Facility: Waterfor	ď						K/A	Cata	log	Rev.	2		Rev.	1 [Date	of Ex	xam: 02/	01/2022
Tior		Croup					RO Þ	K/A C	ateg	ory F	oints	5				SRC	D-Only P	oints
Tier		Group	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	Α	2	G*	Total
1.		1	2	1	4				4	4			3	18		8	3	6
Emergency an	d	2	1	1	2				2	1			2	9	2	2	2	4
Evolutions	n (Tier Totals	3	2	6				6	5			5	27	Ę	2	5	10
2		1	2	3	3	2	2	3	2	2	4	3	2	28	3	3	2	5
Plant		2	1	0	1	1	2	0	1	1	0	2	1	10	0	2	1	3
Systems		Tier Totals	3	3	4	3	4	3	3	3	4	5	3	38	Ę	2	3	8
2 Conorio Kn		has and Abilition C	atogo	rico			1	1	2	~ ~	3	4	4	10	1	2	3 4	7
5. Generic Ki	lowiec	ige and Abilities Ca	alego	mes		~ `	3	~ `	3	4	2	4	2	10	2	2	1 2	'
Note: 1.	Ensu	ure that at least two	o topi	cs fro	om e	very	appli	cable	e K/A	cate	gory	ares	samp	led withir	i eac	n tier	of the R	O and
	SRO	SRO-only outline sections (i.e., except for one category in Tier 3 of the SRO-only section, the "Tier Totals" in each K/A category shall not be less than two). (One Tier 3 radiation control K/A is allowed if it is replaced by a K/A from another Tier 3 category.)															ls" in	
	each K/A f	rom another Tier 3	l not L cate	be le	ss th	ian ti	vo). (One	lier	3 rac	liatio	n coi	ntrol	K/A is allo	owed	IT IT I	s replace	d by a
	10/11	K/A from another Tier 3 category.) The point total for each group and tier in the proposed outline must match that specified in the table. The final																
2.	The	he point total for each group and tier in the proposed outline must match that specified in the table. The final oint total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions.															ne final	
	The	ne 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. he final RO exam must total 75 points, and the SRO-only exam must total 25 points.															lsions.	
2	Suct					,	idoni	ified	on th		tline	Suc	+o mo		iono i	hot.	do pot or	nhy at the
З.	facili	tv should be delete	nin e ed wit	ach c h ius	tifica	tion.	Ope	ratior	on u nallv	ie ou impo	rtant.	oys site	-spe	cific svste	ms/e	volut	tions that	are not
	inclu	ded on the outline	shou	ld be	add	ed. F	Refer	to Se	ectio	n D.1	.b of	ES-	401 f	or guidan	ce re	gard	ing the e	limination
	of ina	appropriate K/A sta	teme	ents.														
4.	Sele	ct topics from as m	any	syste	ems a	and e	volut	ions	as p	ossib	le. S	ampl	le ev	ery syster	n or e	evolu	ution in th	e group
	befo	re selecting a seco	nd to	pic f	or an	y sys	stem	or ev	oluti	on.								
5.	Abse	ent a plant-specific	prior	ity, o	nly th	nose	K/As	havi	ng a	n imp	ortai	nce r	ating	(IR) of 2	.5 or l	highe	er shall b	e
<u>^</u>	selec	cted. Use the RO a	na S	RO r	ating	S TOP	the H	≺∪ a	na S	RO-0	oniy p		ons, r	espective	ıy.			
6. 7	Sele	ct SRU topics for I	iers	and and	ז 2 tr שמים	om ti	าe sr		1 SYS	tems	and	K/A	cate	jories.		h+ +	ha taniaa	musthe
7.	relev	ant to the applicab	le ev	olutio	na 2 on or	svat	em. I	Refer	to S	ectio	n D.1	on∠ 1.b o	f ES-	401 for th	alog, ie apj	plica	ble K/As.	must be
8.	On tl	he following pages	. ente	er the	e K/A	num	bers	. a bi	rief d	escri	ption	ofe	ach t	opic. the	topics	s' IRs	s for the	
	appli	cable license level	, and	the	point	total	s (#)	for e	ach	syste	em ar	nd ca	itego	ry. Enter t	the gi	roup	and tier	totals for
	each	i category in the tal	ble a	bove	. If fu	el-ha	andlir	ng eq	uipm	ient i	s san	npleo	d in a	category	othe	r tha	in Catego	ory A2 or
	G* o	n the SRO-only ex	am, e	enter	it on	the I	eft si	de of	f Coli	umn	A2 fo	or Tie	er 2, (Group 2. (Note	1 dc	pes not a	oply).
	Use	duplicate pages to	r RU	and	SRU	-oniy	exa	ms.										
9.	For 7	Tier 3, select topics	fron	1 Sec	tion	2 of t	he K	/A ca	atalog	g and	l ente	er the	e K/A	numbers	, des	cripti	ions, IRs	and
	point	t totals (#) on Form	ES-	401-3	3. Lin	nit SI	RO s	elect	ions	to K/	As th	at ar	e linł	ked to 10	CFR	55.4	3.	
G* Generic K/As												,						
*	of the	e systems/evolutions e K/A catalog is us ions of the K/A cat	ons m ed to alog	deve	elop	the s	d as ampl	part e pla	of th in. Th	e sar ney a	nple re no	(as a ot rec	quireo	able to th d to be inc	le fac	d wh	when Re en using	evision 3 earlier
**	The		alog.		م دانہ	miner		o m 4		- ا مصر	. (0.0	inch!	o to the f	ail:	\L	n Deviet	on 2 -f
	the k	K/A catalog is used	to de	iay D evelo	e eilf p the	ninai e san	ieu in Iple i	om ti blan	ie sa	ampie	; (as	appi	ICADI		cilly) wrie		01 3 01
							r											

ES-401						PWR	Exa	nination Outline (Waterford)	Form ES-4	01-2
			Eme	rgenc	y an	d Abr	norm	al Plant Evolutions—Tier 1/Group 1 (RO/SRO)		
Item #	E/APE # / Name / Safety Function	K1	К2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#
1	000007 (EPE 7; BW E02 & E10; CE E02) Reactor Trip, Stabilization, Recovery / 1		X					(000007EK2.03) Knowledge of the interrelations between (EPE 7) REACTOR TRIP, STABILIZATION, RECOVERY / 1 and the following (CFR: 41.7 / 45.7): Reactor trip status panel	3.5	11
2	000008 (APE 8) Pressurizer Vapor Space Accident / 3			Х				(000008AK3.02) Knowledge of the reasons for the following responses as they apply to the (APE 8) PRESSURIZER VAPOR SPACE ACCIDENT / 3 (CFR 41.5,41.10 / 45.6 / 45.13): Why PORV or code safety exit temperature is below RCS or PZR temperature	3.6	31
3	000009 (EPE 9) Small Break LOCA / 3				Х			(000009EA1.09) Ability to operate and / or monitor the following as they apply to (EPE 9) SMALL BREAK LOCA / 3 (CFR: 41.7 / 45.5 / 45.6): RCP	3.6	12
4	000009 (EPE 9) Small Break LOCA / 3					X		(000009EA2.01) Ability to determine and interpret the following as they apply to (EPE 9) SMALL BREAK LOCA / 3 (CFR: 43.5 / 45.13): Actions to be taken, based on RCS temp and press, saturated and superheated	4.8	81
5	000011 (EPE 11) Large Break LOCA / 3					Х		(000011EA2.06) Ability to determine and interpret the following as they apply to (EPE 11) LARGE BREAK LOCA / 3 (CFR: 43.5 / 45.13): That fan is in slow speed and dampers are in accident mode during LOCA	3.7	32
6	000015 (APE 15) Reactor Coolant Pump Malfunctions / 4						Х	(000015 (APE 15) Reactor Coolant Pump Malfunctions / 4) (G2.4.11) Knowledge of abnormal condition procedures. (CFR: 41.10)	4.0	33
7	000022 (APE 22) Loss of Reactor Coolant Makeup / 2					Х		(000022AA2.03) Ability to determine and interpret the following as they apply to the (APE 22) LOSS OF REACTOR COOLANT MAKEUP / 2 (CFR: 43.5 / 45.13): Failures of flow control valve or controller	3.1	13
8	000025 (APE 25) Loss of Residual Heat Removal System / 4			Х				(000025AK3.01) Knowledge of the reasons for the following responses as they apply to the (APE 25) LOSS OF RESIDUAL HEAT REMOVAL SYSTEM / 4 (CFR 41.5,41.10 / 45.6 / 45.13): Shift to alternate flowpath	3.1	34
9	000025 (APE 25) Loss of Residual Heat Removal System / 4						X	(000025 (APE 25) Loss of Residual Heat Removal System / 4) (G2.2.40) Ability to apply Tech Specs for a system. (CFR:43.2 / 43.5)	4.7	82
10	000026 (APE 26) Loss of Component Cooling Water / 8			Х				(000026AK3.01) Knowledge of the reasons for the following responses as they apply to the (APE 26) LOSS OF COMPONENT COOLING WATER / 8 (CFR 41.5,41.10 / 45.6 / 45.13): The conditions that will initiate the automatic opening and closing of the SWS isolation valves to the CCWS coolers	3.2	14
11	000027 (APE 27) Pressurizer Pressure Control System Malfunction / 3					Х		(000027AA2.11) Ability to determine and interpret the following as they apply to the (APE 27) PRESSURIZER PRESSURE CONTROL SYSTEM MALFUNCTION / 3 (CFR: 43.5 / 45.13): RCS pressure	4.0	35
12	000027 (APE 27) Pressurizer Pressure Control System Malfunction / 3						X	(000027 (APE 27) Pressurizer Pressure Control System Malfunction / 3) (G2.2.36) Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations. (CFR: 41.10 / 43.2 / 45.13)	4.2	83
13	000029 (EPE 29) Anticipated Transient Without Scram / 1	х						(000029EK1.01) Knowledge of the operational implications of the following concepts as they apply to (EPE 29) ANTICIPATED TRANSIENT WITHOUT SCRAM / 1 (CFR: 41.8 / 41.10 / 45.3): Reactor nucleonics and thermo-hydraulics behavior	2.8	15

14	000038 (EPE 38)				Х			(000038EA1.19) Ability to operate and / or monitor the	3.4	36
	Steam Generator							following as they apply to (EPE 38) STEAM GENERATOR		
	Tube Rupture / 3							TUBE RUPTURE / 3 (CFR: 41.7 / 45.5 / 45.6): MFW System		
								status indicator		
15	000038 (EPE 38)					X		(000038EA2.08) Ability to determine and interpret the	4.4	84
	Steam Generator							following as they apply to (EPE 38) STEAM GENERATOR		
	Tube Rupture / 3							TUBE RUPTURE / 3 (CFR: 43.5 / 45.13): Viable alternatives		
								for placing plant in safe condition when condenser is not		
								available		
16	000040 (APE 40;	Х						(000040AK1.04) Knowledge of the operational implications of	3.2	16
	BW E05; CE E05;							the following concepts as they apply to (APE 40) STEAM LINE		
	W E12) Steam Line							RUPTURE - EXCESSIVE HEAT TRANSFER / 4 (CFR 41.8 /		
	Rupture –							41.10 / 45.3): Nil ductility temperature		
	Excessive Heat									
17	000054 (APE 54;				Х			(000054AA1.02) Ability to operate and / or monitor the	4.4	37
	CE E06) Loss of							following as they apply to the (APE 54) LOSS OF MAIN		
	Main Feedwater /4							FEEDWATER /4 (CFR 41.7 / 45.5 / 45.6): Manual startup of		
								electric and steam-driven AFW pumps		
18	000055 (EPE 55)						X	(000055 (EPE 55) Station Blackout / 6) (G2.1.7) Ability to	4.7	85
	Station Blackout /							evaluate plant performance and make operational		
	6							judgements based on operating characteristics, reactor		
								behavior, and instrument interpretation. (CFR: 43.5)		
19	000056 (APE 56)						Х	(000056 (APE 56) Loss of Offsite Power / 6) (G2.4.8)	3.8	17
	Loss of Offsite							Knowledge of how abnormal operating procedures are used in		
	Power / 6							conjunction with EOPs. (CFR: 41.10 / 43.5 / 45.13)		
20	000057 (APE 57)						X	(000057 (APE 57) Loss of Vital AC Instrument Bus / 6)	4.5	38
	Loss of Vital AC							(G2.4.4) Ability to recognize abnormal indications for system		
	Instrument Bus / 6							operating parameters that are entry-level conditions for		
								43.2 / 45.6)		
					, v					- 10
21	000058 (APE 58)				X			(000058AA1.01) Ability to operate and / or monitor the	3.4	18
	Loss of DC Power /							following as they apply to the (APE 58) LUSS OF DC POWER		
	0							/ 6 (GFR 41.7 / 45.5 / 45.6): Cross-lie of the affected dc bus		
						×				
22	000062 (APE 62)					×		(000062AA2.03) Ability to determine and interpret the	2.9	86
	Loss of Nuclear							following as they apply to the (APE 62) LOSS OF		
	Service water / 4							NUCLEAR SERVICE WATER / 4 (CFR: 43.5 / 45.13): The		
								valve inteups necessary to restart the SWS wille		
								condition		
						V			0.0	00
23	000065 (APE 65)					X		(000065AA2.08) Ability to determine and interpret the following	2.9	39
	Air / 8							as they apply to the (APE 65) LOSS OF INSTRUMENT AIR / 8 (CEP: 43.5 / 45.13): Eailure modes of air operated equipment		
	/ / 0									
24				v				(0000774K2.04) Knowledge of the receive for the following	2.0	40
24	Generator Voltage			^				(000077AK3.01) Knowledge of the reasons for the following	3.9	40
	and Electric Grid							VOLTAGE AND ELECTRIC GRID DISTURBANCES / 6 (CER		
	Disturbances / 6							41.5.41.10 / 45.6 / 45.13): Reactor and turbine trip criteria		
			<u> </u>	<u> </u>						
	Outside							Not Applicable to CE		
	Containment / 3									
	(W E11) Loss of		 	 						
	Emergency Coolant		1		ĺ			Not Applicable to CF		
	Recirculation / 4		1							
	(BW E04: W E05)									
	Inadequate Heat		1							
	Transfer – Loss of							Not Applicable to CF		
	Secondary Heat									
	Sink / 4									
K/A C	Category Totals:	2	1	4	4	4 / 3	3 / <mark>3</mark>	Group Point Total:		18 / <mark>6</mark>

ES-401			_			PWR	Exa	nination Outline (Waterford)	Form ES-4	01-2
	E/ADE #/ Nome /		Eme	rgenc	y and	d Abr I	norma I	al Plant Evolutions—Tier 1/Group 2 (RO/ <mark>SRO</mark>)	<u> </u>	
Item #	E/APE # / Name /	K1	K2	К3	A1	A2	G*	K/A Topic(s)	IR	Q#
25	000001 (APE 1)		Х					(000001AK2.05) Knowledge of the interrelations between the	2.9	41
	Continuous Rod							(APE 1) CONTINUOUS ROD WITHDRAWAL / 1 and the		
	Withdrawal / 1							following (CFR 41.7 / 45.7): Rod motion lights		
26	000003 (APE 3)			Х				(000003AK3.10) Knowledge of the reasons for the following	3.2	42
	Dropped Control							responses as they apply to the (APE 3) DROPPED CONTROL		
	Rod / 1							ROD / 1 (CFR 41.5,41.10 / 45.6 / 45.13): RIL and PDIL		
27	000024 (APE 24)						X	(000024 (APE 24) Emergency Boration / 1) (G2.2.37) Ability	4.6	87
	Emergency Boration / 1							to determine operability and/or availability of safety		
20		v						(0000000 AI(4.04) Knowledge of the expertised involves of	2.0	12
20	Pressurizer (PZR)	^						(000028AK1.01) Knowledge of the operational implications of the following concents as they apply to (APE 28)	2.0	43
	Level Control							PRESSURIZER (PZR) EVEL CONTROL MAI FUNCTION / 2		
	Malfunction / 2							(CFR 41.8 / 41.10 / 45.3): PZR reference leak abnormalities		
	000032 (APE 32)									
	Loss of Source									
	Range Nuclear							Not Selected		
	Instrumentation / 7									
29	000033 (APE 33)				Х			(000033AA1.02) Ability to operate and / or monitor the	3.0	44
	Loss of							following as they apply to the (APE 33) LOSS OF		
	Intermediate Range							INTERMEDIATE RANGE NUCLEAR INSTRUMENTATION / 7		
	Nuclear							(CFR 41.7 / 45.5 / 45.6): Level trip bypass		
	Instrumentation / 7									
30	000036 (APE 36;					X		(000036AA2.03) Ability to determine and interpret the	4.2	88
	BW/A08) Fuel-							following as they apply to the Fuel handling accidents		
	8							(CFR: 43.5 / 45.13): Magnitude of potential radioactive		
	0							Telease		
24				v					4.4	45
31	000037 (APE 37) Steam Generator			×				(000037AK3.08) Knowledge of the reasons for the following	4.1	45
	Tube Leak / 3							GENERATOR TUBE LEAK / 3 (CER 41 5 41 10 / 45 6 /		
								45.13): Criteria for securing RCP		
	000051 (APE 51)							, 3		
	Loss of Condenser							Not Selected		
	Vacuum / 4									
	000059 (APE 59)									
	Accidental Liquid							Net Selected		
	Radwaste Release /							Not Selected		
	9									
	000060 (APE 60)									
	Accidental Gaseous							Not Selected		
	Q									
			<u> </u>						<u> </u>	
	Area Radiation		1							
	Monitoring System		1					Not Selected		
	Alarms / 7		1							
32	000067 (APF 67)				Х			(000067AA1 07) Ability to operate and / or monitor the	2.9	46
	Plant Fire On Site /		1					following as they apply to the (APE 67) PLANT FIRE ON SITE		
	8		1					/ 8 (CFR 41.7 / 45.5 / 45.6): Fire alarm reset panel		
33	000068 (APE 68;		1			X		(000068AA2.03) Ability to determine and interpret the	4.2	89
	BW A06) Control							following as they apply to the (APE 68) CONTROL ROOM		
	Room Evacuation /		1					EVACUATION / 8 (CFR: 43.5 / 45.13): T-hot, T-cold, and in-		
	8							core temperatures		

34	000069 (APE 69; W E14) Loss of Containment Integrity / 5				X	(000069 (APE 69; W E14) Loss of Containment Integrity / 5) (G2.4.21) Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc. (CFR: 41.7 / 43.5 / 45.12)	4.0	47
35	000074 (EPE 74; W E06 & E07) Inadequate Core Cooling / 4			Х		(000074EA2.08) Ability to determine and interpret the following as they apply to (EPE 74) INADEQUATE CORE COOLING / 4 (CFR: 43.5 / 45.13): The effect of turbine bypass valve operation on RCS temperature and pressure	3.8	48
	000076 (APE 76) High Reactor Coolant Activity / 9					Not Selected		
	000078 (APE 78*) RCS Leak / 3					Not Selected		
	(W E01 & E02) Rediagnosis & SI Termination / 3					Not Applicable to CE		
	(W E13) Steam Generator Overpressure / 4					Not Applicable to CE		
	(W E15) Containment Flooding / 5					Not Applicable to CE		
	(W E16) High Containment Radiation /9					Not Applicable to CE		
	(BW A01) Plant Runback / 1					Not Applicable to CE		
	(BW A02 & A03) Loss of NNI-X/Y/7					Not Applicable to CE		
	(BW A04) Turbine Trip / 4					Not Applicable to CE		
	(BW A05) Emergency Diesel Actuation / 6					Not Applicable to CE		
	(BW A07) Flooding / 8					Not Applicable to CE		
	(BW E03) Inadequate Subcooling Margin / 4					Not Applicable to CE		
	(BW E08; W E03) LOCA Cooldown – Depressurization / 4					Not Applicable to CE		
36	(BW E09; CE A13**; W E09 & E10) Natural Circulation/4				Х	((BW E09; CE A13**; W E09 & E10) Natural Circulation/4) (G2.1.20) Ability to interpret and execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)	4.6	49
	(BW E13 & E14) EOP Rules and Enclosures					Not Applicable to CE		
	(CE A11**; W E08) RCS Overcooling – Pressurized Thermal Shock / 4					Not Selected		
37	(CE A16) ExcessRCS Leakage / 2				X	(CE A16 Excess RCS leakage / 2) (G2.2.25) Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits (43.2)	4.2	90

	(CE E09) Functional Recovery							Not Selected	
	(CE E13*) Loss of Forced Circulation / LOOP / Blackout / 4							Not Selected	
K/A (Category Totals:	1	1	2	2	1 / <mark>2</mark>	2 / <mark>2</mark>	Group Point Total:	9 / <mark>4</mark>

ES-401					Pla	PWR nt Sy	Exar stem	ninat ıs —T	ion C ier 2/	utlin Grou	e (Wa ıp 1 (I	aterfo RO/ <mark>S</mark>	ord) i <mark>RO</mark>)	Form ES-4	401-2
Item #	System / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	Q#
38	003 (SF4P RCP) Reactor Coolant Pump System						X						(003K6.04) Knowledge of the of the effect of a loss or malfunction on the following will have on the (SF4P RCP) REACTOR COOLANT PUMP SYSTEM (CFR: 41.7 / 45.7): Containment isolation valves affecting RCP operation	2.8	1
39	004 (SF1; SF2 CVCS) Chemical and Volume Control System											Х	(004 (SF1; SF2 CVCS) CHEMICAL AND VOLUME CONTROL SYSTEM) (G2.4.18) Knowledge of the specific bases for EOPs. (CFR: 41.10 / 43.1 / 45.13)	3.3	2
40	004 (SF1; SF2 CVCS) Chemical and Volume Control System						X						(004K6.05) Knowledge of the of the effect of a loss or malfunction on the following will have on the (SF1; SF2 CVCS) CHEMICAL AND VOLUME CONTROL SYSTEM (CFR: 41.7 / 45.7): Sensors and detectors	2.5	9
41	005 (SF4P RHR) Residual Heat Removal System			X									(005K3.06) Knowledge of the effect that a loss or malfunction of the (SF4P RHR) RESIDUAL HEAT REMOVAL SYSTEM will have on the following (CFR: 41.7 / 45.6): CSS	3.1	3
42	006 (SF2; SF3 ECCS) Emergency Core Cooling System		X										(006K2.04) Knowledge of the bus power supplies to the following (SF2; SF3 ECCS) EMERGENCY CORE COOLING SYSTEM (CFR: 41.7): ESFAS-operated valves	3.6	4
43	006 (SF2; SF3 ECCS) Emergency Core Cooling System								x				(006A2.02) Ability to (a) predict the impacts of the following on the (SF2; SF3 ECCS) EMERGENCY CORE COOLING SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation (CFR: 41.5 /43.5/ 45.3/45.13): Loss of flow path	4.3	76

44	007 (SF5 PRTS) Pressurizer Relief / Quench Tank System			X						(007K5.02) Knowledge of the operational implications of the following concepts as they apply to the (SF5 PRTS) PRESSURIZER RELIEF/QUENCH TANK SYSTEM (CFR: 41.5 / 45.7): Method of forming a steam bubble in the PZR	3.1	5
45	007 (SF5 PRTS) Pressurizer Relief / Quench Tank System					x				(007A2.02) Ability to (a) predict the impacts of the following on the (SF5 PRTS) PRESSURIZER RELIEF/QUENCH TANK SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation (CFR: 41.5 /43.5/ 45.3/45.13): Abnormal pressure in the PRT	3.2	77
46	008 (SF8 CCW) Component Cooling Water System						x			(008A3.08) Ability to monitor automatic operations of the (SF8 CCW) COMPONENT COOLING WATER SYSTEM including (CFR: 41.7 / 45.5): Automatic actions associated with the CCWS that occur as a result of a safety injection signal	3.6	6
47	010 (SF3 PZR PCS) Pressurizer Pressure Control System							x		(010A4.03) (SF3 PZR PCS) PRESSURIZER PRESSURE CONTROL SYSTEM Ability to manually operate and/or monitor in the control room (CFR: 41.7 / 45.5 to 45.8): PORV and block valves	4.0	7
48	010 (SF3 PZR PCS) Pressurizer Pressure Control System								X	(010 (SF3 PZR PCS) PRESSURIZER PRESSURE CONTROL SYSTEM) (G2.4.41) Knowledge of the emergency action level thresholds and classifications. (CFR: 41.10 / 43.5 / 45.11)	4.6	78
49	012 (SF7 RPS) Reactor Protection System				X					(012A1.01) Ability to predict and/or monitor changes in parameters associated with operating the (SF7 RPS) REACTOR PROTECTION SYSTEM controls including (CFR: 41.5 / 45.5): Trip setpoint adjustment	2.9	8
50	012 (SF7 RPS) Reactor Protection System							х		(012A4.01) (SF7 RPS) REACTOR PROTECTION SYSTEM Ability to manually operate and/or monitor in the control room (CFR: 41.7 / 45.5 to 45.8): Manual trip button	4.5	19

51	013 (SF2 ESFAS) Engineered Safety Features Actuation System			X					(013K6.01) Knowledge of the of the effect of a loss or malfunction on the following will have on the (SF2 ESFAS) ENGINEERED SAFETY FEATURES ACTUATION SYSTEM (CFR: 41.7 / 45.7): Sensors and detectors	2.7	10
52	013 (SF2 ESFAS) Engineered Safety Features Actuation System							x	(013 G2.2.38) Engineered Safety Features Actuation System Knowledge of conditions and limits in the facility license (CFR: 43.1)	4.5	79
53	022 (SF5 CCS) Containment Cooling System							Х	(022 (SF5 CCS) CONTAINMENT COOLING SYSTEM) (G2.4.34) Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects. (CFR: 41.10 / 43.5 / 45.13)	4.2	20
	025 (SF5 ICE) Ice Condenser System								Not Applicable to WAT-3		
54	026 (SF5 CSS) Containment Spray System					X			(026A2.08) Ability to (a) predict the impacts of the following on the (SF5 CSS) CONTAINMENT SPRAY SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation (CFR: 41.5 /43.5/ 45.3/45.13): Safe securing of containment spray when it can be done)	3.2	21
55	026 (SF5 CSS) Containment Spray System					x			(026A2.06) Ability to (a) predict the impacts of the following on the (SF5 CSS) CONTAINMENT SPRAY SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation (CFR: 41.5 /43.5/ 45.3/45.13): Safe Securing of Containment Spray (when it can be done)	3.2	80
56	039 (SF4S MSS) Main and Reheat Steam System				X				(039A1.06) Ability to predict and/or monitor changes in parameters associated with operating the (SF4S MSS) MAIN AND REHEAT STEAM SYSTEM controls including (CFR: 41.5 / 45.5): Main steam pressure	3.0	22
	053 (SF1; SF4P ICS*) Int Control System								Not Applicable to CE		
57	059 (SF4S MFW) Main Feedwater System						Х		(059A4.11) (SF4S MFW) MAIN FEEDWATER SYSTEM Ability to manually operate and/or monitor in the control room (CFR: 41.7 / 45.5 to 45.8): Recovery from automatic feedwater isolation	3.1	23

58	061 (SF4S AFW) Auxiliary / Emergency Feedwater System			X						(061K4.06) Knowledge of (SF4S AFW) AUXILIARY / EMERGENCY FEEDWATER SYSTEM design feature(s) and or interlock(s) which provide for the following (CFR: 41.7): AFW startup permissives	4.0	24
59	062 (SF6 ED AC) AC Electrical Distribution System	x								(062K2.01) (SF6 ED AC) AC ELECTRICAL DISTRIBUTION SYSTEM Knowledge of electrical power supplies to the following (CFR: 41.7): Major system loads	3.3	50
60	062 (SF6 ED AC) AC Electrical Distribution System		x							(062K3.01) Knowledge of the effect that a loss or malfunction of the (SF6 ED AC) AC ELECTRICAL DISTRIBUTION SYSTEM will have on the following (CFR: 41.7 / 45.6): Major system loads	3.5	25
61	063 (SF6 ED DC) DC Electrical Distribution System	×								(063K2.01) (SF6 ED DC) DC ELECTRICAL DISTRIBUTION SYSTEM Knowledge of electrical power supplies to the following (CFR: 41.7): Major DC loads	2.9	51
62	064 (SF6 EDG) Emergency Diesel Generator System							X		(064A3.13) Ability to monitor automatic operations of the (SF6 EDG) EMERGENCY DIESEL GENERATOR SYSTEM including (CFR: 41.7 / 45.5): Rpm controller/megawatt load control (breaker-open/ breaker-closed effects)	3.0	26
63	073 (SF7 PRM) Process radiation Monitoring System		X							(073K3.01) Knowledge of the effect that a loss or malfunction of the (SF7 PRM) PROCESS RADIATION MONITORING SYSTEM will have on the following (CFR: 41.7 / 45.6): Radioactive effluent releases	3.6	52
64	073 (SF7 PRM) Process radiation Monitoring System				X					(073K5.01) Knowledge of the operational implications of the following concepts as they apply to the (SF7 PRM) PROCESS RADIATION MONITORING SYSTEM (CFR: 41.5 / 45.7): Radiation theory, including sources, types, units, and effects	2.5	27
65	076 (SF4S SW) Service Water System						X			(076A2.02) 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 operation (CFR: 41.5 /43.5/ 45.3/45.13): Service water header pressure	2.7	53

66	076 (SF4S SW) Service Water	Х											(076K1.19) Knowledge of the physical connections and/or cause-	3.6	28
	System												effect relationships between (SF4S SW) SERVICE WATER SYSTEM		
													and the following (CFR: 41.2 to 41.9		
													heat loads		
67	078 (SF8 IAS) Instrument Air System									х			(078A3.01) Ability to monitor automatic operations of the (SF8 IAS) INSTRUMENT AIR SYSTEM including (CFR: 41.7 / 45.5): Air pressure	3.1	54
68	078 (SF8 IAS) Instrument Air System	X											(078K1.05) Knowledge of the physical connections and/or cause- effect relationships between (SF8 IAS) INSTRUMENT AIR SYSTEM and the following (CFR: 41.2 to 41.9 / 45.7 to 45.8): MSIV air	3.4	29
69	103 (SF5 CNT) Containment System									х			(103A3.01) Ability to monitor automatic operations of the (SF5 CNT) CONTAINMENT SYSTEM including (CFR: 41.7 / 45.5): Containment isolation	3.9	55
70	103 (SF5 CNT) Containment System				X								(103K4.01) Knowledge of (SF5 CNT) CONTAINMENT SYSTEM design feature(s) and or interlock(s) which provide for the following (CFR: 41.7): Vacuum breaker protection	3.0	30
K/A C	Category Totals:	2	3	3	2	2	3	2	2 / <mark>3</mark>	4	3	2 / <mark>2</mark>	Group Point Total:		28 / <mark>5</mark>

ES-401					D	PWR	Exar	ninat	ion C	outlin	e (Wa	aterfo	ord) (SPO)	Form ES-4	401-2
							Jysie	1113 -		2/01					
Item # 71	System / Name 001 (SF1 CRDS)	K1	K2	K3	K4	K5	K6	A1	A2 X	A3	A4	G*	K/A Topic(s) (001A2.13) Ability to (a) predict the	IR 4.4	Q# 59
	Control Rod Drive System												impacts of the following on the (SF1 CRDS) CONTROL ROD DRIVE SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation (CFR: 41.5/43.5/ 45.3/45.13): ATWS		
72	002 (SF2; SF4P RCS) Reactor Coolant System					x							(002K5.12) Knowledge of the operational implications of the following concepts as they apply to the (SF2; SF4P RCS) REACTOR COOLANT SYSTEM (CFR: 41.5 / 45.7): Relationship of temperature average and loop differential temperature to loop hot-let and cold- leg temperature indications	3.7	60
73	011 (SF2 PZR LCS) Pressurizer Level Control System										x		(011A4.03) (SF2 PZR LCS) PRESSURIZER LEVEL CONTROL SYSTEM Ability to manually operate and/or monitor in the control room (CFR: 41.7 / 45.5 to 45.8): PZR heaters	3.3	61
74	014 (SF1 RPI) Rod Position Indication System					x							(014K5.01) Knowledge of the operational implications of the following concepts as they apply to the (SF1 RPI) ROD POSITION INDICATION SYSTEM (CFR: 41.5 / 45.7): Reasons for differences between RPIS and step counter	2.7	62
75	015 (SF7 NI) Nuclear Instrumentation System								x				(015A2.05) Ability to (a) predict the impacts of the following on the (SF7 NI) NUCLEAR INSTRUMENTATION SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation (CFR: 41.5 /43.5/ 45.3/45.13): Core void formation	3.8	91
	016 (SF7 NNI) Non-Nuclear Instrumentation System												Not Selected		
	017 (SF7 ITM) In-Core Temperature Monitoring System												Not Selected		

76	027 (SF5 CIRS) Containment Iodine Removal System						X		(027A4.03) (SF5 CIRS) CONTAINMENT IODINE REMOVAL SYSTEM Ability to manually operate and/or monitor in the control room (CFR: 41.7 / 45.5 to 45.8): CIRS fans	3.3	66
	Hydrogen Recombiner and Purge Control								Not Selected		
	Containment Purge System								Not Selected		
77	033 (SF8 SFPCS) Spent Fuel Pool Cooling System				x				(033A1.02) Ability to predict and/or monitor changes in parameters associated with operating the (SF8 SFPCS) SPENT FUEL POOL COOLING SYSTEM controls including (CFR: 41.5 / 45.5): Radiation monitoring systems	2.8	67
	034 (SF8 FHS) Fuel Handling Equipment System								Not Selected		
78	035 (SF4P SG) Steam Generator System	X							(035K1.02) Knowledge of the physical connections and/or cause- effect relationships between (SF4P SG) STEAM GENERATOR SYSTEM and the following (CFR: 41.2 to 41.9 / 45.7 to 45.8): MRSS	3.2	68
79	041 (SF4S SDS) Steam Dump / Turbine Bypass Control System		x						(041K3.04) Knowledge of the effect that a loss or malfunction of the (SF4S SDS) STEAM DUMP/TURBINE BYPASS CONTROL SYSTEM will have on the following (CFR: 41.7 / 45.6): Reactor power	3.5	73
	045 (SF4S MTG) Main Turbine Generator System								Not Selected		
	050 (SF9 CRV*) Control Room Ventilation								Not selectable KA (r3)		
	055 (SF4S CARS) Condenser Air removal								Not Selected		
80	056 (SF4S CDS) Condensate System							Х	(056 (SF4S CDS) CONDENSATE SYSTEM) (G2.1.23) Ability to perform specific and integrated plant procedures during all modes of operation. (CFR:41.10)	4.3	74
	068 (SF9 LRS) Liquid radwaste								Not Selected		

81	071 (SF9 WGS) Waste Gas Disposal System											X	(071 (SF9 WGS) WASTE GAS4DISPOSAL SYSTEM) (G2.1.32)Ability to explain and applysystem limits and precautions.(CFR: 41.10 / 43.2 / 45.12)	.0	92
	072 (SF7 ARM) Area Radiation Monitoring System												Not Selected		
82	075 (SF8 CW) Circulating Water System				x								(075K4.01) Knowledge of (SF8 CW) 2 CIRCULATING WATER SYSTEM design feature(s) and or interlock(s) which provide for the following (CFR: 41.7): Heat sink	.5	75
83	079 (SF8 SAS**) Station Air System								X				(079A2.01) Ability to (a) predict3the impacts of the following onthe (SF8 SAS**) STATION AIRSYSTEM and (b) based on thosepredictions, use procedures tocorrect, control, or mitigate theconsequences of those abnormaloperation (CFR: 41.5 /43.5/45.3/45.13): Cross-connectionwith IAS	.2	93
	086 (SF8 FPS) Fire Protection												Not Selected		
K/A (Category Totals:	1	0	1	1	2	0	1	1 / <mark>2</mark>	0	2	1 / <mark>1</mark>	Group Point Total:	10 / <mark>3</mark>	

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

		Generic Knowledge and Abilities Outline (Tier 3) (RO/S	SRO)				
Facility: Waterford				Date of Ex	kam:	02/01/2022	2
				R	0	SRO	-Only
Category	K/A #	Торіс	Item #	IR	Q#	IR	Q#
1. Conduct of Operations	G2.1.19	(G2.1.19) Ability to use plant computers to evaluate system or component status. (CFR: 41.10 / 45.12)	84	3.9	56		
	G2.1.21	(G2.1.21) Ability to verify the controlled procedure copy. (CFR: 41.10 / 45.10 / 45.13)	85	3.5	57		
	G2.1.8	(G2.1.8) Ability to coordinate personnel activities outside the control room. (CFR: 41.10 / 45.5 / 45.12 / 45.13)	86	3.4	58		
	G2.1.34	(G2.1.34) Knowledge of primary and secondary plant chemistry limits. (CFR: 41.10 / 43.5 / 45.12)	91			3.5	94
	G2.1.35	(G2.1.35) Knowledge of the fuel-handling responsibilities of SROs. (CFR: 41.10 / 43.7)	92			3.9	95
	Subtotal				3		2
2. Equipment Control	G2.2.12	(G2.2.12) Knowledge of surveillance procedures. (CFR: 41.10 / 45.13)	89	3.7	63		
	G2.2.38	(G2.2.38) Knowledge of conditions and limitations in the facility license. (CFR: 41.7 / 41.10 / 43.1 / 45.13)	90	3.6	64		
	G2.2.43	(G2.2.43) Knowledge of the process used to track inoperable alarms. (CFR: 41.10 / 43.5 / 45.13)	91	3.0	65		
	G2.2.11	(G2.2.11) Knowledge of the process for controlling temporary design changes. (CFR: 41.10 / 43.3 / 45.13)	96			3.3	96
	G2.2.21	(G2.2.21) Knowledge of pre- and post-maintenance operability requirements. (CFR: 41.10 / 43.2)	97			4.1	97
	Subtotal	•			3		2
3. Radiation Control	G2.3.13	(G2.3.13) Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (CFR: 41.12 / 43.4 / 45.9 / 45.10)	94	3.4	69		
	G2.3.7	(G2.3.7) Ability to comply with radiation work permit requirements during normal or abnormal conditions. (CFR: 41.12 / 45.10)	95	3.5	70		
	G2.3.11	(G2.3.11) Ability to control radiation releases. (CFR: 41.11 / 43.4 / 45.10)	98			4.3	98
	Subtotal				2		1
4. Emergency Procedures/Plan	G2.4.17	(G2.4.17) Knowledge of EOP terms and definitions. (CFR: 41.10 / 45.13)	97	3.9	71		
	G2.4.30	(G2.4.30) Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. (CFR: 41.10 / 43.5 / 45.11)	98	2.7	72		
	G2.4.23	(G2.4.23) Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations. (CFR: 41.10 / 43.5 / 45.13)	99			4.4	99
	G2.4.28	(G2.4.28) Knowledge of procedures relating to a security event (non-safeguards information). (CFR: 41.10 / 43.5 / 45.13)	100			4.1	100
	Subtotal		•		2		2
Tier 3 Point Total					10		7

Administrative Topics Outline

Facility: Waterford 3 Date of Examination: 01/25/2022										
Examination Level: RO	SRO	Operating Test Number: 1								
Administrative Topic (see Note)	Type Code*	Describe activity to be performed								
A1	N,R	EFW Pump operability calculation								
Conduct of Operations K/A Importance: 4.6		2.1.20 Ability to interpret and execute procedure steps.								
A2		Calculate Pressurizer heater operability								
Equipment Control K/A Importance: 3.7	N,R	2.2.12, Knowledge of Surveillance Procedures.								
A3 Use created 1/M plot to estimate criticality										
Conduct of Operations K/A Importance: 3.9	N,R	2.1.25, Ability to interpret reference materials, such as graphs, curves, tables, etc								
A4	M,R	2.3.4, Knowledge of radiation exposure limits under normal and emergency conditions.								
Radiation Control K/A Importance: 3.2		Calculate Stay Times Based on Dose Rates								
Emergency Plan Not Selected										
NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).										
* Type Codes and Criteria	 * Type Codes and Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1, randomly selected) 									

Administrative Topics Outline

Facility: <u>Waterf</u> Examination Level: RO	ord 3	Date of Examination: <u>1/25/2022</u> Operating Test Number: 1								
Administrative Topic (see Note)	Type Code*	Describe activity to be performed								
A5 Conduct of Operations K/A Importance: 4.6	N, R	Review EFW pump Operability Calc (TS) 2.1.20, Ability to interpret and execute procedure steps								
A6 Equipment Control K/A Importance: 4.1	N, R	Review PZR HTR Operability (TS) 2.2.12, Knowledge of Surveillance Procedures								
A7 Conduct of Operations K/A Importance: 4.2	N, R	Review 1/M plot and ECP 2.1.25, Ability to interpret reference materials, such as graphs, curves, tables, etc.								
A8 Radiation Control K/A Importance: 3.7	M, R	 2.3.4, Knowledge of radiation exposure limits under normal or emergency conditions. Authorize Emergency Exposure as the Emergency Director in accordance with EP-002-030, Emergency Radiation Exposure Guidelines and Controls. 								
A9 Determine EAL Emergency Plan N,R 2.4.41, Knowledge of the emergency action level K/A Importance: 4.6 thresholds and classifications.										
NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).										
* Type Codes and Criteria	: (C)ontro (D)irect (N)ew o (P)revio	ol room, (S)imulator, or Class(R)oom from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes) r (M)odified from bank (≥ 1) us 2 exams (≤ 1, randomly selected)								

Control Room/In-Plant Systems Outline

Facility: Waterford 3	Date of Examination:	01/25/2022		
Exam Level: RO 🛛 SRO-I 🖾 SRO-U 🖾	Operating Test Number:	1		
Control Room Systems: [*] 8 for RO, 7 for SRO-I, and 2 or 3 fo	r SRO-U			
System/JPM Title	Type Code*	Safety Function		
S1 Adjust Rods for axial flux-Alt path	N, A, S	1		
001 A2.11 Situations requiring Rx trip				
RO-4.4				
S2 Establish natural circulation	N, L, S	2		
CE A13 AA.1.1 Ability to operate components for Nat	Circ			
RO-3.3				
S3 Raise SIT pressure A	N, EN, S	3		
006 A4.02 Ability to operate ECCS valves (SIT)				
RO – 4.1				
S4 Start the B RCP-Alt path	N, A, L, S	4P		
003 A4.06 Ability to operate / monitor RCP parameter	rs			
RO – 2.9				
S5 Place H2 recombiner in service during LOCA-Alt path	N, A, EN, L,	5		
A4.01 HRPS Controls RO - 4.0	5			
S6 Energize 1A safety bus from offsite power	D, S	6		
064 A4.07 Transfer EDG load to grid				
operations RO-3.4 (direct from Aug 2011 Exam)				
S7 Swap SFP cooling pumps-alt path	N, A, S	8		
033 A2.02, LOSS OF SFPC5 RO - 2.7				
S8 Discharge Waste Condensate Tank A to CW system	D, A, S	9		
068 A4.03 Stop release if limits exceeded RO – 3.9				
(NRC 2017 Exam)				
In-Plant Systems: [*] 3 for RO, 3 for SRO-I, and 3 or 2 for SRC)-U			
P1 Locally borate RCS after control room evacuation	N, E, L	1		

Control Room/In-Plant Systems Outline

Form ES-301-2

Facility: <u>Waterford 3</u>	Date of Examination:	01/25/2022
Exam Level: RO 🛛 SRO-I 🖾 SRO-U	Operating Test Num	ber: <u>1</u>
Control Room Systems:* 8 for RO, 7 for SRO-I, and	1 2 or 3 for SRO-U	
System/JPM Title	Type Cod	e* Safety Function
P2 Reset EFW turb trip	D, L, R,	E 4S
061 A2.04 Pump failure or improper operation	on	
RO-3.4 (Used on March 2011 Exam)		
Note: Alternate JPMs may be N2 accum sur startup or Liquid radwaste (LR-42A/44 pane	veillance during ls)	
P3 Place Battery Charger 1B in service	N, A	6
062 A3.04 Operation of inverter RO – 2.7		
* All RO and SRO-I control room (and in-plant) s functions, all five SRO-U systems must serve of functions may overlap those tested in the cont	systems must be different and serve different safety functions, and in-pla rol room.	e different safety ant systems and
* Type Codes	Criteria for R /SRO-I/SRO-L	
 (A)Iternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power/Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator 	46/46 /23 ≤ 9/≤ 8/≤ 4 ≥ 1/≥ 1/≥ 1 ≥ 1/≥ 1/≥ 1 (control room system) ≥ 1/≥ 1/≥ 1 ≥ 2/≥ 2/≥ 1 ≤ 3/≤ 3/≤ 2 (randomly select) ≥ 1/≥ 1/≥ 1	stem) 5 0 9 2 5 6 2 6 2 2 1 8

Alt RCA JPM topics include Swap waste gas, N2 accum SR during startup, Liq Radwaste (local panels LR-42A / LR44), or Boron management LR panel.

NRC JPM Examination Summary Description

S1: The plant has just down-powered to 70% power due to a feedwater heater tube leak and the CRS has directed you to balance ASI IAW procedure OP-010-004, Attachment 9.4 using control rods. Once the applicant has started to move control rods, several rods drop into the core, but an automatic trip does not occur (alt path). The applicant must initiate a reactor trip.

S2: The plant has experienced a loss of offsite power and the CRS has directed you to establish natural circulation IAW procedure OP-902-003, Step 17. This will require adjustment of several parameters to get it at the required values IAW step 17.

S3: The 'A' SIT tank pressure has dropped due the low alarm setpoint and must be raised IAW OP-009-008, section 6.1, using N2, to a final value of 630 psig.

S4: The plant is preparing to startup with only the '2A' RCP running. The CRS has directed you to start the 'B' RCP IAW procedure OP-001-002. After the start, the applicant is monitoring the '2B' RCP parameters and notices alarms for vibrations. The applicant will take actions IAW OP-901-130, section E2, to trip the pump prior to an auto trip.

S5: the plant has experienced a LOCA with containment Hydrogen at 0.7%. The CRS has directed you to place the first hydrogen recombiner in service IAW OP-008-006, section 6.1, starting at 6.1.3. Using time compression, when the first increase to 10kw is completed, power will continue to increase without control (exceeding 75kw) and will require it to be secured.

S6: the CRS has directed you to energize the 1A safety bus from offsite power in accordance with OP-902-009, Standard Appendices. Direct from bank NRC Aug 2011 Exam.

S7: The 'B' SFP cooling pump maintenance was recently completed, and it is ready for a post maintenance run. The CRS has directed you to shift SFP cooling pumps from the 'A' pump to the 'B' pump IAW OP-002-006, section 6.14. Shortly after securing the 'A' pump, the 'B' pump trips, requiring a restart of the 'A' pump due to loss of SFP cooling (Alt Path).

S8: The CRS has directed you to discharge Waste Condensate Tank A to the Circulating Water System in accordance with OP-007-004, Liquid Waste Management System. Upon initiation of flow, LWM flow controller output fails high, raising flow beyond what is permitted by the release permit. (2017 NRC Exam)

P1: The control room was evacuated due to fire and you are at LCP-43 (Remote Shutdown panel) and have completed steps 1-32 of OP-901-502. You are directed to complete steps 33 and 34 to borate the RCS from LCP-43.

P2: Reset overspeed trip of EFW turbine IAW OP-902-005.

P3: The CRS has directed you to place battery charger 1B in service in accordance with OP-006-003, Section 8.3. After alignment, the HI-V Shutdown lamp remains illuminated, which requires both AC and DC isolation breakers to be opened for the 1B battery charger (step 8.3.5).

Form ES-301-5

Facility: Wat-3 Date of Exam: Feb 21, 2022 Operating Test No.: 1																	
A	E								Scer	narios							
P P			1			2			4		3	(spare	e)	Т	1	N	
Ĺ	N	(CREW		CREV	V PO	SITION	CREV	V POS	ITION	CREV	V POS	ITION	0	1	l N	
	Т	PC	DSITIO	N _			_	-		_	-	_	_	Ι		Ì	
A	Т	S R	A T	B O	S R	A T	B	S R	A T	B O	S R	A T	B O	L	r l	J	
N T	P	0	С	Ρ	0	С	Р	0	С	Ρ	0	С	Ρ		1	M(*)	
	E														R	Ι	U
Crew A																	
RO	RX					4								1	1	1	0
SRO-I1	NOR	1												1	1	1	1
	I/C	2,3,4 7,8				3,6		1-4, 6,8,9						14	4	4	2
SRO-U	MAJ	5,6				5,7		5						5	2	2	1
	TS	2,3						1,3,4						4	0	2	2
RO	RX														1	1	0
	NOR									1					1	1	1
SUR	I/C									3,6,8					4	4	2
SRO-U	MAJ									5					2	2	1
	TS														0	2	2
RO1	RX		1											1	1	1	0
	NOR		0				4							1	1	1	1
SRO-I	I/C		4,8,9				2,3,8		2,4,9					9	4	4	2
SRO-U	MAJ		5,6				5,7		5					5	2	2	1
	TS														0	2	2
RO	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
SRO-U	MAJ														2	2	1
	TS														0	2	2
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1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; IS are not applicable for RO applicants. ROs must serve in both the at-the-controls (ATC) and balance-of-plant (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I additionally serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

 Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional I/C malfunctions on a one-for-one basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

4. For new reactor facility licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Transient and Event Checklist

Facility: W	Facility: Wat-3 Date of Exam: Feb 21, 2022 Operating Test No.: 1																	
,	A	E								Scer	narios							
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Cre	ew B																	
RO		RX			0										0	1	1	0
		NOR			1	4									2	1	1	1
SRO-I		I/C			2,3,	2,3,4									8	4	4	2
SRO-U1					7	6, 8												
		MAJ			5,6	5,7									4	2	2	1
_		TS				1,2									2	0	2	2
		RX					4								1	1	1	0
SRO-I2		NOR	1												1	1	1	1
\boxtimes		I/C	2,3,4				3,6								7	4	4	2
SRO-U		MAJ	5.6				5.7								4	2	2	1
		TS	2,3				- ,								3	0	2	2
RO2		RX		1				4							2	1	1	0
\boxtimes		NOR		0				2,3,8							3	1	1	1
SRO-I		I/C		4,8,9				5,7							5	4	4	2
		MAJ		5,6				4							3	2	2	1
		TS														0	2	2
RO		RX														1	1	0
		NOR														1	1	1
SRO-I		I/C														4	4	2
SRO-U		MAJ														2	2	1
		TS														0	2	2
Instructions	3:		1	I					l		l							
1. C F b tt	Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the at-the-controls (ATC) and balance-of-plant (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I additionally serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.																	
2. F S	Reactivity manipulations may be conducted under normal or <i>controlled</i> abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional I/C malfunctions on a one-for-one basis.																	
3. V ir c	3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.																	
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Facility: W	/at-3				Date	e of Ex	am: F	eb 21, 2	2021	C	Dperatii	ng Tes	t No.: 1					

Transient and Event Checklist

Form ES-301-5

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Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the at-the-controls (ATC) and balance-of-plant (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I additionally serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

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3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

4. For new reactor facility licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Appendix D

Scenario Outline

Facility:	Waterford 3	Scena	ario No.:	1	Op Test No.:	2022								
Examiner	rs:			Operators:										
				-										
Initial Cor	itial Conditions: Mode 2, Reactor Power is at POAH. Two Charging Pumps in operation. AB Buses are aligned to Train B. A LPSI pump OOS for repairs. Temp Diesels are not available.													
Turnover	Protected Train is	B. Pull Con	trol rods t	o continue starti	up to 1%.									
Critical Ta	asks: <u>(</u> 1) Trip RCI	⊃s												
(2) M	anually open CS B tra	ain spray val	ve											
Event No.	Malf. No.	Event Type*			Event Description									
1	N/A	R – ATC N – SRO	Pull cont	trol rods to conti	nue startup									
2	RC19C	I-BOP I-SRO TS-SRO	Safety C (Loop T [⁄] bypassir	hannel C RCS (12C) fails high ng affected bista	Cold Leg instrument RC- requiring TS 3.3.1 entry bles	ITI- 0102CC and								
3	CC01A	C – BOP TS –SRO	A CCW	pump trips on O	C. TS 3.7.3 and cascadi	ng								
4	RX14A	I-ATC I-SRO	Selected 100X) fa close in	l Pressurizer Pro ils high and Bot manual	essure Control Channel (h Pressurizer Spray Valv	RC- IPR- es open, will								
5	RC23A	M-All	RCS lea	k, ramps into LE	BLOCA (Critical Task 1	, Trip RCPs)								
6	ED01A ED01B ED01C ED01D EG10A	M-All	Loss of (EDG A t	Off-Site Power rips after 10 sec	onds									
7	CS04B	C-BOP C-SRO	CS B sp manually	ray valve CS-12 / opened (CT-2)	5B fails to auto open and	d must be								
8	RP09E	C-ATC	BAM-11	3A / CVC-183 fa	ail to reposition									
* (I	N)ormal, (R)eactivit	y, (I)nstrun	nent, (C)omponent, (N	1)ajor									

Scenario Quantitative Attributes

1. Malfunctions after EOP entry (1–2)									
2.	Abnormal events (2–4) [Events 2, 3, and 4 credited]	3							
3.	Major transients (1–2)	1							
4.	. EOPs entered/requiring substantive actions (1–2)								
5.	5. Entry into a contingency EOP with substantive actions (\geq 1 per scenario set)								
6.	Preidentified critical tasks (\geq 2)	2							

The crew assumes the shift with the reactor at POAH following a forced outage. The turnover will include instructions to continue the startup by pulling control rods in accordance with the reactivity plan.

Event 1: The reactivity plan will include instructions to pull control rods. Once enough of a reactivity change is seen by the examiners the next event can be triggered.

Event 2: After the first event is complete, the Safety Channel C RCS Cold Leg instrument RC-ITI-0102CC (Loop T112C) fails high requiring TS 3.3.1 entry and bypassing affected bistables. The SRO should review and enter Technical Specification 3.3.1 Action 2 and bypass 3-HI LOCAL POWER and 4-LOW DNBR bistables within 1 hour in accordance with OP-009-007, Plant Protection System.

Event 3: Once TS have been entered and bypasses are complete, the A CCW pump trips, requiring a manual start of another pump. The SRO should review and enter 3.7.3 and cascading Technical Specifications and take actions to align the AB CCW pump within 72 hrs per OP-901-510, Component Cooling Water System Malfunction. Tech Spec 3.8.1.1 will be entered for Electrical Breaker Alignment Check and to verify Train A components and EFW AB operability.

Event 4: After event 3 is complete, the selected Pressurizer Pressure Control Channel (RC- IPR-100X) fails high and both spray valves open but will close in manual. The crew should close the spray valves to stop the pressure reduction. The SRO should enter OP-901-120, Pressurizer Pressure Control Malfunction and implement Section E1 Pressurizer Pressure Control Channel Instrument Failure. The crew should take manual control of the Pressurizer Pressure Controller to restore Pressurizer Pressure to within band (if out), swap control to the Channel Y pressure channel, and return the Pressurizer Pressure Controller back to AUTO.

Event 5: A large Break LOCA is inserted on a ramp. This event contains **CT-1**, **Trip RCPs on LBLOCA**. The ATC will manually trip the reactor then trip RCP's within 3 min following loss of CCW Cooling due to containment pressure reaching 17.7 psia (CSAS) or due to low RCS pressure. The crew will perform Standard Post Trip Actions using OP-902-000, SPTAs and diagnose to OP-902-002, Loss of Coolant Accident Recovery.

Event 6: After the reactor is tripped, and RCPs are secured a loss of offsite power occurs. The A EDG energizes the A safety bus for 10 seconds and then trips on overspeed, the A safety bus remains deenergized (dead) for the remainder of the scenario.

Event 7: CS B spray valve fails to auto open and must be manually opened to meet the containment safety function **(CT-2, manually open CS-125B)** before leaving step 9.3 of the procedure.

Event 8: BAM-113 and CVC-183 fail to reposition following SIAS and should be repositioned. BAM-113 should be manually opened and CVC-183 should be manually closed.

The scenario can be terminated once all CT's are complete (RCPs tripped and CS-125B open), event diagnosed and procedure transition is done, AND event 8 is completed or at the lead examiner's discretion.

Critical Task	Safety Significance	Cueing	Measurable Performance Indicator	Performance Feedback
<u>CT-1:</u> Trip any RCP exceeding operating limits or after 3 min without CCW flow This task is satisfied by manually tripping all 4 Reactor Coolant Pumps within 3 minutes of a loss of CCW flow to the RCPs. This task becomes applicable following the actuation of CSAS.	This step is performed for protection of the RCPs, since CCW, which provides cooling to the RCPs, is isolated upon CSAS actuation.	CCW flow low/lost to RCPs alarms on CP-2 and CP-18 CCW valve status CP-2 CSAS initiated CP-8 Procedurally driven from OP-902-000 step 3.b.1 and 9.3	Stops RCPs using control switch	RCP off light illuminated RCP indicated flow lowering
<u>CT-2:</u> CS-125B, CS B spray, valve fails to auto open This task is satisfied by manually opening CS-125B. This task becomes applicable following the actuation of CSAS (containment pressure exceeds 17.7 psia) and must be complete prior to leaving step 14 of the LOCA procedure OP-902-002.	Preserves containment building boundary by preventing or minimizing pressure excursions.	Containment pressure > 17.7 psia CS-125 indicates closed CS Header flow not indicated Procedurally driven from OP-902-000 step 9.3 OR OP-902-002 step 14	Opens CS-125 valve using control switch	CSAS annunciators actuated CS-125 indicates open CS Header flow indicated

Critical Task (NUREG-1021, Rev. 11 Appendix D)

If an operator or the crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.

Causing an unnecessary plant trip or ESF actuation may constitute a CT failure. Actions taken by the applicant(s) will be validated using the methodology for critical tasks in Appendix D to NUREG-1021.

REFERENCES

Event	Procedures
1	OP-010-003, Plant Startup
2	OP-009-007, Plant Protection System, Rev. 20
	OP-903-013, Monthly Channel Checks, Rev. 19
	Technical Specifications 3.3.1, 3.3.3.5, 3.3.3.6
3	OP-901-510, Component Cooling Water Malfunction, Rev 305
	OP-903-066, Electrical Breaker Alignment Check
	OP-100-014, Technical Specifications and Technical Requirements Compliance, Rev 360
	Technical Specification 3.7.3 Cascading, 3.8.1.1b, 3.8.1.1
4	OP-901-120, Pressurizer Pressure Control Malfunction, Rev. 303
5/6/7/8/9	OP-902-000, Standard Post Trip Actions
	OP-902-002, Loss of Coolant Accident Recovery
	OP-902-009, Standard Appendices, Rev. 319
GEN	EN-OP-115, Conduct of Operations, Rev. 26
	EN-OP-115-08, Annunciator Response, Rev. 5
	OI-038-000, EOP Operations Expectations / Guidance, Rev. 19
	OP-100-017, EOP Implementation Guide, Rev 5

Appendix D

Scenario Outline

Facility:	Waterford 3	Scenario No	o.: 2 Op Test No.: 1			
Examiner	rs:		Operators:			
Initial Cor	Initial Conditions: MOC. Reactor power is 100%. AB Buses are aligned to Train B. Temp Diesels are not available.					
Turnover	Protected Train is B;	Maintain 100%.				
Critical Ta	asks: (1) Trip reactor step 1 of SPTA	during ATWS co 's	onditions by opening the "32" breakers before exiting			
(2) Co two R	CPs	bration before ex	Iting step 1 of SPTA's and within 1 minute of losing			
Event No.	Malf. No.	Event Type*	Event Description			
1	DI-18A3S10-1 = STOP LO-18A3S10-1 = OFF B_M04 = Fail On	TS-SRO	AH-12A, Control Room Air Handler trips (new) TS 3.7.6.3a			
2	SG11A	I – BOP I – SRO TS – SRO	Steam Generator #2 Narrow Range level Safety Channel A fails low (SG-ILT-1123A). (TS 3.3.1, 3,3,2, TRM 3.3.1)			
3	RC21A	I-All	Hot Leg 1 Temperature, RC-ITI-0111X, fails low affecting PZR level setpoint.			
4	FW35B	R-ATC N-BOP N-SRO	5B Feedwater Heater (Low Pressure) tube leak, Rapid Plant Power Reduction (OP Ex April 2021)			
5	ED04A	M-All	Loss of 1A non-safety bus (causes trip of 1A and 2A RCPs), causes reactor trip. ATWS (CT-1, Trip Reactor by de-energizing CEDMs)			
6	RD11A30 RD11A28 RD11A40	C-ATC C-SRO	Three CEDMs stick out due to bowing (CT-2 emergency boration required)			
7	MS03B	M-All	ESD due to Safety Valve MS-106B Fail to 50%.			
8	FW49A1	C – BOP C – SRO	Main Feedwater Isolation Valve Steam Generator 1, FW-184A failed open, will close manually (event trigger setup).			
* (I	N)ormal, (R)eactivity,	(I)nstrument,	(C)omponent, (M)ajor			

Scenario Quantitative Attributes

1.	Malfunctions after EOP entry (1–2)	2
2.	Abnormal events (2–4)	4
3.	Major transients (1–2)	2
4.	EOPs entered/requiring substantive actions (1–2)	1
5.	Entry into a contingency EOP with substantive actions (\geq 1 per scenario set)	0
6.	Preidentified critical tasks (\geq 2)	2

The crew assumes the shift at 100% power with instructions to maintain 100% power. AB Buses are aligned to Train B. Temp Diesels are not available.

Event 1: Following crew turnover, AH-12A trips and AH-12B starts. CRS declares AH-12A inoperable and enters TS 3.7.6.3a 7 day LCO.

Event 2: SG #2 NR Level channel (1123A) fails low. The SRO should direct the BOP to bypass bistables 8, 10, and 20 on PPS Channel A. The SRO will enter TS 3.3.1 action 2, 3.3.2 action 19, TRM 3.3.1 action 1 and comply with TRM 3.3.2. TS 3.3.3.5 and 3.3.3.6 are evaluated and determined to be not applicable. At LCP-43, SG-ILI-1123-A1 is indicating failed low. Use Thunder View if asked for other SG levels at LCP-43.

Event 3: Hot Leg 1 Temperature, RC-ITI-0111X, fails low affecting PZR level setpoint. Pressurizer level setpoint will lower which will cause letdown flow to rise with only one charging pump in operation. Pressurizer level will lower due to this condition. SRO will enter OP-901-110, Pressurizer Level.

Event 4: Once event 3 is complete, a tube leak occurs in Feedwater Heater 5B, causing Condensate flow to isolate through Low Pressure Feedwater Heaters 5B and 6B. The crew will enter OP-901-221, Secondary System Transient, Section E1, Loss of Feedwater Preheating. This also requires a power reduction in accordance with OP-901-212, Rapid Plant Power Reduction, which will prompt a reactivity manipulation.

Event 5: Once event 4 is complete, a Loss of 1A non-safety bus (causes trip of 1A and 2A RCPs), causes reactor trip. ATWS occurs which requires crew to open the 32A and 32B CEDM MG set breakers to insert all control rods per SPTA procedure OP-902-000, step1 **CRITICAL TASK (CT-1)**.

Event 6: Three CEDMs stick out due to bowing and emergency boration is required within 1 minute of the trip of two RCPs and before leaving the step on reactivity control in SPTA procedure **CRITICAL TASK (CT-2)**.

Event 7: AN ESD occurs with MS-106B, Main Steam Line #2 Safety #1, on SG #2 failing 50% open and requires entry into OP-902-004, Excess Steam Demand Recovery Procedure.

Event 8: Main Feedwater Isolation Valve Steam Generator 1, FW-184A fails to AUTO close on MSIS requiring manual closure.

Critical Task	Safety Significance	Cueing	Measurable Performance Indicator	Performance Feedback
CT-1: Trip Reactor during ATWS event with the two "32" breakers when other methods fail to trip it.This task is satisfied by manually tripping the Reactor by de-energizing busses 32A and 32B within 1 minute of the two RCPS tripping and before 	lure to trip the Reactor when an omatic PPS signal has failed to uate can lead to a degradation of ion product barriers. 1 minute is ermined to be a reasonable time t to identify and take action for sfactory performance. OPS nagement standard documented M-OP-100-03. M-OP-100-03, CT-1)	RCP off light illuminated Trips and pre-trips on SG lo flow on CP-7 All CEA rod bottom lights extinguished (after the breakers opened) Procedurally driven from OP-902-000 step 1.a.1.1)	Open indicators for both A32 and B32 feeder breakers	Reactor Trip breakers open All CEA rod bottom lights illuminated (except the three that are stuck out) Reactor power lowering

Critical Task	Safety Significance	Cueing	Measurable Performance Indicator	Performance Feedback
CT-2: Commence emergency boration prior to exiting step 1 of OP-902-000 SPTAs and within 1 minute of tripping two RCPs. This task is satisfied by commencing Emergency Boration flow by either Boric Acid makeup pumps or gravity feed valves in accordance with OP- 902-000, Standard Post Trip Actions step 1, prior to exiting the step to verify Reactivity Control. This task becomes applicable following the initiation of a Reactor Trip.	Based on Emergency Operating Procedure Required actions for Reactivity Control. Failure to initiate emergency boration would result in a condition that is not allowed by the facility license as analysis assumes that all CEAs are fully inserted during a reactor trip with the exception of the most reactive rod. OPS management Standard documented in TM-OP-100-03. (TM-OP-100-03, CT-1)	3 CEA's stuck out (their respective Rod bottom lights are extinguished) CEA indicates withdrawn on CEAC Procedurally driven from OP-902-000 step 1.c.1 OP-901-103, Emergency Boration	Initiate Emergency Boration 1) using Boric Acid Pump as follows: a) Place makeup Mode sel switch to MANUAL b) Open Emergency Boration Valve, BAM-133. c) Start one Boric Acid Pump. d) Close recirc valve for Boric Acid Pump started: BAM-126A Boric Acid Makeup Pump Recirc Valve A or BAM-126B OR 2) Initiate Emergency Boration using Gravity Feed as follows: Open the following Boric Acid Makeup Gravity Feed valves: a) BAM-113A Boric Acid Makeup Gravity Feed Valve A b) BAM-113B Boric Acid Makeup Gravity Feed Valve A b) BAM-113B Boric Acid Makeup Gravity Feed Valve B 3) Close VCT Disch Valve, CVC-183. <u>2022 NRC Exam</u>	Charging flow ≥ 40 gpm on CP-4

	Critical Task	Safety Significance	Cueing	Measurable Performance Indicator	Performance Feedback
С	Critical Task (NUREG-1021, Rev. 11 Appendix D)				
•	 If an operator or the crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review. 				
•	Causing an unnecessary plant trip or l critical tasks in Appendix D to NUREG	ESF actuation may constitute a CT failu G-1021.	re. Actions taken by the applic	ant(s) will be validated using	g the methodology for

REFERENCES

Event	Procedures
1	OP-500-011, Control Room Cabinet M, Rev 042 (ARP)
	TS 3.7.6.3a
2	OP-500-005, Control Room Cabinet K, Rev 20
	OP-009-007, Plant Protection System, Rev. 20
	OP-901-201, SG level Control Malfunction, Rev 7
	Technical Specifications 3.3.1 action 2, 3.3.2 action 19, and TRM 3.3.1 action 1
3	OP-500-008, Control Room Cabinet H, Rev 44
	OP-901-110, Pressurizer level Malfunction, Rev 11
4	OP-500-001, Control Room Cabinet A, Rev 27
	OP-901-221, Secondary System Transient, Rev. 8
	OP-901-212, Rapid Plant Power Reduction, Rev. 16
5	OP-902-000, Standard Post Trip Actions, Rev. 16
6	OP-902-000, Standard Post Trip Actions, Rev. 16
	OP-901-103, Emergency Boration, Rev 004
7	OI-038-000, EOP Operations Expectations/Guidance, Rev 19
GEN	EN-OP-115, Conduct of Operations, Rev. 24
	EN-OP-115-08, Annunciator Response, Rev. 4
	EN-OP-200, Plant Transient Response Rules, Rev. 4
	OI-038-000, EOP Operations Expectations / Guidance, Rev. 16
	TM-OP-100-03, Simulator Training, Rev. 14
	OP-100-017, Emergency Operating Procedures Implementation Guide, Rev 5

Appendix D

Scenario Outline

.Facility:	Waterford 3	Scena	ario No.:	4	Op Test No.:1
Examiner	'S:			Operators:	
Initial Cor	nditions: <u>Reactor</u>	power is 100%	%. AB Bu	ses are aligned	to Train B.
Turnover	Protected Train	is B; Maintain	100%.		
Critical T	ocko: (1) Enorgia	a the 2A cofe	ty huo w		Vhan EDC R tring on overeneed
EDG '	A' fails to energize	3A Safetv Bus	due to 3	A-2A bus tie fai	ling to open on under voltage.
Manua	ally open 3A-2A bus	s tie, allowing I	EDG 'A' c	output breaker to	o close and power the bus.
(2) M a	nually start CCW	Pump A (whe	n it does	not energize on	the sequencer) within 10 minutes
of ED	G 'A' start in order t	o prevent over	heat of th	ne 'A' EDG.	
Event No.	Malf. No.	Event Type*			Event Description
1	FW05	N – BOP TS – SRO	EFW AE overspe	B pump operabi ed. TS 3.7.1.2	lity test - EFW AB trips on mechanical d
2	CV05B2	C – ATC	Letdowr	n backpressure	control valve, CVC-123B, fails closed
3	NI01H	I – BOP TS – SRO	Excore fails low	Nuclear Instrum v. TS 3.3.1, 3.3.3	nent ENI-IJI-0001D middle detector 3.6
4	RC15A1	I – ATC TS-SRO	Pressur TS 3.3.3	izer level transr 3.5a	nitter, RC-ILT-110X, Fails Hi.
5	TU06 ED01A-D	M – ALL	Turbine	Trip, Loss Of C	Offsite Power after 10 seconds,
6	ED23A	C – BOP	3AS to A	A2 Bus Tie Brea	aker Fails to trip on UV (CT1)
7	EG10B	C – None	EDG B	trips on overspe	eed after 20 seconds
8	CC23A	C – BOP	CCW P	ump A Fails to A	Autostart on Sequencer (CT2)
9	CV02A	C – ATC	Chargin	g Pump A fail to	o autostart
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Scenario Quantitative Attributes

1.	Malfunctions after EOP entry (1–2)	2
2.	Abnormal events (2–4)	2
3.	Major transients (1–2)	2
4.	EOPs entered/requiring substantive actions (1–2)	1
5.	Entry into a contingency EOP with substantive actions (\geq 1 per scenario set)	0
6.	Preidentified critical tasks (\geq 2)	2

The crew assumes the shift at 100% power with instructions to maintain 100% power. No equipment is out of service.

Event 1: Following crew turnover, the crew is directed to perform OP-903-046 section 5.3, EFW Pump AB Check. EFW AB will trip on mechanical over speed and cannot be reset due to linkage damage. The CRS will enter TS 3.7.1.2 action d.

Event 2: When the Tech Spec review is complete, letdown backpressure control valve, CVC-123B, fails closed. The SRO should enter OP-901-112, Charging or Letdown Malfunction, section E2 which will place the standby backpressure control valve in service.

Event 3: After the standby letdown backpressure control valve is in service, Log Power Channel D will fail low. The CRS should enter TS 3.3.1 functional unit 3 action 2 and TS 3.3.6 action 29 and bypass bistables 1-4 on PPS Channel D. Bistable 14 may be bypassed while in Mode 1, not applicable until Mode 2.

Event 4: After the crew has addressed TS, Pressurizer Level Channel X, RC-ILI-0110X, fails high. The CRS will enter OP-901-110, Pressurizer Level Control Malfunction, section E1, Pressurizer Level Control Channel Malfunction. The crew will swap controlling channel to Channel Y and restore Pressurizer Control back to Auto. The CRS should enter TS 3.3.3.5 action a. TS 3.3.3.6 should be reviewed and determined to not be applicable.

Event 5: After Pressurizer Control is in auto, the Main Turbine will trip followed by a Loss Of Offsite Power. Charging Pump

Event 6: The 3A to 2A bus tie breaker will fail to open causing EDG A output breaker failing to close. The crew will take action to open the 3A to 2A bus tie breaker (**Critical Task 1**) which will allow EDG A to power the 3A Safety Bus.

Event 7: EDG B will trip on overspeed after 20 seconds from event 5.

Event 8: CCW Pump A will fail to load on the sequencer requiring the BOP to manually start CCW Pump 'A' within 10 minutes of output breaker closure **(Critical Task 2)** to prevent overheating of the only remaining EDG ('A') still powering a vital bus and prevent an SBO event.

Event 9: Charging Pump A will fail to auto start. The ATC should recognize that no charging pumps are operating and start Charging Pump A.

The scenario can be terminated after the crew has powered the 3A Safety Bus, verified proper CCW operation, conserved Steam Generator inventory and have discussed actions for restoring Main Feedwater to at least one Steam Generator per OP-902-006, Loss of Feedwater Recovery, or at the lead examiner's discretion.

Critical Task Safety Significance		Cueing	Measurable Performance Indicator	Performance Feedback
<u>CT-1:</u> Energize the 3A vital AC Bus with 'A' EDG and prevent entering OP-902- 005, Station Blackout Recovery.				
Task is applicable when EDG 'B' over- speeds/trips and loss of offsite power occurs. This task is satisfied by manually opening bus tie breaker 3A-2A, which then allows EDG 'A" to energize the 3 A bus, prior to performing actions in OP- 902-005, Station Blackout Recovery. This task becomes applicable once the	Failure to energize at least one emergency bus will result in the plant remaining in a configuration that will not support protection if a subsequent event would occur. This lowers the mitigative capability of the plant. (WTRN-OPS-CRITTASKS, CT-03)	Breaker indication on CP-1 and control room lighting. OP-902-000, Standard Post Trip Actions	The crew takes action to manually energize the required Safety Bus by opening the required 3-2 tie breaker.	EDG status and output breaker indication
Loss of Offsite power occurs.				
CT-2: Manually start CCW Pump 'A' (when it does not energize on the sequencer) within 10 minutes of EDG 'A' output breaker being closed in order to prevent overheat of the 'A' EDG. This task is satisfied by manually starting the 'A' CCW pump when it fails to sequence on the 3A bus. This task becomes applicable once the Loss of Offsite power occurs	Failure to establish CCW cooling to an operating and loaded EDG within 10 minutes will overheat the EDG and put the plant in an SBO event and place the plant at increased risk of core damage. (WTRN-OPS-CRITTASKS, CT-03)	CCW pump indicating lights and CCW flow on CP-8. OP-902-000, Standard Post Trip Actions	The crew takes action to manually start the CCW 'A' pump.	CCW 'A' pump indicating lights and CCW flow.

Critical Task (NUREG-1021, Rev. 11 Appendix D)

- If an operator or the crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.
- Causing an unnecessary plant trip or ESF actuation may constitute a CT failure. Actions taken by the applicant(s) will be validated using the methodology for critical tasks in Appendix D to NUREG-1021.

REFERENCES

Event	Procedures
1	OP-903-046, Emergency Feed Pump Operability Check, Rev. 323
	Technical Specification 3.7.1.2
	OP-100-014, Technical Specification and Technical Requirements Compliance, Rev. 358
2	OP-901-112, Charging or Letdown Malfunction, section E2, Rev. 9
3	Technical Specification 3.3.1
	Technical Specification 3.3.3.5
	Technical Specification 3.3.3.6
	OP-009-007, Plant Protection System, Rev. 20
4	OP-901-110, Pressurizer Level Control Malfunction, Rev. 11
	OP-903-013, Monthly Channel Checks, Rev. 21
	Technical Specification 3.3.3.5
	Technical Specification 3.3.3.6
5	OP-902-000, Standard Post Trip Actions, Rev 17
	OP-902-003, Loss of Offsite Power / Loss of Forced Circulation, Rev. 11
	OP-902-009, Standard Appendices, Rev. 320
6	OP-902-000, Standard Post Trip Actions, Rev 17
7	None
8	OI-038-000, EOP Operations Expectations / Guidance, Rev. 20
9	EN-OP-115, Conduct of Operations, Rev. 30
GEN	EN-OP-115, Conduct of Operations, Rev. 30
	EN-OP-115-08, Annunciator Response, Rev. 6
	EN-OP-200, Plant Transient Response Rules, Rev. 7
	OI-038-000, EOP Operations Expectations / Guidance, Rev. 20
	OP-100-017, Emergency Operating Procedure Implementation Guide, Rev 5
	EN-TQ-210, Conduct of Simulator Training, Rev. 16
	WTRN-OPS-CRITTASK, Waterford 3 Critical Tasks, Rev 0

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