

Facility: _____		Date of Examination: _____
Developed by: Written - Facility <input type="checkbox"/> NRC <input type="checkbox"/> // Operating - Facility <input type="checkbox"/> NRC <input type="checkbox"/>		
Target Date*	Task Description (Reference)	Chief Examiner's Initials
-180	1. Examination administration date confirmed (C.1.a; C.2.a and b)	
-120	2. NRC examiners and facility contact assigned (C.1.d; C.2.e)	
-120	3. Facility contact briefed on security and other requirements (C.2.c)	
-120	4. Corporate notification letter sent (C.2.d)	
[-90]	[5. Reference material due (C.1.e; C.3.c; Attachment 3)]	
{-75}	6. Integrated examination outline(s) due, including Forms ES-201-2, ES-201-3, ES-301-1, ES-301-2, ES-301-5, ES-D-1's, ES-401-1/2, ES-401-3, and ES-401-4, as applicable (C.1.e and f; C.3.d)	
{-70}	{7. Examination outline(s) reviewed by NRC and feedback provided to facility licensee (C.2.h; C.3.e)}	
{-45}	8. Proposed examinations (including written, walk-through JPMs, and scenarios, as applicable), supporting documentation (including Forms ES-301-3, ES-301-4, ES-301-5, ES-301-6, and ES-401-6, and any Form ES-201-3 updates), and reference materials due (C.1.e, f, g and h; C.3.d)	
-30	9. Preliminary license applications (NRC Form 398's) due (C.1.i; C.2.g; ES-202)	
-14	10. Final license applications due and Form ES-201-4 prepared (C.1.i; C.2.i; ES-202)	
-14	11. Examination approved by NRC supervisor for facility licensee review (C.2.h; C.3.f)	
-14	12. Examinations reviewed with facility licensee (C.1.j; C.2.f and h; C.3.g)	
-7	13. Written examinations and operating tests approved by NRC supervisor (C.2.i; C.3.h)	
-7	14. Final applications reviewed; 1 or 2 (if >10) applications audited to confirm qualifications / eligibility; and examination approval and waiver letters sent (C.2.i; Attachment 5; ES-202, C.2.e; ES-204)	
-7	15. Proctoring/written exam administration guidelines reviewed with facility licensee (C.3.k)	
-7	16. Approved scenarios, job performance measures, and questions distributed to NRC examiners (C.3.i)	
<p>* Target dates are generally based on facility-prepared examinations and are keyed to the examination date identified in the corporate notification letter. They are for planning purposes and may be adjusted on a case-by-case basis in coordination with the facility licensee. [Applies only] {Does not apply} to examinations prepared by the NRC.</p>		

Facility: _____		Date of Examination: _____		
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.			
	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.			
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.			
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.			
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.			
	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 that scenarios will not be repeated on subsequent days.			
	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.			
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.			
	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			
	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.			
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 sections.			
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.			
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.			
	d. Check for duplication and overlap among exam sections.			
	e. Check the entire exam for balance of coverage.			
	f. Assess whether the exam fits the appropriate job level (RO or SRO).			
a. Author _____		Printed Name/Signature _____		Date _____
b. Facility Reviewer (*) _____		_____		_____
c. NRC Chief Examiner (#) _____		_____		_____
d. NRC Supervisor _____		_____		_____
Note: # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required. * Not applicable for NRC-prepared examination outlines				

1. **Pre-Examination**

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of _____ as of the date of my signature. I agree that I will not knowingly divulge any information about these examinations to any persons who have not been authorized by the NRC chief examiner. I understand that I am not to instruct, evaluate, or provide performance feedback to those applicants scheduled to be administered these licensing examinations from this date until completion of examination administration, except as specifically noted below and authorized by the NRC (e.g., acting as a simulator booth operator or communicator is acceptable if the individual does not select the training content or provide direct or indirect feedback). Furthermore, I am aware of the physical security measures and requirements (as documented in the facility licensee's procedures) and understand that violation of the conditions of this agreement may result in cancellation of the examinations and/or an enforcement action against me or the facility licensee. I will immediately report to facility management or the NRC chief examiner any indications or suggestions that examination security may have been compromised.

2. **Post-Examination**

To the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week(s) of _____. From the date that I entered into this security agreement until the completion of examination administration, I did not instruct, evaluate, or provide performance feedback to those applicants who were administered these licensing examinations, except as specifically noted below and authorized by the NRC.

	PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE	NOTE
1.	_____	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____	_____	_____
7.	_____	_____	_____	_____	_____	_____	_____
8.	_____	_____	_____	_____	_____	_____	_____
9.	_____	_____	_____	_____	_____	_____	_____
10.	_____	_____	_____	_____	_____	_____	_____
11.	_____	_____	_____	_____	_____	_____	_____
12.	_____	_____	_____	_____	_____	_____	_____
13.	_____	_____	_____	_____	_____	_____	_____
14.	_____	_____	_____	_____	_____	_____	_____
15.	_____	_____	_____	_____	_____	_____	_____

NOTES:

Facility: _____		Date of Examination: _____
Examination Level: RO <input type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: _____
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations		
Conduct of Operations		
Equipment Control		
Radiation Control		
Emergency Procedures/Plan		
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Facility: _____ Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>		Date of Examination: _____ Operating Test No.: _____	
Control Room Systems® (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)			
System / JPM Title		Type Code*	Safety Function
a.			
b.			
c.			
d.			
e.			
f.			
g.			
h.			
In-Plant Systems® (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
i.			
j.			
k.			
@ 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 $\leq 9 / \leq 8 / \leq 4$ $\geq 1 / \geq 1 / \geq 1$ - / - / ≥ 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:	Date of Examination:	Operating Test Number:		
1. General Criteria		Initials		
		a	b*	c#
a.	The operating test conforms with the previously approved outline; changes are consistent with sampling requirements (e.g., 10 CFR 55.45, operational importance, safety function distribution).			
b.	There is no day-to-day repetition between this and other operating tests to be administered during this examination.			
c.	The operating test shall not duplicate items from the applicants' audit test(s). (see Section D.1.a.)			
d.	Overlap with the written examination and between different parts of the operating test is within acceptable limits.			
e.	It appears that the operating test will differentiate between competent and less-than-competent applicants at the designated license level.			
2. Walk-Through Criteria		--	--	--
a.	Each JPM includes the following, as applicable: <ul style="list-style-type: none"> • initial conditions • initiating cues • references and tools, including associated procedures • reasonable and validated time limits (average time allowed for completion) and specific designation if deemed to be time-critical by the facility licensee • operationally important specific performance criteria that include: <ul style="list-style-type: none"> – detailed expected actions with exact criteria and nomenclature – system response and other examiner cues – statements describing important observations to be made by the applicant – criteria for successful completion of the task – identification of critical steps and their associated performance standards – restrictions on the sequence of steps, if applicable 			
b.	Ensure that any changes from the previously approved systems and administrative walk-through outlines (Forms ES-301-1 and 2) have not caused the test to deviate from any of the acceptance criteria (e.g., item distribution, bank use, repetition from the last 2 NRC examinations) specified on those forms and Form ES-201-2.			
3. Simulator Criteria		--	--	--
The associated simulator operating tests (scenario sets) have been reviewed in accordance with Form ES-301-4 and a copy is attached.				
Printed Name / Signature		Date		
a.	Author _____	_____		
b.	Facility Reviewer(*) _____	_____		
c.	NRC Chief Examiner (#) _____	_____		
d.	NRC Supervisor _____	_____		
NOTE: * The facility signature is not applicable for NRC-developed tests. # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.				

Facility:		Date of Exam:		Scenario Numbers: / /		Operating Test No.:			
QUALITATIVE ATTRIBUTES						Initials			
						a	b*	c#	
1.	The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events.								
2.	The scenarios consist mostly of related events.								
3.	Each event description consists of <ul style="list-style-type: none"> the point in the scenario when it is to be initiated the malfunction(s) that are entered to initiate the event the symptoms/cues that will be visible to the crew the expected operator actions (by shift position) the event termination point (if applicable) 								
4.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.								
5.	The events are valid with regard to physics and thermodynamics.								
6.	Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.								
7.	If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.								
8.	The simulator modeling is not altered.								
9.	The scenarios have been validated. Pursuant to 10 CFR 55.46(d), any open simulator performance deficiencies or deviations from the referenced plant have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.								
10.	Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.5 of ES-301.								
11.	All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).								
12.	Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios).								
13.	The level of difficulty is appropriate to support licensing decisions for each crew position.								
Target Quantitative Attributes (Per Scenario; See Section D.5.d)						Actual Attributes			
1.	Total malfunctions (5-8)					/	/		
2.	Malfunctions after EOP entry (1-2)					/	/		
3.	Abnormal events (2-4)					/	/		
4.	Major transients (1-2)					/	/		
5.	EOPs entered/requiring substantive actions (1-2)					/	/		
6.	EOP contingencies requiring substantive actions (0-2)					/	/		
7.	Critical tasks (2-3)					/	/		

Facility:		Date of Exam:									Operating Test No.:						
A P P L I C A N T	E V E N T T Y P E	Scenarios															
		1			2			3			4			T O T A L	M I N I M U M (*)		
		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									
RO <input type="checkbox"/>	RX														1	1	0
SRO-I <input type="checkbox"/>	NOR														1	1	1
SRO-U <input type="checkbox"/>	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO <input type="checkbox"/>	RX														1	1	0
SRO-I <input type="checkbox"/>	NOR														1	1	1
SRO-U <input type="checkbox"/>	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO <input type="checkbox"/>	RX														1	1	0
SRO-I <input type="checkbox"/>	NOR														1	1	1
SRO-U <input type="checkbox"/>	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO <input type="checkbox"/>	RX														1	1	0
SRO-I <input type="checkbox"/>	NOR														1	1	1
SRO-U <input type="checkbox"/>	I/C														4	4	2
	MAJ														2	2	1
	TS														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:	Date of Examination:	Operating Test No.:														
Competencies	APPLICANTS															
	RO SRO-I SRO-U				RO SRO-I SRO-U				RO SRO-I SRO-U				RO SRO-I SRO-U			
	SCENARIO				SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Interpret/Diagnose Events and Conditions																
Comply With and Use Procedures (1)																
Operate Control Boards (2)																
Communicate and Interact																
Demonstrate Supervisory Ability (3)																
Comply With and Use Tech. Specs. (3)																
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.																

Instructions:

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

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

U.S. Nuclear Regulatory Commission Individual Examination Report				
Applicant's Name			Docket Number 55-	
I	R	Examination Type (Initial or Retake)	Facility Name	
		Reactor Operator	Facility Description	Hot
		Senior Reactor Operator (SRO) Instant		Cold
		SRO Upgrade		BWR
		SRO Limited to Fuel Handling		PWR

Written Examination Summary	
NRC Author/Reviewer	RO/SRO/Total Exam Points ___/___/___
NRC Grader/Reviewer	Applicant Points ___/___/___
Date Administered	Applicant Grade (%) ___/___/___

Operating Test Summary	
Administered by	Date Administered
Walk-Through (Overall)	
Administrative Topics	
Simulator Operating Test	

Examiner Recommendations					
Check Blocks	Pass	Fail	Waive	Signature	Date
Written Examination					
Operating Test					
Final Recommendation					

License Recommendation			
	Issue License	Supervisor's Signature	Date
	Deny License		

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PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

Applicant Docket Number: 55-		Page of
Walk-Through Grading Details	Evaluation (S or U)	Comment Page Number
Administrative Topics		
a.		
b.		
c.		
d.		
e.		
Systems — Control Room		
a.		
b.		
c.		
d.		
e.		
f.		
g.		
h.		
Systems — In-Plant		
i.		
j.		
k.		

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

Applicant Docket Number: 55-					Page of
Reactor Operator Simulator Operating Test Grading Details					
Competencies/ Rating Factors (RFs)	RF Weights	RF Scores	RF Grades	Comp. Grades	Comment Page No.
1. Interpretation/Diagnosis a. Recognize & Verify Status b. Interpret & Diagnose Conditions c. Prioritize Response	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____
2. Procedures/Tech Specs a. Reference b. Procedure Compliance c. Tech Spec Entry	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____
3. Control Board Operations a. Locate & Manipulate b. Understanding c. Manual Control	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____
4. Communications a. Provide Information b. Receive Information c. Carry Out Instructions	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____

[Note: Enter RF Weights (nominal, adjusted, or "0" if not observed (N/O)), RF Scores (1, 2, 3, or N/O), and RF Grades from Form ES-303-3 and sum to obtain Competency Grades.]

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

Applicant Docket Number: 55-					Page	of
Senior Reactor Operator Simulator Operating Test Grading Details						
Competencies/ Rating Factors (RFs)	RF Weights	RF Scores	RF Grades	Comp. Grades	Comment Page No.	
1. Interpretation/Diagnosis a. Recognize & Attend b. Ensure Accuracy c. Understanding d. Diagnose	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	
2. Procedures a. Reference b. EOP Entry c. Correct Use	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	
3. Control Board Operations a. Locate & Manipulate b. Understanding c. Manual Control	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	
4. Communications a. Clarity b. Crew & Others Informed c. Receive Information	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	
5. Directing Operations a. Timely & Decisive Action b. Oversight c. Solicit Crew Feedback d. Monitor Crew Activities	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____	
6. Technical Specifications a. Recognize and Locate b. Compliance	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	_____ _____ _____	

[Note: Enter RF Weights (nominal, adjusted, or "0" if not observed (N/O)), RF Scores (1, 2, 3, or N/O), and RF Grades from Form ES-303-4 and sum to obtain Competency Grades.]

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

1. Interpret/Diagnose Events and Conditions Based on Alarms, Signals, and Readings				
Rating Factors	Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a) Did the applicant RECOGNIZE and VERIFY off-normal trends and status?	N/O = 0	3		
	Nominal = 0.40	2		
	(b) or (c) N/O = 0.57	1		
(b) Did the applicant correctly INTERPRET/DIAGNOSE plant conditions based on control room indications?	N/O = 0	3		
	Nominal = 0.30	2		
	(c) N/O = 0.43	1		
	(a) N/O = 0.50			
(c) Did the applicant ATTEND TO annunciators, alarm signals, and instrument readings in order of importance and severity?	N/O = 0	3		
	Nominal = 0.30	2		
	(b) N/O = 0.43	1		
	(a) N/O = 0.50			
2. Comply with and Use Procedures, References, and Technical Specifications				
Rating Factors	Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a) Did the applicant REFER TO the appropriate procedure or reference in a timely manner?	N/O = 0	3		
	Nominal = 0.30	2		
	(c) N/O = 0.43	1		
	(b) N/O = 0.50			
(b) Did the applicant COMPLY WITH procedures (including precautions and limitations) and references in an accurate and timely manner?	N/O = 0	3		
	Nominal = 0.40	2		
	(a) or (c) N/O = 0.57	1		
(c) Did the applicant RECOGNIZE plant conditions that are addressed in technical specifications?	N/O = 0	3		
	Nominal = 0.30	2		
	(a) N/O = 0.43	1		
	(b) N/O = 0.50			

3. Operate the Control Boards				
Rating Factors	Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a) Did the applicant LOCATE AND MANIPULATE controls in an accurate and timely manner?	N/O = 0	3		
	Nominal = 0.40	2		
	(b) or (c) N/O = 0.57	1		
(b) Did the applicant's actions demonstrate UNDERSTANDING OF SYSTEM OPERATION, including set points, interlocks, and automatic actions?	N/O = 0	3		
	Nominal = 0.30	2		
	(c) N/O = 0.43	1		
	(a) N/O = 0.50			
(c) Did the applicant demonstrate the ability to take MANUAL CONTROL of automatic functions?	N/O = 0	3		
	Nominal = 0.30	2		
	(b) N/O = 0.43	1		
	(a) N/O = 0.50			
4. Communicate and Interact with Other Crew Members				
Rating Factors	Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a) Did the applicant PROVIDE clear and accurate INFORMATION on system status to others for the performance of their jobs?	N/O = 0	3		
	Nominal = 0.34	2		
	(b) or (c) N/O = 0.50	1		
(b) Did the applicant effectively RECEIVE INFORMATION from others (including requesting, acknowledging, and attending to information)?	N/O = 0	3		
	Nominal = 0.33	2		
	(a) or (c) N/O = 0.50	1		
(c) Did the applicant successfully CARRY OUT THE INSTRUCTIONS of the supervisor?	N/O = 0	3		
	Nominal = 0.33	2		
	(a) or (b) N/O = 0.50	1		

1. Interpret/Diagnose Events and Conditions Based on Alarms, Signals, and Readings				
Rating Factors	Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a) Did the applicant RECOGNIZE AND ATTEND TO off-normal trends and status in order of their importance and severity?	N/O = 0	3		
	Nominal = 0.20	2		
	(b) N/O = 0.25	1		
	(c) or (d) N/O = 0.29			
(b) Did the applicant ensure the collection of CORRECT, ACCURATE, and COMPLETE information and reference material on which to base diagnoses?	N/O = 0	3		
	Nominal = 0.20	2		
	(a) N/O = 0.25	1		
	(c) or (d) N/O = 0.28			
(c) Did the applicant's directives and actions demonstrate an UNDERSTANDING of how the PLANT, SYSTEMS, and COMPONENTS OPERATE AND INTERACT (including set points, interlocks, and automatic actions)?	N/O = 0	3		
	Nominal = 0.30	2		
	(a) or (b) N/O = 0.38	1		
	(d) N/O = 0.43			
(d) Did the applicant correctly INTERPRET/DIAGNOSE plant conditions based on control room indications?	N/O = 0	3		
	Nominal = 0.30	2		
	(a) or (b) N/O = 0.37	1		
	(c) N/O = 0.43			
2. Comply with and Use Procedures and References				
Rating Factors	Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a) Did the applicant REFER to correct procedures, procedural steps, and references when appropriate?	N/O = 0	3		
	Nominal = 0.30	2		
	(b) N/O = 0.43	1		
	(c) N/O = 0.50			
(b) Did the applicant RECOGNIZE EOP ENTRY CONDITIONS?	N/O = 0	3		
	Nominal = 0.30	2		
	(a) N/O = 0.43	1		
	(c) N/O = 0.50			
(c) Did the applicant USE PROCEDURES CORRECTLY, including following procedural steps in correct sequence, abiding by procedural cautions and limitations, selecting correct paths on decisions blocks, and correctly transitioning between procedures?	N/O = 0	3		
	Nominal = 0.40	2		
	(a) or (b) N/O = 0.57	1		

3. Operate the Control Boards [NOTE: This competency is optional for SRO-upgrade applicants; refer to Section D.2.b.]				
Rating Factors	Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a) Did the applicant LOCATE AND MANIPULATE CONTROLS in an accurate and timely manner?	N/O = 0	3		_____
	Nominal = 0.34	2		
	(b) or (c) N/O = 0.5	1		
(b) Did the applicant's control manipulations demonstrate an UNDERSTANDING OF SYSTEM OPERATION, including set points, interlocks, and automatic actions?	N/O = 0	3		
	Nominal = 0.33	2		
	(a) or (c) N/O = 0.5	1		
(c) Did the applicant demonstrate the ability to take MANUAL CONTROL of automatic functions?	N/O = 0	3		
	Nominal = 0.33	2		
	(a) or (b) N/O = 0.5	1		
4. Communicate and Interact with the Crew and Other Personnel				
Rating Factors	Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a) Did the applicant communicate in a clear, easily understood manner?	N/O = 0	3		_____
	Nominal = 0.4	2		
	(c) N/O = 0.5	1		
	(b) N/O = 0.67			
(b) Did the applicant keep crew members and those outside the control room informed of plant status?	N/O = 0	3		
	Nominal = 0.4	2		
	(c) N/O = 0.5	1		
	(a) N/O = 0.67			
(c) Did the applicant ENSURE RECEIPT of clear, easily-understood communications from crew and others?	N/O = 0	3		
	Nominal = 0.2	2		
	(a) or (b) N/O = 0.33	1		

5. Direct Shift Operations				
Rating Factors	Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a) Did the applicant take TIMELY AND DECISIVE ACTION that demonstrated appropriate CONCERN for the SAFETY of the plant, staff, and public?	N/O = 0	3		
	Nominal = 0.30	2		
	(c) or (d) N/O = 0.38	1		
	(b) N/O = 0.43			
(b) Did the applicant remain ATTENTIVE to control room indications, stay in a position of OVERSIGHT , and provide an APPROPRIATE AMOUNT of DIRECTION and GUIDANCE that facilitated CREW PERFORMANCE ?	N/O = 0	3		
	Nominal = 0.30	2		
	(c) or (d) N/O = 0.37	1		
	(a) N/O = 0.43			
(c) Did the applicant SOLICIT and INCORPORATE FEEDBACK from the crew to foster an effective, team-oriented approach to problem solving and decision making?	N/O = 0	3		
	Nominal = 0.20	2		
	(d) N/O = 0.25	1		
	(a) or (b) N/O = 0.29			
(d) Did the applicant ensure that CORRECT AND TIMELY ACTIVITIES (including diagnosis, procedural implementation, and control board operations) were carried out BY THE CREW ?	N/O = 0	3		
	Nominal = 0.20	2		
	(c) N/O = 0.25	1		
	(a) or (b) N/O = 0.28			
6. Comply with and Use Technical Specifications (TS)				
Rating Factors	Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a) Did the applicant RECOGNIZE when conditions were covered by the TS and LOCATE the appropriate TS?	N/O = 0	3		
	Nominal = 0.4	2		
	(b) N/O = 1.0	1		
(b) Did the applicant ensure correct COMPLIANCE with TS and LCO action statements?	N/O = 0	3		
	Nominal = 0.6	2		
	(a) N/O = 1.0	1		

Facility:													Date of Exam:				
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												20			7	
	2					N/A					N/A		7			3	
	Tier Totals												27			10	
2. Plant Systems	1												26			5	
	2												12			3	
	Tier Totals												38			8	
3. Generic Knowledge and Abilities Categories					1	2	3	4	10	1	2	3	4	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 ±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.
 - e. 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	BWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)						Form ES-401-1		
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4									
295003 Partial or Complete Loss of AC / 6									
295004 Partial or Total Loss of DC Pwr / 6									
295005 Main Turbine Generator Trip / 3									
295006 SCRAM / 1									
295016 Control Room Abandonment / 7									
295018 Partial or Total Loss of CCW / 8									
295019 Partial or Total Loss of Inst. Air / 8									
295021 Loss of Shutdown Cooling / 4									
295023 Refueling Acc / 8									
295024 High Drywell Pressure / 5									
295025 High Reactor Pressure / 3									
295026 Suppression Pool High Water Temp. / 5									
295027 High Containment Temperature / 5									
295028 High Drywell Temperature / 5									
295030 Low Suppression Pool Wtr Lvl / 5									
295031 Reactor Low Water Level / 2									
295037 SCRAM Condition Present and Reactor 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 Grid Disturbances / 6									
K/A Category Totals:							Group Point Total:		20/7

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / 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														
207000 Isolation (Emergency) Condenser														
209001 LPCS														
209002 HPCS														
211000 SLC														
212000 RPS														
215003 IRM														
215004 Source Range Monitor														
215005 APRM / LPRM														
217000 RCIC														
218000 ADS														
223002 PCIS/Nuclear Steam Supply Shutoff														
239002 SRVs														
259002 Reactor Water Level Control														
261000 SGTS														
262001 AC Electrical Distribution														
262002 UPS (AC/DC)														
263000 DC Electrical Distribution														
264000 EDGs														
300000 Instrument Air														
400000 Component Cooling Water														
K/A Category Point Totals:												Group Point Total:		26/5

ES-401	BWR Examination Outline Plant Systems - Tier 2/Group 2 (RO / SRO)											Form ES-401-1		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic														
201002 RMCS														
201003 Control Rod and Drive Mechanism														
201004 RSCS														
201005 RCIS														
201006 RWM														
202001 Recirculation														
202002 Recirculation Flow Control														
204000 RWCU														
214000 RPIS														
215001 Traversing In-core Probe														
215002 RBM														
216000 Nuclear Boiler Inst.														
219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.														
226001 RHR/LPCI: CTMT Spray Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode														
233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														
239003 MSIV Leakage Control														
241000 Reactor/Turbine Pressure Regulator														
245000 Main Turbine Gen. / Aux.														
256000 Reactor Condensate														
259001 Reactor Feedwater														
268000 Radwaste														
271000 Offgas														
272000 Radiation Monitoring														
286000 Fire Protection														
288000 Plant Ventilation														
290001 Secondary CTMT														
290003 Control Room HVAC														
290002 Reactor Vessel Internals														
K/A Category Point Totals:												Group Point Total:		12/3

Facility:		Date of Exam:																	
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													18			6		
	2				N/A					N/A				9			4		
	Tier Totals													27			10		
2. Plant Systems	1													28			5		
	2													10			3		
	Tier Totals													38			8		
3. Generic Knowledge and Abilities Categories														10	1	2	3	4	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 ±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 / SRO)							
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									
000008 Pressurizer Vapor Space Accident / 3									
000009 Small Break LOCA / 3									
000011 Large Break LOCA / 3									
000015/17 RCP Malfunctions / 4									
000022 Loss of Rx Coolant Makeup / 2									
000025 Loss of RHR System / 4									
000026 Loss of Component Cooling Water / 8									
000027 Pressurizer Pressure Control System Malfunction / 3									
000029 ATWS / 1									
000038 Steam Gen. Tube Rupture / 3									
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4									
000054 (CE/E06) Loss of Main Feedwater / 4									
000055 Station Blackout / 6									
000056 Loss of Off-site Power / 6									
000057 Loss of Vital AC Inst. Bus / 6									
000058 Loss of DC Power / 6									
000062 Loss of Nuclear Svc Water / 4									
000065 Loss of Instrument Air / 8									
W/E04 LOCA Outside Containment / 3									
W/E11 Loss of Emergency Coolant Recirc. / 4									
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4									
000077 Generator Voltage and Electric Grid Disturbances / 6									
K/A Category Totals:							Group Point Total:		18/6

ES-401	PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)						Form ES-401-2		
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1									
000003 Dropped Control Rod / 1									
000005 Inoperable/Stuck Control Rod / 1									
000024 Emergency Boration / 1									
000028 Pressurizer Level Malfunction / 2									
000032 Loss of Source Range NI / 7									
000033 Loss of Intermediate Range NI / 7									
000036 (BW/A08) Fuel Handling Accident / 8									
000037 Steam Generator Tube Leak / 3									
000051 Loss of Condenser Vacuum / 4									
000059 Accidental Liquid RadWaste Rel. / 9									
000060 Accidental Gaseous Radwaste Rel. / 9									
000061 ARM System Alarms / 7									
000067 Plant Fire On-site / 8									
000068 (BW/A06) Control Room Evac. / 8									
000069 (W/E14) Loss of CTMT Integrity / 5									
000074 (W/E06&E07) Inad. Core Cooling / 4									
000076 High Reactor Coolant Activity / 9									
W/E01 & E02 Rediagnosis & SI Termination / 3									
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5									
W/E16 High Containment Radiation / 9									
BW/A01 Plant Runback / 1									
BW/A02&A03 Loss of NNI-X/Y / 7									
BW/A04 Turbine Trip / 4									
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8									
BW/E03 Inadequate Subcooling Margin / 4									
BW/E08; W/E03 LOCA Cooldown - Depress. / 4									
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4									
BW/E13&E14 EOP Rules and Enclosures									
CE/A11; W/E08 RCS Overcooling - PTS / 4									
CE/A16 Excess RCS Leakage / 2									
CE/E09 Functional Recovery									
K/A Category Point Totals:							Group Point Total:		9/4

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / SRO)											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														
004 Chemical and Volume Control														
005 Residual Heat Removal														
006 Emergency Core Cooling														
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water														
010 Pressurizer Pressure Control														
012 Reactor Protection														
013 Engineered Safety Features Actuation														
022 Containment Cooling														
025 Ice Condenser														
026 Containment Spray														
039 Main and Reheat Steam														
059 Main Feedwater														
061 Auxiliary/Emergency Feedwater														
062 AC Electrical Distribution														
063 DC Electrical Distribution														
064 Emergency Diesel Generator														
073 Process Radiation Monitoring														
076 Service Water														
078 Instrument Air														
103 Containment														
K/A Category Point Totals:												Group Point Total:		28/5

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO / SRO)											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														
002 Reactor Coolant														
011 Pressurizer Level Control														
014 Rod Position Indication														
015 Nuclear Instrumentation														
016 Non-nuclear Instrumentation														
017 In-core Temperature Monitor														
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge														
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment														
035 Steam Generator														
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator														
055 Condenser Air Removal														
056 Condensate														
068 Liquid Radwaste														
071 Waste Gas Disposal														
072 Area Radiation Monitoring														
075 Circulating Water														
079 Station Air														
086 Fire Protection														
K/A Category Point Totals:												Group Point Total:		10/3

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.					
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	Subtotal					
2. Equipment Control	2.2.					
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	Subtotal					
3. Radiation Control	2.3.					
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	Subtotal					
4. Emergency Procedures / Plan	2.4.					
	2.4.					
	2.4.					
	2.4.					
	2.4.					
	2.4.					
	Subtotal					
Tier 3 Point Total				10		7

Examination Outline Cross-Reference:	Level	RO	SRO
	Tier #	_____	_____
	Group #	_____	_____
	K/A #	_____	_____
	Importance Rating	_____	_____

Proposed Question:

Proposed Answer: _____

Explanation (Optional):

Technical Reference(s): _____
 (Attach if not previously provided) _____
 (including version/revision number) _____

Proposed references to be provided to applicants during examination: _____

Learning Objective: _____ (As available)

Question Source: Bank # _____
 Modified Bank # _____ (Note changes or attach parent)
 New _____

Question History: Last NRC Exam _____
(Optional: Questions validated at the facility since 10/95 will generally undergo less rigorous review by the NRC; failure to provide the information will necessitate a detailed review of every question.)

Question Cognitive Level: Memory or Fundamental Knowledge _____
 Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 _____
 55.43 _____

Comments:

Facility:	Date of Exam:	Exam Level: RO SRO	
Item Description	Initial		
	a	b*	c#
1. Questions and answers are technically accurate and applicable to the facility.			
2. a. NRC K/As are referenced for all questions. b. Facility learning objectives are referenced as available.			
3. SRO questions are appropriate in accordance with Section D.2.d of ES-401			
4. The sampling process was random and systematic (If more than 4 RO or 2 SRO questions were repeated from the last 2 NRC licensing exams, consult the NRR OL program office).			
5. Question duplication from the license screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate: ___ the audit exam was systematically and randomly developed; or ___ the audit exam was completed before the license exam was started; or ___ the examinations were developed independently; or ___ the licensee certifies that there is no duplication; or ___ other (explain)			
6. Bank use meets limits (no more than 75 percent from the bank, at least 10 percent new, and the rest new or modified); enter the actual RO / SRO-only question distribution(s) at right.	Bank	Modified	New
	/	/	/
7. Between 50 and 60 percent of the questions on the RO exam are written at the comprehension/ analysis level; the SRO exam may exceed 60 percent if the randomly selected K/As support the higher cognitive levels; enter the actual RO / SRO question distribution(s) at right.	Memory		C/A
	/		/
8. References/handouts provided do not give away answers or aid in the elimination of distractors.			
9. Question content conforms with specific K/A statements in the previously approved examination outline and is appropriate for the tier to which they are assigned; deviations are justified.			
10. Question psychometric quality and format meet the guidelines in ES Appendix B.			
11. The exam contains the required number of one-point, multiple choice items; the total is correct and agrees with the value on the cover sheet.			
Printed Name / Signature		Date	
a. Author	_____	_____	_____
b. Facility Reviewer (*)	_____	_____	_____
c. NRC Chief Examiner (#)	_____	_____	_____
d. NRC Regional Supervisor	_____	_____	_____
Note: * The facility reviewer's initials/signature are not applicable for NRC-developed examinations. # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.			

U.S. Nuclear Regulatory Commission
Site-Specific RO Written Examination

Applicant Information

Name:

Date:

Facility/Unit:

Region: I II III IV

Reactor Type: W CE BW GE

Start Time:

Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80.00 percent. Examination papers will be collected 6 hours after the examination begins.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

Applicant's Signature

Results

Examination Value _____ Points

Applicant's Score _____ Points

Applicant's Grade _____ Percent

<p>U.S. Nuclear Regulatory Commission</p> <p>Site-Specific SRO Written Examination</p>	
<p>Applicant Information</p>	
<p>Name: _____</p>	
<p>Date: _____</p>	<p>Facility/Unit: _____</p>
<p>Region: I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/></p>	<p>Reactor Type: W <input type="checkbox"/> CE <input type="checkbox"/> BW <input type="checkbox"/> GE <input type="checkbox"/></p>
<p>Start Time: _____</p>	<p>Finish Time: _____</p>
<p>Instructions</p> <p>Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.</p>	
<p>Applicant Certification</p> <p>All work done on this examination is my own. I have neither given nor received aid.</p> <p style="text-align: right;">_____</p> <p style="text-align: right;">Applicant's Signature</p>	
<p>Results</p>	
<p>RO/SRO-Only/Total Examination Values</p>	<p>_____ / _____ / _____ Points</p>
<p>Applicant's Scores</p>	<p>_____ / _____ / _____ Points</p>
<p>Applicant's Grade</p>	<p>_____ / _____ / _____ Percent</p>

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/units	Back-ward	Q=K/A	SRO Only			

Instructions

[Refer to Section D of ES-401 and Appendix B for additional information regarding each of the following concepts.]

1. Enter the level of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level.
2. Enter the level of difficulty (LOD) of each question using a 1 – 5 (easy – difficult) rating scale (questions in the 2 – 4 range are acceptable).
3. Check the appropriate box if a psychometric flaw is identified:
 - The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).
 - The stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc).
 - The answer choices are a collection of unrelated true/false statements.
 - The distractors are not credible; single implausible distractors should be repaired, more than one is unacceptable.
 - One or more distractors is (are) partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by stem).
4. Check the appropriate box if a job content error is identified:
 - The question is not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational in content).
 - The question requires the recall of knowledge that is too specific for the closed reference test mode (i.e., it is not required to be known from memory).
 - The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).
 - The question requires reverse logic or application compared to the job requirements.
5. Check questions that are sampled for conformance with the approved K/A and those that are *designated SRO-only* (K/A and license level mismatches are unacceptable).
6. Enter question source: (B)ank, (M)odified, or (N)ew. Check that (M)odified questions meet criteria of ES-401 Section D.2.f.
7. Based on the reviewer's judgment, is the question as written (U)nsatisfactory (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
8. At a minimum, explain any "U" ratings (e.g., how the Appendix B psychometric attributes are not being met).

Facility:	Date of Exam:	Exam Level: RO <input type="checkbox"/> SRO <input type="checkbox"/>	
Item Description	Initials		
	a	b	c
1. Clean answer sheets copied before grading			
2. Answer key changes and question deletions justified and documented			
3. Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations)			
4. Grading for all borderline cases (80 ±2% overall and 70 or 80, as applicable, ±4% on the SRO-only) reviewed in detail			
5. All other failing examinations checked to ensure that grades are justified			
6. Performance on missed questions checked for training deficiencies and wording problems; evaluate validity of questions missed by half or more of the applicants			
Printed Name/Signature		Date	
a. Grader	_____	_____	
b. Facility Reviewer(*)	_____	_____	
c. NRC Chief Examiner (*)	_____	_____	
d. NRC Supervisor (*)	_____	_____	
(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.			

Post-Examination Check Sheet	
Facility:	Date of Examination:
Task Description	Date Complete
1. Facility written exam comments or graded exams received and verified complete	
2. Facility written exam comments reviewed and incorporated and NRC grading completed, if necessary	
3. Operating tests graded by NRC examiners	
4. NRC chief examiner review of operating test and written exam grading completed	
5. Responsible supervisor review completed	
6. Management (licensing official) review completed	
7. License and denial letters mailed	
8. Facility notified of results	
9. Examination report issued (refer to NRC MC 0612)	
10. Reference material returned after final resolution of any appeals	

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

Power Plant Examination Results Summary						
Facility:			Plant Status: Hot Cold			
Written Examination Date: Prepared by: Facility NRC			Operating Test Date(s): Prepared by: Facility NRC			
NRC Examiners:						
Overall Results						
Applicants: Total #		# Passed	% Passed	# Failed	% Failed	
RO						
SRO						
Individual Results						
Name	Docket # 55-(_____)	Type (1)	Written Grade RO / SRO / TOT	Operating Test(2)		
				W-T	ADM	SIM
			/ /			
			/ /			
			/ /			
			/ /			
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NOTES: (1) 1=RO; 2=SRO-I; 3=SRO-U; 4=RO-Retake; 5=SRO-I-Retake; 6=SRO-U-Retake; 7=SRO-Fuel (2) P=Passed; F=Failed; W=Waived						

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

Facility:						Date of Exam:							
Tier	K/A Category Points											Total	
	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*		
1. Emergency & Abnormal Plant Evolutions													10
2. Plant Systems													20
3. Generic Knowledge and Abilities Categories	1		2		3		4		GFE			10	
<p>Note: 1. Ensure that at least one topic from every K/A category is sampled within each tier .</p> <p>2. The point total for each tier in the proposed outline must match that specified in the table. The final point total for each tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 40 points.</p> <p>3. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system (except fuel handling equipment) or evolution (except refueling accident).</p> <p>4. The shaded areas are not applicable to the category/tier.</p> <p>5.* 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.</p> <p>6. If the applicants have not previously taken the GFE, Tier 3 shall include basic reactor theory, component, and thermodynamic topics that apply to fuel handling operations.</p> <p>7. Systems/evolutions within each tier are identified on the associated outline. Enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the SRO license level, and the point totals (#) for each system and category. Enter the tier totals for each category in the table above.</p> <p>8. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, importance ratings, and point totals (#) on Form ES-701-3.</p> <p>9. Refer to ES-401, Section D.1, for guidance regarding the elimination of inappropriate K/A statements. The facility licensee's JTA for fuel handlers should be used as the basis for eliminating or adding testable topics.</p>													

	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	#
205000 Shutdown Cooling														
215004 Source Range Monitor														
233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment														
262001 AC Electrical Dist.														
263000 DC Electrical Dist.														
290002 Reactor Vessel Internals														
201002 RMCS														
201003 Control Rod and Drive Mechanism														
203000 RHR/LPCI: Injection Mode														
204000 RWCU														
211000 SLC														
212000 RPS														
214000 RPIS														
215001 Traversing In-Core Probe														
215003 IRM														
215005 APRM / LPRM														
223001 Primary CTMT and Aux.														
223002 PCIS/Nuclear Steam Supply Shutoff														
261000 SGTS														
264000 EDGs														
272000 Radiation Monitoring														
286000 Fire Protection														
288000 Plant Ventilation														
290001 Secondary CTMT														
300000 Instrument Air														
400000 Component Cooling Water														
K/A Category Totals:												Tier Point Total:		20

Facility:						Date of Exam:							
Tier	K/A Category Points											Total	
	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*		
1. Emergency & Abnormal Plant Evolutions													10
2. Plant Systems													20
3. Generic Knowledge and Abilities Categories	1		2		3		4		GFE			10	
<p>Note: 1. Ensure that at least one topic from every K/A category is sampled within each tier .</p> <p>2. The point total for each tier in the proposed outline must match that specified in the table. The final point total for each tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 40 points.</p> <p>3. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system (except fuel handling equipment) or evolution (except refueling accident).</p> <p>4. The shaded areas are not applicable to the category/tier.</p> <p>5.* 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.</p> <p>6. If the applicants have not previously taken the GFE, Tier 3 shall include basic reactor theory, component, and thermodynamic topics that apply to fuel handling operations.</p> <p>7. Systems/evolutions within each tier are identified on the associated outline. Enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the SRO license level, and the point totals (#) for each system and category. Enter the tier totals for each category in the table above.</p> <p>8. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, importance ratings, and point totals (#) on Form ES-701-3.</p> <p>9. Refer to ES-401, Section D.1, for guidance regarding the elimination of inappropriate K/A statements. The facility licensee's JTA for fuel handlers should be used as the basis for eliminating or adding testable topics.</p>													

ES-701**LSRO Generic Knowledge and Abilities Outline (Tier 3)****Form ES-701-3**

Facility:

Date of Exam:

Category	K/A #	Topic	IR	#
1. Conduct of Operations	2.1.			
	2.1.			
	2.1.			
	2.1.			
	Subtotal			
2. Equipment Control	2.2.			
	2.2.			
	2.2.			
	2.2.			
	Subtotal			
3. Radiation Control	2.3.			
	2.3.			
	2.3.			
	2.3.			
	Subtotal			
4. Emergency Procedures / Plan	2.4.			
	2.4.			
	2.4.			
	2.4.			
	Subtotal			
5. Generic Fundamentals				
	Subtotal			
Tier 3 Point Total				10

Applicant Docket Number: 55- Facility:	Page 2 of Date of Examination:		
Title / Description of Tasks (JPMs)	Type Codes*	Evaluation (S or U)	Comment Page Number
Administrative			
1.			
2.			
3.			
Systems			
1.			
2.			
3.			
4.			
Emergency/Abnormal Plant Evolutions			
1.			
2.			
3.			
Type Codes & Criteria: <ul style="list-style-type: none"> (A)lternative path (2 systems; 1 E/APE)) (C)ontrol room (D)irect from bank (≤ 7) (I)n-plant (N)ew or (M)odified from bank including 1(A) (≥ 1 / section) (L)ast NRC exam (≤ 1 / section) (R)efueling accident (1) (T)echnical specification (≥ 2) 			

Facility:		Date of Examination:		
Item	Task Description	Initials		
		a	b*	c#
1. W R I T T E N	a. Verify that the outline fits the model in accordance with ES-701.			
	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 sampled at least once.			
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.			
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.			
2. O P E R A T I N G	a. Verify that the overall operating test: (1) includes at least two tasks that require the use of technical specifications (2) does not duplicate any tasks from the applicants' audit test(s)			
	b. Verify that the administrative tasks: (1) are distributed among the four administrative topics described in ES-301 (2) include no more than one repeat from the last NRC licensing examination (3) include at least one task that is new or significantly modified			
	c. Verify that the systems walk-through includes: (1) two tasks requiring the manipulation of fuel handling equipment (2) two additional tasks related to Tier 2 systems other than fuel handling equipment (3) two tasks requiring implementation of alternative path procedures (4) no more than one repeat from the last NRC licensing examination (5) at least one task that is new or significantly modified			
	d. Verify that the E/APE walk-through includes: (1) three JPMs based on the Tier 1 evolutions, including a refueling accident (2) one task requiring implementation of an alternative path procedure (3) no more than one repeat from the last NRC licensing examination (4) at least one task that is new or significantly modified			
	e. Determine whether there are enough different outlines to test the projected number of applicants and ensure that no items are duplicated on subsequent days.			
3. 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.			
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.			
	c. Assess whether the sampling process adequately considered plant-specific refueling components, systems, and procedures that are not included in the generic models.			
	d. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.			
	e. Check for duplication and overlap among exam sections.			
	f. Check the entire exam for balance of coverage.			
	g. Assess whether the proposed sample is consistent with the LSRO's job responsibilities.			
a. Author _____ b. Facility Reviewer (*) _____ c. NRC Chief Examiner (#) _____ d. NRC Supervisor _____		Printed Name / Signature		Date
Note: * The facility reviewer's initials/signature are not applicable for NRC-developed examinations. # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.				

Facility:		Date of Exam:		
Item Description	Initial			
	a	b*	c#	
1. Questions and answers are technically accurate and applicable to the facility.				
2. a. NRC K/As are referenced for all questions (as applicable). b. Facility learning objectives are referenced as available.				
3. Questions are appropriate for LSRO applicants.				
4. The sampling process was random and systematic (If more than 3 questions were repeated from the last 2 NRC licensing exams, consult the NRR OL program office).				
5. Question duplication from the license screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate: <input type="checkbox"/> the audit exam was systematically and randomly developed, or <input type="checkbox"/> the audit exam was completed before the license exam was started, or <input type="checkbox"/> the examinations were developed independently, or <input type="checkbox"/> the licensee certifies that there is no duplication, or <input type="checkbox"/> other (explain)				
6. Bank use meets limits (no more than 30 questions from the bank, at least 4 new, and the rest modified); enter the actual question distribution at right.	Bank	Modified	New	
7. Between 50 and 60 percent (20 and 24) of the questions on the exam are written at the comprehension/analysis level; enter the actual question distribution at right.	Memory	C/A		
8. References/handouts provided do not give away answers or aid in eliminating distractors.				
9. Question content conforms with specific K/A statements in the previously approved examination outline and is appropriate for the Tier to which they are assigned; deviations are justified.				
10. Question psychometric quality and format meet guidelines in ES Appendix B.				
11. The exam contains 40 one-point, multiple choice items; the total is correct and agrees with value on cover sheet.				
Printed Name / Signature		Date		
a. Author				
b. Facility Reviewer (*)				
c. NRC Chief Examiner (#)				
d. NRC Regional Supervisor				
Note: * The facility reviewer's initials/signature are not applicable for NRC-developed examinations. # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.				

Facility:	Date of Examination:	Operating Test Number:		
Item Description	Initials			
	a	b*	c#	
1. The operating test conforms with the LSRO's job responsibilities and the previously approved outline (Form ES-701-4).				
2. Any changes from the previously approved outline have not caused the test to deviate from any of the acceptance criteria (e.g., item distribution, bank use, repetition from the last two NRC examinations) specified on the outline.				
3. There is no day-to-day repetition between this and other operating tests to be administered during this examination.				
4. The operating test does not duplicate items from the applicants' audit test(s). (See Section D.1.a of ES-301).				
5. Overlap between the written examination and the operating test is within acceptable limits.				
6. It appears that the operating test will differentiate between competent and less-than-competent applicants.				
7. Each JPM includes the following, as applicable: <ul style="list-style-type: none"> • initial conditions • initiating cues • references and tools, including associated procedures • reasonable and validated time limits (average time allowed for completion) and specific designation if deemed to be time-critical by the facility licensee • specific performance criteria that include: <ul style="list-style-type: none"> – detailed expected actions with exact criteria and nomenclature – system response and other examiner cues – statements describing important observations to be made by the applicant – criteria for successful completion of the task – identification of critical steps and their associated performance standards – restrictions on the sequence of steps, if applicable 				
Printed Name / Signature		Date		
a. Author	_____	_____	_____	_____
b. Facility Reviewer(*)	_____	_____	_____	_____
c. NRC Chief Examiner (#)	_____	_____	_____	_____
d. NRC Supervisor	_____	_____	_____	_____
NOTE: * The facility signature is not applicable for NRC-developed tests. # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.				

U.S. Nuclear Regulatory Commission
LSRO Written Examination

Applicant Information

Name: _____

Date: _____

Region: I II III IV

Facility/Unit: _____

Reactor Type: W CE BW GE

Start Time: _____

Stop Time: _____

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be picked up 4 hours after the examination begins.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

Operator's Signature

Results

Test Value _____ Points

Applicant's Score _____ Points

Applicant's Grade _____ Percent

Facility: _____

Task No: _____

Task Title: _____

Job Performance Measure No: _____

K/A Reference: _____

Examinee: _____

NRC Examiner: _____

Facility Evaluator: _____

Date: _____

Method of testing:

Simulated Performance _____

Actual Performance _____

Classroom _____

Simulator _____

Plant _____

Read to the examinee:

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions:

Task Standard:

Required Materials:

General References:

Initiating Cue:

Time Critical Task: Yes No

Validation Time:

Performance Information

Denote critical steps with a check mark

_____ Performance step:

Standard:

Comment:

_____ Performance step:

Standard:

Comment:

_____ Performance step:

Standard:

Comment:

Terminating cue:

Verification of Completion

Job Performance Measure No. _____

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question: _____

Response: _____

Result: Satisfactory / Unsatisfactory

Examiner's signature and date: _____

Every JPM should:

1. _____ be supported by the facility licensee's job task analysis.
2. _____ be operationally important (meet the NRC's K/A Catalog threshold criterion of 2.5 (3 for requalification exams) or as determined by the facility and agreed to by the NRC). JPMs shall not test only for simple recall or memorization (refer to ES-602 Attachment 1).
3. _____ be designed as either SRO only, RO/SRO or AO/RO/SRO.
4. include the following, as applicable:
 - a. _____ initial conditions
 - b. _____ initiating cues
 - c. _____ references and tools, including associated procedures
 - d. _____ validated time limits (average time allowed for completion) and specific designation of those JPMs that are deemed to be time-critical by the facility operations department
 - e. _____ operationally important specific performance criteria that include:
 - (1) _____ expected actions with exact control and indication nomenclature and criteria (switch position, meter reading), even if these criteria are not specified in the procedural step
 - (2) _____ system response and other cues that are complete and correct so that the examiner can properly cue the examinee, if asked
 - (3) _____ statements describing important observations that the examinee should make
 - (4) _____ criteria for successful completion of the task
 - (5) _____ identification of those steps that are considered critical
 - (6) _____ restrictions on the sequence of steps

