WRITTEN EXAM SAMPLE PLAN ONLY

ES-201 **Examination Outline Quality Checklist** **Form ES-201-2**

Facility: North Anna Power Station Date of Examination: September 2012

Item	Task Description	Initials a	Initials b*	Initials c#
1. WRITTEN	a. Verify that the outline(s) fit(s) the appropriate model, in accordance with ES-401.	M	N/A	MB
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled.	M	N/A	MB
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	M	N/A	MB
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.	M	N/A	MB
2. SIMULATOR	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, technical specifications, and major transients.			
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity, and ensure that each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s), and that scenarios will not be repeated on subsequent days.			
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.			
3. W/T	a. Verify that the systems walk-through outline meets the criteria specified on Form ES-301-2: (1) the outline(s) contain(s) the required number of control room and in-plant tasks distributed among the safety functions as specified on the form (2) task repetition from the last two NRC examinations is within the limits specified on the form (3) no tasks are duplicated from the applicants' audit test(s) (4) the number of new or modified tasks meets or exceeds the minimums specified on the form (5) the number of alternate path, low-power, emergency, and RCA tasks meet the criteria on the form.	N		A
	b. Verify that the administrative outline meets the criteria specified on Form ES-301-1: (1) the tasks are distributed among the topics as specified on the form (2) at least one task is new or significantly modified (3) no more than one task is repeated from the last two NRC licensing examinations			
	c. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on subsequent days.			
4. GENERAL	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam sections.	M	N/A	MB
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	M	N/A	MB
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	M	N/A	MB
	d. Check for duplication and overlap among exam sections.	N/A	N/A	N/A
	e. Check the entire exam for balance of coverage.	M	N/A	MB
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	M	N/A	MB

	Printed Name/Signature	Date
a. Author	MICHAEL MEEKS / Michael Meeks	01/06/2012
b. Facility Reviewer (*)	N/A	N/A
c. NRC Chief Examiner (#)	MARK A. BATES / Mark A. Bates	01/06/2012
d. NRC Supervisor	BRUNO CABALLERO / B. Caballero	1-6-12

Note: # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.
* Not applicable for NRC-prepared examination outlines

WRITTEN EXAM SAMPLE PLAN ONLY

Facility: NORTH ANNA POWER STATION Date of Exam: SEPTEMBER 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	2	2				1	2			1	9	2		2		4
	Tier Totals	4	5	5				4	5			4	27	5		5		10
2. Plant Systems	1	3	2	3	3	3	2	3	2	2	3	2	28	3		2		5
	2	1	1	1	1	1	1	1	1	1	1	0	10	0	2	1		3
	Tier Totals	4	3	4	4	4	3	4	3	3	4	2	38	5		3		8
3. Generic Knowledge and Abilities Categories		1		2		3		4					10	1	2	3	4	7
		2		2		3		3						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:
008AA1.02	Pressurizer Vapor Space Accident / 3	4.1	3.9	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	HPI pump to control PZR level/pressure
009EK3.06	Small Break LOCA / 3	3.9	4	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	RCS inventory balance
011EA2.08	Large Break LOCA / 3	3.4	3.9	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Conditions necessary for recovery when accident reaches stable phase
022AK1.04	Loss of Rx Coolant Makeup / 2	2.9	3	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reason for changing from manual to automatic control of charging flow valve controller
025AA1.04	Loss of RHR System / 4	2.8	2.6	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Closed cooling water pumps
027AK2.03	Pressurizer Pressure Control System Malfunction / 3	2.6	2.8	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Controllers and positioners
029EK2.06	ATWS / 1	2.9	3.1	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Breakers, relays, and disconnects.
038EK1.02	Steam Gen. Tube Rupture / 3	3.2	3.5	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Leak rate vs. pressure drop
040AG2.4.20	Steam Line Rupture - Excessive Heat Transfer / 4	3.8	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of operational implications of EOP warnings, cautions and notes.
054AK3.04	Loss of Main Feedwater / 4	4.4	4.6	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Actions contained in EOPs for loss of MFW
055EA2.03	Station Blackout / 6	3.9	4.7	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Actions necessary to restore power

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
056AA2.73	Loss of Off-site Power / 6	3.5	3.6	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	PZR heater on/off
057AG2.1.31	Loss of Vital AC Inst. Bus / 6	4.6	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.
058AK3.01	Loss of DC Power / 6	3.4	3.7	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Use of dc control power by D/Gs
077AK1.01	Generator Voltage and Electric Grid Disturbances / 6	3.3	3.5	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Definition of the terms: volts, watts, amps, VARS, power factor
WE04EA1.1	LOCA Outside Containment / 3	4.0	4.0	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Components and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes and automatic and manual features.
WE05EK2.2	Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	3.9	4.2	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems and relations between the proper operation of these systems to the operation of the facility.
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:
001AA2.04	Continuous Rod Withdrawal / 1	4.2	4.3	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Reactor power and its trend
028AK3.04	Pressurizer Level Malfunction / 2	2.9	3	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Change in PZR level with power change, even though RCS T-ave. constant, due to loop size difference
060AA1.01	Accidental Gaseous Radwaste Rel. / 9	2.8	3	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Area radiation monitors
067AA2.10	Plant Fire On-site / 8	2.9	3.6	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Time limit of long-term-breathing air system for control room
068AK2.07	Control Room Evac. / 8	3.3	3.4	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	ED/G
076AG2.2.3	High Reactor Coolant Activity / 9	3.8	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	(multi-unit license) Knowledge of the design, procedural and operational differences between units.
WE08EK1.3	RCS Overcooling - PTS / 4	3.5	4.0	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Annunciators and conditions indicating signals, and remedial actions associated with the (Natural Circulation Operations).
WE10EK2.2	Natural Circ. With Seam Void/ 4	3.6	3.9	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems and relations between the proper operation of these systems to the operation of the facility.
WE15EK3.1	Containment Flooding / 5	2.7	2.9	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure and reactivity changes and operating limitations and reasons for these operating characteristics.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
003A4.06	Reactor Coolant Pump	2.9	2.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	RCP parameters
003K5.04	Reactor Coolant Pump	3.2	3.5	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Effects of RCP shutdown on secondary parameters, such as steam pressure, steam flow and feed flow
004K2.07	Chemical and Volume Control	2.7	3.2	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Heat tracing
004K5.15	Chemical and Volume Control	3.3	3.5	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Boron and control rod reactivity effects as they relate to MTC
005A2.03	Residual Heat Removal	2.9	3.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	RHR pump/motor malfunction
005K5.05	Residual Heat Removal	2.7	3.1	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Plant response during "solid plant": pressure change due to the relative incompressibility of water
006A3.03	Emergency Core Cooling	4.1	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	ESFAS-operated valves
006A4.08	Emergency Core Cooling	4.2	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	ESF system, including reset
007A3.01	Pressurizer Relief/Quench Tank	2.7	2.9	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Components which discharge to the PRT
008G2.1.27	Component Cooling Water	3.9	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of system purpose and or function.
010K2.02	Pressurizer Pressure Control	2.5	2.7	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Controller for PZR spray valve

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
012A1.01	Reactor Protection	2.9	3.4	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Trip setpoint adjustment
013K6.01	Engineered Safety Features Actuation	2.7	3.1	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Sensors and detectors
022G2.1.7	Containment Cooling	4.4	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior and instrument interpretation.
026K4.09	Containment Spray	3.7	4.1	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Prevention of path for escape of radioactivity from containment to the outside (interlock on RWST isolation after swapover)
039A2.01	Main and Reheat Steam	3.1	3.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Flow paths of steam during a LOCA
059K1.02	Main Feedwater	3.4	3.4	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	AFW system
061K6.01	Auxiliary/Emergency Feedwater	2.5	2.8	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Controllers and positioners
062K1.02	AC Electrical Distribution	4.1	4.4	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	ED/G
063A4.01	DC Electrical Distribution	2.8	3.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	Major breakers and control power fuses
064A1.03	Emergency Diesel Generator	3.2	3.3	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Operating voltages, currents and temperatures
064K4.01	Emergency Diesel Generator	3.8	4.1	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Trips while loading the ED/G (frequency, voltage, speed)

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
073K3.01	Process Radiation Monitoring	3.6	4.2	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Radioactive effluent releases
073K4.01	Process Radiation Monitoring	4.0	4.3	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Release termination when radiation exceeds setpoint
076A1.02	Service Water	2.6	2.6	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Reactor and turbine building closed cooling water temperatures.
076K3.01	Service Water	3.4	3.6	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Closed cooling water
078K1.05	Instrument Air	3.4	3.5	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	MSIV air
103K3.02	Containment	3.8	4.2	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Loss of containment integrity under normal operations

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
002A4.08	Reactor Coolant	3.4	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	Safety parameter display systems
011A2.08	Pressurizer Level Control	2.6	2.8	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Loss of level compensation
014K1.02	Rod Position Indication	3.0	3.3	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	NIS
017K6.01	In-core Temperature Monitor	2.7	3.0	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Sensors and detectors
027K2.01	Containment Iodine Removal	3.1	3.4	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Fans
029A3.01	Containment Purge	3.8	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	CPS isolation
035A1.02	Steam Generator	3.5	3.8	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	S/G pressure
045K5.17	Main Turbine Generator	2.5	2.7	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Relationship between moderator temperature coefficient and boron concentration in RCS as T/G load increases
055K3.01	Condenser Air Removal	2.5	2.7	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Main condenser
068K4.01	Liquid Radwaste	3.4	4.1	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Safety and environmental precautions for handling hot, acidic and radioactive liquids

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
G2.1.26	Conduct of operations	3.4	3.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).
G2.1.40	Conduct of operations	2.8	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of refueling administrative requirements
G2.2.12	Equipment Control	3.7	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of surveillance procedures.
G2.2.43	Equipment Control	3.0	3.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the process used to track inoperable alarms
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
G2.3.4	Radiation Control	3.2	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiation exposure limits under normal and emergency conditions
G2.4.23	Emergency Procedures/Plans	3.4	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations.
G2.4.29	Emergency Procedures/Plans	3.1	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the emergency plan.
G2.4.43	Emergency Procedures/Plans	3.2	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of emergency communications systems and techniques.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
008AG2.4.6	Pressurizer Vapor Space Accident / 3	3.7	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge symptom based EOP mitigation strategies.
025AA2.02	Loss of RHR System / 4	3.4	3.8	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Leakage of reactor coolant from RHR into closed cooling water system or into reactor building atmosphere
056AG2.2.40	Loss of Off-site Power / 6	3.4	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to apply technical specifications for a system.
065AA2.02	Loss of Instrument Air / 8	2.4	2.6	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Relationship of flow readings to system operation
we04EG2.4.18	LOCA Outside Containment / 3	3.3	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the specific bases for EOPs.
WE05EA2.1	Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	3.4	4.4	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
001AA2.04	Continuous Rod Withdrawal / 1	4.2	4.3	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Reactor power and its trend
060AG2.1.19	Accidental Gaseous Radwaste Rel. / 9	3.9	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to use plant computer to evaluate system or component status.
061AA2.05	ARM System Alarms / 7	3.5	4.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Need for area evacuation; check against existing limits
069AG2.1.31	Loss of CTMT Integrity / 5	4.6	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
012A2.01	Reactor Protection	3.1	3.6	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Faulty bistable operation
039A2.03	Main and Reheat Steam	3.4	3.7	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Indications and alarms for main steam and area radiation monitors (during SGTR)
062A2.15	AC Electrical Distribution	2.8	3.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Consequence of paralleling out-of-phase/mismatch in volts
063G2.4.9	DC Electrical Distribution	3.8	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.
103G2.4.31	Containment	4.2	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of annunciators alarms, indications or response procedures

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
028G2.1.25	Hydrogen Recombiner and Purge Control	3.9	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to interpret reference materials such as graphs, monographs and tables which contain performance data.
071A2.01	Waste Gas Disposal	2.3	2.8	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Use of WGDS to prevent entry of oxygen into holdup tanks during liquid transfers
079A2.01	Station Air	2.9	3.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Cross-connection with IAS

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
G2.1.15	Conduct of operations	2.7	3.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of administrative requirements for temporary management directives such as standing orders, night orders, Operations memos, etc.
G2.2.3	Equipment Control	3.8	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	(multi-unit license) Knowledge of the design, procedural and operational differences between units.
G2.2.7	Equipment Control	2.9	3.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the process for conducting special or infrequent tests
G2.3.15	Radiation Control	2.9	3.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiation monitoring systems
G2.3.5	Radiation Control	2.9	2.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to use radiation monitoring systems
G2.4.25	Emergency Procedures/Plans	3.3	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of fire protection procedures.
G2.4.30	Emergency Procedures/Plans	2.7	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of events related to system operations/status that must be reported to internal orginizations or outside agencies.

Facility: **North Anna Power Station** Date of Examination: 9/10/2012
Examination Level: **Combined (*See Below*)** Operating Test Number: 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R G2.1.25	Determine Shutdown Margin (1-PT-10.1). **(ALL) (RO 3.9 / SRO 4.2)**
Conduct of Operations	M, R G2.1.20	Calculate Reactor Coolant System Leak Rate (Hand Calculation) (1-PT-52.2). **(ALL) (RO 4.6 / SRO 4.6)**
Equipment Control	M, R G2.2.37	Perform Alternate Core Cooling Assessment (1-GOP-13.0 & 1-GOP-13.1) **(ALL) (RO 3.6 / SRO 4.6)**
Radiation Control	M, R G2.3.7	Select RWP Task; determine dressout & dosimetry requirements, and calculate stay time. **(ALL) (RO 3.5 / SRO 3.6)**
Emergency Plan	M, R G2.4.41	Classify an emergency event (EPIP-1.01) **(SRO ONLY) (RO 2.9 / SRO 4.6)**

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: North Anna Power Station Date of Examination: 9/10/2012

Exam Level : RO ☒ SRO-I ☒ SRO-U ☐ Operating Test No.: 1

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title (KA)	**Type Code***	**Safety Function**
a) Initiate Bleed & Feed in Response to Loss of Secondary Heat Sink (1-FR-H.1) E05 - EA1.1, (4.1 / 4.0) / **(ALL)**	A, EN, L, M, S	4 (Pri)
b) Align Service Water to Cool Charging Pumps with Gravity Flow (0-AP-12) 076 – A2.01, (3.5 / 3.7) / **(ALL)**	L, N, S	4 (Sec)
c) Perform Attachments 4 and 5 of 1-E-0, Reactor Trip or Safety Injection 013 - A4.01, (4.5 / 4.8) **(ALL)**	A, EN, L, M, S	2
d) Defeat a failed loop ΔT/Tave channel in accordance with 1-MOP-55.74 016 – A4.01, (2.9 / 2.8) **(ALL)**	M, S	7
e) Terminate spurious SI in accordance with 1-AP-0.1 006 - A2.13 (3.9 / 4.2) **(ALL)**	A, EN, L, N, S	3
f) Place Containment Purge in Service 029 – A4.01 (2.5 / 2.5) **(ALL)**	D, L, S	8
g) Perform an RCS Dilution 004 – (3.9 / 3.7) **(RO ONLY)**	A, M, S	1
h) Start and load an Emergency Diesel Generator 062 – A4.07 (3.1 /3.1) **(ALL)**	A, D, S	6
In-Plant Systems@ (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
i) Locally reset trip switches on breakers in accordance with 1-AP-20, Attachment 2 062 – K2.01, (3.3 / 3.4) **(ALL)**	E, N	6
j) Align Auxiliary Feedwater to Supply the HCV Header 061 – A2.04 (3.4 / 3.8) **(ALL)**	D, E, P	4 (sec)
k) Emergency Borate the RCS Locally 024 – AA2.05 (3.3 / 3.9) **(ALL)**	D, E, R	1

@ 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 (similar topic)	≤3 / ≤3 / ≤2 (randomly selected)
(R)CA	≥1 / ≥1 / ≥1
(S)imulator	

Note: There are NO SRO-U candidates for this exam.