Facility: Harris Date of Exam: December, 2013

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	2	3	3	3	2	2	2	3	3	2	3 / 28	3	2	5
	2	1	1	1	1	1	1	1	1	0	1	1 / 10	0 / 1	2	3
	Tier Totals	3	3	4	4	3	3	3	4	3	3	4 / 38	4	4	8
3. Generic Knowledge and Abilities Categories					1		2		3		4	10	1	2	3	4	7
					2		2		3		3		2	2	2	1	

Notes:

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.

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	A2	G	K/A Topic(s)	IR	#
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1	X						007EK1.04; Knowledge of the operational implications of the Decrease in reactor power following reactor trip (prompt drop and subsequent decay) as it applies to the reactor trip.	3.6	
000008 Pressurizer Vapor Space Accident / 3	X						008AK1.01; Knowledge of the operational implications of thermodynamics and flow characteristics of open or leaking Valves as it applies to a Pressurizer Vapor Space Accident.	3.2	
					X		008AA2.30; Ability to determine and interpret Inadequate core cooling as it applies to the Pressurizer Vapor Space Accident.	4.7	
000009 Small Break LOCA / 3						X	009EG2.1.20; Ability to interpret and execute procedure steps.	4.6	
000011 Large Break LOCA / 3				X			011EA1.15; Ability to operate and monitor the RCS temperature and pressure as they apply to a Large Break LOCA.	4.2	
						X	011EG2.2.44; Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.4	
000015/17 RCP Malfunctions / 4				X			015AA1.04; Ability to operate and / or monitor RCP ventilation cooling fan run indicators as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow).	2.5	
000022 Loss of Rx Coolant Makeup / 2					X		022AA2.01; Ability to determine and interpret whether a charging line leak exists as it applies to the Loss of Reactor Coolant Makeup.	3.2	
000025 Loss of RHR System / 4	X						025AK1.01; Knowledge of the operational implications of the loss of RHRS during all modes of operation as it applies to Loss of Residual Heat Removal System.	3.9	
						X	025AG2.4.3: Ability to identify post-accident instrumentation.	3.9	
000026 Loss of Component Cooling Water / 8			X				026AK3.01; Knowledge of the reasons for the conditions that will initiate the automatic opening and closing of the SWS isolation valves to the CCWS coolers as they apply to the Loss of Component Cooling Water.	4.2	
000027 Pressurizer Pressure Control System Malfunction / 3									
000029 ATWS / 1			X				029EK3.06; Knowledge of the reasons for verifying a main turbine trip; methods as they apply to the ATWS.	4.2	

000038 Steam Gen. Tube Rupture / 3									
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4		X					040AK2.01; Knowledge of the interrelations between the Steam Line Rupture and valves.	2.6	
000054 (CE/E06) Loss of Main Feedwater / 4						X	054AG2.4.9; Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.	3.8	
000055 Station Blackout / 6									
000056 Loss of Off-site Power / 6				X			056AA1.08; Ability to operate and / or monitor HVAC chill water pump and unit as they apply to the Loss of Offsite Power.	2.5	
					X		056AA2.54; Ability to determine and interpret breaker position (remote and local) as it applies to the Loss of Offsite Power.	3.0	
000057 Loss of Vital AC Inst. Bus / 6									
000058 Loss of DC Power / 6									
000062 Loss of Nuclear Svc Water / 4						X	062AG2.4.1; Knowledge of EOP entry conditions and immediate action steps.	4.6	
000065 Loss of Instrument Air / 8					X		065AA2.05; Ability to determine and interpret the normal values for SWS-header flow rate and the flow rates to the components cooled by the SWS as they apply to the Loss of Nuclear Service Water.	3.4	
						X	065AG2.2.44; Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.4	
W/E04 LOCA Outside Containment / 3		X					WE04EK2.1; Knowledge of the interrelations between the (LOCA Outside Containment) and components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.5	
					X		WE04EA2.1; Ability to determine and interpret facility conditions and selection of appropriate procedures during abnormal and emergency operations.as they apply to the (LOCA Outside Containment).	4.3	
W/E05 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4		X					WE05EK2.2; Knowledge of the interrelations between the (Loss of Secondary Heat Sink) and the 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.	3.9	
W/E11 Loss of Emergency Coolant Recirc. / 4					X		WE11EA2.2; Ability to determine and interpret adherence to appropriate procedures and operation within the limitations in the facility*s license and amendments as they apply to the (Loss of Emergency Coolant Recirculation).	3.4	
000077 Generator Voltage and Electric Grid Disturbances / 6			X				077AK3.02; Knowledge of the reasons for the actions contained in abnormal operating procedure for voltage and grid disturbances as they apply to Generator Voltage and Electric	3.6	

							Grid Disturbances.		
K/A Category Totals:	3	3	3	3	3/3	3/3	Group Point Total:		18/6

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	A2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1			X				001AK3.02; Knowledge of the reasons for Tech-Spec limits on rod operability as they apply to the Continuous Rod Withdrawal.	3.2	
000003 Dropped Control Rod / 1						X	003G2.2.22; Knowledge of limiting conditions for operations and safety limits.	4.7	
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		036AA2.01; Ability to determine and interpret ARM system indications as they apply to the Fuel Handling Incidents.	3.2	
000037 Steam Generator Tube Leak / 3	X						037AK1.01; Knowledge of the operational implications of the use of steam tables as it applies to Steam Generator Tube Leak.	2.9	
000051 Loss of Condenser Vacuum / 4						X	051AG2.4.46; Ability to verify that the alarms are consistent with the plant conditions.	4.2	
000059 Accidental Liquid RadWaste Rel. / 9									
000060 Accidental Gaseous Radwaste Rel. / 9						X	060AG2.2.12; Knowledge of surveillance procedures.	4.1	
000061 ARM System Alarms / 7					X		061AA2.05; Ability to determine and interpret the need for area evacuation; check against existing limits as it applies to the Area Radiation Monitoring (ARM) System Alarms.	4.2	
000067 Plant Fire On-site / 8									
000068 (BW/A06) Control Room Evac. / 8		X					068AK2.07; Knowledge of the interrelations between the Control Room Evacuation and the ED/G.	3.3	
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									
W/E03 LOCA Cooldown – Depress / 4		X					WE03EK2.2; Knowledge of the interrelations between the (Inadequate	3.7	

							Subcooling Margin) and the 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.		
W/E06 Degraded Core Cooling / 4			X				WE06EK3.2; Knowledge of the reasons for normal, abnormal and emergency operating procedures associated with (Degraded Core Cooling) as they apply to the (Degraded Core Cooling).	3.5	
W/E08 RCS Overcooling – PTS / 4					X		WE08EA2.2; Ability to determine and interpret adherence to appropriate procedures and operation within the limitations in the facility's license and amendments as they apply to (Pressurized Thermal Shock).	3.5	
W/E09&E10 Natural Circ. / 4									
W/E13 Steam Generator Over-pressure / 4									
W/E14 Loss of CTMT Integrity / 5					X		WE14EA2.2; Ability to determine and interpret adherence to appropriate procedures and operation within the limitations in the facility's license and amendments as they apply to the (High Containment Pressure).	3.8	
W/E15 Containment Flooding / 5				X			WE15A1.3; Ability to operate and / or monitor desired operating results during abnormal and emergency situations as they apply to the (Containment Flooding).	2.8	
W/E16 High Containment Radiation / 9									
K/A Category Point Totals:	1	2	2	1	2/2	1/2	Group Point Total:		9/4

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	A2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump									X			003A3.01; Ability to monitor automatic operation of the RCPS, including Seal injection flow.	3.3	
004 Chemical and Volume Control									X			004A3.10; Ability to monitor automatic operation of the CVCS, including PZR level and pressure.	3.9	
				X								004AK4.05; Knowledge of CVCS design feature(s) and/or interlock(s) which provide for the interrelationships and design basis, including fluid flow splits in branching networks (e.g., charging and seal injection flow).	3.3	
005 Residual Heat Removal						X						005K6.03; Knowledge of the effect of a loss or malfunction on the RHR heat exchanger will have on the RHRS.	2.5	
											X	005G2.4.1; Knowledge of EOP entry conditions and immediate action steps.	4.6	
006 Emergency Core Cooling							X					006A1.15; Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including RWST level and temperature.	3.3	
								X				006K2.01; Knowledge of bus power supplies to the ECCS pumps.	3.6	
007 Pressurizer Relief/Quench Tank							X					007A1.03; Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including monitoring quench tank temperature.	2.6	
					X							007K5.02; Knowledge of the operational implications of Method of forming a steam bubble in the PZR as it applies to PRTS.	3.1	
008 Component Cooling Water				X								008K4.02; Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the operation of the surge tank, including the associated valves and controls.	2.9	
010 Pressurizer Pressure Control											X	010G2.1.28; Knowledge of the purpose and function of major system components and controls.	4.1	

						X						012K6.02; Knowledge of the effect of a loss or malfunction of the PZR will have on the PZR PCS.	3.2	
012 Reactor Protection										X		012A4.02; Ability to manually operate and/or monitor in the control room components for individual channels.	3.3	
											X	012G2.4.11; Knowledge of abnormal condition procedures.	4.2	
013 Engineered Safety Features Actuation					X							013K5.02; Knowledge of the operational implications of safety system logic and reliability as they apply to the ESFAS.	2.9	
022 Containment Cooling										X		022A4.03; Ability to manually operate and/or monitor in the control room Dampers in the CCS.	3.2	
025 Ice Condenser														
026 Containment Spray								X				026A2.08; Ability to (a) predict the impacts of Safe securing of containment spray (when it can be done) on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences.	3.2	
			X									026K3.02; Ability to monitor automatic operation of the CSS, including verification that cooling water is supplied to the containment spray heat exchanger.	4.2	
039 Main and Reheat Steam									X			039A3.02; Ability to monitor automatic operation of the MRSS, including isolation of the MRSS.	3.1	
											X	039G2.1.19; Ability to use plant computers to evaluate system or component status.	3.8	
059 Main Feedwater				X								059K4.02; Knowledge of MFW design feature(s) and/or interlock(s) which provide for automatic turbine/reactor trip runback.	3.3	
061 Auxiliary/Emergency Feedwater		X										061K2.01; Knowledge of bus power supplies to the AFW system MOVs.	3.2	
			X									061K3.02; Knowledge of the effect that a loss or malfunction of the AFW will have on the S/G.	4.2	
062 AC Electrical Distribution		X										062K2.01; Knowledge of bus power supplies to major system loads.	3.3	
063 DC Electrical Distribution		X										063A2.01; Ability to (a) predict the impacts of grounds on the DC electrical systems; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences.	2.9	
								X				063A2.02; Knowledge of bus power supplies to the Battery room	3.1	

											ventilation.		
064 Emergency Diesel Generator								X				064A2.04; Ability to (a) predict the impacts of Unloading prior to securing an ED/G on the ED/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences.	2.7	
073 Process Radiation Monitoring											X	073G2.1.30; Ability to locate and operate components, including local controls.	4.4	
076 Service Water	X											076K1.01; Knowledge of the physical connections and/or cause- effect relationships between the SWS and the CCW system.	3.4	
								X				076A2.01; Ability to (a) predict the impacts of loss of SWS on the SWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences.	3.7	
078 Instrument Air			X									078K3.03; Knowledge of the effect that a loss or malfunction of the IAS will have on the cross-tied units.	3.0	
103 Containment	X											103K1.03; Knowledge of the physical connections and/or cause-effect relationships between the containment system and the shield building vent system.	3.1	
								X				103A2.04; Ability to (a) predict the impacts of Containment evacuation (including recognition of the alarm) on the containment system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences.	3.6	
K/A Category Point Totals:	2	3	3	3	2	2	2	3/3	3	2	3/2	Group Point Total:		28/5

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	A2	A 3	A 4	G	K/A Topic(s)	IR	#
001 Control Rod Drive		X										001K2.03; Knowledge of bus power supplies - One-line diagram of power supplies to logic circuits.	2.7	
002 Reactor Coolant														
011 Pressurizer Level Control										X		011A4.05; Ability to manually operate and/or monitor in the control room the HPI system when it is used to refill the refueling cavity.	3.2	
014 Rod Position Indication														
015 Nuclear Instrumentation											X	015G2.1.23; Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.0	
016 Non-nuclear Instrumentation														
017 In-core Temperature Monitor				X								017K4.03; Knowledge of ITM system design feature(s) and/or interlock(s) which provide for the range of temperature indication.	3.1	
027 Containment Iodine Removal								X				027A2.01; Ability to (a) predict the impacts of high temperature in the filter system on the CIRS; and (b) based on those predictions, use Procedures to correct, control, or mitigate the consequences.	3.0	
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge			X									029K3.02; Knowledge of the effect that a loss or malfunction of the Containment Purge System will have on Containment entry.	2.9	
033 Spent Fuel Pool Cooling											X	033G2.4.18; Knowledge of the specific bases for EOPs.	4.0	
034 Fuel Handling Equipment														
035 Steam Generator														
041 Steam Dump/Turbine Bypass Control						X						041K6.03; Knowledge of the effect of a loss or malfunction on controller and positioners, including ICS, S/G, CRDS will have on the SDS.	2.7	
045 Main Turbine Generator							X					045A1.06; Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MT/G system controls including expected response of secondary plant parameters following T/G trip.	3.3	

055 Condenser Air Removal										X	055G2.1.28; Knowledge of the purpose and function of major system components and controls.	4.1	
056 Condensate	X										056K1.03; Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and MFW.	2.6	
068 Liquid Radwaste					X						068K5.04; Knowledge of the operational implication of the biological hazards of radiation and the resulting goal of ALARA as they apply to the Liquid Radwaste System.	3.2	
071 Waste Gas Disposal								X			071A2.06: Ability to (a) predict the impacts of a supply failure to the isolation valve on the Waste Gas Disposal System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences.	2.5	
072 Area Radiation Monitoring													
075 Circulating Water													
079 Station Air													
086 Fire Protection													
K/A Category Point Totals:	1	1	1	1	1	1	1	1/1	0	1	1/2	Group Point Total:	10/3

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.38	Knowledge of the station's requirements for verbal communications when implementing procedures.	3.7			
	2.1.44	Knowledge of RO duties in the control room during fuel handling, such as responding to alarms from the fuel handling area, communication with the fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	3.9			
	2.1.34	Knowledge of primary and secondary plant chemistry limits.			3.5	
	2.1.45	Ability to identify and interpret diverse indications to validate the response of another indication.			4.3	
	2.1.					
	2.1.					
	Subtotal		2		2	
2. Equipment Control	2.2.35	Ability to determine Technical Specification Mode of Operation.	3.6			
	2.2.41	Ability to obtain and interpret station electrical and mechanical drawings.	3.5			
	2.2.17	Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.			3.8	
	2.2.25	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.			4.2	
	2.2.					
	Subtotal		2		2	
3. Radiation Control	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9			

	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2			
	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5			
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, | abnormal, or emergency conditions or activities.			3.8	
	2.3.6	Ability to approve release permits.			3.8	
	2.3.					
	Subtotal		3		2	
4. Emergency Procedures / Plan	2.4.17	Knowledge of EOP terms and definitions.	3.9			
	2.4.37	Knowledge of the lines of authority during implementation of the emergency plan. |	3.0			
	2.4.9	Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.	3.8			
	2.4.38	Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.			4.4	
	2.4.					
	2.4.					
	Subtotal		3		1	
Tier 3 Point Total			10	10	7	7

Facility: Harris Nuclear Plant Date of Examination: November 3, 2014

Examination Level: RO ■ SRO ☐ Operating Test Number: 05000400/2014301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Perform RCS Average Temperature Data Sheet and Determine Inverse Count Rate Ratio (1/M) (GP-004) (JPM ADM-072-a) **Common** *K/A G2.1.43* **2014 NRC RO / SRO A1-1**
Conduct of Operations	M, R	Perform a manual Shutdown Margin Calculation (OST-1036) (JPM ADM-019-c) *K/A G 2.1.25* **2014 NRC RO A1-2**
Equipment Control	D, P, R	Perform a Quadrant Power Tilt Ratio (QPTR) calculation with a control rod misaligned (OST-1039) (JPM ADM-010-g) **Common** *K/A G 2.2.12* **2014 NRC RO / SRO A2**
Radiation Control	M, R	Determine TEDE While Working in a High Airborne Area (PD-RP-ALL-0001) (JPM-ADM-022-c) **Common** *K/A G2.3.4* **2014 NRC RO / SRO A3**
Emergency Procedures/Plan	N/A	NOT SELECTED FOR RO **2014 NRC RO A4**

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	**(4)**
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)	**(1)**
(N)ew or (M)odified from bank (≥ 1)	**(3)**
(P)revious 2 exams (≤ 1; randomly selected)	**(1)**

2014 NRC RO Admin JPM Summary

2014 NRC RO SRO A1-1 - (**Common**) - Perform RCS Average Temperature Data Sheet and Determine Inverse Count Rate Ratio (1/M) (GP-004)
(JPM ADM-072-a) **NEW**

K/A G2.1.43 - Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.
(CFR: 41.10 / 43.6 / 45.6) RO 4.1 SRO 4.3

The plant data for various times during a plant startup will be provided to the candidate. The information provided will allow the candidate complete Attachment 2 and Attachment 3 of GP-004, Reactor Startup (Mode 3 To Mode 2). The candidate must review the plant data provided to plot the results on Attachment 3 and determine the Inverse Count Rate Ratio (1/M). The candidate must predict the reactor will achieve criticality before reaching the 500 pcm below ECC control rod position.

2014 NRC RO A1-2 - Perform a manual Shutdown Margin Calculation (OST-1036)
(JPM ADM-019-c) **MODIFIED**

K/A G2.1.25 - Ability to interpret reference materials, such as graphs, curves, tables, etc.
(CFR: 41.10 / 43.5 / 45.12) RO 3.9 SRO 4.2

The plant is operating at 92% power and the CRS will direct the candidate to complete OST-1036, Shutdown Margin Calculation Modes 1-5, Section 7.3, for the current plant conditions.

NOTE: Modified by changing all values provided as initial conditions and using current cycle curves which will lead the candidate to a new answer that is substantially different than the original.

2014 NRC RO SRO A2 - (**Common**) - Perform a Quadrant Power Tilt Ratio (QPTR) calculation with a control rod misaligned. (OST-1039)
(JPM ADM-010-g) **PREVIOUS** NRC Exam – 2013 *randomly selected from bank

K/A G2.2.12 - Knowledge of surveillance procedures.
(CFR: 41.10 / 45.13) RO 3.7 SRO 4.1

The candidate must perform a QPTR calculation in accordance with surveillance procedure OST-1039, Calculation of Quadrant power Tilt Ratio, Weekly Interval and as required by the AOP-001, Malfunction of Rod Control and Indication System for a misaligned rod at 90% power. The candidate should calculate a QPTR value between 1.02 and 1.09.

2013 NRC RO Admin JPM Summary (continued)

2014 NRC RO SRO A3 - (**Common**) – Determine TEDE While Working in a High Airborne Area (PD-RP-ALL-0001)
(JPM-ADM-022-c) **MODIFIED**

K/A G2.3.4 - Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 41.12 / 43.4 / 45.10) RO 3.2 SRO 3.7

The candidate must calculate and determine if a respirator should or should not be worn when working in an area with a known dose rate and airborne contamination for a given length of time.

NOTE: Modified by providing different initial conditions and different accumulated dose amounts which leads to a new answer that will NOT require the use of a respirator. This answer is substantially different than the original.

2014 NRC RO A4 – Not selected

Revision Comments
2014 NRC RO Admin JPM Summary

JPM A1-1

JPM A1-2

JPM A2

JPM A3

Facility: Harris Nuclear Plant Date of Examination: November 3, 2014

Examination Level: RO ☐ SRO ■ Operating Test Number: 05000400/2014301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Perform RCS Average Temperature Data Sheet and Determine Inverse Count Rate Ratio (1/M) (GP-004) (JPM ADM-072-a) **Common** *K/A G2.1.43* **2014 NRC RO / SRO A1-1**
Conduct of Operations	D, R	Complete GP-002, Attachment 5 - Minimum Equipment List (MEL) for Entry into Mode 4 (GP-002) (JPM ADM-040-b) *K/A G 2.1.20* **2014 NRC SRO A1-2**
Equipment Control	D, P, R	Perform a Quadrant Power Tilt Ratio (QPTR) calculation with a control rod misaligned and Evaluate Tech Specs. (OST-1039) (JPM ADM-010-h-SRO) **Common** *K/A G 2.2.12* **2014 NRC SRO A2**
Radiation Control	M, R	Determine TEDE While Working in a High Airborne Area (PD-RP-ALL-0001) (JPM-ADM-022-c) **Common** *K/A G2.3.4* **2014 NRC RO / SRO A3**
Emergency Procedures/Plan	N, R	Classify an Event (EP-EAL) (JPM ADM-064-a) *K/A G2.4.41* **2014 NRC SRO A4**

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 **(5)**
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) **(2)**
(N)ew or (M)odified from bank (≥ 1) **(3)**
(P)revious 2 exams (≤ 1; randomly selected) **(1)**

2014 NRC SRO Admin JPM Summary

2014 NRC RO SRO A1-1 - (**Common**) - Perform RCS Average Temperature Data Sheet and Determine Inverse Count Rate Ratio (1/M) (GP-004)
(JPM ADM-072-a) **NEW**

K/A G2.1.43 - Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.
(CFR: 41.10 / 43.6 / 45.6) RO 4.1 SRO 4.3

The plant data for various times during a plant startup will be provided to the candidate. The information provided will allow the candidate complete Attachment 2 and Attachment 3 of GP-004, Reactor Startup (Mode 3 To Mode 2). The candidate must review the plant data provided to plot the results on Attachment 3 and determine the Inverse Count Rate Ratio (1/M). The candidate must predict the reactor will achieve criticality before reaching the 500 pcm below ECC control rod position.

2014 NRC SRO A1-2 - Complete GP-002, Attachment 5 - Minimum Equipment List (MEL) for Entry into Mode 4 (GP-002)
(JPM ADM-040-b) **DIRECT**

K/A G2.1.20 - Ability to interpret and execute procedure steps.
(CFR: 41.10 / 43.5 / 45.12) RO 4.6 SRO 4.6

The plant data for current conditions during a plant startup will be provided to the candidate. The information provided will allow the candidate to complete Attachment 5 of GP-002, Normal Plant Heatup From Cold Solid To Hot Subcritical Mode 5 To Mode 3. The candidate must review the plant data provided and determine that three items (Boric Acid Tank, RCS/RHR Loops and Safety Related Electrical Buses) do NOT meet the minimum required for entry into Mode 4.

2014 NRC RO SRO A2 - (**Common**) - Perform a Quadrant Power Tilt Ratio (QPTR) calculation with a control rod misaligned and Evaluate Tech Specs. (OST-1039)
(JPM ADM-010-h) **PREVIOUS** NRC Exam – 2013 *randomly selected from bank

K/A G2.2.12 - Knowledge of surveillance procedures.
(CFR: 41.10 / 45.13) RO 3.7 SRO 4.1

The candidate must perform a QPTR calculation in accordance with surveillance procedure OST-1039, Calculation of Quadrant Power Tilt Ratio, Weekly Interval and as required by the AOP-001, Malfunction of Rod Control and Indication System for a misaligned rod at 90% power. The candidate should calculate a QPTR value between 1.02 and 1.09. For SRO's this JPM requires the candidate to identify applicable Tech Spec LCOs.

2014 NRC SRO Admin JPM Summary (continued)

2014 NRC RO SRO A3 - (**Common**) - Determine TEDE While Working in a High Airborne Area (PD-RP-ALL-0001)
(JPM-ADM-022-c) **MODIFIED**

K/A G2.3.4 - Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 41.12 / 43.4 / 45.10) RO 3.2 SRO 3.7

The candidate must calculate and determine if a respirator should or should not be worn when working in an area with a known dose rate and airborne contamination for a given length of time.

NOTE: Modified by providing different initial conditions and different accumulated dose amounts which leads to a new answer that will NOT require the use of a respirator. This answer is substantially different than the original.

2014 NRC SRO A4 - Classify an Event (EP-EAL)
(JPM-ADM-064-a) **NEW**

K/A G2.4.41 - Knowledge of the emergency action level thresholds and classifications (CFR: 41.10 / 43.5 / 45.11) RO 2.9 SRO 4.6

Given a set of initial conditions and the EAL Flow Matrix, the candidate must classify the appropriate Emergency Action Level for the event in progress.

Revision Comments
2014 NRC SRO Admin JPM Summary

JPM A1-1

JPM A1-2

JPM A2

JPM A3

JPM A4

Facility: Harris Nuclear Plant Date of Examination: November 3, 2014

Exam Level: RO SRO-I **SRO-U (bold)** Operating Test No.: 05000400/2014301

Control Room Systems@ (8 for RO); (7 for SRO-I); (**2 or 3 for SRO-U, including 1 ESF - bold**)

	System / JPM Title	Type Code*	Safety Function
a.	Perform Control Rod and Rod Position Indicator Exercise (OST-1005) (JPM-CR-256-d) Previous NRC 2013 *K/A 001 A2.11*	A, D, P, S	1
b.	**Vent An Un-Isolable SI Accumulator during a Steam Generator Tube Rupture Event (EOP-E-3)** **(JPM-CR-284-a) Previous NRC 2013 Retake** ***K/A 006 A4.02***	**A, EN, D, L, P, S**	**2**
c.	Align ECCS for long term recirculation (EOP-ES-1.3) (JPM-CR-235-a) *K/A 006 A4.05*	A, D, L, S	3
d.	**Start a RCP and respond to a subsequent Spray valve failure (OP-100, AOP-019)** **(JPM-CR-005-g)** ***K/A 003 A2.02***	**A, N, L , S**	**4P**
e.	Using ESW System As A Backup Source of Water To AFW (OP-137) (JPM-CR-107-c) *K/A 054 AA1.01*	D, S	4S
f.	Swapping Containment Fan Cooler Lead Fans (OP-169) (JPM-CR-289-a) *K/A 022 A4.01*	N, S	5
g.	Resetting CVIS and Restoring RM-3502A to Operation (AOP-025) (JPM-CR-253-d) **RO ONLY** *K/A 073 A4.02*	D, S	7
h.	**Restoring Control Room Area HVAC to Normal After a CRIS (OP-173)** **(JPM-CR-171-a)** ***K/A APE 067 AA1.05***	**A, EN, M, S**	**8**

In-Plant Systems[@] (3 for RO); (3 for SRO-I); (**2 or 3 for SRO-U - BOLD**)			
i.	**Shift Battery Chargers (at power, shift from one safety battery charger to the other) (OP-156.01) (JPM IP-074-a)** ***K/A 063 G2.1.30***	**D, EN**	**6**
j.	Isolate the SI Accumulators After a Control Room Evacuation (AOP-004) (JPM-IP-232-a) *K/A APE 068 G2.1.30*	D, E, L	8
k.	**Reset TD AFW Pump Mechanical Overspeed (OP-137) (JPM-IP-001-b)** ***K/A 061 A2.04***	**D, E, EN, L, R**	**4S**

@ 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	(5, 5, 3)
(C)ontrol room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	(8, 7, 3)
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	(2, 2, 1)
(EN)gineered safety feature	- / - / ≥1	(4, 4, 4)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1	(5, 5, 3)
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	(3, 3, 2)
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2	(2, 2, 1)
(R)CA	≥ 1 / ≥ 1 / ≥ 1	(1, 1, 1)
(S)imulator		

Revision Comments
2014 NRC Control Room/In-Plant JPM Summary

Simulator JPMs

JPM a – Perform Control Rod and Rod Position Indicator Exercise per OST-1005 (JPM-CR-256-d) Previous NRC Exam – 2013 *randomly selected from bank - Alternate Path

K/A 001 A2.11 – Ability to (a) predict the impacts of the following malfunction or operations on the CRDS- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Situations requiring a reactor trip
(CFR: 41.5/43.5/45.3/45.13) RO 4.4 / SRO 4.7

The candidate will assume the OATC position with the unit operating at 100% power and will be directed to perform OST-1005 commencing with Control Bank D in section 7.2. The candidate will insert and withdraw Control Bank D 10 steps as required. The candidate will continue OST-1005 and select the next Control Bank and insert the Control Bank 10 steps as required. Once the candidate begins to insert the next selected Control Bank, the **Alternate Path** will begin and a malfunction of the rod control system will result in the Control Rods continuing to insert once the demand for rod motion has stopped. This will cause RCS Tavg, and Reactor Power will lower in response to the control rods inserting and the Control Rod step counter will continue to lower. The candidate should recognize the failure of the rod control system and perform AOP-001 and EOP-E-0 immediate actions to place Rod Control in manual. The candidate may or may not select the manual position. Rod Control is considered to be in manual as long as the Auto position is not selected and being in Control Bank A satisfies this step. Rod motion will continue in either case requiring the candidate to perform the RNO action and initiate a manual reactor trip. Once the candidate verifies that the Reactor and Turbine are tripped this JPM is complete.

JPM b – Vent an Un-Isolable SI Accumulator during a Steam Generator Tube Rupture Event (E-3)
(JPM-CR-284-a) - SRO Upgrade - Previous NRC Exam – 2013 Retest *randomly selected from bank - Alternate Path

K/A 006 A4.02: Emergency Core Cooling System (ECCS) - Ability to manually operate and/or monitor in the control room: Valves
(*CFR: 41.7 / 45.5 to 45.8) RO 4.0 / SRO 3.8*

The candidate will be assigned the OATC position. The initial conditions are a Steam Generator tube rupture has occurred on the 'A' SG. The crew entered AOP-016, Excessive Primary Plant Leakage. During the implementation of AOP-016, RCS leakage exceeded VCT makeup capability and the crew manually tripped the Reactor and Safety Injected. The crew entered EOP-E-0. After identifying the 'A' Steam Generator as ruptured the crew transitioned to and are implementing EOP-E-3, Steam Generator Tube Rupture. The CRS will direct the candidate to continue with E-3 starting at step 90 to check if SI accumulators should be isolated. The candidate will check RCS pressure below 1000 psig (Yes) then contact an Aux Operator to locally unlock and close both breakers for each SI accumulator discharge valve. After the discharge valves are energized the candidate will shut each SI accumulator discharge valve (1SI-246, 1SI-247 and 1SI-248). The 'A' Accumulator discharge valve (1SI-246, Accum 1-A-SA Disc Vlv) will not shut and the **Alternate Path** with begin requiring the candidate to implement the RNO action to vent the unisolable Accumulator using OP-110, Safety Injection, section 8.3. The OP will require the candidate to shut 1SI-287, Accum N_2 Supply Isol valve and open 1SI-295, Accumulator 'A' N_2 Supply

Simulator JPMs (continued)

and Vent valve. They will then slowly adjust HC-936, 1SI-298 Accum Vent Press Cntl control potentiometer output signal to open 1SI-298 and vent the Accumulator to Containment. The goal is to vent the 'A' Accumulator to 0 psig. Verification of 'A' Accumulator pressure reduction will be available by observation of MCB pressure indications, ERFIS screen plots, OSI-PI screen plots and annunciators. After the examiner observes both a low pressure alarm for the 'A' Accumulator (ALB-01-7-1, ACCUMULATOR TANK A HIGH-LOW PRESS, setpoint = 602 psig) and approximately a 5 psig pressure reduction a cue for using "time compression" can be given stating that the 'A' accumulator pressure now reads 0 psig and this JPM is complete.

JPM c – Align ECCS for long term recirculation (ES-1.3)
(JPM-CR-235-a) Direct – Alternate Path

K/A 006 A4.05 – Ability to manually operate and/or monitor in the control room: Transfer of ECCS flowpaths prior to recirculation
(CFR: 41.7 / 45.5 to 45.8) RO 3.9 SRO 3.8

The candidate will be assigned to perform the actions of ES-1.3 following a large break LOCA . The candidate will verify the RHR system is aligned to the containment sump and isolate the system from the RWST. The 1SI-340, SI Train A Cold Leg isolation valve will not shut and the **Alternate Path** begins requiring the candidate to shut 1SI-341, SI Train B Cold Leg isolation. The candidate continues with ES-1.3 to establish the CSIP recirculation alignment and 1CS-746, Train A CSIP alternate miniflow isolation, will fail to shut requiring the candidate to shut 1CS-745, Train A CSIP alternate miniflow block valve before continuing with the CSIP recirculation alignment. Once high head SI Flow is verified to each train of the CSIP this JPM is complete.

JPM d – Start a RCP and respond to a subsequent Spray valve failure (OP-100, AOP-019) (JPM-CR-005-g) - SRO Upgrade - New - Alternate Path

K/A 002 A1.01 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCS controls including: Primary and secondary pressure
(CFR: 41.5 / 45.7) RO 3.8 SRO 4.1

A plant startup will be in progress with the 'B' and 'C' RCPs in operation. Maintenance has been completed on the 'A' RCP and the candidate will be directed to start the 'A' RCP IAW OP-100, Reactor Coolant System. Soon after the RCP is started the 'A' RCP Spray valve will fail open resulting in lowering RCS pressure and various MCB annunciators. The **Alternate Path** begins and the candidate will be expected to determine that entry conditions are met for AOP-019, Malfunction Of RCS Pressure Control and enter the AOP. The candidate is expected to take manual control of the spray valve and shut the valve in accordance with the immediate actions of AOP-019. This will preclude an RCS pressure reduction to a Safety Injection actuation setpoint. When the candidate has shut the RCP 'A' Spray valve, 1RC-107 this JPM is complete.

Revision Comments
2014 NRC Control Room/In-Plant JPM Summary

Simulator JPMs (continued)

JPM e – Using ESW System As A Backup Source of Water To AFW
(JPM-CR-107-c) Direct

K/A 054 AA1.01 – Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater AFW controls, including the use of alternate AFW sources
(CFR 41.7 / 45.5 / 45.6) RO 4.5 SRO 4.4

The candidate will assume shift as the BOP following a LOCA. The candidate is informed that a leak developed in the Condensate Storage Tank (CST). The CST level has lowered to < 10%. The candidate is directed to supply ESW from the A Header to both the A AFW Pump and the Turbine Driven AFW pumps. This will require shutting down the B MDAFW Pump and 'A' Train of Containment Fan Coolers in addition to the ESW valve alignment.

JPM f – Swapping Containment Fan Cooler Lead Fans (OP-169)
(JPM-CR-289-a) New

K/A - 022 A4.01 Ability to manually operate and/or monitor in the control room: CCS fans
(CFR: 41.7 / 45.5 to 45.8) RO 3.6 SRO 3.6

The candidate will assume shift as the BOP with the unit operating at 100% power steady state conditions. The oncoming shift will be performing a test of the sequencer requiring the Containment Fan Cooler lead fan selector switches positioned opposite from the current position. The selector switch repositioning is done in accordance with OP-169, Containment Cooling and Ventilation, Section 8.8. The swap will require each running fan unit (2 fans per unit) to be secured prior to switching the selector. After the selector switch is repositioned each fan in the unit must be restarted in slow speed then switched to high speed operation.

JPM g – Reset CVIS and Restore RM-3502A to Operation IAW AOP-025, Attachment 3
(JPM-CR-253-d) Direct - **RO ONLY**

K/A 073 A4.02 Ability to manually operate and/or monitor in the control room: Radiation monitoring system control panel
(CFR: 41.7 / 45.5 to 45.8)RO 3.7 SRO 3.7

The candidate will be given initial conditions of 100% and breaker 105 opening which resulted in a loss of power to 1A-SA 6.9KV Bus. The bus power has been restored by the 'A' EDG. They will be assigned the BOP position and be directed to perform AOP-025 Attachment 3 to reset and restore Containment Ventilation Isolation System and restore Radiation Monitor RM-3502A to operation. This will require both MCB manipulations and RM-11 control manipulations. Once the candidate has restored RM3502A to service Attachment 3 is complete and the JPM is complete.

Revision Comments
2014 NRC Control Room/In-Plant JPM Summary

Simulator JPMs (continued)

JPM h – Restoring Control Room Area HVAC to Normal After a Control Room Isolation Signal (OP-173)
(JPM-CR-171-a) - SRO Upgrade - Modified - Alternate Path

K/A APE 067 AA1.05 – Ability to operate and / or monitor the following as they apply to the Plant Fire on Site: Plant and control room ventilation systems
(CFR 41.7 / 45.5 / 45.6) RO 3.0 SRO 3.1

The candidate will be given initial conditions of the unit is operating at 100% power when a fire occurred at the Emergency Shutdown Diesel Generator during testing. The smoke from the fire caused a Control Room Ventilation Isolation signal to occur. (Smoke detected at the normal intake Zone 1-150). The Fire Brigade has put the fire out and the smoke has been cleared. The candidate will be directed by the CRS to restore Control Room Area HVAC to normal in accordance with OP-173, Control Room Area HVAC System, Section 8.4. The initial conditions are satisfied and the HVAC system is in operation per section 8.1 of OP-173. While the candidate is shutting the Control Room Emergency Filtration Recirc dampers the **Alternate Path** will begin with the running Control Room Normal Supply Fan breaker tripping open. This will result in annunciator ALB-030-6-4, Cont Room HVAC Normal Supply Fans AH-15 Low Flow – O/L. Using the annunciator panel procedure the candidate will start the standby Normal Supply Fan in accordance with OP-173 section 5.1. Once the candidate has restored the Control Room Normal Supply Fan the JPM is complete.

Revision Comments
2014 NRC Control Room/In-Plant JPM Summary

In-Plant JPMs

JPM i – Shift Battery Chargers, At power, shift from one safety battery charger to the other (OP-156.01)
(JPM IP-074-a) Direct – **SRO Upgrade**

K/A 063 G2.1.30 Ability to locate and operate components, including local controls.

(CFR: 41.7 / 45.7)RO 4.4 / SRO 4.0

The unit is operating at 100%. The CRS will direct the candidate to shift Train A battery chargers from 1A-SA to 1B-SA in service to support scheduled maintenance on the 1A-SA Battery Charger. The candidate will perform OP-156.01 section 8.3. The JPM cues include information of the proper status of the power supply light indications and breaker status. Once the candidate has secured the 1A-SA Battery Charger and verifies the 1A-SB Battery Charger is in service (the No Charge light off and voltage is in the normal band) this JPM is complete.

JPM j – Isolate the SI Accumulators After a Control Room Evacuation (AOP-004)
(JPM-IP-232-a) Direct

K/A APE 068 G2.1.30 Ability to locate and operate components, including local controls.

(CFR: 41.7 / 45.7)RO 4.4 / SRO 4.0

The unit Main Control Room has been evacuated due to a fire. The crew is performing a cooldown in accordance with AOP-004, Remote Shutdown. The CRS will direct the candidate to isolate SI Accumulators. The candidate will perform AOP-004 step 31. The JPM cues include information of the proper status of the power supply light indications. The candidate will be required to obtain the key for the Auxiliary Transfer Panel in order to reposition the SI Accumulator isolation valves from this location. Once the CRS is notified that AOP-004, step 31 is complete and the SI Accumulators are isolated then evaluation on this JPM is complete.

JPM k – Reset the Turbine Driven AFW Pump Mechanical Overspeed (OP-137)
(JPM-IP-001-b) Direct – **SRO Upgrade**

K/A 061 A2.04 Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: pump failure or improper operation

(CFR: 41.5 / 43.5 / 45.3 / 45.13) RO 3.4 / SRO 3.8

NOTE: This JPM is inside the RCA

The unit has tripped from 100% power. The Turbine Driven AFW pump started and has tripped on overspeed. The pump is needed for plant cooldown efforts. The cause of the overspeed trip has been identified and corrected by Maintenance. The CRS has directed the candidate to reset the Turbine Driven AFW mechanical overspeed trip linkage. 1MS-70 and 1MS-72 (steam supply valves to the TDAFW pump) are indicating shut from the MCB. The CRS also notifies the candidate that the Trip and Throttle Valve will be reopened from the Control Room.

Revision Comments
2014 NRC Control Room/In-Plant JPM Summary

Simulator JPM revisions:

JPM a –

JPM b –

JPM c –

JPM d –

JPM e –

JPM f –

JPM g –

JPM h –

In-Plant JPM revisions:

JPM i –

JPM j –

JPM k –