

Facility: <u>Perry</u>		Date of Examination: <u>06/14/1010</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>2010-301</u>

  

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, S	Perform a Valve and System Lineup on RCIC
Conduct of Operations	D, R	Determine Requirements to Reactivate a License
Equipment Control	M, R	Determine Drywell Floor and Equipment Drain Leakage
Radiation Control	D, R	Evaluate an RWP and Survey Map
Emergency Procedures/Plan		<b>n/a</b>

  

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 ( $\leq 3$  for ROs;  $\leq 4$  for SROs & RO retakes)

(N)ew or (M)odified from bank ( $\geq 1$ )

(P)revious 2 exams ( $\leq 1$ ; randomly selected)

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Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, S	Perform a Valve and System Lineup on RCIC
Conduct of Operations	D, R	Determine Requirements to Reactivate a License
Equipment Control	M, R	Determine Drywell Floor and Equipment Drain Leakage
Radiation Control	D, R	Evaluate an RWP and Survey Map
Emergency Procedures/Plan	D, R	Classify an Event and Determine a PAR

  

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 ( $\leq 3$  for ROs;  $\leq 4$  for SROs & RO retakes)

(N)ew or (M)odified from bank ( $\geq 1$ )

(P)revious 2 exams ( $\leq 1$ ; randomly selected)

Facility: <u>Perry</u>		Date of Examination: <u>06/14/2010</u>
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2010-301</u>
Control Room Systems <sup>@</sup> (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. Bypass and Reset Scram/ARI Signals During an ATWS	C, M	1
b. Bypass HPCS and MFP Level 8 Trip for RPV Flooding	C, D	2
c. Start Vacuum Pumps following a Loss of Condenser Vacuum	A, S, L, M	3
d. Establish Shutdown Cooling, Head Spray then Trip Pump Due to Loss of Suction Pressure	A, S, L, M	4
e. Initiate Suppression Pool Makeup (SPMU)	C, D	5
f. Restore Off-Site Power	D, L, C	6
g. Control Rod Bypassed in RACCS	C, D	7
h. Bypass Instrument Air Isolation and Start an Air Compressor	A, M, S	8
In-Plant Systems <sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Perform Alternate Boron Injection	D, E, P, R	1
j. Isolate an Instrument Air Receiver	A, M, E	8
k. LPCI B Shutdown at Division 2 Remote Shutdown Panel	D, E, L	7
<p><sup>@</sup> All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator	4-6 / 4-6 / 2-3  $\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ - / - / $\geq 1$ (control room system) $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$ (randomly selected) $\geq 1 / \geq 1 / \geq 1$	

Facility: <u>Perry</u>		Date of Examination: <u>06/14/2010</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2010-301</u>

  

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
a. Bypass and Reset Scram/ARI Signals During an ATWS	C, M	1
b. Bypass HPCS and MFP Level 8 Trip for RPV Flooding	C, D	2
c. Start Vacuum Pumps following a Loss of Condenser Vacuum	A, S, L, M	3
d. Establish Shutdown Cooling, Head Spray then Trip Pump Due to Loss of Suction Pressure	A, S, L, M	4
e. Initiate Suppression Pool Makeup (SPMU)	C, D	5
f. Restore Off-Site Power	D, L, C	6
g. n/a	n/a	n/a
h. Bypass Instrument Air Isolation and Start an Air Compressor	A, M, S	8

  

In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Perform Alternate Boron Injection	D, E, P, R	1
j. Isolate an Instrument Air Receiver	A, M, E	8
k. LPCI B Shutdown at Division 2 Remote Shutdown Panel	D, E, L	7

  

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.	
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* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator	4-6 / 4-6 / 2-3  $\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ - / - / $\geq 1$ (control room system) $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$ (randomly selected) $\geq 1 / \geq 1 / \geq 1$

Facility: <u>Perry</u>		Date of Examination: <u>06/14/2010</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>		Operating Test No.: <u>2010-301</u>

  

Control Room Systems <sup>@</sup> (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a.		
b.		
c.		
d. Establish Shutdown Cooling, Head Spray then Trip Pump Due to Loss of Suction Pressure	A, S, L, M	4
e Initiate Suppression Pool Makeup (SPMU)	C, D, EN	5
f. Restore Off-Site Power	D, L, C	6
g.		
h.		
In-Plant Systems <sup>@</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Perform Alternate Boron Injection	D, E, P, R	1
j. Isolate an Instrument Air Receiver	A, M, E	8
k.		
<b>@</b> All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path (C)ontrol room (D)irect from bank (E)mergency or abnormal in-plant (EN)gineered safety feature (L)ow-Power / Shutdown (N)ew or (M)odified from bank including 1(A) (P)revious 2 exams (R)CA (S)imulator	4-6 / 4-6 / 2-3  $\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ - / - / $\geq 1$ (control room system) $\geq 1 / \geq 1 / \geq 1$ $\geq 2 / \geq 2 / \geq 1$ $\leq 3 / \leq 3 / \leq 2$ (randomly selected) $\geq 1 / \geq 1 / \geq 1$	

Facility **Perry**Date of Exam **6/14/2010**Operating Test No **2010-01**

A P P L I C A N T	E V E N T  T Y P E	Scenarios													T O T A L	M I N I M U M(-)		
		1			6			3			4 Backup							
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P					
																R	I	U
<b>M A S T E R</b>	RX		2			1			3			1				1	1	0
	NOR	1,2		1	1,2		2	1,3		1	1					1	1	1
	I/C	3,4,5,7, 8,9	8,9	3,4,5,7	3,4,6,7	3,4	3,6,7	2,4,5,7, 9	4,9	2,5,7	2,4,6,8, 9,11	2,8	4,6,9, 11			4	4	2
	MAJ	6,10	6,10	6,10	5	5	5	6,8	6,8	6,8	7,10	7,10	7,10			2	2	1
	TS	3,4,5			3,4			4,5			3,4					0	2	2
SRO-I-1 <input checked="" type="checkbox"/>	RX					1								1		1	1	0
	NOR	1,2								1				3		1	1	1
	I/C	3,4,5,7, 8,9				3,4				2,5,7				11		4	4	2
	MAJ	6,10				5				6,8				5		2	2	1
	TS	3,4,5												3		0	2	2
SRO-I-2 <input checked="" type="checkbox"/>	RX		2											1		1	1	0
	NOR						2	1,3						3		1	1	1
	I/C		8,9				3,6,7	2,4,5,7, 9						10		4	4	2
	MAJ		6,10				5	6,8						5		2	2	1
	TS							4,5						2		0	2	2
SRO-I-3 <input checked="" type="checkbox"/>	RX								3					1		1	1	0
	NOR			1	1,2									3		1	1	1
	I/C			3,4,5,7	3,4,6,7				4,9					10		4	4	2
	MAJ			6,10	5				6,8					5		2	2	1
	TS				3,4									2		0	2	2

## Instructions:

- Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
- Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per section C.2.a of Appendix D. (-) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
- Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right hand columns.

Facility **Perry**Date of Exam **6/14/2010**Operating Test No **2010-01**

A P P L I C A N T	E V E N T  T Y P E	Scenarios													T O T A L	M I N I M U M(-)		
		1			6			3			4 Backup							
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P					
																R	I	U
<b>M A S T E R</b>	RX		2			1			3			1				1	1	0
	NOR	1,2		1	1,2		2	1,3		1	1					1	1	1
	I/C	3,4,5,7, 8,9	8,9	3,4,5,7	3,4,6,7	3,4	3,6,7	2,4,5,7, 9	4,9	2,5,7	2,4,6,8, 9, 11	2,8	4,6,9, 11			4	4	2
	MAJ	6,10	6,10	6,10	5	5	5	6,8	6,8	6,8	7,10	7,10	7,10			2	2	1
	TS	3,4,5			3,4			4,5			3,4					0	2	2
SRO-I-4 <input checked="" type="checkbox"/>	RX					1								1		1	1	0
	NOR	1,2								1				3		1	1	1
	I/C	3,4,5,7, 8,9				3,4				2,5,7				11		4	4	2
	MAJ	6,10				5				6,8				5		2	2	1
	TS	3,4,5												3		0	2	2
SRO-I-5 <input checked="" type="checkbox"/>	RX		2											1		1	1	0
	NOR						2	1,3						3		1	1	1
	I/C		8,9				3,6,7	2,4,5,7, 9						10		4	4	2
	MAJ		6,10				5	6,8						5		2	2	1
	TS							4,5						2		0	2	2
SRO-I-6 <input checked="" type="checkbox"/>	RX								3					1		1	1	0
	NOR			1	1,2									3		1	1	1
	I/C			3,4,5,7	3,4,6,7				4,9					10		4	4	2
	MAJ			6,10	5				6,8					5		2	2	1
	TS				3,4									2		0	2	2

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Facility **Perry**Date of Exam **6/14/2010**Operating Test No **2010-01**

A P P L I C A N T	E V E N T  T Y P E	Scenarios													T O T A L	M I N I M U M (-)		
		1			6			3			4 Backup							
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P					
<b>M A S T E R</b>	RX		2			1			3			1				1	1	0
	NOR	1,2		1	1,2		2	1,3		1	1					1	1	1
	I/C	3,4,5,7, 8,9	8,9	3,4,5,7	3,4,6,7	3,4	3,6,7	2,4,5,7, 9	4,9	2,5,7	2,4,6,8, 9,11	2,8	4,6,9, 11			4	4	2
	MAJ	6,10	6,10	6,10	5	5	5	6,8	6,8	6,8	7,10	7,10	7,10			2	2	1
	TS	3,4,5			3,4			4,5			3,4					0	2	2
SRO-I-7 <input checked="" type="checkbox"/>	RX					1									1	1	1	0
	NOR	1,2								1					3	1	1	1
	I/C	3,4,5,7, 8,9				3,4				2,5,7					11	4	4	2
	MAJ	6,10				5				6,8					5	2	2	1
	TS	3,4,5													3	0	2	2
SRO-I-8 <input checked="" type="checkbox"/>	RX		2												1	1	1	0
	NOR						2	1,3							3	1	1	1
	I/C		8,9				3,6,7	2,4,5,7, 9							10	4	4	2
	MAJ		6,10				5	6,8							5	2	2	1
	TS							4,5							2	0	2	2
SRO-I-9 <input checked="" type="checkbox"/>	RX								3						1	1	1	0
	NOR			1	1,2										3	1	1	1
	I/C			3,4,5,7	3,4,6,7				4,9						10	4	4	2
	MAJ			6,10	5				6,8						5	2	2	1
	TS				3,4										2	0	2	2

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- Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per section C.2.a of Appendix D. (-) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
- Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right hand columns.



Facility **Perry**Date of Exam **6/14/2010**Operating Test No **2010-01**

A P P L I C A N T	E V E N T  T Y P E	Scenarios													T O T A L	M I N I M U M (-)		
		5			2			N/A			N/A							
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P					
															R	I	U	
<b>M A S T E R</b>	RX		2			3										1	1	0
	NOR	1,2		1	1,3		1									1	1	1
	I/C	3,4,5,6,8	3,5,6,8	4,6	2,4,5,9	2,4	5,9									4	4	2
	MAJ	7,9,10	7,9,10	7,9,10	6,7,8	6,7,8	6,7,8,									2	2	1
	TS	3			1,2,4											0	2	2
SRO-U-1 <input checked="" type="checkbox"/>	RX														0	1	1	0
	NOR	1,2			1,3										4	1	1	1
	I/C	3,4,5,6,8			2,4,5,9										9	4	4	2
	MAJ	7,9,10			6,7,8										6	2	2	1
	TS	3			1,2,4										4	0	2	2
RO-1 <input checked="" type="checkbox"/>	RX		2												1	1	1	0
	NOR						1								1	1	1	1
	I/C		3,5,6,8				5,9								6	4	4	2
	MAJ		7,9,10				6,7,8,								6	2	2	1
	TS														0	0	2	2
<input checked="" type="checkbox"/>	RX															1	1	0
	NOR															1	1	1
	I/C															4	4	2
	MAJ															2	2	1
	TS															0	2	2

## Instructions:

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- Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per section C.2.a of Appendix D. (-) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
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Facility: <b>Perry</b>		Date of Examination: <b>6/14/2010</b>								Operating Test No.: <b>2010-01</b>							
Competencies	APPLICANTS																
	SRO-I <input checked="" type="checkbox"/>				ATC <input checked="" type="checkbox"/>				BOP <input checked="" type="checkbox"/>				SRO-U <input checked="" type="checkbox"/>				
	SCENARIO				SCENARIO				SCENARIO				SCENARIO				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Interpret/Diagnosis Events and Conditions	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9, 10 11	6,8 9, 10	2,3 4,6 7,8	3,4 6,8 9	1,2 7,8 10	3,4 5,6 7, 10	1,5 6,7 8,9	1,2 5,6 7,8	4,6 7,9 10 11	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9, 10 11	
Comply With and Use Procedures (1)	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9, 10 11	2,6 8,9 10	2,3 4,6 7,8	3,4 6,8 9	1,2 7,8 10	1,3 4,5 6,7 10	1,5 6,7 8,9	1,2 5,6 7,8	4,6 7,9 10 11	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9, 10 11	
Operate Control Boards (2)	NA	NA	NA	NA	2,6 8,9 10	2,3 4,6 7,8	3,4 6,8 9	1,2 7,8 10	3,6 10	1,5 6,7 8,9	1,2 5,6 7,8	4,6 7,9 10 11	NA	NA	NA	NA	
Communicate and Interact	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9, 10 11	2,6 8,9 10	2,3 4,6 7,8	3,4 6,8 9	1,2 7,8 10	3,4 5,6 7, 10	1,5 6,7 8,9	1,2 5,6 7,8	4,6 7,9 10 11	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9, 10 11	
Demonstrate Supervisory Ability (3)	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9, 10 11	NA	NA	NA	NA	NA	NA	NA	NA	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9 10	1,2 3,4 5,6 7,8 9, 10 11	
Comply With and Use Tech. Specs. (3)	3,4 5	1,2 4	4,5	3,4	NA	NA	NA	NA	NA	NA	NA	NA	3,4 5	1,2 4	4,5	3,4	

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

## Instructions:

Check the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Facility: <b>Perry</b>		Date of Examination: <b>6/14/2010</b>				Operating Test No.: <b>2010-01</b>										
Competencies	APPLICANTS															
	SRO-I <input checked="" type="checkbox"/>				ATC <input checked="" type="checkbox"/>				BOP <input checked="" type="checkbox"/>				SRO-U <input checked="" type="checkbox"/>			
	SCENARIO				SCENARIO				SCENARIO				SCENARIO			
	5	6	N/A	N/A	5	6	N/A	N/A	5	6	N/A	N/A	5	6	N/A	N/A
Interpret/Diagnosis Events and Conditions	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7			2,3 5,6 7,8 9 10	1,3 4,5			1,4 6,7 9 10	2,3 5,6 7			1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7		
Comply With and Use Procedures (1)	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7			2,3 5,6 7,8 9 10	1,3 4,5			1,4 6,7 9 10	2,3 5,6 7			1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7		
Operate Control Boards (2)	NA	NA			2,3 5,6 7,8 9 10	1,3 4,5			1,4 6,7 9 10	2,3 5,6 7			NA	NA		
Communicate and Interact	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7			2,3 5,6 7,8 9 10	1,3 4,5			1,4 6,7 9 10	2,3 5,6 7			1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7		
Demonstrate Supervisory Ability (3)	1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7			NA	NA			NA	NA			1,2 3,4 5,6 7,8 9, 10	1,2 3,4 5,6 7		
Comply With and Use Tech. Specs. (3)	3	3,4			NA	NA			NA	NA			3	3,4		
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.																

Instructions:

Check the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Facility: Perry														Date of Exam: 06/14/2010					
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	3	4	3	N/A			4	3	N/A			3	20	4	3	7		
	2	1	1	1				1	2				1	7	1	2	3		
	Tier Totals	4	5	4				5	5				4	27	5	5	10		
2. Plant Systems	1	4	3	2	3	2	3	2	2	2	1	2	26	3	2	5			
	2	1	0	0	1	2	1	2	1	1	2	1	12	0	1	3			
	Tier Totals	5	3	2	4	4	4	4	3	3	3	3	38	4	4	8			
3. Generic Knowledge and Abilities Categories					1		2		3		4				1	2	3	4	
					2		3		2		3		10		2	2	2	1	7

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  $\pm 1$  from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.

3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding 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. Refer to Section D.1.b of ES-401 for the appropriate K/As.

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 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.

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

BWR Examination Outline										Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 RO											
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						AK1.04 Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Limiting cycle oscillation: Plant-Specific			2.5	1
295003 Partial or Complete Loss of AC / 6		x					AK2.01 Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF A.C. POWER and the following: Station batteries			3.2	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	1
295005 Main Turbine Generator Trip / 3				x			AA1.01 Ability to operate and/or monitor the following as they apply to MAIN TURBINE GENERATOR TRIP: Recirculation system:			3.1	1
295006 SCRAM / 1											
295016 Control Room Abandonment / 7					x		AA2.04 Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT: Suppression pool temperature			3.9	1
295018 Partial or Total Loss of CCW / 8						x	2.4.8 Knowledge of how abnormal operating procedures are used in conjunction with EOPs.			3.8	1
295019 Partial or Total Loss of Inst. Air / 8				x			AA1.04 Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: Service air isolations valves:			3.3	1
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	1
295023 Refueling Acc / 8			x				AK3.01 Knowledge of the reasons for the following responses as they apply to REFUELING ACCIDENTS: Refueling floor evacuation			3.6	1
295024 High Drywell Pressure / 5				x			EA1.10 Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: A.C. distribution			3.4	1
295025 High Reactor Pressure / 3					x		EA2.03 Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE: Suppression pool temperature			3.9	1
295026 Suppression Pool High Water Temp. / 5						x	2.2.22 Knowledge of limiting conditions for operations and safety limits.			4.0	1
295027 High Containment Temperature / 5	x						EK1.03 Knowledge of the operational implications of the following concepts as they apply to HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY): Containment integrity			3.8	1
295028 High Drywell Temperature / 5		x					EK2.04 Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: Drywell ventilation			3.6	1
295030 Low Suppression Pool Wtr Lvl / 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	1
295031 Reactor Low Water Level / 2				x			EA1.06 Ability to operate and/or monitor the following as they apply to REACTOR LOW WATER LEVEL: Automatic depressurization system			4.4	1

295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1					x		EA2.05 Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: Control rod position	4.2	1
295038 High Off-site Release Rate / 9						x	2.4.31 Knowledge of annunciator alarms, indications, or response procedures	4.2	1
600000 Plant Fire On Site / 8	x						AK1.02 Knowledge of the operation applications of the following concepts as they apply to Plant Fire On Site: Fire Fighting	2.9	1
700000 Generator Voltage and Electric Grid Disturbances / 6		x					AK2.01 Knowledge of the interrelations between GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES and the following: Motors	3.1	1
K/A Category Totals:	3	4	3	4	3	3	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		AA2.02 Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE: Reactor power	4.1	1	
295008 High Reactor Water Level / 2										
295009 Low Reactor Water Level / 2						x	2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	4.5	1	
295010 High Drywell Pressure / 5										
295011 High Containment Temp / 5	x						AK1.01 Knowledge of the operational implications of the following concepts as they apply to HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY): Containment pressure: Mark-III	4.0	1	
295012 High Drywell Temperature / 5										
295013 High Suppression Pool Temp. / 5										
295014 Inadvertent Reactivity Addition / 1		x					AK2.01 Knowledge of the interrelations between INADVERTENT REACTIVITY ADDITION and the following: RPS	3.9	1	
295015 Incomplete SCRAM / 1										
295017 High Off-site Release Rate / 9										
295020 Inadvertent Cont. Isolation / 5 & 7			x				AK3.01 Knowledge of the reasons for the following responses as they apply to INADVERTENT CONTAINMENT ISOLATION: Reactor SCRAM	3.8	1	
295022 Loss of CRD Pumps / 1										
295029 High Suppression Pool Wtr Lvl / 5				x			EA1.02 Ability to operate and/or monitor the following as they apply to HIGH SUPPRESSION POOL WATER LEVEL: HPCS	3.1	1	
295032 High Secondary Containment Area Temperature / 5										
295033 High Secondary Containment Area Radiation Levels / 9					x		EA2.01 Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS: Area radiation levels	3.8	1	
295034 Secondary Containment Ventilation High Radiation / 9										
295035 Secondary Containment High Differential Pressure / 5							<b>Not Applicable to Perry</b>			
295036 Secondary Containment High Sump/Area Water Level / 5										
500000 High CTMT Hydrogen Conc. / 5										
K/A Category Point Totals:	1	1	1	1	2	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								K4.09 Knowledge of RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) design feature(s) and/or interlocks which provide for the following: Surveillance for all operable components	3.1	1
205000 Shutdown Cooling					x							K5.03 Knowledge of the operational implications of the following concepts as they apply to SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE): Heat removal mechanisms	2.8	1
206000 HPCI												Not Applicable to Perry		
207000 Isolation (Emergency) Condenser												Not Applicable to Perry		
215005 OPRM						x						K6.04 Knowledge of the effect that a loss or malfunction of the following will have on the OSCILATING POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM: Trip units	3.1	1
209001 LPCS							x					A1.03 Ability to predict and/or monitor changes in parameters associated with operating the LOW PRESSURE CORE SPRAY SYSTEM controls including: Reactor water level	3.8	1
209002 HPCS								x				A2.10 Ability to (a) predict the impacts of the following on the HIGH PRESSURE CORE SPRAY SYSTEM (HPCS) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Valve openings: BWR-5,6	2.7	1
211000 SLC		x							x			A3.01 Ability to monitor automatic operations of the STANDBY LIQUID CONTROL SYSTEM including: Pump discharge pressure  K2.01 Knowledge of electrical power supplies to the following: SBLC pumps	3.5  2.9	2
212000 RPS	x										x	2.4.11 Knowledge of abnormal condition procedures.  K1.04 Knowledge of the physical connections and/or cause/effect relationships between REACTOR PROTECTION SYSTEM and the following: A.C. electrical distribution	4.0  3.4	2
215003 IRM		x										K2.01 Knowledge of electrical power supplies to the following: IRM channels/detectors	2.5	1
215004 Source Range Monitor			x									K3.04 Knowledge of the effect that a loss or malfunction of the SOURCE RANGE MONITOR (SRM) SYSTEM will have on following: Reactor power and indication	3.7	1
215005 APRM / LPRM				x								K4.06 Knowledge of AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM design feature(s) and/or interlocks which provide for the following: Effects of detector aging on LPRM/APRM readings	2.6	1
217000 RCIC					x							K5.07 Knowledge of the operational implications of the following concepts as they apply to REACTOR CORE ISOLATION COOLING SYSTEM (RCIC): Assist core cooling	3.1	1
218000 ADS						x						K6.06 Knowledge of the effect that a loss or malfunction of the following will have on the AUTOMATIC DEPRESSURIZATION SYSTEM: D.C. power:	3.4	1



223002 PCIS/Nuclear Steam Supply Shutoff								x										A1.01 Ability to predict and/or monitor changes in parameters associated with operating the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF controls including: System indicating lights and alarms	3.5	1
239002 SRVs									x									A2.03 Ability to (a) predict the impacts of the following on the RELIEF/SAFETY VALVES ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open SRV	4.1	1
259002 Reactor Water Level Control										x								A3.06 Ability to monitor automatic operations of the REACTOR WATER LEVEL CONTROL SYSTEM including: Reactor water level setpoint setdown following a reactor scram: Plant-Specific	3.0	1
261000 SGTS											x							A4.01 Ability to manually operate and/or monitor in the control room: Off-site release levels	3.2	1
262001 AC Electrical Distribution												x						2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.	4.1	1
262002 UPS (AC/DC)	x																	K1.19 Knowledge of the physical connections and/or cause/effect relationships between UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) and the following: Power range neutron monitoring system: Plant-Specific	2.9	1
263000 DC Electrical Distribution		x																K2.01 Knowledge of electrical power supplies to the following: Major D.C. loads	3.1	1
264000 EDGs			x															K3.02 Knowledge of the effect that a loss or malfunction of the EMERGENCY GENERATORS (DIESEL/JET) will have on following: A.C. electrical distribution	3.9	1
300000 Instrument Air				x														K4.03 Knowledge of (INSTRUMENT AIR SYSTEM) design feature(s) and or interlocks which provide for the following: Securing of IAS upon loss of cooling water  K1.05 Knowledge of the connections and / or cause effect relationships between INSTRUMENT AIR SYSTEM and the following: Main Steam Isolation Valve air	2.8 3.1	2
400000 Component Cooling Water						x												K2.01 Knowledge of electrical power supplies to the following: CCW pumps  A1.02 Ability to predict and / or monitor changes in parameters associated with operating the CCWS controls including: CCW temperature	2.9 2.8	2
K/A Category Point Totals:	4	3	2	3	2	3	2	2	2	2	1	2						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												<b>Not Applicable to Perry</b>		
201003 Control Rod and Drive Mechanism	x											K1.02 Knowledge of the physical connections and/or cause/effect relationships between CONTROL ROD AND DRIVE MECHANISM and the following: Reactor water	2.9	1
201004 RSCS												<b>Not Applicable to Perry</b>		
201005 RCIS					x							K5.09 Knowledge of the operational implications of the following concepts as they apply to ROD CONTROL AND INFORMATION SYSTEM (RCIS): High power setpoints	3.5	1
201006 RWM												<b>Not Applicable to Perry</b>		
202001 Recirculation														
202002 Recirculation Flow Control									x			A3.01 Ability to monitor automatic operations of the RECIRCULATION FLOW CONTROL SYSTEM including: Flow control valve operation: BWR-5,6	3.6	1
204000 RWCU														
214000 RPIS												<b>Not Applicable to Perry</b>		
215001 Traversing In-core Probe														
215002 RBM												<b>Not Applicable to Perry</b>		
216000 Nuclear Boiler Inst.				x								K4.01 Knowledge of NUCLEAR BOILER INSTRUMENTATION design feature(s) and/or interlocks which provide for the following: Reading of nuclear boiler parameters outside the control room	3.6	1
219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.														
226001 RHR/LPCI: CTMT Spray Mode							x					A1.07 Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE controls including: System pressure	3.1	1
230000 RHR/LPCI: Torus/Pool Spray Mode												<b>Not Applicable to Perry</b>		
233000 Fuel Pool Cooling/Cleanup										x		A4.04 Ability to manually operate and/or monitor in the control room: Pool level	2.9	1
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam					x							K5.09 Knowledge of the operational implications of the following concepts as they apply to MAIN AND REHEAT STEAM SYSTEM: Decay heat removal	3.4	1
239003 MSIV Leakage Control												<b>Not Applicable to Perry</b>		
241000 Reactor/Turbine Pressure Regulator							x					A1.13 Ability to predict and/or monitor changes in parameters associated with operating the REACTOR/TURBINE PRESSURE REGULATING SYSTEM controls including: Main turbine speed	2.7	1
245000 Main Turbine Gen. / Aux.														

[illegible]

ility: Perry		Date of Exam: January 2009				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.43	Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.	4.1	1		
	2.1.44	Knowledge of RO duties in the control room during fuel handling such as responding to alarms from the fuel handling area, communication with the fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	3.9	1		
	2.1.1	Knowledge of conduct of operations requirements.			4.2	1
	2.1.36	Knowledge of procedures and limitations involved in core alterations.			4.1	1
	Subtotal			2		2
2. Equipment Control	2.2.37	Ability to determine operability and/or availability of safety related equipment.	3.6	1		
	2.2.39	Knowledge of less than or equal to one hour Technical Specification action statements for systems.	3.9	1		
	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	1		
	2.2.23	Ability to track Technical Specifications limiting conditions for operations.			4.6	1
	2.2.36	Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.			4.2	1
Subtotal			3		2	
3. Radiation Control	2.3.13	Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.4	1		
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	1		
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.			3.7	1
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.			3.1	1
	Subtotal			2		2
4. Emergency Procedures / Plan	2.4.14	Knowledge of general guidelines for EOP usage.	3.8	1		
	2.4.32	Knowledge of operator response to loss of all annunciators.	3.6	1		
	2.4.43	Knowledge of emergency communications systems and techniques.	3.2	1		
	2.4.40	Knowledge of SRO responsibilities in emergency plan implementation.			4.5	1
Subtotal			3		1	
Tier 3 Point Total				10		7

Facility: Perry														Date of Exam: 06/14/2010					
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	3	4	3	N/A			4	3	N/A			3	20	4	3	7		
	2	1	1	1	N/A			1	2	N/A			1	7	1	2	3		
	Tier Totals	4	5	4	N/A			5	5	N/A			4	27	5	5	10		
2. Plant Systems	1	4	3	2	3	2	3	2	2	2	1	2	26	3	2	5			
	2	1	0	0	1	2	1	2	1	1	2	1	12	0	1	3			
	Tier Totals	5	3	2	4	4	4	4	3	3	3	3	38	4	4	8			
3. Generic Knowledge and Abilities Categories					1		2		3		4				1	2	3	4	
					2		3		2		3		10		2	2	2	1	7

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  $\pm 1$  from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.

3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding 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. Refer to Section D.1.b of ES-401 for the appropriate K/As.

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 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.

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

ES-401		BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 <b>SRO</b>						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		AA2.05 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: Whether a partial or complete loss of A.C. power has occurred	4.2	1
295004 Partial or Total Loss of DC Pwr / 6						x	2.4.11 Knowledge of abnormal condition procedures.	4.2	1
295005 Main Turbine Generator Trip / 3					x		AA2.03 Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP: Turbine valve position	3.1	1
295006 SCRAM / 1						x	2.4.41 Knowledge of the emergency action level thresholds and classifications.	4.6	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					x		AA2.02 Ability to determine and/or interpret the following as they apply to REFUELING ACCIDENTS: Fuel pool level	3.7	1
295024 High Drywell Pressure / 5									
295025 High Reactor Pressure / 3									
295026 Suppression Pool High Water Temp. / 5						x	2.1.19 Ability to use plant computers to evaluate system or component status.	3.8	1
295027 High Containment Temperature / 5									
295028 High Drywell Temperature / 5									
295030 Low Suppression Pool Wtr Lvl / 5					x		EA2.02 Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: Suppression pool temperature.	3.9	1
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									
600000 Plant Fire On Site / 8									
700000 Generator Voltage and Electric Disturbances / 6									
K/A Category Totals:					4	3	Group Point Total:		7

ES-401		BWR Examination Outline						Form ES-401-1	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 SRO									
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						x	2.4.18 Knowledge of the specific bases for EOPs.	4.0	1
295011 High Containment Temp / 5									
295012 High Drywell Temperature / 5					x		AA2.01 Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE: Drywell temperature.	3.9	1
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1									
295015 Incomplete SCRAM / 1									
295017 High Off-site Release Rate / 9									
295020 Inadvertent Cont. Isolation / 5 & 7									
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Wtr Lvl / 5						x	2.1.32 Ability to explain and apply system limits and precautions.	4.0	1
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							Not Applicable to Perry		
295036 Secondary Containment High Sump/Area Water Level / 5									
500000 High Containment 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												Not Applicable to Perry		
207000 Isolation (Emergency) Condenser												Not Applicable to Perry		
209001 LPCS														
209002 HPCS														
211000 SLC														
212000 RPS														
215003 IRM								x				A2.05 Faulty or erratic operation of detectors/system	3.5	1
215004 Source Range Monitor														
215005 APRM / LPRM														
215005 OPRM														
217000 RCIC											x	2.1.27 Knowledge of system purpose and/or function.	4.0	1
218000 ADS														
223002 PCIS/Nuclear Steam Supply Shutoff								x				A2.08 Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Surveillance testing	3.1	1
239002 SRVs											x	2.4.46 Ability to verify that the alarms are consistent with the plant conditions.	4.2	1
259002 Reactor Water Level Control														
261000 SGTS								x				A2.07 Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A.C. electrical failure	2.8	1
262001 AC Electrical Distribution														
262002 UPS (AC/DC)														
263000 DC Electrical Distribution														
264000 EDGs														
300000 Instrument Air														
400000 Component Cooling Water														
K/A Category Point Totals:								3			2	Group Point Total:		5



[illegible]

288000 Plant Ventilation																
290001 Secondary CTMT																
290003 Control Room HVAC																
290002 Reactor Vessel Internals																
K/A Category Point Totals:								1			2	Group Point Total:				3

Facility: Perry			Date of Exam: January 2009			
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.43	Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.	4.1	1		
	2.1.44	Knowledge of RO duties in the control room during fuel handling such as responding to alarms from the fuel handling area, communication with the fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	3.9	1		
	2.1.1	Knowledge of conduct of operations requirements.			4.2	1
	2.1.36	Knowledge of procedures and limitations involved in core alterations.			4.1	1
	Subtotal			2		2
2. Equipment Control	2.2.37	Ability to determine operability and/or availability of safety related equipment.	3.6	1		
	2.2.39	Knowledge of less than or equal to one hour Technical Specification action statements for systems.	3.9	1		
	2.2.42	Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	1		
	2.2.23	Ability to track Technical Specifications limiting conditions for operations.			4.6	1
	2.2.36	Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.			4.2	1
Subtotal			3		2	
3. Radiation Control	2.3.13	Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.4	1		
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9	1		
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.			3.7	1
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.			3.1	1
	Subtotal			2		2
4. Emergency Procedures / Plan	2.4.14	Knowledge of general guidelines for EOP usage.	3.8	1		
	2.4.32	Knowledge of operator response to loss of all annunciators.	3.6	1		
	2.4.43	Knowledge of emergency communications systems and techniques.	3.2	1		
	2.4.40	Knowledge of SRO responsibilities in emergency plan implementation.			4.5	1
Subtotal			3		1	
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1 RO	295038 2.2.38	Was unable to write a question for selected K/A (2.2.38 Knowledge of conditions and limitations in the facility license). Randomly selected 295038 2.4.31.
1/1/RO	700000 AK2.06	Was unable to write a discriminating question for selected K/A (700000 AK2.06 Reactor power). Randomly selected K/A 700000 AK2.01 Motors
2/1/RO	207000 K2.06	Selected K/A was on Isolation Condenser system, not applicable to Perry. Randomly selected K/A 215005 (OPRM) K6.04 Trip units
2/1/RO	215004 K3.01	Was unable to write a discriminating question for selected K/A (K3.01 RPS). Randomly selected K/A K3.04 (Reactor power and indication)
2/1 RO	218000 K6.05	Selected K/A was covered under 295031 EA1.06 (question 26). Randomly selected K/A 218000 K6.06
2/1/RO	259002 A3.08	Selected K/A was on FWCI system, not applicable to Perry. Randomly selected K/A 259002 A3.06 (Reactor water level setpoint setdown following a reactor scram)
2/1/RO	262002 K1.15	Selected K/A was on Stack gas monitors powered from a UPS system, not applicable to Perry. Randomly selected K/A 262002 K1.19 (Power range neutron monitoring system)
2/1/RO	300000 K5.13	Was unable to write a discriminating question for selected K/A (K5.13 Filters). Randomly selected K/A 300000 K1.05 (Main Steam Isolation Valve air)
2/1/RO	400000 A1.04	Selected K/A was covered under Audit Exam (question 53). Randomly selected K/A 400000 A1.02
2/2/RO	201002 2.2.40	Selected K/A was on RMCS system, not applicable to Perry. Randomly selected K/A 233000 A4.04 (Ability to . . . in the control room: Pool level)
2/2/RO	215001 2.4.31	Selected K/A was on Alarms and indications for the Traversing In-Core Probe, Alarms and indications not applicable to Perry. Randomly selected K/A 226001 A1.07 (CONTAINMENT SPRAY: System pressure)
2/2/RO	239001 K5.07	Selected K/A was on Hydraulic operated MSIV's, not applicable to Perry. Randomly selected K/A 239001 K5.09 (Decay heat removal)
2/2/RO	239003 K6.01	Selected K/A was on MSIV Leakage Control system, not applicable to Perry. Randomly selected K/A 202002 A3.01 (Flow control valve operation)
2/2/RO	241000 A1.24	Was unable to write a discriminating question for selected K/A. Randomly selected K/A 241000 A1.13 (Main turbine speed)
2/2/RO	268000 A1.01	Was unable to write a discriminating question for selected K/A (Radwaste). Randomly selected K/A 290003 K6.01 (CONTROL ROOM HVAC: Electrical power)
3/SRO	2.2.1	Was unable to write a question for selected K/A (SRO's operating controls). Randomly selected K/A 2.2.23
1/1/SRO	295004 2.1.19	Was unable to write a SRO level question for selected K/A. Randomly selected K/A 295004 2.4.11 (Knowledge of abnormal condition procedures) (Dell McNeil concurred)
1/1SRO	295030 EA2.04	Selected K/A was on Drywell/ suppression chamber, not applicable to Perry. Randomly selected K/A 295030 EA2.02 (Suppression pool temperature)
1/2/SRO	500000 2.4.4	Was unable to write a SRO level question for selected K/A. Keith Walton (USNRC) concurred with rejecting K/A. Randomly selected K/A 295029 2.1.32
2/1/SRO	207000A2.03	Selected K/A was on Isolation Condenser system, not applicable to Perry. Randomly selected K/A 215003 A2.05 (Faulty or erratic operation of detectors/system)
2/2/SRO	201002 2.4.50	Selected K/A was on RMCS system, not applicable to Perry. Randomly selected K/A 202002 2.1.32
2/2/SRO	204000 A2.02	Selected K/A was Pressure control valve failure: LP-RWCU – not applicable to Perry. Randomly selected A2.12

Facility: Perry

Scenario No.: 1 - 100%

Op-Test No.: 2010-01

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Initial Conditions:** Reactor Power 100%. BOL Pull Sheets, Rods @ Step 64.  
 IOI-3 Step 4.5 is complete.  
 ESW B is running to support vibration testing. HPCS ESW running to support HPCS run.  
 RFBP A is OOS for motor replacement. Control Rod 34-55 is inserted.  
 A severe thunderstorm watch has been issued for Lake, Geauga, & Ashtabula counties.  
 Green Risk.

**Turnover:** Start HPCS in CST to CST for SVI. Personnel have been briefed and are on station to support field activities. When SCC request lower power to 95% per IOI-3 Power Maneuvering.

Event No.	Malf. No.	Event Type*	Event Description
1		N-BOP/SRO	Start HPCS for SVI (CST → CST)
2		R-ATC N-SRO	Lower power with flow
3	cp02_1e22c0001	C-BOP/SRO	HPCS pump trips on over-current
		SRO	Tech Spec 3.5.1
4	cb01_1p45c0001b	C-BOP/SRO	ESW 'B' pump trips – discharge valve fails to auto close
		SRO	Tech Spec 3.7.1 & 3.8.1
5	pt01_1c34n0004c	I-BOP/SRO	C34N004C fails high
		SRO	ORM 6.2.13
6	pt01_1c34n0004b	M-All	Loss of feedwater EOP-1 RPV Control & EOP-1A (ATWS)
7	mv06_1e51f0013	C-BOP/SRO	RCIC Injection valve fails closed (loss of all HP injection) Trip RCIC on min flow due to injection valve failure
8	cb03_1b33s101b cb03_1b33s105b cb03_1b33s106b	C-ATC/SRO	Reactor Recirc pump B fails to trip from fast speed
9	TC04A	C-ATC/SRO	Bypass valve #1 fails open
10		M-All	Emergency Depressurize EOP-4-2 on inability to maintain > -25"

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

Facility: Perry Scenario No.: 2 - 11% Op-Test No.: 2010-01

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: Reactor Power 11%. BOL Pull Sheets, Rods @ Step 31, Gang 32 at Position 28.  
 Power ascension is in progress. IOI-3 Step 4.1, step 1.  
 Main Turbine is at 1800 RPM  
 Hotwell Pump C is tagged out for oil leak. IRM D is INOP and bypassed due to drawer failure during startup.  
 Green Risk.

Turnover: Shift AEGTS fans from A to B for run time. Continue with power ascension and synchronize the generator top the grid.

Event No.	Malf. No.	Event Type*	Event Description
1		N-BOP/SRO	Shift AEGTS fans from A to B
		SRO	Tech Specs 3.6.4.3
2	NM04H	I-ATC/SRO	APRM 'H' fails downscale – rod block - Bypass APRM 'H'
		SRO	Tech Spec 3.3.1.1
3		R-ATC N-SRO	Pull Control rods to get 2 ½ bypass valves open
4	RD01R2635	C-ATC/SRO	Control Rod 26-35 stuck @ position 12 – will move to position 20 then stick again. ONI-C11-1
		SRO	Tech Spec 3.1.3 for Stuck Withdrawn Control Rod
5	cp02_1p44c0001b	C-BOP/SRO	Loss of TBCC B pump
6	1B21N00678A	M-All	Both Reactor Recirc pumps trip
7	RD15	M-All	ATWS, ONI-C71-1 Reactor Scram
8	RD16	M-All	Scram discharge Volume leak in containment – press ↑
9	mv06_1e12f0537a	C-BOP/SRO	Containment Spray 'A' will not initiate, transition to Containment Spray 'B' or Emergency Depressurize

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

Facility: Perry Scenario No.: 3 - 3% Op-Test No.: 2010-01

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Initial Conditions:** Reactor Power 3%, BOL Pull Sheets, Rods @ Step 24 Gang 37 at Position 12.  
 Power ascension in progress to make Mode change. HW Pump B is in Standby & HW Pump C is Emergency Start pump. IOI-2 Hot Startup Section 4.7.  
 RFBP 'B' and NCC Pump 'C' are Out of Service.  
 APRM 'A' is bypassed for I&C SVI-C51-T0027A.  
 Due to a problem with resetting the main turbine, warming the turbine has not yet commenced.  
 Reactor Engineer is available in the Control Room.

**Turnover:** Continue Power Ascension per IOI-2 Hot Startup. Place Circulating Water Pump 'C' in service per SOI-N71 Circulating Water System. Hot Water Inlet MOVs 5 and 10 are closed. NLO has been briefed for Circ Water Pump start and is on station. Rx Engineer concurs with Gang Mode and Continuous Rod Withdrawal

Event No.	Malf. No.	Event Type*	Event Description
1		R ATC N/SRO	Pull Control Rods per IOI-2 for Transfer to Run
2		N-BOP/SRO	Place Circulating Water Pump C in service
3	RP01A	C-All	RPS Bus A EPA Failure, Loss of RPS Bus A
		SRO	ONI-C71-2 Loss of RPS Bus, ORM 6.3.1.5
4	NM02G	I-ATC	IRM 'G' Fails upscale, Bypass IRM 'G', Range IRMs and Reset ½ Scram
		SRO	Tech Spec 3.3.1.1(IRM G) and ORM 6.2.3
5	PC04	M-All	Suppression Pool Leak, EOP-3 Secondary Containment Control and EOP-2 Containment Control
6	ZD1E22F0004	C (BOP)	HPCS Injection valve fails open. Override HPCS Pump to off
7	cb04_1p42c0001a	C (BOP)	ECC 'A' pump fails to auto start – manually start ECC pump
8		M-All	Emergency Depressurize EOP-4-2, on lowering Pool Level

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