Facility: Hope Creek Generating Station Date of Examination: 6/16/03

Examination Level: ☒ RO ☐ SRO Operating Test Number: v

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions	
A.1	Conduct of Operations Plant Parameter Verification	2.1.12 JPM-	Ability to apply technical specifications to a system. (2.9) Gather information and determines if conditions are satisfactory for a Recirculation Pump restart. (New) (Simulator Perform)
	System Lineup	2.1.31 JPM -	Ability to locate control room switches/controls and indications and to determine that they are correctly reflecting the desired plant lineup. (4.2) RHR System Piping and Flow Path Verification (Simulator Perform) (07/02 NRC Exam)
A.2	Equipment Control Surveillance Procedures	2.2.12 JPM-	Knowledge of surveillance procedures. (3.0) Perform alternate determination of Drywell Air Temperature. (Simulator Perform) (03/02 NRC)
A.3	Radiation Control	2.3.9 JPM -	Knowledge of the process for performing a containment purge. (2.5) Complete containment purge paperwork. (Bank)
A.4	Emergency Plan Emergency Communications	2.4.39 JPM-	Knowledge of the RO's responsibilities in emergency plan implementation. (3.3) Complete the Operational Status Board-Hope Creek (Simulator Perform) (03/02 NRC Modified)

ES-301 Administrative Topics Outline FORM ES-301-1

Facility: Hope Creek Generating Station Date of Examination: 6/16/03

Examination Level: ☐ RO ☒ SRO Operating Test Number: 1

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions	
A.1	Conduct of Operations Plant Parameter Verification	2.1.25	Ability to obtain and interpret station reference materials such as graphs/monographs/and tables which contain data. (2.8)
		Question-	Given plant conditions, what is the highest recommended 00K107 discharge pressure that gives reasonable assurance of avoiding surge. (New)
		2.1.25	Ability to obtain and interpret station reference materials such as graphs/monographs/and tables which contain data. (2.8)
		Question-	Given plant conditions, determine the Reactor Temperature at which a HPCI high RPV Level 8 Trip occurs during a Reactor cooldown. (New)
	Shift Manning	2.1.5	Ability to locate and use procedures and directives related to shift staffing and activities. (3.4)
		JPM-	Determine if minimum shift manning requirements are met. (3/03 LSRO)
A.2	Equipment Control Surveillance Procedures	2.2.12	Knowledge of surveillance procedures. (3.4)
		JPM-	Perform a review of a completed surveillance. (Modified)
A.3	Radiation Control	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized. (3.0)
		Question-	Given an emergency condition, determine allowable stay times. (Bank)
		2.3.1	Knowledge of 10CFR20 and related facility radiation control requirements. (3.0)
		Question-	Apply the NBU radiation exposure limits for a Declared Pregnant Worker with existing exposure. (Bank)
A.4	Emergency Plan Emergency Action Levels and Classifications	2.4.38	Ability to take actions called for in the facility emergency plan/including (if required) supporting or acting as emergency coordinator. (4.0)
		JPM -	Given a set of conditions, classify an event. (Bank)

ES-301 Control Room Systems and Facility Walk-Through Test Outline FORM ES-301-2

Facility: Hope Creek Generating Station Date of Examination: 6/16/03

Examinations Developed by: ☒ Facility ☐ NRC

Examination Level: ☒ RO ☒ SRO(I) ☐ SRO(U) Operating Test Number: 1

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. Conduct Reactor Recirculation Two Loop Operation / Respond to a Positive Reactivity Addition (Abnormal)	(D), (A), (S)	1
b. Perform The Weekly RPS Manual SCRAM Test / Multiple Control Rods Scram During Testing (Abnormal)	(N), (A), (S)	7
c. Place the First RFPT In-Service	(D), (S), (L)	2
d. Equalize SACS Expansion Tank Levels	(N), (S)	8
e. Shutdown the HPCI System	(D), (S)	4
f. Perform Non Emergency Operation of the Diesel Generators	(N), (S), (E)	6
g. Respond To A Low Turbine Hydraulic Pressure (03/02 NRC)	(D), (A), (S)	3

B.2 Facility Walk-Through

a. Place the Emergency Instrument Air Compressor In Service from the Local Control Panel	(D), (A), (P), (R)	8
b. Bypass A Control Rod in the Reactor Manual Control System	(D), (P)	1
c. Defeat ARI Interlocks (Emergency)	(D), (P)	7

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (P)lant, (R)CA, (E)SF

Facility: Hope Creek Generating Station Scenario Number: 1 Operating Test Number: 1

Examinees:				Evaluators:		
	SRO1	SRO3	SRO5			
	RO1	RO2	RO3			
	SRO2	SRO4	SRO6			

Initial Conditions: 70% Power. A Reactor startup is in progress. (Bank)

Turnover: Continue with Reactor startup.

Event Number	Malf. Number	Event Type*	Event Description
1		N(PO) N(SRO)	Alternate Reactor Auxiliary Cooling Pumps
2		C(PO) C(SRO)	Reactor building isolation
3	ED02/ ED03	R(RO) C(PO) C(SRO)	Loss of station power transformer T-4 and 10A110
4	RR26/ RR13	C(ALL)	Recirculation pump high vibrations and subsequent trip
5	RR31/ FW01	M(ALL)	LOCA with Loss of Feedwater
6	HP01	C(PO)	HPCI auto start failure

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

Facility: Hope Creek Generating Station Scenario Number: 2 Operating Test Number: 1

Examinees:				Evaluators:		
	SRO2	SRO4	SRO6			
	SRO1	SRO3	SRO5			
	RO1	RO2	RO3			

Initial Conditions: Reactor startup in progress at approximately 17% power. (New)

Turnover: Withdraw Control Rods. Inerting the Containment. Continue startup.

Event Number	Malf. Number	Event Type*	Event Description
1		R(RO) N(SRO)	Raise Reactor Power with Control Rods
2	CD03	C(RO) C(SRO)	Stuck Control Rod
3		N(PO) N(SRO)	Inerting the Containment (Similar to audit. Audit-pressure control.)
4	ED09A2	C(PO) C(SRO)	Loss of 1AD482 inverter
5	MS04	C(ALL)	Steam leak in the steam tunnel
6	RR31/ RH07	M(ALL)	Small break LOCA/RHR pump room flooding(Failure to isolate)
7	AD01	C(PO) C(SRO)	Emergency Depressurization/SRV Failure to open

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

Facility: Hope Creek Generating Station Scenario Number: 3 Operating Test Number: 1

Examinees:	-	-	-	Evaluators:	-	-	-
	SRO2	SRO4	SR06				
	SRO1	SRO3	SRO5				

Initial Conditions: 95% Reactor power. Shutdown in progress. (Bank Modified)

Turnover: Continue with Reactor shutdown.

Event Number	Malf. Number	Event Type*	Event Description
1		R(RO) N(SRO)	Lower Reactor Power with Recirculation Flow
2	FW04	C(RO) C(SRO)	Secondary Condensate Pump Trip/Failure of Recirculation Pump to Runback
3	CU01	C(RO) C(SRO)	RWCU Pump Trip
4	ED011 6/ EG12	M(ALL)	Loss of Station Power Transformer, and then a loss of offsite power
5	DG02/ DG08	C(PO) C(SRO)	Failure of "B" EDG, and failure of "A" EDG breaker to auto close
6	HP09/ HP10	C(PO) C(SRO)	HPCI steam leak with failure to automatically isolate
7	RC01	C(PO) C(SRO)	RCIC turbine overspeed/Emergency Depressurization

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

Facility: Hope Creek Generating Station Scenario Number: SP Operating Test Number: 1

Examinees: _____ _____ _____ Evaluators: _____ _____ _____

Initial Conditions: Plant startup is in progress. Reactor power is approximately 45%. (Bank Modified)

Turnover: Continue with startup.

Event Number	Malf. Number	Event Type*	Event Description
1		R(RO) N(SRO)	Raise power with Control Rods
2	NM21/ CD06	C(RO) C(SRO)	APRM failure upscale with single rod scram
3	EG04/ TC06	C(PO) C(SRO)	Failure of Main Turbine to runback following loss of Stator Water Cooling
4	RP06/ RP07	M(ALL)	Full-core ATWS (Modified from Half-Core ATWS)
5	TC01-10	C(ALL)	Turbine Bypass Valve failure
6	SL01/ SL04	C(RO) C(SRO)	SLC Failure to Automatically Initiate / SLC Pump A trip

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

Outline Changes

Original KA	*Original Exam Level*	*New KA*	*New Exam Level*	*Reason*
295008K203	B	295001K206	B	295008K203 replaced with 295001K206 randomly selected to reduce oversampling of the Reactor Water Level Control topic and increase variety of sampled topics.
295009K201	B	295014K201	B	295009K201 replaced with 295014K201randomly selected to reduce oversampling of the Reactor Water Level Control topic and increase variety of sampled topics.
203000k202	B	206000A402	S	Replaced 203000K202 due to too many power supply questions and need for one k/a in category A4. Randomly selected 206000 from unsampled K/A's of Teir 2 Group 1. Randomly selected A402 from the A4 category.
203000K202	B	206000G123	R	Replaced 203000K202 due to too many power supply questions and need for one k/a in category G. Randomly selected 206000 from unsampled K/A's of Teir 2 Group 1. Randomly selected G 2.1.24 from the available Generic category K/As.
295038A103	B	295038A102	B	295038A103 Replaced KA due to reduce overemphasis on Process Radiation Monitors. Randomly selected 295038A102 for replacement.
203000K103	B	203000K110	B	Changed due to oversampling in RHR/LPCI keep-fill systems. 203000K110 ramdomly selected from remaining Kas
239002A206	R	239002A201	R	Replaced 239002A206 with 239002A201 randomly selected to reduce sampling in area of high reactor pressure and broaden exam breadth.
290001A301	B	290001A301	B	Replaces 290001A302 with 290001A301 due to being too similar to KA 295035.G2.1.32 in question 42. 290001A301 selected due to be the only KA in 290001A3 category.
295036K301	B	295036K303	B	Changed KA from 295036 K3.01 to K3.03 due to no plausible reactor coolant leak would cause flooding without other problems.
223002K407	B	223002K408	B	KA 223002K4.07 replaced with 223002K4.08 Original KA material too low discrimintory level for RO's
295024G127	R	295024G418	R	KA changed from 295024G127 to 295024G418 per Chief Examiner request. LOD too low. Non plausible distractors.
234000G446	S	234000G222	S	Original question KA Mismatch. Ability to verify alarms are consistent with plant conditions and Emergency Plan category not suitable for Refueling Equipment system level question. Reselected SRO level Generic KA 234000 G 2.2.22.

Facility: Hope Creek Generating Station Date of Exam: 6/17/2003 Exam Level: SRO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	
1. Emergency & Abnormal Plant Evolutions	1	4	5	4				4	5			4	26
	2	3	3	3				2	3			3	17
	Tier Totals	7	8	7				6	8			7	43
2. Plant Systems	1	3	1	2	2	2	2	2	2	2	2	3	23
	2	2	1	1	1	1	1	2	1	1	0	2	13
	3	1	0	0	1	0	0	1	0	0	0	1	4
	Tier Totals	6	2	3	4	3	3	5	3	3	2	6	40

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	
	4	4	3	6	17

Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).
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 exam must total 100 points.
3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6. *The generic 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.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified based on plant-specific priorities. Enter the tier totals for each category in the table above.

Emergency and Abnormal Evolutions - Tier 1/Group 1

System #	Name	K1	K2	K3	A1	A2	G	KA Topic(s)	Imp.	Pts.
295003	Partial or Complete Loss of A.C. Power	X						AK1.05 Failsafe component design	2.7	1
295003	Partial or Complete Loss of A.C. Power		X					AK2.04 A.C. electrical loads	3.5	1
295006	SCRAM		X					AK2.05 CRD mechanism	3.3	1
295007	High Reactor Pressure			X				AK3.05 Low pressure system isolation	3.2	1
295007	High Reactor Pressure		X					AK2.02 Reactor power	3.8	1
295009	Low Reactor Water Level					X		AA2.01 Reactor water level	4.2	1
295010	High Drywell Pressure									
295013	High Suppression Pool Temperature									
295014	Inadvertent Reactivity Addition		X					AK2.01 RPS	4.1	1
295015	Incomplete SCRAM									
295016	Control Room Abandonment		X					AK2.03 Control room HVAC	3.1	1
295016	Control Room Abandonment			X				AK3.01 Reactor SCRAM	4.2	1
295017	High Off-Site Release Rate						X	2.1.32 Ability to explain and apply system limits and precautions.	3.8	1
295023	Refueling Accidents						X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
295023	Refueling Accidents	X						AK1.03 Inadvertent criticality	4.0	1
295024	High Drywell Pressure					X		EA2.04 Suppression chamber pressure: Plant-Specific	3.9	1
295024	High Drywell Pressure					X		EA2.01 Drywell pressure	4.4	1
295025	High Reactor Pressure				X			EA1.03 Safety/relief valves: Plant-Specific	4.4	1
295026	Suppression Pool High Water Temperature			X				EK3.04 SBLC injection	4.1	1

Emergency and Abnormal Evolutions - Tier 1/Group 1

System #	Name	K1	K2	K3	A1	A2	G	KA Topic(s)	Imp.	Pts.
295026	Suppression Pool High Water Temperature	X						EK1.02 Steam condensation	3.8	1
295027	High Containment Temperature (Mark III Containment Only)									
295030	Low Suppression Pool Water Level				X			EA1.06 Condensate storage and transfer (make-up to the suppression pool): Plant-Specific	3.4	1
295030	Low Suppression Pool Water Level						X	2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
295031	Reactor Low Water Level					X		EA2.02 Reactor power	4.2	1
295031	Reactor Low Water Level				X			EA1.01 Low pressure coolant injection (RHR): Plant-Specific	4.4	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown						X	2.4.6 Knowledge symptom based EOP mitigation strategies.	4.0	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown					X		EA2.03 SBLC tank level	4.4	1
295038	High Off-Site Release Rate			X				EK3.01 Implementation of site emergency plan	4.5	1
295038	High Off-Site Release Rate				X			EA1.02 Meteorological instrumentation	3.8	1
500000	High Containment Hydrogen Concentration	X						EK1.01 Containment integrity	3.9	1

Emergency and Abnormal Evolutions - Tier 1/Group 2

System #	Name	K1	K2	K3	A1	A2	G	KA Topic(s)	Imp.	Pts.
295001	Partial or Complete Loss of Forced Core Flow Circulation		X					AK2.06 Reactor power	3.8	1
295002	Loss of Main Condenser Vacuum					X		AA2.02 Reactor power: Plant-Specific	3.3	1
295004	Partial or Complete Loss of D.C. Power									
295005	Main Turbine Generator Trip				X			AA1.03 Reactor manual control/rod control and information system	2.8	1
295005	Main Turbine Generator Trip						X	2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
295008	High Reactor Water Level	X						AK1.03 Feed flow/steam flow mismatch	3.2	1
295011	High Containment Temperature (Mark III Containment Only)									
295012	High Drywell Temperature						X	2.4.6 Knowledge symptom based EOP mitigation strategies.	4.0	1
295012	High Drywell Temperature	X						AK1.02 Reactor power level control	3.2	1
295018	Partial or Complete Loss of Component Cooling Water									
295019	Partial or Complete Loss of Instrument Air		X					AK2.07 Condensate system	3.2	1
295019	Partial or Complete Loss of Instrument Air					X		AA2.01 Instrument air system pressure	3.6	1
295020	Inadvertent Containment Isolation		X					AK2.03 Drywell/containment ventilation/cooling: Plant- Specific	3.3	1
295020	Inadvertent Containment Isolation	X						AK1.02 Power/reactivity control	3.8	1
295021	Loss of Shutdown Cooling			X				AK3.02 Feeding and bleeding reactor vessel	3.4	1
295022	Loss of CRD Pumps			X				AK3.02 CRDM high temperature	3.1	1
295028	High Drywell Temperature									
295029	High Suppression Pool Water Level					X		EA2.03 Drywell/containment water level	3.5	1
295032	High Secondary Containment Area Temperature									

Emergency and Abnormal Evolutions - Tier 1/Group 2

System #	Name	K1	K2	K3	A1	A2	G	KA Topic(s)	Imp.	Pts.
295033	High Secondary Containment Area Radiation Levels				X			EA1.02 Process radiation monitoring system	3.8	1
295034	Secondary Containment Ventilation High Radiation									
295035	Secondary Containment High Differential Pressure						X	2.1.32 Ability to explain and apply system limits and precautions.	3.8	1
295036	Secondary Containment High Sump/Area Water Level			X				EK3.03 Isolating affected systems	3.6	1
600000	Plant Fire On Site									

Plant Systems - Tier 2/Group 1

System	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic(s)	Imp.	Pts.
201005	Rod Control and Information System (RCIS)														
202002	Recirculation Flow Control System														
203000	RHR/LPCI: Injection Mode (Plant Specific)	X											K1.10 ECCS room coolers	3.2	1
206000	High Pressure Coolant Injection System										X		A4.02 Flow controller: BWR-2, 3, 4	3.8	1
207000	Isolation (Emergency) Condenser														
209001	Low Pressure Core Spray System								X				A2.06 Inadequate system flow	3.2	1
209002	High Pressure Core Spray System (HPCS)														
211000	Standby Liquid Control System		X										K2.02 Explosive valves	3.2	1
212000	Reactor Protection System										X		A4.04 Bypass SCRAM instrument volume high level SCRAM signal	3.9	1
215004	Source Range Monitor (SRM) System														
215005	Average Power Range Monitor/Local Power Range Monitor System							X					A1.02 RPS status	4.0	1
215005	Average Power Range Monitor/Local Power Range Monitor System						X						K6.04 Trip units	3.2	1
216000	Nuclear Boiler Instrumentation											X	2.2.22 Knowledge of limiting conditions for operations and safety limits.	4.1	1
216000	Nuclear Boiler Instrumentation							X					A1.04 System venting	2.8	1
217000	Reactor Core Isolation Cooling System (RCIC)			X									K3.01 Reactor water level	3.7	1
217000	Reactor Core Isolation Cooling System (RCIC)					X							K5.02 Flow indication	3.1	1
218000	Automatic Depressurization System				X								K4.02 Allows manual initiation of ADS logic	4.0	1
223001	Primary Containment System and Auxiliaries														
223002	Primary Containment Isolation System/Nuclear Steam Supply Shut-Off				X								K4.08 Manual defeating of selected isolations during specified emergency conditions	3.7	1
226001	RHR/LPCI: Containment Spray System Mode	X											K1.08 Nuclear boiler instrumentation	3.4	1

Plant Systems - Tier 2/Group 1

System	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic(s)	Imp.	Pts.
239002	Relief/Safety Valves								X				A2.04 ADS actuation	4.2	1
241000	Reactor/Turbine Pressure Regulating System											X	2.2.22 Knowledge of limiting conditions for operations and safety limits.	4.1	1
241000	Reactor/Turbine Pressure Regulating System					X							K5.04 Turbine inlet pressure vs. reactor pressure	3.3	1
259002	Reactor Water Level Control System			X									K3.07 Reactor water level indication	3.4	1
259002	Reactor Water Level Control System											X	2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications.	4.0	1
261000	Standby Gas Treatment System														
262001	A.C. Electrical Distribution														
264000	Emergency Generators (Diesel/Jet)									X			A3.04 Operation of the governor control system on frequency and voltage control	3.1	1
264000	Emergency Generators (Diesel/Jet)						X						K6.01 Starting air	3.9	1
290001	Secondary Containment									X			A3.01 Secondary containment isolation	4.0	1
290001	Secondary Containment	X											K1.07 Turbine building ventilation (steam tunnel): Plant- Specific	3.1	1

Plant Systems - Tier 2/Group 2

System	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic(s)	Imp.	Pts.
201001	Control Rod Drive Hydraulic System						X						K6.05 A.C. power	3.3	1
201001	Control Rod Drive Hydraulic System			X									K3.03 Control rod drive mechanisms	3.2	1
201002	Reactor Manual Control System							X					A1.05 Local reactor power	3.6	1
201004	Rod Sequence Control System (Plant Specific)														
201006	Rod Worth Minimizer System (RWM) (Plant Specific)											X	2.1.32 Ability to explain and apply system limits and precautions.	3.8	1
202001	Recirculation System								X				A2.03 Single recirculation pump trip	3.7	1
204000	Reactor Water Cleanup System	X											K1.03 Reactor feedwater system	3.1	1
205000	Shutdown Cooling System (RHR Shutdown Cooling Mode)														
214000	Rod Position Information System														
215002	Rod Block Monitor System														
215003	Intermediate Range Monitor (IRM) System														
219000	RHR/LPCI: Torus/Suppression Pool Cooling Mode		X										K2.01 Valves	2.9	1
230000	RHR/LPCI: Torus/Suppression Pool Spray Mode														
234000	Fuel Handling Equipment											X	2.2.22 Knowledge of limiting conditions for operations and safety limits.	4.1	1
239003	MSIV Leakage Control System														
245000	Main Turbine Generator and Auxiliary Systems														
259001	Reactor Feedwater System														
262002	Uninterruptable Power Supply (A.C./D.C.)	X											K1.01 Feedwater level control: Plant-Specific	3.0	1
263000	D.C. Electrical Distribution							X					A1.01 Battery charging/discharging rate	2.8	1
271000	Offgas System														

Plant Systems - Tier 2/Group 2

System	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic(s)	Imp.	Pts.
272000	Radiation Monitoring System														
286000	Fire Protection System														
290003	Control Room HVAC									X			A3.01 Initiation/reconfiguration	3.5	1
300000	Instrument Air System (IAS)					X							K5.01 Air compressors	2.5	1
400000	Component Cooling Water System (CCWS)				X								K4.01 Automatic start of standby pump	3.9	1

Plant Systems - Tier 2/Group 3

System	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic(s)	Imp.	Pts.
201003	Control Rod and Drive Mechanism														
215001	Traversing In-Core Probe														
233000	Fuel Pool Cooling and Clean-up							X					A1.01 Surge tank level	2.9	1
233000	Fuel Pool Cooling and Clean-up	X											K1.09 Component cooling water systems	2.6	1
239001	Main and Reheat Steam System														
256000	Reactor Condensate System				X								K4.06 Control of extraction steam	2.8	1
268000	Radwaste											X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1
288000	Plant Ventilation Systems														
290002	Reactor Vessel Internals														

Facility: Hope Creek Date of Exam 06/17/2003 Exam Level: SRO

Category	KA #	Topic	Imp.	oints
Conduct of Operations	2.1.11	Knowledge of less than one hour technical specification action statements for systems.	3.8	1
	2.1.12	Ability to apply technical specifications for a system.	4.0	1
	2.1.34	Ability to maintain primary and secondary plant chemistry within allowable limits.	2.9	1
	2.1.8	Ability to coordinate personnel activities outside the control room.	3.6	1
	Total			4
Equipment Control	2.2.27	Knowledge of the refueling process.	3.5	1
	2.2.7	Knowledge of the process for conducting tests or experiments not described in the safety analysis report.	3.2	1
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	4.1	1
	2.2.26	Knowledge of refueling administrative requirements.	3.7	1
	Total			4
Radiological Controls	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	3.3	1
	2.3.11	Ability to control radiation releases.	3.2	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1
	Total			3
Emergency Procedures and Plan	2.4.48	Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and	3.8	1
	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and	4.3	1
	2.4.17	Knowledge of EOP terms and definitions.	3.8	1
	2.4.30	Knowledge of which events related to system operations/status should be reported to outside agencies.	3.6	1
	2.4.44	Knowledge of emergency plan protective action recommendations.	4.0	1
	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.7	1
	Total			6
Tier 3 Target Point Total (RO/SRO)				17

Facility: Hope Creek Generating Station Date of Exam: 6/17/2003 Exam Level: RO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	
1. Emergency & Abnormal Plant Evolutions	1	2	3	2				3	2			1	13
	2	5	5	4				4	0			1	19
	3	1	0	2				1	0			0	4
	Tier Totals	8	8	8				8	2			2	36
2. Plant Systems	1	2	2	3	3	2	3	3	3	3	3	1	28
	2	4	2	2	2	2	0	1	2	2	2	0	19
	3	1	0	1	0	0	0	1	0	0	0	1	4
	Tier Totals	7	4	6	5	4	3	5	5	5	5	2	51

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	
	3	4	2	4	13

Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).
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 exam must total 100 points.
3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6. *The generic 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.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified based on plant-specific priorities. Enter the tier totals for each category in the table above.

BWR RO Examination Outline

Emergency and Abnormal Evolutions - Tier 1/Group 1

System #	Name	K1	K2	K3	A1	A2	G	KA Topic(s)	Imp.	Pts.
295005	Main Turbine Generator Trip				X			AA1.03 Reactor manual control/rod control and information system	2.7	1
295006	SCRAM		X					AK2.05 CRD mechanism	3.1	1
295007	High Reactor Pressure			X				AK3.05 Low pressure system isolation	3.0	1
295007	High Reactor Pressure		X					AK2.02 Reactor power	3.8	1
295009	Low Reactor Water Level			X				AK3.01 Recirculation pump run back: Plant-Specific	3.2	1
295010	High Drywell Pressure									
295014	Inadvertent Reactivity Addition		X					AK2.01 RPS	3.9	1
295015	Incomplete SCRAM	X						AK1.01 Shutdown margin	3.6	1
295024	High Drywell Pressure						X	2.4.18 Knowledge of the specific bases for EOPs.	2.7	1
295024	High Drywell Pressure					X		EA2.01 Drywell pressure	4.2	1
295025	High Reactor Pressure				X			EA1.03 Safety/relief valves: Plant-Specific	4.4	1
295031	Reactor Low Water Level				X			EA1.01 Low pressure coolant injection (RHR): Plant-Specific	4.4	1
295037	SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown					X		EA2.03 SBLC tank level	4.3	1
500000	High Containment Hydrogen Concentration	X						EK1.01 Containment integrity	3.3	1

Emergency and Abnormal Evolutions - Tier 1/Group 2

System #	Name	K1	K2	K3	A1	A2	G	KA Topic(s)	Imp.	Pts.
295001	Partial or Complete Loss of Forced Core Flow Circulation		X					AK2.06 Reactor power	3.8	1
295002	Loss of Main Condenser Vacuum									
295003	Partial or Complete Loss of A.C. Power		X					AK2.04 A.C. electrical loads	3.4	1
295003	Partial or Complete Loss of A.C. Power	X						AK1.05 Failsafe component design	2.6	1
295004	Partial or Complete Loss of D.C. Power									
295008	High Reactor Water Level	X						AK1.03 Feed flow/steam flow mismatch	3.2	1
295011	High Containment Temperature (Mark III Containment Only)									
295012	High Drywell Temperature	X						AK1.02 Reactor power level control	3.1	1
295013	High Suppression Pool Temperature				X			AA1.02 Systems that add heat to the suppression pool	3.9	1
295016	Control Room Abandonment			X				AK3.01 Reactor SCRAM	4.1	1
295016	Control Room Abandonment		X					AK2.03 Control room HVAC	2.9	1
295017	High Off-Site Release Rate						X	2.1.32 Ability to explain and apply system limits and precautions.	3.4	1
295018	Partial or Complete Loss of Component Cooling Water									
295019	Partial or Complete Loss of Instrument Air		X					AK2.07 Condensate system	3.2	1
295020	Inadvertent Containment Isolation		X					AK2.03 Drywell/containment ventilation/cooling: Plant- Specific	3.1	1
295020	Inadvertent Containment Isolation	X						AK1.02 Power/reactivity control	3.5	1
295022	Loss of CRD Pumps			X				AK3.02 CRDM high temperature	2.9	1
295026	Suppression Pool High Water Temperature	X						EK1.02 Steam condensation	3.5	1
295026	Suppression Pool High Water Temperature			X				EK3.04 SBLC injection	3.7	1

Emergency and Abnormal Evolutions - Tier 1/Group 2

System #	Name	K1	K2	K3	A1	A2	G	KA Topic(s)	Imp.	Pts.
295027	High Containment Temperature (Mark III Containment Only)									
295028	High Drywell Temperature									
295029	High Suppression Pool Water Level									
295030	Low Suppression Pool Water Level				X			EA1.06 Condensate storage and transfer (make-up to the suppression pool): Plant-Specific	3.4	1
295033	High Secondary Containment Area Radiation Levels				X			EA1.02 Process radiation monitoring system	3.7	1
295034	Secondary Containment Ventilation High Radiation									
295038	High Off-Site Release Rate				X			EA1.02 Meteorological instrumentation	3.0	1
295038	High Off-Site Release Rate			X				EK3.01 Implementation of site emergency plan	3.6	1
600000	Plant Fire On Site									

Emergency and Abnormal Evolutions - Tier 1/Group 3

System #	Name	K1	K2	K3	A1	A2	G	KA Topic(s)	Imp.	Pts.
295021	Loss of Shutdown Cooling			X				AK3.02 Feeding and bleeding reactor vessel	3.3	1
295023	Refueling Accidents	X						AK1.03 Inadvertent criticality	3.7	1
295032	High Secondary Containment Area Temperature				X			EA1.01 Area temperature monitoring system	3.6	1
295035	Secondary Containment High Differential Pressure									
295036	Secondary Containment High Sump/Area Water Level			X				EK3.03 Isolating affected systems	3.5	1

Plant Systems - Tier 2/Group 1

System	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic(s)	Imp.	Pts.
201001	Control Rod Drive Hydraulic System			X									K3.03 Control rod drive mechanisms	3.1	1
201001	Control Rod Drive Hydraulic System						X						K6.05 A.C. power	3.3	1
201002	Reactor Manual Control System							X					A1.05 Local reactor power	3.4	1
201005	Rod Control and Information System (RCIS)														
202002	Recirculation Flow Control System														
203000	RHR/LPCI: Injection Mode (Plant Specific)	X											K1.10 ECCS room coolers	3.2	1
206000	High Pressure Coolant Injection System											X	2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation.	3.9	1
207000	Isolation (Emergency) Condenser														
209001	Low Pressure Core Spray System		X										K2.01 Pump power	3.0	1
209001	Low Pressure Core Spray System								X				A2.06 Inadequate system flow	3.2	1
209002	High Pressure Core Spray System (HPCS)														
211000	Standby Liquid Control System		X										K2.02 Explosive valves	3.1	1
211000	Standby Liquid Control System				X								K4.02 Component and system testing	3.0	1
212000	Reactor Protection System									X			A3.07 SCRAM air header pressure	3.6	1
212000	Reactor Protection System										X		A4.04 Bypass SCRAM instrument volume high level SCRAM signal	3.9	1
215003	Intermediate Range Monitor (IRM) System										X		A4.03 IRM range switches	3.6	1
215003	Intermediate Range Monitor (IRM) System	X											K1.02 Reactor manual control	3.6	1
215004	Source Range Monitor (SRM) System														
215005	Average Power Range Monitor/Local Power Range Monitor System						X						K6.04 Trip units	3.1	1
215005	Average Power Range Monitor/Local Power Range Monitor System							X					A1.02 RPS status	3.9	1

Plant Systems - Tier 2/Group 1

System	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic(s)	Imp.	Pts.
216000	Nuclear Boiler Instrumentation							X					A1.04 System venting	2.6	1
217000	Reactor Core Isolation Cooling System (RCIC)					X							K5.02 Flow indication	3.1	1
217000	Reactor Core Isolation Cooling System (RCIC)			X									K3.01 Reactor water level	3.7	1
218000	Automatic Depressurization System										X		A4.02 ADS logic initiation	4.2	1
218000	Automatic Depressurization System				X								K4.02 Allows manual initiation of ADS logic	3.8	1
223001	Primary Containment System and Auxiliaries														
223002	Primary Containment Isolation System/Nuclear Steam Supply Shut-Off				X								K4.08 Manual defeating of selected isolations during specified emergency conditions	3.3	1
239002	Relief/Safety Valves								X				A2.01 Stuck open vacuum breakers	3.0	1
239002	Relief/Safety Valves								X				A2.04 ADS actuation	4.1	1
241000	Reactor/Turbine Pressure Regulating System					X							K5.04 Turbine inlet pressure vs. reactor pressure	3.3	1
259001	Reactor Feedwater System									X			A3.07 FWRV position	3.2	1
259002	Reactor Water Level Control System			X									K3.07 Reactor water level indication	3.4	1
261000	Standby Gas Treatment System														
264000	Emergency Generators (Diesel/Jet)									X			A3.04 Operation of the governor control system on frequency and voltage control	3.1	1
264000	Emergency Generators (Diesel/Jet)						X						K6.01 Starting air	3.8	1

System	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic(s)	Imp.	Pts.
201003	Control Rod and Drive Mechanism														
201004	Rod Sequence Control System (Plant Specific)														
201006	Rod Worth Minimizer System (RWM) (Plant Specific)														
202001	Recirculation System								X				A2.03 Single recirculation pump trip	3.6	1
204000	Reactor Water Cleanup System	X											K1.03 Reactor feedwater system	3.1	1
205000	Shutdown Cooling System (RHR Shutdown Cooling Mode)														
214000	Rod Position Information System														
215002	Rod Block Monitor System		X										K2.03 APRM channels: BWR-3, 4, 5	2.8	1
219000	RHR/LPCI: Torus/Suppression Pool Cooling Mode		X										K2.01 Valves	2.5	1
219000	RHR/LPCI: Torus/Suppression Pool Cooling Mode										X		A4.04 Minimum flow valves	3.0	1
226001	RHR/LPCI: Containment Spray System Mode										X		A4.04 Keep fill system	2.8	1
226001	RHR/LPCI: Containment Spray System Mode	X											K1.08 Nuclear boiler instrumentation	3.2	1
230000	RHR/LPCI: Torus/Suppression Pool Spray Mode														
239001	Main and Reheat Steam System														
245000	Main Turbine Generator and Auxiliary Systems					X							K5.03 Hydraulically operated valve operation	2.6	1
256000	Reactor Condensate System				X								K4.06 Control of extraction steam	2.8	1
256000	Reactor Condensate System								X				A2.06 Low hotwell level	3.2	1
262001	A.C. Electrical Distribution														
262002	Uninterruptable Power Supply (A.C./D.C.)	X											K1.01 Feedwater level control: Plant-Specific	2.8	1
263000	D.C. Electrical Distribution							X					A1.01 Battery charging/discharging rate	2.5	1

Plant Systems - Tier 2/Group 2

System	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic(s)	Imp.	Pts.
271000	Offgas System														
272000	Radiation Monitoring System			X									K3.01 Station liquid effluent release monitoring	3.2	1
286000	Fire Protection System														
290001	Secondary Containment									X			A3.01 Secondary containment isolation	3.9	1
290001	Secondary Containment	X											K1.07 Turbine building ventilation (steam tunnel): Plant- Specific	3.0	1
290003	Control Room HVAC									X			A3.01 Initiation/reconfiguration	3.3	1
300000	Instrument Air System (IAS)					X							K5.01 Air compressors	2.5	1
400000	Component Cooling Water System (CCWS)				X								K4.01 Automatic start of standby pump	3.4	1
400000	Component Cooling Water System (CCWS)			X									K3.01 Loads cooled by CCWS	2.9	1

Plant Systems - Tier 2/Group 3

System	Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic(s)	Imp.	Pts.
215001	Traversing In-Core Probe														
233000	Fuel Pool Cooling and Clean-up							X					A1.01 Surge tank level	2.6	1
233000	Fuel Pool Cooling and Clean-up	X											K1.09 Component cooling water systems	2.6	1
234000	Fuel Handling Equipment														
239003	MSIV Leakage Control System														
268000	Radwaste														
288000	Plant Ventilation Systems											X	2.4.50 Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	1
290002	Reactor Vessel Internals			X									K3.03 Reactor power	3.3	1

Facility: Hope Creek Date of Exam 06/17/2003 Exam Level: RO

Category	KA #	Topic	Imp.	oints
Conduct of Operations	2.1.28	Knowledge of the purpose and function of major system components and controls.	3.2	1
	2.1.11	Knowledge of less than one hour technical specification action statements for systems.	3.0	1
	2.1.8	Ability to coordinate personnel activities outside the control room.	3.8	1
	Total			3
Equipment Control	2.2.35	Knowledge of control rod programming.	2.5	1
	2.2.27	Knowledge of the refueling process.	2.6	1
	2.2.26	Knowledge of refueling administrative requirements.	2.5	1
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	3.4	1
	Total			4
Radiological Controls	2.3.11	Ability to control radiation releases.	2.7	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1
	Total			2
Emergency Procedures and Plan	2.4.48	Ability to interpret control room indications to verify the status and operation of system, and understand how operator action s and	3.5	1
	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.4	1
	2.4.17	Knowledge of EOP terms and definitions.	3.1	1
	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and	4.0	1
	Total			4
Tier 3 Target Point Total (RO/SRO)				13