ES-201	Examination Preparation Checklist	Form ES-201-1

Facility: SURRY Date of Examination: 9/19 - 10/10/2016

Developed by: Written: Facility ☒ NRC ☐ // Operating Facility ☒ NRC ☐

Target Date*		Task Description (Reference)	Chief Examiner's Initials
-180	1.	Examination administration date confirmed (C.1.a; C.2.a and b)	gwe
-150	2.	NRC examiners and facility contact assigned (C.1.d; C.2.e)	gwe
-150	3.	Facility contact briefed on security and other requirements (C.2.c)	gwe
-150	4.	Corporate notification letter sent (C.2.d)	gwe
[-120]	5.	Reference material due (C.1.e; C.3.c; Attachment 3)	gwe
{-90}	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, ES-401-1/2, ES-401N-1/2, ES-401-3, ES-401N-3, ES-401-4, and ES-401N-4, as applicable (C.1.e and f; C.3.d)	gwe
{-85}	7.	Examination outline(s) reviewed by NRC and feedback provided to facility licensee (C.2.h; C.3.e)	gwe
{-60}	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, ES-401N-6, and any Form ES-201-2, ES-201-3, ES-301-1, or ES-301-2 updates), and reference materials due (C.1.e, f, g and h; C.3.d)	gwe
-45	9.	Written exam and operating test reviews completed. (C.3.f)	gwe
-30	10.	Preliminary license applications (NRC Form 398's) due (C.1.l; C.2.g; ES-202)	gwe
-21	11.	Examination approved by NRC supervisor for facility licensee review (C.2.h; C.3.f)	gwe
-21	12.	Examinations reviewed with facility licensee (C.1.j; C.2.f and h; C.3.g)	gwe
-14	13.	Final license applications due and Form ES-201-4 prepared (C.1.l; C.2.i; ES-202)	gwe
-14	14.	Written examinations and operating tests approved by NRC supervisor (C.2.i; C.3.h)	gwe
-7	15.	Facility licensee management queried regarding the licensee's views on the examination. (C.2 j)	gwe
-7	16.	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)	gwe
-7	17.	Proctoring/written exam administration guidelines reviewed with facility licensee (C.3.k)	gwe
-7	18.	Approved scenarios, job performance measures, and questions distributed to NRC examiners (C.3.i)	gwe

* 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.

ES-201 **Examination Outline Quality Checklist** **Form ES-201-2**

Facility: Surry Power Station Date of Examination: 9/19/2016

Item		Task Description	Initials a	b*	c#
1 WRITTEN	a	Verify that the outline(s) fit(s) the appropriate model, in accordance with ES-401 or ES-401N	①	RP	
	b	Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 or ES-401N and whether all K/A categories are appropriately sampled	①	RP	
	c	Assess whether the outline over-emphasizes any systems, evolutions, or generic topics		RP	
	d	Assess whether the justifications for deselected or rejected K/A statements are appropriate		RP	
2 SIMULATOR	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		RP	
	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		RP	
	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		RP	
3 WALK THROUGH	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		RP	
	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		RP	
	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		RP	
4 GENERAL	a	Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam sections		RP	
	b	Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate		RP	
	c	Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5		RP	
	d	Check for duplication and overlap among exam sections		RP	
	e	Check the entire exam for balance of coverage		RP	
	f	Assess whether the exam fits the appropriate job level (RO or SRO)		RP	

	Printed Name/Signature	Date
a Author	Michael R Meyer/ Michael R Meyer	9-7-2016
b Facility Reviewer (*)	Rich Philpot/ Richard P Philpot	9/7/16
c NRC Chief Examiner (#)		
d NRC Supervisor	Gerald McCoy/ Gerald McCoy	9/14/2016

Note: # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required
* Not applicable for NRC-prepared examination outlines

① Sample plan developed by Chief Examiner, Bruno Caballero.

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 9/19 - 9/27 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 9/19/16 - 9/30/16. 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.	Paul K. Orrison	Exam Lead		10/22/15		10/4/16	
2.	Brown, Aaron D	Simulator Software		10/20/15		" 10/6	
3.	Tran-Lam Pham	Simulator Dev		10/22/15		10/10/16	
4.	Huth Christopher	SSG Software		10/26/15		10/10/16	
5.	Mike Meyer	Exam Writer		10/26/15		10/12/16	
6.	Robert W Schaefer	Simulator OPS		11/3/15		10/11/16	
7.	Kevin Labat	Exam Writer		12/2/15		10/11/16	
8.	R. Philpot	Training Supervisor		2/15/16		10/10/16	
9.	Robert Young	Instructor		4/21/16		10/10/16	
10.	Stanley Alexander	Instructor / LORP		4/21/16		10/11/16	
11.	Bonnie Jurewicz	Senior Nuclear Instructor / LORP		4/21/16		10-11-16	
12.	John C. Greenwell	Senior Nuclear Instructor/LORP		4-22-16		10-11-16	
13.	Geoffrey R. Hill	Unit Supervisor		5/3/16		10-10-16	
14.	Robert Lewis	RO		5/4/16		10/10/16	
15.	John Gasby	RO		5/5/16		10/18/16	

NOTES:

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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 9/19-9/27 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.	David H Wilson	Asst Ops Mgr		5/10/16		10/10/16	
2.	Jeffrey A. Chapin	ILT Instructor		5/26/16		10/10/16	
3.	Neil S. Turner	Mgr-EP		5-26-16		10-13-16	
4.	William R Thompson	EP		5-27-16		10/13/16	
5.	TIM B KEATING	SRO/STA/SMT		5.27.16		10/10/16	
6.	[illegible]	LORP Instructor		[illegible]		[illegible]	
7.	Adina LaFrance	Reactor Engineer		6/14/16		10/11/16	
8.	Daniel Monk	SROIT		8-1-16		10-11-16	
9.	Richard Post	SRO IT		8/1/16		10/10/16	
10.	Shawn Maciejunes	SROIT		8/1/16		10/10/16	
11.	Joshua Humphries	SRO		8.5.16		10-18-16	
12.	SHATEEK MAJOR	SRO		8-6-16		10-19-16	
13.	Leslie A. Baker	Manager - Training		8/22/16		10/1/16	
14.	DAVID SCHLEGEL	INSTRUCTOR		8.29.16		10-10-16	
15.	AMY EPPS	TRAINING ADMINISTRATOR	Amy Epps	08-31-16	Amy C. Epps	10/19/16	
16.	LORI HUSLEY	Training Administrator		08-31-16		10-14-16	

NOTES:

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 9/19-9/27 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 9/19-9/27. 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.	WILLIAM W. MARSHALL	CONTRACTOR		9/15/16		10/1/16	①
2.	Curt F. Irwin III	instructor		9/16/16		10/16/16	
3.	Cynthia Howell	Admin		9/19/16		10/11/16	
4.	G.J. Ford	instructor		9/19/16		10/19/16	
5.	SEAN LOCASCIO	instructor		9/20/16		10/11/16	
6.	RANDY JOHNS	MGR OPS		9/20/16		10/11/16	
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							

NOTES: ① William W. Marshall signed off per Telecon 10/1/16

Facility: _Surry_____ Date of Examination: _9/19/2016__

Examination Level: RO ■ SRO □ Operating Test Number: SR 2016 301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations		
Conduct of Operations	M, R	Perform a Calorimetric
Equipment Control	N, R	RCS Leakrate
Radiation Control	D, R	Dose Rate Calculation
Emergency Plan	N, R	Complete EPIP-2.01 Initial Report Form

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items)

* 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: __Surry_____ Date of Examination: 9/19/2016____

Examination Level: RO ☐ SRO ■ Operating Test Number: SR 2016 301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R	Shift Staffing
Conduct of Operations	M, R	Perform a Calorimetric TRM Determination
Equipment Control	N, R	RCS Leakrate Tech Spec Determination
Radiation Control	D, R	Dose Rate Calculation
Emergency Plan	N, S	Determine PAR

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

* 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: Surry Date of Examination: 9/19/16

Exam Level: RO ■ SRO-I ☐ SRO-U ☐ Operating Test No.: SR 2016 301

Control Room Systems:* 8 for RO; 7 for SRO-I; 2 or 3 for SRO-U

System / JPM Title	Type Code*	Safety Function
a. Adjust the PRNIs IAW 1-OPT-RX-001 (001 AA2.05 4.4/4.6)	A,M,S	7
b. Isolate a Leaking RSHX (059 AK3.01 3.5/3.9)	D,L,S	9
c. Perform E-0, Attachment 4 (WE14 EA1.3 3.3/3.8)	N,L,EN,S	5
d. Transfer the SI System to Cold Leg Recirc (006 A3.08 4.2/4.3)	D,A,L,S	2
e. Respond to a Loss of the Operating RHR Pump (005 A2.03 2.9/3.1)	D,L,S	4P
f. Bypass Containment Detection ON 0-FP-MON-IMS-1 (086 A4.02 3.5 3.5)	D,S	8
g. Respond to a Secondary Transient (SYS 016 A2.01 3.0/3.1)	A,D,S	4S
h. Synchronize and Transfer Electrical Power Systems (062 A4.01 3.3/3.1)	D,S	6
In-Plant Systems* (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Locally Isolate Flooding #3 MER (062 AA2.03 2.6/2.9)	D,A,L,E	4P
j. Locally Establish RCS & SG Hi/Lo Interface Integrity (068 AA1.12 4.4/4.4)	D,L,E	8
k. Locally Swap U-2 AFW to Fire Water (061 K4.01 4.1/4.2)	M,L,E,R	4S

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all five 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
A)lternate path	4 (4 - 6)
(C)ontrol room	
(D)irect from bank	8 (≤ 9)
(E)mergency or abnormal in-plant	3 (≥ 1)
(EN)gineered safety feature	1 (≥ 1) (control room system)
(L)ow-Power / Shutdown	7 (≥ 1)
(N)ew or (M)odified from bank including 1(A)	3 (≥ 2)
(P)revious 2 exams	0 (≤ 3) (randomly selected)
(R)CA	1 (≥ 1)
(S)imulator	

Facility: Surry Date of Examination: 9/19/16

Exam Level: RO ☐ SRO-I ■ SRO-U ☐ Operating Test No.: SR 2016 301

Control Room Systems:* 8 for RO; 7 for SRO-I; 2 or 3 for SRO-U

System / JPM Title	Type Code*	Safety Function
a. Adjust the PRNIs IAW 1-OPT-RX-001 (001 AA2.05 4.4/4.6)	A,M,S	7
b. Isolate a Leaking RSHX (059 AK3.01 3.5/3.9)	D,L,S	9
c. Perform E-0, Attachment 4 (WE14 EA1.3 3.3/3.8)	N,L,EN	5
d. Transfer the SI System to Cold Leg Recirc (006 A3.08 4.2/4.3)	D,A,L,S	2
e. Respond to a Loss of the Operating RHR Pump (005 A2.03 2.9/3.1)	D,L,S	4P
f. Bypass Containment Detection ON 0-FP-MON-IMS-1 (086 A4.02 3.5 3.5)	D,S	8
g. Respond to a Secondary Transient (SYS 016 A2.01 3.0/3.1)	A,D,S	4S
h.		
In-Plant Systems* (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Locally Isolate Flooding #3 MER (076 A2.01 3.5/3.7)	D,A,L,E	4P
j. Locally Establish RCS & SG Hi/Lo Interface Integrity (068 AA1.12 4.4/4.4)	D, L,E	8
k. Locally Swap U-2 AFW to Fire Water (061 K4.01 4.1/4.2)	M,L,E,R	4S

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all five 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 SRO-I
A)lternate path	4 (4 – 6)
(C)ontrol room	
(D)irect from bank	6 (≤ 8)
(E)mergency or abnormal in-plant	3 (≥ 1)
(EN)gineered safety feature	1 (≥1) (control room system)
(L)ow-Power / Shutdown	8 (≥ 1)
(N)ew or (M)odified from bank including 1(A)	4 (≥ 2)
(P)revious 2 exams	0 (≤ 3) (randomly selected)
(R)CA	1 (≥ 1)
(S)imulator	

Facility: Surry Date of Examination: 9/19/16

Exam Level: RO ☐ SRO-I ☐ SRO-U ■ Operating Test No.: SR 2016 301

Control Room Systems:* 8 for RO; 7 for SRO-I; 2 or 3 for SRO-U

System / JPM Title	Type Code*	Safety Function
a. Adjust the PRNIs IAW 1-OPT-RX-001 (001 AA2.05 4.4/4.6)	A,M,S	7
b. Isolate a Leaking RSHX (059 AK3.01 3.5/3.9)	D,L,S	9
c. Perform E-0, Attachment 4 (WE14 EA1.3 3.3/3.8)	N,L,EN,S	5
d.		
e.		
f.		
g.		
h.		
In-Plant Systems* (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Locally Isolate Flooding #3 MER (076 A2.01 3.5/3.7)	D,A,L,E	4P
k. Locally Swap U-2 AFW to Fire Water (061 K4.01 4.1/4.2)	M,L,E,R	4S

* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all five 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 SRO-U
A)lternate path	2 (2-3)
(C)ontrol room	
(D)irect from bank	2 (≤ 4)
(E)mergency or abnormal in-plant	2 (≥ 1)
(EN)gineered safety feature	1 (≥ 1) (control room system)
(L)ow-Power / Shutdown	3 (≥ 1)
(N)ew or (M)odified from bank including 1(A)	3 (≥ 1)
(P)revious 2 exams	0 (≤ 2) (randomly selected)
(R)CA	1 (≥ 1)
(S)imulator	

Facility:	Date of Examination: 9/19/2016	Operating Test Number: SR301-2016		
	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).	m	RP	G-C
b.	There is no day-to-day repetition between this and other operating tests to be administered during this examination.	m	RP	G-C
c.	The operating test shall not duplicate items from the applicants' audit test(s). (see Section D.1.a.)	m	RP	G-C
d.	Overlap with the written examination and between different parts of the operating test is within acceptable limits.	m	RP	G-C
e.	It appears that the operating test will differentiate between competent and less-than-competent applicants at the designated license level.	m	RP	G-C
	2. Walk-Through Criteria	--	--	--
a.	Each JPM includes the following, as applicable: • 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: – 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	m	RP	G-C
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.	m	RP	G-C
	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.		m	RP	G-C

		Printed Name / Signature	Date
a.	Author	Michael R Meyer/ Michael R Meyer	9-7-2016
b.	Facility Reviewer(*)	Rich Philpot/ Richard P Philpot	9/7/16
c.	NRC Chief Examiner (#)	GARY CALLAWAY / Gary Callaway	9/10/16
d.	NRC Supervisor	Gerald McCoy / Jerald McCoy	9/14/2016

NOTE: * The facility signature is not applicable for NRC-developed tests.
Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.

Facility: Surry Date of Exam: 9-19-16 Scenario Numbers: 1 / 2 / 3 / 4 Operating Test No.:SR301-2016

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 • the point in the scenario when it is to be initiated • the malfunction(s) or conditions 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. The events are valid with regard to physics and thermodynamics.			
5. Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.			
6. 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.			
7. The simulator modeling is not altered.			
8. 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.			
9. 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.			
10. All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).			
11. The scenario set provides the opportunity for each applicant to be evaluated in each of the applicable rating factors. (Competency Rating factors as described on forms ES-303-1 and ES-303-3.)			
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. Malfunctions after EOP entry (1-2)	2 / 2 / 2 / 2			
2. Abnormal events (2-4)	4 / 4 / 4 / 4			
3. Major transients (1–2)	1 / 1 / 1 / 1			
4. EOPs entered/requiring substantive actions (1–2)	1 / 1 / 2 / 0			
5. EOP contingencies requiring substantive actions (0-2)	1 / 1 / 1 / 1			
6. EOP based Critical tasks (2–3)	2 / 2 / 2 / 2			

NOTE: * The facility signature is not applicable for NRC-developed tests.
Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.

Facility: Surry		Date of Exam: (/19/16												Operating Test No.: SR 2016 301			
APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ■ SRO-I □ SRO-U □	RX		5			6			6			1		1,1 1,1	1	1	0
	NOR														1	1	1
	I/C		2,3			2,5			3,5			3,4		2,2 2,2	4	4	2
	MAJ		6			7,8			7			6		1,2 1,1	2	2	1
	TS														0	2	2
RO □ SRO-I ■ SRO-U □	RX														1	1	0
	NOR			2,5			1,6			1,6			1	2,2 2,1	1	1	1
	I/C			1,4			3,4			2,4			2,5	2,2 2,2	4	4	2
	MAJ			6			7,8			7			6	1,2 1,1	2	2	1
	TS														0	2	2
RO □ SRO-I ■ SRO-U □	RX	5			6			6			1			1,1 1,1	1	1	0
	NOR				1			1						0,1 1,0	1	1	1
	I/C	1,2,3, 4			2,3,4 ,5			2,3,4 ,5			2,3,4 ,5			4,4 4,4	4	4	2
	MAJ	6			7,8			7			6			1,2 1,1	2	2	1
	TS	1,2			2,3,5			3,4,5			2,4			2,3 3,2	0	2	2
RO □ SRO-I □ SRO-U ■	RX	5			6			6			1			1,1 1,1	1	1	0
	NOR				1			1						0,1 1,0	1	1	1
	I/C	1,2,3, 4			2,3,4 ,5			2,3,4 ,5			2,3,4 ,5			4,4 4,4	4	4	2
	MAJ	6			7,8			7			6			1,2 1,1	2	2	1
	TS	1,2			2,3,5			3,4,5			2,4			2,3 3,2	0	2	2

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 (SRO-I) 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 SRO-I *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 one-for-one 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.

4. For licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: Surry Date of Examination: 9/19/16 Operating Test No.: SR301-2016

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	1,2,3, 4,6	2,3, 4,5, 7,8	2,3, 4,5, 7	2,3, 4,5, 6	1,2, 3,4, 6	2,3, 4,5, 7,8	2,3, 4,5, 7	2,3, 4,5, 6	1,2, 3,4, 6	2,3, 4,5, 7,8	2,3, 4,5, 7	2,3,4, 5,6				
Comply With and Use Procedures (1)	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL				
Operate Control Boards (2)	ALL	ALL	ALL	ALL												
Communicate and Interact	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL				
Demonstrate Supervisory Ability (3)					ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL				
Comply With and Use Tech. Specs. (3)					1,2	2,3, 5	3,4, 5	2,4	1,2	2,3, 5	3,4, 5	2,4				

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. (This includes all rating factors for each competency.) (Competency Rating factors as described on forms ES-303-1 and ES-303-3.)

Facility: SURRY Date of Exam: SEPTEMBER 2016

Tier	Group	RO K/A Category Points											SRO-Only Points		
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	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				2	2			1	9	2	2	4
	Tier Totals	4	4	5				5	5			4	27	5	5	10
2. Plant Systems	1	3	2	2	2	3	3	3	3	2	3	2	28	3	2	5
	2	1	1	1	1	1	1	1	Ø	1	1	1	10	2	3	3
	Tier Totals	4	3	3	3	4	4	4	3	3	4	3	38	5	3	8
3. Generic Knowledge and Abilities Categories		1: 3			2: 3			**3: 1			4: 3		10	1: 2	2: 2	**3: 1 4: 2		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). (One Tier 3 Radiation Control K/A is allowed if the K/A is replaced by a K/A from another Tier 3 Category). *
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 with justification; 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 a category 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.

G* Generic K/As

(RO)

ES-401, REV 10 **T1G1 PWR EXAMINATION OUTLINE** **FORM ES-401-2**

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
007EG2.4.45	Reactor Trip - Stabilization - Recovery / 1	4.1	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to prioritize and interpret the significance of each annunciator or alarm.
008AK3.01	Pressurizer Vapor Space Accident / 3	3.7	4.4	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Why PZR level may come back on scale if RCS is saturated.
011EK2.02	Large Break LOCA / 3	2.6	2.7	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Pumps
015AK2.10	RCP Malfunctions / 4	2.8	2.8	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	RCP indicators and controls
022AG2.2.37	Loss of Rx Coolant Makeup / 2	3.6	4.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to determine operability and/or availability of safety related equipment
026AA1.03	Loss of Component Cooling Water / 8	3.6	3.6	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	SWS as a backup to the CCWS
029EK1.01	ATWS / 1	2.8	3.1	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reactor nucleonics and thermo-hydraulics behavior
040AA1.18	Steam Line Rupture - Excessive Heat Transfer / 4	4.2	4.2	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Control rod position indicators
054AA2.03	Loss of Main Feedwater / 4	4.1	4.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Conditions and reasons for AFW pump startup
055EA2.03	Station Blackout / 6	3.9	4.7	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Actions necessary to restore power
056AK1.01	Loss of Off-site Power / 6	3.7	4.2	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Principle of cooling by natural convection

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
058AK3.01	Loss of DC Power / 6	3.4	3.7	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Use of dc control power by D/Gs
062AA2.03	Loss of Nuclear Svc Water / 4	2.6	2.9	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	The valve lineups necessary to restart the SWS while bypassing the portion of the system causing the abnormal condition
065AK3.08	Loss of Instrument Air / 8	3.7	3.9	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Actions contained in EOP for loss of instrument air
077AK1.03	Generator Voltage and Electric Grid Disturbances / 6	3.3	3.4	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Under-excitation
WE04EA1.3	LOCA Outside Containment / 3	3.8	4.0	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Desired operating results during abnormal and emergency situations.
WE05EK2.2	Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	3.9	4.2	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems and relations between the proper operation of these systems to the operation of the facility.
we11EG2.4.6	Loss of Emergency Coolant Recirc. / 4	3.7	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge symptom based EOP mitigation strategies.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
001AK3.02	Continuous Rod Withdrawal / 1	3.2	4.3	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Tech-Spec limits on rod operability
036AA2.01	Fuel Handling Accident / 8	3.2	3.9	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	ARM system indications
037AG2.2.12	Steam Generator Tube Leak / 3	3.7	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of surveillance procedures.
051AA1.04	Loss of Condenser Vacuum / 4	2.5	2.5	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Rod position
059AA1.02	Accidental Liquid RadWaste Rel. / 9	3.3	3.4	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	ARM system
069AK3.01	Loss of CTMT Integrity / 5	3.8	4.2	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Guidance contained in EOP for loss of containment integrity
074EK2.09	Inad. Core Cooling / 4	2.6	2.6	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Controllers and positioners
WE03EK1.1	LOCA Cooldown - Depress. / 4	3.4	4.0	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Components, capacity, and function of emergency systems.
WE15EA2.2	Containment Flooding / 5	2.9	3.3	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
003A2.03	Reactor Coolant Pump	2.7	3.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Problems associated with RCP motors, including faulty motors and current, winding and bearing temperature problems
004A2.27	Chemical and Volume Control	3.5	4.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Improper RWST boron concentration
004K5.46	Chemical and Volume Control	2.5	2.9	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Reason for going solid in PZR (collapsing steam bubble): make sure no steam is in PRT when PORV is opened to drain RCS
005A1.03	Residual Heat Removal	2.5	2.6	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Closed cooling water flow rate and temperature
006A2.13	Emergency Core Cooling	3.9	4.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Inadvertent SIS actuation
006G2.1.28	Emergency Core Cooling	4.1	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the purpose and function of major system components and controls.
007A1.02	Pressurizer Relief/Quench Tank	2.7	2.9	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Maintaining quench tank pressure
008K2.02	Component Cooling Water	3.0	3.2	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	CCW pump, including emergency backup
010K1.08	Pressurizer Pressure Control	3.2	3.5	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	PZR LCS
010K6.01	Pressurizer Pressure Control	2.7	3.1	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Pressure detection systems
012K4.07	Reactor Protection	3.0	3.2	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	First-out indication

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
013A4.01	Engineered Safety Features Actuation	4.5	4.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	ESFAS-initiated equipment which fails to actuate
013K6.01	Engineered Safety Features Actuation	2.7	3.1	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Sensors and detectors
022A4.01	Containment Cooling	3.6	3.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	CCS fans
026A1.03	Containment Spray	3.5	3.5	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Containment sump level
026A4.01	Containment Spray	4.5	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	CSS controls
039A3.02	Main and Reheat Steam	3.1	3.5	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Isolation of the MRSS
039K5.08	Main and Reheat Steam	3.6	3.6	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Effect of steam removal on reactivity
059K4.18	Main Feedwater	2.8	3.0	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Automatic feedwater reduction on plant trip
061K2.03	Auxiliary/Emergency Feedwater	4.0	3.8	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	AFW diesel driven pump
062A3.01	AC Electrical Distribution	3.0	3.1	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Vital ac bus amperage
063G2.4.20	DC Electrical Distribution	3.8	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of operational implications of EOP warnings, cautions and notes.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
063K3.02	DC Electrical Distribution	3.5	3.7	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Components using DC control power
064K6.08	Emergency Diesel Generator	3.2	3.3	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Fuel oil storage tanks
073K5.02	Process Radiation Monitoring	2.5	3.1	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Radiation intensity changes with source distance
076K1.15	Service Water	2.5	2.6	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	FPS
078K3.03	Instrument Air	3.0	3.4	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Cross-tied units
103K1.02	Containment	3.9	4.1	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Containment isolation/containment integrity

ES-401, REV 9 (RO) **T2G2 PWR EXAMINATION OUTLINE** **FORM ES-401-2**

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
015A1.02	Nuclear Instrumentation	3.5	3.6	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	SUR
016A3.02	Non-nuclear Instrumentation	2.9	2.9	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Relationship between meter readings and actual parameter value
027K2.01	Containment Iodine Removal	3.1	3.4	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Fans
028K5.04	Hydrogen Recombiner and Purge Control	2.6	3.2	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	The selective removal of hydrogen
034K6.02	Fuel Handling Equipment	2.6	3.3	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Radiation monitoring systems
071K3.04	Waste Gas Disposal	2.7	2.9	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Ventilation system
072A4.01	Area Radiation Monitoring	3.0	3.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	Alarm and interlock setpoint checks and adjustments
075G2.1.30	Circulating Water	4.4	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to locate and operate components, including local controls.
079K4.01	Station Air	2.9	3.2	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Cross-connect with IAS
086K1.02	Fire Protection	2.7	3.2	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Raw service water

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
G2.1.15	Conduct of operations	2.7	3.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of administrative requirements for temporary management directives such as standing orders, night orders, Operations memos, etc.
G2.1.3	Conduct of operations	3.7	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of shift or short term relief turnover practices.
G2.1.43	Conduct of operations	4.1	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to use procedures to determine the effects on reactivity of plant changes
G2.2.20	Equipment Control	2.6	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the process for managing troubleshooting activities.
G2.2.22	Equipment Control	4.0	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of limiting conditions for operations and safety limits.
G2.2.7	Equipment Control	2.9	3.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the process for conducting special or infrequent tests
G2.3.13	Radiation Control	3.4	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiological safety procedures pertaining to licensed operator duties
G2.4.11	Emergency Procedures/Plans	4.0	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of abnormal condition procedures.
G2.4.13	Emergency Procedures/Plans	4.0	4.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of crew roles and responsibilities during EOP usage.
G2.4.27	Emergency Procedures/Plans	3.4	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of "fire in the plant" procedures.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
029EA2.09	ATWS / 1	4.4	4.5	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Occurrence of a main turbine/reactor trip
038EG2.4.8	Steam Gen. Tube Rupture / 3	3.8	4.5	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of how abnormal operating procedures are used in conjunction with EOPs.
054AG2.1.23	Loss of Main Feedwater / 4	4.3	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to perform specific system and integrated plant procedures during all modes of plant operation.
055EA2.03	Station Blackout / 6	3.9	4.7	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Actions necessary to restore power
058AG2.4.20	Loss of DC Power / 6	3.8	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of operational implications of EOP warnings, cautions and notes.
WE12EA2.2	Steam Line Rupture - Excessive Heat Transfer / 4	3.4	3.9	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
061AG2.4.30	ARM System Alarms / 7	2.7	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of events related to system operations/status that must be reported to internal orginizations or outside agencies.
068AA2.08	Control Room Evac. / 8	3.9	4.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	S/G pressure
we08EG2.1.19	RCS Overcooling - PTS / 4	3.9	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to use plant computer to evaluate system or component status.
WE13EA2.1	Steam Generator Over-pressure / 4	2.9	3.4	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
012A2.01	Reactor Protection	3.1	3.6	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Faulty bistable operation
039A2.03	Main and Reheat Steam	3.4	3.7	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Indications and alarms for main steam and area radiation monitors (during SGTR)
062A2.04	AC Electrical Distribution	3.4	3.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Effect on plant of de-energizing a bus
076G2.1.32	Service Water	3.8	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to explain and apply all system limits and precautions.
103G2.2.44	Containment	4.2	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	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

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
002A2.04	Reactor Coolant	4.3	4.6	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Loss of heat sinks
014G2.2.22	Rod Position Indication	4.0	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of limiting conditions for operations and safety limits.
068A2.02	Liquid Radwaste	2.7	2.8	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Lack of tank recirculation prior to release

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
G2.1.41	Conduct of operations	2.8	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the refueling processes
G2.1.7	Conduct of operations	4.4	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior and instrument interpretation.
G2.2.13	Equipment Control	4.1	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of tagging and clearance procedures.
G2.2.40	Equipment Control	3.4	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to apply technical specifications for a system.
G2.3.12	Radiation Control	3.2	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiological safety principles pertaining to licensed operator duties
G2.4.46	Emergency Procedures/Plans	4.2	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to verify that the alarms are consistent with the plant conditions.
G2.4.9	Emergency Procedures/Plans	3.8	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies.

Tier / Group	Randomly Selected K/A	Reason for Rejection
T1 / G1	026AA1.05.	026AA1.03 SWS does not backup CCW at Surry. Replaced 11/19/15 (Mark Bates for Bruno Caballero).
T2 / G1	061K2.02	061K2.03 Surry has no diesel AFW pumps. Replaced 11/19/15 (Mark Bates for Bruno Caballero).
T2 / G1	076K1.19	076K1.15 FPS has not interface with SWS at Surry. Replaced 11/19/15 (Mark Bates for Bruno Caballero).
T2 / G1	004K5.37	004K5.46 Could not write a discriminating question. Replaced 11/19/15 (Mark Bates for Bruno Caballero)
T2 / G2	086K1.03	086K1.02 FPS has not interface with SWS at Surry. Replaced 11/19/15 (Mark Bates for Bruno Caballero)
T2 / G2	017A2.02	SRO: 068A2.02 Limited SRO responsibilities led to inability to write discriminating question on original topic. Replaced 11/19/15 (Mark Bates for Bruno Caballero).

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Facility: Surry Date of Exam: 9-19-16 Exam Level: RO ☐ SRO ☐

Item	Description	Initial a	Initial b*	Initial c* a
1	Questions and answers are technically accurate and applicable to the facility	m	RP	GVE
2	a NRC K/As are referenced for all questions b Facility learning objectives are referenced as available	m	RP	GVE
3	S=O questions are appropriate in accordance with Section D.2.d of ES-401	m	RP	GVE
4	The sampling process was random and systematic (If more than 4 RO or 2 SRO questions were repeated from the last two NRC licensing exams, consult the NRR/NRO OL program office.)	m	RP	GVE
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)	m	RP	GVE
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: 10/0 Modified: 21/24 New: 69/76	m	RP	GVE
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: 42/4 C/A: 58/96	m	RP	GVE
8	References/handouts provided do not give away answers or aid in the elimination of distractors	m	RP	GVE
9	Question content conforms to specific K/A statements in the previously approved examination outline and is appropriate for the tier to which they are assigned; deviations are justified	m	RP	GVE
10	Question psychometric quality and format meet the guidelines in ES Appendix B	m	RP	GVE
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	m	RP	GVE

		Printed Name / Signature	Date
a	Author	Michael R. Meyer / Michael R Meyer	6-17-16
b	Facility Reviewer (*)	Rich Philpot / Richard Philpot	6/20/16
c	NRC Chief Examiner (#)	GARY CALLAWAY / Gary Callaway	8/24/16
d	NRC Regional Supervisor	Gerald McCoy / Jerry McCoy	9/14/2016

Note: * The facility reviewer's initials or signature are not applicable for NRC-developed examinations.
a Independent NRC reviewer initials items in Column "c"; chief examiner concurrence required.

Q	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. Source (B/ M / N)	7. Status (U /E /S)	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist	Partial	Job-Link	Minutia	# / Units	Back ward	Q – K/A	SR O Only			
1	F	2												N	U	K/A mismatch. K/A is for continuous rod withdrawal, question is for rod drop. Also, actual drop time is window dressing. Deleted actual rod drop time. Changed P1 question to meet K/A. I think it has a subset issue. If B is true, A is true. Chang to ask for a maximum drop time. Added "maximum" to P2 question to correct subset issue. SAT
2	F	2												N	E	If the RCP is tripped IAW step 16ff there is no procedure direction to close a spray valve. Change to ask the relationship between RCPs and spray valves. Moved AP-9.00 ref. from question to P1. Changed Part 2 to question relationship between RCPs and Spray valve. Second part is clumsy. Change to ___ spray valve must be closed when 1-RC-P-1A is tripped. Changed second part as noted. SAT
3	F	2												N	E	"a minimum boron of" should say "a minimum boron concentration of". Added "concentration" to P1. SAT
4	H	2				X						X		N	U	This question does not test the **Effects** of boron saturation on ion exchanger behavior i.e. What happens differently when saturated vs. not saturated. Also has subsset issues. If A is true, so is B. Same with C and D. Changed Q to better meet K/A. Question stem changed by asking effect of changing temp for a demin bed that has been in service and is boron saturated. This tests knowledge of change in boron saturation. Changed P2 to eliminate subset by asking for maximum allowed difference in boron allowed. SAT
5	H	2												N	S	
6	H	4												N	E	Change to ask for the first SI signal actuated. Changed P1 to ask for first SI signal. SAT
7	H	2												N	S	

8	H	2											M	E	Initial PRT conditions and RCP status are window dressing. Removed PRT, and RCP conditions from stem. SAT
9	H	2											N	E	“Spurious” is window dressing. Removed “Spurious” from question stem. SAT
10	H	2											N	S	
11	H	2											N	S	
12	H	2											N	S	

13	H	2											N	S	
14	H	2											N	E	Do not diagnose in stem (LBLOCA). Removed LBLOCA from stem. SAT

Q	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. Source (B/ M / N)	7. Status (U /E /S)	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist	Partial	Job-Link	Minutia	# / Units	Back ward	Q – K/A	SR O Only			
15	F	2												N	E	Borderline LOD 1. The question gives that the initiating event is a loss of flow and asks the applicant to determine that the cause of the trip is loss of flow. Change the initial condition to a power level closer to (but above) P-8. Perhaps 2-part. First part, is cause of trip. RCS flow or SG level. Second part, Is this indicated by color or flashing rate. The reason for the RCP trip is window dressing. Changed power level in stem of question to 40%. Changed to 2-part question. P1 asks for annunciator that caused reactor trip. P2 asks for color of First out annunciator. SAT
16	H	2												N	E	Do not diagnose in stem (LBLOCA). Replaced LBLOCA with indications that would be present; Crew enters AP-16.00 (Initial); RCS pressure 150 psia and lowering (Current). Subset. If A is true, B is true. Say minimum action required. Also, since the justification for the distractor is that a different pump requires CLS to be reset, that seems like a more credible distractor (Reset CLS, place control switch in PTL. Changed Part 2 to "What is minimum action required…" Changed distractor A2 and C2 as noted above. SAT
17	H	2												N	S	
18	H	2												B	S	
19	F	2				X								B	E	"to minimize the time required to repressurize the RCS" is not a credible distractor. What is the link between continued RCP operation and time to subsequently repressurize? Changed C2 and D2 distractor to a more credible distractor that relates to Seal DP. SAT
20	H	2				X								N	E	One only needs to know the definition of the word "median" to get the second half correct. Suggest you ask about control response (or lack of control response). Changed P2 to ask about "Control Rods". Change from asking what "will" happen to asking what "should" happen. Changed P2 question to "Should control rods move?" SAT

21	F	2												N	E	Do not diagnose in the stem (SBLOCA). Just give observable info the applicant needs to answer the question. Deleted "small break LOCA. Added bullet to indicate RCS pressure is 800 psig and lowering. SAT
22	F	2				X						X		N	U	It is intuitive that the least number of charging pumps best accomplishes overpressure mitigation. The applicant does not have to know anything about the LCO to get this one. Also this has nothing to do with loss of Rx coolant makeup. Changed question to better meet K/A. Question poses scenario where a boration path is rendered inop. Candidates have to assess if they meet TS requirements for Boron injection. The word "claiming" in the stem is unnecessary. Removed "claiming" and replaced with ____, making this question a fill-in-the-blank question. SAT
23	F	2										X		N	U	KA mismatch. Do not have to know anything about containment sump level to correctly answer this question. Changed question from Containment Spray To Recirc Spray requirements which states that Recirc Spray pumps must be secured if Ctmt. Sump level is < 4.0 feet. Subsets. If B is true, C is true. Ditto A and D. Need a limiter in the stem. Also restate stem as a requirement (must be secured). Added limiter to eliminate subset issue, and changed question to "…the minimum Containment sump level for operatin of the Recirc Spray pumps is ___." Kept distractor values the same. SAT
24	F	2												N	S	
25	H	2												M	E	Don't ask what shall be done. Ask what is required. Changed question from "what shall be…" to "what action is required to be taken…" SAT
26	F	2												N	S	

Q	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. Source (B/ M / N)	7. Status (U /E /S)	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist	Partial	Job-Link	Minutia	# / Units	Back ward	Q – K/A	SRO Only			
27	F	2												N	E	Give a range on the distractor temperature to match the structure of the correct answer. Do not diagnose in the stem (LBLOCA). Give the applicant the observable indication necessary to answer the question. Gave range on distractors and changed indications to not diagnose in stem. SAT
28	H	2												M	E	Don't diagnose in stem (ATWS). Give an initial power level. The first two columns comprise four unique answers. The second 2 columns add nothing. "Several minutes" is too fuzzy. After some time, RCS pressure will either be controlled by safeties/PORVs, or else go offscale high. Either way, pressure will not rise forever. Does "all feedwater . . .has been lost" include AFW? If not, specify. If so, I think this accident has not been analyzed. Re-wrote stem to give initial power as well as specify loss of MFW. Removed PZR Level and Steam Pressure columns. Changed "several minutes" to "two (2) minutes". SAT
29	F	2												N	E	Don't ask what "would" happen. Ask about requirements. Changed stem to ask which of the listed RMs was required to be in service for fuel movement. The version you sent me did not include this change. Intended change was inadvertently not sent, desired change attached. Stem should refer to required OPERABILITY of the rad monitor. Added "to be operable" to stem. SAT
30	H	2				X								N	E	Is there a link between loading a spent fuel cask and an area rad alarm in the new fuel storage area? Ensure this is operationally valid. The New fuel storage area and Spent fuel storage area are in same building and adjacent to each other. A fuel handling accident in the Fuel Building would affect both radiation monitors. Also, it does not seem credible to me that a valid area rad alarm has no effect on fuel handling activities. The distractor analysis refers to fuel assembly reconstitution, but the stem says that cask loading is in progress.

																Revised question to ask the required MCR actions regarding ventilation lineup. Also revised distractor analysis to reflect cask load vice fuel reconstitution. SAT
31	H	2										X		N	U	Appears to be a K/A mismatch. What surveillance procedure is involved? Changed question to require candidate to use 0-OSP-RC-002 to calculate a primary-to-secondary leak rate. Now matches KA. SAT
32	H	2												M	E	Much window dressing. The question simply asks what devices reposition in response to a main steam isolation signal and what causes such a signal. Everything above "Which ONE" seems to be unnecessary. Removed "window dressing" and changed wording as needed. SAT
33	H	2												M	S	How can the applicant determine that MTC is negative? Added bullet stating that ramp plan calls for dilutions for duration of ramp, implying negative MTC. Your comment does not describe what you actually did, but what you did is probably fine. If the value of MTC is normally available in the control room this question is SAT. It MTC is not normally readily accessible, give a boron concentration indicative of late in core life. MTC is not readily accessible in MCR, so changed bullet stating that RCS boron is 300 ppm. This should provide enough information to the candidates that MTC is negative. SAT

Q	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. Source (B/ M / N)	7. Status (U /E /S)	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist	Partial	Job-Link	Minutia	# / Units	Back ward	Q – K/A	SRO Only			
34	H	2				X								N	E	The distractor analysis says that if the turbine were in IMP IN, inward rod motion is credible. Wouldn't IMP IN aggravate the situation and make the cooldown worse? i.e. the turbine would respond to the drop in impulse pressure by taking more steam? Removed reference to IMP IN and added explanation of Power Mismatch Circuit. SAT
35	H	2												N	S	
36	H	2												M	S	
37	H	2												N	E	Ensure that the name of the switch in the stem exactly matches plant labeling. i.e. if "giveaway" is not on the label, don't use it in the question. Replaced "giveaway" with actual switch name (non-unit-specific). SAT
38	H	2												B	E	Lowering SG pressure by itself does not indicate Natural circulation is in progress. It would drop as a result of steaming and feeding even if loop isolation valves were closed. Perhaps "consistent with" is a more accurate phrase. Also, "slowly lowering" may be necessary (per procedure). If it rapidly lowers and Tcold doesn't follow it, this is an indication of a loss of NC. Changed stem to replace "indicates" with "is consistent with". Also changed "stable or lowering" to "slowly lowering". With this wording, I think B is also correct. Replace t with a distractor that is inconsistent with natural circulation. Replaced distractor B with an indication that is NOT consistent with Natural Circulation; "CETCs rising." SAT
39	F	2												N	S	
40	F	1												N	U	It is general employee knowledge to stop a radioactive leak if possible. This does not test licensed knowledge. Also, is AUX BLDG SAMPLE Radiation Monitor 1-RM-156 an area monitor? Perhaps require the applicant to identify a possible source for a given Area rad alarm? Rewrote question to require applicant to identify likely source of a particular RM alarm.

																SAT
41	F	2												M	S	Send a reference that shows that median Tavg is used for feed isolation. Added reference (0-AP-53.00, Attachment 4) showing Tave Control Circuit. SAT
42	F	2												B	S	
43	H	2												M	S	
44	H	2												N	S	
45	F	2										X		N	U	This does not test an EOP warning, caution, or note. This question can be answered with system knowledge only. Discussed with Chief – Surry doesn't have EOP actions for Loss of DC. Caution will come from 1-AP-10.06, Loss of DC Power. Chief agreed on phone call. SAT

Q	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. Source (B/ M / N)	7. Status (U /E /S)	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist	Partial	Job-Link	Minutia	# / Units	Back ward	Q – K/A	SRO Only			
46	F	2												B	E	Each possible answer contains a different component failure, 3 of which are wrong, so the "why" adds nothing. Simply ask which of these responses is a direct result of the loss of the associated DC Power. Removed the "why" component in the responses. SAT
47	F	2										X		B	U	K/A mismatch. This tests the effect of an EDG failure on fuel oil system, instead of the other way around. Rewrote question to determine the effect on EDGs (Tech Spec) with the Aboveground Fuel Oil Storage Tank removed from service. Tested the candidates knowledge of the minimum on-site fuel oil required. This version of the question makes most of the stem into window dressing. I believe that the minimum requirement is independent of the current status of tanks. I suggest you make this an evaluation of how the unavailability of the above ground tank affects EDG operability. Removed the bullets pertaining to the Underground Fuel Oil Storage Tanks. Changed question to ask minimum fuel oil in UFOSTS per TS 3.16. Changed distractor D to 40,000 gal. to better match question. Re-sequence answers from higher to lower or vice versa. Re-sequenced answers from higher to lower. SAT
48	H	2												N	S	
49	F	2										X		N	U	Do not diagnose in stem (SBLOCA). K/A mismatch. This is not "guidance contained in EOP" Rewrote question to use EOP guidance and removed SBLOCA from stem. FR-Z.1 step 6 also directs closing MSTVs. Is the point to ask which one is first? Changed stem bullet to indicate all other ESF equip responded as designed (other than MSTVs). This done to bolster question to support fact that FR-Z.1 is not required to be entered because both trains of CS operated. Changed P1 to state "…which procedure will first close MSTVs" Note: this may not be necessary if FR-Z.1 entry conditions are not met. SAT
50	F	2												M	E	Explain how this is a "ventilation system". Process Ventilation System takes suction of dilution air in the Auxiliary Building near the Primary Sample Sink using Process Ventilation Blowers, discharging

																through the lightning rods on top of containment. Drawing attached. SAT
51	F	2												M	S	
52	H	2												M	S	
53	H	2												N	U	K/A mismatch. This question can be answered solely on system knowledge. Everything following "Given the following" is window dressing. The particular condition of the plant is not relevant to the question. Don't diagnose in stem (small LOCA). Rewrote question to better match the KA. SAT
54	F	2												N	E	The question is confusing. It implies that the pump start location is dependent on screen speed. Is screen in fast an interlock or only a procedure requirement? Split question into 2 discrete parts to allay confusion. SAT
55	H	2												N	E	Don't diagnose in stem. Give indication the operator can see. Revised stem to give operator indications rather than diagnosis. SAT
56	F	2												N	S	
57	H	2												N	S	
58	H	2												N	S	

Q	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. Source (B/ M / N)	7. Status (U /E /S)	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist	Partial	Job-Link	Minutia	# / Units	Back ward	Q – K/A	SRO Only			
59	H	2												N	S	
60	F	2												B	S	
61	F	2												M	E	Don't diagnose in stem. Revised stem. SAT
62	F	2				X								N	E	The 2nd part does not discriminate. The applicant is told that a pressure change has a reactivity effect and then asks the applicant to determine that this is due to a pressure coefficient of reactivity. Also, I suspect that the pressure coefficient is due, at least in part, to voids from nucleate boiling. Revised question to better differentiate what causes the reactivity change. SAT
63	F	2												N	S	
64	F	2												M	S	
65	F	2												M	S	
66	F	2												N	S	
67	F	2												N	S	
68	F	2												N	U	There is no apparent link to radiation control or radiological safety procedures. Replaced question with a bank question from North Anna's 2014 NRC exam. SAT
69	F	2												N	S	
70	F	2												M	S	
71	F	2												N	S	
72	H	2												N	E	Don't' diagnose in stem. Revised stem. SAT
73	H	2												N	E	Don't diagnose in stem. Revised stem.

																SAT
74	H	2												M	S	
75	H	2												M	E	Don't diagnose in stem. Revised Stem. SAT

Q	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. Source (B/ M / N)	7. Status (U /E /S)	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist	Partial	Job-Link	Minutia	# / Units	Back ward	Q – K/A	SR O Only			
76	H	2												M	S	
77	H	2												N	S	
78	H	2												N	S	
79	H	2												N	S	
80	H	2												N	S	
81	H	2												N	E	One tube rupture cause N-16 alarms on all SGs? What is the reference for this? In order to conclude from SG WR trends that the 'B" SG is ruptured, it is necessary to know AFW flow rates and steaming rates. Since our N-16 RMs are located very close to each other (w/in ~ 5 feet), it is expected that a SGTR in one SG will cause all N-16 RMs to alarm due to "shine". They are designed to detect very small leaks (0-200 gpd - equivalent to 0.14 gpm) that would otherwise not be seen. Revised stem to include feed/steam rates. SAT
82	H	2												N	S	
83	H	2						X						N	E	It does not seem operationally valid for PZR level and subcooling to be stable with an elevated containment pressure. What is the source of pressure in containment? The distractor analysis for A says "Plausible if candidate determines . . . based on PRZR level lowering". PRZR level is stable in the stem. Clumsy wording in stem. "The First procedure attempted to" and Which procedure, will the team". Perhaps "The first attempt to load EDG #1 is done in accordance with" and remove the comma in the second part (after procedure). Revised conditions and stem IAW NRC comments. Provided more operationally-valid indications. CTMT pressure would be expected to be elevated due to loss of cooling. Revised distractor analysis to refer to elevated CTMT pressure vice PZR level. SAT

84	H	2												N	E	A complete loss of DC is *possible* at any time. Add to the first part "in accordance with ECA 0.0." Giving the entire TRM to the applicant contains a risk of compromising another question. Ensure that no other question is affected by this reference. Revised stem IAW NRC comments. Only one other question (#63) refers to the TRM, and then only to administrative requirements if a TRM item is determined to be inadequate. There is no compromise by giving the TRM as a reference. Subset issues. If C is correct, A is correct (so I wouldn't pick C because I know there are not 2 correct answers). Ned a modifier in stem. Added modifier "minimum" to P1. Used a range of time which better matches ECA-0.0 Note. This started as a TRM question, but in the present form, how is this SRO only? The form says it is procedure selection, but no procedure is selected. If this is unique to the SRO position in your training program. Attach the relevant learning objective. Added Objective C for ND-88.1-LP-10, TRM Overview to Objective field and Part 55 content. Added Figure1: Screening for SRO-only linked to 10CFR 55.43(b)(2), to Question Reference section. SAT

Q	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. Source (B/ M / N)	7. Status (U /E /S)	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist	Partial	Job-Link	Minutia	# / Units	Back ward	Q – K/A	SRO Only			
85	H	2												N	S	What does the note before the question mean?. It seems to me that adding the third bullet inappropriately tells the applicant that an emergency classification is necessary when that seemed to be the point of the question. Also, I thought the reference we were providing was the E-plan classification document. The associated learning objective says "utilizing the EAL charts". Removed note and third bullet. The E-plan classification document is interchangeably referred to as the "EAL Matrix" or "EAL Charts". SAT
86	H	2						X						N	E	The 5 minute delay does not seem operationally relevant. In the stated sequence, this 5 minutes would have elapsed. Also, explain how the loss of this bus is causing intake canal level to go down. Revised to ask the reason for the 5-minute delay. The loss of 1G bus results in the loss of all Unit 1 CW pumps. With power restored, the crew would be expected to restart any previously running CW pumps. SAT
87	H	2												M	E	Don't diagnose in the stem. Why is RVLIS rising? Revised stem to give indications that the operator would have. Removed "rising" from RVLIS indication. SAT
88	H	2				S								N	E	"Reference provided" is contradicted by "Reference provided to applicant: NO" It seems that this would lead to E-plan activation, so 4 hour is not a credible distractor. The explanation says 'requires hospitalization" but this information is not in the stem. Changed "No" to "Yes" for reference provided. Changed 4-hour report to 8-hour report as this is more plausible. VPAP-2802, section 6.3.5.b requires an 8-hour report to be made if an Alert/SAE/GE was declared. Actual report of the EAL is governed by EPIP-2.0.1/2.0.2, and not VPAP 2802. Changed the stem to include "require hospitalization for their injuries". SAT You must have changed you mind about someone needing hospitalization as part of the question.
89	H	2												N	E	Doesn't the low temperature in the pump house make all ESW pumps inoperable which affects both units?

																If so, that seems more operationally relevant than the battery inoperability. Revised Part 1 to remove reference to ESW Pump batteries and just asked for ESW Pump status. Both units are affected, but TS allows two ESW pumps to be operable if one unit is in CSD with low SFP heat load. Unit 2 is on the way there, but not there yet. SAT
90	H	2												M	E	Why is circ/serv water temperature given in stem? CW/SW temperature is a required variable to determine Containment Allowable Air Partial Pressure IAW the TS figure. SAT
91	F	2												N	S	
92	H	2												N	S	
93	H	2												N	S	
94	H	2						X						N	E	Don't make it generic. Pick a particular example where this rule applies and use that as the premise of the question. It could be open reference for the LCO in question (but do not include the basis section that applies to specifically answer the question). Made the question more specific, relating to a faulted electrical bus. Reference not required. SAT

Q	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. Source (B/ M / N)	7. Status (U /E /S)	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist	Partial	Job-Link	Minutia	# / Units	Back ward	Q – K/A	SR O Only			
95	H	2												N	E	The sentence that begins with "Which ONE of the following" is unnecessary and does not flow with the following statements. Removed the unnecessary statement. SAT
96	H	2												N	S	
97	H	2												N	S	
98	H	2												M	E	Inappropriate references to FR-H.1. (technical references, distractor analysis). Is the operator expected to determine that pressure/temperature conditions are to the right of limit A from memory? On other questions that allow references, there was a note that said "references provided". I did not see that here. This is not SRO only because of procedure selection, but because of the classification. Red path entry is RO knowledge. Removed references to FR-H.1. Yes, the operator is expected to know the conditions that would place him/her to the right of Limit A. Removed reference since a picture of the screen is provided in the body of the question. Removed reference to procedure selection as basis for SRO-only. SAT
99	H	2												M	E	Don't ask what the SRO will do. Ask what is required. Revised stem to incorporate NRC comments. SAT
100	H	2												M	E	Priority is fuzzy when use of yellow path procedures is optional. Ask about the terminus of the heat sink status tree. Don't ask about expected team actions. Ask what the procedure referenced in the above terminus would direct. You clearly changed the question but I think you comments got lost here. The 2nd part of the C distractor is not credible the way it is written. Perhaps you meant to use the PORV to steam the level down. Perhaps say "to reduce inventory. Added "reduce inventory" to C2. SAT

Facility: SURRY Date of Exam: 9/19 - 10/10/2016 Exam Level: RO X SRO X

Item Description		Initials a	Initials b	Initials c
1.	Clean answer sheets copied before grading	SS	N/A	GE
2.	Answer key changes and question deletions justified and documented N/A			
3.	Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations)	SS	N/A	GE
4.	Grading for all borderline cases (80 ±2% overall and 70 or 80, as applicable, ±4% on the SRO-only) reviewed in detail	SS	N/A	GE
5.	All other failing examinations checked to ensure that grades are justified N/A			
6.	Performance on missed questions checked for training deficiencies and wording problems; evaluate validity of questions missed by half or more of the applicants	SS	N/A	GE

	Printed Name/Signature	Date
a. Grader	Swetha Shah Swetha Shah	10/03/2016
b. Facility Reviewer(*)	N/A	
c. NRC Chief Examiner (*)	Gary W. Callaway	10/4/2016
d. NRC Supervisor (*)	Eugene Guthrie	10/11/16

(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

May 6, 2016

Catherine Haney, Regional Administrator
United States Nuclear Regulatory Commission Region II
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

Serial No. 16-143
SS&L/TSC
Docket Nos. 50-280
50-281
License Nos. DPR-32
DPR-37

Dear Ms. Haney,

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
SUBMITTAL OF OPERATING TEST OUTLINES AND
SUPPORTING REFERENCE MATERIALS

NRC letter dated March 24, 2016, Notification of License Operator Initial Examination - Surry Power Station, requested transmittal of the operating test outlines, and reference materials by May 3, 2016. The written examination will be due by May 16, 2016, and the operating test will be due by June 21, 2016. The timely submittal will support the initial reactor operator and senior reactor operator examinations scheduled for the weeks of September 19 and September 26, 2016.

This letter is to inform you that the initial license operating test outlines and Forms ES-201-2, ES-201-3, ES-301-1, ES-301-2, ES-301-5, ES-D1, ES-401-2, ES-401-3 and ES-401-4 were transmitted to Mr. Gary Callaway, NRC Chief Examiner, on May 2, 2016 and received on May 3, 2016. We request that the materials submitted to the NRC be withheld from public disclosure until after the operator examinations have been administered.

If you have any questions or require additional information, please contact Mr. Paul Orrison or Mike Meyer at (757) 365-2835.

Very truly yours,

N. L. Lane
Site Vice President
Surry Power Station

Commitments: None

copy: Mr. Gerald J. McCoy
Chief, Operations Branch
United States Nuclear Regulatory Commission Region II
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Document Control Desk
United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Senior Resident Inspector
Surry Power Station

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

May 25, 2016

Catherine Haney, Regional Administrator
United States Nuclear Regulatory Commission Region II
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

Serial No. 16-143A
SS&L/TSC
Docket Nos. 50-280
50-281
License Nos, DPR-32
DPR-37

Dear Ms. Haney,

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
SUBMITTAL OF WRITTEN EXAMINATION

NRC letter dated March 24, 2016, Surry Power Station - Notification of Licensed Operator Initial Examination, requested transmittal of the written examination to support the initial reactor operator and senior reactor operator tests scheduled for the weeks of September 19 and September 26, 2016. This letter is to inform you that the written examination was transmitted on May 16, 2016 and received by Mr. Gary Callaway, NRC Chief Examiner, on May 17, 2016.

We request that the materials submitted to the NRC be withheld from public disclosure until after the operator examinations have been administered.

If you have any questions or require additional information, please contact Mr. Paul Orrison or Mr. Mike Meyer at (757) 365-2835.

Sincerely,

N. L. Lane
Site Vice President
Surry Power Station

Commitments made by this letter: None

cc: Mr. Gerald J. McCoy
Chief, Operations Branch
United States Nuclear Regulatory Commission Region II
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245 Peachtree Center Ave., NE, Suite 1200
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United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Senior Resident Inspector
Surry Power Station