

Facility: Hope Creek Scenario No.: 1 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: 100% power.

Turnover: Maintain 100% power. Swap SACS Pumps for upcoming maintenance.

Critical Tasks: 1. Reduce power to below License Limit. 2. Emer. Depressurize (Containment).

Event No.	Malf. No.	Event Type*	Event Description
1.		N(BOP) N(SRO)	Swap SACS Pumps
2.		I(ATC) I(SRO) TS(SRO)	APRM Failure
3.		R(ATC) R(SRO) C(BOP)	FWH Leak
4.		TS(SRO)	Loss Of Essential 480V Bus 10B420
5.		C(ALL)	Earthquake/Condensate Pipe Break
6.	(P)	M(ALL)	LOCA
7.		C(ATC) C(SRO)	Penetration Failure to Isolate
8.		C(BOP) C(SRO)	Drywell Spray Valve Failure

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

(P)=Previous 2 NRC Examinations

Facility: Hope Creek Scenario No.: 2 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: 95% power with power ascension to 100% power in progress.

Turnover: Raise power to 100%.

Critical Tasks: 1. Reduce power. 2. Manual scram/isolation. 3. Isolate leak.

Event No.	Malf. No.	Event Type*	Event Description
1.	(P)	R(ATC) N(SRO)	Raise Reactor Power with Recirculation System
2.	(P)	I(ATC) R(SRO) TS(SRO)	Recirculation Pump Runaway
3.		TS(SRO)	Failure of RRCS Level Transmitter
4.		C(BOP) C(SRO)	Trip of a Fuel Pool Cooling Pump
5.		M(ALL)	Fuel Cladding/MSIV Isolation.
6.		C(ATC) C(SRO)	Rod Bounce (LP ATWS)
7.		C(BOP) C(SRO)	RCIC Failure To Auto Initiate
8.		C(BOP) C(SRO)	HPCI Steam Leak

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

(P)=Previous 2 NRC Examinations

Facility: Hope Creek Scenario No.: 3 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: 100% power.

Turnover: Maintain 100% power.

Critical Tasks: 1. Start EDG. 2. Emer. Depressurize (RPV Level). 3. RPV flooding.

Event No.	Malf. No.	Event Type*	Event Description
1.		C(ATC) C(SRO)	RWCU Pump Trip
2.	(P)	C(BOP) R(ATC) R(SRO) TS(SRO)	SRV Open/Closes
3.	(P)	TS(SRO)	Loss of 10D410 125VDC 1E Bus
4.		C(ALL)	Main Turbine High Vibration
5.	(P)	C(ALL)	Loss of Offsite Power
6.	(P)	C(BOP) C(SRO)	EDG Failure to Auto-start
7.	(P)	M(ALL)	LOCA
8.		I(ALL)	Loss of RPV Level Indication

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

(P)=Previous 2 NRC Examinations

Facility: <u>Hope Creek</u>	Date of Examination: <u>2/12/2018</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>	Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D,P,R	Complete the Daily Surveillance Logs. (ZZ017)
Conduct of Operations	D,R	Complete OP-HC-108-114-1001 Attachment 3. (ZZ052)
Equipment Control	D,R	Review Operations Department Tests for Completeness and Compliance with Acceptance Criteria. (ZZ027)
Radiation Control	M,R	Verify and Close Out today's Containment Prepurge Cleanup, Inerting, Or Pressure Control Valve Permit. (ZZ059)
Emergency Plan	N,R	Utilize The ECG To Determine The Emergency Classification And/Or Reportability Of An Event And/Or Plant Condition (ESG016)

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)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)

Facility: <u>Hope Creek</u>		Date of Examination: <u>2/12/2018</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N,S	Complete A Control Console Log For Conditions 4 And 5. (ZZ058)
Conduct of Operations	M,S	Conduct Reactor Recirculation Single Loop Operation. (ZZ013)
Equipment Control	D,P,R	Perform A Manual Tagout When ESOMS is Unavailable. (ZZ055)
Radiation Control		
Emergency Plan	M,S	Perform the Licensed Operator Review of the Major Equipment and Electrical Status (MEES) Form. (ZZ060)

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)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)

Facility: <u>Hope Creek</u>	Date of Examination: <u>2/12/2018</u>	
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>	Operating Test Number: _____	
Control Room Systems: * 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U		
System/JPM Title	Type Code*	Safety Function
a. Reactor Protection /Control Rod Out Of Position (SB013)	A,D,L,P,S	7
b.		
c. High Pressure Coolant Injection/Place HPCI into the Full Flow Test Mode (BJ014)	A,D,EN,P,S	4
d.		
e.		
f.		
g.		
h. Reactor Condensate/Start a Primary Condensate Pump (AD001)	A,N,S	2
In-Plant Systems: * 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i.		
j. D.C. Electrical Distribution/Respond To A LOP (NJ002)	E,EN,L,N,R	6
k. Reactor Manual Control System/Bypass Rod (SF012)	E,M	1
<p>* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for R /SRO-I/SRO-U	
(A)lternate 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	4-6/4-6 /2-3 $\leq 9/\leq 8/\leq 4$ $\geq 1/\geq 1/\geq 1$ $\geq 1/\geq 1/\geq 1$ (control room system) $\geq 1/\geq 1/\geq 1$ $\geq 2/\geq 2/\geq 1$ $\leq 3/\leq 3/\leq 2$ (randomly selected) $\geq 1/\geq 1/\geq 1$	

Facility: <u>Hope Creek</u>	Date of Examination: <u>2/12/2018</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test Number: _____

Control Room Systems: * 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U

System/JPM Title	Type Code*	Safety Function
a. Reactor Protection /Control Rod Out Of Position (SB013)	A,D,L,P,S	7
b.		
c. High Pressure Coolant Injection/Place HPCI into the Full Flow Test Mode (BJ014)	A,D,EN,P,S	4
d. Main Turbine Generator and Auxiliary/Roll the Main Turbine (AC004)	A,D,S	3
e. A.C. Electrical Distribution/Shift The Breaker Alignment (KJ008)	D,EN,S	6
f. Component Cooling Water/Place RACS Pump BP209 In Service (ED002)	A,D,S	8
g. Plant Ventilation Systems/Place Control Area Ventilation In-Service Without Cooling (GK003)	D,EN,S	9
h. Reactor Condensate/Start a Primary Condensate Pump (AD001)	A,N,S	2

In-Plant Systems: * 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U

i. Residual Heat Removal/Line up for Alternate Injection Using Fire Water (BC007)	D,E,EN,L	2
j. D.C. Electrical Distribution/Respond To A LOP (NJ002)	E,EN,L,N,R	6
k. Reactor Manual Control System/Bypass Rod (SF012)	E,M	1

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for R /SRO-I/SRO-U
(A)lternate path	4-6/4-6 /2-3
(C)ontrol room	
(D)irect from bank	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2/≥ 2/≥ 1
(P)revious 2 exams	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA	≥ 1/≥ 1/≥ 1
(S)imulator	

Facility: <u>Hope Creek</u>	Date of Examination: <u>2/12/2018</u>
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test Number: _____

Control Room Systems: 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U		
System/JPM Title	Type Code*	Safety Function
a. Reactor Protection /Control Rod Out Of Position (SB013)	A,D,L,P,S	7
b. Recirculation Flow Control/Reset Scoop Tube Lockup (BB002)	D,S	1
c. High Pressure Coolant Injection/Place HPCI into the Full Flow Test Mode (BJ014)	A,D,EN,P,S	4
d. Main Turbine Generator and Auxiliary/Roll the Main Turbine (AC004)	A,D,S	3
e. A.C. Electrical Distribution/Shift The Breaker Alignment (KJ008)	D,EN,S	6
f. Component Cooling Water/Place RACS Pump BP209 In Service (ED002)	A,D,S	8
g. Plant Ventilation Systems/Place Control Area Ventilation In-Service Without Cooling (GK003)	D,EN,S	9
h. Reactor Condensate/Start a Primary Condensate Pump (AD001)	A,N,S	2

In-Plant Systems: 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. Residual Heat Removal/Line up for Alternate Injection Using Fire Water (BC007)	D,E,EN,L	2
j. D.C. Electrical Distribution/Respond To A LOP (NJ002)	E,EN,L,N,R	6
k. Reactor Manual Control System/Bypass Rod (SF012)	E,M	1

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for R /SRO-I/SRO-U
(A)lternate path	4-6/4-6 /2-3
(C)ontrol room	
(D)irect from bank	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2/≥ 2/≥ 1
(P)revious 2 exams	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA	≥ 1/≥ 1/≥ 1
(S)imulator	

Facility:		Hope Creek 2018 NRC Exam										Date of Exam:		02/12/18			
Tier	Group	RO K/A Category Points											SRO-Only Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total	
1. Emergency & Plant Evolution	1	4	3	4				3	3			3	20	2	5	7	
	2	1	1	2				1	1			1	7	1	2	3	
	Tier Totals	5	4	6				4	4			4	27	3	7	10	
2. Plant Systems	1	3	3	2	3	3	1	3	2	3	1	2	26	3	2	5	
	2	1	0	2	1	1	1	2	1	1	1	1	12	0	2	3	
	Tier Totals	4	3	4	4	4	2	5	3	4	2	3	38	5	3	8	
3. Generic Knowledge & Abilities Categories				1		2		3		4		10	1	2	3	4	7
				2		2		3		3			2	2	1	2	
<p>Note:</p> <ol style="list-style-type: none"> 1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two). (One Tier 3 Radiation Control K/A is allowed if the K/A is replaced by a K/A from another Tier 3 Category). 2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points. 3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to section D.1.b of ES-401, for guidance regarding elimination of inappropriate K/A statements. 4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution. 5. Absent a plant specific priority, only those KAs having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively. 6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories. 7. The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/A's. 8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above. If fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams. 9. For Tier 3, select topics from Section 2 of the K/A Catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10CFR55.43 																	
<p>G* Generic K/As</p>																	

Hope Creek 2018 NRC Exam
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295006 SCRAM / 1						X	2.4.30 - 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.	4.1	76
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1					X		EA2.02 - Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : Reactor water level	4.2	77
295018 Partial or Complete Loss of CCW/ 8					X		AA2.04 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: System flow	2.9	78
295016 Control Room Abandonment / 7						X	2.1.32 - Conduct of Operations: Ability to explain and apply all system limits and precautions.	4.0	79
295038 High Off-site Release Rate / 9						X	2.4.45 - Emergency Procedures / Plan: Ability to prioritize and interpret the significance of each annunciator or alarm.	4.3	80
295024 High Drywell Pressure / 5						X	2.4.6 - Knowledge of EOP mitigation strategies.	4.7	81
295004 Partial or Total Loss of DC Pwr / 6						X	2.4.30 - 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.	4.1	82
295004 Partial or Total Loss of DC Pwr / 6	X						AK1.04 - Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Effect of battery discharge rate on capacity	2.8	39
295026 Suppression Pool High Water Temp. / 5	X						EK1.02 - Knowledge of the operational implications of the following concepts as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE : Steam condensation	3.5	40
295006 SCRAM / 1	X						AK1.02 - Knowledge of the operational implications of the following concepts as they apply to SCRAM : Shutdown margin	3.4	41
295031 Reactor Low Water Level / 2		X					EK2.01 - Knowledge of the interrelations between REACTOR LOW WATER LEVEL and the following: Reactor water level indication	4.4	42
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1		X					EK2.02 - Knowledge of the interrelations between SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN and the following: RRCS: Plant-Specific	4.0	43
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4		X					AK2.01 - Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION and the following: Recirculation system	3.6	44
295016 Control Room Abandonment / 7			X				AK3.03 - Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT :	3.5	45

Hope Creek 2018 NRC Exam
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
							Disabling control room controls		
295025 High Reactor Pressure / 3			X				EK3.06 - Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE : Alternate rod insertion: Plant-Specific	4. 2	46
295038 High Off-site Release Rate / 9			X				EK3.02 - Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: System isolations	3. 9	47
295005 Main Turbine Generator Trip / 3				X			AA1.03 - Ability to operate and/or monitor the following as they apply to MAIN TURBINE GENERATOR TRIP : Reactor manual control/Rod control and information system	2. 7	48
295018 Partial or Total Loss of CCW / 8				X			AA1.01 - Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER : Backup systems	3. 3	49
295024 High Drywell Pressure / 5				X			EA1.16 - Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: Containment/drywell vacuum breakers Containment/drywell vacuum breakers.	3. 4	50
295030 Low Suppression Pool Water Level / 5					X		EA2.01 - Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL : Suppression pool level	4. 1	51
600000 Plant Fire On-site / 8					X		AA2.17 - Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Systems that may be affected by the fire	3.1	52
295021 Loss of Shutdown Cooling / 4					X		AA2.03 - Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING : Reactor water level	3. 5	53
295019 Partial or Total Loss of Inst. Air / 8						X	2.4.18 - Emergency Procedures / Plan: Knowledge of the specific bases for EOPs.	3. 3	54
700000 Generator Voltage and Electric Grid Disturbances						X	2.4.50 - Emergency Procedures / Plan: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4. 2	55
295023 Refueling Accidents Cooling Mode / 8						X	2.4.9 - Emergency Procedures / Plan: Knowledge of low power / shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.	3. 8	56
295003 Partial or Complete Loss of AC / 6			X				AK3.05 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Reactor SCRAM	3. 7	57
295028 High Drywell Temperature / 5	X						EK1.02 - Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL TEMPERATURE : Equipment environmental qualification	2.9	58
K/A Category Totals:	4	3	4	3	3/2	3/5	Group Point Total:	20/7	

Hope Creek 2018 NRC Exam
Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

EAPE # / Name Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Q#
295029 High Suppression Pool Water Level / 5					X		EA2.03 - Ability to determine and/or interpret the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL : Drywell/containment water level	3.5	83
295034 Secondary Containment Ventilation High Radiation / 9						X	2.4.41 - Emergency Procedures / Plan: Knowledge of the emergency action level thresholds and classifications.	4.6	84
295014 Inadvertent Reactivity Addition / 1						X	2.1.7 - Conduct of Operations: Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	85
295032 High Secondary Containment Area Temperature / 5	X						EK1.03 - Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Secondary containment leakage detection: Plant Specific	3.5	59
295008 High Reactor Water Level / 2		X					AK2.08 - Knowledge of the interrelations between HIGH REACTOR WATER LEVEL and the following: Main turbine: Plant-Specific	3.4	60
295036 Secondary Containment High Sump/Area Water Level / 5			X				EK3.01 - Knowledge of the reasons for the following responses as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL : Emergency depressurization	2.6	61
295015 Incomplete SCRAM / 1				X			AA1.01 - Ability to operate and/or monitor the following as they apply to INCOMPLETE SCRAM : CRD hydraulics	3.8	62
295022 Loss of CRD Pumps / 1					X		AA2.03 - Ability to determine and/or interpret the following as they apply to LOSS OF CRD PUMPS : CRD mechanism temperatures	3.1	63
295035 Secondary Containment High Differential Pressure / 5						X	2.4.11 – Knowledge of abnormal condition procedures.	4.0	64
295010 High Drywell Pressure / 5			X				AK3.04 - Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE : Leak investigation	3.5	65
K/A Category Totals:	1	1	2	1	1/1	1/2	Group Point Total:	7/3	

Hope Creek 2018 NRC Exam
Written Examination Outline
Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp .	Q#
264000 EDGs								X				A2.06 - Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Opening normal and/or alternate power to emergency bus	3.4	86
211000 SLC								X				A2.08 - Ability to (a) predict the impacts of the following on the STANDBY LIQUID CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Failure to SCRAM	4.2	87
215005 APRM / LPRM											X	2.2.44 - Equipment Control: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives effect plant and system conditions.	4.4	88
206000 HPCI											X	2.2.37 - Equipment Control: Ability to determine operability and / or availability of safety related equipment.	4.6	89
400000 Component Cooling Water								X				A2.02 - Ability to (a) predict the impacts of the following on the CCWS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: High/low surge tank level	3.0	90
218000 ADS	X											K1.01 - Knowledge of the physical connections and/or cause- effect relationships between AUTOMATIC DEPRESSURIZATION SYSTEM and the following: RHR/LPCI: Plant-Specific	4.0	1
239002 SRVs	X											K1.04 - Knowledge of the physical connections and/or cause- effect relationships between RELIEF/SAFETY VALVES and the following: Main steam	3.6	2
206000 HPCI		X										K2.04 - Knowledge of electrical power supplies to the following: Turbine control circuits: BWR-2,3,4	2.5	3
203000 RHR/LPCI: Injection Mode		X										K2.03 - Knowledge of electrical power supplies to the following: Initiation logic	2.7	4

Hope Creek 2018 NRC Exam
Written Examination Outline
Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp	Q#
261000 SGTS				X									3.7	5
259002 Reactor Water Level Control			X										3.7	6
212000 RPS				X									4.2	7
262002 UPS (AC/DC)				X									3.1	8
215004 Source Range Monitor					X								2.8	9
262001 AC Electrical Distribution					X								2.6	10
400000 Component Cooling Water						X							2.8	11
300000 Instrument Air					X								2.5	12
209001 LPCS							X						3.3	13
264000 EDGs							X						2.8	14

Hope Creek 2018 NRC Exam
Written Examination Outline
Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G		Imp	Q#
215003 IRM								X				A2.01 - Ability to (a) predict the impacts of the following on the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Power supply degraded	2.8	15
211000 SLC (new K/A to align with system not EOP)								X				A2.01 - Ability to (a) predict the impacts of the following on the STANDBY LIQUID CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Pump trip	3.5	16
215005 APRM / LPRM									X			A3.01 - Ability to monitor automatic operations of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM including: Four rod display: Plant-Specific	3.5	17
205000 Shutdown Cooling									X			A3.02 - Ability to monitor automatic operations of the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) including: Pump trips	3.2	18
217000 RCIC										X		A4.06 - Ability to manually operate and/or monitor in the control room: Suppression pool level	3.6	19
263000 DC Electrical Distribution							X					A1.01 - Ability to predict and/or monitor changes in parameters associated with operating the D.C. ELECTRICAL DISTRIBUTION controls including: Battery charging/discharging rate	2.5	20
223002 PCIS/Nuclear Steam Supply Shutoff											X	2.1.31 - Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.	4.6	21
215005 APRM / LPRM											X	2.4.34 - Emergency Procedures / Plan: Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.	4.2	22
209001 LPCS		X										K2.01 - Knowledge of electrical power supplies to the following: Pump power	2.5	23

Hope Creek 2018 NRC Exam
Written Examination Outline
Plant Systems – Tier 2 Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp .	Q#
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218000 ADS									X			A3.04 - Ability to monitor automatic operations of the AUTOMATIC DEPRESSURIZATION SYSTEM including: Primary containment pressure	3.7	24
259002 Reactor Water Level Control	X											K1.03 - Knowledge of the physical connections and/or cause- effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following: Reactor water level	3.8	25
262001 AC Electrical Distribution			X									K3.01 - Knowledge of the effect that a loss or malfunction of the A.C. ELECTRICAL DISTRIBUTION will have on following: Major system loads	3.5	26
K/A Category Totals:	3	3	2	3	3	1	3	2/3	3	1	2/2	Group Point Total:	26/5	

Hope Creek 2018 NRC Exam
Written Examination Outline
Plant Systems – Tier 2 Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp.	Q #
214000 RPIS								X				A2.03 - Ability to (a) predict the impacts of the following on the ROD POSITION INFORMATION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Overtravel/in-out	3.9	91
202002 Recirculation Flow Control											X	2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	4.6	92
288000 Plant Ventilation								X				A2.01 - Ability to (a) predict the impacts of the following on the PLANT VENTILATION SYSTEMS ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High drywell pressure: Plant-Specific	3.4	93
288000 Plant Ventilation	X											K1.04 - Knowledge of the physical connections and/or cause- effect relationships between PLANT VENTILATION SYSTEMS and the following: Applicable component cooling water system: Plant-Specific	2.6	27
233000 Fuel Pool Cooling/Cleanup			X									K3.01 - Knowledge of the effect that a loss or malfunction of the FUEL POOL COOLING AND CLEAN-UP will have on the following: Fuel pool temperature	3.2	28
245000 Main Turbine Gen. / Aux.			X									K3.03 - Knowledge of the effect that a loss or malfunction of the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS will have on following: Reactor power	3.9	29
215002 RBM				X								K4.01 - Knowledge of ROD BLOCK MONITOR SYSTEM design feature(s) and/or interlocks which provide for the following: Prevent control rod withdrawal: BWR-3,4,5	3.4	30
234000 Fuel Handling Equipment					X							K5.01 - Knowledge of the operational implications of the following concepts as they apply to FUEL HANDLING EQUIPMENT : Crane/hoist operation	2.9	31
223001 Primary CTMT and Aux.						X						K6.11 - Knowledge of the effect that a loss or malfunction of the following will have on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES : A.C. electrical distribution	3.0	32

Hope Creek 2018 NRC Exam
Written Examination Outline
Plant Systems – Tier 2 Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G		Imp.	Q #
256000 Reactor Condensate							X					A1.08 - Ability to predict and/or monitor changes in parameters associated with operating the REACTOR CONDENSATE SYSTEM controls including: System water quality	2.7	33
202002 Recirculation Flow Control								X				A2.06 - Ability to (a) predict the impacts of the following on the RECIRCULATION FLOW CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low reactor water level: Plant-Specific	3.3	34
201001 CRD Hydraulic									X			A3.08 - Ability to monitor automatic operations of the CONTROL ROD DRIVE HYDRAULIC SYSTEM including: Drive water flow	3.0	35
230000 RHR/LPCI: Torus/Pool Spray Mode										X		A4.02 - Ability to manually operate and/or monitor in the control room: Spray valves	3.8	36
268000 Radwaste											X	2.3.11 – Ability to control radiation releases.	3.8	37
226001 RHR/LPCI: CTMT Spray Mode							X					A1.10 - Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE controls including: Emergency generator loading	3.0	38
K/A Category Totals:	1	0	2	1	1	1	2	1/2	1	1	1/1	Group Point Total:	12/3	

Facility:		Hope Creek 2018 NRC Exam		Date:		02/12/18	
Category	K/A #	Topic	RO		SRO-Only		
			IR	Q#	IR	Q#	
1. Conduct of Operations	2.1.38	Knowledge of the station's requirements for verbal communications when implementing procedures.			3.8	94	
	2.1.41	Knowledge of the refueling process.			3.7	100	
	2.1.8	Ability to coordinate personnel activities outside the control room.	3.4	66			
	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	67			
	Subtotal			2		2	
2. Equipment Control	2.2.5	Knowledge of the process for making design or operating changes to the facility.			3.2	95	
	2.2.15	Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.			4.3	98	
	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	4.5	68			
	2.2.39	Knowledge of less than or equal to one hour Technical Specification action statements for systems.	3.9	69			
Subtotal			2		2		
3. Radiation Control	2.3.13	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.			3.8	96	

	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5	70		
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	71		
	2.3.14	Knowledge of radiation or containment hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4	74		
	Subtotal			3		1
4. Emergency Procedures / Plan	2.4.29	Knowledge of the emergency plan.			4.4	97
	2.4.6	Knowledge of EOP mitigation strategies.			4.7	99
	2.4.25	Knowledge of fire protection procedures.	3.3	72		
	2.4.18	Knowledge of the specific bases for EOPs.	3.3	73		
	2.4.42	Knowledge of emergency response facilities.	2.6	75		
	Subtotal			3		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1 (#82)	295004 / 2.4.18	<p>Emergency Procedures / Plan: Knowledge of the specific bases for EOPs.</p> <p>No Bases document for Loss of DC Pwr.</p> <p>Randomly selected 2.4.30 - 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.</p>
1/1 (#81)	295024 / 2.2.22	<p>Equipment Control: Knowledge of limiting conditions for operations and safety limits.</p> <p>No safety limit associated with HI D/W Pressure. The associated T.S. is a 1 Hour LCO which is an RO level question topic. The K/A is not discriminating at SRO Level.</p> <p>Randomly selected 2.4.6 - Knowledge of EOP mitigation strategies.</p>
2/2 (#92)	202002 / 2.4.1	<p>Emergency Procedures / Plan: Knowledge of EOP entry conditions and immediate action steps</p> <p>No EOP entries on Reactor Recirc Flow Control malfunctions.</p> <p>Randomly selected 2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications.</p>
1/1 (#78)	600000 / AA2.12	<p>600000 / AA2.12 - Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Location of vital equipment within fire zone.</p> <p>Topic not discriminatory at the SRO level.</p> <p>Randomly selected 295018 / AA2.04 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: System flow.</p>
2/1 (#12)	300000 / K6.03	<p>Knowledge of the effect that a loss or malfunction of the following will have on the INSTRUMENT AIR SYSTEM: Temperature indicators.</p> <p>No relationship of a loss or malfunction of a temperature indicator and operation of the Instrument Air Compressor.</p> <p>Randomly selected K5.01 - Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Air compressors.</p>

2/1 (#21)	223002 /2.4.20	<p>Emergency Procedures / Plan: Knowledge of operational implications of EOP warnings, cautions, and notes.</p> <p>There are no EOP warnings, cautions, or notes that specifically address NS4 or PCIS.</p> <p>Randomly selected 2.1.31 – Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.</p>
2/1 (#24)	218000 /A3.05	<p>Ability to monitor automatic operations of the AUTOMATIC DEPRESSURIZATION SYSTEM including: Suppression pool level.</p> <p>There is no direct relationship of Suppression Pool Level to the automatic operation of ADS.</p> <p>Randomly selected A3.04 - Ability to monitor automatic operations of the AUTOMATIC DEPRESSURIZATION SYSTEM including: Primary containment pressure.</p>
2/2 (#28)	233000 /K2.02	<p>Knowledge of electrical power supplies to the following: RHR pumps.</p> <p>Could not write a discriminating question at the RO level.</p> <p>Randomly selected K3.01 - Knowledge of the effect that a loss or malfunction of the FUEL POOL COOLING AND CLEAN-UP will have on the following: Fuel pool temperature.</p>
1/2 (#59)	295032 /EK1.01	<p>Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Personnel protection.</p> <p>There is no licensed level discriminating question. More of a generic employee training topic.</p> <p>Randomly selected EK1.03 - Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Secondary containment leakage detection: Plant Specific.</p>
2/1 (#25)	259002 /K1.16	<p>Knowledge of the physical connections and/or cause- effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following: HPCI: Plant-Specific.</p> <p>No physical connection or direct relationship between HPCI and Digital Reactor Feedwater Control System.</p> <p>Randomly selected K1.03 - Knowledge of the physical connections and/or cause- effect relationships between REACTOR WATER LEVEL CONTROL SYSTEM and the following: Reactor water level.</p>

2/2 (#32)	223001 /K6.05	<p>Knowledge of the effect that a loss or malfunction of the following will have on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES : Hydrogen recombiner: Plant-Specific</p> <p>Very low discriminatory value for a licensed operator exam. The Hydrogen Recombiner does not function IAW normal, abnormal, or EOPs. (SAMG)</p> <p>Randomly selected K6.11 - Knowledge of the effect that a loss or malfunction of the following will have on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES: A.C. electrical distribution.</p>
2/2 (#36)	230000 /A4.11	<p>Ability to manually operate and/or monitor in the control room: System venting.</p> <p>There are no dedicated indicators or controls from the control room for system venting of RHR in Torus Spray mode. There is no procedural guidance of system venting of RHR in Torus Spray mode.</p> <p>Randomly selected A4.02 - Ability to manually operate and/or monitor in the control room: Spray valves.</p>
2/2 (#37)	268000 /2.1.7	<p>Conduct of Operations: Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretation.</p> <p>No direct relationship between reactor behavior and Radwaste systems.</p> <p>Randomly selected 2.3.11 – Ability to control radiation releases.</p>
3 (#68)	2.2.17	<p>Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, coordination with the transmission system operator.</p> <p>Risk assessment is at the SRO level.</p> <p>Randomly selected 2.2.1 - Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.</p>
3 (#69)	2.2.23	<p>Ability to track Technical Specification limiting conditions for operations.</p> <p>Tracking LCOs is at the SRO level.</p> <p>Randomly selected 2.2.39 - Knowledge of less than or equal to one hour Technical Specification action statements for systems.</p>

2/1 (#5)	261000 /K3.06	<p>Knowledge of the effect that a loss or malfunction of the STANDBY GAS TREATMENT SYSTEM will have on following: Primary containment oxygen content: Mark-I&II</p> <p>No direct relationship between SGTS (RBVS/FRVS) and Primary containment oxygen concentration.</p> <p>Randomly selected K4.01 - Knowledge of STANDBY GAS TREATMENT SYSTEM design feature(s) and/or interlocks which provide for the following: Automatic system initiation.</p>
2/1 (#20)	263000 /A4.03	<p>Ability to manually operate and/or monitor in the control room: Battery discharge rate: Plant-Specific</p> <p>No indications or controls specific to battery discharge rate in the main control room.</p> <p>Randomly selected A1.01 - Ability to predict and/or monitor changes in parameters associated with operating the D.C. ELECTRICAL DISTRIBUTION controls including: Battery charging/discharging rate. (This is outside MCR)</p>
2/1 (#26)	262001 /A4.05	<p>Ability to manually operate and/or monitor in the control room: Voltage, current, power, and frequency on A.C. buses</p> <p>Similar to K/A for question #14. (Ability to predict and/or monitor changes in parameters associated with operating the EMERGENCY GENERATORS (DIESEL/JET) controls including: Operating voltages, currents, and temperatures)</p> <p>Randomly selected K3.01 - Knowledge of the effect that a loss or malfunction of the A.C. ELECTRICAL DISTRIBUTION will have on following: Major system loads.</p>
2/1 (#1)	218000 /K1.04	<p>Knowledge of the physical connections and/or cause- effect relationships between AUTOMATIC DEPRESSURIZATION SYSTEM and the following: Drywell/containment pressure: Plant-Specific.</p> <p>Similar to the K/A for question #24. (Ability to monitor automatic operations of the AUTOMATIC DEPRESSURIZATION SYSTEM including: Primary containment pressure)</p> <p>Randomly selected K1.01 - Knowledge of the physical connections and/or cause- effect relationships between AUTOMATIC DEPRESSURIZATION SYSTEM and the following: RHR/LPCI: Plant-Specific.</p>