

2009 PALISADES NUCLEAR PLANT

INITIAL EXAMINATION

OUTLINE SUBMITTAL



February 23, 2009

NUREG-1021

Mr. Nicholas Valos
U.S. Nuclear Regulatory Commission
Region III
2443 Warrenville Road
Suite 210
Lisle, IL 60532-4352

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Initial License Examination Outline

Dear Sir:

Entergy Nuclear Operations, Inc. is submitting the initial license examination outline, for the Palisades Nuclear Plant, in accordance with NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1. The initial license examination is scheduled for May 26 through June 5, 2009. The following materials are enclosed:

- One Form ES-201-2, Examination Outline Quality Checklist
- One Form ES-201-3, Examination Security Agreement
- One Form ES-301-1, Administrative Topics Outline (SRO)
- One Form ES-301-1, Administrative Topics Outline (RO)
- One Form ES-301-2, Control Room/In-Plant Systems Outline (SRO-I)
- One Form ES-301-2, Control Room/In-Plant Systems Outline (SRO-U)
- One Form ES-301-2, Control Room/In-Plant Systems Outline (RO)
- Four Forms, ES-D-1, Scenario Outline, one for each projected scenario and one spare scenario
- Four Forms ES-301-5, Transient and Event Checklist, one for each crew

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- One Form ES-401-2, PWR Examination Outline (RO/SRO)
- One Form ES-401-3, Generic Knowledge and Abilities Outline (RO/SRO)
- One Form ES-401-4, Record of Rejected K/As (RO/SRO exams)
- K/A Selection Methodology and Suppression Report

Pursuant to NUREG-1021, these materials shall be withheld from public disclosure until after the examinations are complete.

Please contact Jeffrey Iliff at (269) 764-2974 if you have any questions regarding this submittal.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.



Laurie A. Lahti
Licensing Manager
Palisades Nuclear Plant

Enclosure (1)

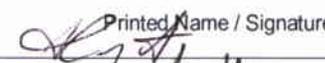
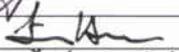
CC Administrator, Region III, USNRC (w/o enclosure)
Project Manager, Palisades, USNRC (w/o enclosure)
Resident Inspector, Palisades, USNRC (w/o enclosure)
Document Control Desk, USNRC (w/o enclosure)

**WITHHOLD ENCLOSURE FROM PUBLIC DISCLOSURE
IN ACCORDANCE NUREG-1021, REVISION 9, SUPPLEMENT 1**

ENCLOSURE

PALISADES NUCLEAR PLANT

INITIAL LICENSED OPERATOR EXAMINATION OUTLINE

Facility: Palisades		Date of Examination: May 2009		
Item	Task Description	Initials		
		a	b*	c#
1. W R I T T E N	a. Verify that the outline(s) fit(s) the appropriate model, in accordance with ES-401.	✓	TPH	NAV
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled.	✓	TPH	NAV
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	✓	TPH	NAV
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.	✓	TPH	NAV
2. S I M U L A T O R	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, technical specifications, and major transients.	✓	TPH	NAV
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity, and ensure that each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s), and scenarios will not be repeated on subsequent days.	✓	TPH	NAV
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.	✓	TPH	NAV
3. W / T	a. Verify that the systems walk-through outline meets the criteria specified on Form ES-301-2: (1) the outline(s) contain(s) the required number of control room and in-plant tasks distributed among the safety functions as specified on the form (2) task repetition from the last two NRC examinations is within the limits specified on the form (3) no tasks are duplicated from the applicants' audit test(s) (4) the number of new or modified tasks meets or exceeds the minimums specified on the form (5) the number of alternate path, low-power, emergency, and RCA tasks meet the criteria on the form	✓	TPH	NAV
	b. Verify that the administrative outline meets the criteria specified on Form ES-301-1: (1) the tasks are distributed among the topics as specified on the form (2) at least one task is new or significantly modified (3) no more than one task is repeated from the last two NRC licensing examinations	✓	TPH	NAV
	c. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on subsequent days.	✓	TPH	NAV
4. G E N E R A L	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.	✓	TPH	NAV
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	✓	TPH	NAV
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	✓	TPH	NAV
	d. Check for duplication and overlap among exam sections.	✓	TPH	NAV
	e. Check the entire exam for balance of coverage.	✓	TPH	NAV
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	✓	TPH	NAV
a. Author <u>Jeffrey Liff /</u>  Printed Name / Signature b. Facility Reviewer (*) <u>Timothy Horan /</u>  c. NRC Chief Examiner (#) <u>Nicholas A. Valos / Nicholas A. Valos</u> d. NRC Supervisor <u>Hironori Petersen / Hironori Petersen</u>		Date 2-16-09 2/16/09 3/4/09 3/4/09		
NOTE: # Independent NRC Reviewer initial items in Column "c"; chief examiner concurrence required * Not applicable for NRC-prepared examinations				

Facility: <u>Palisades</u>		Date of Examination: <u>May 2009</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>1</u>
Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, M	(2.1.25) Determine Feedwater Reserve Inventory
Conduct of Operations	R, D	(2.1.19) Perform a PCS Heatup Determination
Equipment Control	S, D	(2.2.12) Perform TSST SHO-1
Radiation Control	-----	-----
Emergency Procedures/ Plan	S, P	(2.4.39) Obtain Meteorological Data for Emergency Notification Form
<p>NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.</p>		
<p>* Type Codes & Criteria:</p> <ul style="list-style-type: none"> (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) 		

Facility: <u>Palisades</u>		Date of Examination: <u>May 2009</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Operating Test Number: <u>1</u>
Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, M	(2.1.25) Determine Feedwater Reserve Inventory
Conduct of Operations	S, D	(2.1.19) Monitor PCS Heatup via PPC
Equipment Control	R, N	(2.2.12) Review Completed TSST SHO-1
Radiation Control	R, N	(2.3.4) Calculate Maximum Permissible Stay Time
Emergency Procedures/ Plan	R, D	(2.4.41)(2.4.44) Classify Event and Determine 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 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)		

Facility: <u>Palisades</u>	Date of Examination: <u>May 2009</u>	
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test Number: <u>1</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. Lineup and Establish Hot Leg Injection via Pressurizer – Split Flow	N	2
b. Swap Pressurizer Pressure Control Channels	A, D	3
c. Open MSIVs After Reactor is Critical	A, D, L	4s
d. Withdraw Shutdown Group Control Rods	A, N, L	1
e. Perform a Diesel Generator (D/G) Voltage Regulator Test on 1-2 D/G	D, P	6
f. Place a Containment Radiation Monitor in Service	A, D, P, EN	7
g. Vent the Quench Tank	D	5
h. Initiate a Containment Purge While in Mode 5	A, D, L	8
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Operate P-55C from LCC-13	R, D, E	2
j. Start AFW Pump P-8B locally using CV-0522B	A, D, E	4s
k. Manually Start P-41 Diesel Fire Pump	D, P, E	8
@ 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	4-6 / 4-6 / 2-3	
(C)ontrol room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	
(EN)gineered safety feature	- / - / ≥ 1 (control room system)	
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1	
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	
(R)CA	≥ 1 / ≥ 1 / ≥ 1	
(S)imulator		

Facility: <u>Palisades</u>		Date of Examination: <u>May 2009</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test Number: <u>1</u>
Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. Lineup and Establish Hot Leg Injection via Pressurizer – Split Flow	N	2
b. Swap Pressurizer Pressure Control Channels	A, D	3
c. Open MSIVs After Reactor is Critical	A, D, L	4s
d. Withdraw Shutdown Group Control Rods	A, N, L	1
e. Perform a Diesel Generator (D/G) Voltage Regulator Test on 1-2 D/G	D, P	6
f. Place a Containment Radiation Monitor in Service	A, D, P, EN	7
g. N/A		
h. Initiate a Containment Purge While in Mode 5	A, D, L	8
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Operate P-55C from LCC-13	R, D, E	2
j. Start AFW Pump P-8B locally using CV-0522B	A, D, E	4s
k. Manually Start P-41 Diesel Fire Pump	D, P, E	8
<p>[@] 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	4-6 / 4-6 / 2-3	
(C)ontrol room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	
(EN)gineered safety feature	- / - / ≥ 1 (control room system)	
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1	
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	
(R)CA	≥ 1 / ≥ 1 / ≥ 1	
(S)imulator		

Facility: <u>Palisades</u>		Date of Examination: <u>May 2009</u>	
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>		Operating Test Number: <u>1</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. N/A			
b. N/A			
c. Open MSIVs After Reactor is Critical	A, D, L	4s	
d. Withdraw Shutdown Group Control Rods	A, N, L	1	
e. N/A			
f. Place a Containment Radiation Monitor in Service	A, D, P, EN	7	
g. N/A			
h. N/A			
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
i. Operate P-55C from LCC-13	R, D, E	2	
j. N/A			
k. Manually Start P-41 Diesel Fire Pump	D, P, E	8	
<p>@ 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	4-6 / 4-6 / 2-3		
(C)ontrol room			
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4		
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1		
(EN)gineered safety feature	- / - / ≥ 1 (control room system)		
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1		
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1		
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)		
(R)CA	≥ 1 / ≥ 1 / ≥ 1		
(S)imulator			

Facility: **Palisades** Date of Exam: **May/June 2009** Operating Test No.: **1**

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			2			3			SPARE (#)								
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N								
		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		
SRO-U	RX			S U R R O G A T E	-							-			0			0	
	NOR				12								1			4			1
	I/C				34579								234			9			2
	MAJ				8								6			2			1
	TS				45								24			4			2
SRO-I	RX	-				2						-	1		1		1		
	NOR	12				1						1	-		3		1		
	I/C	3458				3579						234	247		8		4		
	MAJ	7				8						6	6		2		2		
	TS	345				-						24	-		3		2		
RO	RX		2										1	-	1	1			
	NOR		1				2							1	2	1			
	I/C		4568				67						247	2345	6	4			
	MAJ		7				8						6	6	2	2			
	TS		-				-							-	0	0			

Notes: (1) The above three candidates will form one operating crew (**Crew 2**).
 (2) # The spare scenario is not counted toward the total.
 (3) @ The totals for SRO-U are combined with Crew 1.

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: **Palisades** Date of Exam: **May/June 2009** Operating Test No.: **1**

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			2			3			SPARE (#)						
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N						
		S R O	A T C	B O P													
SRO-I	RX	-						2			-	1	-	1		1	
	NOR	12					2				1	-	1	3		1	
	I/C	3458					67		468		234	247	345	9		4	
	MAJ	7					8		7		6	6	6	3		2	
	TS	45					-		-		24	-	-	2		2	
SRO-I	RX		2			-					-	1		1		1	
	NOR		1		12				2		1	-		4		1	
	I/C		4568		34579				3456		234	247		13		4	
	MAJ		7		8				7		6	6		3		2	
	TS		-		45				45		24	-		5		2	
RO	RX			-		2						1	-	1	1		
	NOR			2		1					12		1	4	1		
	I/C			3456		3579				356		247	2345	11	4		
	MAJ			7		8				7		6	6	3	2		
	TS			-		-						-	-	0	0		

Notes: (1) The above three candidates will form one operating crew (**Crew 3**).
 (2) # The spare scenario is not counted toward the total.

Instructions:

1. 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.
2. 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.
3. 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: **Palisades** Date of Exam: **May/June 2009** Operating Test No.: **1**

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			2			3			SPARE (#)							
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N							
		S R O	A T C	B O P	R		I	U										
SRO-I	RX	-						2			-	1	-	1		1		
	NOR	12					2				1	-	1	3		1		
	I/C	3458					67		468		234	247	345	9		4		
	MAJ	7					8		7		6	6	6	3		2		
	TS	45					-		-		24	-	-	2		2		
SRO-I	RX		2			-					-	1		1		1		
	NOR		1		12			2			1	-		4		1		
	I/C		4568		34579			3456			234	247		13		4		
	MAJ		7		8			7			6	6		3		2		
	TS		-		45			45			24	-		5		2		
RO	RX			-		2						1	-	1	1			
	NOR			2		1							1	4	1			
	I/C			3456		3579				356		247	2345	11		4		
	MAJ			7		8			7		6	6		3		2		
	TS			-		-								0		0		

Notes: (1) The above three candidates will form one operating crew (**Crew 4**).
 (2) # The spare scenario is not counted toward the total.

Instructions:

1. 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.
2. 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.
3. 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: Palisades													Date of Exam: May/June 2009				
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	3	3	N/A			3	3	N/A			3	18	3	3	6
	2	1	1	2	N/A			1	2	N/A			2	9	2	2	4
	Tier Totals	4	4	5	N/A			4	5	N/A			5	27	5	5	10
2. Plant Systems	1	2	2	2	2	2	3	3	3	3	3	3	28	2	3	5	
	2	1	0	1	1	1	1	1	1	1	1	1	10	X	2	1	3
	Tier Totals	3	2	3	3	3	4	4	4	4	4	4	38	4	4	8	
3. Generic Knowledge and Abilities Categories				1		2		3		4		10	1	2	3	4	7
				3		3		2		2			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/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
 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 applicable 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		PWR Examination Outline						Form ES-401-2	
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	#
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1	X						EK1.1 - Knowledge of the operational implications of components, capacity, and function of emergency systems.	2.9	1
000008 Pressurizer Vapor Space Accident / 3		X					AK2.01 - Interrelations between the Pressurizer Vapor Space Accident and Valves.	2.7	1
000009 Small Break LOCA / 3			X				EK3.18 - Knowledge of the reasons for Monitoring containment radiation levels.	3.9	1
000011 Large Break LOCA / 3				X			EA1.07 - Ability to operate and monitor Containment isolation system.	4.4	1
000015/17 RCP Malfunctions / 4					X		AA2.01 - Determine and interpret cause of RCP failure.	3.0	1
000022 Loss of Rx Coolant Makeup / 2						X	G2.4.46 - Ability to verify that the alarms are consistent with plant conditions.	4.2	1
000025 Loss of RHR System / 4	X						AK1.01 - Operational implications of loss of RHRs during all modes of plant operation.	3.9	1
000026 Loss of Component Cooling Water / 8			X				AK3.03 - Knowledge of the reasons for guidance actions contained in EOP for loss of CCW.	4.0	1
000027 Pressurizer Pressure Control System Malfunction / 3		X					AK2.03 - Knowledge of interrelations between Pressurizer Pressure malfunction and controllers and positioners.	2.6	1
000029 ATWS / 1				X			EA1.08 - Ability to operate and monitor the reactor trip switch pushbutton for an ATWS.	4.5	1
000038 Steam Gen. Tube Rupture / 3					X		EA2.09 - Ability to determine and interpret the existence of natural circulation.	4.2	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4						X	G2.4.35 - Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.	3.8	1
000054 (CE/E06) Loss of Main Feedwater / 4	X						EK1.3 - Knowledge of the operational implications of annunciators and conditions indicating signals, and remedial actions.	3.2	1
000055 Station Blackout / 6						X	G2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	1
000057 Loss of Vital AC Inst. Bus / 6			X				AK3.01 - Knowledge of the reasons for actions contained in EOP for loss of vital instrument AC bus.	4.1	1
000058 Loss of DC Power / 6				X			AA1.01 - Ability to operate and/or monitor cross-tie of the affected DC bus with an alternate power supply.	3.4	1
000062 Loss of Nuclear Svc Water / 4					X		AA2.04 - Ability to determine and interpret the normal values and upper limits for the temperatures of the components cooled by SWS.	2.5	1
000077 Generator Voltage and Electric Grid Disturbances / 6		X					AK2.07 - Knowledge of the interrelations between generator voltage and grid disturbance and Turbine/Generator control.	3.6	1
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:		18

ES-401		PWR Examination Outline							Form ES-401-2	
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO)										
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#	
000028 Pressurizer Level Malfunction / 2			X				AK3.05 - Knowledge of the reasons for actions contained in EOP for PZR level malfunction.	3.7	1	
000036 (BW/A08) Fuel Handling Accident / 8						X	G2.4.46 - Ability to verify that alarms are consistent with plant conditions.	4.2	1	
000037 Steam Generator Tube Leak / 3					X		AA2.11 - Ability to determine and interpret when to isolate one or more S/Gs.	3.8	1	
000060 Accidental Gaseous Radwaste Rel. / 9						X	G2.4.21 - Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.0	1	
000061 ARM System Alarms / 7	X						AK1.01 - Knowledge of the operational implications of detector limitations.	2.5	1	
000067 Plant Fire On-site / 8			X				AK3.04 - Knowledge of the reasons for actions contained in EOP for plant fire on site.	3.3	1	
000069 (W/E14) Loss of CTMT Integrity / 5					X		AA2.02 - Ability to determine and interpret verification of auto and manual means of restoring integrity.	3.9	1	
000076 High Reactor Coolant Activity / 9		X					AK2.01 - Knowledge of the interrelations between high reactor coolant activity and process radiation monitors.	2.6	1	
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4				X			AA1.1 - Ability to operate and/or monitor Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.3	1	
K/A Category Point Totals:	1	1	2	1	2	2	Group Point Total:		9	

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO)											Form ES-401-2	
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	#
003 Reactor Coolant Pump						X						K6.04 - Knowledge of effect of loss or malfunction of containment isolation valve.	2.8	1
004 Chemical and Volume Control							X					A1.11 - Ability to predict and/or monitor changes in letdown and charging flows.	3.0	1
005 Residual Heat Removal								X				A2.03 - Ability to predict impact of RHR pump/motor malfunction and use procedures to correct.	2.9	1
006 Emergency Core Cooling									X			A3.01 - Ability to monitor automatic operation of accumulators.	4.0	1
007 Pressurizer Relief/Quench Tank										X		A4.04 - Ability to operate and/or monitor PZR vent valve.	2.6	1
008 Component Cooling Water											X	G2.4.4 - Ability to recognize parameters that are entry-level conditions for emergency and abnormal operating procedures.	4.5	1
008 Component Cooling Water	X											K1.04 - Knowledge of physical connections with RCS.	3.3	1
010 Pressurizer Pressure Control		X										K2.02 - Knowledge of bus power supplies for spray valve controllers.	2.5	1
012 Reactor Protection			X									K3.01 - Knowledge of effect of loss or malfunction of RPS on CRDs.	3.9	1
013 Engineered Safety Features Actuation				X								K4.05 - Knowledge of ESFAS design feature that provides for core spray actuation reset.	4.0	1
013 Engineered Safety Features Actuation					X							K5.02 - Knowledge of operational implications of safety system logic and reliability.	2.9	1
022 Containment Cooling											X	G2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm.	4.1	1
026 Containment Spray							X					A1.01 - Ability to predict and/or monitor changes in containment pressure.	3.9	1
039 Main and Reheat Steam								X				A2.04 - Ability to predict impact of a malfunctioning steam dump and use procedures to correct.	3.4	1
039 Main and Reheat Steam									X			A3.02 - Ability to monitor automatic operation of isolation of MRSS.	3.1	1
059 Main Feedwater										X		A4.08 - Ability to manually operate and monitor FRV controller.	3.0	1
061 Auxiliary/Emergency Feedwater						X						K6.01 - Knowledge of effect of loss or malfunction of AFW controllers and positioners.	2.5	1
062 AC Electrical Distribution	X											K1.02 - Knowledge of physical connections with ED/G.	4.1	1
062 AC Electrical Distribution		X										K2.01 - Knowledge of bus power supplies for major system loads.	3.3	1

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO) - cont'd											Form ES-401-2	
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	#
063 DC Electrical Distribution			X									K3.02 - Knowledge of effect of loss or malfunction of DC system will have on components using DC control power.	3.5	1
064 Emergency Diesel Generator				X								K4.11 - Knowledge of ED/G design feature that provides automatic load sequencer: safeguards.	3.5	1
064 Emergency Diesel Generator						X						K6.08 - Knowledge of effect of loss or malfunction of fuel oil storage tanks.	3.2	1
073 Process Radiation Monitoring					X							K5.02 - Knowledge of operational implications of radiation intensity changes with source distance.	2.5	1
076 Service Water							X					A1.02 - Ability to predict and/or monitor changes in reactor and turbine building closed cooling water temperatures.	2.6	1
076 Service Water								X				A2.01 - Ability to predict impact of a loss of the SWS and use procedures to correct.	3.5	1
078 Instrument Air									X			A3.01 - Ability to monitor automatic operation of air pressure.	3.1	1
078 Instrument Air										X		A4.01 - Ability to manually operate and/or monitor pressure gauges.	3.1	1
103 Containment											X	G2.4.18 - Knowledge of the specific bases for EOPs.	3.3	1
K/A Category Point Totals:	2	2	2	2	2	3	3	3	3	3	3	Group Point Total:		28

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO)											Form ES-401-2	
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	#
001 Control Rod Drive						X						K6.13 - Knowledge of effect of loss or malfunction of location and operation of RPIS.	3.6	1
002 Reactor Coolant											X	G2.1.28 - Knowledge of the purpose and function of major system components and controls.	4.1	1
014 Rod Position Indication							X					A1.03 - Ability to predict and/or monitor changes in PDIL, PPDIL.	3.6	1
029 Containment Purge									X			A3.01 - Ability to monitor automatic operation of CPS isolation.	3.8	1
035 Steam Generator			X									K3.03 - Knowledge of effect of loss or malfunction of S/GS will have on the secondary system.	3.0	1
041 Steam Dump/Turbine Bypass Control				X								K4.09 - Knowledge of SDS design feature that provides relationship of low/low T-ave setpoint in SDS to primary cooldown.	3.0	1
045 Main Turbine Generator					X							K5.18 - Knowledge of operational implications of purpose of low-power reactor trips (limited to 25% power).	2.7	1
068 Liquid Radwaste								X				A2.04 - Ability to predict impact of a failure to automatically isolate and use procedures to correct.	3.3	1
075 Circulating Water										X		A4.01 - Ability to manually operate and/or monitor emergency/essential SWS pumps.	3.2	1
086 Fire Protection	X											K1.03 - Knowledge of physical connections with AFW system.	3.4	1
K/A Category Point Totals:	1	0	1	1	1	1	1	1	1	1	1	Group Point Total:		10

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (SRO)			Form ES-401-2	
E/APE # / Name / Safety Function	A 2	G	K/A Topic(s)	IR	#	
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1	X		EA2.1 - Ability to determine and interpret facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.7	1	
000026 Loss of Component Cooling Water / 8		X	G2.2.40 - Ability to apply Technical Specifications for a system.	4.7	1	
000038 Steam Gen. Tube Rupture / 3	X		EA2.07 - Ability to determine or interpret plant conditions, from survey of control room indications.	4.8	1	
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4		X	G2.4.30 - Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.	4.1	1	
000054 (CE/E06) Loss of Main Feedwater / 4	X		EA2.2 - Ability to determine and interpret adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	4.2	1	
000056 Loss of Off-site Power / 6		X	G2.2.36 - Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.	4.2	1	
K/A Category Totals:	3	3	Group Point Total:		6	

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (SRO)			Form ES-401-2	
E/APE # / Name / Safety Function	A 2	G	K/A Topic(s)	IR	#	
000067 Plant Fire On-site / 8		X	G2.4.2 - Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.	4.6	1	
000068 (BW/A06) Control Room Evac. / 8	X		AA2.06 - Ability to determine and interpret RCS Pressure.	4.3	1	
000074 (W/E06&E07) Inad. Core Cooling / 4		X	G2.2.37 - Ability to determine operability and/or availability of safety related equipment.	4.6	1	
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4	X		AA2.1 - Ability to determine and interpret facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.7	1	
K/A Category Point Totals:	2	2	Group Point Total:		4	

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 1 (SRO)			Form ES-401-2	
System # / Name	A 2	G	K/A Topic(s)	IR	#	
006 Emergency Core Cooling	X		A2.02 - Ability to predict the impact of loss of flow path and use procedures to correct.	4.3	1	
010 Pressurizer Pressure Control		X	G2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	1	
064 Emergency Diesel Generator		X	G2.2.23 - Ability to track Technical Specification limiting conditions for operations.	4.6	1	
073 Process Radiation Monitoring	X		A2.02 - Ability to predict the impact of a detector failure and use procedures to correct.	3.2	1	
076 Service Water		X	G2.2.44 - Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.4	1	
K/A Category Point Totals:	2	3	Group Point Total:		5	

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 2 (SRO)			Form ES-401-2	
System # / Name	A 2	G	K/A Topic(s)	IR	#	
011 Pressurizer Level Control	X		A2.03 - Ability to predict the impact of a loss of PZR level and use procedures to correct.	3.9	1	
015 Nuclear Instrumentation	X		A2.01 - Ability to predict the impact of a power supply loss or erratic operation and use procedures to correct.	3.9	1	
016 Non-nuclear Instrumentation		X	G2.1.32 - Ability to explain and apply system limits and precautions.	4.0	1	
K/A Category Point Totals:	2	1	Group Point Total:		3	

Facility: Palisades			Date of Exam: May 2009			
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.19	Ability to use plant computers to evaluate system or component status.	3.9	1		
	2.1.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.	3.9	1		
	2.1.40	Knowledge of refueling administrative requirements.	2.8	1		
	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management.			4.6	1
	2.1.42	Knowledge of new and spent fuel movement procedures.			3.4	1
	Subtotal				3	
2. Equipment Control	2.2.7	Knowledge of the process for conducting special or infrequent tests.	2.9	1		
	2.2.43	Knowledge of the process used to track inoperable alarms.	3.0	1		
	2.2.44	Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.	4.2	1		
	2.2.17	Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.			3.8	1
	2.2.25	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.			4.2	1
	Subtotal				3	
3. Radiation Control	2.3.11	Ability to control radiation releases.	3.8	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		
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.			3.8	1
	Subtotal				2	
4. Emergency Procedures / Plan	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.0	1		
	2.4.50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	4.2	1		
	2.4.16	Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.			4.4	1
	2.4.38	Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.			4.4	1
	Subtotal				2	
Tier 3 Point Total:				10		7

Facility: PalisadesScenario No.: ONEOp-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: 100% power with P-66B HPSI Pump tagged out.

Turnover: P-66B HPSI Pump is tagged out for bearing inspection and will be restored to operable in 4 hours. Shift orders are to alternate running Service Water pumps and then lower power to approximately 87% at 4% per hour to perform Turbine valve testing on the next shift.

Event No.	Malf. No.	Event Type*	Event Description
1	NA	SRO (N) RO (N)	Alternate Running Service Water Pumps
2	NA	SRO (N) BOP (N) RO (R)	Power Reduction
3	Override	RO (C) SRO (C)	'A' Train CR HVAC Outside Air Damper fails closed
4	RP22A	SRO (I, T) RO (I) BOP (I)	Hot Leg RTD Failure Low
5	SG01A	SRO (C, T) RO (C) BOP (C)	'A' S/G tube leak at 0.25 gpm (requires controlled shutdown). Leak then rises to require a reactor trip. (≥ 0.4 gpm requires reactor trip.)
6	Override	RO (I) BOP (I)	C-02 Reactor Trip P/B fails (requires trip from C-06)
7	SG01A	ALL (M)	SGTR on 'A' S/G
8	Override	SRO (C) RO (C)	Loop Injection MO-3066 fails to open on SIAS

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

Facility: **Palisades**Scenario No.: **TWO**Op-Test No.: **1**

Examiners: _____ Operators: _____

Initial Conditions: 60% power. P-7C, Service Water Pump, is out of service.

Turnover: Shift orders are to alternate running Component Cooling Water pumps and then continue power ascension.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	SRO (N) RO (N)	Alternate operating CCW pumps
2	N/A	SRO (N) RO (R) BOP (N)	Power ascension
3	RX08B	SRO (I) RO (I)	PZR Level Control Channel failed low
4	SI04D	SRO (C, T)	T-82D, Safety Injection Tank loss of pressure (leak)
5	RM08G	SRO (I, T) RO(I)	West ESS Room Ventilation Radiation Monitor Failure
6	MS06B	SRO (C) RO (C) BOP (C)	Main Steam Relief Valve RV-0706 leak
7	FW03	BOP (C)	Failure of AFW Pumps to start in AUTO
8	RC04	ALL (M)	Primary Coolant System leak
9	RD16	SRO (C) RO (C)	Two stuck control rods

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

Facility: PalisadesScenario No.: THREEOp-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions: 25% power.

Turnover: The plant is at approximately 25% power MOL following a startup from a forced outage. P-8A, AFW Pump, is OOS for seal replacement and is currently 12 hours into the 72 hour LCO action statement. The Turbine Drain Valves are closed per SOP-8. A Chemistry hold has just been lifted with S/G chemistry within specifications. GCL-5.1, Power Escalation in Mode 1, has been completed through Step 2.12f. Shift orders are to place DEH Speed Loop to OUT and commence a power escalation to full power at 8%/hour.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	BOP (N)	Place DEH Speed Loop to OUT
2	N/A	SRO (N) BOP (N) RO (R)	Power escalation
3	MS11	SRO (C) BOP (C)	Turbine Bypass Valve fails open. Requires manual action to terminate steam demand
4	CV06	SRO (I, T) RO (I)	Loss of CVCS Letdown Backpressure Controller
5	Override	SRO (C, T) BOP (C)	Diesel Generator Low Lube Oil temperature
6	MS03A	ALL (C)	'A' S/G Main Steam Line Leak Inside Containment (small leak requiring a manual plant trip)
7	MS03A	ALL (M)	ESDE inside containment (ramped in at time of trip)
8	ED13A ED13B CH05A CH05B	RO (I)	Right and Left Channel SI Initiate Signals fail Right and Left Channel CHP Signals fail

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

Facility: **PALISADES**Scenario No.: **SPARE**Op-Test No.: **1**

Examiners: _____ Operators: _____

Initial Conditions: 100% power. P-8A, Auxiliary Feedwater Pump has just been returned to service from a pump seal replacement.

Turnover: Shift orders to lower plant power at 4% per hour to 87% to perform Turbine Valve Testing.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	SRO (N) RO (R) BOP (N)	Power de-escalation.
2	ED08B	SRO (I, T) RO (I) BOP (I)	Loss of preferred Bus Y-20
3	RX14A	SRO (I) BOP (I)	FT-0701, Feedwater Flow Transmitter failure
4	SG01B	SRO (C, T) RO (C) BOP (C)	'B' S/G tube leak (requires plant trip)
5	TC02	BOP (I)	Failure of Turbine to auto trip
6	RC21	ALL (M)	PZR Safety valve RV-1040 Leak (initiates at time of trip)
7	SI09B	RO (C)	Failure of P-66B, HPSI Pump to start

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