Form 4.1-BWR Boiling-Water Reactor Examination Outline

Facility: Perr	у					K/A (Catalo	og Re	v. 3			Rev	.0	Dat	e of E	Exam:	:12/12	/2022
					F	, Ю К/	/A Ca	itegoi	ry Po	ints				:	SRO	-Only	/ Poiı	nts
l ier	Group	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	Total	A	2	C	3	Total
1	1	4	3	3		<u> </u>	<u> </u>	3	4			3	20	3	3	4	4	7
Emergency and Abnormal Plant	2	1	1	1		N/A	L	1	1	N	/A	1	6	2	2		1	3
Evolutions	Tier Totals	5	4	4				4	5			4	26	ŧ	5	;	5	10
	1	2	3	3	3	2	2	2	2	3	2	2	26	3	3	2	2	5
2. Plant Systems	2	1	1	1	1	1	1	1	1	1	1	1	11	0	2		1	3
Cystems .	Tier Totals	3	4	4	4	3	3	3	3	4	3	3	37	ŧ	5	:	3	8
	СО		E	C	<u> </u>		RC			E	М	•		со	EC	RC	EM	
3. Generic Knowledge and Abilities Categories	2			2			1				1		6	2	2	1	2	7
	Reactor T	heor	у			<u> </u>	The	ermoo	dynar	nics								
4. Theory	3								3				6					
Notes: CO =Cono EM =Eme	ปนct of Operatic rgency Procedเ	ons; ures/	EC = /Plar	= Ec	uipr	nent	: Cor	ntrol	; RC	; = F	Radia	atior	n Cont	rol;				

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ES-4.1	-BWR					В	WRI	Examination Outline (Perry)		
			Em	erger	ncy an	id Abr	norma	al Plant Evolutions—Tier 1/Group 1 (RO/ <mark>SRO</mark>)		
Item #	E/APE # / Name / Safety Function	K1	K2	К3	A1	A2	G	K/A Topic(s)	IR	Q#
1	(295001) (APE 1) PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION	x						(295001AK1.04) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (APE 1) PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: (CFR: 41.8 to 41.10) Thermal-hydraulic instabilities	4.3	13
2	(295003) (APE 3) PARTIAL OR COMPLETE LOSS OF AC POWER			x				(295003AK3.01) Knowledge of the reasons for the following responses or actions as they apply to (APE 3) PARTIAL OR COMPLETE LOSS OF AC POWER: (CFR: 41.5 / 45.6) Manual and automatic bus transfer	3.7	14
3	(295004) (APE 4) PARTIAL OR COMPLETE LOSS OF DC POWER						х	(295004) (APE 4) PARTIAL OR COMPLETE LOSS OF DC POWER (G2.4.31) EMERGENCY PROCEDURES/PLAN Knowledge of annunciator alarms, indications, or response procedures (CFR: 41.10 / 45.3)	4.2	15
4	(295005) (APE 5) MAIN TURBINE GENERATOR TRIP		x					(295005AK2.05) Knowledge of the relationship between the (APE 5) MAIN TURBINE GENERATOR TRIP and the following systems or components: (CFR: 41.7 / 45.8) Main and reheat steam system	2.9	16
5	(295006) (APE 6) SCRAM			x				(295006AK3.04) Knowledge of the reasons for the following responses or actions as they apply to (APE 6) SCRAM: (CFR: 41.5 / 41.6) Reactor water level setpoint setdown	3.7	17
6	(295016) (APE 16) CONTROL ROOM ABANDONMENT					x		(295016AA2.05) Ability to determine and/or interpret the following as they apply to (APE 16) CONTROL ROOM ABANDONMENT: (CFR: 41.10 / 43.5 / 45.13) Drywell pressure	3.9	18
7	(295018) (APE 18) PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER (CCW)					×		(295018AA2.05) Ability to determine and/or interpret the following as they apply to (APE 18) PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER (CCW): (CFR: 41.10 / 43.5 / 45.13) System pressure	3.7	19
8	(295019) (APE 19) PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR						x	(295019) (APE 19) PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR (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
9	(295021) (APE 21) LOSS OF SHUTDOWN COOLING						х	(295021) (APE 21) LOSS OF SHUTDOWN COOLING (G2.1.19) CONDUCT OF OPERATIONS: Ability to use available indications to evaluate system or component status (CFR: 41.10 / 45.12)	3.9	21
10	(295023) (APE 23) REFUELING ACCIDENTS				х			(295023AA1.03) Ability to operate or monitor the following as they apply to (APE 23) REFUELING ACCIDENTS: (CFR: 41.7 / 45.6) Fuel handling equipment	3.1	22
11	(295024) (EPE 1) HIGH DRYWELL PRESSURE	х						(295024EK1.02) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (EPE 1) HIGH DRYWELL PRESSURE: (CFR: 41.8 to 41.10) Containment building integrity (Mark III)	4.0	23
12	(295025) (EPE 2) HIGH REACTOR PRESSURE			x				(295025EK3.01) Knowledge of the reasons for the following responses or actions as they apply to (EPE 2) HIGH REACTOR PRESSURE: (CFR: 41.5 / 45.6) Safety/relief valve operation	4.3	24

13	(295026) (EPE 3) SUPPRESSION POOL HIGH WATER TEMPERATURE	x					(295026EK1.04) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (EPE 3) SUPPRESSION POOL HIGH WATER TEMPERATURE: (CFR: 41.8 to 41.10) Suppression pool level	3.5	25
14	(295027) (EPE 4) HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY)			x			(295027EA1.02) Ability to operate or monitor the following as they apply to (EPE 4) HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY): (CFR: 41.7 / 45.6) Containment ventilation/cooling	3.7	26
15	(295030) (EPE 7) LOW SUPPRESSION POOL WATER LEVEL	х					(295030EK1.05) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (EPE 7) LOW SUPPRESSION POOL WATER LEVEL: (CFR: 41.8 to 41.10) SRV discharge submergence	4.0	27
16	(295031) (EPE 8) REACTOR LOW WATER LEVEL		х				(295031EK2.17) Knowledge of the relationship between the (EPE 8) REACTOR LOW WATER LEVEL and the following systems or components: (CFR: 41.7 / 45.8) Feedwater system	3.9	28
17	(295037) (EPE 14) SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN				x		(295037EA2.01) Ability to determine or interpret the following as they apply to (EPE 14) SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: (CFR: 41.10 / 43.5 / 45.13) Reactor power	4.3	29
18	(295038) (EPE 15) HIGH OFFSITE RADIOACTIVITY RELEASE RATE			x			(295038EA1.04) Ability to operate or monitor the following as they apply to (EPE 15) HIGH OFFSITE RADIOACTIVITY RELEASE RATE: (CFR: 41.7 / 45.6) Plant process computer/parameter display systems	3.4	30
19	(600000) (APE 24) PLANT FIRE ON SITE		x				(600000AK2.06) Knowledge of the relationship between (APE 24) PLANT FIRE ON SITE and the following systems or components: (CFR: 41.7 / 45.7) Fire pumps	3.8	31
20	(700000) (APE 25) GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES				x		(700000AA2.10) Ability to determine or interpret the following as they apply to (APE 25) GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: (CFR: 41.5 and 43.5 / 45.5 / 45.7 / 45.8) Generator overheating and the required actions	3.7	32
21	(295004) (APE 4) PARTIAL OR COMPLETE LOSS OF DC POWER				x		(295004AA2.01) Ability to determine or interpret the following as they apply to (APE 4) PARTIAL OR COMPLETE LOSS OF DC POWER: (CFR: 41.10 / 43.5 / 45.13) Partial or complete loss of DC power	4.1	8
22	(295005) (APE 5) MAIN TURBINE GENERATOR TRIP					x	(295005) (APE 5) MAIN TURBINE GENERATOR TRIP (G2.4.4) EMERGENCY PROCEDURES/PLAN Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures (CFR: 41.10 / 43.2 / 45.6)	4.7	9
23	(295018) (APE 18) PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER (CCW)					x	(295018) (APE 18) PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER (CCW) (G2.1.9) CONDUCT OF OPERATIONS Ability to direct licensed personnel activities inside the control room (SRO Only) (CFR: 43.1 / 45.5 / 45.12 / 45.3)	4.5	10
24	(295025) (EPE 2) HIGH REACTOR PRESSURE				x		(295025EA2.03) Ability to determine or interpret the following as they apply to (EPE 2) HIGH REACTOR PRESSURE: (CFR: 41.10 / 43.5 / 45.13) Suppression pool temperature	3.5	11
25	(295027) (EPE 4) HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY)				x		(295027EA2.01) Ability to determine or interpret the following as they apply to (EPE 4) HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY): (CFR: 41.10 / 43.5 / 45.13) Containment temperature	4.1	12

26	(295030) (EPE 7) LOW SUPPRESSION POOL WATER LEVEL						x	(295030) (EPE 7) LOW SUPPRESSION POOL WATER LEVEL (G2.1.20) CONDUCT OF OPERATIONS Ability to interpret and execute procedure steps (CFR: 41.10 / 43.5 / 45.12) 4.6	13
27	(295031) (EPE 8) REACTOR LOW WATER LEVEL						x	(295031) (EPE 8) REACTOR LOW WATER LEVEL (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)	14
K	A Category Totals:	4	3	3	3	7	7	Group Point Total:	27

ES-4 1	-BWR					В	WRF	Examination Outline (Perry)				
LU-7.1	5.00		Fm	eraer	icv an	ld Abr	orme	al 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#		
28	(295002) (APE 2) LOSS OF MAIN CONDENSER VACUUM	х						(295002AK1.04) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to the (APE 2) LOSS OF MAIN CONDENSER VACUUM: (CFR: 41.8 to 41.10) Offgas flow changes	3.4	33		
29	(295008) (APE 8) HIGH REACTOR WATER LEVEL				x			(295008AA1.06) Ability to operate or monitor the following as they apply to (APE 8) HIGH REACTOR WATER LEVEL: (CFR: 41.7 / 45.6) HPCS	3.8	34		
30	(295009) (APE 9) LOW REACTOR WATER LEVEL						х	(295009) (APE 9) LOW REACTOR WATER LEVEL (G2.1.30) CONDUCT OF OPERATIONS Ability to locate and operate components, including local controls (CFR: 41.7 / 45.7)	4.4	35		
30 (295009) (APE 9) LOW REACTOR WATER LEVEL X (295009) (APE 9) LOW REACTOR WATER LEVEL (G2.1.30) CONDUCT OF OPERATIONS Ability to locate and operate components, including local controls (CFR: 41.7 / 45.7) 4.4 35 31 (295011) (APE 11) HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY) X X (295011AK3.01) Knowledge of the reasons for the following responses or actions as they apply to (APE 11) HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY): (CFR: 41.5 / 45.6) Increased containment cooling 3.6 36												
32	(295014) (APE 14) INADVERTENT REACTIVITY ADDITION		x					(295014AK2.05) Knowledge of the relationship between the (APE 14) INADVERTENT REACTIVITY ADDITION and the following systems or components: (CFR: 41.7 / 45.8) Neutron monitoring system/OPRMs	4.2	37		
33	(295033) (EPE 10) HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS					x		(295033EA2.01) Ability to determine or interpret the following as they apply to (EPE 10) HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS: (CFR: 41.10 / 43.5 / 45.13) Area radiation levels	4.1	38		
34	(295010) (APE 10) HIGH DRYWELL PRESSURE					x		(295010AA2.06) Ability to determine or interpret the following as they apply to (APE 10) HIGH DRYWELL PRESSURE: (CFR: 41.10 / 43.5 / 45.13) Drywell temperature	3.7	15		
35	(295020) (APE 20) INADVERTENT CONTAINMENT ISOLATION						x	(295020) (APE 20) INADVERTENT CONTAINMENT ISOLATION (G2.2.37) EQUIPMENT CONTROL Ability to determine operability or availability of safety-related equipment (SRO Only) (CFR: 43.2 / 43.5 / 45.12)	4.6	16		
36	(295022) (APE 22) LOSS OF CONTROL ROD DRIVE PUMPS					X		(295022AA2.03) Ability to determine or interpret the following as they apply to (APE 22) LOSS OF CONTROL ROD DRIVE PUMPS: (CFR: 41.10 / 43.5 / 45.13) CRD mechanism temperatures	3.1	17		
k	A Category Totals:	1	1	1	1	3	2	Group Point Total:		9		

ES-4.1	-BWR Examination Outline (Perry) Emergency and Abnormal Plant Evolutions—Tier 2/Group 1 (RO/SRO)														
			Em	erger	ncy ar	nd Abı	norma	al Plar	nt Evo	lution	s—Tie	er 2/G	Group 1 (RO/ <mark>SRO</mark>)		
Item #	System / Name	K1	K2	К3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	Q#
37	(203000) (SF2, SF4 RHR/LPCI) RHR/LPCI: INJECTION MODE											x	(203000) (SF2, SF4 RHR/LPCI) RHR/LPCI: INJECTION MODE / Section 5 (291001K1.04 Valves) The failed-valve positions for different operators (open, closed, and as-is positions; spring-loaded valves; hydraulically/pneumatically controlled valves; electric motor- driven valves) (CFR 41.4)	2.8	39
38	(205000) (SF4 SCS) SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE)						x						(205000K6.05) Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF4 SCS) SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE): (CFR: 41.7 / 45.7) Component cooling water systems	3.2	40
39	(209001) (SF2, SF4 LPCS) LOW PRESSURE CORE SPRAY SYSTEM				x								(209001K4.03) Knowledge of (SF2, SF4 LPCS) LOW PRESSURE CORE SPRAY SYSTEM design features and/or interlocks that provide for the following: (CFR: 41.7) Motor cooling	2.9	41
40	(209002) (SF2, SF4 HPCS) HIGH PRESSURE CORE SPRAY SYSTEM			x									(209002K3.08) Knowledge of the effect that a loss or malfunction of the (SF2, SF4 HPCS) HIGH PRESSURE CORE SPRAY SYSTEM will have on the following systems or system parameters: (CFR: 41.7 / 45.4) Condensate storage tank level	3.2	42
41	(209002) (SF2, SF4 HPCS) HIGH PRESSURE CORE SPRAY SYSTEM					x							(209002K5.04) Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF2, SF4 HPCS) HIGH PRESSURE CORE SPRAY SYSTEM: (CFR: 41.5 / 45.3) Adequate core cooling	4.5	43
42	(211000) (SF1 SLCS) STANDBY LIQUID CONTROL SYSTEM							x					(211000A1.10) Ability to predict and/or monitor changes in parameters associated with operation of the (SF1 SLCS) STANDBY LIQUID CONTROL SYSTEM including: (CFR: 41.5 / 45.5) Lights and alarms	3.6	44
43	(212000) (SF7 RPS) REACTOR PROTECTION SYSTEM					x							(212000K5.02) Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF7 RPS) REACTOR PROTECTION SYSTEM: (CFR: 41.5 / 45.3) Logic channel arrangements	4.1	45

44	(215003) (SF7 IRM) INTERMEDIATE RANGE MONITOR SYSTEM	x							(215003K2.01) (SF7 IRM) INTERMEDIATE RANGE MONITOR SYSTEM Knowledge of electrical power supplies to the following: (CFR: 41.7) IRM channels/detectors	3.4	46
45	(215003) (SF7 IRM) INTERMEDIATE RANGE MONITOR SYSTEM		x						(215003K4.10) Knowledge of (SF7 IRM) INTERMEDIATE RANGE MONITOR SYSTEM design features and/or interlocks that provide for the following: (CFR: 41.7) Automatically bypassing IRM rod block signals	3.6	47
46	(215004) (SF7 SRMS) SOURCE RANGE MONITOR SYSTEM					x			(215004A2.01) Ability to (a) predict the impacts of the following on the (SF7 SRMS) SOURCE RANGE 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 / 45.6) Degraded power supply	3.1	48
47	(215005) (SF7 PRMS) AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR				x				(215005A1.04) Ability to predict and/or monitor changes in parameters associated with operation of the (SF7 PRMS) AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR including: (CFR: 41.5 / 45.5) SCRAM and rod block trip setpoints	4.0	49
48	(217000) (SF2, SF4 RCIC) REACTOR CORE ISOLATION COOLING SYSTEM	x							(217000K2.04) (SF2, SF4 RCIC) REACTOR CORE ISOLATION COOLING SYSTEM Knowledge of electrical power supplies to the following: (CFR: 41.7) Gland seal compressor (vacuum pump)	2.6	50
49	(218000) (SF3 ADS) AUTOMATIC DEPRESSURIZATION SYSTEM							x	(218000) (SF3 ADS) AUTOMATIC DEPRESSURIZATION SYSTEM (G2.2.44) EQUIPMENT CONTROL 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 (CFR: 41.5 / 43.5 / 45.12)	4.2	51
50	(223002) (SF5 PCIS) PRIMARY CONTAINMENT ISOLATION SYSTEM / NUCLEAR STEAM SUPPLY SHUTOFF						x		(223002A4.01) Ability to manually operate and/or monitor the (SF5 PCIS) PRIMARY CONTAINMENT ISOLATION SYSTEM / NUCLEAR STEAM SUPPLY SHUTOFF in the control room: (CFR: 41.7 / 45.5 to 45.8) System valve operations	4.2	52
51	(239002) (SF3 SRV) SAFETY RELIEF VALVES			x					(239002K6.03) Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF3 SRV) SAFETY RELIEF VALVES: (CFR: 41.7 / 45.5 to 45.8) AC power	3.2	53

52	(259002) (SF2 RWLCS) REACTOR WATER LEVEL CONTROL SYSTEM						x			(259002A2.01) Ability to (a) predict the impacts of the following on the (SF2 RWLCS) REACTOR WATER LEVEL CONTROL 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 / 45.6) Loss of any number of main steam flow inputs	3.8	54
53	(261000) (SF9 SGTS) STANDBY GAS TREATMENT SYSTEM		x							(261000K2.01) (SF9 SGTS) STANDBY GAS TREATMENT SYSTEM Knowledge of electrical power supplies to the following: (CFR: 41.7) Standby gas treatment system fans	3.5	55
54	(262001) (SF6 AC) AC ELECTRICAL DISTRIBUTION							x		(262001A3.01) Ability to monitor automatic operation of the (SF6 AC) AC ELECTRICAL DISTRIBUTION including: (CFR: 41.7 / 45.7) Breaker tripping	3.6	56
55	(262001) (SF6 AC) AC ELECTRICAL DISTRIBUTION			x						(262001K3.01) Knowledge of the effect that a loss or malfunction of the (SF6 AC) AC ELECTRICAL DISTRIBUTION will have on the following systems or system parameters: (CFR: 41.7 / 45.4) Operationally significant AC loads	4.1	57
56	(262002) (SF6 UPS) UNINTERRUPTABLE POWER SUPPLY (AC/DC)							x		(262002A3.01) Ability to monitor automatic operation of the Uninterruptable Power Supply (AC/DC), including: (CFR: 41.7 / 45.7) Transfer of power sources	3.4	58
57	(263000) (SF6 DC) DC ELECTRICAL DISTRIBUTION								x	(263000A4.01) Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) Operationally significant breakers and control power fuses	3.7	59
58	(264000) (SF6 EGE) EMERGENCY GENERATORS (DIESEL/JET)				х					(264000K4.09) Knowledge of (SF6 EGE) EMERGENCY GENERATORS (DIESEL/JET) design features and/or interlocks that provide for the following: (CFR: 41.7) Standby readiness	3.8	60
59	(300000) (SF8 IA) INSTRUMENT AIR SYSTEM							x		300000A3.03 Ability to monitor automatic operation of the (SF8 IA) INSTRUMENT AIR SYSTEM including: (CFR: 41.8 / 45.7) Compressor automatic starts/trips	3.5	61
60	(400000) (SF8 CCS) COMPONENT COOLING WATER SYSTEM	x								(400000K1.15) Knowledge of the physical connections and/or cause and effect relationships between the (SF8 CCS) COMPONENT COOLING WATER SYSTEM and the following systems: (CFR: 41.4 to 41.5 / 41.7 to 41.9 / 45.6 to 45.8) Turbine generator and auxiliary systems	3.2	62

61	(400000) (SF8 CCS) COMPONENT COOLING WATER SYSTEM			x									(400000K3.17) Knowledge of the effect that a loss or malfunction of the (SF8 CCS) COMPONENT COOLING WATER SYSTEM will have on the following systems or system parameters: (CFR 41.7 / 45.6) Reactor condensate system	3.1	63
62	(510000) (SF4 SWS) SERVICE WATER SYSTEM	x											(51000K1.09) Knowledge of the physical connections and/or cause and effect relationships between the (SF4 SWS) SERVICE WATER SYSTEM and the following systems: (CFR: 41.4 to 41.8 / 45.7 to 45.8) Fire protection system	2.9	64
63	(203000) (SF2, SF4 RHR/LPCI) RHR/LPCI: INJECTION MODE								x				(203000A2.06) Ability to (a) predict the impacts of the following on the (SF2, SF4 RHR/LPCI) RHR/LPCI: INJECTION MODE and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6) Emergency generator failure	3.9	18
64	(211000) (SF1 SLCS) STANDBY LIQUID CONTROL SYSTEM								x				(211000A2.03) Ability to (a) predict the impacts of the following on the (SF1 SLCS) STANDBY LIQUID CONTROL 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 / 45.6) AC power failures	3.7	19
65	(217000) (SF2, SF4 RCIC) REACTOR CORE ISOLATION COOLING SYSTEM											x	(217000) (SF2, SF4 RCIC) REACTOR CORE ISOLATION COOLING SYSTEM (G2.4.22) EMERGENCY PROCEDURES/PLAN Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations (CFR: 41.7 / 41.10 / 43.5 / 45.12)	4.4	20
66	(239002) (SF3 SRV) SAFETY RELIEF VALVES											x	(239002) (SF3 SRV) SAFETY RELIEF VALVES (G2.4.6) EMERGENCY PROCEDURES/PLAN Knowledge of emergency and abnormal operating procedures major action categories (CFR: 41.10 / 43.5 / 45.13)	4.7	21
67	(262002) (SF6 UPS) UNINTERRUPTABLE POWER SUPPLY (AC/DC)								x				(262002A2.05) Ability to (a) predict the impacts of the following on the (SF6 UPS) UNINTERRUPTABLE POWER SUPPLY (AC/DC) and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6) Loss of UPS	3.9	22
ł	K/A Category Totals:	2	3	3	3	2	2	2	5	3	2	4	Group Point Total:		31

ES-4.1	1-BWR BWR Examination Outline (Perry) Emergency and Abnormal Plant Evolutions—Tier 2/Group 2 (RO/SRO)														
			Em	erger	ncy ar	nd Abı	norma	al Plar	nt Evo	lution	s—Tie	er 2/G	Group 2 (RO/SRO)		
Item #	System / Name	K1	K2	К3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	IR	Q#
68	(201005) (SF1, SF7 RCIS) ROD CONTROL AND INFORMATION SYSTEM					x							(201005K5.03) Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the (SF1, SF7 RCIS) ROD CONTROL AND INFORMATION SYSTEM: (CFR: 41.5 to 41.7 / 45.3 / 45.5) Rod groups	3.3	65
69	(201001) (SF1 CRDH) CRD HYDRAULIC									x			(201001A3.03) Ability to monitor automatic operation of the (SF1 CRDH) CONTROL ROD DRIVE HYDRAULIC SYSTEM including: (CFR: 41.1-2 / 41.5-7 / 41.9 / 45.1-6 / 45.8 / 45.12-13) System pressure	3.5	66
70	(216000) (SF7 NBI) NUCLEAR BOILER INSTRUMENTATION							x					(216000A1.05) Ability to predict and/or monitor changes in parameters associated with operation of the (SF7 NBI) NUCLEAR BOILER INSTRUMENTATION including: (CFR: 41.5 / 45.5) Lights and alarms	3.3	67
71	(233000) (SF9 FPCCU) FUEL POOL COOLING/CLEANUP										x		(233000A4.02) Ability to manually operate and/or monitor the (SF9 FPCCU) FUEL POOL COOLING/CLEANUP in the control room: (CFR: 41.7 / 45.5 to 45.8) Fuel pool cooling system valves	2.8	68
72	(234000) (SF8 FH) FUEL HANDLING											x	(234000) (SF8 FH) FUEL HANDLING (G2.1.32) CONDUCT OF OPERATIONS Ability to explain and apply system precautions, limitations, notes, or cautions (CFR: 41.10 / 43.2 / 45.12)	3.8	69
73	(239001) (SF3, SF4 MRSS) MAIN AND REHEAT STEAM SYSTEM								x				(239001A2.13) Ability to (a) predict the impacts of the following on the (SF3, SF4 MRSS) MAIN AND REHEAT STEAM 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 / 45.6) High reactor water level	4.1	70
74	(241000) (SF3 RTPRS) REACTOR/TURBINE PRESSURE REGULATING SYSTEM	x											(241000K1.24) Knowledge of the physical connections and/or cause and effect relationships between the (SF3 RTPRS) REACTOR/TURBINE PRESSURE REGULATING SYSTEM and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) Main turbine generator and auxiliary systems	3.3	71

75	(245000) (SF4 MTGEN) MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS				x								(245000K4.06) Knowledge of (SF4 MTGEN) MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS design features and/or interlocks that provide for the following: (CFR: 41.7) Generator protection	3.5	72
76	(256000) (SF2 CDS) CONDENSATE SYSTEM		x										(256000K2.02) (SF2 CDS) CONDENSATE SYSTEM Knowledge of electrical power supplies to the following: (CFR: 41.7) Motor-operated valves	2.7	73
77	(272000) (SF7, SF9 RMS) RADIATION MONITORING SYSTEM			×									(272000K3.06) Knowledge of the effect that a loss or malfunction of the (SF7, SF9 RMS) RADIATION MONITORING SYSTEM will have on the following systems or system parameters: (CFR: 41.5 / 45.3) Plant ventilations systems	3.3	74
78	(290003) (SF9 CRV) CONTROL ROOM VENTILATION						x						(290003K6.03) Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the (SF9 CRV) CONTROL ROOM VENTILATION: (CFR: 41.7 / 45.7) Plant pneumatic system	2.7	75
79	(202002) (SF1 RSCTL) RECIRCULATION FLOW CONTROL SYSTEM								x				(202002A2.12) Ability to (a) predict the impacts of the following on the (SF1 RSCTL) RECIRCULATION FLOW CONTROL 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 / 45.6) APRM/LPRM	3.4	23
80	(223001) (SF5 PCS) PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES								x				(223001A2.04) Ability to (a) predict the impacts of the following on the (SF5 PCS) PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: (CFR: 41.5 / 43.5 / 45.6) High containment/drywell hydrogen concentration	3.8	24
81	(510001) (SF8 CWS) CIRCULATING WATER SYSTEM											x	(510001) (SF8 CWS) CIRCULATING WATER SYSTEM (G2.2.20) EQUIPMENT CONTROL Knowledge of the process for managing troubleshooting activities (CFR: 41.10 / 43.5 / 45.13)	3.8	25
k	A Category Totals:	1	1	1	1	1	1	1	3	1	1	2	Group Point Total:		14

Form 4.1-COMMON Common Examination Outline

ES-4.1-COMMON		COMMON Examination Outline (Perry)					
Facility:	Perry			Da	te of Exam:	12/12/2022	
		Generic Knowledge and Abilities Outline (Tier 3) (RO/ <mark>S</mark> F	(O)			
					RO	SRO-C	Dnlv
Category	K/A #	Торіс	Item #	IR	Q#	IR	Q#
	G2.1.23	(G2.1.23) CONDUCT OF OPERATIONS Ability to perform general or normal operating procedures during any plant condition (CFR: 41.10 / 43.5 / 45.2 / 45.6)	82	4.3	1		
	G2.1.45	(G2.1.45) CONDUCT OF OPERATIONS Ability to identify and interpret diverse indications to validate the response of another indication (CFR: 41.7 / 43.5 / 45.4)	83	4.3	2		
1. Conduct of Operations	G2.1.25	(G2.1.25) CONDUCT OF OPERATIONS Ability to interpret reference materials, such as graphs, curves, and tables (reference potential) (CFR: 41.10 / 43.5 / 45.12)	84			4.2	1
	G2.1.39	(G2.1.39) CONDUCT OF OPERATIONS Knowledge of conservative decision-making practices (CFR: 41.10 / 43.5 / 45.12)	85			4.3	2
		Subtotal			2		2
	G2.2.1	(G2.2.1) EQUIPMENT CONTROL Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity (CFR: 41.5 / 41.10 / 43.5 / 43.6 / 45.1)	86	4.5	3		
	G2.2.14	(G2.2.14) EQUIPMENT CONTROL Knowledge of the process for controlling equipment configuration or status (CFR: 41.10 / 43.3 / 45.13)	87	3.9	4		
2. Equipment Control	G2.2.5	(G2.2.5) EQUIPMENT CONTROL Knowledge of the process for making design or operating changes to the facility, such as 10 CFR 50.59, "Changes, Tests and Experiments," screening and evaluation processes, administrative processes for temporary modifications, disabling annunciators, or installation of temporary equipment (CFR: 41.10 / 43.3 / 45.13)	88			3.2	3
	G2.2.36	(G2.2.36) EQUIPMENT CONTROL Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operation (CFR: 41.10 / 43.2 / 45.13)	89			4.2	4
		Subtotal			2		2
	G2.3.5	(G2.3.5) RADIATION CONTROL Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms or personnel monitoring equipment (CFR: 41.11 / 41.12 / 43.4 / 45.9)	90	2.9	5		
3. Radiation Control	G2.3.11	(G2.3.11) RADIATION CONTROL Ability to control radiation releases (CFR: 41.11 / 43.4 / 45.10)	91			4.3	5
		Subtotal			1		1
	G2.4.3	(G2.4.3) EMERGENCY PROCEDURES/PLAN Ability to identify post- accident instrumentation (CFR: 41.6 / 45.4)	92	3.7	6		
4. Emergency Procedures / Plan	G2.4.16	(G2.4.16) EMERGENCY PROCEDURES/PLAN Knowledge of emergency and abnormal operating procedures implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, or severe accident management guidelines (CFR: 41.10 / 43.5 / 45.13)	93			4.4	6
	G2.4.5	(G2.4.5) EMERGENCY PROCEDURES/PLAN Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions (CFR: 41.10 / 43.5 / 45.13)	94			4.3	7
		Subtotal			1		2
		Tier 3 Point Total			6		7

Form 4.1-COMMON Common Examination Outline

ES-4.1-COMMON COMMON Examination Outline (Perry)									
Facility:Perry Date of Exam: 12/12/2022									
Theory (Tier 4) (RO)									
Category	K/A #	Торіс	Item #	RO					
				IR	Q#				
Reactor Theory	292002	(292002K1.10) NEUTRON LIFE CYCLE (CFR: 41.1) Define shutdown margin	95	3.5	7				
	292006	(292006K1.05) FISSION PRODUCT POISONS (CFR: 41.1) Describe the following processes and state their effect on reactor operations: Equilibrium xenon	96	2.9	8				
	292007	(292007K1.01) FUEL DEPLETION AND BURNABLE POISONS (CFR: 41.1) Define burnable poison and state its use in the reactor	97	3.1	9				
	Subtotal								
Thermodynamics	293004	(293004K1.04) THERMODYNAMIC PROCESS (CFR: 41.14) (NOZZLES) Describe the functions of nozzles in air ejectors	98	2.6	10				
	293005	(293005K1.06) THERMODYNAMIC CYCLES (CFR: 41.14) Describe how changes in system parameters affect thermodynamic efficiency	99	2.6	11				
	293007	(293007K1.06) HEAT TRANSFER (CFR: 41.14) (HEAT EXCHANGERS) Discuss the factors that affect heat transfer rate in a heat exchanger	100	2.8	12				
	Subtotal								
Tier 3 Point Total									

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