Final Submittal
(Blue Paper)

FINAL OUTLINES

HATCH DECEMBER 2007 EXAM

05000321/2007301 AND 05000366/2007301

DECEMBER 3 - 6, 2007, AND
DECEMBER 10, 2007, (WRITTEN)

FINAL

Facility: **Plant E.I Hatch** Date of Examination: **12/03/2007 – 12/07/2007**

Exam Level: RO SRO-I **SRO-U** Operating Test No.: _____

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for **SRO-U**, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
Control Rod and Drive Mechanism / Withdraw Control Rods (rod uncouples)	S A N L	3.1 Reactivity Control – JPM 1.10 (12 min) KA 201003A2.02 (RO 3.7/SRO 3.8), **SIM 1 - ALL**
RCIC / RCIC Start, with start pushbutton failure	S D	3.2 Reactor Water Level Control – JPM 25022 (5 min) KA 217000A2.01 (RO 3.8/SRO 3.7) **SIM 2 - ALL**
Reactor/Turbine pressure regulating system Perform RC-3, Rx pressure control (Bypass valve stuck open) (ESF)	S A N	3.3 Reactor Pressure Control – JPM 20166 – (10 min) KA 241000A2.03 (RO 4.1/SRO 4.2) **SIM 3 - All**
HPCI / Place HPCI in Pressure Control Mode	S N	3.4 Heat removal from Reactor Core – JPM 5.15 - (10 min) KA 206000A4.06 (RO 4.3/SRO 4.3) **SIM 4 – SRO-I and RO**
RHR/LPCI: Containment Spray System Mode / Initiate Drywell Spray with a valve failure	S A D	3.5 Containment Integrity – JPM 25033 (10 minutes) KA 226001A2.11 (RO 3.0/SRO 3.0) **SIM 5 – SRO-I and RO**
Bypass valve fails-RPS B fails, scram logic manual actuation fails, Mode switch to Shutdown	S A N L	3.7 Instrumentation – (10 min) JPM 25063 KA 215003A3.03 (RO 3.7/SRO 3.6) **SIM 6 – SRO-I and RO**
Plant Ventilation Systems / Verify an Automatic Secondary Containment Isolation	S A M P	3.9 Radioactivity Release – Modified from JPM 13.38 – (13Min) KA 288000A2.04 JPM 20021 **SIM 7 – SRO-I and RO**
A.C. Electrical Distribution / Energize Startup Aux Transformer 2D *(RO only)*	S D	3.6 Electrical – JPM 27.49 (8 min) KA 262001A4.01 (RO 3.4/SRO 3.7) **SIM 8 – RO Only**
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
Emergency Generators / Locally Start an Emergency Diesel Generator using the air start override	A D E	3.6 Electrical - JPM 28.24 (17 min) KA 264000A2.09 (RO 3.7/SRO 4.1) **IP 9 - ALL**
Loss of Air / Align Emergency Nitrogen to drywell Pneumatics	D R E	3.8 Plant Service Systems – JPM 25028 (16 min) KA 295019AA1.01 (RO 3.5/SRO 3.3) **IP 10 – SRO-I and RO**
Scram / Insert a SCRAM using the SDV level switches	D R E	3.1 Reactivity Control – JPM 10.18 (8 min) KA 295006AA1.06 (RO 3.5/SRO 3.6) **IP 11 - ALL**

Final

Facility: Plant E. I. Hatch
Examination Level: RO/SRO
Date of Examination: 12/03/2007 – 12/07/2007
Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R	(Based on JPM 25101) Determine the effect of the failure of a relay on system performance. G 2.1.24 (RO 2.8/ SRO 3.1) JPM 10018
Conduct of Operations **SRO only**	N, R	Given a set of conditions, Determine the current Reactor mode and if Core Alterations can be performed. (G2.1.22) (SRO 3.3) JPM 10019
Conduct of Operations **RO only**	D, S/R	JPM 25101 - Correct Reactor Water Level for high drywell temperatures. G 2.1.25 (RO 2.8/ SRO 3.1)
Equipment Control	N S/R	Determine if section 7.5 of the Control Room Surveillance checks, 34SV-SUV-019-1 requires additional Drywell cooling to be placed in service. G 2.2.12 (RO 3.0/SRO 3.4) JPM 10022
Radiation Control	M, R	Given a set of exposure conditions, determine the minimum level of authorization required to allow a worker to perform work which will exceed administrative exposure limits. G2.3.4 (RO 2.5/SRO 3.1) JPM 10020
Emergency Plan **SRO only**	M, S/R	Given Plant Conditions, Determine the Emergency Classification and complete the ENN Form (Based on NEI 99-01 EAL scheme.) G2.4.29 (SRO 4.0) JPM 25062

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

FINAL

Facility: E. I Hatch **Scenario No.:** 4 **Op-Test No.:**

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions: Unit 2 is at 75% RTP following a Control Rod pattern adjustment.

Turnover: 34IT-T45-001-2, Reactor Bldg. Instrument Sump Isolation Valve Exercise surveillance is to be performed. Increase Reactor Power to 100% RTP using Rx Recirc system and 34GO-OPS-005-2, Power Changes.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Perform 34IT-T45-001-2, Reactor Bldg. Instrument Sump Isolation Valve Exercise surveillance
2	mf60131124 aoE21_R600A	C (CBO)	Core Spray Pump A valve leakage (high discharge pressure) with CS pump in standby
3		R (CBO)	Increase Rx Power with Recirc
4	D fail to start mf65021472 mfP41_264A	(SRO TS) C (BOP)	PSW Pump "A" overload, PSW D fail to auto start, start PSW pump "D"
5**	mfE41_103	(SRO TS) C (BOP)	****Optional** -- HPCI Inadvertent initiation.
6	mfB21_130G	C (BOP)	SRV G fails open until fuses are pulled, RHR must be placed in torus cooling
7	mf_113	(SRO TS) C (CBO)	RCIC Auto isolation, E51-F008, due to failed steam line flow instrument. TC repair and un-isolate
8A	mfE51_250 svoE51074 svoE51075 rfC71_279	M (All)	RCIC Steam line break in the Rx bldg. RCIC isolation valves fail to close. SRO directs crew to manually SCRAM the Rx.
8B	mfE41_106	I (BOP)	HPCI Flow control fails and HPCI must be manually controlled after MSIVs close on high temp. from RCIC leak.
9A	mfE51_250	M (All)	Emergency Depress Due to steam leak into Secondary Containment.
9B	mfB21_129A mfB21_129E mfB21_129L	C (CBO)	Three ADS valves fail to open for Emergency Depress
			Scenario is terminated after reactor is emergency depressed.

* Total time was 1 hour and 50 minutes including, including optional failure.

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

FINAL

Facility: E. I Hatch **Scenario No.:** 3 **Op-Test No.:**

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions: Unit 2 is at 100% RTP. Drywell pressure is at 0.65psig due to normal pressure increase. 2N40-R600, GEN/XFMR Temperature recorder, has failed downscale. Condition Report written. ETR 3 days.

Turnover: Vent the Drywell for normal pressure increase using SBGT "2A". Maintain Rated Power.

Event No.	Malf. No.	Event Type*	Event Description
1	diT46-D001A-1	C (BOP) (SRO TS)	Standby Gas Treatment 2A fails to start manually, 2B must be manually started and suction source re-aligned.
2		N (BOP)	Vent Primary Containment
3	mfC32_90	I(CBO)	Feedwater master controller losses power. (time compressed repair, then return to Auto)
4	aoN40R600 mf65111604 mf651116045	C(BOP)	Unit Auxiliary Transformer 2B high temp, must be removed from service. Reactor power must be reduced to <2558 MWth, 4160 VAC buses 2A & 2B must be transferred to Start-up transformer 2C
5		R (CBO)	Reduce Recirc flow to decrease power to < 2558 MWth
6	mfG31_207A svoG31071 mfG31_52	C(CBO) (SRO TS)	RWCU line break outside containment. Must be manually isolated, with failure of outboard isolation valve to close.
7	mfE51_114 diE51A-S17	C(CBO) (SRO TS)	RCIC Inadvertent start, with a trip pushbutton failure.
8	mfC11_211 mfN43_158A mfN43_158B mfC41_240A mfC41_240B	M (All)	Stator cooling pump 2A trips, 2B will not start. Rx scram with ATWS requiring RWL be maintained between –60" and –90" SBLC Pump start failure
9	C11_30A	C (CBO)	CRD "2A" pump trip. Must start "2B" to continue to insert rods.
10	mfE51_112	C (BOP)	RCIC manual initiation with controller failure (low).
			Scenario is terminated after all Rods are full in.

Total time was 1 hour and 50 minutes including, including optional failure.

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

FINAL

Facility: E. I Hatch **Scenario No.:** 1 **Op-Test No.:**

Examiners: _____ **Operators:** _____ **SRO**

_____ _____ **RO**

_____ _____ **BOP**

Initial Conditions: Unit 2 is at 8% power in mode 2, performing a start-up. IRM "A" is inoperable due to failure of the Range 6 to 7 overlap. IRM "A" is in bypass.

Turnover: I & C will be performing a functional test on IRM "A." 34GO-OPS-001-2, "Plant Start-up," is in progress at step 7.4.5. Once the mode switch has been transferred to Run, continue pulling control rods to obtain two bypass valves 100% open for the HPCI surveillance per section 7.4.25.2. Another group of operators will be performing the HPCI run, and are having their pre-job brief at this time.

Event No.	Malf. No.	Event Type*	Event Description
1		N (CBO)	Transfer the Rx Mode switch to Run per 34GO-OPS-001-2, Plant Start-up.
2		R (CBO)	Withdraw control rods to increase reactor power.
3	diD11-F053	(SRO TS) C (BOP)	Fission Product Monitor valve 2D11-F053 fails closed. Time compressed (TC) repair, Return to service.
4	diC51-K617-S2 diC51-K617-S1 mfC12_2614-39	(SRO TS) C (CBO)	PRNM 2out of 4 logic module trips causing a half scram and a control rod to scram in due to a blown fuse. The control rod fuse and logic module are repaired (TC) and the rod withdrawn.
5	mfP51_222C loP51-C001BG1 loP51-C001BR2 diP51-C001B	C (BOP)	Station Service Air Compressor "C" trips. B runs unloaded. Must manually start "A".
6	mfC11_30A mf60311334	I (CBO)	CRD "A" trips due to low suction pressure instrument failure. Must start "B."
**7	mfE51_65	(SRO TS) I (BOP)	**Optional – RCIC swaps suction due to a failed ATTS torus water level instrument. (TC repair, re-align)
8A	mfS11_161 mfP64_193A,B	M (ALL)	Loss of all offsite power occurs.
8B	mfR43_62B, mfR43_239C	C (CBO)	2C Emergency Diesel Generator (EDG) starts, but fails to tie to 4160 VAC 2G. Must be manually tied. The "B" EDG fails to auto start and must be started manually after control is transferred to Unit 2.
8C	mfE41_235A,B mfE51_110 diC11B-S4A,B mfC11_30B	C (BOP)	HPCI fails to auto start, must be manually started. RCIC trips and cannot be reset.
9			The scenario is terminated after the Station Black abnormal procedure is exited, all 4160 VAC emergency buses are energized, and RWL is being control in the normal band.

Total time was 1 hour and 40 minutes including, including optional failure.

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

Facility: **HATCH - RO** **FINAL**

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 & Abnormal Plant Evolutions	1	7	6	1	N/A			3	1	N/A		2	20			
	2	2	2	1				0	1			1	7			
	Tier Totals	9	8	2				3	2			3	27			
2. Plant Systems	1	0	3	6	4	1	2	3	2	1	1	3	26			
	2	3	0	2	1	1	0	0	1	1	1	2	12			
	Tier Totals	3	3	8	5	2	2	3	3	2	2	5	38			
3. Generic Knowledge and Abilities Categories		1			2			3			4		10	1	2	3	4	
		2			3			2			3							

Note:1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).

2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.

3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.

5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.

6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.

7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.

8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (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 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. Use duplicate pages for RO and SRO-only exams.

9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO)							Form ES-401-1	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4	x						K1.01 Natural Circulation	3.5	1
295003 Partial or Complete Loss of AC / 6				x			A1.04 DC Electrical Distribution	3.6	1
295004 Partial or Total Loss of DC Pwr / 6					x		A2.04 System Lineups	3.2	1
295005 Main Turbine Generator Trip / 3			x				K3.03 FW temperature decrease	2.8	1
295006 SCRAM / 1	x						K1.01 Decay Heat Generation & Removal	3.7	1
295016 Control Room Abandonment / 7				x			A1.06 Reactor Water Level	4.0	1
295018 Partial or Total Loss of CCW / 8		x					K2.02 Plant Operations	3.4	1
295019 Partial or Total Loss of Inst. Air / 8		x					K2.11 Radwaste	2.5	1
295021 Loss of Shutdown Cooling / 4		x					K2.07 Reactor Recirculation	3.1	1
295023 Refueling Acc / 8		x					K2.01 Fuel handling equipment	3.3	1
295024 High Drywell Pressure / 5	x						K1.01 Drywell Integrity	4.1	1
295025 High Reactor Pressure / 3	x						K1.03 Safety/relief valve tailpipe temp/press relationships	3.6	1
295026 Suppression Pool High Water Temp. / 5						x	G2.4.23 Knowledge of basis for prioritizing emerg proc implementation during emerg ops	2.8	1
295026 Suppression Pool High Water Temp. / 5	x						K1.02 Steam Condensation	3.5	1
295028 High Drywell Temperature / 5		x					K2.01 Drywell Spray: Mark I & II	3.7	1
295030 Low Suppression Pool Wtr Lvl / 5	x						K1.01 Steam Condensation	3.8	1
295031 Reactor Low Water Level / 2						x	G2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm	3.3	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1				x			A1.07 RMCS - Plant Specific	3.9	1
295038 High Off-site Release Rate / 9	x						K1.03 Meteorological effects on offsite release	2.8	1
600000 Plant Fire On Site / 8		x					K2.01 Sensors/detectors and valves	2.6	1
K/A Category Totals:	7	6	1	3	1	2	Group Point Total:		20

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)							Form ES-401-1	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3									
295007 High Reactor Pressure / 3					x		A2.01 Reactor Pressure	4.1	
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5									
295011 High Containment Temp / 5									
295012 High Drywell Temperature / 5			x				K3.01 Increased DW Cooling	3.5	
295013 High Suppression Pool Temp. / 5	x						K1.03 Localized heating	3.0	
295014 Inadvertent Reactivity Addition / 1						x	G2.1.30 Ability to locate & operate components/including local controls	3.9	
295015 Incomplete SCRAM / 1		x					K2.08 Neutron Monitoring System	3.6	
295017 High Off-site Release Rate / 9	x						K1.02 Protection of the general public	3.8	
295020 Inadvertent Cont. Isolation / 5 & 7									
295022 Loss of CRD Pumps / 1		x					K2.07 Reactor Pressure (Scram Assist): Plant Specific	3.4	
295029 High Suppression Pool Wtr Lvl / 5									
295032 High Secondary Containment Area Temperature / 5									
295033 High Secondary Containment Area Radiation Levels / 9									
295034 Secondary Containment Ventilation High Radiation / 9									
295035 Secondary Containment High Differential Pressure / 5									
295036 Secondary Containment High Sump/Area Water Level / 5									
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals:	2	2	1	0	1	1	Group Point Total:		7

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 1 (RO)											Form ES-401-1	
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection Mode		x										K2.02 Valves	2.5	1
205000 Shutdown Cooling			x									K3.01 Reactor Pressure	3.3	1
206000 HPCI							x					A1.01 Reactor Water Level: BWR-2,3,4	4.3	1
206000 HPCI					x							K5.06 Turbine Speed Measurement BWR-2,3,4	2.6	1
209001 LPCS											x	G2.1.31 Ability to locate control room switches/controls and indications and to determine that they are correctly reflecting the desired plant lineup	4.2	1
211000 SLC		x										K2.01 SBLC Pumps	2.9	1
212000 RPS				x								K4.07 Manual System activation (trip)	4.1	1
212000 RPS		x										K2.02 Analog trip system cabinets	2.7	1
215003 IRM				x								K4.06 Alarm seal-in	2.6	1
215004 Source Range Monitor							x					A1.01 Detector Position	3.0	1
215005 APRM / LPRM			x									K3.08 Core thermal calculations	3.0	1
217000 RCIC									x			A3.03 System Pressure	3.7	1
218000 ADS						x						K6.02 Low Pressure Core Spray System Pressure: Plant Specific	4.1	1
223002 PCIS/Nuclear Steam Supply Shutoff								x				A2.09 System Initiation	3.6	1
223002 PCIS/Nuclear Steam Supply Shutoff			x									K3.01 Reactor water level	3.7	1
239002 SRVs											x	G2.4.22 Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations	3.0	1
259002 Reactor Water Level Control				x								K4.02 Bypassing of the RWM: Plant Specific	2.8	1
259002 Reactor Water Level Control						x						K6.01 Plant air systems	3.2	1
261000 SGTS							x					A1.05 Primary Containment O2 level: Mark I & II	2.7	1
262001 AC Electrical Distribution								x				A2.03 Loss of Offsite Power	3.9	1
262002 UPS (AC/DC)			x									K3.15 Main Turbine Operation	2.6	1
263000 DC Electrical Distribution											x	G2.1.29 Knowledge of how to conduct and verify valve lineups	3.4	1
264000 EDGs										x		A4.05 Transfer to emergency generator (with load) to grid	3.6	1
264000 EDGs			x									K3.01 Emergency Core Cooling Systems	4.2	1
300000 Instrument Air				x								K4.02 Cross-over to other air systems	3.0	1
400000 Component Cooling Water			x									K3.01 Loads cooled by CCWS	2.9	1
K/A Category Point Totals:	0	3	6	4	1	2	3	2	1	1	3	Group Point Total:		26

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2 (RO)												Form ES-401-1	
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic														
201002 RMCS	x											K1.04 Rod Block Monitor: Plant specific	3.5	1
201003 Control Rod and Drive Mechanism														
201006 RWM														
202001 Recirculation								x				A2.07 Recirculation pump speed mismatch: Plant specific	3.1	1
202002 Recirculation Flow Control				x								K4.03 Signal Failure Detection: Plant specific	3.0	1
204000 RWCU														
214000 RPIS														
215001 Traversing In-core Probe														
215002 RBM														
216000 Nuclear Boiler Inst.														
219000 RHR/LPCI: Torus/Pool Cooling Mode									x			A3.01 Valve operation	3.3	1
223001 Primary CTMT and Aux.														
226001 RHR/LPCI: CTMT Spray Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode										x		A4.03 Keep fill system	3.1	1
233000 Fuel Pool Cooling/Cleanup											x	G2.4.50 Ability to verify system alarm setpoints and operate controls identified in the alarm response manual	3.3	
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														
239003 MSIV Leakage Control														
241000 Reactor/Turbine Pressure Regulator														
245000 Main Turbine Gen. / Aux.			x									K3.05 Reactor feedwater pump: Plant Specific	2.7	1
256000 Reactor Condensate														
259001 Reactor Feedwater			x									K3.08 RCIC	2.9	1
268000 Radwaste														
271000 Offgas					x							K5.06 Catalytic Recombination	2.7	1
272000 Radiation Monitoring											x	G2.2.30 Knowledge of RO CR duties during fuel handling: alarms from fuel handling area/communication w/ fuel storage facility/ systems operated from CR in support of fuel handling operations/ & supporting instrumentation.	3.5	1
286000 Fire Protection														
288000 Plant Ventilation	x											K1.03 Standby Gas Treatment	3.7	1
290001 Secondary CTMT	x											K1.07 Turbine building ventilation (steam tunnel): Plant specific	3.0	1
290003 Control Room HVAC														
290002 Reactor Vessel Internals														
K/A Category Point Totals:	3	0	2	1	1	0	0	1	1	1	2	Group Point Total:		12

Facility: **HATCH - RO** **FINAL** Date of Exam: December 10, 2007

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.2	Knowledge of operator responsibilities during all modes of plant operation	3.0	1		
	2.1.25	Ability to obtain and interpret station reference materials such as graphs/monographs/and tables which contain performance data	2.8	1		
	Subtotal			**2**		
2. Equipment Control	2.2.4	Ability to explain the variations in control board layouts/systems/instrumentation and procedural actions between units at a facility.	2.8	1		
	2.2.11	Knowledge of process for controlling temporary changes	2.5	1		
	2.2.27	Knowledge of the refueling process	2.6	1		
	Subtotal			**3**		
3. Radiation Control	2.3.2	Knowledge of the facility ALARA program	2.5	1		
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure	2.9	1		
	Subtotal			**2**		
4. Emergency Procedures / Plan	2.4.7	Knowledge of event based EOP mitigation strategies	3.1	1		
	2.4.29	Knowledge of the emergency plan	2.6	1		
	2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm	3.3	1		
	Subtotal			**3**		
Tier 3 Point Total				**10**		

Facility: **HATCH - SRO** **FINAL**

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 & Abnormal Plant Evolutions	1				N/A					N/A				4		3		7		
	2													1		2		3		
	Tier Totals													5		5		10		
2. Plant Systems	1													4		1		5		
	2														2	1		3		
	Tier Totals													6		2		8		
3. Generic Knowledge and Abilities Categories		1		2		3		4						1	2	3	4	7		
														2	2	1	2			

Note:1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).

2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.

3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding the elimination of inappropriate K/A statements.

4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.

5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.

6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.

7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.

8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (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 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. Use duplicate pages for RO and SRO-only exams.

9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)							Form ES-401-1	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4									
295003 Partial or Complete Loss of AC / 6					X		A2.04 System lineups	3.7	1
295004 Partial or Total Loss of DC Pwr / 6					X		A2.02 Extent of partial or complete loss of DC power	3.9	1
295005 Main Turbine Generator Trip / 3									
295006 SCRAM / 1									
295016 Control Room Abandonment / 7									
295018 Partial or Total Loss of CCW / 8									
295019 Partial or Total Loss of Inst. Air / 8									
295021 Loss of Shutdown Cooling / 4									
295023 Refueling Acc / 8									
295024 High Drywell Pressure / 5									
295025 High Reactor Pressure / 3					X		A2.06 Reactor water level	3.8	1
295026 Suppression Pool High Water Temp. / 5						X	G2.1.28 Knowledge of the purpose and function of major system components and controls	3.3	1
295028 High Drywell Temperature / 5					X		A2.06 torus/suppression chamber air space temperature: Plant specific	3.7	1
295030 Low Suppression Pool Wtr Lvl / 5									
295031 Reactor Low Water Level / 2									
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1									
295038 High Off-site Release Rate / 9						X	G2.2.22 Knowledge of LCO and safety limits	4.1	1
600000 Plant Fire On Site / 8						X	G2.4.49 Ability to perform w/o reference to procedures those actions that require immediate operation of system components and controls.	4.0	1
K/A Category Totals:					4	3	Group Point Total:		7

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)							Form ES-401-1	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3									
295007 High Reactor Pressure / 3									
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5									
295011 High Containment Temp / 5									
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1						x	G2.4.31: Knowledge of annunciators, alarms, and indications/ and use of the response instructions	3.4	1
295015 Incomplete SCRAM / 1									
295017 High Off-site Release Rate / 9									
295020 Inadvertent Cont. Isolation / 5 & 7					x		A2.04 Reactor pressure	3.9	1
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Wtr Lvl / 5									
295032 High Secondary Containment Area Temperature / 5									
295033 High Secondary Containment Area Radiation Levels / 9						x	G2.4.50: Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	3.3	1
295034 Secondary Containment Ventilation High Radiation / 9									
295035 Secondary Containment High Differential Pressure / 5									
295036 Secondary Containment High Sump/Area Water Level / 5									
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals:					1	2	Group Point Total:		3

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 1 (SRO)												Form ES-401-1	
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection Mode														
205000 Shutdown Cooling														
206000 HPCI														
209001 LPCS														
211000 SLC											x	G2.1.14 Knowledge of system status criteria which require the notification of plant personnel	3.3	1
212000 RPS								x				A2.20 Full system activation (full scram)	4.2	1
215003 IRM														
215004 Source Range Monitor								x				A2.02 SRM inop condition	3.7	1
215005 APRM / LPRM														
217000 RCIC														
218000 ADS														
223002 PCIS/Nuclear Steam Supply Shutoff														
239002 SRVs														
259002 Reactor Water Level Control														
261000 SGTS														
262001 AC Electrical Distribution								x				A2.08 Opening a disconnect under load	3.6	1
262002 UPS (AC/DC)														
263000 DC Electrical Distribution														
264000 EDGs														
300000 Instrument Air														
400000 Component Cooling Water								x				A2.03 High/Low CCW temperature	3.0	1
K/A Category Point Totals:								4			1	Group Point Total:		5

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2 (SRO)												Form ES-401-1	
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic														
201002 RMCS														
201003 Control Rod and Drive Mechanism								x				A2.05 Reactor Scram	4.1	1
201006 RWM														
202001 Recirculation														
202002 Recirculation Flow Control														
204000 RWCU											x	G2.1.2 Knowledge of operator responsibilities during all modes of plant operation	4.0	1
214000 RPIS														
215001 Traversing In-core Probe														
215002 RBM														
216000 Nuclear Boiler Inst.														
219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.														
226001 RHR/LPCI: CTMT Spray Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode														
233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														
239003 MSIV Leakage Control														
241000 Reactor/Turbine Pressure Regulator														
245000 Main Turbine Gen. / Aux.								x				A2.07 Loss of reactor/turbine pressure control system: Plant specific	3.8	1
256000 Reactor Condensate														
259001 Reactor Feedwater														
268000 Radwaste														
271000 Offgas														
272000 Radiation Monitoring														
286000 Fire Protection														
288000 Plant Ventilation														
290001 Secondary CTMT														
290003 Control Room HVAC														
290002 Reactor Vessel Internals														
K/A Category Point Totals:								2			1	Group Point Total:		3

ES-401, Rev. 9 **Generic Knowledge and Abilities Outline (Tier 3)** **Form ES-401-3**

Facility: **HATCH - SRO** **FINAL** Date of Exam: December 10, 2007

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics/ reactor behavior/ and instrument interpretation. (43.5)			4.4	1
	2.1.14	Knowledge of system status criteria which require the notification of plant personnel. (43.5)			3.3	1
	Subtotal					**2**
2. Equipment Control	2.2.19	Knowledge of maintenance work order requirements (43.5)			3.1	1
	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity. (43.6)			3.2	1
	Subtotal					**2**
3. Radiation Control	2.3.9	Knowledge of the process for performing a containment purge. (43.4)			3.4	1
	Subtotal					**1**
4. Emergency Procedures / Plan	2.4.11	Knowledge of abnormal condition procedures (43.5)			3.6	1
	2.4.26	Knowledge of facility protection requirements including fire brigade and portable fire fighting equipment usage. (43.5)			3.3	1
	Subtotal					**2**
Tier 3 Point Total						7