

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

Examiners: _____ Operators: _____

Initial Conditions: ≈79% power. B RFPT in Recirc

Turnover: ≈79% Power. Power was reduced to remove RFPT B from feeding.

Raise power to 84% IAW IO-6 and REMA.

Critical Tasks: Described on next page

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R	Raise Power with Recirculation Pumps
2	PC07A	C	Earthquake (TS)
3	QQ09	C	Trip of SSW Pump (TS)
4	RM01A	I	MSLRMS Channel A Fails upscale (TS)
5	RR31A1	I	Instrument Line Break in Drywell
6	RP06	M	ATWS
7	HP06E	C	HPCI Auto Initiation Failure
8	CU11B	C	RWCU Auto Isolation Failure

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

Facility: Hope Creek Scenario No.: 2 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: 100% Power

Turnover: RPS MG Set 1BG401 has a noisy bearing. Transfer RPS Bus B Power to its Alternate Supply in accordance with HC.OP-SO.SB-0001.

Critical Tasks: See next page

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N	Transfer 'B' RPS to Alternate Power Supply (TS)
2	N/A	R	Reduce Power to 95%
3	RZ02A	C	RRCS Pressure Transmitter Failure (TS)
4	CU11A	C	RWCU Leak w/Failure to Automatically Isolate (TS)
5	TC02-2	C	High Reactor Pressure
6	RR31A2	M	LOCA
7	PC03E	I	A/C Channel Initiation Failures
8.	ET052	C	KL-HV-5147 Failure to Close

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

Facility: Hope Creek Scenario No.: 3 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: 100% power

Turnover: 100% power

Critical Tasks: _____

Event No.	Malf. No.	Event Type*	Event Description
1	FW12B	R, C	FWH Leak (TS)
2	SL03A	C	Inadvertent SBLC System Actuation (TS)
3	ED11A	I	Loss of 10D410 (TS)
4	EG12	M	Loss of Offsite Power
5	DG03B DG04B	C	Auto Start Failure of EDGs
6	RC01	C	RCIC Trip on Overspeed
7	QQ15	C	SACS Pump Trip

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

Facility: <u>Hope Creek Generating Station</u>		Date of Examination: <u>2/15/21</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>1</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, S	<p>Perform a Reactor Recirculation Pump Quick Restart</p> <p>Task Standard: Operator completes Step G.12 of HC.OP-AB.RPV-0003 for restart of Reactor Recirculation Pump</p> <p>KA - 2.1.18 - Ability to make accurate, clear, and concise logs, records, status boards, and reports.</p>
Conduct of Operations	D, S	<p>Perform Steps 5.1 through 5.6.3 of HC.OP-ST.SH-0001</p> <p>Task Standard: Operator performs Steps 5.1 through 5.6.3 of HC.OP-ST.SH-0001(Q) and notifies CRS and/or system engineering of any variance</p> <p>KA - 2.1.45 - Ability to identify and interpret diverse indications to validate the response of another indication.</p>
Equipment Control	N, R	<p>ISOLATE AND DRAIN CRD PP "A" to perform the a pump internal inspection. Using controlled station drawings (provided):</p> <ol style="list-style-type: none"> 1. IDENTIFY the Mechanical components that are required to be tagged, and their required positions. 2. IDENTIFY the Electrical component(s) that is/are required to be tagged, and required position. <p>KA - 2.2.41 – Ability to Obtain and Interpret Station Electrical & Mechanical Drawings</p>
Radiation Control	D	<p>Determine Liquid Radwaste Rad Monitor CTB Weir Flow</p> <p>Task Standard: Operator completes the Day Shift reading for HC.OP-DL.ZZ-0026, Attachment 1a, ITEM 47, for the RMS Cooling Tower Blowdown Weir Flow Rate Monitor and identifies any variance.</p> <p>KA - 2.3.11 - Ability to control radiation releases.</p>

Emergency Plan		N/A
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 Generating Station</u>		Date of Examination: <u>2/15/21</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Operating Test Number: <u>1</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, R	<p>PERFORM the Shift Manager review of the OP-AA-105-102, Attachment 2, for an SRO license renewal for the Control Room Supervisor position</p> <p>Task Standard: Determines license reactivation requirements have not been met (and why) in accordance with OP-AA-105-102.</p> <p>KA 2.1.5 Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.</p>
Conduct of Operations	P, R	<p>Complete Daily Surveillance log</p> <p>Task Standard: Operator implements the log at the beginning of the day by completing Attachment 1, Section A, of HC.OP-DL.ZZ-0026 and identifies attachments required IAW the answer key</p> <p>KA – 2.1.18 – Ability to make accurate, clear, and concise, logs, records, status boards and reports</p>
Equipment Control	N, R	<p>Review and approve Work Clearance Documents (WCDs). You have been presented with the WCD for Independent Review and Pre-Approval in accordance with OP-AA-109-115, Safety Tagging Operations for CRD PP "A"</p> <p>Task Standard: Identify discrepancies IAW answer key</p> <p>KA - 2.2.41 – Ability to Obtain and Interpret Station Electrical & Mechanical Drawings</p>
Radiation Control	D, R	<p>PERFORM step 5.1.11 of HC.OP-GP.ZZ-0004 to determine the leakage into the Core Spray Loop A Injection Header. Determine any required actions and RECORD them below</p> <p>Task Standard: Operator completes the CRS/SM review of a completed HC.OP-GP.ZZ-0004 and notes actions required.</p> <p>KA - 2.3.11 Ability to control radiation releases.</p>

<p>Emergency Plan</p>	<p>D, R</p>	<p>Utilize The ECG To Determine The Emergency Classification And/Or Reportability Of An Event And/Or Plant Condition</p> <p>Task Standard: Operator appropriate declaration in accordance with answer key; initiates a PAR; and makes notifications within identified Critical Times in accordance with EP-HC-111-101.</p> <p>KA 2.4.38 - Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.</p>
<p>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).</p>		
<p>* 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)</p>		

Facility: <u>Hope Creek Generating Station</u>	Date of Examination: <u>2/15/21</u>	
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test Number: <u>1</u>	
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. Respond to Rising Drywell Pressure	S,D,A,L	5
b. Place HPCI in full flow Test Operation	S,P,A,EN,L	4
c. Place RCIC in service from the RSP	S,D,A,EN	2
d. Perform Non-Emergency Operation of the EDG	S,D	6
e. Swap RACs pumps	S,N, A	8
f. Enabling Automatic Backup Stability Protection for an APRM IAW HC.OP-SE-0001 Step 4.10	S,N	7
g. Resetting RPS Trips	S,P,A	1
h. Swap Control Room Vent trains IAW HC.OP-SO.GK-0001	S,D	9
In-Plant Systems: * 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. Transfer RPS Bus A/B Power from Alternate Source to RPS MG Set	D,A	7
j. Shift in-service CRD flow control valves	D,R	1
k. Respond to a Failed Open SRV	D,E	3
* 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 Generating Station</u>		Date of Examination: <u>2/15/21</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test Number: <u>1</u>
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. Respond to Rising Drywell Pressure	S,D,A,L	5
b. Place HPCI in full flow Test Operation	S,D,A,EN	4
c. Place RCIC in service from the RSP	S,D,A,EN	2
d. Perform Non-Emergency Operation of the EDG	S,D	6
e. Swap RACs pumps	S,N,A	8
f. Enabling Automatic Backup Stability Protection for an APRM IAW HC.OP-SE-0001 Step 4.10	S,N	7
g. Resetting RPS Trips	S,P,A	1
In-Plant Systems: * 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. Transfer RPS Bus A/B Power from Alternate Source to RPS MG Set	D,A	7
j. Shift in-service CRD flow control valves	D,R	1
k. Respond to a Failed Open SRV	D,E	3
* 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:		HC21-2		Date of Exam:		02/21											
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 Evolutions	1	3	5	3				4	4			1	20	4	3	7	
	2	1	2	0				1	2			1	7	2	1	3	
	Tier Totals	4	7	3				5	6			2	27	6	4	10	
2. Plant Systems	1	2	2	2	3	2	2	3	2	2	4	2	26	2	3	5	
	2	1	1	2	1	1	1	1	1	1	1	1	12	0	1	2	
	Tier Totals	3	3	4	4	3	3	4	3	3	5	3	38	3	5	8	
3. Generic Knowledge & Abilities Categories				1		2		3		4		10	1	2	3	4	7
				2		3		3		2			2	2	1	2	

- Note:
- Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and 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.)
 - 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.
 - Systems/evolutions within each group are identified on the outline. Systems or evolutions that do not apply at the facility should be deleted with justification. Operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
 - 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.
 - Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
 - Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
 - 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/As.
 - On the following pages, enter the K/A numbers, a brief description of each topic, the topics' IRs for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above. If fuel-handling equipment is sampled in a category 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.
 - For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.
- G* Generic K/As
- * These systems/evolutions must be included as part of the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan. They are not required to be included when using earlier revisions of the K/A catalog.
 - ** These systems/evolutions may be eliminated from the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan.

HC21-2
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#
295026 Suppression Pool High Water Temp. / 5					X		EA2.01 - Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Suppression pool water temperature	4.2	76
295016 Control Room Abandonment / 7					X		AA2.03 - Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT : Reactor pressure	4.4	77
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1					X		EA2.07 - Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : Containment conditions/isolations	4.2	78
295021 Loss of Shutdown Cooling / 4						X	2.2.40 - Equipment Control: Ability to apply Technical Specifications for a system.	4.7	79
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4						X	2.4.50 - Emergency Procedures / Plan: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4.0	80
295018 Partial or Total Loss of CCW / 8						X	2.4.4 - Emergency Procedure/Plan: Ability to recognize abnormal indications for system operating parameters that are entry level conditions for emergency and abnormal operating procedures	4.7	81
600000 Plant Fire On-site / 8					X		AA2.03 - Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Fire alarm	3.2	82
295024 High Drywell Pressure / 5	X						EK1.01 - Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE Drywell integrity: Plant-Specific	4.1	39
295037 SCRAM Conditions Present and Reactor Power Above APRM Downscale or Unknown / 1	X						EK1.03 - Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Boron effects on reactor power (SBLC)	4.2	40
295030 Low Suppression Pool Water Level / 5	X						EK1.03 - Knowledge of the operational implications of the following concepts as they apply to LOW SUPPRESSION POOL WATER LEVEL: Heat capacity	3.8	41
295038 High Off-site Release Rate / 9		X					EK2.06 - Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: Process liquid radiation monitoring system	3.4	42
295003 Partial or Complete Loss of AC / 6		X					AK2.02 - Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF A.C. POWER and the following: Emergency generators	4.1	43
600000 Plant Fire On-site / 8		X					AK2.03 - Knowledge of the interrelations between PLANT FIRE ON SITE and the following: Motors	2.5	44
295004 Partial or Total Loss of DC Pwr / 6			X				AK3.02 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Ground isolation/fault	2.9	45

HC21-2
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#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4			X				AK3.03 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Idle loop flow	2.8	46
700000 Generator Voltage and Electric Grid Disturbances			X				AK3.02 - Knowledge of the reasons for the following responses as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Actions contained in abnormal operating procedure for voltage and grid disturbances.	3.6	47
295026 Suppression Pool High Water Temp. / 5				X			EA1.03 - Ability to operate and/or monitor the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: Temperature monitoring	3.9	48
295023 Refueling Accidents Cooling Mode / 8				X			AA1.07 - Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS : Fuel pool cooling and cleanup system	2.9	49
295025 High Reactor Pressure / 3				X			EA1.05 - Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: RCIC: Plant-Specific	3.7	50
295006 SCRAM / 1					X		AA2.04 - Ability to determine and/or interpret the following as they apply to SCRAM : Reactor pressure	4.1	51
295005 Main Turbine Generator Trip / 3					X		AA2.03 - Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP : Turbine valve position	3.1	52
295019 Partial or Total Loss of Inst. Air / 8					X		AA2.01 - Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR : Instrument air system pressure	3.5	53
295018 Partial or Total Loss of CCW / 8		X					AK2.02 - Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER and the following: Plant operations	3.4	54
295016 Control Room Abandonment / 7				X			AA1.06 - Ability to operate and/or monitor the following as they apply to CONTROL ROOM ABANDONMENT: Reactor water level	4.0	55
295031 Reactor Low Water Level / 2		X					EK2.12- Knowledge of the interrelations between REACTOR LOW WATER LEVEL and the following: Primary containment isolation system/NS4	4.5	56
295021 Loss of Shutdown Cooling / 4					X		AA2.02 - Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING : RHR/shutdown cooling system flow	3.4	57
295028 High Drywell Temperature / 5						X	2.4.18 - Emergency Procedures / Plan: Knowledge of the specific bases for EOPs	3.3	58
K/A Category Totals:	3	5	3	4	4/4	1/3	Group Point Total:	20/7	

HC21-2
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#
295015 Incomplete SCRAM / 1					X		AA2.01 - Ability to determine and/or interpret the following as they apply to INCOMPLETE SCRAM : Reactor power	4.3	83
295012 High Drywell Temperature / 5						X	2.1.25 - Conduct of Operations: Ability to interpret reference materials, such as graphs, curves, tables, etc.	4.2	84
295010 High Drywell Pressure / 5					X		AA2.02 - Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE : Drywell pressure	3.9	85
295008 High Reactor Water Level / 2	X						AK1.03 - Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR WATER LEVEL : Feed flow/steam flow mismatch	3.2	59
295022 Loss of CRD Pumps / 1		X					AK2.04 - Knowledge of the interrelations between LOSS OF CRD PUMPS and the following: Reactor water level	2.5	60
295009 Low Reactor Water Level					X		AA2.01 - Ability to determine and/or interpret the following as they apply to LOW REACTOR WATER LEVEL: Reactor water level	4.2	61
295034 Secondary Containment Ventilation High Radiation / 9				X			EA1.04 - Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION : SBTG/FRVS: Plant-Specific	4.1	62
295032 High Secondary Containment Area Temperature / 5					X		EA2.01 - Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE : Area temperature	3.8	63
295020 Inadvertent Cont. Isolation / 5 & 7						X	2.1.31 - Conduct of Operations: Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.	4.6	64
500000 High CTMT Hydrogen Conc. / 5		X					EK2.03 - Knowledge of the interrelations between HIGH CONTAINMENT HYDROGEN CONCENTRATIONS and the following: Containment Atmosphere Control System	3.3	65
K/A Category Totals:	1	2	0	1	2/2	1/1	Group Point Total:		7/3

**HC21-2
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#
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215005 APRM / LPRM								X				A2.08 - Ability to (a) predict the impacts of the following on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions: Faulty or erratic operation of detectors/systems	3.4	86
263000 DC Electrical Distribution								X				A2.01 - Ability to (a) predict the impacts of the following on the D.C. ELECTRICAL DISTRIBUTION ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Grounds	3.2	87
223002 PCIS/Nuclear Steam Supply Shutoff										X		2.4.49 - Emergency Procedures / Plan: Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.4	88
300000 Instrument Air 72069										X		2.4.11 - Emergency Procedures / Plan: Knowledge of abnormal condition procedures.	4.2	89
218000 ADS										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	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											K1.06 - Knowledge of the physical connections and/or cause- effect relationships between RELIEF/SAFETY VALVES and the following: Drywell instrument air/ drywell pneumatics: Plant-Specific	3.4	2
203000 RHR/LPCI: Injection Mode		X										K2.01 - Knowledge of electrical power supplies to the following: Pumps	3.5	3
215003 IRM		X										K2.01 - Knowledge of electrical power supplies to the following: IRM channels/detectors	2.5	4

**HC21-2
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#
262001 AC Electrical Distribution			X									3.5	5
262002 UPS (AC/DC)			X									2.9	6
259002 Reactor Water Level Control				X								3.1	7
205000 Shutdown Cooling				X								3.6	8
263000 DC Electrical Distribution					X							2.6	9
264000 EDGs					X							3.4	10
212000 RPS						X						2.8	11
211000 SLC						X						3.2	12
217000 RCIC							X					3.7	13
400000 Component Cooling Water							X					2.8	14

**HC21-2
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				3.2	15
215005 APRM / LPRM								X				2.7	16
223002 PCIS/Nuclear Steam Supply Shutoff									X			3.5	17
206000 HPCI									X			3.6	18
300000 Instrument Air										X		2.6	19
215004 Source Range Monitor										X		3.2	20
209001 LPCS										X		3.7	21
211000 SLC											X	4.4	22
400000 Component Cooling Water System (CCWS)				X								3.4	23
259002 Reactor Water Level Control										X		3.8	24
262001 AC Electrical Distribution											X	4.6	25

**HC21-2
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						
A1.03 - Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including: Off-site release levels												3.2	26
K/A Category Totals:	2	2	2	3	2	2	3	2/2	2	4	2/3	Group Point Total: 26/5	

**HC21-2
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	A 2	A 3	A 4	G	Imp	Q #
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215002 RBM								X						A2.03 - Ability to (a) predict the impacts of the following on the ROD BLOCK MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of associated reference APRM channel: BWR-3,4,5	3.3	91
290003 Control Room HVAC											X			2.4.31 - Emergency Procedures / Plan: Knowledge of annunciator alarms, indications, or response procedures.	4.1	92
272000 Radiation Monitoring											X			2.4.30 - Emergency Procedures / Plan; 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	93
256000 Reactor Condensate	X													K1.07 - Knowledge of the physical connections and/or cause- effect relationships between REACTOR CONDENSATE SYSTEM and the following: SJAЕ condenser	2.9	27
223001 Primary CTMT and Aux.		X												K2.10 - Knowledge of electrical power supplies to the following: Drywell chillers: Plant-Specific	2.7	28
234000 Fuel Handling Equipment K3.03			X											K3.04 - Knowledge of the effect that a loss or malfunction of the FUEL HANDLING EQUIPMENT will have on following: Reactor manual control system: Plant-Specific	2.9	29
271000 Off-gas				X										K4.01 - Knowledge of OFFGAS SYSTEM design feature(s) and/or interlocks which provide for the following: Dilution of hydrogen gas concentration	2.9	30
230000 RHR/LPCI: Torus/Pool Spray Mode					X									K5.04 - Knowledge of the operational implications of the following concepts as they apply to RHR/LPCI: TORUS/SUPPRESSION POOL SPRAY MODE : Evaporative cooling	2.5	31
216000 Nuclear Boiler Inst.						X								K6.01 - Knowledge of the effect that a loss or malfunction of the following will have on the NUCLEAR BOILER INSTRUMENTATION : A.C. electrical distribution	3.1	32

**HC21-2
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	A 2	A 3	A 4	G	Imp	Q #
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202001 Recirculation							X					A1.13 - Ability to predict and/or monitor changes in parameters associated with operating the RECIRCULATION SYSTEM controls including: Recirculation loop temperatures: Plant-Specific	3.1	33
201003 Control Rod and Drive Mechanism								X				A2.05 - Ability to (a) predict the impacts of the following on the CONTROL ROD AND DRIVE MECHANISM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Reactor Scram	4.1	34
219000 RHR/LPCI: Torus/Pool Cooling Mode									X			A3.01 - Ability to monitor automatic operations of the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE including: Valve operation	3.3	35
201006 RWM										X		A4.03 - Ability to monitor automatic operations of the ROD WORTH MINIMIZER SYSTEM (RWM) (PLANT SPECIFIC) including: Latched group indication: P-Spec(Not-BWR6)	3.0	36
204000 RWCU											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	37
201002 RMCS			X									K3.02 - Knowledge of the effect that a loss or malfunction of the REACTOR MANUAL CONTROL SYSTEM will have on following: Rod block monitor: Plant-Specific	2.9	38
K/A Category Totals:	1	1	2	1	1	1	1	1/1	1	1	1/2	Group Point Total:		12/3

Facility:		HC21-2		Date:		02/01/21	
Category	K/A #	Topic	RO		SRO-Only		
			IR	Q#	IR	Q#	
1. Conduct of Operations	2.1.45	Ability to identify and interpret diverse indications to validate the response of another indicator.			4.3	94	
	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.			4.4	98	
	2.1.7	Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	66			
	2.1.32	Ability to explain and apply all system limits and precautions.	3.8	67			
	Subtotal			2	2		
2. Equipment Control	2.2.11	Knowledge of the process for controlling temporary design changes.			3.3	95	
	2.2.7	Knowledge of the process for conducting special or infrequent tests.			3.6	99	
	2.2.12	Knowledge of surveillance procedures.	3.7	68			
	2.2.15	Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.	3.9	69			
	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	74			
	Subtotal			3	2		
3. Radiation Control	2.3.6	Ability to approve release permits.			3.8	96	
	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5	70			
	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.	3.4	71			

	2.3.14	Knowledge of radiation or containment hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.4	75		
	Subtotal			3		1
4. Emergency Procedures / Plan	2.4.40	Knowledge of SRO responsibilities in emergency plan implementation.			4.5	97
	2.4.6	Knowledge of EOP mitigation strategies.			4.7	100
	2.4.35	Knowledge of local auxiliary operator tasks during emergency and the resultant operational effects.	3.8	72		
	2.4.28	Knowledge of procedures relating to a security event.	3.2	73		
	Subtotal			2		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
2/1 (#2)	239002/K1.06	<p>K1.02 - Knowledge of the physical connections and/or cause-effect relationships between RELIEF/SAFETY VALVES and the following: SPDS/ERIS/CRIDS/GDS: Plant-Specific</p> <p>There is no specific physical connection to SPDS/ERIS/CRIDS/GDS with a cause-effect relationship for SRVs. No license level question can be written for this specific K/A for SRVs.</p> <p>Randomly reselected: Drywell instrument air/ drywell pneumatics: Plant-Specific (PCIG)</p>
2/1 (#14)	400000/A1.04	<p>A1.03 - Ability to predict and / or monitor changes in parameters associated with operating the CCWS controls including: CCW Pressure</p> <p>There is no pressure setpoint or value for the CCW systems that is specifically monitored. Flows, Temperatures, and Surge Tank levels are continuously monitored along with setpoints.</p> <p>Randomly reselected: Surge Tank Level</p>
2/1 (#21)	209001/A4.11	<p>2.1.23 - Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.</p> <p>There is no reference to the Core Spray system in the integrated procedures at a level for a license exam question.</p> <p>Randomly reselected: Ability to manually operate and/or monitor in the control room: System flow.</p>
2/1 (#22)	211000/ 2.1.30	<p>2.2.38 - Equipment Control: Knowledge of conditions and limitations in the facility license.</p> <p>This K/A references Tech Specs which is at the SRO level.</p> <p>Randomly reselected: Conduct of Operations: Ability to locate and operate components, including local controls.</p>
2/1 (#24)	259002/A4.01	<p>A4.09 - Ability to manually operate and/or monitor in the control room: TDRFP lockout reset: TDRFP</p> <p>There is no lockout parameter for the RFP's at Hope Creek.</p> <p>Randomly reselected: All individual component controllers in the manual mode.</p>

2/1 (#25)	262001/ 2.1.20	<p>2.1.27 - Conduct of Operations: Knowledge of system purpose and / or function.</p> <p>Cannot write a license level question with a purpose of a system. Too low of a cognitive level question.</p> <p>Randomly reselected: Ability to interpret and execute procedure steps.</p>
2/1 (#26)	261000/ A1.03	<p>A1.05 - Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including: Primary containment oxygen level: Mark-I&II</p> <p>There is no Oxygen parameter that directly interfaces with the FRVS system.</p> <p>Randomly reselected: Off-site release levels</p>
1/1 (#40)	295037/ EK1.03	<p>EK1.06 - Knowledge of the operational implications of the following concepts as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Cooldown effects on reactor power.</p> <p>A cooldown of the RPV prior to being shutdown under all conditions would not be allowed IAW emergency operating procedures.</p> <p>Randomly reselected: Boron effects on reactor power (SBLC).</p>
1/1 (#42)	295038/ EK2.06	<p>EK2.12 Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: Feedwater leakage control: BWR-6</p> <p>There are no Hope Creek procedures that reference Feedwater leakage control with Offsite Release. Cannot write a license level question for this K/A.</p> <p>Randomly reselected: Process liquid radiation monitoring system</p>
1/1 (#45)	295004/ AK3.02	<p>AK3.01 - Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER : Load shedding</p> <p>There is no automatic "load shedding" due to a loss of D.C. Load shedding occurs from a loss of A.C.</p> <p>Randomly reselected: Ground isolation/fault determination</p>

1/1 (#49)	295023/ AA1.02	<p>AA1.07 - Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS : Standby gas treatment/FRVS</p> <p>The above concept (K/A) is similar to Question #26 which would cause "Double Jeopardy" on the exam.</p> <p>Randomly reselected: Fuel pool cooling and cleanup system</p>
1/1 (#51)	295006/ AA2.04	<p>AA2.01 - Ability to determine and/or interpret the following as they apply to SCRAM : Reactor power</p> <p>L.O.D for a question on what happens to reactor power on a scram (power lowers, APRMs downscale) would be 1.</p> <p>Randomly reselected: Reactor pressure</p>
1/1 (#58)	295028 2.4.18	<p>2.4.6 - Emergency Procedures / Plan: Knowledge of EOP mitigation strategies.</p> <p>EOP mitigation strategies are at the SRO level due to selection of EOP procedures and actions within the legs of the EOP procedures to satisfy the mitigation strategy.</p> <p>Randomly selected: Knowledge of the specific bases for EOPs.</p>
2/1 (#89)	300000 2.4.11	<p>2.4.41- Emergency Procedures / Plan: Knowledge of the emergency action level thresholds and classifications.</p> <p>There are no ECG/classifications for the Instrument Air System IAW the Hope Creek EALs and RALs.</p> <p>Randomly reselected: Knowledge of abnormal condition procedures.</p>
2/2 (#91)	215002/ A2.03	<p>A2.01- Ability to (a) predict the impacts of the following on the ROD BLOCK MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Withdrawal of control rod in high power region of core: BWR-3,4,5</p> <p>There is no procedure that directly addresses or mitigates the consequences of a control rod withdrawal in the higher power region of the core. This is more of a GFES type K/A.</p> <p>Randomly reselected: Loss of associated reference APRM channel: BWR-3,4,5</p>

3/4 (#97)	2.4.40	<p>2.4.26 Knowledge of facility protection requirements, including fire brigade and portable firefighting equipment usage.</p> <p>There is no fire brigade (separate fire department) at Hope Creek. Cannot write a SRO license level question to this K/A.</p> <p>Randomly reselected: Knowledge of SRO responsibilities in emergency plan implementation.</p>
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