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

Facility: VOGTLE Date of Exam: MARCH 2012

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	3	3	N/A			3	3	N/A		3 / 18	3	3	6
	2	1	1	2				2	2			1 / 9	2	2	4
	Tier Totals	4	4	5				5	5			4 / 27	5	5	10
2. Plant Systems	1	3	2	3	3	3	3	2	3	2	2	2 / 28	3	2	5
	2	1	1	1	1	1	0	1	1	1	1	1 / 10	0 / 2	1	3
	Tier Totals	4	3	4	4	4	3	3	4	3	3	3 / 38	5	3	8
3. Generic Knowledge and Abilities Categories		1			2			3			4	10	1	2	3	4 / 7
		2			3			3			2		1	2	2	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.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
007EG2.4.2	Reactor Trip - Stabilization - Recovery / 1	4.5	4.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.
008AK3.04	Pressurizer Vapor Space Accident / 3	4.2	4.6	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	RCP tripping requirements
015AK2.10	RCP Malfunctions / 4	2.8	2.8	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	RCP indicators and controls
022AG2.2.42	Loss of Rx Coolant Makeup / 2	3.9	4.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to recognize system parameters that are entry-level conditions for Technical Specifications
025AK2.03	Loss of RHR System / 4	2.7	2.7	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Service water or closed cooling water pumps
026AA1.03	Loss of Component Cooling Water / 8	3.6	3.6	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	SWS as a backup to the CCWS
029EK1.01	ATWS / 1	2.8	3.1	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reactor nucleonics and thermo-hydraulics behavior
040AA1.20	Steam Line Rupture - Excessive Heat Transfer / 4	4.1	4.2	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Containment pressure and temperature trends
054AA2.02	Loss of Main Feedwater / 4	4.1	4.4	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Differentiation between loss of all MFW and trip of one MFW pump
055EA2.02	Station Blackout / 6	4.4	4.6	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	RCS core cooling through natural circulation cooling to S/G cooling
056AK1.03	Loss of Off-site Power / 6	3.1	3.4	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Definition of subcooling: use of steam tables to determine it

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
058AK3.01	Loss of DC Power / 6	3.4	3.7	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Use of dc control power by D/Gs
062AA2.03	Loss of Nuclear Svc Water / 4	2.6	2.9	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	The valve lineups necessary to restart the SWS while bypassing the portion of the system causing the abnormal condition
065AK3.04	Loss of Instrument Air / 8	3	3.2	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Cross-over to backup air supplies
077AK1.02	Generator Voltage and Electric Grid Disturbances / 6	3.3	3.4	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Over-excitation
WE04EA1.3	LOCA Outside Containment / 3	3.8	4.0	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Desired operating results during abnormal and emergency situations.
WE05EK2.1	Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	3.7	3.9	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Components and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes and automatic and manual features.
we11EG2.4.6	Loss of Emergency Coolant Recirc. / 4	3.7	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge symptom based EOP mitigation strategies.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
001AA1.02	Continuous Rod Withdrawal / 1	3.6	3.4	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Rod in-out-hold switch
036AK3.03	Fuel Handling Accident / 8	3.7	4.1	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Guidance contained in EOP for fuel handling incident
037AK1.02	Steam Generator Tube Leak / 3	3.5	3.9	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Leak rate vs. pressure drop
051AA2.02	Loss of Condenser Vacuum / 4	3.9	4.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Conditions requiring reactor and/or turbine trip
068AA2.10	Control Room Evac. / 8	4.2	4.4	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Source range count rate
074EA1.25	Inad. Core Cooling / 4	3.8	3.8	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Atmospheric dump valve controllers and indicators
WE03EK2.1	LOCA Cooldown - Depress. / 4	3.6	4.0	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Components and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes and automatic and manual features.
WE08EK3.4	RCS Overcooling - PTS / 4	3.4	3.7	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated.
we15EG2.1.32	Containment Flooding / 5	3.8	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to explain and apply all system limits and precautions.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
003K2.02	Reactor Coolant Pump	2.5	2.6	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	CCW pumps
004A2.21	Chemical and Volume Control	2.7	2.7	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Excessive letdown flow, pressure and temperatures on ion exchange resins (also causes)
004K3.06	Chemical and Volume Control	3.4	3.6	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	RCS temperature and pressure
005A1.03	Residual Heat Removal	2.5	2.6	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Closed cooling water flow rate and temperature
006G2.2.4	Emergency Core Cooling	3.6	3.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	(multi-unit) Ability to explain the variations in control board layouts, systems, instrumentation and procedural actions between units at a facility.
007A2.06	Pressurizer Relief/Quench Tank	2.6	2.8	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Bubble formation in PZR
008A3.08	Component Cooling Water	3.6	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Automatic actions associated with the CCWS that occur as a result of a safety injection signal
010K5.02	Pressurizer Pressure Control	2.6	3.0	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Constant enthalpy expansion through a valve
010K6.03	Pressurizer Pressure Control	3.2	3.6	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	PZR sprays and heaters
012K1.06	Reactor Protection	3.1	3.1	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	T/G
012K4.09	Reactor Protection	2.8	3.1	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Separation of control and protection circuits

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
013A4.01	Engineered Safety Features Actuation	4.5	4.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	ESFAS-initiated equipment which fails to actuate
022A4.01	Containment Cooling	3.6	3.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	CCS fans
026A1.02	Containment Spray	3.6	3.9	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Containment temperature
026K2.01	Containment Spray	3.4	3.6	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Containment spray pumps
039G2.1.25	Main and Reheat Steam	3.9	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to interpret reference materials such as graphs, monographs and tables which contain performance data.
039K5.08	Main and Reheat Steam	3.6	3.6	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Effect of steam removal on reactivity
059K4.08	Main Feedwater	2.5	2.7	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Feedwater regulatory valve operation (on basis of steam flow, feed flow mismatch)
061A3.04	Auxiliary/Emergency Feedwater	4.1	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Automatic AFW isolation
061K6.02	Auxiliary/Emergency Feedwater	2.6	2.7	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Pumps
062A2.11	AC Electrical Distribution	3.7	4.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Aligning standby equipment with correct emergency power source (D/G)
063K3.01	DC Electrical Distribution	3.7	4.1	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	ED/G

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
063K4.04	DC Electrical Distribution	2.6	2.9	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Trips
064K6.07	Emergency Diesel Generator	2.7	2.9	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Air receivers
073K5.03	Process Radiation Monitoring	2.9	3.4	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Relationship between radiation intensity and exposure limits
076K1.09	Service Water	3.0	3.1	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reactor building closed cooling water
078K3.01	Instrument Air	3.1	3.4	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Containment air system
103K1.07	Containment	3.5	3.7	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Containment vacuum system

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
001A3.06	Control Rod Drive	3.9	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	RCS temperature and pressure
011K2.01	Pressurizer Level Control	3.1	3.2	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Charging pumps
015G2.4.45	Nuclear Instrumentation	4.1	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to prioritize and interpret the significance of each annunciator or alarm.
016K1.09	Non-nuclear Instrumentation	3.7	3.7	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	ESFAS
028A2.02	Hydrogen Recombiner and Purge Control	3.5	3.9	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	LOCA condition and related concern over hydrogen
041K3.02	Steam Dump/Turbine Bypass Control	3.8	3.9	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	RCS
071A1.06	Waste Gas Disposal	2.5	2.8	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Ventilation system
072K5.02	Area Radiation Monitoring	2.5	3.2	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Radiation intensity changes with source distance
075K4.01	Circulating Water	2.5	2.8	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Heat sink
086A4.06	Fire Protection	3.2	3.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	Halon system

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
G2.1.29	Conduct of operations	4.1	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.
G2.1.8	Conduct of operations	3.4	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to coordinate personnel activities outside the control room.
G2.2.1	Equipment Control	4.5	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.
G2.2.17	Equipment Control	2.6	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the process for managing maintenance activities during power operations.
G2.2.3	Equipment Control	3.8	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	(multi-unit license) Knowledge of the design, procedural and operational differences between units.
G2.3.11	Radiation Control	3.8	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to control radiation releases.
G2.3.13	Radiation Control	3.4	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiological safety procedures pertaining to licensed operator duties
G2.3.14	Radiation Control	3.4	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities
G2.4.31	Emergency Procedures/Plans	4.2	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of annunciators alarms, indications or response procedures
G2.4.46	Emergency Procedures/Plans	4.2	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to verify that the alarms are consistent with the plant conditions.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
008AG2.1.19	Pressurizer Vapor Space Accident / 3	3.9	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to use plant computer to evaluate system or component status.
054AG2.1.7	Loss of Main Feedwater / 4	4.4	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior and instrument interpretation.
055EA2.01	Station Blackout / 6	3.4	3.7	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Existing valve positioning on a loss of instrument air system
058AG2.4.9	Loss of DC Power / 6	3.8	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.
077AA2.08	Generator Voltage and Electric Grid Disturbances / 6	4.3	4.4	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Criteria to trip the turbine or reactor
WE05EA2.2	Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	3.7	4.3	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
001AA2.01	Continuous Rod Withdrawal / 1	4.2	4.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Reactor tripped breaker indicator
037AA2.10	Steam Generator Tube Leak / 3	3.2	4.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Tech-Spec limits for RCS leakage
we06EG2.4.18	Degraded Core Cooling / 4	3.3	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the specific bases for EOPs.
we10EG2.4.47	Natural Circ. With Seam Void/ 4	4.2	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
012G2.1.27	Reactor Protection	3.9	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of system purpose and or function.
039G2.1.28	Main and Reheat Steam	4.1	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the purpose and function of major system components and controls.
063A2.01	DC Electrical Distribution	2.5	3.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Grounds
076A2.02	Service Water	2.7	3.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Service water header pressure
103A2.02	Containment	2.2	3.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Necessary plant conditions for work in containment

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
015A2.05	Nuclear Instrumentation	3.3	3.8	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Core void formation
028A2.03	Hydrogen Recombiner and Purge Control	3.4	4.0	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	The hydrogen air concentration in excess of limit flame propagation or detonation with resulting equipment damage in containment
071G2.1.23	Waste Gas Disposal	4.3	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to perform specific system and integrated plant procedures during all modes of plant operation.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
G2.1.38	Conduct of operations	3.7	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the stations requirements for verbal communication when implamenting procedures
G2.2.13	Equipment Control	4.1	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of tagging and clearance procedures.
G2.2.18	Equipment Control	2.6	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the process for managing maintenance activities during shutdown operations.
G2.3.12	Radiation Control	3.2	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiological safety principles pertaining to licensed operator duties
G2.3.6	Radiation Control	2.0	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to aprove release permits
G2.4.12	Emergency Procedures/Plans	4.0	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of general operating crew responsibilities during emergency operations.
G2.4.37	Emergency Procedures/Plans	3.0	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the lines of authority during implamentation of an emergency plan.

Facility: Vogtle 1 & 2 Date of Examination: 3/26/12 – 4/20/12
Examination Level: RO ☑ SRO Operating Test Number: 2012-301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, P	V-NRC-JP-14915-HL17 Perform AFD Monitoring **Description**: With data provided, candidate will perform 14915 Data sheet 6 for AFD monitoring. G2.1.37 (4.3 / 4.6)
Conduct of Operations	R, D	V-NRC-JP-19001-HL17 Calculate Boron Addition with 3 Stuck Rods **Description**: With data given, the candidate will calculate the amount of Boric Acid that is required to compensate for the stuck rods. G2.1.25 (3.9 / 4.2)
Equipment Control	R, N	V-NRC-JP-NMP-AD-003-HL17 Determine Tagging Requirements **Description:** Candidate will determine appropriate fluid boundary points and their associated positions required for the Tagout of Containment Spray Pump 1A. G2.2.13 (4.1 / 4.3)
Radiation Control	R, D	V-NRC-JP-00930-HL17 Radiation Posting Requirements **Description:** Candidate will determine the posting requirements for a room with a radioactive component temporarily stored in it. G2.3.12 (3.2 / 3.8)
Emergency Procedures/Plan	R, D	N/A

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

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

Facility: Vogtle 1 & 2 Date of Examination: 3/26/12 – 4/20/12
Examination Level: RO SRO ☑ SROU ☑ Operating Test Number: 2012-301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, P	V-NRC-JP-14915-HL17 Evaluate Inoperable AFD Monitor Alarm **Description:** With data provided, candidate will select 14915 Data sheet 6 for AFD monitoring, evaluate data and take appropriate actions. G2.1.37 (4.3 / 4.6)
Conduct of Operations	R, D	V-NRC-JP-14005-HL17 Calculate Shutdown Margin-Keff Determination for Shutdown Bank Withdrawal **Description:** Reactor Startup in progress. Candidate will determine Keff for Shutdown Bank withdrawal. G2.1.25 (3.9 / 4.2)
Equipment Control	R, N	V-NRC-JP-NMP-AD-003-HL17 Determine Tagging Requirements Description: Candidate will determine appropriate fluid boundary points and their associated positions required for the Tagout of Containment Spray Pump 1A. The candidate must also determine any Tech Spec required actions to allow this system to be tagged. G2.2.13 (4.1 / 4.3)
Radiation Control	R, D	V-NRC-JP-00930-HL17 Radiation Posting Requirements /Controls **Description:** Candidate will determine the posting requirements for a room with a radioactive component temporarily stored in it. The candidate must state the Tech Spec Admin controls required to access the area. G2.3.12 (3.7)
Emergency Procedures/Plan	R, D	V-NRC-JP-NMP-EP-112-HL17 Determine Offsite Protective Area Recommendations **Description:** With a General Emergency declared, the candidate will determine the required offsite PARs with the data given. G2.4.44 (4.4)

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

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

Facility: Vogtle 1 & 2 Date of Examination: 3/26/12 – 4/20/12

Exam Level: RO ☑ SRO-I ☑ SRO-U ☑ Operating Test No.: 2012-301

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. V-NRC-JP-14410-HL17 Perform Control Rod Operability Test-Alt path (Two rods drop requiring a manual Reactor Trip). **Description:** Candidate performs control rod operability test for Control bank A. This JPM is modified to drop two rods in a staggered sequence on CBA when CBB test is started. This will require a manual reactor trip per 18003-C, "Rod Control System Malfunction". 001A2.17 (3.3 / 3.8) (RO / SROI)	A, M, S	1
Alternate a. V-NRC-JP-13009-HL17 Perform a Manual Makeup To VCT(Alt-loss off boric acid flow) **Description:** Candidate performs a manual makeup to VCT. This JPM is modified to simulate a blown control power fuse stops the running boric acid transfer pump requiring stopping the makeup. 004A4.12 (3.8 / 3.3) (RO / SROI)	A,M,S	1
b. V-NRC-JP-19013-HL17 Transfer ECCS Pumps To Cold Leg Recirc (Cold Leg Recirc path not available) **Description:** Equipment failures will prevent cold leg recirculation. Candidate is required to identify a loss of emergency coolant recirculation. 006A4.05 (3.9 / 3.8) (RO / SROI / SROU)	A, EN, D, S	2
c. V-NRC-JP-19030-HL17 Depressurize RCS To Reduce Break Flow to Ruptured SG (Normal Pressurizer Spray Not available and 1st PORV Block Valve fails to open) **Description:** A SGTR has occurred. The candidate task is to "Depressurize the RCS beginning with 19030-C step 34, until one termination criterion is met". Normal spray controllers will not function. Candidate should use a PORV with complications. 038EA1.04 (4.3 / 4.1) (RO / SROI)	A, P, S	3

d. V-NRC-JP-13003-HL17 Start a RCP with a Seal Failure **Description:** Plant is in Mode 3 at 557°F, 2235 psig with three RCPs running. The candidate must start RCP 2 per SOP 13003-1. On start, the #1 seal fails requiring pump shutdown. 003A2.02 (3.7 / 3.9) (RO / SROI)	A, D, L, S	4P
Alternate d. V-NRC-JP-13011-HL-17 Place an RHR Train In Service for RCS Cooldown **Description:** The candidate must place a train of RHR in service for RCS cooldown per SOP 13011-1. 005A4.01 (3.6 / 3.4) (RO / SROI)	D,L,S	4P
e. V-NRC-JP-13610-HL17 Transfer AFW Suction Source to CST 2 **Description:** The candidate must transfer the AFW suction source to CST 2 with AFW in service per SOP 13610-1. 061A1.04 (3.9 / 3.9) (RO / SROI)	D, EN, L, S	4S
f. V-NRC-JP-13130-HL17 Dilute Containment With Service Air **Description:** The candidate will be required to use SOP 13130-1, section 4.4.2 to align service air to containment to dilute hydrogen. 028A4.01 (4.0 / 4.0) (RO / SROI)	P, S	5
g. V-NRC-JP-13427-HL17 Energizing 4160v Bus 1AA02 from Alternate Incoming Source (RAT "B") using 13427A-1 **Description:** A loss of all AC power has occurred. The candidate must energize Train A 4160 V bus from the Train B RAT. 062A4.01 (3.3 / 3.1) (RO / SROI / SROU)	N, S	6
h. V-NRC-JP-13301-HL17 Manually Actuate CRI Due to Smoke **Description:** A brush fire on site is causing smoke to enter the control room air intakes. The candidate must perform a Control Room Isolation. 067AA1.05 (3.0 / 3.1) (RO)	M, S	**RO ONLY** 8

In-Plant Systems[@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. V-NRC-JP-18019-HL17 Establish RWST Gravity Drain Through RHR Pumps to RCS Hot Legs (Cold Legs Not Available) **Description:** During a loss of RHR at midloop level, establish gravity drain to the hot legs per AOP 18019-C Attachment A section C. 025G2.1.20 (4.6 / 4.6) (RO / SROI / SROU)	A, R, P	4P
j. V-NRC-JP-18038-HL17 Establish Local Control of 1E Switchgears **Description:** The candidate must take local control of the 4160 V switchgear breakers and verify an ACCW pump in service per AOP 18038-1. 068AA1.20 (3.9 / 4.1) (RO / SROI / SROU)	N, E	8
k. V-NRC-JP-18001-HL17 Place Steam Pressure Bistables in the Tripped Condition **Description:** The candidate must place 2PT-0524 bistables in the tripped condition per AOP 18001-C. 012A4.04 (3.3 / 3.3) (RO / SROI / SROU)	C, D	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 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	