Form 4.1-PWR Pressurized-Water Reactor Examination Outline

Facility: Shearon Harris	**K/A Catalog Rev. 3**	**Rev.** dd/mm/yyyy	**Date of Exam:** 6/10/2024

Tier	Group	RO K/A Category Points												SRO-Only Points		
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2	G*	Total
1. Emergency and Abnormal Plant Evolutions	1	3	3	3				3	3			3	18			
	2	2	1	1				1	1			2	8			
	Tier Totals	5	4	4				4	4			5	26			
2. Plant Systems	1	2	3	2	3	2	2	2	3	3	3	3	28			
	2	1	0	1	1	1	2	1	1	0	0	1	9			
	Tier Totals	3	3	3	4	3	4	3	4	3	3	4	37			

3. Generic Knowledge and Abilities Categories	CO	EC	RC	EM	
	2	2	1	1	6

SRO-Only Points				
CO	EC	RC	EM	

4. Theory	Reactor Theory	Thermodynamics	
	3	3	6

Notes: CO = Conduct of Operations; EC = Equipment Control; RC = Radiation Control;
EM = Emergency Procedures/Plan

* These systems/evolutions may be eliminated from the sample when Revision 2 of the K/A catalog is used to develop the sample plan.

** These systems/evolutions are only included as part of the sample (as applicable to the facility) when Revision 2 of the K/A catalog is used to develop the sample plan.

ES-4.1-PWR	Shearon Harris									
	Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/**SRO**)									
Item #	E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#
1	(000007) (EPE 7; BW E02 & E10; CE E02) REACTOR TRIP, STABILIZATION, RECOVERY					X		(000007EA2.05) Ability to determine and/or interpret the following as they apply to (EPE 7) REACTOR TRIP, STABILIZATION, RECOVERY (CFR: 41.7 / 45.5 / 45.6): Lights and alarms	3.7	1
2	(000009) (EPE 9) SMALL BREAK LOCA				X			(000009EA1.01) Ability to operate and/or monitor the following as they apply to (EPE 9) SMALL-BREAK LOCA (CFR: 41.7 / 45.5 / 45.6): RCS pressure and temperature	4.0	2
3	(000011) (EPE 11) LARGE BREAK LOCA				X			(000011EA1.05) Ability to operate and/or monitor the following as they apply to (EPE 11) LARGE-BREAK LOCA (CFR: 41.7 / 45.5 / 45.6): CVCS	3.5	3
4	(000015) (APE 15) REACTOR COOLANT PUMP MALFUNCTIONS		X					(000015AK2.12) Knowledge of the relationship between (APE 15) REACTOR COOLANT PUMP MALFUNCTIONS and the following systems or components (CFR: 41.7 / 45.7): RCS pressure control valves	3.5	4
5	(000022) (APE 22) LOSS OF REACTOR COOLANT			X				(000022AK3.04) Knowledge of the reasons for the following responses and/or actions as they apply to (APE 22) LOSS OF REACTOR COOLANT MAKEUP (CFR: 41.5 / 41.10 / 45.6 / 45.13): Isolating letdown	3.7	5
6	(000025) (APE 25) LOSS OF RESIDUAL HEAT REMOVAL		X					(000025AK2.17) Knowledge of the relationship between (APE 25) LOSS OF RESIDUAL HEAT REMOVAL SYSTEM and the following systems or components (CFR: 41.7 / 45.7): SGS	3.2	6
7	(000026) (APE 26) LOSS OF COMPONENT COOLING WATER						X	(000026) (APE 26) LOSS OF COMPONENT COOLING WATER (G2.1.7) CONDUCT OF OPERATIONS: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation (CFR: 41.5 / 43.5 / 45.12 / 45.13)	4.4	7
8	(000027) (APE 27) PRESSURIZER PRESSURE CONTROL SYSTEM			X				(000027AK3.03) Knowledge of the reasons for the following responses and/or actions as they apply to (APE 27) PRESSURIZER PRESSURE CONTROL SYSTEM MALFUNCTION (CFR: 41.5 / 41.10 / 45.6 / 45.13): Actions contained in AOPs for a PZR PCS malfunction	3.9	8
9	(000029) (EPE 29) ANTICIPATED TRANSIENT WITHOUT SCRAM		X					(000029EK2.14) Knowledge of the relationship between (EPE 29) ANTICIPATED TRANSIENT WITHOUT SCRAM (ATWS) and the following systems or components (CFR: 41.7 / 45.7): AMSAC	4.2	9
10	(000040) (APE 40; BW E05; CE E05; W E12) STEAM LINE RUPTURE – EXCESSIVE HEAT TRANSFER	X						(WE12EK1.06) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to (W E12) UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS (CFR: 41.5 / 41.7 / 45.7 / 45.8): Effect on automatic transfer of high-head SI pump suction to RWST after SI reset.	3.5	10
11	(000054) (APE 54; CE E06) LOSS OF MAIN FEEDWATER	X						(000054AK1.02) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to (APE 54) LOSS OF MAIN FEEDWATER (CFR: 41.8 / 41.10 / 45.3): Effects of feedwater introduction on a dry S/G	4.0	11

12	(000056) (APE 56) LOSS OF OFFSITE POWER						X	(000056) (APE 56) LOSS OF OFFSITE POWER (G2.1.20) CONDUCT OF OPERATIONS: Ability to interpret and execute procedure steps (CFR: 41.10 / 43.5 / 45.12)	4.6	12
13	(000057) (APE 57) LOSS OF VITAL AC INSTRUMENT BUS			X				(000057AK3.01) Knowledge of the reasons for the following responses and/or actions as they apply to (APE 57) LOSS OF VITAL AC ELECTRICALINSTRUMENT BUS (CFR: 41.5 / 41.10 / 45.6 / 45.13): Actions contained in AOPs for the loss of a vital AC electrical instrument bus	4.1	13
14	(000058) (APE 58) LOSS OF DC POWER					X		(000058AA2.01) Ability to determine and/or interpret the following as they apply to (APE 58) LOSS OF DC POWER (CFR: 43.5 / 45.13): Verification that alternate power sources have come on line	3.4	14
15	(000065) (APE 65) LOSS OF INSTRUMENT AIR	X						(000065AK1.02) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to (APE 65) LOSS OF INSTRUMENT AIR (CFR: 41.8 / 41.10 / 45.3): Effects of water and/or particulate matter in instrument air lines (operating experience)	3.1	15
16	(000077) (APE 77) GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES				X			(000077AA1.02) Ability to operate and/or monitor the following as they apply to (APE 77) GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES (CFR: 41.5 / 41.10 / 45.5 / 45.7 / 45.8): Turbine/generator controls	3.6	16
17	(W E11) LOSS OF EMERGENCY COOLANT RECIRCULATION					X		(WE11EA2.03) Ability to determine and/or interpret the following as they apply to (W E11) LOSS OF EMERGENCY COOLANT RECIRCULATION (CFR: 41.10 / 43.5 / 45.13): Indications of sump blockage	3.0	17
18	(BW E04; W E05) INADEQUATE HEAT TRANSFER – LOSS OF SECONDARY HEAT SINK						X	(BW E04; W E05) INADEQUATE HEAT TRANSFER – LOSS OF SECONDARY HEAT SINK (G2.1.19) CONDUCT OF OPERATIONS: Ability to use available indications to evaluate system or component status, 10 CFR Part 55 (CFR: 41.10 / 45.12)	3.9	18
K/A Category Totals:		3	3	3	3	6	6	Group Point Total:		18

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

Item #	E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#
19	(000001) (APE 1) CONTINUOUS ROD		X					(000001AK2.13) Knowledge of the relationship between (APE 1) CONTINUOUS ROD WITHDRAWAL and the following systems or components (CFR: 41.7 / 45.7): NIS	3.8	19
	(003) (APE 3) Dropped Control Rod / 1									
20	(000005) (APE 5) INOPERABLE/STUCK CONTROL ROD						X	(000005) (APE 5) INOPERABLE/STUCK CONTROL ROD (G2.4.20) EMERGENCY PROCEDURES/PLAN: Knowledge of the operational implications of emergency and abnormal operating procedures warnings, cautions, and notes (CFR: 41.10 / 43.5 / 45.13)	3.8	20
21	(000024) (APE 24) EMERGENCY BORATION						X	(000024) (APE 24) EMERGENCY BORATION (G2.2.2) EQUIPMENT CONTROL: Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels (CFR: 41.6 / 41.7 / 45.2)	4.6	21
22	(000028) (APE 28) PRESSURIZER (PZR) LEVEL CONTROL MALFUNCTION	X						(000028AK1.02) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to (APE 28) PRESSURIZER (PZR) LEVEL CONTROL MALFUNCTION (CFR: 41.7 / 41.8 / 41.10 / 45.3): Cause for PZR level deviation alarm: controller malfunction or other instrument	3.6	22
	(032) (APE 32) Loss of Source Range Nuclear Instrumentation / 7									
	(036) (APE 36; BW/A08) Fuel-Handling Incidents / 8									
	(037) (APE 37) Steam Generator Tube Leak / 3									
	(051) (APE 51) Loss of Condenser Vacuum / 4									
	(059) (APE 59) Accidental Liquid Radwaste Release / 9									
	(060) (APE 60) Accidental Gaseous Radwaste Release / 9									
	(061) (APE 61) Area Radiation Monitoring System Alarms / 7									
	(068) (APE 68; BW A06) Control Room Evacuation / 8									
23	(000069) (APE 69; W E14) LOSS OF CONTAINMENT INTEGRITY			X				(WE14EK3.06) Knowledge of the reasons for the following responses and/or actions as they apply to (W E14) HIGH CONTAINMENT PRESSURE (CFR: 41.5 / 41.10 / 45.6 / 45.13): Establishing containment spray	4.1	23
	(076) (APE 76) High Reactor Coolant Activity / 9									

24	(000078) (APE 78*) RCS LEAK					X		(000078AA2.09) Ability to determine and/or interpret the following as they apply to (APE 78) REACTOR COOLANT SYSTEM LEAK (CFR: 43.5 / 45.13): Reactor trip setpoints	4.8	24
25	(W E01 & E02) REDIAGNOSIS & SI TERMINATION				X			(WE02EA1.11) Ability to operate and/or monitor the following as they apply to (W E02) SI TERMINATION (CFR: 41.5 to 4.18 / 45.5 to 45.8): SDS	2.9	25
	(W E13) Steam Generator Overpressure / 4									
	(W E15) Containment Flooding / 5									
26	(W E16) HIGH CONTAINMENT RADIATION	X						(WE16EK1.01) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to (W E16) HIGH CONTAINMENT RADIATION (CFR: 41.5 / 41.7 / 45.7 / 45.8): Value(s) of high radiation and/or associated radiation monitors that require entry into the FRZ EOP for high radiation	3.4	26
	(BW A01) Plant Runback / 1									
	(BW A02 & A03) Loss of NNI-X/Y/7									
	(BW A04) Turbine Trip / 4									
	(BW A05) Emergency Diesel Actuation / 6									
	(BW A07) Flooding / 8									
	(BW E03) Inadequate Subcooling Margin / 4									
	(BW E08; W E03) LOCA Cooldown – Depressurization / 4									
	(BW E09; CE A13**; W E09 & E10) Natural Circulation/4									
	(BW E13 & E14) EOP Rules and Enclosures									

	(CE A16) Excess RCS Leakage / 2									
	(CE E09) Functional Recovery									
	(CE E13*) Loss of Forced Circulation / LOOP / Blackout / 4									
K/A Category Totals:		2	1	1	1	3	4	Group Point Total:		12

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Plant Systems—Tier 2/Group 1 (RO/**SRO**)

Item #	System / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	Q#
27	(003) (SF4P RCP) REACTOR COOLANT PUMP SYSTEM											X	(003) (SF4P RCP) REACTOR COOLANT PUMP SYSTEM (191007K1.11) DEMINERALIZERS AND ION EXCHANGERS (CFR: 41.3): Plant evolutions that can cause crud bursts and the effect on demineralizers	2.8	27
28	(004) (SF1; SF2 CVCS) CHEMICAL AND VOLUME CONTROL SYSTEM					X							(004K5.26) Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF1; SF2 CVCS) CHEMICAL AND VOLUME CONTROL SYSTEM (CFR: 41.5 / 45.7): Relationship between VCT pressure and NPSH for charging pumps	3.5	28
29	(005) (SF4P RHR) RESIDUAL HEAT REMOVAL SYSTEM			X									(005K3.01) Knowledge of the effect that a loss or malfunction of the (SF4P RHR) RESIDUAL HEAT REMOVAL SYSTEM will have on the following systems or system parameters (CFR: 41.7 / 45.6): RCS	4.5	29
30	(006) (SF2; SF3 ECCS) EMERGENCY CORE COOLING SYSTEM	X											(006K1.11) Knowledge of the physical connections and/or cause and effect relationships between the (SF2; SF3 ECCS) EMERGENCY CORE COOLING SYSTEM and the following systems (CFR: 41.2 to 41.8 / 45.3 / 45.7 / 45.8): CCWS	3.7	30

31	(007) (SF5 PRTS) PRESSURIZER RELIEF/QUENCH TANK SYSTEM										X		(007A4.01) Ability to manually operate and/or monitor the (SF5 PRTS) PRESSURIZER RELIEF/QUENCH TANK SYSTEM in the control room (CFR: 41.5 / 41.7 / 45.5 / 45.7 / 45.8): PRT/quench tank makeup valve	2.8	31
32	(007) (SF5 PRTS) PRESSURIZER RELIEF/QUENCH TANK SYSTEM				X								(007K4.06) Knowledge of (SF5 PRTS) PRESSURIZER RELIEF/QUENCH TANK SYSTEM design features and/or interlocks that provide for the following (CFR: 41.7): Venting PRT/quench tank	2.6	32
33	(008) (SF8 CCW) COMPONENT COOLING WATER SYSTEM											X	(008) (SF8 CCW) COMPONENT COOLING WATER SYSTEM (G2.4.31) Knowledge of annunciator alarms, indications or response procedures (CFR: 41.10 / 45.3)	4.2	33
34	(008) (SF8 CCW) COMPONENT COOLING WATER SYSTEM		X										(008K2.02) Knowledge of electrical power supplies to the following (CFR: 41.7): (SF8 CCW) COMPONENT COOLING WATER SYSTEM CCW pumps	3.9	34
35	(010) (SF3 PZR PCS) PRESSURIZER PRESSURE CONTROL SYSTEM							X					(010A1.07) Ability to predict and/or monitor changes in parameters associated with operation of the (SF3 PZR PCS) PRESSURIZER PRESSURE CONTROL SYSTEM, including (CFR: 41.5 / 45.5): RCS or PZR pressure	3.9	35
36	(012) (SF7 RPS) REACTOR PROTECTION SYSTEM								X				(012A2.02) Ability to (a) predict the impacts of the following on the (SF7 RPS) REACTOR PROTECTION SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations (CFR: 41.5 / 43.5 / 45.3 / 45.5): Loss of instrument power	3.9	36
37	(012) (SF7 RPS) REACTOR PROTECTION SYSTEM						X						(012K6.06) Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF7 RPS) REACTOR PROTECTION SYSTEM (CFR: 41.7 / 45.7): Sensors and detectors	3.7	37
38	(013) (SF2 ESFAS) ENGINEERED SAFETY FEATURES ACTUATION SYSTEM		X										(013K2.01) Knowledge of electrical power supplies to the following (CFR: 41.7): (SF2 ESFAS) ENGINEERED SAFETY FEATURES ACTUATION SYSTEM ESFAS/safeguards train power supplies	4.0	38

39	(022) (SF5 CCS) CONTAINMENT COOLING SYSTEM				X								(022K4.02) Knowledge of (SF5 CCS) CONTAINMENT COOLING SYSTEM design features and/or interlocks that provide for the following (CFR: 41.7): Correlation of fan speed and flowpath changes with containment pressure	3.4	39
	(025) (SF5 ICE) ICE CONDENSER SYSTEM														
40	(026) (SF5 CSS) CONTAINMENT SPRAY SYSTEM									X			(026A3.01) Ability to monitor automatic features of the (SF5 CSS) CONTAINMENT SPRAY SYSTEM, including (CFR: 41.7 / 45.5): Pump starts and correct valve positioning	4.1	40
41	(026) (SF5 CSS) CONTAINMENT SPRAY SYSTEM		X										(026K2.02) Knowledge of electrical power supplies to the following (CFR: 41.7): (SF5 CSS) CONTAINMENT SPRAY SYSTEM Motor-operated valves	3.6	41
42	(039) (SF4S MSS) MAIN AND REHEAT STEAM SYSTEM									X			(039A3.02) Ability to monitor automatic features of the (SF4S MSS) MAIN AND REHEAT STEAM SYSTEM, including (CFR: 41.5 / 45.5): Isolation of the MRSS	3.3	42
	(053) (SF1; SF4P ICS*) INTEGRATED														

43	(059) (SF4S MFW) MAIN FEEDWATER SYSTEM			X									(059K3.03) Knowledge of the effect that a loss or malfunction of the (SF4S MFW) MAIN FEEDWATER SYSTEM will have on the following systems or system parameters (CFR: 41.7 / 45.6): S/Gs	3.8	43
44	(061) (SF4S AFW) AUXILIARY / EMERGENCY FEEDWATER SYSTEM							X					(061A1.01) Ability to predict and/or monitor changes in parameters associated with operation of the (SF4S AFW) AUXILIARY/EMERGENCY FEEDWATER SYSTEM, including (CFR: 41.5 / 45.5): S/G level	4.2	44
45	(061) (SF4S AFW) AUXILIARY / EMERGENCY FEEDWATER SYSTEM									X			(061A3.01) Ability to monitor automatic features of the (SF4S AFW) AUXILIARY/EMERGENCY FEEDWATER SYSTEM, including (CFR: 41.7 / 45.7): AFW system automatic start	4.2	45
46	(062) (SF6 ED AC) AC ELECTRICAL DISTRIBUTION SYSTEM	X											(062K1.10) Knowledge of the physical connections and/or cause and effect relationships between the (SF6 ED AC) AC ELECTRICAL DISTRIBU_TION SYSTEM and the following systems (CFR: 41.4 to 41.8): Non Class 1E AC distribution system	3.1	46

47	(063) (SF6 ED DC) DC ELECTRICAL DISTRIBUTION SYSTEM										X		(063A4.02) Ability to manually operate and/or monitor the (SF6 ED DC) DC ELECTRICAL DISTRIBUTION SYSTEM in the control room (CFR: 41.7 / 45.5 to 45.8): Load shedding	3.6	47
48	(064) (SF6 EDG) EMERGENCY DIESEL GENERATOR SYSTEM						X						(064K6.11) Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF6 EDG) EMERGENCY DIESEL GENERATOR SYSTEM (CFR: 41.7 / 45.7): DC distribution system	3.9	48
49	(073) (SF7 PRM) PROCESS RADIATION MONITORING SYSTEM				X								(073K4.01) Knowledge of (SF7 PRM) PROCESS RADIATION MONITORING SYSTEM design features and/or interlocks that provide for the following (CFR: 41.7): Release termination	3.9	49
50	(076) (SF4S SW) SERVICE WATER SYSTEM								X				(076A2.08) Ability to (a) predict the impacts of the following on the (SF4S SW) SERVICE WATER SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations (CFR: 41.1 / 41.5 / 43.5 / 45.3 / 45.6 / 45.13): Malfunction of breakers, relays, and disconnects	3.5	50
51	(078) (SF8 IAS) INSTRUMENT AIR SYSTEM										X		(078A4.03) Ability to manually operate and/or monitor the (SF8 IAS) INSTRUMENT AIR SYSTEM in the control room (CFR: 41.7 / 45.5 to 45.8): Isolation/restoration of instrument air to isolated components/systems	3.2	51
52	(078) (SF8 IAS) INSTRUMENT AIR SYSTEM											X	(078) (SF8 IAS) INSTRUMENT AIR SYSTEM (G2.2.2) Ability to manipulate thet console controls as required to operate the facility between shutdown and designated power levels (CFR: 41.6 / 41.7 / 45.2)	4.6	52
53	(103) (SF5 CNT) CONTAINMENT SYSTEM								X				(103A2.06) Ability to (a) predict the impacts of the following on the (SF5 CNT) CONTAINMENT SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations (CFR: 41.5 / 43.5 / 45.3 / 45.13): High containment pressure	4.5	53

54	(103) (SF5 CNT) CONTAINMENT SYSTEM					X							(103K5.01) Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF5 CNT) CONTAINMENT SYSTEM (CFR: 41.5 / 45.7): Containment isolation/containment integrity	4.1	54
K/A Category Totals:		2	3	2	3	2	2	2	5	3	3	6	Group Point Total:		33

ES-4.1-PWR	Shearon Harris Plant Systems—Tier 2/Group 2 (RO/**SRO**)														
Item #	System / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	Q#
55	(001) (SF1 CRDS) CONTROL ROD DRIVE SYSTEM						X						(001K6.06) Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF1 CRDS) CONTROL ROD DRIVE SYSTEM (CFR: 41.1 / 41.2 / 41.5 / 41.6 / 45.7): Rod drive M/G set(s)	3.8	55
	(002) (SF2; SF4P RCS) REACTOR COOLANT														
56	(011) (SF2 PZR LCS) PRESSURIZER LEVEL CONTROL SYSTEM							X					(011A1.07) Ability to predict and/or monitor changes in parameters associated with operation of the (SF2 PZR LCS) PRESSURIZER LEVEL CONTROL SYSTEM, including (CFR: 41.5 / 45.5): RCS leak rate	3.9	56
57	(014) (SF1 RPI) ROD POSITION INDICATION SYSTEM					X							(014K5.04) Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF1 RPI) ROD POSITION INDICATION SYSTEM (CFR: 41.6 / 41.7 / 45.7): Reasons for differences between RPIS and demand position	3.4	57
58	(015) (SF7 NI) NUCLEAR INSTRUMENTATION SYSTEM			X									(015K3.02) Knowledge of the effect that a loss or malfunction of the (SF7 NI) NUCLEAR INSTRUMENTATION SYSTEM will have on the following systems or system parameters (CFR: 41.7 / 45.6): CRDS	3.7	58
	(016) (SF7 NNI) NONNUCLEAR INSTRUMENTATION SYSTEM														
59	(017) (SF7 ITM) IN CORE TEMPERATURE MONITOR SYSTEM								X				(017A2.02) Ability to (a) predict the impacts of the following on the (SF7 ITM) IN CORE TEMPERATURE MONITOR SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations (CFR: 41.5 / 43.5 / 45.3 / 45.5): Elevated in-core temperatures that can cause or have caused core damage	4.1	59

	(027) (SF5 CIRS) CONTAINMENT IODINE REMOVAL SYSTEM											X			
	(028) (SF5 HRPS) HYDROGEN RECOMBINER AND PURGE CONTROL														
60	(029) (SF8 CPS) CONTAINMENT PURGE SYSTEM												(029) (SF8 CPS) CONTAINMENT PURGE SYSTEM (191003K1.10) Controllers and Positioners (CFR: 41.7): Function and characteristics of air-operated valves, including failure modes	2.8	60
61	(033) (SF8 SFPCS) SPENT FUEL POOL COOLING SYSTEM				X								(033K4.05) Knowledge of (SF8 SFPCS) SPENT FUEL POOL COOLING SYSTEM design features and/or interlocks that provide for the following (CFR: 41.7): Adequate SDM	3.6	61
62	(034) (SF8 FHS) FUEL HANDLING EQUIPMENT SYSTEM						X						(034K6.05) Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF8 FHS) FUEL HANDLING EQUIPMENT SYSTEM (CFR: 41.6 / 41.7 / 43.5 / 45.7): SFPCS	3.3	62
	(041) (SF4S SDS) STEAM DUMP / TURBINE BYPASS CONTROL														
63	(050) (SF9 CRV*) CONTROL ROOM VENTILATION	X											(050K1.01) Knowledge of the physical connections and/or cause and effect relationships between the (SF9 CRV) CONTROL ROOM VENTILATION and the following systems (CFR: 41.2 to 41.9 / 45.7 / 45.8): RMS	3.5	63

	(055) (SF4S CARS) CONDENSER AIR REMOVAL														
	(056) (SF4S CDS) CONDENSATE SYSTEM														
	(068) (SF9 LRS) LIQUID RADWASTE														
	(071) (SF9 WGS) WASTE GAS DISPOSAL														
	(072) (SF7 ARM) AREA RADIATION MONITORING SYSTEM														
	(075) (SF8 CW) CIRCULATING WATER SYSTEM														

	(079) (SF8 SAS**) STATION AIR SYSTEM														
K/A Category Totals:		1	0	1	1	1	2	1	2	0	0	3	Group Point Total:		12

Form 4.1-COMMON Common Examination Outline

ES-4.1-COMMON	COMMON Examination Outline (Shearon Harris)					
Facility: Shearon Harris				Date of Exam: 6/10/2024		

Generic Knowledge and Abilities Outline (Tier 3) (RO/SRO)

Category	K/A #	Topic	Item #	RO		SRO-Only	
				IR	Q#	IR	Q#
1. Conduct of Operations							
	G2.1.3	(G2.1.3) CONDUCT OF OPERATIONS: Knowledge of shift or short-term relief turnover practices (CFR: 41.10 / 45.13)	64	3.7	64		
	G2.1.38	(G2.1.38) CONDUCT OF OPERATIONS: Knowledge of the station's requirements for verbal communications when implementing procedures (CFR: 41.10 / 45.13)	65	3.7	65		
	Subtotal			N/A	2	N/A	
2. Equipment Control	G2.2.2	(G2.2.2) EQUIPMENT CONTROL: Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels (CFR: 41.6 / 41.7 / 45.2)	66	4.6	66		
	G2.2.35	(G2.2.35) EQUIPMENT CONTROL: Ability to determine TS for mode of operation (CFR: 41.7 / 41.19 / 43.2 / 45.13)	67	3.6	67		
	Subtotal			N/A	2	N/A	
3. Radiation Control	G2.3.5	(G2.3.5) RADIATION CONTROL: Ability to use RMSs, such as fixed radiation monitors and alarms or personnel monitoring equipment (CFR: 41.11 / 41.12 / 43.4 / 45.9)	68	2.9	68		
	Subtotal			N/A	1	N/A	
4. Emergency Procedures / Plan	G2.4.14	(G2.4.14) EMERGENCY PROCEDURES/PLAN: Knowledge of general guidelines for emergency and abnormal operating procedures usage (CFR: 41.10 / 43.1 / 45.13)	69	3.8	69		
	Subtotal			N/A	1	N/A	
Tier 3 Point Total				N/A	**6**	N/A	

Form 4.1-COMMON Common Examination Outline

ES-4.1-COMMON	COMMON Examination Outline (Shearon Harris)	
Facility: Shearon Harris		Date of Exam: 6/10/2024

Theory (Tier 4) (RO)

Category	K/A #	Topic	Item #	RO IR	RO Q#
Reactor Theory	192006	(192006K1.01) FISSION PRODUCT POISONS (CFR: 41.1): Define fission product poison	70	2.6	70
	192007	(192007K1.04) FUEL DEPLETION AND BURNABLE POISONS (CFR: 41.1): Describe how and why boron concentration changes over core life	71	3.4	71
	192008	(192008K1.20) REACTOR OPERATIONAL PHYSICS (CFR: 41.1): (POWER OPERATION) Explain the effects of control rod motion or boration/dilution on reactor power	72	3.9	72
	Subtotal			N/A	3
Thermodynamics	193003	(193003K1.16) STEAM (CFR: 41.14): Define the following term: -- subcooled and compressed liquids	73	2.7	73
	193004	(193004K1.11) THERMODYNAMIC PROCESS (CFR: 41.14): (CONDENSERS) Describe the process of condensate depression (subcooling) and its effect on plant operation	74	2.5	74
	193009	(193009K1.10) CORE THERMAL LIMITS (CFR: 41.14): Define and calculate quadrant tilt (symmetric offset) ratio	75	3.3	75
	Subtotal			N/A	3
Tier 4 Point Total				N/A	**6**

2024 Harris Initial Licensed Operator Retake Exam (2024-302)

ES-2.3 **Written Examination Review Worksheet** Form ES-2.3-5

Q#	1. LOK (F/H)	2. LOD (1–5)	3. Psychometric Flaws					4. Job Content Flaws				5. K/A Use Flaws		6. Source (B/M/N)	7. Status (U/E/S)	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job Link	Minutia	#/Units	Logic	Q–K/A	License Level			
1	H	3												B 2013	S	(000007EA2.05) The reference states that it "could be" failure of the shunt trip coil. Is there something else? It needs to be "dead on" failure of the shunt trip coil. If something else could cause it, you may want to re-do the question as "A failure of the shunt trip coil ____ would/would NOT give you this indication. We can discuss before you make any changes. Do you know how they did on this in 2013? KDS 5/7 10 of the 13 candidates correctly answered this question. The statement as written is 100% correct given the 2 options UV or Shunt trip coil. Other things could cause this indication i.e. blown light bulb, ground, etc., however a failure of the UV Trip coil would NOT result in the indications of the stem. No changes made at this time. RCWH 5/10 SAT KDS 5/13 Per validation feedback, the first three bullets were removed from the question stem as this information is not needed to answer the question. JRG 5/23 SAT KDS 6/25
2	H (P)	3												B 2014	S	(000009EA1.01) KDS 5/7
3	H (P)	3												B 2013	S	(000011EA1.05) KDS 5/7
4	H (P)	2												N	S	(000015AK2.12) Is there a point where a reactor trip is not required prior to tripping a RCP or is it anytime the RTBs are closed, you need to trip prior to securing a RCP? I did not see in the reference provided where it states to shut the Pzr Spray Valve Loop B. KDS 4/30 Our event procedures require us to trip the reactor prior to securing a RCP. AOP-018 Section 4.3 Step 8.b RNO addresses shutting the 1RC-103, PRZ Spray Loop B. Per validation feedback: First part of the question was modified to ask the primary reason for isolating letdown (RCS inventory control) per the AOP basis document. Second part of the question was modified to ask whether or not the spray valve is required to be shut

																following the RCP trip (removed time requirement). JRG 5/23 SAT KDS 6/25
5	F (P)	2				X								N	S	(000022AK3.04) Cred Dist: 1st part of A&B not plausible: It would read that the reason for not isolating the letdown system is (neither 2nd part makes sense). Recommend: Drop the second bullet. Ask " Letdown _____ can/can NOT be isolated prior to AOP-018, Reactor Coolant Pump Abnormal Conditions entry." The reason for isolating Letdown is to _____ keep the second answers. KDS 4/30 Modified stem as recommended by Chief Examiner. RCWH 5/2 Needs to be can / can NOT. Should is debatable. Also add "entry into" before AOP-018 KDS 5/6 Modified stem as recommended by Chief Examiner. RCWH 5/6 Add "The" to the beginning of the first question. KDS 5/13 Modified stem as recommended by Chief Examiner. JRG 5/23 SAT KDS 6/3
6	H (P) -	2	X											N	S	(000025AK2.17) Questions: Not comfortable with "may use based on plant conditions". Either put them in plant conditions that would require it or ask something different. Its too gray for me. In this case, would you not use the B train of RHR? What are the plant conditions that would warrant using the SG? KDS 4/30 Modified stem to ask if "establishing of steam cooling using… is/is NOT allowed" to remove the gray area. The unit is in mode 4 at 315 °F which requires one RHR pump to be in ECCS mode. B RHR is still aligned to the RWST therefore steam cooling is allowed until either the A RHR pump is restored or T.S. 3.5.3 would be entered to align B RHR pump in the SDC . RCWH 5/2 I believe this is ok. When in an ECCS "standby" lineup, do you refer to it as ECCS cooling. I found that confusing but if that's what they call it, leave it. KDS 5/6 We call the alignment for safety injection ECCS Mode and removed "Cooling" and added Mode to stem. RCWH 5/7 SAT KDS 6/10

7	H (P)	2												N	S	(000026) (APE 26) SAT KDS 5/13 Per validation feedback, capitalized "T" for temperature in the last bullet in the question stem for consistency with the other terms. JRG 5/23 Removed "Attachment 1" from all for responses based on validation round 3 feedback. RCWH 6/17 SAT KDS 6/25
8	F (P)	X	X											N	S	(000027AK3.03) **LOD:** Are ROs required to know basis information for AOPs? It just seems a little deep for ROs. **Stem Focus**:Add "In Accordance With AOP-019" to the beginning of the first question. There is a lot of material around this step mentioning LTOP which, while making the incorrect step more plausible, may not give you the desired result. You can keep as is but consider tacking this on the first part: to reduce RCS pressure to its____2____. previous setpoint / minimum setpoint. 4/23/24 → changes made as recommended. We'll see how this validates. If poorly, we'll see how the original version validates. SAT KDS 6/25
9	H (P) -	2	X											N	S	(000029EK2.14) **Stem Focus**: Start 2nd question with " In Accordance with EOP-FR-S.1. Consider simplifying the 1st question. AMSAC ____1-____ will/will not automatically start AFW pumps or something to that effect. 4/23/24 → changes made per recommendations. SAT KDS 5/9 Combines bullet 1 and 2 of stem to read " Reactor power is 29%, with power ascension in progress" based on validation round 3 feedback. RCWH 6/17 SAT KDS 6/25
10	F -	3	X											N	S	(WE12EK1.06) Stem Focus: change "AND the CSIP suctions" to "AND upon MANUAL Safety Reinitiation, the CSIP suctions" Modified stem as recommended by Chief Examiner. RCWH 5/2 Change "realign" to "realign(ed) to make B and D grammatically correct. KDS 5/6 Modified stem as recommended by Chief Examiner. RCWH 5/6

																SAT KDS 5/13
11	F (P)	3												B 2016	S	(000054AK1.02) KDS 5/7
12	H (P)	3												B 2018	S	(000056) (APE 56) KDS 5/7 Modified distractor C/D(1) to read " 20°F / Hr " based on validation round 3 feedback. RCWH 6/17/2024 Change back to 50 F
13	H (P)	3												B 2018	S	(000057AK3.01) KDS 5/7
14	H	3												B 2013M	S	(000058AA2.01) KDS 5/7
15	F (P) +	3											X	N	S	(000065AK1.02) K/A: Do not think the question ask about the operational implications of water/particulate in the air lines. Recommend: Make half the question about moisture causing buildup of corrosion products from _____corrosion in the air lines. General/Galvanic or something of that sort. KDS 4/30 Modified stem as recommended by Chief Examiner. RCWH 5/9 Could there be some initial plant conditions or some intro to set up the question. It looks like two random statements. KDS 5/13 Modified stem to read " Given the following plant conditions - The unit is at 100% power - The running Air Compressor Air Dryer is being placed in service in accordance with OP-151.01, Compressed Air" as recommended by the Chief Examiner RCWH 5/14 Still need a little work. The second question is worded such that you re in the AOP and it reads as though the bypass valves are what is malfunctioning. Discuss: How about this? If the air dryer is malfunctioning, AOP-017, Loss of Instrument Air FIRST directs you to _____ (switch / bypass) the air dryer). Modified stem as recommended by Chief Examiner. RCWH 6/14 SAT KDS 6/10
16	H (P)	3	X											N	S	(000077AA1.02) Stem Focus: Remove first couple of bullets. Not needed. Look below and see if you think it flows better. Answers are the same except the order.

																Given the following plant conditions: -Reactor power = 20% - Grid frequency is fluctuating between 60.8 Hz and 58.6 Hz over the last three (3) minutes - AOP-028, Grid Instability has been entered Main Generator indications: - Turbine speed is 1776 RPM Based on the conditions above, which ONE of the following completes the statements below? In accordance with AOP-028, current plant conditions _____ (do/do NOT) require a MANUAL reactor trip. If RCP bus frequency continues to degrade with no operator actions, an automatic reactor trip _____actuate. (will/will NOT) KDS 5/13 Modified stem as recommended by Chief Examiner. RCWH 5/14 SAT KDS 6/3
17	F (P)	2	X			X								N	S	(WE04EA2.03) Cred Dist. Mini Flow just not plausible when compared with flow. Stem Focus: More restrictive is too gray for me (opinion). Rec: Since the indications used are all low/oscillating, Ask: RHR Pump current _____ high/low RHR Pump Disch Press _____high/low With low/low being correct. Modified stem as recommended by Chief Examiner. RCWH 5/9 Need to replace first two bullets under "subsequently". They say oscillating and your choices are high or low. Recommend stating that "RHR Pump A operating parameters are abnormal" KDS 5/13 Modified stem to read " Subsequently the following conditions exist: - RHR Pump B has tripped - RHR Pump A is operating parameters are abnormal" based on validation feedback and as recommended by the Chief Examiner RCWH 5/14 KDS SAT 6/3
18	H (P) +	3	X											B	S	(BW E04; W E05) Stem Focus: I can't seem to make the A MFWP the correct answer. If by stating "recovery" as already being on Bleed and Feed, FR-H.1 lists options in bulleted form (Step 35) with AFW, MFW, Cond being the choices. (Rev 6 is the newest rev that I could find) so this may be spot on if there is a newer revision. If you mean before reaching the criteria, it lists AFW first and if that doesn't work, try to get MFW.

																If a newer procedure makes this ok , lets take another look. Recommend: Ask which path is established first (Bleed or Feed). KDS 4/30 Modified part 2 to read "the RCS (2) path will be established first." as recommended by Chief Examiner. RCWH 5/2 Now we're kinda cuing.in that we are asking if it is required, then how to do it. Recommend When implementing RCS Bleed and Feed IAW EOP-FR-H.1, the _____flowpath is established first. For the above plant conditions, IAW EOP-FR-H.1, RCS Bleed and Feed _____ required. KDS 5/6 Modified stem as recommended by Chief Examiner. RCWH 5/6 KDS SAT 6/3 Move the 2nd question to the first question. Then replace "When implementing" to IF implementing". KDS 5/13 Modified stem as recommended by Chief Examiner. RCWH 5/14 Modified statement 2 to read " IF implementing RCS Bleed and Feed in accordance with EOP-FR-H.1, (2) is performed first. " Then changed distractor A/C(2) to read " actuation of Safety Injection" and distractor B/D(2) to read " opening of PRZ PORVs" based on validation round 3 feedback. RCWH 6/17 SAT KDS 6/10
19	H (P)	3				X								N	S	(000001AK2.13) Cred Dist: Not being able to move CRs doesn't seem plausible to me. Rec: Ask if the AOP directs using MANUAL Control Rods or reducing power to get back to within limits. Make sure reducing power cannot be correct. I only have one page of the AOP. Modified part 2 to read "in accordance with AOP-001, (2) is directed to restore this limit.as recommended by Chief Examiner. Confirmed that Section 3.2 does not direct the use of the turbine to restore AFD to within the limits of the COLR. RCWH 5/10 Can you put a bullet to state that the control rods stopped withdrawing when placed in MANUAL. KDS 5/13 Modified stem as recommended by Chief Examiner. Per validation feedback: Current power level of 45% added and wording modified for AFD in question stem.

																Part 1 of the question was modified to ask if the AFD LCO applies for the current power level. Part 2 of the question was modified slightly to remove the word "affected" from B.2 and D.2 as this terminology was confusing the validators. JRG 5/23 SAT KDS 6/3
20	H	3												N	S	(000005) (APE 5) KDS 4/30
21	H (P)	3												B 2016	S	(000024) (APE 24) KDS 5/8
22	H	1				X								B	S	(000028AK1.02) LOD/Cred Dist: Stating that the level transmitter fails high pretty much makes A & C not plausible, D not much better. Recommend: State that the diaphragm has a hole or something else that will cause DP to go to 0. Then have a combination of HI/LO effects and/or 460 does or does not control. Or change the detector. Ex: A. FCV-121 opens B. FCV-121 closes C. Orifice isolation valves close D. Pzr High Level alarm actuates Modified stem to read " The FIRST plant response that will occur after LT-460, Pressurizer Level transmitter, develops a reference leg leak is . " as recommended by Chief Examiner. RCWH 5/9 SAT KDS 5/13 Modified distractor C/D to add " goes full " to ensure only 1 correct answer vice first to occur based on validation round 3 feedback. RCWH 6/17 SAT KDS 6/10
23	H (P)	3	X											N	S	(WE14EK3.06) Stem Focus: Change "at least" to "a MINIMUM of" KDS 5/8 Modified stem as recommended by Chief Examiner. RCWH 5/9 SAT KDS 5/13 Per validation feedback, changed CNMT pressure in question stem from 25 psig to 30 psig and rising. JRG 5/23 Change 30 to 29 to get it off of setpoint. KDS 6/3 Per validation feedback, changed CNMT pressure in question stem from "29 psig to 18 psig and lowering" and changed correct answer to B. This aligns correct answer requirements of EOP-ECA-1.1 and EOP-E-1.. RCWH 6/17 SAT KDS 6/10

24	H (P)	3												N	S	(000078AA2.04) KDS 5/9
25	F (P) +	2	X											N	S	(WE02EA1.11) Stem Focus: Change 2nd Q to: IF used to dump steam, EOP-ES-1.1 directs the condenser steam dumps to be in the ____(2)____mode. steam pressure / Tave (Check my verbiage) KDS 5/1 Modified part 2 to read " IF used to dump steam, EOP-ES-1.1 directs the condenser steam dumps to be in the (2) mode." as recommended by Chief Examiner. RCWH 5/2 SAT KDS 5/6
26 (P) -	F	3	X											N	S	(WE16EK1.01) Stem Focus: In keeping with simplicity, can we change the 2nd part to just ask if the Rad Monitors are susceptible to high containment temperature? High Range Post LOCA Containment Radiation monitors _____are/are not susceptible to high containment temperatures. Something like that 4/23/24 → Revised; Instead of are/are not went with may/will not [be susceptible] to keep in alignment with the note. I don't want to get into a debate with the "are" implying 100% of the time. We can discuss if you have other recommendation on wording. I would just stay are from "are" being the correct answer. 4/29/24: The EOP Users Guide gives the crew an out from HAVING to enter a FR procedure on a yellow condition- discretion based on what else is going on. The word "require" in the first statement could make for an alternate answer. To remove this possibility, remove the word "require" and replace it with, "The MINIMUM color on the CSFST Ffor Containment which ~~requires~~ meets an entry condition into EOP-FR-Z.3,…" Modified stem as recommended by Operation SRO to remove possibility of multiple correct answers and improve operational validity. RCWH 5/9 SAT KDS 5/13
5/13 27	F (P)	3				X								N	S	(003) (SF4P RCP) LOD/ Cred Dist: Both halves just are not enough. Rec: Maybe loop A (because of letdown) or All loops and crud removed by filtration/ion exchange. Something like that. KDS 5/1

																Modified to read "In accordance with GP-007, Normal Plant Cooldown (Mode 3 To Mode 5), maintaining (1) RCP(s) running until cleanup (CRUD Burst) is complete will improve the cleanup evolution AND the cleanup (CRUD Burst) is removed by (2) in the letdown demineralizers." as recommended by Chief Examiner. RCWH 5/2 SAT KDS 5/6
28	H (P)	3	X			X								B 2013	S	(004K5.26) Note: Q28 is similar to Q24 in using 5% VCT level. I do not believe I would call it overlap due to one being incorrect and one correct and asking different questions however, do you think Q28 could cue applicants to the incorrect answer in Q24? KDS 5/9 The fleet reviewers discussed this and decided because two different procedures were address that it was not cueing. RCWH 5/9 Stem Focus: The low alarm is at 15% and the low level condition is a prelude to gas binding. I don't really see either procedure stating that the problem starts when you get to 5%. Cred Dist: The way the question is worded, there is a subset problem. Even if the procedure said 10%, 5% would still answer the question correctly. Rec: Ask about the NPSH as level lowers. KDS 6/4 Modified statement 1 to read "In accordance with AOP-003, Malfunction Of Reactor Makeup Control, gas binding of the running CSIP is a concern when VCT level FIRST lowers below (1) . " as recommended by Chief Examiner. RCWH 6/14 SAT KDS 6/10
29	F	2				X								B 2010	S	(005K3.01) Cred Dist: Second part of B & C not really plausible. Bypassing the HX causing RCS temp to go down and vice versa. Rec: 1RH-20, RHR Heat Exchanger A Bypass position _____ (varies / is held constant) when adjusting RCS temp and if Instrument Air is lost to 1RH-20, it will cause RCS temperature to _____ (rise / lower). Something close to this. KDS 5/1 Modified to read " 1RH-20, RHR Heat Exchanger A Bypass, position (1) when adjusting RCS temperature AND if instrument air is lost to 1RH-20, RCS temperature will (2) ." as recommended by Chief Examiner. RCWH 5/2

																SAT KDS 5/6 Per validation feedback, modified question stem to add status of 1RH-20 controller (AUTO). JRG 5/23 Remove that bullet. It provides to the cue that the bypass valve is whats controlling temperature. KDS 6/3 Modified stem as recommended by Chief Examiner. RCWH 6/14 SAT KDS 6/25
30	F	2												N	S	(006K1.11) KDS 5/9 Per validation feedback, modified part 2 of the question to ask the location of the RHR Heat Exchangers. JRG 5/22 SAT KDS 6/4
31	F	2	X											N	S	(007A4.01) Stem Focus: I can't distinguish between Primary Makeup and Reactor Makeup (I think you could argue that they are the same thing. Rec: Remove "makeup water" from the end of the first question and change it to : Reactor _____. (makeup water / coolant). I think it asks the same thing but distinguishes between the two better. KDS 5/9 Modified part 1 to read "The source of water to refill the PRT is Reactor (1) .." RCWH 5/9 KDS 5/13
32	F	2												N	S	(007K4.06) KDS 5/9 Per validation feedback: Added noun name descriptors for each Waste Gas Decay Tank. Replaced WGDT A with WGDT B due to current deficiency with WGDT A. JRG 5/23 SAT KDS 6/4
33	F	3												N	S	(008) (SF8 CCW) Replaced question based on Duke procedure requirements and validation feedback. RCWH 5/14 SAT KDS 6/4
34	F	3												N	S	(008K2.02) Need to explain the plausibility statement for B better. I have no idea of what it'saying. KDS 5/9
35														B	S	(010A1.07) KDS
36	H (P)	3												N	S	(012A2.02) KDS Added plant noun name to PT-456. Modified statement 2 to read " If subsequently PT-456, PRZ

																Pressure Channel II Transmitter, were to fail high a Reactor trip (2) occur." based on validation feedback. RCWH 5/14 KDS SAT 6/5
37	H	3												B 2014	S	(012K6.06) KDS
38	F	3												N	S	(013K2.01) KDS 5/9 Replaced question based on Duke procedure requirements and validation feedback. RCWH 5/14 SAT KDS 6/10 There is a lot of information in the distractor analysis that is not required.
39	H	2												B	S	(022K4.02) Would like to change the plausibility statement for the Post Accident Damper being closed: Plausible because some ventilation dampers will close during a SBLOCA (give an example if you like). Modified plausibility as recommended by Chief Examiner. RCWH 5/9 SAT KDS 5/9
40	H	2												B	S	(026A3.02) KDS
41	F	3												N	S	(026K2.02) KDS 5/9
42	F	2												B 2020	S	(039A3.02) KDS 5/9
43	H (P)	2	X											N	S	(059K3.03) Stem Focus: Add in accordance with GP-005, Power Operation Mode 2 to Mode 1 to first bullet added -For this and all of the Qs. Can you put "Based on the above plant conditions, which one of the following…."We can discuss this. Added – also added to all other applicable early submit questions. -Remove the second "action" in the statement "one of the required actions that the operating crew should take ~~action~~ is to" removed The justification statement states that you are at 63% while the question states 57%. corrected 4/23/24 → all changes/corrections made per recommendations. SAT KDS 5/9
44	H (P)	3												B 2013	S	(061A1.01) SAT KDS 5/9
45	H	3												B	S	(061A3.01) KDS

																Modified bullet 3 to read " Steam Generator parameters have lowered to the following values:" AND split statement into 2 separate statements based on validation feedback. RCWH 5/14 SAT KDS 6/4
46	F	3										X		B	S	(062K1.10) KA: Question does not address Non 1E AC Dist System (AFW is 1E). Maybe something like tying the EDG to its bus and fault causes bad things including Non-1E…….to go south…..give it a shot or call me. KDS 5/1 Modified to read "… are extinguished for the 'A' Main Feedwater Pump." as recommended by Chief Examiner. RCWH 5/2 Question is still addressing the relationship between AC and DC systems. Lets stay away from Control Power. KDS 5/6 Replaced with a modification of Bank question RCWH 5/7 SAT KDS 5/13
47	F (P)	3	X											N	S	(063A4.02) Stem Focus: on the first question, add "a MAXIMUM of" after "within" and before the blank. KDS 5/9 Modified part 1 as recommended by Chief Examiner. RCWH 5/9 Rec for second question: After securing the DC Emergency Bearing Oil Pump, EOP-ECA-0.0 directs you to_____. Keep the answers just tweak the grammar to make sense. KDS 5/13 Modified statement 2 to read " After securing the DC Emergency Bearing Oil Pump, EOP-ECA-0.0 directs (2) ." as recommended by Chief Examiner. Replaced distractor B/D(2) with "DP-1A-SA vice DP-1-250" based on validator feedback. RCWH 5/14 SAT KDS 6/5
48	H	2												B 2018	S	(064K6.11) SAT KDS 5/9
49	F	2												N	S	(073K4.01) SAT KDS 5/9
50	H	3				X								B	S	(076A2.08) Cred Dist: Low Service water pressure and not entering the AOP for Loss of Service Water is not plausible. Plausibility statement didn't make a lot of sense to me.

																KDS 5/2 Per discussion with exam author, entry is not performed for 60 seconds after alarm. SAT KDS 5/9
51	H	2												N	S	(078A4.03) KDS 5/9
52	F (P) -													N	S	(078) (SF8 IAS) KDS 5/13 Modified part 2 to read "The actions of Attachment 7 are completed locally in the Turbine Building at (2) ." and replace part 2 answers based on Duke procedures and validator feedback. RCWH 5/14 SAT KDS 6/5
53	F (P)	2												N	S	(103A2.06) SAT KDS 5/13
54	F	2												B	S	(103K5.01) SAT KDS 5/14 Modified stem conditions to read " Given the following plant conditions: - The Containment Isolation System (CIS), Phase A has actuated as a result of Loss of Coolant Accident - CNMT pressure has risen to 3.4 psig" based on validation feedback. RCWH 5/14 SAT KDS 6/4
55	F	3	X											B	S	(001K6.06) Stem Focus: If a trip would occur (answer D), it would be in the conditions (from an applicants point of view). Change 2nd sentence to: Subsequently, the 1A Rod Drive MG set trips. KDS 5/14 Modified part 1 as recommended by Chief Examiner. RCWH 5/14 SAT KDS 6/4
56	H	3				X								N	S	(011A1.07) Cred Dist: Less charging flow during an RCS leak is not plausible. Recommend asking about demand for FK-122.1. (raise / lower) KDS 5/14 Modified part 1 as recommended by Chief Examiner. RCWH 5/14 SAT KDS 6/5
57	L	3												B	S	(014K5.04) SAT KDS 5/14 Step counter reading changed from 208 to 212 steps in question stem to improve operational validity. JRG 5/23 SAT KDS 6/5

58	H	3												N	S	(015K3.02) SAT KDS 5/14
59	H	3												M	S	(017A2.02) To be consistent, the format for this question is different than the rest of the exam as for as how the questions are asked. Up to you. Modified stem as recommended by Chief Examiner. RCWH 5/2 SAT KDS 5/9 Modified part 1 to read "ONE of the requirements for the ECCS Acceptance criteria is to maintain (1)_ temperature < 2200°F.." and replace part 1 answers based on Duke procedures and validator feedback. RCWH 5/14 Per validation feedback, part 1 of the question was modified to ask if core exit thermocouples could still be monitored in the MCR or if they have to be monitored at a local panel with a loss of ERFIS. JRG 5/23 SAT KDS 6/6
60	F	3	X										U	B 2012	S	(027) (SF5 CIRS) Stem Focus Could be a subset issue. Rec: ask for the setpoint or state "when pressure FIRST lowers to", something to that effect. KDS 5/2 Modified to read "1CB-6, Vacuum Relief SB CIV, FIRST receives an open signal at (1) INWG AND will fail (2) on a loss of air." as recommended by Chief Examiner. RCWH 5/2 Need an initial value and where its going. KDS 5/6 Modified to read " With CNMT pressure at its normal value, which ONE of the following completes the statement below? The setpoint at which 1CB-6, Vacuum Relief SB CIV, FIRST receives an open signal is (1) INWG AND will fail (2) on a loss of air." as recommended by Chief Examiner. RCWH 5/6 SAT KDS 5/13 Per validation feedback, changed distractor A/B(1) to read "-1.0 vice -1.50" and modified noun name to read "1CB-6, Vacuum Relief SB CNMT Isolation Valve".. RCWH 6/17 SAT KDS 6/10
61	F	2												N	S	(033K4.06) KDS

																Replaced distractor A/B(1) with “4000 vice 2400 ppm” based on validator feedback. RCWH 5/14 Per validation feedback, the word “Mode” was capitalized in the question stem and the Tech Spec mode description was added as well. JRG 5/23 Replaced distractor A/B(1) with “1770 vice 4000 ppm” based on validator feedback. RCWH 6/14 SAT KDS 6/10
62	F	3												N	S	(034K6.05) KDS Modified part 1 to read “ ALB-023-4-16, Spent FP Hi Temp, will alarm when the Spent fuel Pool FIRST reaches a water temperature of (1) °F.” and replace part 1 answers C/D(1) based on Duke procedures and validator feedback. RCWH 5/14 Per validation feedback, part 2 of the question was modified to ask if rising spent fuel temperatures is/is not a criteria in AOP-041 for stopping fuel movement due to evacuation of the FHB. JRG 5/23 SAT KDS 6/6
63	F	3	X											N	S	(050K1.01) Stem Focus: Ad “ALL of” to stem after “identifies”. Consider making 2 state “either post accident outside air intake” and have D be correct. 4/23/24 → revised as requested. KDS SAT 5/9
64	F	3												N	S	(G2.1.3) SAT KDS 5/14
65	F +	2												N	S	(G2.1.38) Lets discuss the 2nd part a little. Its ok as written but I would not think that the peer check would repeat the expected outcome. Just want to make sure you are comfortable with the “expected outcome” portion. 4/23/24 → We are alright with removing expected outcome form question 2. It does not change the answer. Tentatively removed pending chief examiner approval. KDS
66	F +	2												N	S	(G2.2.2) KDS
67	F	2												B 2022	S	(G2.2.13) SAT KDS 5/14

68	F	3										X		N	S	(G2.3.5) KA: There was nothing in the question about using the radiation monitor. Rec: Change 2nd part to ask something about the surveillance. Modified part 2 to read "When testing the affected radiation monitor(s) a channel HIGH signal is indicated on the RM-23 by the (2) LED indicator illuminating." as recommended by Chief Examiner. RCWH 5/2 SAT KDS 5/6
69	F +	2												N	S	(G2.4.14) SAT KDS 6/6
70	F -	2	X											M GFES	S	(192006K1.01) Stem Focus: Add "In Accordance With AD-OP-ALL-0203, Reactivity Management" to the second question. 4/23/24 → added statement to second question. SAT KDS 5/9
71	F	2												B GFES	S	(192007K1.04) SAT KDS 5/14
72	H	3												N	S	(192008K1.20) SAT KDS 5/14 Per validation feedback, "above just" changed to "just above" in the question stem for clarity. JRG 5/23 SAT KDS 6/6
73	F	2												B GFES	S	(193003K1.16) SAT KDS 5/14 Removed LP Turbine Exhaust and Modified statement to read "During the condenser cooling process the temperature lowers to 100°F which at this time is a . ." based on Duke procedures and validator feedback. RCWH 5/14 Add "fluid" before temperature in the question. KDS 6/6
74	H	2												B GFES	S	(193004K1.11) SAT KDS 5/14 Replaced question based on Duke procedure requirements and validation feedback. Question designated NEW and tests multiple related topics in the GFES question bank. JRG 5/23 SAT KDS 6/6
75	F	2											X	N	S	(193009K1.10) KA: KA states define and calculate. You can keep the first part and do a calculation or just do a calculation with 4 different answers. KDS 5/14 Discussed potential issue due to JPM performance vice written exam question standard and determine

																question is acceptable to remain as currently written. RCWH 5/15 SAT KDS 6/6

2024 Harris Initial Licensed Operator Retake Exam (2024-302)

ES-2.3 **Written Examination Review Worksheet** Form ES-2.3-5

Form 2.3-5 Instructions for Written Examination Review Worksheet

Refer to ES-4.2 for the definitions of terms used in this worksheet for the written examination. Review each question (Q) as submitted and as subsequently revised and document the following in the associated worksheet columns:

1. Enter the level of knowledge (LOK) as either (F)undamental or (H)igher cognitive level.
2. Enter the level of difficulty (LOD) from 1 (easy) to 5 (difficult); mark direct lookup questions (applicant can directly determine the answer from the provided reference) as LOD 1. A question is (U)nsatisfactory if it is LOD 1 or LOD 5.
3. Check the appropriate box if a psychometric flaw is identified:
   - "Stem Focus": The stem lacks enough focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information). This is an (U)nsatisfactory question.
   - "Cues": The stem or one or more answer choices contains cues (e.g., clues, specific determiners, phrasing, length). This is an (U)nsatisfactory question.
   - "T/F": All of the answer choices are a collection of unrelated true/false statements. This is an (U)nsatisfactory question.
   - "Cred. Dist.": The distractors are not credible; single implausible distractors require (E)nhancement, and more than one noncredible distractor in the same question results in an (U)satisfactory question.
   - "Partial": One or more distractors are partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by the stem). This is an (U)nsatisfactory question.

4. Check the appropriate box if a job content flaw is identified:
   - "Job Link": The question is not linked to the job requirements (i.e., the question has a valid knowledge or ability (K/A) but, as written, is not operational in content). This is an (U)nsatisfactory question.
   - "Minutia": The question requires the recall of knowledge that is too specific for the closed-reference test mode (i.e., it is not required to be known from memory). This is an (U)nsatisfactory question.
   - "#/Units": The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons). This is an (U)nsatisfactory question.
   - "Logic": The question requires backward or reverse logic or application compared to the job requirements. This is an (U)nsatisfactory question.
5. Check the first box if a K/A mismatch flaw exists. Check the second box if the question is flawed because it is written at the wrong license level. Either condition results in an (U)nsatisfactory question.
6. Enter the question's source: (B)ank, (M)odified, or (N)ew. Verify that (M)odified questions meet the criteria of ES-4.2.
7. Based on the review performed in steps 2–5, mark the question as (U)nsatisfactory, in need of (E)nhancement, or (S)atisfactory.
8. Fully explain the reason for any (U) in column 7 (e.g., how the psychometric attributes are not being met).
9. Save the initial review comments and detail subsequent comment resolution so that each exam-bound question is marked by an (S) on this form.

Form 4.1-1 Record of Rejected Knowledge and Abilities

Refer to Examination Standard (ES)-4.2, “Developing Written Examinations,” Section B.3, for deviations from the approved written examination outline.

Tier/Group	Randomly Selected K/A	Reason for Rejection
1/1 (Q#17)	WE04 / EA2.03	Topic was examined on the 2024-1 exam and is too close to topic/K/A from exam just failed, Additionally the topic procedure guidance for evaluation of RCS pressure is limited. Replaced with WE11/EA2.03 Loss of Emergency Coolant Recirculation
1 / 2 (Q#21)	024 / AG2.2.7	Emergency Boration does not enter in the IPTE process. Replaced with G 2.2.2, Ability to manipulate the console controls…
1 /2 (Q#24)	078 / AA2.04	Component Cooling Water does not have an isolation valve on the systems surge tank. Replaced with AA2.09, Ability to determine and/or interpret Reactor Trip Setpoints.
2 / 1 (Q#40)	026 / A3.02	Containment Spray does not have any system heat exchangers Replaced with A3.01, Pump starts and correct valve positioning
2 / 2 (Q#60)	027 / K1.10	Plant does not have a Containment Iodine Removal System. Iodine removal is accomplished through Containment Spray scrubbing effect and NaOH addition. In addition, the valves in the system are not air operated. Replaced with 029, Containment Purge System
3 (Q#67)	G2.2.20	Not a discriminatory RO job responsibility (management of the process). Replaced with G 2.2.35 Ability to determine TS for mode of operation
As discussed in the PJB, the following are requests to swap K/As based on question is difficult to write within a short timeframe.		
2 / 2 (Q#57)	014 / K5.04	Replaced with K5.01, Reasons for differences between RPIS and demand position
2/ 2 (Q#61)	033 / K4.06	Replaced with K4.05 Adequate SDM