
(EN)gineered safety feature	- / - / ≥ 1 (2) (control room system)
(L)ow-Power / Shutdown	≥ 1 (1) / ≥ 1 (1) / ≥ 1 (1)
(N)ew or (M)odified from bank including 1(A)	≥ 2 (5) / ≥ 2 (5) / ≥ 1 (3)
(P)revious 2 exams	≤ 3 (1) / ≤ 3 (1) / ≤ 2 (0) (randomly selected)
(R)CA	≥ 1 (2) / ≥ 1 (2) / ≥ 1 (1)
(S)imulator	

JPM

JPM Description

- S-1** A plant startup is in progress with reactor power just below the APRM downscale setpoint (2%). The Control Room Supervisor (CRS) has directed the Operator at the Controls (OATC) to transfer the Mode Switch to RUN IAW OP 0105, "Reactor Operations", phase 2D, step 10a → 10g. This involves withdrawing control rods to clear APRM downscales, transferring the mode switch to RUN, withdrawing IRM detectors, and switching recorders.
- S-2** The crew has entered OT 3115, "Reactor Pressure Transients", due to a failed EPR. Direction has been given to perform OT 3115, step 2 to swap pressure regulation from the EPR to the MPR. Once the operator lowers pressure back to its pre-transient pressure, the MPR will fail requiring the operator to take the immediate action of scrambling the reactor due to a failed EPR AND MPR.
- S-3** A plant startup is in progress. While operating at ~55-57% RTP (OP 0105, "Reactor Operations", Phase 4B, step 12), the operator is directed to perform MSIV Full Closure Timing and RPS Relay Actuation Functional Test IAW OP 4113, Section "A". Steps 1 through 5 are complete. This is an alternate path JPM as follows: the closure time for MS-86A will be UNSAT (step 9.a.3) requiring the operator to suspend further MSIV testing and close MS-80A.
- S-4** While operating at rated power, a trip of the "A" CRD Pump has resulted in the crew entering OPON-3145-01, "Loss of CRD Regulating Function". The operator has been directed to start the "B" CRD Pump to restore CRD Hydraulics IAW OPON-3145-01, step 3.5.
- S-5** While operating at rated power, the operator is directed to perform the monthly Emergency Governor Test IAW OP 0150, "Conduct of Operations and Operator Rounds" VYOPF 0150.08 (Operations Department Monthly Task Performance Listing), and OP 4160, "Turbine Generator Surveillance", Section "G". This is an alternate path JPM as follows: the Emergency Governor will not reset requiring a second attempt at resetting it. After the second attempt is unsuccessful, the trip/test switch is left in the lockout position and Maintenance contacted.
- S-6** While operating at rated power, the Control Room receives annunciator CRP 9-5-H-1, "RX BLDG/REFUEL FLR CH A RAD HI". The operator is directed to verify the validity of the alarm and if necessary confirm/initiate the automatic actions associated with the Alarm Response Sheet (ARS). These actions include verifying Standby Gas Treatment (SBGT) automatically started, a full Group III Primary Containment Isolation System (PCIS) isolation occurred, and Reactor Building (RB) Ventilation isolated. This is an alternate path JPM as follows: Reactor Building ventilation failed to isolate and the operator is expected to take action IAW EN-OP-115, "Conduct of Operations", section 5.3[2].
- S-7** A plant startup is in progress. While operating at ~83-86% RTP, the operator is directed to start the "B" RFP IAW OP 0105, "Reactor Operations", Phase 4B, step 22. This is an alternate path JPM as follows: the discharge valve strokes closed following pump start. The operator is expected to trip the "B" RFP IAW OP 0105 Phase 4B caution for step 22 (If minimum flow path or normal flow cannot be established, the pump shall be immediately secured).
- S-8** While the plant was operating at rated power, an electrical fault on Bus 3 resulted in the loss of Buses 3 and 8. The crew has entered ON 3171, "Loss of Bus 3". The operator is directed to cross tie buses 9 and 8 IAW ON 3171, operator action step 4 and OP 2143, "480 and Lower Voltage AC System", Appendix "C", Energizing 480Vac Bus 8 (Dead Bus) From Bus 9".
- P-1** The Control Room has been abandoned and actions of OP 3126, "Shutdown Using Alternate Shutdown Methods" have been taken. The Control Room Supervisor has directed you to shutdown the "A" Emergency Diesel Generator locally IAW OP 3126, Appendix 19, step 19 using OP 2126 "Emergency Diesel Generators", section "D".
- P-2** While operating at rated power, an electrical ATWS occurred resulting in the failure of all control rods to insert. The crew has entered EOP-2, "ATWS RPV Control". The operator has been directed to vent the scram air header IAW OE 3107, "EOP/SAG Appendices", Appendix "D", "Manual Isolation and Venting of the Scram Air Header".
- P-3** While operating at rated power, spurious electrical trips have resulted in the trips of the Reactor Protection System (RPS) MG set output breaker and RPS Power Protection Panels PP-A-1 and PP-A-2. The operator has been directed to reset the RPS Power Protection Panel trips IAW OP 2134, "Reactor Protection System", section "F".

Facility:	VERMONT YANKEE	Scenario No.:	1	Op Test No.:	VY 2010
Examiners:	_____	Operators:	CRS -		
	_____		OATC -		
	_____		BOP -		
Initial Conditions: A reactor power reduction is in progress to support planned maintenance on the "C" Reactor Feedwater Pump seal and electrical grid maintenance.					
Turnover: The crew is directed to continue with a power reduction to 80% RTP to support planned maintenance on the "C" Reactor Feedwater Pump seal. The seal has minor leakage and there are no operational restrictions on operating with the current leakage. From there, maintain 80% RTP until the maintenance is complete and RFP restored to service. The plant is expected to remain at 80% RTP for ~48 hours to support maintenance activities.					
Critical Tasks: <ol style="list-style-type: none"> 1. When PCIS Group 1, 2, 3, 5, or 6 fails to isolate (2 valves in PCIS Group 3 for this scenario) with a leak present, initiate PCIS Group manually. STANDARD: Leak or release terminated within 10 minutes of receipt of the auto isolation signal. 2. When torus pressure exceeds the suppression chamber spray initiation pressure, initiate drywell containment spray while in the safe region of the drywell spray initiation limit. STANDARD: spray the drywell within 10 minutes of exceeding a Torus pressure of 10 psig AFTER power has been restored to Bus 3 AND RPV level not an overriding priority. 					
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	R- OATC N-CRS N- BOP	With the plant at 90% RTP, continue a power reduction to 80% RTP to support planned maintenance on the "C" RFP seal. Remove the "C" Reactor Feedwater pump from service following power reduction.		
4	IOR RHdi3210A S34A	TS- CRS	Respond to Annunciator 3-J-9 (RHR/CS A BUS/LOGIC FAIL) (TS)		
2	mfRC_04	C- ALL TS- CRS	Inadvertent Initiation of RCIC (positive reactivity addition) (OT) (TS)		
3	mfFW_14	I- OATC I- CRS	Steam Flow Summer failure low (OT)		
5	Mf_06A	C- ALL	Small steam Leak in the drywell		

6	mfED_03A	M- ALL	Loss of Bus 1 resulting in the loss of Feedwater
	mfDG_05B	C- BOP C- CRS	"B" EDG fails to start
	Mf_06A	M- ALL	Larger steam Leak in the drywell
	mfPC_1SB06 mfPC_1SB06A	C- BOP	PCIS Group 3 failure (SGT-6 and AC-6B fail to close)
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Vermont Yankee 2010 NRC Scenario #1

The crew takes the watch with the reactor operating at 90% RTP. They will continue a power reduction to 80% and remove the "C" Reactor Feedwater Pump (RFP) IAW OP-0105, "Reactor Operations". This will be done to perform corrective maintenance on the 'C" RFP.

The crew will respond to annunciator 3-J-9, "RHR/CS A BUS/LOGIC FAIL". When an operator is sent to investigate, it will be determined that DC-2C circuit breaker #2 was found tripped. As a result, the CRS will enter TS LCO 3.5.A.6 (24 hour cold shutdown).

The crew will respond to an inadvertent initiation of Reactor Core Isolation Cooling IAW OT 3110, "Positive Reactivity Insertion". After verifying the requirements of EN-OP-115, "Conduct of Operations", the crew can override the system by tripping RCIC. The CRS will determine that RCIC is INOPERABLE and enter TS LCO 3.5.G.2 (14 days). RCIC will remain AVAILABLE for the remainder of the scenario.

The crew will respond to a downscale failure of the Steam Flow Summer. The failure will result in RPV water level lowering and require the OATC to take manual control of the FWLC system to restore level IAW OT 3113, "Reactor Low Level" and transfer the FWLC System to Single Element.

The crew will respond to a small leak in the Drywell IAW OT 3111' "High Drywell Pressure. Efforts to control drywell pressure will be unsuccessful, and the crew will insert a manual scram prior to reaching the high Drywell pressure setpoint. Entry into EOP-1, "RPV Control" and EOP-3, "Primary Containment Control", will be required.

After the RPV water level band has been given to the OATC, the crew will respond to the loss of Bus 1 and the loss of ALL feedwater IAW OPOT-3169-01, "Loss of Bus 1". The "B" EDG will not start automatically or manually due to an air start solenoid failure. IAW EOP-1, RPV level control will be shifted to alternate preferred injection systems (Table "C").

As the water level control issues are being addressed, the steam leak will become larger requiring additional actions in EOP-3. Two PCIS Group 3 valves will fail (SGT-6 and AC-6B) requiring manual operation to shut them with a leak in containment (**CRITICAL TASK**). As Torus pressure rises to 10 psig, action will be taken to initiate Drywell Sprays (**CRITICAL TASK**). To do this power will have to be restored to Bus 3 from the Vernon Tie for the "B"/"D" RHRSW pumps.

Facility:	VERMONT YANKEE	Scenario No.:	2	Op Test No.:	VY 2010																															
Examiners:	_____	Operators:	CRS -																																	
	_____		OATC -																																	
	_____		BOP -																																	
Initial Conditions: The plant is operating at 100% RTP. RHR-39A (TORUS SPRAY/CLG RHR) valve motor actuator is being repaired (30-day LCO entered 1 day ago per TS 3.5.B.1).																																				
Turnover: Maintain 100% RTP in conjunction with performing "Once/Week Pump Performance Testing" IAW OP 4160, "Turbine Generator Surveillance", section B.1.c → B.1.f. Local testing is not desired. Sections B.1.a and B.1.b have been completed.																																				
Critical Tasks: <ol style="list-style-type: none"> 1. During an ATWS with conditions met to perform power/level control TERMINATE AND PREVENT INJECTION into the RPV using appendix GG, until conditions are met to re-establish injection. STANDARD: completion of Terminate and prevent injection IAW OE 3107 Appendix GG within 7 minutes of loss of forced circulation. 2. With a reactor scram required and the reactor not shutdown, TAKE ACTION TO REDUCE POWER by injecting boron and/or inserting control rods, to prevent exceeding the primary containment design limits. STANDARD: Actions taken within 15 minutes of the scram failure to implement appropriate appendices and/or inject SLC (Implement Appendix "G" in this scenario). Only one method needs to be used. The method must result in successful control rod insertion or SLC injection (Control rod insertion in this scenario). 																																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Event No.</th> <th style="width: 10%;">Malf. No.</th> <th style="width: 10%;">Event Type*</th> <th style="width: 70%;">Event Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N/A</td> <td>N- BOP N-CRS</td> <td>Complete "Once/Week Pump Performance Testing" IAW OP 4160, "Turbine Generator Surveillance", section B.1.c → B.1.f. Local testing is not desired.</td> </tr> <tr> <td>2</td> <td>mfED_06E</td> <td>TS- CRS</td> <td>Loss of DC-2AS (TS)</td> </tr> <tr> <td>3</td> <td>mfFW_10A</td> <td>I- OATC I- CRS</td> <td>Failure of the 'A' Feedwater Regulating valve controller (OT)</td> </tr> <tr> <td>4</td> <td>mfMC_08</td> <td>C- BOP C- CRS</td> <td>Condenser air in-leakage/High Condenser backpressure (OT) due to "A" Condenser casing failure</td> </tr> <tr> <td></td> <td>N/A</td> <td>R- OATC</td> <td>Power reduction IAW OT 3120, "Condenser High Backpressure"</td> </tr> <tr> <td rowspan="2">5</td> <td>mfED_05C</td> <td>C- ALL TS- CRS</td> <td>Loss of Bus 8 (ON) (TS)</td> </tr> <tr> <td>mfPC_11A</td> <td>C- BOP</td> <td>Failure of SBGT train "A" fan to auto start</td> </tr> </tbody> </table>						Event No.	Malf. No.	Event Type*	Event Description	1	N/A	N- BOP N-CRS	Complete "Once/Week Pump Performance Testing" IAW OP 4160, "Turbine Generator Surveillance", section B.1.c → B.1.f. Local testing is not desired.	2	mfED_06E	TS- CRS	Loss of DC-2AS (TS)	3	mfFW_10A	I- OATC I- CRS	Failure of the 'A' Feedwater Regulating valve controller (OT)	4	mfMC_08	C- BOP C- CRS	Condenser air in-leakage/High Condenser backpressure (OT) due to "A" Condenser casing failure		N/A	R- OATC	Power reduction IAW OT 3120, "Condenser High Backpressure"	5	mfED_05C	C- ALL TS- CRS	Loss of Bus 8 (ON) (TS)	mfPC_11A	C- BOP	Failure of SBGT train "A" fan to auto start
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5	mfED_05C	C- ALL TS- CRS	Loss of Bus 8 (ON) (TS)																																	
	mfPC_11A	C- BOP	Failure of SBGT train "A" fan to auto start																																	

6	mfNM_05D mfRD_12A mfRD_12B	M- ALL	APRM "D" Fails upscale with and Hydraulic ATWS
	mfRP_01A mfRP_01B	C- OATC C- CRS	Failure to auto scram; manual scram insertion results in partial rod insertion; ARI/RPT initiated
	mfRP_09A mfRP_09B	C- OATC	Failure of RWCU to completely isolate on SLC initiation.
	mfSL_01A	C- OATC	Failure of running SLC pump
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Vermont Yankee 2010 NRC Scenario #2

The crew will complete the "Once/Week Pump Performance Testing" IAW OP 4160, "Turbine Generator Surveillance", section B.1.c → B.1.f. B.1.a and B.1.b are complete and local testing is not desired.

The crew will respond to a loss of DC-2AS. The CRS will take actions IAW ON 3163, "Loss of DC-2AS" and enter required TRM and TS LCOs (section 3.10)

Shortly after the "A" EDG control power has been transferred to its alternate source, a failure of the 'A' feedwater regulating valve controller will occur. The crew will respond IAW OT 3114 (Reactor High Level) and place the "A" FRV Controller in manual control to block the auto signal failure.

Once level has been restored to its pre-transient value, Main Condenser air in-leakage will result in rising condenser backpressure and entry into OT 3120. While attempts are made to determine the cause, a power reduction will be ordered IAW OT 3120. The leak will be slow enough to perform a controlled power reduction in order to get a reactivity manipulation.

After Main Condenser backpressure is stabilized, the crew will respond to a loss of Bus 8. SBTGT "A" fan will fail to auto-initiate upon receipt of the Group III isolation signal. The crew will backup the Group III isolation and initiate SBTGT "A". Review of Tech Specs will reveal a 24-hour shutdown LCO due to inadequate RHR torus cooling/spray capability and inadequate LPCI (loss of emergency bus 8 will also get the plant into a 24 hour LCO).

Once the 24-hour shutdown LCO has been determined, the "D" APRM fails upscale, it will result in a trip of RPS Channel "B" which will fail and subsequently, an ATWS will result. The manual scram pushbuttons will only insert control rods partially and ARI/RPT pushbuttons will be used unsuccessfully. The crew will be evaluated controlling and shutting down the plant in accordance with EOP-1 and EOP-2. IAW EOP-2, "ATWS RPV Control", actions are taken to insert control rods and/or initiate SLC (**CRITICAL TASK**), and terminate and prevent injection (**CRITICAL TASK**). When SLC is initiated, the Group V isolation will fail and CU-18 and 68 will fail to isolate (CU-15 lost power and tripped the RWCU pump during the loss of Bus 8). After three minutes of operation, the "A" SLC pump will trip resulting in no SLC injection. PCV-CRD-22 will initially fail to manually close resulting in the crew having to insert individual control rods using OE 3107, Appendix "G". After several control rods are inserted, the valve can be opened to insert all control rods.

Facility:	VERMONT YANKEE	Scenario No.:	3	Op Test No.:	VY 2010
Examiners:	_____	Operators:	CRS -		
	_____		OATC -		
	_____		BOP -		
Initial Conditions: The plant is operating at 100% RTP. A seven day LCO is in effect for the "B" train of Standby Gas Treatment (SBGT) being INOPERABLE (TS 3.7.B.3.a)					
Turnover: Maintain 100% RTP in conjunction with performing OP 0150, Section E, "Operations Department Weekly and Monthly Task Performance Listing", surveillance of swapping the TBCCW and RBCCW pumps IAW RP 4183 and OP 2182. VYOPF 0150.08 will be documented when the surveillances are completed. The TBCCW Heat Exchangers have been swapped and temperatures have stabilized.					
Critical Tasks:					
<ol style="list-style-type: none"> 1. With a Primary system discharging into Secondary Containment and area radiation/temperature/water levels exceed Maximum Safe Operating Levels in more than one area, initiate an RPV-ED. STANDARD: Initiate RPV-ED within 5 minutes of area radiation/temperature/water levels exceeding Maximum Safe Operating Levels in more than one area. 2. When a leak is present, dispatch personnel to manually isolate associated PCIS valves that have failed to isolate automatically and manually from the Control Room. STANDARD: Direct I&C/Maintenance/AOs to manually isolate PCIS valves within 15 minutes of receipt of the isolation signal. (Environmental considerations and power source may affect the time standard for this critical task). 					
Event No.	Mal. No.	Event Type*	Event Description		
1	N/A	N-BOP N- CRS	Monthly TBCCW/RBCCW pump swaps IAW OP 0150, OP 2182, and RP 4183		
2	mfPC_2LR8 294	TS- CRS	Respond to annunciator 4-M-3, "DWL SUMP VLV CLOSED" (alarm due to blown fuses for LRW-82 and LRW-94) (TS)		
3	mfRR_07A	C-BOP	Respond to a failure of the inboard seal on the "A" Recirculation pump.		
4	mfED_05B	C- ALL	Loss of Bus 7 (Off Normal event using OP 2143)		
		R- OATC TS- CRS C- CRS	"B" Recirculation Pump Trip (OT) (TS)		
5	mfEG_05A	M- ALL	Trip of the "A" Stator Water Cooling pump resulting in the loss of ALL Stator Water Cooling → Turbine trip and Reactor Scram		

6	mfHP_09	M- ALL	HPCI Steam Leak before HPCI-14
	mfRP_01A	C-OATC	Failure of Automatic Scram
	mfRP_01B		Failure of manual scram pushbuttons
	mfPC_1HP15 mfPC_1HP16	C- BOP C- CRS	Failure of HPCI to auto and manually isolate (PCIS Group VI failure)
	mfTC_12	C-OATC	Failure of bypass valves to open (at 600 psig)
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Vermont Yankee 2010 NRC Scenario #3

The crew will be directed to perform the OP 0150, Section E, "Operations Department Weekly and Monthly Task Performance Listing", surveillance of swapping the TBCCW and RBCCW pumps IAW RP 4183 and OP 2182. VYOPF 0150.08 will be documented when the surveillances are completed. The swap of the TBCCW heat exchangers will be turned over as being completed with all temperatures stabilized.

The crew will respond to 4-M-3, "DWL SUMP VLV CLOSED". After it is reported the cause of the valves closing is a blown fuse, The CRS will enter TS LCOs 3.6.C.2 (7 days) and 3.7.D.2/4.7.D.2 (close and deactivate a valve in the line containing the INOPERABLE PCIS valve and verify the line is isolated every 31 days).

The crew will respond to a loss of the inboard "A" Recirculation Pump seal IAW ON 3142. This will involve monitoring temperatures and pressures for the failed seal.

The crew will respond to a loss of Bus 7. The loss of Bus 7 will result in the trip of the "B" Recirculation Pump requiring entry into OT 3118, Recirculation Pump trip. The crew will take actions including a power reduction to 40-45% RTP. The CRS will address single loop operation Technical Specifications.

Following the power reduction, the crew will respond to a trip of the "A" Stator Water Cooling pump. They must realize that this will result in a complete loss of Stator Water Cooling. If actions are not taken in a timely manner (1 minute), the turbine will automatically trip. Direction will be provided by the CRS to manually trip the turbine and insert a manual scram within 1 minute of the "A" Stator Water Cooling pump trip. A failure of the automatic (in the event the crew does not trip the turbine within 1 minute) and manual scram pushbuttons will require the OATC to initiate ARI/RPT. All Control Rods will insert and the crew will address reactor plant parameters in EOP-1.

Following the immediate actions of OT 3100 and the order to control plant pressure and level in band, a break will occur in the HPCI Steam Line upstream of HPCI-14. Rising temperatures in the Reactor Building will result in entry in EOP-4, "Secondary Containment Control". The PCIS Group VI automatic isolation signal will fail as well as manual attempts to shut the valves from the Control Room. The crew will have to take action to contact support personnel to shut the valves locally within 15 minutes in an attempt to shut the PCIS valves with an automatic isolation signal failure (**CRITICAL TASK**). Bypass valves will fail to open at 600 psig to allow an RPV-ED to be evaluated.

As EOP-4 is entered, once the first area reaches its Maximum Safe Operating Limit, the steam leak will get larger. Once temperatures reach the Maximum Safe Operating Limit in more than one area (RB 252' and 280' elevations), and RPV-Emergency Depressurization will be performed IAW EOP-5, "RPV-ED" within 5 minutes (**CRITICAL TASK**).

Facility: VERMONT YANKEE Scenario No.: 4 Op Test No.: VY 2010
SPARE

Examiners: _____ Operators: CRS -
 _____ OATC -
 _____ BOP -

Initial Conditions: Power is ~1% with a reactor startup in progress.

Turnover: OP 0105, "Reactor Operations", is complete thru Phase 2.C. The crew will be directed to perform a Turbine Chest warm-up IAW OP 0105 Phase 2.D. Step 1 and continue Reactor Startup (60 to 80 degree/hour heat up rate).

Critical Tasks:

1. When torus level cannot be maintained above 7 ft, perform RPV emergency depressurization. **STANDARD:** Initiate RPV-ED such that RPV pressure is < 50 psig when Torus level reaches 5.5 ft.
2. During an ATWS with Emergency Depressurization required, terminate and prevent injection into the RPV (using OE 3107, "EOP/SAG Appendices", Appendix GG) until conditions are met to re-establish injection. **STANDARD:** Terminate and prevent injection IAW Appendix GG such that no system other than SLC, CRD, and/or RCIC is/are injecting during the RPV-ED.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N- BOP N-CRS	Perform Turbine Chest warm-up.
2	N/A	R- OATC	Withdraw control rods to continue power ascension.
3	mfNM_03F	I- OATC I- CRS TS- CRS	IRM "F" fails upscale (TS).
4	rfPP_06	C- BOP C- CRS TS- CRS	Seismic Event resulting in a leak in the SLC Tank (TS) (Off Normal event using OP 3127)
	mfMS_09	C- BOP	Gland Seal Regulator Fails Closed
	mfSW_14A mfSW_21B	C--OATC	Failure of the standby TBCCW pump to auto start after running pump trips due to seismic event. (OT)
5	rfPP_06 mfED_17	M- ALL	Seismic Event (after shock)/Loss of Normal Power

	mfDG_09B	C- BOP	Failure of the "B" Emergency Diesel Generator breaker to auto close
	mfRP_01A mfRP_01B mfRD_022227 mfRD_021035 mfRD_023011 mfRD_021019	C- OATC C- CRS	Failure of manual scram; 4 control rods stuck out
6	mfPC_10	M- ALL	Leak in the Torus
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Vermont Yankee 2010 NRC Scenario #4

The crew will initiate Turbine Chest Warming and continue with the reactor startup, withdrawing control rods to continue with the power ascension. As the startup progresses, IRM "F" will fail upscale resulting in a rod withdrawal block and a half scram, requiring the crew to evaluate Tech Specs, and bypass the failed IRM.

The crew will be evaluated responding to a seismic event that causes a leak in the SLC tank and a trip of the running TBCCW/failure of the standby TBCCW pump to auto start. The actions of OP 3127, "Natural Phenomena" and EN-OP-115, "Conduct of Operations"/OT 3165, "Loss of TBCCW", will be taken to respond to the seismic event and failure of the standby pump to start. Technical Specifications will be consulted, revealing a 24-hour shutdown LCO (TS section 3.4). Also, the Gland Seal Regulator will fail closed requiring the crew to open the bypass valve IAW the ARS to maintain condenser backpressure.

A seismic aftershock will occur resulting in the Loss of Normal Power (LNP) and a break in the weld of the 'A' RHR suction line to the torus. The crew will be evaluated responding to the seismic event (OP 3127), Loss of Normal Power (OT 3122, "Loss of Normal Power") and failure of the "B" Emergency Diesel Generator breaker to automatically close. The breaker will be able to be closed by the operator in the Control Room. A failure of both automatic and manual scram capability exists. ARI/RPT initiation will result in successful rod insertion of all rods but 4 control rods which are stuck out.

A loss of high pressure injection from Feed and Condensate will result in direction to control level with EOP-2 Table "H" systems: Based on the low power history, the CRS may direct the use of RCIC or maximizing CRD. HPCI should not be needed

During the RPV-ED, an alternate injection system (EOP-2, Table "J") may be required although maximizing CRD flow may be enough to support rapid depressurization based on low power history.

Once the lowering torus level is noted, the crew will be evaluated on entry into and execution of EOP-3, "Primary Containment Control" and EOP-4, "Secondary Containment Control". The crew will also enter ON 3158, "Reactor Building High Level/Temperature", due to high RB water level. Because of the size of the leak, the crew will perform an RPV Emergency Depressurization (**CRITICAL TASK**). With an RPV-ED required during an ATWS condition, the crew will be required to terminate and prevent injection prior to the RPV-ED (**CRITICAL TASK**).