Facility: 2017-301 Brunswick Date of Examination: 7/24/17

Developed by: Written: Facility [X] NRC [ ] // Operating Facility [X] NRC [ ]

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

* 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: Brunswick Nuclear Plant Date of Examination: 07/24/2017

Item	Task Description	Initials a	Initials b*	Initials c#
1. WRITTEN	a. Verify that the outline(s) fit(s) the appropriate model, in accordance with ES-401 or ES-401N.			
	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.			
	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. 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.			
	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. 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.			
	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. GENERAL	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).			

	Printed Name/Signature	Date
a. Author	J. Vieira /	4/3/2017
b. Facility Reviewer (*)	N/A	
c. NRC Chief Examiner (#)	Phillip G. Capehart /	4/3/2017
d. NRC Supervisor	Gerald J. McCoy /	4/19/2017

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

ILT 2017 NRC Exam

ES-201 | **Examination Security Agreement** | **Form ES-201-3**

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 7-24/7-31/8-7 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 1-24/31/8-7 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.	Dan Hudgin	Exam Writer		1-11-17		8/9/17	
2.	Robert Bolin	Exam writer		1-11-17		8/9/17	
3.	Byron Batson	Security Systems Specialist		1-11-17		8/24/17	
4.	Eddie Rail	EXAM Supervisor		1-11-17		8/9/17	
5.	Craig Oliver	Facility Reviewer		1-24-17		8-9-17	
6.	Ricky Lumpkin	OPS INSTRUCTOR - INITIAL		3-20-17		8/14/17	
7.	Jeffrey DeLoach	SIM SUPPORT		3/28/17		8/15/17	
8.	John Beggs	SIM SUPPORT		4/18/17		8/9/17	
9.	DAVID S. PUTLAND	RX OPERATOR		4-19-17		8-15-17	
10.	SHAWN TANDLER	R.O.		4-19-17		8-29-17	
11.	BRIAN WEST	CRS		4-19-17		8/15/17	
12.	Michael D. Long	CRS		5-2-17		8-11-17	
13.	Freddie Bunnell	RO		5/2/17		8/15/17	
14.	Robert Lax	RO		5-2-17		8-16-17	
15.	Jimmy Booker	RO		5-4-17		8-15-17	

NOTES:

ES-201 | **Examination Security Agreement** | **Form ES-201-3**

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 7/24 - 7/31 - 8/7 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 7/24 - 8/7. 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.	CHARLES BROUSSARD	RO		5-4-17		8-15-17	
2.	John Cannon	SRO		5/8/17		9/18/17	
3.	Spring Seiger	SRO		5-9-17		8/23/17	
4.	Beechaw	SRO		5-9-17		8-23-17	
5.	HUNTER MORRIS	RO		5-9-17		8-14-17	
6.	Andrew Stoltz	RO		5-5-17		8-14-17	
7.	Kimberly Embry	RO		5/20/17		8/15/17	
8.	Rob McHs	SRO		5-20-17	Robert W	8-22-17	
9.	Jacob Bush	RO		5.20.17		8.10.17	
10.	CHRIS LAMPE	RO		5-24-17	left company	9-11-17	
11.	Mark Smiley	OTM		6/5/17		8-10-17	
12.	MICHAEL MARCELLE	RO		6/20/17		8.10.17	
13.	Kevin Hamm	SRO		6/20/17	via telecom	9-11-17	
14.	Adam Williams	SRO		6/20/17		8/15/17	
15.	David Cribb	RO		6/22/17		8/10/17	

NOTES:

ES-201 **Examination Security Agreement** **Form ES-201-3**

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 7/24 - 8/7. 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.	Jim Doblar	CRS		6/22/17		8-22-17	
2.	R. Neal Gaulger	CRS		6/26/17		8-15-17	
3.	L. Hoggard	CRS		6-26-17		8-16-17	
4.	Laurence Dunlap	SIM SUPPORT		6/26/17		8/15/17	
5.	Travis McPherson	I/E		6-26-17		8-14-17	
6.	Jackie McPherson	I/C		6-26-17		8-14-17	
7.	Keith L. Hudson	OPS		6-26-17		8-9-17	
8.	Debbie Pickett	OPS		7/6/17		8/9/17	
9.	Kurt Krueger	OPS MGR		7/7/17		8-9-17	
10.	Doug Dillmann	OPS / CRS		7-8-17		8-9-17	
11.	James Buchingham	OPS TNG		8/7/17		8/9/17	
12.	~~Jacob Bu~~ 8.10.17						
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14.							
15.							

840-3766 ed
70-4951 ed

NOTES:

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 7/24/17 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

ADMIN JPM RC-1

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 7/24. 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.	Brian P. Stetson	Ops Instructor	BP Stetson	7/21/17	BP Stetson	07/28/17	
2.	Joshua R Ashcroft	Ops Instructor	Josh Ashcroft	7/21/17	Josh Ashcroft	8/2/17	
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NOTES:

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 7/24/17 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

IN-PLANT JPM's

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 7/24/17. 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 Poplin	SEQUESTER		7-28-17		7-28-17	
2	Brian P Stetson	Ops Instructor		7/24/17		7/24/17	
3	Josh Ashcroft	Ops Instructor		7/28/17		8/2/17	
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NOTES:

1. **Pre-Examination**

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 7/24/17 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**

Admin JPM's

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 7/24/17. 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.	Brian Stetson	Ops Instructor	BP Stetson	07/31/17	BP Stetson	7/31/17	
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NOTES:

Facility: Brunswick Nuclear Plant Date of Examination: 07/24/2017

Examination Level: RO Operating Test Number: 2017-301

Administrative Topic (see Note)	Type Code *	Describe activity to be performed
Conduct of Operations (COO-1, RO/SRO)	R, D	Evaluate Jet Pump performance per 0PT-13.1 K/A G2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation (4.3)
Conduct of Operations (COO-2, RO only)	R, M	Perform Total Ground Resistance Calculation for DC SWBD 2A and 2B per 2OP-51 K/A G2.1.7 Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretation. (4.4)
Equipment Control (EQ-1, RO only)	R, M	Verify Protected Equipment Area K/A G2.2.14 Knowledge of the process for controlling equipment configuration or status. (3.9)
Radiation Control (RC, RO/SRO)	R, N	Determine TEDE While Working in a High Airborne Area K/A G2.3.4 Knowledge of Radiation Exposure Limits under normal or emergency conditions. (3.2)
Emergency Plan	n/a	n/a

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)

Conduct of Operations (COO-1): Evaluate Jet Pump performance per 0PT-13.1

For COO-1, with a set of given data sheets, the applicant is expected to perform 0PT-13.1. Ensure that JPM critical steps include acceptable parameter ranges for critical step performance (e.g. calculated speed determined to be 90% +/- 1%, recirculation flow 45k gpm +/- 500 gpm, or jet pump psid 30% +/- 1%). Acceptable ranges should have a basis that stems from accuracy of the indications being used.

This JPM requires a completed 0PT-13.1 Answer Key. Ensure the JPM Initiating Cue specifies that the Applicant is to determine what actions (if any) are required based on the given conditions (include correct responses as JPM critical steps).

Bank JPM (may be modified following inclusion of applicant determined actions)

Reference: LOT-ADM-JP-002-02

Conduct of Operations (COO-2): Perform Total Ground Resistance Calculation for DC SWBD 2A and 2B per 2OP-51

For COO-2, with a set of given ground detector readings for DC SWBD 1(2)A and 1(2)B, the applicant is expected to use 1(2)OP-51 Section 6.3.1 and Attachment 4 to determine each SWBD's total resistance to ground.

After performing the calculations, applicants should determine that the readings for one SWBD indicate > 25kΩ (i.e. indications of normal operation) while readings for the other SWBD indicate < 25kΩ (i.e. presence of a ground).

Ensure the JPM Initiating Cue specifies that the Applicant is to determine what actions (if any) are required based on the given conditions (include correct responses as JPM critical steps). This JPM requires an Attachment 4 Answer Key. Ensure that there are no examiner prompts specified for JPM completion (i.e. ensure required performance information is included in the given conditions).

Modified, Bank JPM.

Reference: AOT-ADM-JP-051-05

Equipment Control (EQ-1): Verify Protected Equipment Area

For EQ-1, the applicant will perform a verification of a Protected Equipment (PE) scheme already established for maintenance work in a Diesel Cell. Ensure that a map of the DG Building 20' (?) elevation is provided (blank map) with an AD-OP-ALL-0201, Attachment 1 sheet, that lists the PE setup already established. There should be two errors associated with the Attachment 1 list; 1) an omission of the rear DG cell door (i.e. the back door is not protected) and 2) an inclusion of a barrier within the cell that is not required. Identification of both errors should be JPM Critical Steps.

Modified, Bank JPM.

Reference: SOT-ADM-JP-201-D01

Radiation Control (RC): Determine TEDE While Working in a High Airborne Area

For RC, the applicant is required to determine TEDE based on given conditions for two job situations, with and without respirator usage. The applicant is then asked whether the task can be performed while staying within compliance of corporate guidance.

This new JPM is included below.

Facility: Brunswick Nuclear Plant Date of Examination: 07/24/2017

Examination Level: SRO Operating Test Number: 2017-301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations (COO-1, RO/SRO)	R, D	Evaluate Jet Pump performance per 0PT-13.1 K/A G2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation (4.4)
Conduct of Operations (COO-3, SRO only)	R, M	Determine If Electrical Loading Is Within The Limits K/A G2.1.32 Ability to explain and apply system limits and precautions. (4.0)
Equipment Control (EQ-2, SRO only)	R, N	Determine Post-Maintenance Testing Requirements K/A G2.2.21 Knowledge of pre- and post-maintenance operability requirements. (4.1)
Radiation Control (RC, RO/SRO)	R, N	Determine TEDE While Working in a High Airborne Area K/A G2.3.4 Knowledge of Radiation Exposure Limits under normal or emergency conditions. (3.7)
Emergency Plan (EP, SRO only)	R, N	Protective Action Recommendation K/A G2.4.44 Knowledge of emergency plan protective action recommendations. (4.4)

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)

Conduct of Operations (COO-1): Evaluate Jet Pump performance per 0PT-13.1

For COO-1, with a set of given data sheets, the applicant is expected to perform 0PT-13.1. Ensure that JPM critical steps include acceptable parameter ranges for critical step performance (e.g. calculated speed determined to be 90% +/- 1%, recirculation flow 45k gpm +/- 500 gpm, or jet pump psid 30% +/- 1%). Acceptable ranges should have a basis that stems from accuracy of the indications being used.

This JPM requires a completed 0PT-13.1 Answer Key. Ensure the JPM Initiating Cue specifies that the Applicant is to determine what actions (if any) are required based on the given conditions (include correct responses as JPM critical steps).

Bank JPM (may be modified with inclusion of applicant determined actions)

Reference: LOT-ADM-JP-002-02

Conduct of Operations (COO-3): Evaluate Off-Site power source Operability

For COO-3, the applicant will make a determination of plant electrical loading based on performance of 2OI-03.2, Reactor Operator Daily Surveillance Report, Item Number 16 (with corresponding Note T). Using the information gained from simulator indications and running loads, the applicant will apply a procedural NOTE to determine that Technical Specifications require entry due to inoperability of offsite sources.

Although included as a reference, the previously generated JPM requires updating to remove required Examiner cueing of values and running loads. It may be appropriate to revise the given condition of this JPM to being performed in a different plant configuration from Item Number 16 (e.g. Item Numbers 17, 18, 19, or 20).

Modified JPM

Reference: LOT-SIM-JP-201-D07

Equipment Control (EQ-2): Determine Post-Maintenance Testing Requirements

For EQ-2, the applicant is required to determine the post maintenance testing required following completion of maintenance on a component. The applicant is also asked if the PMT's already performed (i.e. given) meet the requirements required.

This new JPM is included below.

Radiation Control (RC): Determine TEDE While Working in a High Airborne Area

For RC, the applicant is required to determine TEDE based on given conditions for two job situations, with and without respirator usage. The applicant is then asked whether the task can be performed while staying within compliance with corporate guidance.

This new JPM is included below.

Emergency Plan (EP): Protective Action Recommendation

For EP, the applicant will complete an Emergency Notification Form based on a set of given conditions. Completion of a PAR is required.

This new JPM is included below.

Facility: Brunswick Nuclear Plant Date of Examination: 07/24/2017

Exam Level: RO ☒ SRO-I ☒ SRO-U ☒ Operating Test No.: 2017-301

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

	System / JPM Title	Type Code*	Safety Function
a.	CRD / Shift running CRD pumps (AP Two Scrammed Rods)	A, N, S	1
b.	RWCU / Reduce RPV water level using RWCU to Radwaste	L, D, S	2
c.	RBCCW / Re-establish RBCCW during SBO (pump failure)	A, M, S	8
d.	(**ALL**) RHR / Spray the Drywell IAW 0EOP-01-SEP-02	EN, N, S	5
e.	RCIC / RCIC restart following AUTO initiation and Turbine Trip using the Hard Card (controller failure)	A, D, S	4
f.	(**ALL**) Main Turbine / Perform 0PT-40.2.6 (breaker failure)	A, N, S	3
g.	(**ALL**) RWM / Perform 0PT-01.6.2 (failure to enforce rod block)	A, L, D, S	7
h.	(**RO only**) SBGT / SBGT system operation to reduce humidity	D, S	9
In-Plant Systems* (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
i.	(**ALL**) Electrical / Transfer Recirc VFD UPS from Inverter Operation to Maintenance Bypass	N, R	6
j.	RR / Restoring seal purge flow with pump running - Seal leakage abnormal	D, R	1
k.	(**ALL**) IA / Setting SA dryer sweep value to zero IAW 0AOP-20.0	E, M, R	8

* 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 / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	≥1 / ≥1 / ≥ 1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Control Room Systems (JPM A): CRD / Shift running CRD pumps (two rods scram)

For JPM A, the applicant will shift running CRD pumps per initiating cue direction. Upon completion, 2 control rods will scram while less than 25% power, announces scram of 2 control rods and inserts a reactor scram (alternate path).

This new JPM is included below.

Control Room Systems (JPM B): Reduce RPV water level using RWCU to Radwaste

For JPM B, the applicant is directed to establish RWCU reject in order to lower RPV water level to within a directed band. The JPM will complete once applicant control of RPV water level is established in the directed band.

Ensure a final JPM step is included in the task standard that specifies completion of the JPM when the applicant throttles back on reject flow, indicating control of RPV water level.

Bank JPM

Reference: LOT-SIM-JP-014-A02

Control Room Systems (JPM C): Re-Establish RBCCW during SBO (pump failure)

For JPM C, the applicant will perform a directed procedural step of 2EOP-01-SBO-12 to place a RBCCW pump in service. Following completion of SBO procedure actions of Step 18, the applicant will determine that performance of 2OP-21, Section 6.3.7, Restarting RBCCW Pumps in RBCCW Mode with High Drywell Temperature, is required to place a RBCCW pump in service.

Ensure that the initiating cue specifies that any appropriate wait times have already been completed (ref 2OP-21, Attachment 7). Following determination that conditions are met, the applicant will start an RBCCW pump (applicant can select). After the applicant has directed field operator completion of Step 5.d, the running RBCCW pump will inadvertently trip, requiring applicant action to place another RBCCW pump in service IAW 2EOP-01-SBO-12 (alternate path). Once the second RBCCW pump attempted has been placed in service, this JPM is complete. Bank JPM (for previous revision to procedure) modified due to inclusion of alternate path.

Modified, Bank JPM.

Reference: LOT-SIM-JP-303-A07

(**ALL**) Control Room Systems (JPM D): RHR / Perform 0EOP-01-SEP-02

For JPM D, the applicant will place the 2B RHR Loop into the DW Spray mode per 0EOP-01-SEP-02. This JPM's endpoint will occur upon successfully lowering DW pressure (JPM termination criteria).

This may be a pre-existing bank JPM, although not found in provided bank. New JPM requiring development.

Control Room Systems (JPM E): RCIC / RCIC restart following AUTO initiation and Turbine Trip using the Hard Card (controller failure)

For JPM E, the applicant will place RCIC in service using the OP-16 Hard Card. Once the flow controller is taken to AUTO, the controller will fail requiring operator action to establish suitable flow to restore level.

Ensure the method(s) available to the operator to mitigate the controller failure are included as success criteria in the JPM guide. Ensure that the JPM completion criteria is modified to require applicant restoration of RPV level to within the band directed by the initiating cue (i.e. JPM complete when level restored to within 170"-200").

Bank JPM

Reference: LOT-SIM-JP-016-01

(**ALL**) Control Room Systems (JPM F): Main Turbine / Perform 0PT-40.2.6 (breaker failure)

For JPM F, the applicant will perform a portion of 0PT-40.2.6. Once the Main Turbine has been tripped, the applicant is expected to confirm a failure of the Generator Output Breakers to trip and then manually trip them.

Ensure that a pre-marked copy of 0PT-40.2.6 (up to step 9) is available for JPM administration.

This new JPM is included below.

(**ALL**) Control Room Systems (JPM G): RWM / Perform 0PT-01.6.2 (failure to enforce rod block)

For JPM G, the applicant will perform 0PT-01.6.2. Upon determination that the RWM is not enforcing rod blocks as designed, the applicant is expected to restore proper rod configuration (via control rod insertion) and end the test.

Although not JPM failure criteria, insert Examiner evaluation steps at the points in the procedure where indications existed for a malfunctioning RWM based on given indications (i.e. Rod Withdraw Permissive Lights lit when they shouldn't be) prior to JPM Step 22. Ensure that an additional Examiner cue is inserted into the JPM standard that addresses premature termination of the JPM if the applicant determines that the test is UNSAT during performance.

Bank JPM

Reference: LOT-SIM-JP-07.1-03

(**RO only**) Control Room Systems (JPM H): SBGT / SBGT system operation to reduce humidity

For JPM H, the applicant will place the 2A SBGT in service to lower RB relative humidity to below 70%. Once in service, the applicant will cue the applicant that relative humidity has lowered below the initiating cue threshold. The applicant will then secure the 2A SBGT.

Bank JPM

Reference: LOT-SIM-JP-010-01

(**ALL**) In-Plant Systems (JPM I): Electrical / Transfer Recirc VFD UPS from Inverter Operation to Maintenance Bypass

For JPM I, the applicant will perform 1OP-02, Section 6.3.14, field activities to swap the Recirc UPS from inverter operation to maintenance bypass.

This new JPM is included below.

In-Plant Systems (JPM J): RR / Restoring seal purge with pump running – Seal leakage abnormal

For JPM J, the applicant will perform 1OP-02, Section 6.3.8, field activities to restore seal purge to an examiner selected reactor recirculation pump.

Ensure that selected recirculation pump used during exam administration is the same to ensure administration consistency.

Bank JPM

Reference: AOT-OJT-JP-002-A03

(**ALL**) In-Plant Systems (JPM K): IA / Setting SA dryer sweep value to zero IAW 0AOP-20.0

For JPM K, the applicant will perform 0AOP-20.0, Attachment 1, field activities to set the 1B SA dryer sweep value to zero.

Ensure this JPM is updated to reflect use of a different SA dryer and changes to 0AOP-20.0.

Modified JPM

Reference: AOT-OJT-JP-302-K01

ES-301 **Operating Test Quality Checklist** **Form ES-301-3**

Facility: Brunswick Nuclear Plant Date of Examination: 07/24/2017 Operating Test Number: 2017-301

	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: • 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			
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	J. Viera /	4/3/2017
b.	Facility Reviewer(*)	n/a	
c.	NRC Chief Examiner (#)	Phillip G. Capehart /	4/3/2017
d.	NRC Supervisor	Gerald J. McCoy /	4/19/2017

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

Facility: **Brunswick Nuclear Plant** Date of Exam: **07/24/2017** Scenario Numbers: **1 /2 /3 /4 /Spare** Operating Test No.: **2017-301**

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)	**3 / 5 / 2 / 4 / 2**			
2. Abnormal events (2-4)	**4 / 3 / 4 / 4 / 4**			
3. Major transients (1–2)	**1 / 1 / 1 / 1 / 1**			
4. EOPs entered/requiring substantive actions (1–2)	**3 / 3 / 3 / 3 / 2**			
5. EOP contingencies requiring substantive actions (0-2)	**1 / 1 / 0 / 0 / 0**			
6. EOP based Critical tasks (2–3)	**2 / 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: **Brunswick Nuclear Plant** Date of Exam: **7/24/2017** Operating Test No.: **2017-301**

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-1 ☒	RX		1				0						0	**1**	1		
	NOR		0				1						1	**2**	1		
	I/C		2				2						2	**6**	4		
	MAJ		1				1						1	**3**	2		
	TS		0				0						0	**0**	0		
RO-2 ☒	RX			0					1				0	**1**	1		
	NOR			1					0				1	**2**	1		
	I/C			2					2				2	**6**	4		
	MAJ			1					1				1	**3**	2		
	TS			0					0				0	**0**	0		
RO-3 ☒	RX		1				0							**1**	1		
	NOR		0				1							**1**	1		
	I/C		2				2							**4**	4		
	MAJ		1				1							**2**	2		
	TS		0				0							**0**	0		
RO-4 ☒	RX			0								1		**1**	1		
	NOR			1								0		**1**	1		
	I/C			2								2		**4**	4		
	MAJ			1								1		**2**	2		
	TS			0								0		**0**	0		

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: **Brunswick Nuclear Plant** Date of Exam: **7/24/2017** Operating Test No.: **2017-301**

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-5 ☒	RX		1							0				**1**	1		
	NOR		0							1				**1**	1		
	I/C		2							2				**4**	4		
	MAJ		1							1				**2**	2		
	TS		0							0				**0**	0		
RO-6 ☒	RX			0						0		1		**1**	1		
	NOR			1						1		0		**2**	1		
	I/C			2						2		2		**6**	4		
	MAJ			1						1		1		**3**	2		
	TS			0						0		0		**0**	0		
RO-7 ☒	RX						0			0		1		**1**	1		
	NOR						1			1		0		**2**	1		
	I/C						2			2		2		**6**	4		
	MAJ						1			1		1		**3**	2		
	TS						0			0		0		**0**	0		
RO-8 ☒	RX								1				0	**1**	1		
	NOR								0				1	**1**	1		
	I/C								2				2	**4**	4		
	MAJ								1				1	**2**	2		
	TS								0				0	**0**	0		

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.

Transient and Event Checklist — Form ES-301-5

Facility: **Brunswick Nuclear Plant** Date of Exam: **7/24/2017** Operating Test No.: **2017-301**

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
SRO-I-1 ☒	RX	0				1		0						**1**		1	
	NOR	1				0		1						**2**		1	
	I/C	4				2		4						**10**		4	
	MAJ	1				1		1						**3**		2	
	TS	2				0		2						**4**		2	
SRO-I-2 ☒	RX	0				1		0						**1**		1	
	NOR	1				0		1						**2**		1	
	I/C	4				2		4						**10**		4	
	MAJ	1				1		1						**3**		2	
	TS	2				0		2						**4**		2	
SRO-I-3 ☒	RX	0			0				1					**1**		1	
	NOR	1			1				0					**2**		1	
	I/C	4			4				2					**10**		4	
	MAJ	1			1				1					**3**		2	
	TS	2			2				0					**4**		2	
SRO-I-4 ☒	RX					1		0			0			**1**		1	
	NOR					0		1			1			**2**		1	
	I/C					2		4			4			**10**		4	
	MAJ					1		1			1			**3**		2	
	TS					0		2			2			**4**		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.

Transient and Event Checklist — Form ES-301-5

Facility: **Brunswick Nuclear Plant** Date of Exam: **7/24/2017** Operating Test No.: **2017-301**

APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3 (SPARE)			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
SRO-U-1 ☒	RX				0						0			**0**			0
	NOR				1						1			**2**			1
	I/C				4						4			**8**			2
	MAJ				1						1			**2**			1
	TS				2						2			**4**			2
SRO-U-2 ☒	RX				0						0			**0**			0
	NOR				1						1			**2**			1
	I/C				4						4			**8**			2
	MAJ				1						1			**2**			1
	TS				2						2			**4**			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: Brunswick Nuclear Plant Date of Examination: 07/24/2017 Operating Test No.: 2017-301

Competencies	APPLICANTS									
	RO ☒				SRO-I ☒				SRO-U ☒	
	SCENARIO				SCENARIO				SCENARIO	
	1	2	3	4	1	2	3	4	2	4
Interpret/Diagnose Events and Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	2, 3, 4, 5, 6, 7, 8	2, 3, 4, 5, 6, 7, 8, 10	2, 4, 5, 6, 7, 8, 9, 11	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	2, 3, 4, 5, 6, 7, 8	2, 3, 4, 5, 6, 7, 8, 10	2, 4, 5, 6, 7, 8, 9, 11	2, 3, 4, 5, 6, 7, 8	2, 4, 5, 6, 7, 8, 9, 11
Comply With and Use Procedures (1)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7, 8, 10	1, 3, 4, 5, 6, 7, 8, 9, 11	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7, 8, 10	1, 3, 4, 5, 6, 7, 8, 9, 11	1, 2, 3, 4, 5, 6, 7, 8	1, 3, 4, 5, 6, 7, 8, 9, 11
Operate Control Boards (2)	1, 2, 3, 4, 5, 6, 7, 10	1, 2, 3, 4, 5, 6, 7, 8,	1, 2, 3, 4, 5, 6, 7, 8, 10	1, 3, 4, 5, 6, 7, 8, 9, 11	1, 2, 3, 4, 5, 6, 7, 10	1, 2, 3, 4, 5, 6, 7, 8,	1, 2, 3, 4, 5, 6, 7, 8, 10	1, 3, 4, 5, 6, 7, 8, 9, 11	1, 2, 3, 4, 5, 6, 7, 8,	1, 3, 4, 5, 6, 7, 8, 9, 11
Communicate and Interact	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7, 8, 10	1, 2, 3, 4, 5, 6, 7, 8, 9, 11	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7, 8, 10	1, 2, 3, 4, 5, 6, 7, 8, 9, 11	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7, 8, 9, 11
Demonstrate Supervisory Ability (3)					1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1, 2, 3, 4, 5, 6, 7, 8	1, 2, 3, 4, 5, 6, 7, 8, 10	1, 3, 4, 5, 6, 7, 8, 9, 11	1, 2, 3, 4, 5, 6, 7, 8	1, 3, 4, 5, 6, 7, 8, 9, 11
Comply With and Use Tech. Specs. (3)					2, 6	2, 5	2, 4	2, 7	2, 5	2, 7

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-

Facility: **Brunswick** Date of Exam: **July 2017**

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

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

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	A2	G*	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4				X			(Revised from 295001AA1.08, 1/12/17) AA1.06: Ability to operate and/or monitor Neutron Monitoring System as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION	3.3	
295003 Partial or Complete Loss of AC / 6					X		AA2.01: Ability to determine and/or interpret the cause of partial or complete loss of A.C. power as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER	3.4	
295004 Partial or Total Loss of DC Pwr / 6						X	G2.1.30: Ability to locate and operate components, including local controls, as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER	4.4	
295005 Main Turbine Generator Trip / 3	X						AK1.01: Knowledge of the operational implications of the Pressure effects on reactor power as they apply to MAIN TURBINE GENERATOR TRIP	4.0	
295006 SCRAM / 1	X						AK1.02: Knowledge of the operational implications of Shutdown margin as they apply to SCRAM	3.4	
295016 Control Room Abandonment / 7			X				AK3.03: Knowledge of the reasons for Disabling control room controls as they apply to CONTROL ROOM ABANDONMENT	3.5	
295018 Partial or Total Loss of CCW / 8						X	G2.4.20: Knowledge of the operational implications of EOP warnings, cautions, and notes as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER	3.8	
295019 Partial or Total Loss of Inst. Air / 8		X					AK2.18: Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR and ADS	3.5	
295021 Loss of Shutdown Cooling / 4						X X	G2.1.25: Ability to interpret reference materials, such as graphs, curves, tables, etc. as they apply to LOSS OF SHUTDOWN COOLING G2.1.7: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation as they apply to LOSS OF SHUTDOWN COOLING	3.9 4.7	
295023 Refueling Acc / 8		X			 X		(Revised from 295023AK3.02, 11/17/16) AK2.02: Knowledge of the interrelations between REFUELING ACCIDENTS and Fuel pool cooling and cleanup system. AA2.04: Ability to determine and/or interpret the Occurrence of fuel handling accident as they apply to REFUELING ACCIDENTS	2.9 4.1	
295024 High Drywell Pressure / 5			X				EK3.04: Knowledge of the reasons for Emergency depressurization as they apply to HIGH DRYWELL PRESSURE	3.7	
295025 High Reactor Pressure / 3	X						EK1.03: Knowledge of the operational implications of Safety/relief valve tailpipe temperature/pressure relationships as they apply to HIGH REACTOR PRESSURE	3.6	

295026 Suppression Pool High Water Temp. / 5				X			EA1.03: Ability to operate and/or monitor Temperature monitoring as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE	3.9	
						X	G2.4.35: Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE	4.0	
295027 High Containment Temperature / 5									
295028 High Drywell Temperature / 5		X					EK2.01: Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and Drywell spray	3.7	
						X	G2.1.23: Ability to perform specific system and integrated plant procedures during all modes of plant operation as they apply to HIGH DRYWELL TEMPERATURE	4.4	
295030 Low Suppression Pool Wtr Lvl / 5				X			EA1.01: Ability to operate and/or monitor ECCS systems (NPSH considerations) as they apply to LOW SUPPRESSION POOL WATER LEVEL	3.6	
295031 Reactor Low Water Level / 2					X		EA2.04: Ability to determine and/or interpret Adequate core cooling as they apply to REACTOR LOW WATER LEVEL	4.6	
							(Revised from 295006AA2.03, 3/29/17)		
					X		EA2.04: Ability to determine and/or interpret Adequate core cooling as they apply to REACTOR LOW WATER LEVEL	4.8	
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1					X		EA2.06: Ability to determine and/or interpret Reactor pressure as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN	4.0	
295038 High Off-site Release Rate / 9			X				(Revised from 295038EK3.01, 9/15/16)	3.7	
							EK3.03: Knowledge of the reasons for Control room ventilation isolation as they apply to HIGH OFF-SITE RELEASE RATE		
					X		EA2.03: Ability to determine and/or interpret Radiation levels as they apply to HIGH OFF-SITE RELEASE RATE	4.3	
600000 Plant Fire On Site / 8	X						AK1.01: Knowledge of the operation applications of the Fire Classifications by type as they apply to Plant Fire On Site	2.5	
					X		AA2.13: Ability to determine and interpret Need for emergency plant shutdown as they apply to PLANT FIRE ON SITE	3.8	
700000 Generator Voltage and Electric Grid Disturbances / 6		X					AK2.03: Knowledge of the interrelations between GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES and Sensors, detectors, indicators	3.0	
K/A Category Totals:	4	4	3	3	3/4	3/3	Group Point Total:		20/7

ES-401 BWR Examination Outline Form ES-401-1
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A2	G*	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3									
295007 High Reactor Pressure / 3									
295008 High Reactor Water Level / 2						X	G2.1.20: Ability to interpret and execute procedure steps as they apply to HIGH REACTOR WATER LEVEL	4.6	
295009 Low Reactor Water Level / 2					X		AA2.01: Ability to determine and/or interpret Reactor water level as they apply to LOW REACTOR WATER LEVEL	4.2	
295010 High Drywell Pressure / 5									
295011 High Containment Temp / 5									
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1					X		AA2.02: Ability to determine and/or interpret Reactor period as they apply to INADVERTENT REACTIVITY ADDITION	3.9	
295015 Incomplete SCRAM / 1									
295017 High Off-site Release Rate / 9	X						AK1.03: Knowledge of the operational implications of Meteorological effects on off-site release as they apply to HIGH OFF-SITE RELEASE RATE	2.7	
295020 Inadvertent Cont. Isolation / 5 & 7			X				AK3.02: Knowledge of the reasons for Drywell/containment pressure response as they apply to INADVERTENT CONTAINMENT ISOLATION	3.3	
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Wtr Lvl / 5			X		X		EK3.03: Knowledge of the reasons for Reactor SCRAM as they apply to HIGH SUPPRESSION POOL WATER LEVEL EA2.02: Ability to determine and/or interpret Reactor pressure as they apply to HIGH SUPPRESSION POOL WATER LEVEL	3.4 3.6	
295032 High Secondary Containment Area Temperature / 5						X	G2.4.11: Knowledge of abnormal condition procedures as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE	4.0	
295033 High Secondary Containment Area Radiation Levels / 9									
295034 Secondary Containment Ventilation High Radiation / 9				X			EA1.01: Ability to operate and/or monitor Area radiation monitoring system as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION	3.8	
295035 Secondary Containment High Differential Pressure / 5									
295036 Secondary Containment High Sump/Area Water Level / 5		X					EK2.01: Knowledge of the interrelations between SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL and Secondary containment equipment and floor drain system	3.1	
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals:	1	1	2	1	1/2	1/1	Group Point Total:		7/3

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	A2	A 3	A 4	G*	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection Mode								X				A2.04: Ability to (a) predict the impacts of A.C. failures on the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations	3.5	
205000 Shutdown Cooling		X										K2.01: Knowledge of electrical power supplies to Pump motors	3.1	
206000 HPCI			X									K3.02: Knowledge of the effect that a loss or malfunction of the HIGH PRESSURE COOLANT INJECTION SYSTEM will have on Reactor pressure control (Revised from 206000A2.17, 3/15/17)	3.8	
								X				A2.15: Ability to (a) predict the impacts of Loss of control oil pressure on the HIGH PRESSURE COOLANT INJECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations	3.5	
207000 Isolation (Emergency) Condenser														
209001 LPCS											X	G2.2.22: Knowledge of limiting conditions for operations and safety limits as they apply to LOW PRESSURE CORE SPRAY SYSTEM	4.0	
							X					A1.04:Ability to predict and/or monitor changes in parameters associated with operating the LOW PRESSURECORE SPRAY SYSTEM controls including: Reactor pressure	3.7	
209002 HPCS														
211000 SLC			X									K3.01: Knowledge of the effect that a loss or malfunction of the STANDBY LIQUID CONTROL SYSTEM will have on Ability to shutdown the reactor in certain conditions	4.3	
212000 RPS										X		A4.16: Ability to manually operate and/or monitor Manually activate anticipated transient without SCRAM circuitry/RRCS in the control room	4.4	
								X				A2.13: Ability to (a) predict the impacts of Low condenser vacuum on the REACTOR PROTECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations	3.9	
215003 IRM					X							K5.03: Knowledge of the operational implications of Changing detector position as they apply to INTERMEDIATE RANGE MONITOR (IRM) SYSTEM	3.0	
215004 Source Range Monitor		X										K2.01: Knowledge of electrical power supplies to SRM channels/detectors	2.6	

215005 APRM / LPRM			X						X		A4.01: Ability to manually operate and/or monitor IRM/APRM recorder in the control room K3.07: Knowledge of the effect that a loss or malfunction of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM will have on Rod block monitor	3.2 3.8	
217000 RCIC				X							K4.01: Knowledge of REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) design feature(s) and/or interlocks which provide for Prevent water hammer	2.8	
218000 ADS							X			 X	A1.05: Ability to predict and/or monitor changes in parameters associated with operating the AUTOMATIC DEPRESSURIZATION SYSTEM controls including Reactor water level G2.4.34: Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects as they apply to AUTOMATIC DEPRESSURIZATION SYSTEM	4.1 4.2	
223002 PCIS/Nuclear Steam Supply Shutoff				X							K4.06: Knowledge of PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF design feature(s) and/or interlocks which provide for Once initiated, system reset requires deliberate operator action	3.4	
239002 SRVs						X				 X	K6.02: Knowledge of the effect that a loss or malfunction of Air (Nitrogen) supply will have on the RELIEF/SAFETY VALVES G2.4.8: Knowledge of how abnormal operating procedures are used in conjunction with EOPs as they apply to RELIEF/SAFETY VALVES	3.4 4.5	
259002 Reactor Water Level Control							X				A1.04: Ability to predict and/or monitor changes in parameters associated with operating the REACTOR WATER LEVEL CONTROL SYSTEM controls including Reactor water level control controller indications	3.6	
261000 SGTS	X										K1.06: Knowledge of the physical connections and/or cause-effect relationships between STANDBY GAS TREATMENT SYSTEM and High pressure coolant injection system	3.0	
262001 AC Electrical Distribution								X			A3.04: Ability to monitor automatic operations of the A.C. ELECTRICAL DISTRIBUTION including Load sequencing	3.4	
262002 UPS (AC/DC)	X									 X	K1.15: Knowledge of the physical connections and/or cause-effect relationships between UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.) and Stack gas monitors G2.4.11: Knowledge of abnormal operating procedures as they apply to UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.)	2.7 4.2	
263000 DC Electrical Distribution								X			A3.01: Ability to monitor automatic operations of the D.C. ELECTRICAL DISTRIBUTION including Meters, dials, recorders, alarms, and indicating lights	3.2	

264000 EDGs								X X				A2.07: Ability to (a) predict the impacts of Loss of off-site power during full-load testing on the EMERGENCY GENERATORS (DIESEL/JET) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations (Revised from 264000A2.09, 2/16/17) A2.06: Ability to (a) predict the impacts of Opening normal and/or alternate power to emergency bus on the EMERGENCY GENERATORS (DIESEL/JET) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations	3.5 3.4	
300000 Instrument Air								X				A2.01: Ability to (a) predict the impacts of Air dryer and filter malfunctions on the INSTRUMENT AIR SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation K5.01: Knowledge of the operational implications of Air compressors as they apply to the INSTRUMENT AIR SYSTEM	2.9 2.5	
400000 Component Cooling Water						X X						K6.05: Knowledge of the effect that a loss or malfunction of Motors will have on the CCWS K6.07: Knowledge of the effect that a loss or malfunction of Breakers, relays, and disconnects will have on the CCWS	2.8 2.7	
K/A Category Point Totals:	2	2	3	2	2	3	3	3/3	2	2	2/2	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		X										K2.05: Knowledge of electrical power supplies to Alternate rod insertion valve solenoids	4.5	
201002 RMCS														
201003 Control Rod and Drive Mechanism											X	G2.1.27: Knowledge of system purpose and/or function as they apply to CONTROL ROD AND DRIVE MECHANISM	3.9	
201004 RSCS														
201005 RCIS														
201006 RWM														
202001 Recirculation														
202002 Recirculation Flow Control						X						K6.05: Knowledge of the effect that a loss or malfunction of Reactor water level will have on the RECIRCULATION FLOW CONTROL SYSTEM	3.1	
204000 RWCU								X				A2.02: Ability to (a) predict the impacts of (LP-RWCU) Pressure control valve failure on the REACTOR WATER CLEANUP SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations	3.2	
214000 RPIS											X	G2.1.25: Ability to interpret reference materials, such as graphs, curves, tables, etc. as they apply to ROD POSITION INFORMATION SYSTEM	4.2	
215001 Traversing In-Core Probe														
215002 RBM									X			A3.03: Ability to monitor automatic operations of the ROD BLOCK MONITOR SYSTEM including Alarm and indicating lights	3.1	
216000 Nuclear Boiler Inst.														
219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.				X								K4.03: Knowledge of PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES design feature(s) and/or interlocks which provide for Containment/drywell isolation	3.7	
226001 RHR/LPCI: CTMT Spray Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode														
233000 Fuel Pool Cooling/Cleanup								X				A2.11: Ability to (a) predict the impacts of Fuel pool gate seal high flow on the FUEL POOL COOLING AND CLEAN-UP ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations	3.2	

234000 Fuel Handling Equipment							X					A1.03: Ability to predict and/or monitor changes in parameters associated with operating the FUEL HANDLING EQUIPMENT controls including core reactivity level	3.4	
239001 Main and Reheat Steam														
239003 MSIV Leakage Control														
241000 Reactor/Turbine Pressure Regulator										X		A4.18: Ability to manually operate and/or monitor Turbine shell warming in the control room	2.9	
245000 Main Turbine Gen. / Aux.								X				A2.01: Ability to (a) predict the impacts of Turbine trip on the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations	3.7	
256000 Reactor Condensate		X										K2.01: Knowledge of electrical power supplies to System pumps	2.7	
259001 Reactor Feedwater					X							K5.03: Knowledge of the operational implications of Turbine operation as they apply to REACTOR FEEDWATER SYSTEM	2.8	
268000 Radwaste														
271000 Offgas														
272000 Radiation Monitoring			X									K3.03: Knowledge of the effect that a loss or malfunction of the RADIATION MONITORING System will have on Station area radiation monitoring	3.2	
286000 Fire Protection	X											K1.04: Knowledge of the physical connections and/or cause-effect relationships between FIRE PROTECTION SYSTEM and D.C. electrical distribution	2.6	
288000 Plant Ventilation														
290001 Secondary CTMT														
290003 Control Room HVAC														
290002 Reactor Vessel Internals														
K/A Category Point Totals:	1	2	1	1	1	1	1	1/2	1	1	1/1	Group Point Total:		12/3

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.20	Ability to interpret and execute procedure steps.	4.6			
	2.1.29	Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.	4.1			
	2.1.39	Knowledge of conservative decision making practices.	3.6			
	2.1.43	Ability to use procedures to determine the effects on reactivity of plant changes, such as reactor coolant system temperature, secondary plant, fuel depletion, etc.			4.3	
	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.			3.9	
	Subtotal			3		2
2. Equipment Control	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	4.5			
	2.2.6	Knowledge of the process for making changes to procedures.	3.0			
	2.2.7	Knowledge of the process for conducting special or infrequent tests.	2.9			
	2.2.11	Knowledge of the process for controlling temporary design changes.			3.3	
	Subtotal			3		1
3. Radiation Control	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	2.9			
	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5			
	2.3.11	Ability to control radiation releases.			4.3	
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.			3.7	
	Subtotal			2		2
4. Emergency Procedures / Plan	2.4.11	Knowledge of abnormal condition procedures.	4.0			
	2.4.26	Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.	3.1			
	2.4.30	Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.			4.1	
	2.4.35	Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects.			4.0	
	Subtotal			2		2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
T1G1	295038EK3.01	K/A unsuitable for development at the RO level. Replaced with 295038EK3.03 on 9/15/16.
T1G1	295023AK3.02	K/A unsuitable for development at the RO level. Replaced with 295023AK2.02 on 11/17/16.
T1G1	295001AA1.08	K/A unsuitable for development due to plant design. K/A is specific to BWR-1 plant design. Replaced with 295001AA1.06 on 1/12/17.
T1G1	295006AA2.03	K/A unsuitable for development at the SRO level. Replaced with 295031EA2.04 on 3/29/17.
T2G1	264000A2.09	K/A unsuitable for development at the SRO level. Replaced with 264000A2.06 on 2/16/17.
T2G1	206000A2.17	K/A unsuitable for development at the SRO level. Replaced with 206000A2.15 on 3/15/17.

ES-401 **Written Examination Quality Checklist** **Form ES-401-6**

Facility: Brunswick Nuclear Plant Date of Exam: 07/24/2017 Exam Level: RO ☒ SRO ☒

	Item Description	Initial a	Initial b*	Initial 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 two NRC licensing exams, consult the NRR/NRO OL program office).	✓		✓
5.	Question duplication from the licensee 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 X 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: 6 / 1; Modified: 10 / 3; New: 59 / 21	✓		✓
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: 37 / 7; C/A: 38 / 18	✓		✓
8.	References/handouts provided do not give away answers or aid in the elimination of distractors.	✓		✓
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.	✓		✓
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	J. Nieri /	4/3/2017
b. Facility Reviewer (*)	N/A	
c. NRC Chief Examiner (#)	Phillip G. Capehart / PGCapehart	4/3/2017
d. NRC Regional Supervisor	Gerald J. McCoy / GJMcCoy	4/19/2017

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

FINAL

ES-401 **Written Examination Quality Checklist** **Form ES-401-6**

Facility: Brunswick Date of Exam: 08/08/17 Exam Level: RO ■ SRO ■

Item Description					Initial a	Initial b*	Initial 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 two NRC licensing exams, consult the NRR/NRO OL program office).						
5.	Question duplication from the licensee 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			
		8/2	12/4	55/19			
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			
		37 / 6		38 / 19			
8.	References/handouts provided do not give away answers or aid in the elimination of distractors.						
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.						
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 (#)	Phillip G. Capehart / Phillip G. Capehart	7/12/17
d. NRC Regional Supervisor	Gerald J. McCoy / Gerald J. McCoy	7/18/17

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

ES-403	Written Examination Grading Quality Checklist	Form ES-403-1

Facility: **Brunswick** Date of Exam 8/8/17 Exam Level: RO ☒ SRO ☒

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

	Printed Name/Signature	Date
a. Grader	Newton Lacy/	9/6/17
b. Facility Reviewer(*)	NA	NA
c. NRC Chief Examiner (*)	Phillip Capehart/	9/6/17
d. NRC Supervisor (*)	Gerald McCoy/	10/17/2017

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

DUKE ENERGY.

Enclosures Contain Operator Examination Material
Withhold from public disclosure until
completion of examination

William R. Gideon
Vice President
Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461
910.457.3698

AUG 0 9 2017

Serial: BSEP 17-0073

U.S. Nuclear Regulatory Commission, Region II
ATTN: Ms. Catherine Haney, Regional Administrator
245 Peachtree Center Ave, NE, Suite 1200
Atlanta, GA 30303-1257

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Renewed Facility Operating License Nos. DPR-71 and DPR-62
Docket Nos. 50-325 and 50-324
Reactor Operator and Senior Reactor Operator License Post-Examination Documentation and Comments

Reference: Letter from Gerald J. McCoy (NRC) to William R. Gideon (Duke Energy), "Brunswick Steam Electric Plant – Notification of Licensed Operator Initial Examination 05000325/2017301 and 05000324/2017301," dated February 1, 2017, ADAMS Accession Number ML17034A367

Dear Ms. Haney:

In accordance with the guidance contained in Revision 10 of NUREG-1021, "Operator Licensing Standards for Power Reactors," Section ES-402, "Administering Initial Written Examinations," and ES-501, "Initial Post-Examination Activities," Duke Energy Progress, LLC (Duke Energy), is providing the NRC the specified documentation for the reactor operator and senior reactor operator written examinations, which were administered at the Brunswick Steam Electric Plant on Tuesday, August 8, 2017. The enclosures containing examination documentation are being provided only to Mr. Phillip Capehart, with his copy of this letter. Duke Energy has post-exam comments relating to the written examination included with this submittal letter as Enclosure 2.

The master examination and answer key are provided in Enclosure 6 of this letter, with annotations. All substantive comments made by the applicants following the written examination are included with Enclosure 2. Lastly, the original ES-201-3 forms, "Examination Security Agreement," with all the pre- and post-examination signatures will be provided via email, as confirmed with the NRC chief examiner on August 7, 2017.

This document contains no regulatory commitments.

Enclosures Contain Operator Examination Material
Withhold from public disclosure until
completion of examination

Please refer any questions regarding this submittal to Mr. Lee Grzeck, Manager – Regulatory Affairs, at (910) 457-2487.

Sincerely,

for W. R. GIDEON

William R. Gideon

WRG/mkb

Enclosures:

1. ES-403-1, "Written Examination Grading Quality Checklist"
2. Written Examination Performance Analysis Results (with recommended substantive changes)
3. Graded Written Examinations and Applicants' Answer Sheets
4. Applicants' Questions Asked and Answers Given During the Written Examination
5. Written Examination Seating Chart
6. Master Examination and Answer Key
7. ES-201-3, "Examination Security Agreement"

cc (with enclosures):

U.S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Phillip Capehart, Chief Examiner
245 Peachtree Center Ave, NE, Suite 1200
Atlanta, GA 30303-1257

cc (without enclosures):

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

U.S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Gerald J. McCoy, Chief
Operations Branch 1
245 Peachtree Center Ave, NE, Suite 1200
Atlanta, GA 30303-1257

U.S. Nuclear Regulatory Commission
ATTN: Mr. Andrew Hon (Mail Stop OWFN 8G9A) **(Electronic Copy Only)**
11555 Rockville Pike
Rockville, MD 20852-2738
Andrew.Hon@nrc.gov

U.S. Nuclear Regulatory Commission
ATTN: Mr. Gale Smith, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

Chair - North Carolina Utilities Commission **(Electronic Copy Only)**
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