

Draft Submittal

**E. I. HATCH NUCLEAR PLANT
EXAM 2002-301
50-321 & 50-366
OCTOBER 16 - 18, 21 - 25, &
OCTOBER 30, 2002,**

1. Written Exam Sample outlines

Facility: HATCH Date of Exam: Oct 02 Exam Level: SRO													
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	5	5				4	5			4	26
	2	2	3	3				3	3			3	17
	Tier Totals	5	8	8				7	8			7	43
2. Plant Systems	1	2	2	2	2	3	2	2	2	2	2	2	23
	2	1	1	1	1	2	1	2	1	1	1	1	13
	3				1			1	1			1	4
	Tier Totals	3	3	3	4	5	3	5	4	3	3	4	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		17
					4		4		4		5		
<p>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).</p> <p>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.</p> <p>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.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>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.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>													

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295003 Partial or Complete Loss of AC Pwr / 6		X					AK2.01 Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF A.C. POWER and the following: station batteries.	3.2/3.3	1
295006 SCRAM / 1			X			X	AK3.01 Knowledge of the reasons for the following responses as they apply to SCRAM: Reactor water level response. *2.2.22 Knowledge of limiting conditions for operations and safety limits.	3.8/3.9 3.4/4.1	2
295007 High Reactor Pressure / 3				X			AA1.04 Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: Safety/relief valve operation.	3.9/4.1	1
295009 Low Reactor Water Level / 2	X					X	AK1.05 Knowledge of the operational implications of the following concepts as they apply to LOW REACTOR WATER LEVEL: Natural circulation. 2.4.1 Knowledge of EOP entry conditions and immediate action steps.	3.3/3.4 4.3/4.6	2
295010 High Drywell Pressure / 5					X		*AA2.06 Ability to determine and/or interpret the following as they apply to HIGH DRYWELL PRESSURE: Drywell temperature.	3.6/3.6	1
295013 High Suppression Pool Temp. / 5	X		X				AK1.03 Knowledge of the operational implications of the following concepts as they apply to HIGH SUPPRESSION POOL TEMPERATURE: Localized heating. AK3.01 Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL TEMPERATURE: Suppression pool cooling operation.	3.0/3.3 3.6/3.8	2
295014 Inadvertent Reactivity Addition / 1		X					AK2.03 Knowledge of the interrelations between INADVERTENT REACTIVITY ADDITION and the following: Fuel temperature.	3.3/3.4	1
295015 Incomplete SCRAM / 1					X		AA2.01 Ability to determine and/or interpret the following as they apply to INCOMPLETE SCRAM: Reactor power.	4.1/4.3	1
295016 Control Room Abandonment / 7			X				AK3.01 Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT: Reactor SCRAM.	4.1/4.2	1
295017 High Off-site Release Rate / 9						X	*2.3.4 Knowledge of radiation exposure limits and contamination control/including permissible levels in excess of those authorized.	2.5/3.1	1
295023 Refueling Accidents Cooling Mode / 8	X						AK1.03 Knowledge of the operational implications of the following concepts as they apply to REFUELING ACCIDENTS: Inadvertent criticality.	3.7/4.0	1
295024 High Drywell Pressure / 5				X			EA1.04 Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: RHR/LPCI.	4.1/3.9	1
295025 High Reactor Pressure / 3				X	X		EA1.07 Ability to operate and/or monitor the following as they apply to HIGH REACTOR PRESSURE: ARI/RPT/ATWS. *EA2.04 Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE: Suppression pool level.	4.1/4.1 3.9/3.9	2
295026 Suppression Pool High Water Temp. / 5		X					EK2.04 Knowledge of the interrelations between SUPPRESSION POOL HIGH WATER TEMPERATURE and the following: SPDS/ERIS/CRIDS/GDS.	2.5/2.8	1

295030 Low Suppression Pool Water Level / 5			X		X		EK3.03 Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: RCIC operation. *EA2.01 Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: Suppression pool level.	3.6/3.7 4.1/4.2	2
295031 Reactor Low Water Level / 2						X	*2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.0/4.3	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1		X	X				EK2.05 Knowledge of the interrelations between SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN and the following: CRD hydraulic system. EK3.02 Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: SBLC injection.	4.0/4.1 4.3/4.5	2
295038 High Off-site Release Rate / 9		X			X		EK2.03 Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: Plant ventilation systems. EA2.03 Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: Radiation levels.	3.6/3.8 3.5/4.3	2
500000 High Containment Hydrogen Conc. / 5				X			EA1.01 Ability to operate and monitor the following as they apply to HIGH CONTAINMENT HYDROGEN CONTROL: Primary containment hydrogen instrumentation.	3.4/3.3	1
K/A Category Totals:	3	5	5	4	5	4	Group Point Total:		26

ES-401

BWR SRO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

Form ES-401-1 (R8, S1)

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4		X					AK2.07 Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION and the following: Core flow indication.	3.4/3.4	1
295002 Loss of Main Condenser Vacuum / 3					X		*AA2.02 Ability to determine and/or interpret the following as they apply to LOSS OF MAIN CONDENSER VACUUM: Reactor power.	3.2/3.3	1
295004 Partial or Total Loss of DC Pwr / 6			X				AK3.03 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: Reactor SCRAM.	3.1/3.5	1
295005 Main Turbine Generator Trip / 3				X			AA1.05 Ability to operate and/or monitor the following as they apply to MAIN TURBINE GENERATOR TRIP: Reactor/turbine pressure regulating system.	3.6/3.6	1
295008 High Reactor Water Level / 2			X				AK3.01 Knowledge of the reasons for the following responses as they apply to HIGH REACTOR WATER LEVEL: Main turbine trip.	3.4/3.5	1
295011 High Containment Temperature / 5							Does not apply to Hatch. For Mark III containment only.		
295012 High Drywell Temperature / 5				X			AA1.02 Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell cooling system.	3.8/3.8	1
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.	3.4/3.6	1
295019 Partial or Total Loss of Inst. Air / 8							Not selected.		
295020 Inadvertent Cont. Isolation / 5 & 7							Not selected.		
295021 Loss of Shutdown Cooling / 4		X					AK2.05 Knowledge of the interrelations between LOSS OF SHUTDOWN COOLING and the following: Fuel pool cooling and cleanup system.	2.7/2.8	1
295022 Loss of CRD Pumps / 1						X	2.1.30 Ability to locate and operate components / including local controls.	3.9/3.4	1
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.	2.9/3.1	1
295029 High Suppression Pool Water Level / 5	X						EK1.01 Knowledge of the operational implications of the following concepts as they apply to HIGH SUPPRESSION POOL WATER LEVEL: Containment integrity.	3.4/3.7	1
295032 High Secondary Containment Area Temperature / 5			X				EK3.03 Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE: Emergency/normal depressurization.	3.5/3.8	1
295033 High Secondary Containment Area Radiation Levels / 9						X	*2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9/3.3	1

295034 Secondary Containment Ventilation High Radiation / 9					X		*EA2.02 Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION: Cause of high radiation levels.	3.7/4.2	1
295035 Secondary Containment High Differential Pressure / 5						X	*2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics / reactor behavior / and instrument interpretation.	3.7/4.4	1
295036 Secondary Containment High Sump/Area Water Level / 5				X			EA1.02 Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: Affected systems so as to isolate damaged portions..	3.5/3.6	1
600000 Plant Fire On Site / 8					X		AA2.06 Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Need for pressurizing control room (recirculation mode).	2.5/2.8	1
K/A Category Point Totals:	2	3	3	3	3	3	Group Point Total:		17

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201005 RCIS												System does not apply to Hatch.		
202002 Recirculation Flow Control			X									K3.05 Knowledge of the effect that a loss or malfunction of the RECIRCULATION FLOW CONTROL SYSTEM will have on the following: Recirculation pump speed.	3.2/3.3	1
203000 RHR/LPCI: Injection Mode							X					A1.01 Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE controls including: Reactor water level.	4.2/4.3	1
206000 HPCI					X	X						*K5.08 Knowledge of the operational implications of the following concepts as they apply to HIGH PRESSURE COOLANT INJECTION SYSTEM: Vacuum breaker operation. K6.08 Knowledge of the effect that a loss or malfunction of the following will have on the HIGH PRESSURE COOLANT INJECTION SYSTEM: Reactor pressure.	3.0/3.2 3.8/3.8	2
207000 Isolation (Emergency) Condenser												System does not apply to Hatch.		
209001 LPCS											X	*2.2.21 Knowledge of pre and post maintenance operability requirements.	2.3/3.5	1
209002 HPCS												System does not apply to Hatch.		
211000 SLC									X	X		A3.04 Ability to monitor automatic operations of the STANDBY LIQUID CONTROL SYSTEM including: Reactor power. A4.01 Ability to manually operate and/or monitor in the control room: Tank level.	4.3/4.4 3.9/3.9	2
212000 RPS				X								K4.06 Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: Select rod insertion.	3.0/3.0	1
215004 Source Range Monitor					X							*K5.03 Knowledge of the operational implications of the following concepts as they apply to SOURCE RANGE MONITOR (SRM) SYSTEM: Changing detector position.	2.8/2.8	1
215005 APRM / LPRM								X				A2.03 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 or operations: Inoperative trip (all causes).	3.6/3.8	1
216000 Nuclear Boiler Instrumentation		X										K2.01 Knowledge of electrical power supplies to the following: Analog trip system.	2.8/2.8	1

K/A Category Point Totals:	2	2	2	2	3	2	2	2	2	2	2	Group Point Total:	23
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ES-401

BWR SRO Examination Outline
Plant Systems - Tier 2/Group 2

Form ES-401-1 (R8, S1)

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic												Not selected.		
201002 RMCS									X			A3.03 Ability to monitor automatic operations of the REACTOR MANUAL CONTROL SYSTEM including: rod drift alarm.	3.2/3.2	1
201004 RSCS												Does not apply to Hatch.		
201006 RWM												Not selected.		
202001 Recirculation							X					A1.07 Ability to predict and/or monitor changes in parameters associated with operating the RECIRCULATION SYSTEM controls including: Recirculation pump speed.	2.7/2.8	1
204000 RWCU					X							*K5.08 Knowledge of the operational implications of the following concepts as they apply to REACTOR WATER CLEANUP SYSTEM: Temperature measurement.	2.6/2.6	1
205000 Shutdown Cooling											X	*2.1.22 Ability to determine Mode of Operation.	2.8/3.3	1
214000 RPIS				X								K4.01 Knowledge of ROD POSITION INFORMATION SYSTEM design feature(s) and/or interlocks which provide for the following: Reed switch locations.	3.0/3.1	1
215002 RBM												Not selected.		
215003 IRM												Not selected.		
219000 RHR/LPCI: Torus/Pool Cooling Mode								X				A2.08 Ability to (a) predict the impacts of the following on the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Pump seal failure.	2.8/3.1	1
230000 RHR/LPCI: Torus/Pool Spray Mode												Changed to 272000K2.05 due to KA selected was the same as 226001K2.02.		
234000 Fuel Handling Equipment						X						K6.02 Knowledge of the effect that a loss or malfunction of the following will have on the FUEL HANDLING EQUIPMENT: Reactor manual control system.	2.8/3.5	1
239003 MSIV Leakage Control												Does not apply to Hatch.		
245000 Main Turbine Gen. and Auxiliaries	X											K1.09 Knowledge of the physical connections and/or cause-effect relationships between MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS and the following: D.C. electrical distribution.	2.7/2.7	1

ES-401

BWR SRO Examination Outline
Plant Systems - Tier 2/Group 3

Form ES-401-1 (R8, S1)

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism												Not selected.		
215001 Traversing In-core Probe												Not selected.		
233000 Fuel Pool Cooling and Cleanup												Not selected.		
239001 Main and Reheat Steam				X								K4.04 Knowledge of MAIN AND REHEAT STEAM SYSTEM design feature(s) and/or interlocks which provide for the following: limits steam flow during a steam line rupture to 200%	3.4/3.5	1
256000 Reactor Condensate												Not selected.		
268000 Radwaste							X					A1.01 Ability to predict and/or monitor changes in parameters associated with operating the RADWASTE controls including: Radiation level.	2.7/3.1	1
288000 Plant Ventilation								X				A2.05 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: Extreme outside weather conditions.	2.6/2.7	1
290002 Reactor Vessel Internals											X	2.1.28 Knowledge of the purpose and function of major system components and controls.	3.2/3.3	1
K/A Category Point Totals:				1			1	1			1	Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points

Plant-Specific Priority Total (limit 10):			

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Facility: <u>HART</u>		Date of Exam: <u>OCTOBER 2002</u>		Exam Level: <u>SRO</u>	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.4*	Knowledge of shift staffing requirements.	2.3/3.4	1	
	2.1.22*	Ability to determine Mode of Operation.	2.8/3.3	1	
	2.1.29	Knowledge of how to conduct and verify valve lineups.	3.4/3.3	1	
	2.1.32	Ability to explain and apply system limits and precautions.	3.4/3.8	1	
	Total			4	
Equipment Control	2.2.1	Ability to perform pre-startup procedures for the facility / including operating those controls associated with plant equipment that could affect reactivity.	3.7/3.6	1	
	2.2.6*	Knowledge of the process for making changes in procedures as described in the safety analyses report.	2.3/3.3	1	
	2.2.27*	Knowledge of the refueling process.	2.6/3.5	1	
	2.2.32*	Knowledge of the effects of alterations on core configuration.	2.3/3.3	1	
	Total			4	
Radiation Control	2.3.1	Knowledge of 10 CFR:20 and related facility radiation control requirements.	2.6/3.0	1	
	2.3.2	Knowledge of facility ALARA program.	2.5/2.9	1	
	2.3.3*	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g. waste disposal and handling systems).	1.8/2.9	1	
	2.3.4*	Knowledge of radiation exposure limits and contamination control / including permissible levels in excess of those authorized.	2.5/3.1	1	
	Total			4	

Emergency Procedures/ Plan	2.4.12	Knowledge of crew roles and responsibilities during EOP flowchart use.	3.4/3.9	1
	2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures.	3.0/4.0	1
	2.4.43	Knowledge of emergency communication systems and techniques..	2.8/3.5	1
	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.4/3.7	1
	2.4.48*	Ability to interpret control room indications to verify the status and operation of system / and understand how operator actions and directives affect plant and system operation.	3.5/3.8	1
Total				5
Tier 3 Point Total (RO/SRO)				13/17

WRITTEN EXAMINATION SAMPLE PLAN DIFFERENCES

PWR				BWR			
K/A	K/A TOPIC	RO Tier	SRO Tier	K/A	K/A TOPIC	RO Tier	SRO Tier
001A	ROD WDR	1/2	1/1	295003	LOSS AC	1/2	1/1
003A	DROP ROD	1/2	1/1	295005	MT TRIP	1/1	1/2
011E	LB LOCA	1/2	1/1	295013	HI SP TEMP	1/2	1/1
W/E04	LOCA	1/2	1/1	295016	CR ABAND	1/2	1/1
W/E01	SI TERM	1/2	1/1	295017	OS REAL	1/2	1/1
027A	PPC MALF	1/1	1/2	295021	LOSS SDC	1/3	1/2
029E	ATWAS	1/2	1/1	295023	REFUEL AC	1/3	1/1
059A	LIQ RELS	1/2	1/1	295026	SP WTR TEM	1/2	1/1
065A	LOSS IA	1/3	1/2	295027	HI CONT TP.	1/2	1/1
				295030	LO SP LVL	1/2	1/1
014	RPI	2/2	2/1	295032	HI SC TMP	1/3	1/2
026	CNT SPRAY	2/2	2/1	295035	SC DP	1/3	1/2
027	IODINE RVL	2/3	2/2	295036	SC HI SMP	1/3	1/2
028	H2 RECOMB	2/3	2/2	295038	OS REAL	1/2	1/1
034	FUEL HAND	2/3	2/2	201001	CRD HYDR	2/1	2/2
063	DC ELEC	2/2	2/1	201002	RMCS	2/1	2/2
103	CONT	2/3	2/2	215003	IRM	2/1	2/2
				226001	C SPRAY	2/2	2/1
				259001	FEEDWATER	2/1	2/2
				262001	AC ELEC	2/2	2/1
				290001	SEC CTMT	2/2	2/1
				201003	CRD	2/2	2/3
				234000	FUEL HAND	2/3	2/2
				239001	MAIN STM	2/2	2/3
				239003	MSIV LEAKG	2/3	2/2
				256000	COND	2/2	2/3

Facility:		Date of Exam:		Exam Level: RO									
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	1	2	2				5	2			1	13
	2	3	5	5				1	2			3	19
	3	1	1	1				1					4
	Tier Totals	5	8	8				7	4			4	36
2. Plant Systems	1	3	3	3	2	1	3	3	3	3	2	2	28
	2	2	2	2	3	2	1	2	1	1	2	1	19
	3						1	1	1			1	4
	Tier Totals	5	5	5	5	3	5	6	5	4	4	4	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13
					4		3		2		4		
<p>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).</p> <p>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.</p> <p>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.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>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.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>													

K/A Category Totals:	1	2	2	5	2	1	Group Point Total:			13

ES-401

BWR RO Examination Outline
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

Form ES-401-2 (R8, S1)

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4		X					AK2.07 Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION and the following: Core flow indication.	3.4/3.4	1*
295002 Loss of Main Condenser Vacuum / 3						X	2.1.2 Knowledge of operator responsibilities during all modes of plant operation.	3.0/4.0	1
295003 Partial or Complete Loss of AC Pwr / 6		X					AK2.01 Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF A.C. POWER and the following: station batteries.	3.2/3.3	1
295004 Partial or Complete Loss of DC Pwr / 6			X				AK3.03 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: Reactor SCRAM.	3.1/3.5	1
295008 High Reactor Water Level / 2			X				AK3.01 Knowledge of the reasons for the following responses as they apply to HIGH REACTOR WATER LEVEL: Main turbine trip.	3.4/3.5	1*
295011 High CTMT Temperature / 5							Does not apply to Hatch. For Mark III containment only.		
295012 High Drywell Temperature / 5				X			AA1.02 Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell cooling system.	3.8/3.8	1*
295013 High Suppression Pool Temp. / 5	X		X				AK1.03 Knowledge of the operational implications of the following concepts as they apply to HIGH SUPPRESSION POOL TEMPERATURE: Localized heating. AK3.01 Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL TEMPERATURE: Suppression pool cooling operation.	3.0/3.3 3.6/3.8	2*
295016 Control Room Abandonment / 7			X				AK3.01 Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT: Reactor SCRAM.	4.1/4.2	1*
295017 High Off-site Release Rate / 9							Not selected.		
295018 Partial or Complete 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.	3.4/3.6	1*
295019 Part. or Comp. Loss of Inst. Air / 8							Not selected.		
295020 Inadvertent Cont. Isolation / 5 & 7						X	2.1.31 Ability to locate control room switches / controls and indications and to determine that they are correctly reflecting the desired plant lineup.	4.2/3.9	1
295022 Loss of CRD Pumps / 1						X	2.1.30 Ability to locate and operate components / including local controls.	3.9/3.4	1*
295026 High Suppression Pool Water Temp. / 5		X					EK2.04 Knowledge of the interrelations between SUPPRESSION POOL HIGH WATER TEMPERATURE and the following: SPDS/ERIS/CRIDS/GDS.	2.5/2.8	1*
295027 High Containment Temperature / 5							Does not apply to Hatch. Mark III containment only.		

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.	2.9/3.1	1*
295029 High Suppression Pool Water Level / 5	X						EK1.01 Knowledge of the operational implications of the following concepts as they apply to HIGH SUPPRESSION POOL WATER LEVEL: Containment integrity.	3.4/3.7	1*
295030 Low Suppression Pool Water Level / 5			X				EK3.03 Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: RCIC operation.	3.6/3.7	1*
295033 High Sec. Cont. Area Rad. Levels / 9							Not selected.		
295034 Sec. Cont. Ventilation High Rad. / 9							Not selected.		
295038 High Off-site Release Rate / 9		X				X	EK2.03 Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following: Plant ventilation systems. EA2.03 Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE: Radiation levels.	3.6/3.8 3.5/4.3	2*
600000 Plant Fire On Site / 8						X	AA2.06 Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: Need for pressurizing control room (recirculation mode).	2.5/2.8	1*
K/A Category Point Totals:	3	5	5	1	2	3	Group Point Total:		19

K/A Category Point Totals:	1	1	1	1			Group Point Total:	4
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ES-401

BWR RO Examination Outline
Plant Systems - Tier 2/Group 1

Form ES-401-2 (R8, S1)

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic		X									X	K2.02 Knowledge of electrical power supplies to the following: Scram valve solenoids. 2.1.28 Knowledge of the purpose and function of major system components and controls.	3.6/3.7 3.2/3.3	2
201002 RMCS									X			A3.03 Ability to monitor automatic operations of the REACTOR MANUAL CONTROL SYSTEM including: rod drift alarm.	3.2/3.2	1*
201005 RCIS												System does not apply to Hatch.		
202002 Recirculation Flow Control			X									K3.05 Knowledge of the effect that a loss or malfunction of the RECIRCULATION FLOW CONTROL SYSTEM will have on the following: Recirculation pump speed.	3.2/3.3	1*
203000 RHR/LPCI: Injection Mode							X					A1.01 Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE controls including: Reactor water level.	4.2/4.3	1*
206000 HPCI						X		X				K6.08 Knowledge of the effect that a loss or malfunction of the following will have on the HIGH PRESSURE COOLANT INJECTION SYSTEM: Reactor pressure. A2.16 Ability to (a) predict the impacts of the following on the HIGH PRESSURE COOLANT INJECTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High drywell pressure.	3.8/3.8 4.0/4.1	1* 1
207000 Isolation (Emerg.) Condenser												System does not apply to Hatch.		
209001 LPCS					X						X	K5.01 Knowledge of the operational implications of the following concepts as they apply to LOW PRESSURE CORE SPRAY SYSTEM: Indications of pump cavitation. 2.4.31 Knowledge of annunciators alarms and indications / and use of the response instructions.	2.6/2.7 3.3/3.4	2
209002 HPCS												System does not apply to Hatch.		
211000 SLC									X	X		A3.04 Ability to monitor automatic operations of the STANDBY LIQUID CONTROL SYSTEM including: Reactor power. A4.01 Ability to manually operate and/or monitor in the control room: Tank level.	4.3/4.4 3.9/3.9	2*
212000 RPS				X					X			K4.06 Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: Select rod insertion. A3.05 Ability to monitor automatic operations of the REACTOR PROTECTION SYSTEM including; SCRAM instrument volume level.	3.0/3.0 3.9/3.9	1* 1

215003 IRM											X		A4.05 Ability to manually operate and/or monitor in the control room: Trip bypasses.	3.4/3.4	1
215004 SRM		X											K2.01 Knowledge of electrical power supplies to the following: SRM channels/detectors.	2.6/2.8	1
215005 APRM / LPRM											X		A2.03 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 or operations: Inoperative trip (all causes).	3.6/3.8	1*
216000 Nuclear Boiler Instrumentation		X											K2.01 Knowledge of electrical power supplies to the following: Analog trip system.	2.8/2.8	1*
217000 RCIC	X												K1.01 Knowledge of the physical connections and/or cause-effect relationships between REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) and the following: Condensate storage and transfer system.	3.5/3.5	1*
218000 ADS													Not selected.		
223001 Primary CTMT and Auxiliaries											X		A2.12 Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Abnormal suppression pool temperature.	3.7/3.8	1*
223002 PCIS/Nuclear Steam Supply Shutoff	X												K1.07 Knowledge of the physical connections and/or cause-effect relationships between PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF and the following: Reactor core isolation cooling.	3.4/3.6	1*
239002 SRVs						X	X						A1.01 Ability to predict and/or monitor changes in parameters associated with operating the RELIEF/SAFETY VALVES controls including: Tail pipe temperature. K6.05 Knowledge of the effect that a loss or malfunction of the following will have on the RELIEF/SAFETY VALVES: Vacuum breaker operation.	3.3/3.4 2.7/3.0	1* 1
241000 Reactor/Turbine Pressure Regulator						X							K6.05 Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR/TURBINE PRESSURE REGULATING SYSTEM: Condenser vacuum.	3.4/3.4	1*
259001 Reactor Feedwater	X												K1.05 Knowledge of the physical connections and/or cause-effect relationships between REACTOR FEEDWATER SYSTEM and the following: Condensate system.	3.2/3.2	1

259002 Reactor Water Level Control			X												K3.02 Knowledge of the effect that a loss or malfunction of the REACTOR WATER LEVEL CONTROL SYSTEM will have on the following: Reactor feedwater system.	3.7/3.7	1*
261000 SGTS				X											K4.01 Knowledge of STANDBY GAS TREATMENT SYSTEM design feature(s) and/or interlocks which provide for the following: Automatic system initiation.	3.7/3.8	1*
264000 EDGs			X					X							K3.01 Knowledge of the effect that a loss or malfunction of the EMERGENCY GENERATORS will have on the following: Emergency core cooling systems. A1.01 Ability to predict and/or monitor changes in parameters associated with operating the EMERGENCY GENERATORS controls including: Lube oil temperature.	4.2/4.4 3.0/3.0	2
K/A Category Point Totals:	3	3	3	2	1	3	3	3	3	2	2	Group Point Total:					28

BWR RO Examination Outline Plant Systems - Tier 2/Group 2													Form ES-401-2 (R8, S1)		
ES-401	System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
	201003 Control Rod and Drive Mechanism												Not selected.		
	201004 RSCS												Not selected.		
	201006 RWM												Not selected.		

Plant-Specific Priority Total: (limit 10)			



Facility: HATCH		Date of Exam: OCTOBER 2002		Exam Level: RO	
Category	K/A #	Topic	Imp.	Points	
Conduct of Operations	2.1.2	Knowledge of operator responsibilities during all modes of plant operation.	3.0/4.0	1	
	2.1.10	Knowledge of conditions and limitations in the facility license.	2.7/3.9	1	
	2.1.29	Knowledge of how to conduct and verify valve lineups.	3.4/3.3	1*	
	2.1.32	Ability to explain and apply system limits and precautions.	3.4/3.8	1*	
	Total			4	
Equipment Control	2.2.1	Ability to perform pre-startup procedures for the facility / including operating those controls associated with plant equipment that could affect reactivity.	3.7/3.6	1*	
	2.2.3	Knowledge of the design / procedural / and operational differences between units.	3.1/3.3	1	
	2.2.13	Knowledge of tagging and clearance procedures.	3.6/3.8	1	
	Total			3	
Radiation Control	2.3.1	Knowledge of 10 CFR:20 and related facility radiation control requirements.	2.6/3.0	1*	
	2.3.2	Knowledge of facility ALARA program.	2.5/2.9	1*	
	Total			2	
Emergency Procedures/ Plan	2.4.12	Knowledge of crew roles and responsibilities during EOP flowchart use.	3.4/3.9	1*	
	2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures.	3.0/4.0	1*	
	2.4.43	Knowledge of emergency communication systems and techniques.	2.8/3.5	1*	
	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.4/3.7	1*	

	Total			4
Tier 3 Point Total (RO/SRO)				13/17