FPL Energy
Seabrook Station

FPL Energy Seabrook Station
P.O. Box 300
Seabrook, NH 03874
(603) 773-7000

April 11, 2007

Docket 50-443
SBK-L-07066

United States Nuclear Regulatory Commission
Attn: Mr. John Caruso, Senior Operations Engineer/Examiner
475 Allendale Road
King of Prussia, PA 19406-1415

Seabrook Station
Submittal of Information for Operator Licensing Examinations

In a letter dated March 22, 2007, FPL Energy Seabrook, LLC received a request to furnish documentation to support the administration of Senior Reactor Operator and Reactor Operator licensing examinations scheduled for the weeks of July 2 and July 9, 2007. The letter requested examination outlines be provided by April 16, 2007 with the written examinations, operating tests, and supporting reference materials identified in Attachment 2 of ES-201, "Initial Licensing Examination Process; Examination Security," to be furnished by May 14, 2007.

Per your request, FPL Energy Seabrook, LLC encloses the examination outlines as follows:

ES-201-2, Examination Outline Quality Checklist
ES-301-1, Administrative Topics
ES-301-2, Control Room/In-Plant Systems Outline
ES-301-5, Transient and Event Checklist
ES-D-1s, Scenario Outlines
ES-401-2, PWR Examination Outline
ES-401-3, Generic Knowledges and Abilities Outline
Outline of Sampling Methodology
Draft Exam Week Schedule

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The information provided in the enclosure is confidential in nature and is not for release to the public.

Should you have any questions regarding this matter, please contact Mr. Tim Cassidy, Training Support Supervisor, at (603) 773-7651.

Very truly yours,

FPL Energy Seabrook, LLC

Gene St. Pierre
Site Vice President

cc (Without Enclosures):
Document Control Desk
S. J. Collins, NRC Region I Administrator
M. Sykes, NRC Region I Chief
G. E. Miller, NRC Project Manager, Project Directorate I-2
G. T. Dentel, NRC Senior Resident Inspector

Enclosure to SBK-L-07066

4/18/07

Seabrook Exam Outline - Review Comments

Schedule

Revise proposed schedule to have exam team travel Monday morning and administer in-plant JPMs in the afternoon with one examiner administering 1-2 JPMs in the simulator in parallel.

Written Outline

- Tier 1/grp 1 SRO - 000027 doesn't look like SRO level entry level condition EOP
- Tier 2/grp 1 RO - 006 and 007 - topics sounds too easy non discriminatory - normal water supply SIS?
- Tier 2/grp 1 RO - 003 and 005 - topics sounds too easy non-discriminatory
- Tier 2/grp 1 SRO - 012, 061and 064 - purpose questions doesn't sound like SRO level topics
- Tier 2/grp 2 RO - 056 - loss of condensate pump seems too easy
- Tier 3 - RO - 2.1.28 - purpose questions - sounds too easy non-discriminatory

Scenario Outlines

- scenario "C" Initial Conditions provides some scenario overview of event failures.
- scenario "C" - events 2 and 3 TS calls must include required operator actions to count for other crew applicant evaluations.
- scenario "C" - the EDG failure is really part of the MT just setting up for the loss of all AC no crew actions required to restore this EDG.
- scenario "D" - did you have a lower power scenario <5% in the last 2 NRC exams - response "Yes".
- scenario "A" - events 2 and 3 TS calls must include required operator actions to count for other crew applicant evaluations.
- scenario "A" - seems like a very direct scenario - not subtle diagnosis.
- scenario "B" - Initial Conditions provides some scenario overview of event failures.

Note: Sent via e-mail some CC scenarios administered last year as a template regra

JPM Outlines

- all 3 in-plant JPMs are directly from the bank and one of the primary purpose of in-plant JPMs is plant locations and once exposed this part is lost. There are also 6 of 8 simulator JPMs are directly from bank. Although, this is acceptable consider modifying or replacing at least one in-plant JPM and 2 simulator JPMs that were taken directly from the bank. Consider modifying or replacing those JPMs that are also common to the SROU outline.

- SRO admin. Rad Control and E plan consider modifying these JPMs should be easy top change.

Facility:

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	3	2	3	N/A			3	4	N/A		3	18	4		2		6
	2	1	1	2				2	2			1	9	2		2		4
	Tier Totals	4	3	5				5	6			4	27	6		4		10
2. Plant Systems	1	4	1	4	4	1	2	3	2	3	2	2	28	2		3		5
	2	2	1	1	1	1	1	1	1	0	0	1	10		1	2		3
	Tier Totals	6	2	5	5	2	3	4	3	3	2	3	38	3		5		8
3. Generic Knowledge and Abilities Categories		1			2			3		4			10	1	2	3	4	7
		4			2			2		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 that are not included on the outline should be added. Refer to ES-401, Attachment 2, 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.

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.

Seabrook Station 2007 NRC Exam Tier 1/Group1 RO

ES-401 PWR Examination Outline Form ES-401-2

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1						X	2.1.20 Ability to execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)	4.3	1
000008 Pressurizer Vapor Space Accident / 3	X						AK1.01 Thermodynamics and flow characteristics of open or leaking valves. (CFR 41.8/41.10/45.3)	3.2	1
000009 Small Break LOCA / 3					X		EA2.15 Ability to determine or interpret the following as they apply to a small break LOCA: RCS parameters (CFR 43.5/ 45.13)	3.3	1
000011 Large Break LOCA / 3		X					EK2.02 Knowledge of the interrelationship between the following and a large break LOCA: Pumps (CFR 43.5/ 45.13)	2.6	1
000015/17 RCP Malfunctions / 4				X			AA1.07, Ability to operate and/or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of Flow): RCP Seal Water Injection Subsystem (CFR 41.7/45.5/45.6)	3.5	1
000022 Loss of Rx Coolant Makeup / 2			X				AK3.02, Knowledge of the interrelations between the Loss of Reactor Coolant Makeup and the following: Actions contained in SOPs and EOPs for RCPs, loss of makeup, loss of charging, and abnormal charging. (CFR 41.5/41.10/45.6/45.13)	3.5	1
000025 Loss of RHR System / 4						X	2.4.11, Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13)	3.4	1
000026 Loss of Component Cooling Water / 8									
000027 Pressurizer Pressure Control System Malfunction / 3	X						AK1.02, Knowledge of the operational implications of the following concepts as they apply to Pressurizer Pressure Control Malfunctions: Expansion of liquids as temperature increases. (CFR 41.8/41.10/45.3)	2.8	1
000029 ATWS / 1				X			EA1.01, Ability to operate and monitor the following as they apply to a ATWS: Charging Pumps. (CFR 41.7/45.5/45.6)	3.4	1
000038 Steam Gen. Tube Rupture / 3									
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4		X					AK2.02, Knowledge of the interrelationship between the Steam Line Rupture and the following: Sensors and detectors (CFR 41.7/45.7)	2.6	1
000054 (CE/E06) Loss of Main Feedwater / 4									
000055 Station Blackout / 6			X				EK3.02, Knowledge of the reasons for the following responses as they apply to the Station Blackout: Actions contained in EOP for loss of offsite and onsite power (CFR 41.5/41.10/45.6/45.13)	4.3	1

Seabrook Station 2007 NRC Exam Tier 1/Group1 RO (Continued)

000056 Loss of Off-site Power / 6				X			AA1.18, Ability to operate and/or monitor the following as they apply to the Loss of Offsite Power: Control room normal ventilation supply fan. (CFR 41.7/45.5/45.6)	3.2	1
000057 Loss of Vital AC Inst. Bus / 6					X		AA2.15, Ability to determine and interpret the following as the apply to Loss Of Vital AC Instrument Bus: That a loss of ac has occurred: (CRF 43.5/45.13)	3.8	1
000058 Loss of DC Power / 6						X	2.4.11, Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13)	3.4	1
000062 Loss of Nuclear Svc Water / 4			X				AK3.02, Knowledge of the reasons for the following responses as they apply to the Loss Of Nuclear Service Water: The automatic actions (alignments) within the nuclear service water resulting from the actuation of ESFAS. (CFR 41.4/41.8/45.7)	3.6	1
000065 Loss of Instrument Air / 8					X		AA2.05, Ability to determine and interpret the following as they apply to the Loss of Instrument Air: When to commence plant shutdown if instrument air pressure is decreasing. (CFR 43.5/45.13)	3.4	1
W/E04 LOCA Outside Containment / 3	X						EK1.3, Knowledge of the operational implications of the following concepts as they apply to the LOCA Outside Containment: Annunciators and conditions indicating signals, and remedial actions associated with the LOCA Outside Containment. (CFR 41.8/41.10/45.3)	3.5	1
W/E11 Loss of Emergency Coolant Recirc. / 4					X		EA2.1 Ability to determine and interpret the following as they apply to the Loss Of Emergency Coolant Recirculation: Facility conditions/selection of procedures during abnormal and emergency operations. (CFR 43.5/45.13)	3.4	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4									
K/A Category Totals:	3	2	3	3	4	3	Group Point Total:		18/6

Seabrook Station 2007 NRC Exam Tier 1/Group1 SRO

ES-401 PWR Examination Outline Form ES-401-2

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1					X		EA2.04, Ability to determine or interpret the following as they apply to a reactor trip: If reactor should be tripped but has not done so, manually trip the reactor and carry out actions in ATWS EOP. (CFR 41.7/45.5/45.6)	4.6	1
000008 Pressurizer Vapor Space Accident / 3									
000009 Small Break LOCA / 3									
000011 Large Break LOCA / 3					X		EA2.10, Ability to determine or interpret the following as they apply to a Large Break LOCA: Verification of adequate core cooling. (CFR 43.5/45.13)	4.7	1
000015/17 RCP Malfunctions / 4						X	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (CFR: 43.5 / 45.12 / 45.13)	4.4	1
000022 Loss of Rx Coolant Makeup / 2									
000025 Loss of RHR System / 4									
000026 Loss of Component Cooling Water / 8									
000027 Pressurizer Pressure Control System Malfunction / 3						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal ~~operating~~ procedures. (CFR 41.10 / 43.2 / 45.6)	4.3	1
000029 ATWS / 1									
000038 Steam Gen. Tube Rupture / 3					X		EA2.15, Ability to determine and interpret the following as they apply to a SGTR: Pressure at which to maintain RCS during S/G cooldown. (CFR 43.5/45.13)	4.4	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4									
000054 (CE/E06) Loss of Main Feedwater / 4									
000055 Station Blackout / 6					X		EA2.03, Ability to detemine or interpret the following as they apply to a Station Blackout: Actions necessary to restore power. (CFR 43.5/45.13)	4.7	1
000056 Loss of Off-site Power / 6									
000057 Loss of Vital AC Inst. Bus / 6									
000058 Loss of DC Power / 6									

Seabrook Station 2007 NRC Exam Tier 1/Group1 SRO (Continued)									
000062 Loss of Nuclear Svc Water / 4									
000065 Loss of Instrument Air / 8									
W/E04 LOCA Outside Containment / 3									
W/E11 Loss of Emergency Coolant Recirc. / 4									
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4									
K/A Category Totals:					4	2	Group Point Total:		18/6

Seabrook Station 2007 NRC Exam Tier 1/Group 2 RO

ES-401 PWR Examination Outline Form ES-401-2

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1									
000003 Dropped Control Rod / 1			X				AK3.04, Knowledge of the reasons for the following responses as they apply to the Dropped Control Rod: Actions contained in the EOP for dropped control rod. (CFR 41.5/41.10/45.6/45.13)	3.8	1
000005 Inoperable/Stuck Control Rod / 1									
000024 Emergency Boration / 1									
000028 Pressurizer Level Malfunction / 2					X		AA2.03, Ability to determine and interpret the following as they apply to the Pressurizer Level Control Malfunction: Charging subsystem flow indicator and controller. (CFR 43.5/45.13)	2.8	1
000032 Loss of Source Range NI / 7									
000033 Loss of Intermediate Range NI / 7									
000036 (BW/A08) Fuel Handling Accident / 8									
000037 Steam Generator Tube Leak / 3									
000051 Loss of Condenser Vacuum / 4					X		AA2.02, Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: Conditions requiring reactor and/or turbine trip. (CFR 43.5/45.13)	3.9	1
000059 Accidental Liquid RadWaste Rel. / 9									
000060 Accidental Gaseous Radwaste Rel. / 9									
000061 ARM System Alarms / 7									
000067 Plant Fire On-site / 8									
000068 (BW/A06) Control Room Evac. / 8									
000069 (W/E14) Loss of CTMT Integrity / 5									
000074 (W/E06&E07) Inad. Core Cooling / 4				X			EA1.3, Ability to operate and/or monitor the following as they apply to Degraded Core Cooling: Desired operating results during abnormal and emergency situations. (CFR 41.7/45.5/45.6)	3.7	1
000076 High Reactor Coolant Activity / 9						X	2.4.11 Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13)	3.4	1
W/EO1 & E02 Rediagnosis & SI Termination / 3									
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5									

Seabrook Station 2007 NRC Exam Tier 1/Group 2 RO (Continued)

W/E16 High Containment Radiation / 9				X			**EA1.1, Ability to operate and/or monitor the following as they apply to High Containment Radiation:** **Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.** **(CFR 41.7/45.5/45.6)**	**3.1**	**1**
BW/A01 Plant Runback / 1									
BW/A02&A03 Loss of NNI-X/Y / 7									
BW/A04 Turbine Trip / 4									
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8									
BW/E03 Inadequate Subcooling Margin / 4									
BW/E08; W/E03 LOCA Cooldown - Depress. / 4			X				EK3.2, Knowledge of the reasons for the following responses as they apply to the LOCS Cooldown and Depressurization: Normal, abnormal, and emergency operating procedures associated with LOCA Cooldown and Depressurization. (CFR 41.5/41.10/45.6/45.13)	**3.4**	**1**
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4	X						**EK1.2, Knowledge of the operational implications of the following concepts as they apply to the Natural Circulation Cooldown:** **Normal, abnormal, and emergency operating procedures associated with Natural Circulation Cooldown.** **(CFR 41.8/41.10/45.3)**	**3.3**	**1**
BW/E13&E14 EOP Rules and Enclosures									
CE/A11; W/E08 RCS Overcooling - PTS / 4		X					**EK2.1, Knowledge of the interrelationships between the Pressurized Thermal Shock and the following:** **Components and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automati and manual features.** **(CFR 41.7/45.7)**	**3.4**	**1**
CE/A16 Excess RCS Leakage / 2									
CE/E09 Functional Recovery									
K/A Category Point Totals:	**1**	**1**	**2**	**2**	**2**	**1**	**Group Point Total:**		**9/4**

Seabrook Station 2007 NRC Exam Tier 1/Group 2 SRO

ES-401 PWR Examination Outline Form ES-401-2

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1					X		AA2.05, Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: Uncontrolled rod withdrawal, from available indications. (CFR 43.5/45.13)	4.6	1
000003 Dropped Control Rod / 1									
000005 Inoperable/Stuck Control Rod / 1									
000024 Emergency Boration / 1									
000028 Pressurizer Level Malfunction / 2									
000032 Loss of Source Range NI / 7									
000033 Loss of Intermediate Range NI / 7									
000036 (BW/A08) Fuel Handling Accident / 8						X	2.2.27, Knowledge of the refueling process. (CFR: 43.6 / 45.13)	3.5	1
000037 Steam Generator Tube Leak / 3									
000051 Loss of Condenser Vacuum / 4									
000059 Accidental Liquid RadWaste Rel. / 9									
000060 Accidental Gaseous Radwaste Rel. / 9									
000061 ARM System Alarms / 7									
000067 Plant Fire On-site / 8									
000068 (BW/A06) Control Room Evac. / 8						X	2.1.20 Ability to execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)	4.2	1
000069 (W/E14) Loss of CTMT Integrity / 5									
000074 (W/E06&E07) Inad. Core Cooling / 4									
000076 High Reactor Coolant Activity / 9									
W/EO1 & E02 Rediagnosis & SI Termination / 3					X		EA2.2, Ability to determine and interpret the following as they apply to the SI Termiation: Adherence to appropriate procedures and operation within the limitations in the facilities license and amendments. (CFR 43.5/45.13)	4.0	1
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5									
W/E16 High Containment Radiation / 9									
BW/A01 Plant Runback / 1									
BW/A02&A03 Loss of NNI-X/Y / 7									
BW/A04 Turbine Trip / 4									
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8									
BW/E03 Inadequate Subcooling Margin / 4									
BW/E08; W/E03 LOCA Cooldown - Depress. / 4									
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4									
BW/E13&E14 EOP Rules and Enclosures									

Seabrook Station 2007 NRC Exam Tier 1/Group 2 SRO (Continued)									
CE/A11; W/E08 RCS Overcooling - PTS / 4									
CE/A16 Excess RCS Leakage / 2									
CE/E09 Functional Recovery									
K/A Category Point Totals:					2	2	Group Point Total:		9/4

Seabrook Station 2007 NRC Exam Tier 2/Group 1 RO

ES-401 PWR Examination Outline Form ES-401-2
Plant Systems - Tier 2/Group 1 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump						X						K6.04, Knowledge of the effect of a loss or malfunction one of the following will have on the RCPS: Containment isolation valves affecting RCP operation. (CFR 41.7/45.5)	2.8	1
004 Chemical and Volume Control		X										K2.03, Knowledge of bus power supplies to the following: Charging Pumps (CFR 41.7)	3.3	1
005 Residual Heat Removal			X									K3.01, Knowledge of the effect that a loss or malfunction of the RHRS will have on the following: RCS (CFR 41.7/45.6)	3.9	1
006 Emergency Core Cooling				X								K4.07, Knowledge of ECCS design features and/or interlocks which provide the following: Normal water supply for SIS (CFR 41.7)	3.3	1
007 Pressurizer Relief/Quench Tank				X								K4.01, Knowledge of the PRTS design features and/or interlocks which provide for the following: Quench tank cooling (CFR 41.7)	2.6	1
008 Component Cooling Water							X					A1.04, Ability to predict and/or monitor changes in parameters associated with operating the CCWS controls including: Surge Tank Level (CFR 41.5/45.5)	3.1	1
010 Pressurizer Pressure Control						X						K6.01, Knowledge of the effect of a loss or malfunction that the following will have on the PZR PCS: Pressure Detection Systems (CFR 41.7/45.7)	2.7	1
012 Reactor Protection	X											K1.03, Knowledge of the physical connections and/or cause effect relationships between the RPS and the following systems: CRDS (CFR 41.2 to 41.9/45.7 to 45.8)	3.7	1
013 Engineered Safety Features Actuation									X			A3.01, Ability to monitor automatic operation of the ESFAS including: Input channels and logic. (CFR: 41.7/45.5)	3.7	1
022 Containment Cooling										X		A4.05, Ability to manually operate and/or monitor in the control room: Containment readings of temperature, pressure, and humidity. (CFR 41.7/45.5 to 45.8)	3.8	1

Seabrook Station 2007 NRC Exam Tier 2/Group 1 RO (Continued)														
025 Ice Condenser												System not applicable at Seabrook Station.		
026 Containment Spray											X	G 2.4.2, Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. (CFR: 41.7 / 45.7 / 45.8)	3.9	1
039 Main and Reheat Steam										X		A4.07, Ability to manually operate or monitor in the control room: Steam dump valves (CFR 41.7/45.5 to 45.8)	2.8	1
059 Main Feedwater									X			A3.02, Ability to monitor automatic operation of the MFW, including: Programmed levels of the S/G. (CFR 41.7/45.5)	2.9	1
061 Auxiliary/Emergency Feedwater								X				A2.07, Ability to predict the impacts of the following malfunctions or operations on the EFW system and based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations. Air or MOV failure. (CFR 41.5/43.5/45.3/45.13)	3.4	1
062 AC Electrical Distribution							X					A1.01, Ability to predict and/or monitor changes in parameters associated with operating the ac distribution controls, including: Significance of D/G load limits (CFR 41.5/45.7)	3.4	1
063 DC Electrical Distribution			X									K3.02, Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: Components using DC control power (CFR 41.7/45.6)	3.5	1
064 Emergency Diesel Generator				X								K4.02, Knowledge of the ED/G system design features and/or interlocks which provide for the following: Trips for ED/G while operating (normal or emergency) (CFR 41.7)	3.9	1
073 Process Radiation Monitoring	X											K1.01, Knowledge of the physical connections and/or cause/effects relationships between the PRM system and the following systems: Those served by PRM (CFR 41.2 to 41.9/45.7 to 45.8)	3.6	1
076 Service Water	X											K1.16, Knowledge of the physical connections and/or cause/effects relationships between the SWS system and the following systems: ESF (CFR 41.2 to 41.9/45.7 to 45.8)	3.6	1
078 Instrument Air			X									A3.01, Ability to monitor automatic operation of the IAS, including: Air pressure (CFR 41.7/45.5)	3.1	1
103 Containment									X			A3.01, Ability to monitor automatic operation of the containment system, including: Containment isolation (CFR 41.7/45.5)	3.9	1

Seabrook Station 2007 NRC Exam Tier 2/Group 1 RO (Continued)

003 Reactor Coolant Pump	X											K1.02, Knowledge of the physical connections and/or cause effect relationships between the RCPS and the following systems: RCP motor cooling and ventialation (CFR 41.2 to 41.9/45.7 to 45.8)	2.6	1
004 Chemical and Volume Control					X							K5.19, Knowledge of the operational implications of the following concepts as they apply to the CVCS: Concept of SDM (CFR 41.5/45.7)	3.5	1
005 Residual Heat Removal											X	2.1.28 Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)	3.2	1
010 Pressurizer Pressure Control							X					A1.06, Ability to predict and/or monitor changes in parameters associated with operating the PZR PCS controls including: RCS heatup and cooldown effect on pressure. (CFR 41.5/45.5)	3.1	1
012 Reactor Protection								X				A2.05, Ability to predict the impacts of the following malfunctions or operations on the RPS and, based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Faulty or erratic operation of detectors and function generators. (CFR 41.5/43.5/45.3/45.5)	3.1	1
059 Main Feedwater			X									K3.04, Knowledge of the effect that a loss or malfunction of the MFW will have on the following: RCS (CFR 41.7/45.6)	3.6	1
061 Auxiliary/Emergency Feedwater				X								K4.04, Knowledge of the AFW design features and/or interlocks which provide for the following: Prevention of AFW runout by limiting AFW flow. (CFR 41.7)	3.1	1
K/A Category Point Totals:	4	1	4	4	1	2	3	2	3	2	2	Group Point Total:		28/5

Seabrook Station 2007 NRC Exam Tier 2/Group 1 SRO

ES-401 PWR Examination Outline Form ES-401-2
Plant Systems - Tier 2/Group 1 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump														
004 Chemical and Volume Control								X				A2.07, Ability to predict the impacts of the following malfunctions or operations on the CVCS, and based on these predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations. Isolation of Letdown/Makeup (CFR 41.5/43.5/45.3/45.5)	3.7	1
005 Residual Heat Removal														
006 Emergency Core Cooling											X	2.1.12 Ability to apply technical specifications for a system. (CFR: 43.2 / 43.5 / 45.3) IMPORTANCE RO 2.9 SRO 4.0	4.0	1
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water														
010 Pressurizer Pressure Control														
012 Reactor Protection											X	2.1.27 Knowledge of system purpose and or function. (CFR: 41.7)	2.9	1
013 Engineered Safety Features Actuation														
022 Containment Cooling														
025 Ice Condenser														
026 Containment Spray														
039 Main and Reheat Steam														
059 Main Feedwater														
061 Auxiliary/Emergency Feedwater														
062 AC Electrical Distribution											X	2.1.28 Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)	3.3	1
063 DC Electrical Distribution														
064 Emergency Diesel Generator								X				A2.02, Ability to predict the impacts of the following malfunctions or operations on the ED/G system: Load, VARS, pressure on air compressor, speed droop, frequency, voltage, fuel oil level, temperatures. (CFR 41.5/43.5/45.3/45.13)	2.9	1
073 Process Radiation Monitoring														

Seabrook Station 2007 NRC Exam Tier 2/Group 1 SRO (Continued)

076 Service Water														
078 Instrument Air														
103 Containment														
K/A Category Point Totals:								2			3	Group Point Total:		28/5

Seabrook Station 2007 NRC Exam Tier 2/Group 2 RO

ES-401 PWR Examination Outline Form ES-401-2
Plant Systems - Tier 2/Group 2 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
001 Control Rod Drive	X											K1.05 Knowledge of the physical connections and/or cause-effect relationships between the CRDS and the following: NIS and RPS (CFR: 41.2 to 41.9 / 45.7 to 45.8)	4.5	1
002 Reactor Coolant	X											K1.09, Knowledge of the physical conection and/or cause and effect relationships between the RCS and the following: PZR (CFR 41.2 to 41.9/45.7 to 45.8)	4.1	1
011 Pressurizer Level Control		X										K2.02, Knowledge of bus power supplies to the following: PZR Heaters (CFR 41.7)	3.1	1
014 Rod Position Indication														
015 Nuclear Instrumentation			X									K3.01, Knowledge of the effect that a loss or malfunction of the NIS will have on the following: RPS (CFR 41.7/45.6)	3.9	1
016 Non-nuclear Instrumentation														
017 In-core Temperature Monitor				X								K4.02, Knowledge of ITM system design features and/or interlocks which provide for the following: Sensing and determination of location core hot spots. (CFR 41.7)	3.1	1
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge														
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment														
035 Steam Generator					X							K5.03, Knowledge of operational implications of the following concepts as they apply to the S/G's: Shrink and swell concepts (CFR 41.5/45.7)	2.8	1
041 Steam Dump/Turbine Bypass Control						X						K6.03, Knowledge of the effect of a loss or malfunction that the following will have on the SDS: Controller and positioners, including ICS, S/G,CRDS (CFR 41.7/45.7)	2.7	1

Seabrook Station 2007 NRC Exam Tier 2/Group 2 RO (Continued)

045 Main Turbine Generator							X					A1.05, Ability to predict and/or monitor changes in parameters associated with operating the MT/G system controls including: Expected response of primary system parameters following T/G trip. (CFR 41.5/45.5)	3.8	1
055 Condenser Air Removal														
056 Condensate								X				A2.04, Ability to predict the impacts of the following malfunctions or operations on the Condensate System: Loss of Condensate pumps (CFR 41.5/43.5/45.3/45.13)	2.6	1
068 Liquid Radwaste														
071 Waste Gas Disposal														
072 Area Radiation Monitoring														
075 Circulating Water											X	2.1.32 Ability to explain and apply all system limits and precautions. (CFR: 41.10 / 43.2 / 45.12)	3.4	1
079 Station Air														
086 Fire Protection														
K/A Category Point Totals:	2	1	1	1	1	1	1	·	0	0	·	Group Point Total:		10/3

Seabrook Station 2007 NRC Exam Tier 2/Group 2 SRO

ES-401 PWR Examination Outline Form ES-401-2
Plant Systems - Tier 2/Group 2 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
001 Control Rod Drive														
002 Reactor Coolant											X	2.2.25 Knowledge of basis in Tech. Specs for LCOs and safety limits	3.7	1
011 Pressurizer Level Control														
014 Rod Position Indication														
015 Nuclear Instrumentation														
016 Non-nuclear Instrumentation														
017 In-core Temperature Monitor														
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge														
033 Spent Fuel Pool Cooling								X				A2.03, Ability to predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System and based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Abnormal spent fuel pool water level or loss of water level. (CFR 41.5/43.5/45.3/45.13)	3.5	1
034 Fuel Handling Equipment														
035 Steam Generator														
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator														
055 Condenser Air Removal														
056 Condensate														
068 Liquid Radwaste											X	2.3.6, Knowledge of the requirements for reviewing and approving release permits. (CFR: 43.4 / 45.10)	3.1	1
071 Waste Gas Disposal														
072 Area Radiation Monitoring														
075 Circulating Water														
079 Station Air														
086 Fire Protection														

Seabrook Station 2007 NRC Exam Tier 2/Group 2 SRO (Continued)														
K/A Category Point Totals:								1			2	**Group Point Total:**		**10/3**

Seabrook Station 2007 NRC Exam Tier 3 RO

Facility:	Date of Exam:					
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.1	G 2.1.1 Knowledge of conduct of operations requirements. (CFR: 41.10 / 45.13)	3.7	1		
	2.1.11	G 2.1.11 Knowledge of less than one hour technical specification action statements for systems. (CFR: 43.2 / 45.13)	3.0	1		
	2.1.28	2.1.28 Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)	3.2	1		
	2.1.33	2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications. (CFR: 43.2 / 43.3 / 45.3)	3.4	1		
	2.1.					
	2.1.					
	Subtotal			4		
2. Equipment Control	2.2.13	2.2.13 Knowledge of tagging and clearance procedures. (CFR: 41.10 / 45.13)	3.6	1		
	2.2.22	2.2.22 Knowledge of limiting conditions for operations and safety limits. (CFR: 43.2 / 45.2)	3.4	1		
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	Subtotal			2		

Seabrook Station 2007 NRC Exam Tier 3 RO (Continued)						
3. Radiation Control	2.3.1	2.3.1 Knowledge of 10 CFR: 20 and related facility radiation control requirements. (CFR: 41.12 / 43.4. 45.9 / 45.10)	2.6	1		
	2.3.4	2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. (CFR: 43.4 / 45.10)	2.5	1		
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	Subtotal			2		
4. Emergency Procedures / Plan	2.4.27	2.4.27 Knowledge of fire in the plant procedure. (CFR: 41.10 / 43.5 / 45.13)	3.0	1		
	2.4.49	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (CFR: 41.10 / 43.2 / 45.6)	4.0	1		
	2.4.					
	2.4.					
	2.4.					
	2.4.					
	Subtotal			2		
Tier 3 Point Total				10		

Seabrook Station 2007 NRC Exam Tier 3 SRO

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.4	2.1.4 Knowledge of shift staffing requirements. (CFR: 41.10 / 43.2)			3.4	1
	2.1.10	2.1.10 Knowledge of conditions and limitations in the facility license. (CFR: 43.1 / 45.13)			3.9	1
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	Subtotal					2
2. Equipment Control	2.2.21	2.2.21 Knowledge of pre- and post-maintenance operability requirements. (CFR: 43.2)			3.5	1
	2.2.25	2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits. (CFR: 43.2)			3.7	1
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	Subtotal					2
3. Radiation Control	2.3.4	2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. (CFR: 43.4 / 45.10)			3.1	1
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	Subtotal					1

Seabrook Station 2007 NRC Exam Tier 3 SRO (Continued)						
4. Emergency Procedures / Plan	2.4.21	2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions including: 1. Reactivity control 2. Core cooling and heat removal 3. Reactor coolant system integrity 4. Containment conditions 5. Radioactivity release control. (CFR: 43.5 / 45.12)			4.3	1
	2.4.38	2.4.38 Ability to take actions called for in the facility emergency plan, including (if required) supporting or acting as emergency coordinator. (CFR: 43.5 / 45.11)			4.0	1
	2.4.					
	2.4.					
	2.4.					
	2.4.					
	Subtotal					2
Tier 3 Point Total						7

Seabrook Station 2007 NRC Exam Admin Topics-RO

Facility: **Seabrook** Date of Examination: **July 9,2007**

Examination Level: RO [X] SRO [ ] Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,M	2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. Activity- Perform RCS Steady State Leakrate Calculations.
Conduct of Operations	R,M	2.1.25 Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. Activity- Calculate Shutdown Margin in Mode 2 With Dropped Rod.
Equipment Control	R,M	2.2.1 Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affectreactivity. Activity-Calculate the Required Flow Controller and Totalizer Setpoints for a 1000 Gallon Manual Blended Makeup to the RWST
Radiation Control	R,D,P	2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. Activity-Perform Initiation of a Liquid Effluent Waste Sample Request.
Emergency Plan		

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)

Seabrook Station 2007 NRC Exam Admin Topics-SRO

Facility: **Seabrook** Date of Examination: **July 9,2007**

Examination Level: RO [ ] SRO [X] Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,M	**2.1.6 Ability to supervise and assume a management role during plant transients and upset conditions.** **Activity- Perform Required Notifications Of On-Site Personnel For Off-Normal Events.**
Conduct of Operations	R,M	**2.1.12 Ability to apply technical specifications for a system.** **Activity- Determine Which Tech. Spec. Actions Apply And Determine The Allowed Outage Time and Mode Restrictions.**
Equipment Control	R,M	**2.2.12 Knowledge of surveillance procedures.** **Activity-Perform Manual RCS Steady State Leak Rate Determination.**
Radiation Control	P,R,D	**2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.** **Activity-Perform Verifications of a Liquid Effluent Waste Sample Request.**
Emergency Plan	S or R,D	**2.4.40 Knowledge of the SRO's responsibilities in emergency plan implementation.** **Activity-Perform Required Notifications Of On-Site and Off-Site Personnel For Emergency Events (Site Area Emergency)**

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)

Seabrook Station 2007 NRC Exam JPM-RO

Facility: **Seabrook** Date of Examination: **July 9, 2007**

Exam Level: RO [X] SRO-I [ ] SRO-U [ ] Operating Test No.: _____

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. Steam Generator System/MS-PT-3001 Fails High	S,A,D	4
b. Emergency Diesel Generators/Emergency Trip of DG 1B	S,A,D	6
c. Nuclear Instrumentation System/Power Range NI Failure	S,D,E	7
d. Containment Purge System/Containment Online Purge Lineup	A,S,D,P	8
e. Reactor Coolant System/Depressurize RCS Using Aux Spray (E-3)	A,S,E,D	2
f. Containment Spray System/ Transfer To Cold Leg Recirc (CBS-V-2 Fails)	A,S,E,P,M	5
g. Emergency Core Cooling System/Perform SI Termination/ Reduction	S,E,M	3
h. Chemical and Volume Control System/Shifting From CCP to PDP	S,D	1
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. AC Electrical Distribution/Transfer Vital Instrument Bus	L,D	6
j. Component Cooling Water System/Align Alternate Cooling To CCP Lube Oil Cooler	D,E,R	8
k. Chemical and Volume Control System/Local Rapid Manual Boration	A,E,L,D	1

@ All control room (and in-plant) systems must be different and 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
(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	

Seabrook Station 2007 NRC Exam JPM-SROU

Facility: **Seabrook** Date of Examination: **July 9, 2007**

Exam Level: RO ☐ SRO-I ☐ SRO-U ☒ Operating Test No.: _____

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. Containment Spray System/ Transfer To Cold Leg Recirc (CBS-V-2 Fails)	A,S,E,P,M	5
b. Emergency Diesel Generators/Emergency Trip of DG 1B	S,A,D	6
c. Reactor Coolant System/Depressurize RCS Using Aux Spray (E-3)	A,S,E,D	2
d.		
e.		
f.		
g.		
h.		
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. AC Electrical Distribution/Transfer Vital Instrument Bus	L,D	6
j. Component Cooling Water System/Align Alternate Cooling To CCP Lube Oil Cooler	D,E,R	8
k.		

@ All control room (and in-plant) systems must be different and 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
(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	

Seabrook Station 2007 NRC Exam JPM-SROI

Facility: **Seabrook** Date of Examination: **July 9, 2007**

Exam Level: *RO* ☐ *SRO-I* ☒ *SRO-U* ☐ Operating Test No.: _____

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. Steam Generator System/MS-PT-3001 Fails High	S,A,D	4
b. Emergency Diesel Generators/Emergency Trip of DG 1B	S,A,D	6
c. Nuclear Instrumentation System/Power Range NI Failure	S,D,E	7
d. Containment Purge System/Containment Online Purge Lineup	A,S,D,P	8
e. Reactor Coolant System/Depressurize RCS Using Aux Spray (E-3)	A,S,E,D	2
f. Containment Spray System/ Transfer To Cold Leg Recirc (CBS-V-2 Fails)	A,S,E,P,M	5
g. Liquid Radwaste System/Respond To Liquid Radwaste Hi Rad	S,E,P,M	9
h.		
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. AC Electrical Distribution/Transfer Vital Instrument Bus	L,D	6
j. Component Cooling Water System/Align Alternate Cooling To CCP Lube Oil Cooler	D,E,R	8
k. Chemical and Volume Control System/Local Rapid Manual Boration	A,E,L,D	1

@ All control room (and in-plant) systems must be different and 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
(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	

Seabrook Station 2007 NRC Exam-Simulator Scenarios

Facility: **Seabrook** Scenario No.: **A** Op-Test No.:

Examiners: **John Caruso** Operators: _____

*****This scenario is designed to represent possible consequences associated with the ongoing Alloy 600 Pressurizer penetration weld industry concern.*****

Initial Conditions: **IC #31, Middle of Core Life, 75% Power, Xenon building in after an approx. 20%/hr power decrease, Boron Concentration = 1171 ppm, Axial Flux Difference = - 1.12 %.**

Turnover: **Continue power increase to 100% @ a rate of 10%/hr.**

Event No.	Malf. No.	Event Type*	Event Description
-----	-----	-----	**Setup: Insert the following malfunctions:**
		C	**Safety Injection: mfSI003, SI-P-6A fails to auto start.** **mfSI004, SI-P-6B fails to auto start.** **MfRH006, RH-P-8B fails to auto start.**
1		N,R	**Continue power increase to 100% power.**
2	ctFWFK 530 ctFWLT 533	I,C	**"C" Feedwater regulating valve fails to 100% output. At the same time the controlling channel for level fails low.** **Insert malfunctions: ltFWFK530** **Select: FAIL OUTPUT (AUTO)** **Value: 100%** **Ramp: 30 seconds** **LtFWLT533** **Select: FAIL LOW** **Crew responds with OS1235.03, SG Level Instrument Failure. The operator should take manual control of SG level and maintain 45% to 55%. The feedwater reg. valve will remain in manual for the remainder of the scenario.**
3	PtRCPT 455	I,C	**Controlling pressurizer pressure instrument fails high. This causes the master pressure controller to malfunction.** **Insert malfunction: ptRCPT455** **Value: 2500** **Ramp: 15 seconds** **Crew responds with OS1201.06, PZR Instrument Component Failure.**

4	mfRC 048C	C,M	RCS leak develops. Insert malfunction: Reactor Coolant, mfRC048C, RCS Hot Leg 3 Leak, 0-175000 GPM. Final Value: 30 GPM Ramp: 60 seconds Crew responds with OS1201.02, RCS Leak. Crew should recognize E-Plan call for Unusual Event, RCS Leakage > 10 gpm, Unusual Event, item 15A.
5	mfRC052	M C	Pressurizer manway failure (meant to represent a pressurizer weld failure). Insert malfunction: Reactor Coolant, mfRC052, PZR Steam Leak (Max: Manway failure: 11,500 lbs/sec.) Final Value: 250 Ramp: 120 seconds Crew responds to increasing leak rate. Crew trips the reactor. Crew enters E-0, Reactor Trip or Safety Injection. Crew Actuates SI . Crew trips Reactor Coolant Pumps when subcooling goes to less than 40°F. At step 12 of E-1, Loss of Reactor or Secondary Coolant, the crew transitions to ES-1.2, Post LOCA Cooldown and Depressurization. Terminate the exam at the Lead Examiner discretion when crew enters ES-1.2.
			<u>Crew Critical Tasks</u> (1) Establish flow from at least one intermediate head ECCS pump (SI-P-6A or SI-P-6B) before transitioning out of E-0. (2) Trip all RCP's if subcooling is less than 40°F (not time dependant) such that an orange path on Core Cooling does not occur when forced circulation in RCS stops.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Seabrook Station 2007 NRC Exam-Simulator Scenarios

Facility: **Seabrook** Scenario No.: **B** Op-Test No.:

Examiners: **John Caruso** Operators:

Initial Conditions: **IC #31, Middle of Core Life, 75% Power, Reactor will not trip automatically or manually. EDG-1B breaker will not close on damand. The turbine driven EFW pump will trip due to overspeed. A loss of offsite power will occur after the reactor is tripped**

Turnover: **The plant is at 75% power. SI-P-6A is out of service for bearing inspection. The remaining allowed outage time for SI-P-6A is 140 hours. The quarterly surveillance for the Main Feedwater Isolation Valves needs to be performed as soon as possible. The surveillance activity number is 1-FW-OT033.**

Event No.	Malf. No.	Event Type*	Event Description
1		N R	The BOP will be directed to perform the Feedwater Isolation Valve surveillance (no other operator support available). At the Chief Examiners discretion continue to the next event. This surveillance does not take long and can be abandoned at any time without consequence to the remainder of the scenario. Crew continues power increase to 100%
2	ltRCLT 459	I	The controlling channel of Pressurizer level will fail low. Insert Malfunction: Reactor Coolant Component Malfunctions, ltRCLT459, FAILS LOW. The crew responds using OS1201.07, PZR Level Instrument Failure.
3	mfCS016	C	An over-current trip of Charging Pump, CS-P-2A will occur. Insert Malfunction: Chemical and Volume Control System, mfCS016, CS-P-2A OC Trip. The crew responds using OS1202.02, Charging System Failure.
4	FWP32B	M,C	The B Main Feedwater Pump shaft will shear (no pump trip signal). Insert Malfunction: FWP32B Shaft Shear. Select: INSERT The B Main Feedwater Pump trip will initiate the major event. Feedwater flow will be drastically reduced. No automatic plant setback will occur because a pump trip signal is not generated. Steam Generator levels decrease

			rapidly and a SG Lo-Lo level reactor trip demand occurs.
5	mfRPS001 mfRPS002 mfRPS027 mfRPS028 mfRC014 mfED038	M,C M,C	The reactor does not trip. The crew will respond by performing the immediate actions of E-0, Reactor Trip or Safety Injection. • The RO will attempt to trip the reactor. The reactor does not trip. • The crew transitions to FR-S.1, Response to Nuclear Power Generation/ATWS. • The RO performs the immediate actions of FR-S.1. • The BOP Operator performs immediate actions of FR-S.1. • The crew continues with FR-S.1 steps. After the reactor is manually tripped, a loss of offsite power occurs and the B Emergency Diesel Generator breaker does not close. No means of emergency boration will exist at this point. The motor driven EFW pump is not available because it is powered from Bus 6 (B EDG). The turbine driven EFW pump trips on overspeed and will not be restored. The Startup Feedwater Pump will be a success path in FR-H.1. The crew completes FR-S.1 and goes to the procedure and step in effect (Normally E-0). The crew should go straight to FR-H.1, due to the H Red Path and E-0 having been already exited. • At step 1 of FR-H.1, the crew verifies heat sink required. • At step 2 the crew will note that no CCP (charging pump) is available and go directly to step 10 (bleed and feed). • The crew will perform steps 10 through 18, and at step 20 begins to look for sources to feed the steam generators. • The crew will establish the Startup Feedwater Pump as a feed source using step 5 as a guideline and return to step 21 to continue with the procedure. • At steps 24 and 25 the crew will close the PORV's and transition to E-1, Loss of Reactor or Secondary Coolant, when subcooling is less than required. • At step 12 of E-1 the crew goes to ES-1.2, Post LOCA Cooldown and Depressurization. Terminate the exam at the Chief Examiners discretion.
			<u>Crew Critical Tasks</u> (1) INSERT negative reactivity into the core by at least one of the following methods in accordance with FR-S.1. • Automatic and/or manual insertion of the RCCA's. • Establish Emergency Boration flow to the RCS. (2) ISOLATE the main turbine from the SG's before proceeding to step 5 of FR-S.1 on an ATWS initiated by a loss of feedwater.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: **Seabrook** Scenario No.: **C** **(Standby Scenario)** Op-Test No.:

Examiners: **John Caruso** Operators: _____

Initial Conditions: **IC #30, Middle of Core Life, 100% Power, On the loss of power and "A" Emergency Diesel Generator restart the Service Water pumps will fail to auto start, requiring manual actuation.**

Turnover: **The plant is at 100% power. Decrease plant power at 5%/hr. Main Steam Atmospheric Steam Dump ("D"ASDV) valve, MS-PV-3004 is Danger Tagged due to excessive seat leakage. MS-V-49 is closed and tagged. Plant Engineering has recommended a plant shutdown to work on both valves safely. Tech. Spec. 3.7.1.6 was entered 4 days ago.**

Event No.	Malf. No.	Event Type*	Event Description
1		N,R	Decrease plant power @ 5%/hr.
2	ttRCTT411	I	RCS Tavg will fail high causing inward control rod motion. Insert Malfunction: Reactor Coolant Component. Select: FAIL HIGH The crew responds using OS1201.08, Tavg/Delta T Instrument Failure.
3	MfCS012	C	Initiation of a letdown line leak. Insert Malfunction: MfCS012, Letdown Line Leak At Inlet To Reactor Coolant Filter. Value: 0.5 Select: INSERT The crew responds with OS1201.02, RCS Leak. At step 7 RNO the crew may enter OS1202.02, Charging System Failure. The crew could also enter the Area High Radiation abnormal procedure.
4	MfED038	M,C	The plant has a loss of offsite power. Insert Malfunction: Electrical Distribution, mfED038, Loss of Offsite Power. Select: INSERT
		C	The loss of offsite power will cause a plant trip. The Main Turbine will fail to trip. The BOP Operator must manually trip the Main Turbine.
		C	The "A" Emergency Diesel Generator will fail to start. The "B" Emergency Diesel Generator will trip on Low Lube Oil Pressure. The crew will transition to ECA-0.0, Loss Of All AC Power. During step 14 of ECA-0.0 the "A" Emergency Diesel Generator is restored to service and the crew will go to step 24 of ECA-0.0. The crew will manually start "A" Train Service Water Pumps. The crew will transition to ECA-0.2. Terminate the exam at

			the Chief Examiner discretion.
			<u>Crew Critical Tasks</u> **(1) Manually trip the Main Turbine or close the Main Steam Isolation Valves before a severe (Orange Path) challenge develops on either the Subcriticality or Integrity Status Tree's.** **(2) Establish 500 gpm EFW flow to the Steam Generators prior to completing the first four steps of ECA-0.0.** **(3) Manually start an ocean Service Water Pump or a Cooling Tower Pump such that the "A" Emergency Diesel Generator is not damaged due to engine overheating.**
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Seabrook Station 2007 NRC Exam-Simulator Scenarios

Facility: **Seabrook** Scenario No.: **D** **(Standby Scenario)** Op-Test No.:
Op-Test No.:**4**

Examiners: **John Caruso** Operators: _____

Initial Conditions: **IC #34, Middle of Core Life, 30% Power, "D" Main Steam Atmospheric Steam Dump Valve (ASDV) is failed closed and Danger Tagged.**

Turnover: **The plant is at 30% power. Decrease plant power at 5%/hr. Main Steam Atmospheric Steam Dump ("D"ASDV) valve, MS-PV-3004 is Danger Tagged due to excessive seat leakage. MS-V-49 is closed and tagged. Plant Engineering has recommended a plant shutdown to work on both valves safely. Tech. Spec. 3.7.1.6 was entered 4 days ago.**

Event No.	Malf. No.	Event Type*	Event Description
1		N,R	Power decrease at the discretion of the Chief Examiner.
2	ptFWPT 505	I,R	This failure causes a Tavg/Tref mismatch and control rods will insert. Insert Malfunction: Feedwater Component, ptFWPT505. Fail to Specific Value: 0.0 Ramp: 120 seconds The crew responds with OS1235.0, Turbine Impulse Pressure PT-505 or PT-506 Instrument Failure.
3	mfR016	C	This failure causes a Reactor Coolant Pump "D" #1 seal failure. Insert Malfunction: Reactor Coolant, mfR016, RCP D #1 Seal Failure. Final Value: 0.25 Select: INSERT The crew responds with OS1201.01, RCP Malfunction. The crew manually raises Steam Generator level and removes the "D" Reactor Coolant Pump from service.
4	MfSG002 D	D,M,C	This failure causes a Tube Rupture on the "D" Steam Generator. Insert Malfunction: Steam Generators, mfSG002D, SG D DBL End Tube Rupture Final Value: 600 GPM Ramp: 180 seconds The crew responds with OS1227.02, Steam Generator Tube Leak. Step 2 RNO directs a reactor trip and Safety Injection
	RvMSAV R50	C,M	This failure causes a steam generator safety valve to fail open when Steam Generator pressure reaches 1185 psig. Insert Malfunction: Main Steam Component, rvMSAVR50. Select: OPEN (when SG pressure reaches 1185 psig. The crew transitions to E-2 from E-3 and then back to E-3.

			Possible transition to ECA-3.1 at step 6 of E-3.Terminate the exam when the crew reaches ECA-3.1, step 13.
			<u>Crew Critical Tasks</u> **(1) E-3. Isolate Feedwater flow into and steam flow from the ruptured steam generator before transition to ECA-3.1 is required.** **(2) ECA-3.1. Cool down the RCS to cold shutdown conditions such that a severe (Orange Path) challenge to the Integrity Critical Safety Function is not encountered. NOTE: Only requires initiation of a cooldown.**
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

RANDOM SAMPLING PROCESS USED TO DEVELOP 2007 NRC EXAM

As required by NUREG 1021, Rev 9 (ES-401 D.1.b), the licensee shall submit along with the NRC examination outline, a description of the systematic and random selection process used to develop the examination outline.

A manual random sampling process was utilized due to technical difficulties associated with the W/D Associates random examination generation program (received through the Westinghouse Owners Group). The following additional detail is provided:

- Attachments 1 & 2 of ES-401, were used as guidance for K/A elimination prior to and after manual exam outline generation.

- **Prior** to exam outline generation, the following K/As were suppressed/eliminated:
  - Generic K/A statements 2.2.3 and 2.2.4 (multi-unit) – Seabrook is a single unit facility.
  - All K/As associated with Non-Nuclear Instrumentation (016) – This system is N/A to Seabrook.
  - All K/As associated with Ice Condenser (025) – This system is N/A to Seabrook.
  - All K/As associated with Containment Iodine Removal (27) – This system is included as part of the Containment Building Spray System at Seabrook.

- A separate RO and SRO outline was manually developed for the NRC examinations. A separate manual outline will be generated for the Company Audit Exam that will ensure no specific subject matter overlap with the NRC exam. Prior to finalizing the manually generated outline, an independent peer check was performed to ensure the generated outline met NRC criteria (i.e.: no K/A's < 2.5, required number of questions etc....).

- K/A categories were systematically and randomly selected to ensure a reasonably even distribution of categories throughout each Tier and Tier Group. The individual K/A item numbers were selected as follows:

  a) For each system, procedure, or general knowledge category, a list of all applicable K/A items having a value of 2.5 or greater was compiled. This included only the item number and did not describe the item topic. K/A item numbers were randomly chosen from this compiled list.

  b) If a particular K/A category had been selected that did not include any K/A topics with values of 2.5 or above, another K/A category was selected and another K/A topic list was generated for random sampling.

RANDOM SAMPLING PROCESS USED TO DEVELOP 2007 NRC EXAM

Site-specific issues and/or Operating Experience will be included in the exam. For example, one of the simulator scenarios is designed to represent a possible consequence associated with the ongoing Pressurizer penetration alloy 600 weld industry concern.

To the extent practical, when creating the written examination, overlap with scenarios and JPM's have been minimized to make the examination more balanced and well rounded.

As required by ES-301 all scenarios are new or modified from existing bank scenarios.