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

Facility: Harris Date of Examination: 9/2013

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) 1/3/13	BAL
-120	2. NRC examiners and facility contact assigned (C.1.d; C.2.e) 1/3/13	BAL
-120	3. Facility contact briefed on security and other requirements (C.2.c) 1/3/13	BAL
-120	4. Corporate notification letter sent (C.2.d) 1/14/13	BAL
[-90]	[5. Reference material due (C.1.e; C.3.c; Attachment 3)] 3/25/13	BAL
{-75}	6. Integrated examination outline(s) due, including Forms ES-201-2, ES-201-3, ES-301-1, ES-301-2, ES-301-5, ES-D-1's, ES-401-1/2, ES-401-3, and ES-401-4, as applicable (C.1.e and f; C.3.d) 3/25/13	BAL
{-70}	{7. Examination outline(s) reviewed by NRC and feedback provided to facility licensee (C.2.h; C.3.e)} 4/3/13	BAL
{-45}	8. Proposed examinations (including written, walk-through JPMs, and scenarios, as applicable), supporting documentation (including Forms ES-301-3, ES-301-4, ES-301-5, ES-301-6, and ES-401-6, and any Form ES-201-3 updates), and reference materials due (C.1.e, f, g and h; C.3.d) 7/8/13	BAL
-30	9. Preliminary license applications (NRC Form 398's) due (C.1.l; C.2.g; ES-202) 8/9/13	BAL
-14	10. Final license applications due and Form ES-201-4 prepared (C.1.l; C.2.i; ES-202) 8/26/13	BAL
-14	11. Examination approved by NRC supervisor for facility licensee review (C.2.h; C.3.f)	N/A
-14	12. Examinations reviewed with facility licensee (C.1.j; C.2.f and h; C.3.g) 8/21-23/13	BAL
-7	13. Written examinations and operating tests approved by NRC supervisor (C.2.i; C.3.h) 9/16/13 9/4/13	BAL
-7	14. Final applications reviewed; 1 or 2 (if >10) applications audited to confirm qualifications / eligibility; and examination approval and waiver letters sent (C.2.i; Attachment 5; ES-202, C.2.e; ES-204)	BAL
-7	15. Proctoring/written exam administration guidelines reviewed with facility licensee (C.3.k) 11/7/13	BAL
-7	16. Approved scenarios, job performance measures, and questions distributed to NRC examiners (C.3.i) 9/4/13	BAL

* 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.

-WRITTEN EXAM SAMPLE PLAN ONLY-

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

Facility: SHEARON HARRIS Date of Examination: SEPTEMBER 2013

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.	M	N/A	BBL
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled.	M	N/A	BBL
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	M	N/A	BBL
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.	M	N/A	BBL
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. W/T	a. Verify that the systems walk-through outline meets the criteria specified on Form ES-301-2: (1) the outline(s) contain(s) the required number of control room and in-plant tasks distributed among the safety functions as specified on the form (2) task repetition from the last two NRC examinations is within the limits specified on the form (3) no tasks are duplicated from the applicants' audit test(s) (4) the number of new or modified tasks meets or exceeds the minimums specified on the form (5) the number of alternate path, low-power, emergency, and RCA tasks meet the criteria on the form.	N		A
	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.	M	N/A	BBL
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	M	N/A	BBL
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	M	N/A	BBL
	d. Check for duplication and overlap among exam sections.	N/A	N/A	N/A
	e. Check the entire exam for balance of coverage.	M	N/A	BBL
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	M	N/A	BBL

N-1

	Printed Name/Signature	Date
a. Author	MICHAEL MEEKS / Michael K. Meeks	12/17/2012
b. Facility Reviewer (*)	N/A	N/A
c. NRC Chief Examiner (#)	BRUNO CABALLERO / Bruno Caballero	12-18-12
d. NRC Supervisor	MARK FRANKE	12/18/12

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

This Form ES-201-2 documents only the written exam outline.

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

Facility: Harris Nuclear Plant Date of Examination: 09-09-2013

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.			
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled.	N		A
	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.	✓	✓	BSL
	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.	✓	✓	BSL
	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.	✓	✓	BSL
3. W/T	a. Verify that the systems walk-through outline meets the criteria specified on Form ES-301-2: (1) the outline(s) contain(s) the required number of control room and in-plant tasks distributed among the safety functions as specified on the form (2) task repetition from the last two NRC examinations is within the limits specified on the form (3) no tasks are duplicated from the applicants' audit test(s) (4) the number of new or modified tasks meets or exceeds the minimums specified on the form (5) the number of alternate path, low-power, emergency, and RCA tasks meet the criteria on the form.	✓	✓	BSL
	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	✓	✓	BSL
	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.	✓	✓	BSL
4. GENERAL	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam sections.	✓	✓	BSL
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	✓	✓	BSL
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	✓	✓	BSL
	d. Check for duplication and overlap among exam sections.	✓	✓	BSL
	e. Check the entire exam for balance of coverage.	✓	✓	BSL
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	✓	✓	BSL

	Printed Name/Signature	Date
a. Author	RICHARD (JC) HOUTON /	03/21/2013
b. Facility Reviewer (*)	SIMON SCHWINDT /	03/21/2013
c. NRC Chief Examiner (#)	BRUNO CABALLERO / B. Caballero	9-3-13
d. NRC Supervisor	MARK FRANKE /	9/4/13

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

This form ES-201-2 documents only the Simulator and Walkthrough exam outline.

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 9/9/2013 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 9/9-9/26 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.	Richard (JR) Horton	SNOTI / Lead Exam Developer		12/17/12		9-26-13	
2.	Rod L. Bright	Simulator Support		1/3/13		9/26/13	
3.	Duane McDonald	Simulator Support		2/3/13			(1)
4.	Ken Pace	SIM SUPPORT		1-15-13		9-26-13	
5.	ARCHIE LUCKY	SNOTI		2-18-13		9-26-13	
6.	DAVID J BUNT	FIN SRO		2/26/13		9-26-13	
7.	BOB WINKLER	WCC-SRO		2/26/13		9-26-13	
8.	WILLIAM GUNTER	MSO		3/18/13		10/01/13	
9.	SIMON SCHWINDT	FACILITY REP-CONT SUPV		3/18/13		9/26/13	
10.	VR PETRELLA	SNOTI		4-14-13		9-26-13	
11.	Billy Lance	RO		5-1-13		9-26-13	
12.	Mike Spellman	CRS		5/1/13		9/26/13	
13.	Randy Atkins	SRO		5-1-13		9-26-13	
14.	DUANE MCLAUGHLIN	CO		5-1-13		9-26-13	
15.	TRUC DUONG	SIMULATOR SUPPORT		5-1-13		9-26-13	

NOTES:

(1) SIGNED OFF VIA e mail see attached

10/2/13

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of 9/9/2013 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 9/2 - 9-13. 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
# 16	1. Robert Bolin	Fleet exam writer	Robert Bolin	5/28/13			(1)
	2. James Grigsby	FLEET EXAM WRITER		5/28/13		9/26/13	
	3. Josh Lambdin	SRO		6/10/13		9/26/13	
	4. Bradley A Rouse	RO		6/17/13		9/30/13	
	5. Rick Vandenberg	SRO/SM		6/17/13		9/26/13	
	6. Ken Oliver	SNOTI		6/18/13		9/26/13	
	7. Eric S. Szkolnicki	SRO		6/19/13		9/26/13	
	8. Lathe Keeson	SRO/CRS		6/20/13		9/26/13	
	9. Ashley Acker	Admin		6/20/13		9/26/13	
	10. Kyle Kelly	CRS		6-24-13		9-26-13	
	11. Eugene Eagle	Reactor Operator		6/24/13		9/26/13	
	12. Bruce Horne	RO		6/24/13			(1)
	13. Michael Hinman	RO		7-1-13			(1)
	14. Mark Christopherson	CRS		7-2-13			(1)
30	15. Robert Stephenson	CRS		7/22/13		9/26/13	

NOTES:

(1) SIGNED OFF VIA Email See attached

10/2/13

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 9-9-2013 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 9/9 - 9/13. 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
#31	1. JUSTEN P. DEVERS	REACTOR OPERATOR		7-22-13		9-26-13	
	2. Taylor K. Lane	Admin.	Taylor Lane	8/28/13	Taylor Lane	9/26/13	
	3. Maria N. Powers	RO / STA	Maria N Powers	8/29/13	Maria N Powers	9-26-13	
	4. Michael S. Matheny	SRO		9/2/13		9-26-13	
	5. DONALD L. GRIFFIN	TRNG MGR	D.L. Griffin	9.6.13	D.L. Griffin	9.26.13	
	6. Vince Parente (43)	OPS-TRN	Vince Parente	9-9-13	Vince Parente	9-26-13	
37	7. Ed Bertram	OPS-TRN		9-9-13		9-26-13	
	8. MICHAEL VON RA RGEN	SNJ-TRN		9-9-13		9-26-13	
	9. Artie Sylvester	SUPV-LOCT (OIT)		9-9-13		9-26-13	
	10. WILLIAM MOORE	OPS TRN SNOTI		9-9-13		9-26-13	
	11. JIMMIE COX	OPS-TRN		9-9-13		9-26-13	
	12. Sigourney Clark	NTA - OPS	Sigourney Clark	9/9/13	Sig Clark	9-26-13	
	13. George Picker	ILT Supv		9/10/13			(2)
	14. RYAN LIPSLY	SNOTI - ILT		09/10/13		09/26/13	
415	15. MATTHEW MYERS						

NOTES: 9/26/13

(2) SIGNED OFF VIA TELEPHONE

Horton, Richard (JR)

From: Mac McDade <mcdade54@gmail.com>
Sent: Thursday, September 26, 2013 10:58 PM
To: Horton, Richard (JR)
Subject: Re: 2013 Harris Station NRC Exam Completion

I agree to the statement. How did the exam go?

On Sep 26, 2013 10:38 PM, "Horton, Richard (JR)" <Richard.Horton2@duke-energy.com> wrote:

To all,

Examination Security has been lifted for the HNP ILC 13-1 NRC Exam. The Operating Exam was administered the week of 9/9/13 and 9/16/13. The written exam was administered on 9/25/13. The Exam Security forms are located on my desk in the HEEC building on the instructor office wing (Across from C-109). Please come by and sign off the agreement and return your red exam security badge. It is preferred that you sign off in person, however if unable to come by my desk, I can sign you off if you reply to this e-mail stating that you agree with the following statement:

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 of 9/9/13, 9/16/13 and on 9/25/13. 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.

The e-mails are going to be attached to the security agreement forms and mailed to the NRC Chief Examiner. After you send me this statement you may remove your exam badge. Either send me your badge through the company mail or leave your security badge on my desk the next time you are at the HEEC building. When responding that you would like me to sign you off the agreement please respond with the following statement

(or similar).

I have read and agree with the bolded statement below. Please sign me off the security agreement.

Thanks for your support during the development and implementation of the ILC 13-1 NRC Exam.

Horton, Richard (JR)

From: Bolin, Bob
Sent: Thursday, September 26, 2013 2:33 PM
To: Horton, Richard (JR)
Subject: RE: 2013 Harris Station NRC Exam Completion

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 of 9/9/13, 9/16/13 and on 9/25/13. 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.

I have read and agree with the bolded statement below. Please sign me off the security agreement.

Bob Bolin
Sr. OPs Training Instructor
DUKE ENERGY. PROGRESS
Brunswick Nuclear Plant
Bob.Bolin@duke-energy.com
Work – (910) 457-3078

10/2/13

Horton, Richard (JR)

From: Horne, Bruce
Sent: Tuesday, October 01, 2013 8:37 AM
To: Horton, Richard (JR)
Subject: RE: 2013 Harris Station NRC Exam Completion

Richard,
I have read and agree with the bolded statement below. Please sign me off the security agreement.

Scott

From: Horton, Richard (JR)
Sent: Thursday, September 26, 2013 2:30 PM
To: Gunter, William; Bolin, Bob; Rouse, Bradley; Kelly, Kyle; Eagle III, Eugene; Horne, Bruce; Hinman, Michael; Christopherson, Mark; Matheny, Michael; Pickar, George; Lipsky, Ryan
Subject: 2013 Harris Station NRC Exam Completion

To all,
Examination Security has been lifted for the HNP ILC 13-1 NRC Exam. The Operating Exam was administered the week of 9/9/13 and 9/16/13. The written exam was administered on 9/25/13. The Exam Security forms are located on my desk in the HEEC building on the instructor office wing (Across from C-109). Please come by and sign off the agreement and return your red exam security badge. It is preferred that you sign off in person, however if unable to come by my desk, I can sign you off if you reply to this e-mail stating that you agree with the following statement:

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 of 9/9/13, 9/16/13 and on 9/25/13. 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.

The e-mails are going to be attached to the security agreement forms and mailed to the NRC Chief Examiner. After you send me this statement you may remove your exam badge. Either send me your badge through the company mail or leave your security badge on my desk the next time you are at the HEEC building. When responding that you would like me to sign you off the agreement please respond with the following statement
(or similar).

I have read and agree with the bolded statement below. Please sign me off the security agreement.

Thanks for your support during the development and implementation of the ILC 13-1 NRC Exam.

JR Horton
Sr Nuclear Training Instructor
Harris Nuclear Plant
Duke Energy Progress, Inc
Email: richard.horton2@duke-enegy.com
Phone: 919-362-3334
Exam room: 919-362-3582
Mobile: 919-600-4875
Vnet: 8-772-3334/3582

10/2/13

Horton, Richard (JR)

From: Hinman, Michael
Sent: Tuesday, October 01, 2013 4:33 AM
To: Horton, Richard (JR)
Subject: RE: signing security agreement

I have read and agree with the bolded statement below. Please sign me off the security agreement.

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 of 9/9/13, 9/16/13 and on 9/25/13. 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.

-----Original Message-----
From: Horton, Richard (JR)
Sent: Monday, September 30, 2013 11:13 PM
To: Hinman, Michael
Subject: signing security agreement

You get a chance to signoff security?

10/2/13

Horton, Richard (JR)

From: Christopherson, Mark
Sent: Tuesday, October 01, 2013 2:08 PM
To: Horton, Richard (JR)
Subject: RE: 2013 Harris Station NRC Exam Completion

JR, ***I have read and agree with the bolded statement below. Please sign me off of the security agreement the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week of 9/9/13, 9/16/13 and on 9/25/13. 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.***

From: Horton, Richard (JR)
Sent: Thursday, September 26, 2013 2:29 PM
To: Gunter, William; Bolin, Bob; Rouse, Bradley; Kelly, Kyle; Eagle III, Eugene; Horne, Bruce; Hinman, Michael; Christopherson, Mark; Matheny, Michael; Pickar, George; Lipsky, Ryan
Subject: 2013 Harris Station NRC Exam Completion

To all,
Examination Security has been lifted for the HNP ILC 13-1 NRC Exam. The Operating Exam was administered the week of 9/9/13 and 9/16/13. The written exam was administered on 9/25/13. The Exam Security forms are located on my desk in the HEEC building on the instructor office wing (Across from C-109). Please come by and sign off the agreement and return your red exam security badge. It is preferred that you sign off in person, however if unable to come by my desk, I can sign you off if you reply to this e-mail stating that you agree with the following statement:

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 of 9/9/13, 9/16/13 and on 9/25/13. 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.

The e-mails are going to be attached to the security agreement forms and mailed to the NRC Chief Examiner. After you send me this statement you may remove your exam badge. Either send me your badge through the company mail or leave your security badge on my desk the next time you are at the HEEC building. When responding that you would like me to sign you off the agreement please respond with the following statement
(or similar).

I have read and agree with the bolded statement below. Please sign me off the security agreement.

Thanks for your support during the development and implementation of the ILC 13-1 NRC Exam.

JR Horton
Sr Nuclear Training Instructor
Harris Nuclear Plant
Duke Energy Progress, Inc
Email: richard.horton2@duke-enegy.com
Phone: 919-362-3334
Exam room: 919-362-3582
Mobile: 919-600-4875
Vnet: 8-772-3334/3582

10/2/13

Facility: Harris Nuclear Plant Date of Examination: September 9, 2013

Examination Level: RO ■ SRO ☐ Operating Test Number: 05000400/2013301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Determine Active / Inactive Status Of Off Shift License Personnel (JPM ADM-069-a) **Common** *K/A G2.1.1* **2013 NRC RO / SRO A1-1**
Conduct of Operations	D, R	Determine Average RCS Boron Concentration per EOP-ECA-0.1 (JPM ADM-020-a) **Common** *K/A G 2.1.20* **2013 NRC RO / SRO A1-2**
Equipment Control	M, R	Perform a Quadrant Power Tilt Ratio (QPTR) calculation with a control rod misaligned. (JPM ADM-010-e) *K/A G 2.2.12* **2013 NRC RO A2**
Radiation Control	P, R	Using Survey Maps, Simplified Drawings, Plant Maps and valve lists, determine stay times while performing a clearance activity (JPM-ADM-51-c) **Common** *K/A G2.3.4* **2013 NRC RO / SRO A3**
Emergency Procedures/Plan	N/A	NOT SELECTED FOR RO **2013 NRC RO A4**

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:		
	(C)ontrol room, (S)imulator, or Class(R)oom	**(4)**
	(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)	**(2)**
	(N)ew or (M)odified from bank (≥ 1)	**(2)**
	(P)revious 2 exams (≤ 1; randomly selected)	**(1)**

9/3/13

2013 NRC RO Admin JPM Summary

2013 NRC SRO A1-1 - (**Common**) - Determine Active / Inactive Status Of Off Shift License Personnel
(JPM ADM-069-a) **NEW**

K/A G2.1.1 - Knowledge of conduct of operations requirements.
(CFR: 41.10 / 45.13) RO 3.8 SRO 4.2

The work history of four license operators is provided to the candidate. The operators work on the FIN Team, rotational assignment to Training, Work Control and the Procedures Writer's group. The candidate must review the work history for each individual and determine the active or inactive status of each person in order to stand an on-shift watch position.

2013 NRC RO A1-2 - (**Common**) - Determine Average RCS Boron Concentration per EOP-ECA-0.1
(JPM ADM-020-b)

K/A G2.1.20 - Ability to interpret and execute procedure steps.
(CFR: 41.10 / 43.5 / 45.12) RO 4.6 / SRO 4.6

The candidate must perform a calculation to determine average RCS boron concentration in order to complete a Shutdown Margin calculation as required by EOP-ECA-0.1, Loss Of All AC Power Recovery Without SI Required. The candidate is provided a list of plant conditions and is required to calculate the average RCS boron concentration for these conditions IAW EOP-ECA-0.1, Attachment 1.

2013 NRC RO A2 - Perform a Quadrant Power Tilt Ratio (QPTR) calculation with a control rod misaligned.
(JPM ADM-010-e) **MODIFIED**

K/A G2.2.12 - Knowledge of surveillance procedures.
(CFR: 41.10 / 45.13) RO 3.7 SRO 4.1

The candidate must perform a QPTR calculation in accordance with surveillance procedure OST-1039, Calculation of Quadrant power Tilt Ratio, Weekly Interval and as required by the AOP-001, Malfunction of Rod Control and Indication System for a misaligned rod at 95% power. For SRO's this JPM requires the candidate to identify applicable Tech Spec LCOs.

NOTE: This JPM will be modified by changing the initial reactor power, the control rod that is dropped into the reactor, and the values of the PRNI upper and lower detectors. These changes result in the QPTR value that exceeds 1.09. The Tech Spec action is now different due to the value exceeding 1.09.

2013 NRC RO Admin JPM Summary (continued)

2013 NRC RO A3 - (**Common**) - Using Survey Maps, Simplified Drawings, Plant Maps and valve lists, determine stay times while performing a clearance activity (JPM-ADM-51-c) Previous - 2011 NRC Exam JPM *randomly selected from bank

K/A G2.3.4 - Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 41.12 / 43.4 / 45.10) RO 3.2 / SRO 3.7

The applicant will be supplied a survey map of a location in the RAB and a clearance mission to complete in this radioactive area. The location also contains one or more hot spots. They must determine the individual stay times of two Auxiliary Operators (AO), and ensure they are or are not exceeding the annual administrative dose limits. They will be provided Survey Maps, Simplified plant drawings to locate valves, Plant Maps of the area and a plant valve list to determine the location of the valves they will be hanging a clearance on. The given information will supply the accumulated annual whole body doses for the two AOs, one of which recently worked for another utility. They must perform their calculations based on Progress Energy Administrative Dose Limits.

2013 NRC RO A4 – Not selected

Revision Comments
2013 NRC RO Admin JPM Summary

JPM A1-1 was replace with NEW JPM on the topic of license maintenance to as recommended by the enhancement from the NRC to remove the overlap Error with the audit exam administrative JPM. The new JPM will require the candidate to evaluate the active or inactive status of 4 off-shift license holding personnel and determine which persons are eligible to stand watch based on meeting the requirements of an active license.

JPM A1-2 was updated to the current procedure revision, but did not require major changes from the original submittal form.

JPM A2 was modified as described and updated based on feedback from the Chief Examiner and did not require major changes for the original submittal form.

JPM A3 was replaced by randomly selecting a previously used A3 Administrative Topic. The 2011 NRC Exam A3 JPM was selected from the previous 4 NRC and Audit exam A3 topics and updated for the current procedure revision. The selected JPM requires the candidate to determine the stay time for two Auxiliary Operators hanging clearance on the CVCS system. The original submittal form was revised to reflect the changes to the selected JPM.

All comments during NRC Prep week have also been addressed. Attached is a separate attached copy of the required changes and checked completion.

Facility: Harris Nuclear Plant Date of Examination: September 9, 2013

Examination Level: RO ☐ SRO ■ Operating Test Number: 05000400/2013301

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Determine Active / Inactive Status Of Off Shift License Personnel (JPM ADM-069-a) **Common** *K/A G2.1.1* **2013 NRC RO / SRO A1-1**
Conduct of Operations	D, R	Determine Average RCS Boron Concentration per EOP-ECA-0.1 (JPM ADM-020-b) **Common** *K/A G 2.1.20* **2013 NRC RO / SRO A1-2**
Equipment Control	M, R	Perform a Quadrant Power Tilt Ratio (QPTR) calculation with a control rod misaligned and Evaluate Tech Specs. (JPM ADM-010-f) *K/A G 2.2.12* **2013 NRC SRO A2**
Radiation Control	P, R	Using Survey Maps, Simplified Drawings, Plant Maps and valve lists, determine stay times while performing a clearance activity (JPM-ADM-51-b) **Common** *K/A G2.3.4* **2013 NRC RO / SRO A3**
Emergency Procedures/Plan	N, R	Given a Set of Plant Conditions, Classify an Event. (JPM ADM-064-a) *K/A G2.4.41* **2013 NRC SRO A4**

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:		
	(C)ontrol room, (S)imulator, or Class(R)oom	**(5)**
	(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)	**(2)**
	(N)ew or (M)odified from bank (≥ 1)	**(3)**
	(P)revious 2 exams (≤ 1; randomly selected)	**(1)**

2013 NRC SRO Admin JPM Summary

2013 NRC SRO A1-1 - (**Common**) - Determine Active / Inactive Status Of Off Shift License Personnel
(JPM ADM-069-a) **NEW**

K/A G2.1.1 - Knowledge of conduct of operations requirements.
(CFR: 41.10 / 45.13) RO 3.8 SRO 4.2

The work history of four license operators is provided to the candidate. The operators work on the FIN Team, Training Department Rotation of Assignment, Work Control and the Procedures Writer's group. The candidate must review the work history for each individual and determine the active or inactive status of each person in order to stand an on-shift watch position.

2013 NRC SRO A1-2 - (**Common**) - Determine Average RCS Boron Concentration per EOP-ECA-0.1
(JPM ADM-020-b) **DIRECT**

K/A G2.1.20 - Ability to interpret and execute procedure steps.
(CFR: 41.10 / 43.5 / 45.12) RO 4.6 / SRO 4.6

The candidate must perform a calculation to determine average RCS boron concentration in order to complete a Shutdown Margin calculation as required by EOP-ECA-0.1, Loss Of All AC Power Recovery Without SI Required. The candidate is provided a list of plant conditions and is required to calculate the average RCS boron concentration for these conditions IAW EOP-ECA-0.1, Attachment 1.

2013 NRC SRO A2 - Perform a Quadrant Power Tilt Ratio (QPTR) calculation with a control rod misaligned and Evaluate Tech Specs
(JPM ADM-010-f) **MODIFIED**

K/A G2.2.12 - Knowledge of surveillance procedures.
(CFR: 41.10 / 45.13) RO 3.7 SRO 4.1

The candidate must perform a QPTR calculation in accordance with surveillance procedure OST-1039, Calculation of Quadrant power Tilt Ratio, Weekly Interval and as required by the AOP-001, Malfunction of Rod Control and Indication System for a misaligned rod at 95% power. For SRO's this JPM requires the candidate to identify applicable Tech Spec LCOs.

NOTE: This JPM will be modified by changing the initial reactor power, the control rod that is dropped into the reactor, and the values of the PRNI upper and lower detectors. These changes result in the QPTR value that exceeds 1.09. The Tech Spec action is now different due to the value exceeding 1.09.

2013 NRC SRO Admin JPM Summary (continued)

2013 NRC SRO A3 - (**Common**) - Using Survey Maps, Simplified Drawings, Plant Maps and valve lists, determine stay times while performing a clearance activity
(JPM-ADM-51-b) Previous - 2011 NRC Exam JPM *randomly selected from bank

K/A G2.3.4 - Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 41.12 / 43.4 / 45.10) RO 3.2 SRO 3.7

The applicant will be supplied a survey map of a location in the RAB and a clearance mission to complete in this radioactive area. The location also contains one or more hot spots. They must determine the individual stay times for two Auxiliary Operators (AO) without exceeding the annual administrative dose limits. They will be provided Survey Maps, Simplified plant drawings to locate valves, Plant Maps of the area and a plant valve list to determine the location of the valves they will be hanging a clearance on. The given information will supply the accumulated annual whole body doses for the two AOs, one of which recently worked for another utility. They must perform their calculations based on Progress Energy Administrative Dose Limits.

2013 NRC SRO A4 - Given a set of conditions, Classify an Event
(JPM-ADM-064-a) **NEW**

K/A G2.4.41 - Knowledge of the emergency action level thresholds and classifications (CFR: 41.10 / 43.5 / 45.11) RO 2.9 SRO 4.6

Given a set of initial conditions and the EAL Flow Path, the candidate must classify the appropriate Emergency Action Level for the event in progress.

Revision Comments
2013 NRC SRO Admin JPM Summary

JPM A1-1 was replace with NEW JPM on the topic of license maintenance to as recommended by the enhancement from the NRC to remove the overlap Error with the audit exam administrative JPM. The new JPM will require the candidate to evaluate the active or inactive status of 4 off-shift license holding personnel and determine which persons are eligible to stand watch based on meeting the requirements of an active license.

JPM A1-2 was updated to the current procedure revision, but did not require major changes from the original submittal form.

JPM A2 was modified as described and updated based on feedback from the Chief Examiner and did not require major changes for the original submittal form.

JPM A3 was replaced by randomly selecting a previously used A3 Administrative Topic. The 2011 NRC Exam A3 JPM was selected from the previous 4 NRC and Audit exam A3 topics and updated for the current procedure revision. The selected JPM requires the candidate to determine the stay time for two Auxiliary Operators hanging clearance on the CVCS system. The original submittal form was revised to reflect the changes to the selected JPM.

JPM A4 was created as described and updated based on feedback from the Chief Examiner and did not require major changes for the original submittal form.

All comments during NRC Prep week have also been addressed. Attached is a separate attached copy of the required changes and checked completion.

Facility: Harris Nuclear Plant		Date of Examination: 09/09/2013	
Exam Level: RO SRO-I **SRO-U (bold)**		Operating Test No.: 05000400/2013301	
Control Room Systems@ (8 for RO); (7 for SRO-I); (**2 or 3 for SRO-U, including 1 ESF - bold**)			
	System / JPM Title	Type Code*	Safety Function
a.	**Perform Control Rod and Rod Position Indicator Exercise per OST-1005 (OST-1005) (JPM-CR-256-d)** **K/A 001 A2.11**	**A, N, S**	**1**
b.	Respond to the loss of the running CSIP (AOP-018) (JPM-CR-038-a) *K/A APE 022 AA1.01*	A, D, S	2
c.	**Pressurizer PORV Failure (AOP-019) (JPM-CR-282-a)** ***K/A APE 027 AA1.01***	**A, N, S**	**3**
d.	Perform Max Rate Cooldown for a SG Tube Rupture (E-3) (JPM-CR-282-a) *K/A 041 A4.08*	A, N, L, S	4S
e.	Return the Containment Fan Coolers to normal following a Safety Injection actuation. (OP-169) (JPM CR-260-a) **RO Only** *K/A 022 A4.01*	D, EN, L, S	5
f.	**Loss Of All AC While Paralleling EDG from MCB for Testing (OP-155) (JPM-CR-203-c)** ***K/A 064 A4.06***	**A, M, EN, S**	**6**
g.	Restore an Excore NI Channel to service (at power, NI-43 failed) (OWP-RP-25) (JPM-CR-278-a) *K/A 015 A4.03*	N, S	7
h.	Align CCW to Support RHR System (OP-145) (JPM CR-085-a) *K/A 008 A4.01*	D, L, S	8

a/3/13

In-Plant Systems[@] (3 for RO); (3 for SRO-I); (**2 or 3 for SRO-U - BOLD**)			
i.	**Place the ASI System in Standby Alignment (OP-185) (JPM-IP-277-a)** ***K/A 004 A4.11***	**L, N, R**	**2**
j.	Local Inspection of Annunciator Cabinets (AOP-037) (JPM IP-273-a) *K/A 016 A2.02*	D, E	7
k.	**Perform an Instrument Air System Leak Isolation Locally (Turbine Bldg / Yard) (JPM-IP-161-a)** ***K/A APE 065 AA2.03***	**D, E, L**	**8**

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	(5, 5, 3)
(C)ontrol room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	(5, 4, 1)
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	(2, 2, 1)
(EN)gineered safety feature	- / - / ≥1	(2, 1, 1)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1	(5, 4, 2)
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	(5, 5, 4)
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2	(0, 0, 0)
(R)CA	≥ 1 / ≥ 1 / ≥ 1	(1, 1, 1)
(S)imulator		

9/3/13

2013 NRC Control Room/In-Plant JPM Summary

Simulator JPMs

JPM a – Perform Control Rod and Rod Position Indicator Exercise per OST-1005 (JPM-CR-256-d) New **- SRO Upgrade**

K/A 001 A2.11 – Ability to (a) predict the impacts of the following malfunction or operations on the CRDS- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Situations requiring a reactor trip
(CFR: 41.5/43.5/45.3/45.13) RO 4.4 / SRO 4.7

The candidate will assume the watch with the unit operating at 100% power and will be directed to perform OST-1005 commencing with Control Bank D in section 7.2. The candidate will insert and withdraw Control Bank D 10 steps as required. The candidate will continue OST-1005 and select the next Control Bank and insert the Control Bank 10 steps as required. Once the candidate begins to insert the next selected Control Bank, the **Alternate Path** will begin and a malfunction of the rod control system will result in the Control Rods continuing to insert once the demand for rod motion has stopped. This will cause RCS Tavg, and Reactor Power will lower in response to the control rods inserting and the Control Rod step counter will continue to lower. The candidate should recognize the failure of the rod control system and perform AOP-001 immediate actions to place Rod Control in manual. The candidate may or may not select the manual position. Rod Control is considered to be in manual as long as the Auto position is not selected and being in Control Bank A satisfies this step. Rod motion will continue in either case requiring the candidate to perform the RNO action and initiate a manual reactor trip. The candidate will announce the Reactor is tripped and begin to perform the immediate actions of E-0. Once the candidate verifies that the Reactor and Turbine are tripped evaluation on this JPM is complete.

JPM b – Respond to the loss of the running CSIP (JPM-CR-038-a) Direct

K/A APE 022 AA1.01 - Ability to operate and / or monitor the following as they apply to the Loss of Reactor Coolant Makeup: CVCS letdown and charging
(CFR: 41.7 / 45.5 / 45.6) RO 3.4 / SRO 3.3

With the plant at 100% power and the ASI system OOS for planned maintenance the candidate will assume the Operator at the Controls (OAC) responsibilities. The A CSIP will trip requiring the candidate to enter AOP-018. AOP-018 will direct the candidate to isolate letdown in response to the loss of charging flow. While the candidate is assessing letdown RCP Thermal Barrier Flow Control valve (1CC-252) will shut. Following the isolation of letdown the candidate will evaluate the status of component cooling water to the RCP Thermal Barrier and determine that flow is isolated. The **Alternate Path** of this JPM will begin when the candidate evaluates AOP-018, Attachment 1 RCP trip limits. They will determine that the trip limit #4 "Loss of all RCP seal injection (including ASI)" is met due to the loss of CCW flow to the RCP Thermal Barrier Hx. The actions that should be taken for this condition are to Trip the Reactor and complete the immediate actions of EOP-E-0. After the Reactor and Turbine trip is verified the candidate will return to AOP-018 to stop all RCPs and shut the PRZ Spray controllers for RCS loops A and B. Once the candidate has stopped all RCPs and shut the PRZ Spray controllers for RCS loops A and B, evaluation on this JPM is complete.

Simulator JPMs (continued)

JPM c – Pressurizer PORV Failure (AOP-019)
(JPM-CR-252-a) New - **SRO Upgrade**

K/A APE 027 AA1.03 – Ability to operate and / or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions: Pressure control when on a steam bubble
(CFR 41.7 / 45.5 / 45.6) RO 3.6 SRO 3.5

The candidate will assume the Operator at the Controls (OAC) responsibilities and be directed to maintain current plant conditions of 100% steady state power. Soon after assuming the watch the Pressurizer Pressure Master Controller PK-444B will begin to fail in Automatic to 100%. This will cause BOTH Pressurizer Spray valves to go from full closed to the full open position. The candidate should identify the failure and enter AOP-019. While performing the immediate actions the candidate should complete the **Alternate Path** (Take manual control of the Pressurizer Master Controller and lower the output to close the Pressurizer Spray Valves.) IF the candidate takes manual of control of BOTH Pressurizer Spray valves and NOT PK-444B then the master controller will continue to fail and Pressurizer PORV 444B will go full open. When the RCS pressure is < 2000 psig an auto shut signal will be sent to PORV 444B but by this time the pressure excursion will be so great that it will most likely cause an automatic Reactor Trip on OTΔT and Safety Injection on Low Pressurizer Pressure (at 1850 psig). Once the candidate places the Pressurizer Master Controller is in manual OR both Pressurizer Spray Valves are manually shut AND PORV 444B is shut, evaluation on this JPM is complete.

JPM d – Perform Max Rate Cooldown for a SG Tube Rupture (E-3)
(JPM-CR-282-a) New

K/A 041 A4.08 Ability to manually operate and/or monitor in the control room: Steam dump valves (CFR: 41.7 / 45.5 to 45.8)) RO 3.0 SRO 3.1

The candidate will be assigned the BOP position and is directed to perform E-3 commencing with step 28. The candidate will be required to determine the target temperature for the ruptured SG and perform a Max rate cooldown to the target temperature using the Steam Dumps. The **Alternate Path** will be that once the cooldown using the Steam Dumps is in progress the condenser steam dumps will become unavailable and go shut. The candidate must determine that the cooldown has stopped due to the failure of the Steam Dumps and recommence the Max rate cooldown using the SG PORVs on the intact A and B SGs. Once the candidate stabilizes the RCS below the target temperature, evaluation of this JPM is complete.

 9/3/13

Simulator JPMs (continued)

JPM e – Return the Containment Fan Coolers to normal following an SI actuation. (OP-169) (JPM CR-260-a) Direct **RO Only**

K/A 026 A4.01 Ability to manually operate and/or monitor in the control room: CCS fans (CFR: 41.7 / 45.5 to 45.8) RO 3.6 / SRO 3.6

The candidate is informed an inadvertent SI initiation has occurred and the control room staff has entered EOP-E-0 and EOP-ES-1.1. Attachment 1 of EOP-ES-1.1 is being performed to realign plant systems. The candidate is directed to realign containment fan coolers IAW Attachment 1 step 6.a using OP-169, Containment Cooling And Ventilation, Section 8.4. The candidate will be directed to align the A Train of CNMT Fan Coolers for normal service. The candidate will secure both A Train CNMT Fan Coolers and verify proper damper alignment for the secured fans. The candidate will restart the A Train Fans per section 5.1 of OP-169. To minimize the starting current required for Hi-Speed operation the fans are initially started in Lo-Speed, then stopped and restarted in Hi-Speed. The candidate will return to section 8.4 to secure the B Train of CNMT Fan Coolers. Once the B Train of CNMT Fan Coolers are in standby and the determination is made that Maximum Cooling Mode is NOT required, evaluation on this JPM is complete.

JPM f – Loss Of All AC While Paralleling a Emergency Diesel Generator from the Main Control Room for Testing (OP-155) (JPM-CR-203-c) – **SRO Upgrade**
Modified - Previous NRC Exam – 2012 *randomly selected from bank

K/A 064 A4.06 Ability to manually operate and/or monitor in the control room: Manual start, loading, and stopping of the ED/G
(CFR: 41.7 / 45.5 to 45.8) RO 3.9 SRO 3.9

The candidate will be informed that they are the BOP Operator and will be directed by the CRS to parallel the 1B-SB Emergency Diesel Generator (EDG) to the grid from the Main Control Board IAW section 5.3 of OP-155. The candidate will exercise the EDG voltage and governor controls then parallel the EDG. After parallel operations have been achieved a Loss of Off Site Power will occur when the generator load exceeds 2 MW. The **Alternate Path** occurs when the loss of power requires the candidate to manually open the EDG output breaker IAW OP-155 precaution and limitation #24. The EDG output breaker will not automatically close requiring the candidate to perform the actions of ECA-0.0 to restore power to the 6.9 Emergency Bus by closing the EDG output breaker. Previous JPM was modified to include the failure of the undervoltage relay for the 1B-SB Emergency Bus in addition to the failure of the LOSP logic for the EDG output breaker. This additional failure requires the candidate to perform the actions of ECA-0.0 to re-energize the Emergency Bus.

 9/3/13

Simulator JPMs (continued)

JPM g – Restore an Excore NI Channel to service (at power, NI failed) (OWP-RP-25) (JPM-CR-278-a) New

K/A 015 A4.03 – Ability to manually operate and/or monitor in the control room: Trip bypasses (CFR: 41.7 / 45.5 to 45.8) RO 3.8 / SRO 3.9

New JPM to restore previously repaired failed NI-43 to service.
The candidate will assume the watch with the plant at 100% steady state power and the PRNI channel NI-43 which failed downscale earlier repaired. The candidate will be required to return NI-43 to service IAW OWP-RP-25. OWP-RP-25 ensures the components that have NI-43 as an input, Rod Control and SG Feedwater regulating bypass valves are in manual control to prevent spurious movement or uncontrolled changes in level. The candidate will verify the controllers are in manual. The OWP will require the candidate to contact maintenance (I&C personnel) to return the two previously trip bistables for the Channel III OTΔT signals to normal in the Process Instrument Cabinet 3 (PIC-3).
The candidate will return the following items to NORMAL

- At the Detector Current Comparator Drawer: Both upper and lower sections of NI-43
- At the Comparator and Rate Drawer: Comparator Channel Defeat switch

The candidate will return the following items to OPERATE

- At the Miscellaneous Control and Indication Panel: Power Mismatch Bypass switch and the Rod Stop Bypass switch.

The candidate will have to contact maintenance (I&C personnel) a second time and direct them to re-connect the NI-43 power supply leads to the NI drawer. After the I&C personnel re-connect the NI-43 power supply leads the candidate will verify proper bi-stable and annunciator configuration for the restoration of NI-43 to service. Finally the candidate will have to restore the plant computer (ERFIS) point to processing and document the position of MCB components for the current plant conditions with NI-43. Once the candidate reports that OWP-RP-25 is complete to the CRS, evaluation on this JPM is complete.

JPM h – Align CCW to Support RHR System (OP-145)
(JPM CR-085-a) Direct

K/A 008 A4.10 Ability to manually operate and/or monitor in the control room: Conditions that require the operation of two CCW coolers
(CFR: 41.7 / 45.5) RO 3.3 / SRO 3.1

The plant is in Mode 4 and a cool down is in progress. The CRS directs the candidate to align CCW to support RHR operation IAW OP-145 section 8.9. After reviewing section 8.9 the candidate determines a second CCW pump is required to be started and transitions to section 5.2. The candidate starts the B CCW pump IAW section 5.2 and returns to section 8.9 and isolates the A train essential header of the CCW from the non essential header. The candidate will align the B train essential header to supply RHR HX B. The candidate will verify both trains of the CCW system operating parameters are within the required band on the MCB indicators. The candidate will contact a non license operator (NLO) to locally verify the CCW flow to the Gross Failed Fuel Detector is within the required band. Once the candidate contacts the NLO to verify CCW flow locally then evaluation on this JPM is complete.

In-Plant JPMs

JPM i – Place the ASI System in Standby Alignment (OP-185)
(JPM-IP-277-a) New **- SRO Upgrade**

K/A 004 A4.11 Ability to manually operate and/or monitor in the control room: RCP Seal injection flow (CFR: 41.7 / 45.5 to 45.8) RO 3.4 / SRO 3.3

NOTE: This JPM is inside the RCA.

The plant is in Mode 4 and a heat up is in progress. The CRS directs the candidate to place the ASI system in automatic standby alignment IAW OP-185 section 5.1. The candidate will verify the ASI supply header isolation valves are open and the status of the ASI system control panel. The candidate will realign the ASI pump to automatic and return the Squib valve bypass control switches to normal alignment on the ASI control panel. The candidate will turn on the ASI system control panel feeder supply breaker and the ASI pump power supply breaker. The candidate will recheck the indications on the ASI system control panel for the proper standby alignment of the system. Once the candidate proceeds to section 5.1.3, Automatic Standby alignment configuration control closeout then evaluation on this JPM is complete.

JPM j – Local Inspection of Annunciator Cabinets (AOP-037)
(JPM IP-273-a) Direct

K/A 016 A2.02 Ability to (a) predict the impacts of the following malfunctions or operations on the NNIS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of power supply
(CFR: 41.5 / 43.5 / 45.3 / 45.5) RO 2.9 / SRO 3.2

The candidate is informed that the control room annunciator System 2 power failure alarm has been received and the CRS has entered AOP-037. The CRS will direct the candidate to check the status of System 2 annunciator power supplies per AOP-037 Attachment 2. The candidate will perform Attachment 2 and obtain the annunciator cabinet key. The JPM cues include information of the proper status of the power supply light indications. The candidate will initial for the indications that remain lit. The candidate will determine based on the cues that one of the System 2, Bay 1, 12 VDC power supplies, one of the System 2, Bay 3, 12 VDC power supplies and the System 2, Bay 5, 24 VDC power supplies are de-energized. The candidate will also be asked to identify how many annunciators are affected by the malfunction. Once the CRS is notified that AOP-037, Attachment 2 is complete and the number of annunciators affected are identified then evaluation on this JPM is complete.

 8/3/13

In-Plant JPMs (continued)

JPM k – Perform an Instrument Air System Leak Isolation Locally (Turbine Bldg / Yard) (AOP-017) (JPM-IP-161-a) Direct - **SRO Upgrade**

K/A APE 065 AA2.03 Ability to determine and interpret the following as they apply to the Loss of Instrument Air: Location and isolation of leaks
(CFR: 43.5 / 45.13) RO 2.6 / SRO 2.9

The candidate is informed that the plant was operating at 100% when the plant was tripped due to lowering instrument air pressure. AOP-017 is being performed. The CRS directs the operator to perform Attachment 3 of AOP-017 to reduce instrument air header loads. They will be required to isolate individual sections of the instrument air system within the Turbine Building and contact the Main Control room staff following the completion of each action to determine if the prior actions have successfully isolated the instrument air leak. The JPM cues include information of the proper sequence of actions that must be taken in order reposition the valves and due to the valve locations a description of the nearest ladder location is given to simulate climbing to the valve location. Once notified by the Main Control room that the instrument air header pressure has stabilized then evaluation on this JPM is complete.

9/3/13

Revision Comments
2013 NRC Control Room/In-Plant JPM Summary

Simulator JPM revisions:

JPM a – Completion of the JPM has been extended to wait until AFTER the candidate verifies that the Reactor and the Turbine are tripped in accordance with immediate action steps 1 and 2 of E-0, Reactor Trip or Safety Injection.

JPM b – no changes were made to this JPM.

JPM c – Replaced JPM c "Pressurizer Pressure Master Controller Failure" based on NRC comment that the JPM was in "error" stating that the JPM was NOT an Alternate Path JPM. The replacement JPM has is a "new" JPM titled "Pressurizer PORV Failure". This JPM has also been chosen to be used for the SRO Upgrades. The JPM was developed based on the example provided by the NRC for a "no-tell" JPM. The new JPM has the candidate assume the shift during normal full power operation. Pressurizer PORV 445A will then inadvertently lift. Adverse affects of the PORV on the RCS will cause RCS pressure to lower and both Pressurizer Spray valves to shut. Indications that the PORV has lifted will be annunciators, PORV tail pipe temperature increase, PRT temperature and level changes and the PORV 445A red and green indicating lights will both be ON. The candidate will respond by identifying AOP-019, Malfunction of RCS Pressure Control entry conditions are met. After identification of the malfunction the candidate should shut the associated block valve and verify that the RCS pressure stabilizes. IF the candidate does not act on this failure a Reactor Trip and Safety Injection actuation will occur.

JPM d – During development of enhancement changes recommended by the NRC and comments received during Operator validation of this JPM we determined that the JPM should be replaced with another Safety Function 4 JPM.

Increasing the levels on the SG's to high levels was not realistic since having SG high levels indicated that the crew was not maintaining control of SG levels during this event. The event in progress was a Small Break LOCA with Containment Pressure in excess of 3 psig (adverse Containment). In this case SG levels would be maintained between 40-50%. We had raised the SG levels to 75% and as soon as the Operator assumed shift they reduced AFW flow to zero to prevent SG overfill and attempt to get level back in band. With the immediate reduction of AFW flow the failure criteria for SG overfill was immediately removed. Even when told not to reduce AFW flows we could not get consistent results that would provide pass/fail criteria based on flow or discharge pressure.

Additionally, Operator validation determined that a Loss Of Power to the control system would need to have more indications than the ones we developed for the JPM. We asked the Simulator support group to help in the development of additional variations of AFW system responses and were unable to complete the changes to get the JPM validated prior to the required date to send the exam to the NRC. The Simulator support person in charge of modifying the event for us is currently on vacation and jury duty. We may have been able to incorporate the changes prior to prep week but instead chose to replace this JPM.

JPM d is now "Verify Main Feedwater Actuation Per OMM-004 Attachment 6". This JPM will NOT be used for the SRO Upgrades since JPM "c" will be used.

9/3/13

Revision Comments
2013 NRC Control Room/In-Plant JPM Summary

During NRC Exam prep week the previous identified JPM was determined to not provide substantive evaluation property and was replaced with a new JPM. The new JPM will have the candidate perform the max rate cooldown for a ruptured SG and while the cooldown is in progress the Steam dumps will fail shut requiring the candidate to complete the cooldown using the SG PORVs. This JPM is now identified as NEW on form ES-301-2.

JPM e – No changes to JPM e. We replaced the Audit Exam JPM to eliminate the "error" of this JPM being too similar to the Audit Exam JPM that was selected. The Audit Exam JPM will have the candidates reduce Containment Spray flow following Containment Spray actuation. They will have to determine the required number of spray pumps to have in operation based on Containment pressure, RWST level and the number of Containment Fan Coolers in operation.

JPM f - We have replaced the original JPM "Restore Off-site Power to an Emergency Bus" with "LOSP While Paralleling EDG from MCB for Testing". We were unable to modify the JPM to correct the error identified by the NRC and took the suggestion of replacement. The JPM we selected was randomly chosen from the HNP JPM bank of Safety Function 6 JPMs. The replacement JPM was last used on the 2012 NRC Exam. We have identified this JPM on form ES-301-2 as "Previous".

During NRC Exam prep week the previous 2012 JPM was modified to provide a different outcome for the candidate to remove predictability. The failure of the Emergency Bus undervoltage relay requires the candidate to perform the actions of ECA-0.0. This JPM is now identified as Modified on form ES-301-2.

JPM g – No changes were made to this "new" JPM.

JPM h – This HNP bank JPM was enhanced per instructions provided by the NRC to ensure that the standards for each JPM step involving a verification of CCW flow has a band, a value, and pass/fail criteria for being outside the band based on instrument the scale of the instrument used.

In-Plant JPM revisions:

JPM i – We have enhanced the communication cues and included a requirement of finding the location of the local tank level gauge. The JPM will now have the candidate go to three different areas to complete the task.

JPM j – We have enhanced the JPM by adding marked up drawings to provide the candidate the indications of the light configuration of the power supplies. This has eliminated the communication for which light is on or off. Additionally, we have added a requirement to identify how many of the annunciators were affected based on the results of which power supplies were de-energized.

JPM k - We have added cues in the initial steps that will provide a reduction in communications. We have not changed the JPM to have the candidate perform ALL 5 steps based on how the travel paths that would be involved to complete this JPM. The steps would have to be performed in the order that is written which would

9/9/13

have the candidate and evaluator travel from the Turbine Building into the RAB, back to the Turbine Building and back into the RAB. Since we have already included a JPM that involves entering the RAB and received feedback from the Operators that they would have more than one individual perform this task we have the JPM written out to ONLY do the actions in the Turbine Building. These actions are in several locations and will provide a good evaluation of the candidate's ability to "find" the equipment and demonstrate how to operate the valves while employing personal safety.

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

Facility: Shearon Harris Date of Examination: 09-09-2013 Operating Test Number: 05000400/2013301

	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).	✓	✓	BH
b.	There is no day-to-day repetition between this and other operating tests to be administered during this examination.	✓	✓	BH
c.	The operating test shall not duplicate items from the applicants' audit test(s). (see Section D.1.a.)	✓	✓	BH
d.	Overlap with the written examination and between different parts of the operating test is within acceptable limits.	✓	✓	BH
e.	It appears that the operating test will differentiate between competent and less-than-competent applicants at the designated license level.	✓	✓	BH
	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	✓	✓	BH
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.	✓	✓	BH
	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.		✓	✓	BH

		Printed Name / Signature	Date
a.	Author	Richard (JR) Horton /	8/31/13
b.	Facility Reviewer(*)	Simon Schwindt /	8/31/13
c.	NRC Chief Examiner (#)	BRUNO CABALLERO / Bruno Caballero	9/3/13
d.	NRC Supervisor	MARK FRANKE	9/4/13

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

9/3/13

ES-301 **Simulator Scenario Quality Checklist** **Form ES-301-4**

Facilty: Shearon Harris Date of Exam: 09-09-2013 Scenario Numbers: 1 / 2 / 3 / 4 / 5 Operating Test No.: 05000400/2013301

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) that are entered to initiate the event • the symptoms/cues that will be visible to the crew • the expected operator actions (by shift position) • the event termination point (if applicable)			
4. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.			
5. The events are valid with regard to physics and thermodynamics.			
6. Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.			
7. If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.			
8. The simulator modeling is not altered.			
9. The scenarios have been validated. Pursuant to 10 CFR 55.46(d), any open simulator performance deficiencies or deviations from the referenced plant have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.			
10. Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.5 of ES-301.			
11. All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).			
12. Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios).			
13. The level of difficulty is appropriate to support licensing decisions for each crew position.			

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes	--	--	--
1. Total malfunctions (5–8)	9 / 9 / 10 / 8 / 8			
2. Malfunctions after EOP entry (1–2)	4 / 2 / 3 / 2 / 3			
3. Abnormal events (2–4)	4 / 5 / 6 / 5 / 6			
4. Major transients (1–2)	1 / 2 / 2 / 1 / 1			
5. EOPs entered/requiring substantive actions (1–2)	2 / 2 / 2 / 1 / 3			
6. EOP contingencies requiring substantive actions (0–2)	0 / 1 / 1 / 1 / 1			
7. Critical tasks (2–3)	2 / 2 / 3 / 4 / 2			

9/3/13

SCENARIO'S 1, 2, 3 AND 4
RO List (5 total)

ES-301 **Transient and Event Checklist** **Form ES-301-5**

Facility: Shearon Harris Date of Exam: 09-09-2013 Operating Test No.: 05000400/2013301

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 ■ SRO-I ☐ SRO-U ☐	RX											R2		1	1		
	NOR			N1										1	1		
	I/C			I2 C4								I1 I3 C6		6	4		
	MAJ			M6								M7		2	2		
	TS													0	0		
RO - 2 ■ SRO-I ☐ SRO-U ☐	RX								R6					1	1		
	NOR						N1						N2	2	1		
	I/C						C3 I6		C1 C3				C4 C5	6	4		
	MAJ						M8		M7				M7	3	2		
	TS													0	0		
RO - 3 ■ SRO-I ☐ SRO-U ☐	RX											R2		1	1		
	NOR			N1						N5				2	1		
	I/C			I2 C4						I2 C4		I1 I3 C6		7	4		
	MAJ			M6						M7		M7		3	2		
	TS													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 must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

9/3/13

SCENARIO'S 1, 2, 3 AND 4
RO List (5 total)

ES-301 **Transient and Event Checklist** **Form ES-301-5**

Facility: Shearon Harris Date of Exam: 09-09-2013 Operating Test No.: 05000400/2013301

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 - 4 ■ SRO-I ☐ SRO-U ☐	RX								R6					1	1		
	NOR												N2	1	1		
	I/C								C1 C3				C4 C5	4	4		
	MAJ								M7				M7	2	2		
	TS													0	0		
RO - 5 ■ SRO-I ☐ SRO-U ☐	RX					R1								1	1		
	NOR					N5							N2	2	1		
	I/C					C2 C4							C4 C5	4	4		
	MAJ					M8							M7	2	2		
	TS													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 must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

a/3/13

SCENARIO'S 1, 2, 3 AND 4
SRO Instant List (5 total)

ES-301 **Transient and Event Checklist** **Form ES-301-5**

Facility: Shearon Harris | Date of Exam: 09-09-2013 | Operating Test No.: 05000400/2013301

APPLICANT	EVENT TYPE	Scenarios 1 SRO	1 ATC	1 BOP	2 SRO	2 ATC	2 BOP	3 SRO	3 ATC	3 BOP	4 SRO	4 ATC	4 BOP	TOTAL	MINIMUM(*) R	MINIMUM(*) I	MINIMUM(*) U
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
RO ☐ SRO-I 1 ■ SRO-U ☐	RX		R1								R2			2		1	
	NOR						N1				N2			2		1	
	I/C		I3 I5				C3 I6				I1 I3 C4 C5 C6			9		4	
	MAJ		M6				M8				M7			3		2	
	TS										T1 T3 T5			3		2	
RO ☐ SRO-I 2 ■ SRO-U ☐	RX		R1								R2			2		1	
	NOR						N1				N2			2		1	
	I/C		I3 I5				C3 I6				I1 I3 C4 C5 C6			9		4	
	MAJ		M6				M8				M7			3		2	
	TS										T1 T3 T5			3		2	
RO ☐ SRO-I 3 ■ SRO-U ☐	RX		R1								R2			2		1	
	NOR									N5	N2			2		1	
	I/C		I3 I5							I2 C4	I1 I3 C4 C5 C6			9		4	
	MAJ		M6							M7	M7			3		2	
	TS										T1 T3 T5			3		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 must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

9/3/13

SCENARIO'S 1, 2, 3 AND 4
SRO Instant List (5 total)

ES-301 **Transient and Event Checklist** **Form ES-301-5**

Facility: Shearon Harris Date of Exam: 09-09-2013 Operating Test No.: 05000400/2013301

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 4 ■ SRO-U ☐	RX				R1							R2		2		1	
	NOR			N1	N1 N5									2		1	
	I/C			I2 C4	C2 C3 C4 I6							I1 I3 C6		9		4	
	MAJ			M6	M8							M7		3		2	
	TS				T3 T4 T6									3		2	
RO ☐ SRO-I 5 ■ SRO-U ☐	RX					R1		R6						2		1	
	NOR					N5		N5						2		1	
	I/C					C2 C4		C1 I2 C3 C4						6		4	
	MAJ					M8		M7						2		2	
	TS							T1 T3 T4						3		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 must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

9/3/13

SCENARIO'S 1, 2, 3 AND 4
SRO Upgrade List (3 total)

ES-301 **Transient and Event Checklist** **Form ES-301-5**

Facility: Shearon Harris Date of Exam: 09-09-2013 Operating Test No.: 05000400/2013301

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-U1 ■	RX	R1												1			0
	NOR	N1												1			1
	I/C	I2 I3 C4 I5												4			2
	MAJ	M6												1			1
	TS	T2 T4												2			2
RO ☐ SRO-I ☐ SRO-U2 ■	RX	R1			R1									2			0
	NOR	N1			N1 N5									3			1
	I/C	I2 I3 C4 I5			C2 C3 C4 I6									8			2
	MAJ	M6			M8									2			1
	TS	T2 T4			T3 T4 T6									5			2
RO ☐ SRO-I ☐ SRO-U3 ■	RX	R1						R6						2			0
	NOR	N1						N5						2			1
	I/C	I2 I3 C4 I5						C1 I2 C3 C4						8			2
	MAJ	M6						M7						2			1
	TS	T2 T4						T1 T3 T4						5			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 must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

9/3/13

SCENARIO "SPARE"

ES-301 **Transient and Event Checklist** **Form ES-301-5**

Facility: Shearon Harris Date of Exam: 09-09-2013 Operating Test No.: 05000400/2013301

APPLICANT	EVENT TYPE	Scenarios 5 CREW POSITION SRO	CREW POSITION ATC	CREW POSITION BOP	TOTAL	MINIMUM(*) R	I	U
RO ☐ SRO-I ■ SRO-U ■	RX				0	1	1	0
	NOR	N1			1	1	1	1
	I/C	I2 C3 C4 C5 C6			5	4	4	2
	MAJ	M7			1	2	2	1
	TS	T3 T5			2	0	2	2
RO ■ SRO-I ☐ SRO-U ☐	RX				0	1	1	0
	NOR				0	1	1	1
	I/C		I2 C5 C6		3	4	4	2
	MAJ		M7		1	2	2	1
	TS				0	0	2	2
RO ■ SRO-I ☐ SRO-U ☐	RX				0	1	1	0
	NOR			N1	1	1	1	1
	I/C			C3 C4	2	4	4	2
	MAJ			M7	1	2	2	1
	TS				0	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 must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Revision FINAL – Changes have been made to the transient and event checklist based on the incorporation of NRC enhancements into HNP Scenarios that were revised during the Prep Week. The events listed in this revision correspond to the HNP Scenarios 1-5 submitted on 8-31-2013.

JR Horton 8-31-2013

Facility: Harris Nuclear Plant Date of Examination: 09-09-2013

Operating Test No.: 05000400/2013301

Competencies	APPLICANTS																
	RO				RO (BOP)				SRO-U				SRO-I				
	SCENARIO				SCENARIO				SCENARIO				SCENARIO				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2-SRO	2-RO	3	4
Interpret / Diagnose Events and Conditions	0	2,4, 7,8, 9, 10, 11	1,3, 5,6, 8	1,3, 6,7, 8	2,4, 6,7	3,4, 7,8, 9,10	2,4, 6,7, 8,9	4,5, 7,8, 9	2,3, 4,5, 6,7, 8,9, 10	2,3, 4,5, 7,9, 10, 11	0	0	3,5, 6,8	2,3, 4,5, 7,9, 10, 11	2,5, 7,8, 9,10 ,11	1,2, 3,4, 5,6, 7,8, 9	1,3, 4,5, 6,7, 8,9
Comply With and Use Procedures (1)	0	1,2, 5,6, 7,8, 9, 10, 11	1,3, 5,6, 8	1,2, 3,6, 7,8	1,2, 4,6, 7	1,3, 4,7, 8,9, 10	2,4, 5,6, 7,8, 9	2, 4,5, 7,8, 9	1,2, 3,4, 5,6, 7,8, 9,10	1,2, 3,4, 5,6, 7,10 11	0	0	1,3, 5,6, 8	1,2, 3,4, 5,6, 7, 10, 11	1,2, 5,6, 7,8, 9,10 ,11	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6, 7,8, 9
Operate Control Boards (2)	0	1,2, 5,6, 7,8, 10, 11	1,3, 5,6	1,2, 3,6, 7,8	1,2, 4,6, 7	1,3, 4,7, 8,9, 10	2,4, 5,6, 7,8, 9	2, 4,5, 7,8, 9	0	0	0	0	1,3, 5,6, 8	0	1,2, 5,6, 7,8, 10, 11	0	0
Communicate and Interact	0	1,2, 5,6, 7,8, 9, 10, 11	1,3, 5,6, 8	1,2, 3,6, 7,8	1,2, 4,6, 7	1,3, 4,7, 8,9, 10	2,4, 5,6, 7,8, 9	2, 4,5, 7,8, 9	1,2, 3,4, 5,6, 7,8, 9,10	1,2, 3,4, 5,6, 7,9, 10, 11	0	0	1,3, 5,6, 8	1,2, 3,4, 5,6, 7, 9,10, 11	1,2, 5,6, 7,8, 9,10 ,11	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6, 7,8, 9
Demonstrate Supervisory Ability (3)	0	0	0	0	0	0	0	0	1,2, 3,4, 5,6, 7,8, 9,10	1,2, 3,4, 5,6, 7,9, 10, 11	0	0	0	1,2, 3,4, 5,6, 7, 9,10, 11	0	1,2, 3,4, 5,6, 7,8, 9	1,2, 3,4, 5,6, 7,8, 9
Comply With and Use Tech. Specs. (3)	0	0	0	0	0	0	0	0	2,4	3,4, 6	0	0	0	3,4,5	0	1, 3, 5	2,4, 5,8, 9

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.

9/3/13

Facility: Harris Nuclear Plant Date of Examination: 09-09-2013

Operating Test No.: 05000400/2013301

Competencies	APPLICANTS			
	RO	RO (BOP)	SRO-U	SRO-I
	SCENARIO	SCENARIO	SCENARIO	SCENARIO
Interpret/Diagnose/ Events and Conditions	2,5,6,7,8,9	3,4,7,10	2,3,4,5,6,7, 8,9,10	2,3,4,5,6,7,8, 9,10
Comply With and Use Procedures (1)	2,5,6,7,8,9	1,3,4,7,10	1,2,3,4,5,6, 7,8,9,10	1,2,3,4,5,6,7, 8,9,10
Operate Control Boards (2)	2,5,6,7,8,9	1,3,4,7,10	0	0
Communicate and Interact	2,5,6,7,8,9	1,3,4,7,10	1,2,3,4,5,6, 7,8,9,10	1,2,3,4,5,6,7, 8,9,10
Demonstrate Supervisory Ability (3)	0	0		
Comply With and Use Tech. Specs. (3)	0	0	3,5	3,5

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

SCENARIO # 5 submitted as a SPARE Scenario

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.

Revision 1 – Changes made to list based on re-ordering Scenario to match events sent for 45 day submittal.

Archie Lucky 7-03-2013

9/3/13

Facility: SHEARON HARRIS Date of Exam: SEPTEMBER 2013

Tier	Group	RO K/A Category Points												SRO-Only Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2		G*		Total
1. Emergency & Abnormal Plant Evolutions	1	3	3	3				3	3			3	18	3		3		6
	2	1	1	2	N/A			2	2	N/A		1	9	2		2		4
	Tier Totals	4	4	5				5	5			4	27	5		5		10
2. Plant Systems	1	2	2	3	3	2	3	3	3	2	3	2	28	3		2		5
	2	1	1	1	1	1	1	0	1	1	1	1	10	0	2	1		3
	Tier Totals	3	3	4	4	3	4	3	4	3	4	3	38	5		3		8
3. Generic Knowledge and Abilities Categories		1			2			3			4		10	1	2	3	4	7
		3			2			2			3			1	2	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).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
7. * The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.
8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401 PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)									Form ES-401-2
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1		R					R 007 EK2.02		
000008 Pressurizer Vapor Space Accident / 3		R					R 008 AK2.02		
000009 Small Break LOCA / 3		R					R 009 K2.03		
000011 Large Break LOCA / 3						R	R 011 EG2.4.47		
000015/17 RCP Malfunctions / 4	R						R 015 K1.02		
000022 Loss of Rx Coolant Makeup / 2				R			R 022 AA1.08		
000025 Loss of RHR System / 4					S		S 025 AA2.05		
000026 Loss of Component Cooling Water / 8				R			R 026 AA1.05		
000027 Pressurizer Pressure Control System Malfunction / 3									
000029 ATWS / 1	R				S		R 029 EK1.01 S 029 EA2.09		
000038 Steam Gen. Tube Rupture / 3						S	S 038 EG2.4.30		
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4			R				R 040 AK3.03 Replaced w/ AK3.02		
000054 (CE/E06) Loss of Main Feedwater / 4					R	S	R 054 AA2.02 S 054 AG2.4.47		
000055 Station Blackout / 6					S		S 055 EA2.04		
000056 Loss of Off-site Power / 6						R	R 056 AG2.4.45		
000057 Loss of Vital AC Inst. Bus / 6									
000058 Loss of DC Power / 6					R	S	R 058 AA2.01 S 058 AG2.4.3		
000062 Loss of Nuclear Svc Water / 4					R		R 062 AA2.01		
000065 Loss of Instrument Air / 8			R				R 065 AK3.08		
W/E04 LOCA Outside Containment / 3			R				R WE04 EK3.2		
W/E11 Loss of Emergency Coolant Recirc. / 4				R			R WE11 EA1.3		
BW/E04, W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	R						R WE05 EK1.2		
000077 Generator Voltage and Electric Grid Disturbances / 6						R	R 077 AG2.4.4		
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:		18/6

3 3

(RO)

ES-401, REV 9 **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:
007EK2.02	Reactor Trip - Stabilization - Recovery / 1	2.6	2.8	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Breakers, relays and disconnects
008AK2.02	Pressurizer Vapor Space Accident / 3	2.7	2.7	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Sensors and detectors
009EK2.03	Small Break LOCA / 3	3	3.3	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	S/Gs
011EG2.4.47	Large Break LOCA / 3	4.2	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.
015AK1.02	RCP Malfunctions / 4	3.7	4.1	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Consequences of an RCPS failure
022AA1.08	Loss of Rx Coolant Makeup / 2	3.4	3.3	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	VCT level
026AA1.05	Loss of Component Cooling Water / 8	3.1	3.1	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	The CCWS surge tank, including level control and level alarms and radiation alarm
029EK1.01	ATWS / 1	2.8	3.1	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Reactor nucleonics and thermo-hydraulics behavior
040AK3.03	Steam Line Rupture - Excessive Heat Transfer / 4	3.2	3.5	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Steam line non-return valves
054AA2.02	Loss of Main Feedwater / 4	4.1	4.4	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Differentiation between loss of all MFW and trip of one MFW pump
056AG2.4.45	Loss of Off-site Power / 6	4.1	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to prioritize and interpret the significance of each annunciator or alarm.

Please make sure not solely testing GFES; when you write -- must test plant specific knowledge

Replaced w/ AK3.02

12/18/2012 2:20 PM

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
058AA2.01	Loss of DC Power / 6	3.7	4.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	That a loss of dc power has occurred; verification that substitute power sources have come on line
062AA2.01	Loss of Nuclear Svc Water / 4	2.9	3.5	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Location of a leak in the SWS
065AK3.08	Loss of Instrument Air / 8	3.7	3.9	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Actions contained in EOP for loss of instrument air
077AG2.4.4	Generator Voltage and Electric Grid Disturbances / 6	4.5	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.
WE04EK3.2	LOCA Outside Containment / 3	3.4	4.0	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Normal, abnormal and emergency operating procedures associated with (LOCA Outside Containment).
WE05EK1.2	Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	3.9	4.5	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Normal, abnormal and emergency operating procedures associated with (Loss of Secondary Heat Sink).
WE11EA1.3	Loss of Emergency Coolant Recirc. / 4	3.7	4.2	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Desired operating results during abnormal and emergency situations.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
025AA2.05	Loss of RHR System / 4	3.1	3.5	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Limitations on LPI flow and temperature rates of change
029EA2.09	ATWS / 1	4.4	4.5	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Occurrence of a main turbine/reactor trip
038EG2.4.30	Steam Gen. Tube Rupture / 3	2.7	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of events related to system operations/status that must be reported to internal orginizations or outside agencies.
054AG2.4.47	Loss of Main Feedwater / 4	4.2	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.
055EA2.04	Station Blackout / 6	3.7	4.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Instruments and controls operable with only dc battery power available
058AG2.4.3	Loss of DC Power / 6	3.7	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to identify post-accident instrumentation.

ES-401	PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO) / SRO)								Form ES-401-2
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1					R		R001 AA2.01		
000003 Dropped Control Rod / 1									
000005 Inoperable/Stuck Control Rod / 1					S		S 005 AA2.03		
000024 Emergency Boration / 1									
000028 Pressurizer Level Malfunction / 2									
000032 Loss of Source Range NI / 7									
000033 Loss of Intermediate Range NI / 7									
000036 (BW/A08) Fuel Handling Accident / 8		R					R 036 AK2.01		
000037 Steam Generator Tube Leak / 3						R	R 037 AG2.4.34 Replaced w/	AG	2.4.31
000051 Loss of Condenser Vacuum / 4				R			R 051 AA1.04		
000059 Accidental Liquid RadWaste Rel. / 9			R				R 059 AK3.04		
000060 Accidental Gaseous Radwaste Rel. / 9						S	S 060 AG2.2.37		
000061 ARM System Alarms / 7					S		S 061 AA2.02		
000067 Plant Fire On-site / 8									
000068 (BW/A06) Control Room Evac. / 8									
000069 (W/E14) Loss of CTMT Integrity / 5				R		S	R WE14 EA1.1 S 069 AG2.2.25		
000074 (W/E06&E07) Inad. Core Cooling / 4					R		R 074 EA2.03		
000076 High Reactor Coolant Activity / 9									
W/EO1 & E02 Rediagnosis & SI Termination / 3									
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5			R				R WE15 EK3.1		
W/E16 High Containment Radiation / 9									
BW/A01 Plant Runback / 1									
BW/A02&A03 Loss of NNI-X/Y / 7									
BW/A04 Turbine Trip / 4									
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8									
BW/E03 Inadequate Subcooling Margin / 4									
BW/E08; W/E03 LOCA Cooldown - Depress. / 4	R						R WE03 EK1.1		
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4									
BW/E13&E14 EOP Rules and Enclosures									
CE/A11; W/E08 RCS Overcooling - PTS / 4									
CE/A16 Excess RCS Leakage / 2									
CE/E09 Functional Recovery									
K/A Category Point Totals:	1	1	2	2	2	1	Group Point Total:		9/4

22

(RO)

ES-401, REV 9 **T1G2 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:
001AA2.01	Continuous Rod Withdrawal / 1	4.2	4.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Reactor tripped breaker indicator
036AK2.01	Fuel Handling Accident / 8	2.9	3.5	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Fuel handling equipment
037AG2.4.34	Steam Generator Tube Leak / 3	4.2	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects
				Replaced w/ AG2.4.31											
051AA1.04	Loss of Condenser Vacuum / 4	2.5	2.5	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Rod position
059AK3.04	Accidental Liquid RadWaste Rel. / 9	3.8	4.3	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Actions contained in EOP for accidental liquid radioactive-waste release
074EA2.03	Inad. Core Cooling / 4	3.8	4.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Availability of turbine bypass valves for cooldown
WE03EK1.1	LOCA Cooldown - Depress. / 4	3.4	4.0	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Components, capacity, and function of emergency systems.
WE14EA1.1	Loss of CTMT Integrity / 5	3.7	3.7	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Components and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes and automatic and manual features.
WE15EK3.1	Containment Flooding / 5	2.7	2.9	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure and reactivity changes and operating limitations and reasons for these operating characteristics.

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
005AA2.03	Inoperable/Stuck Control Rod / 1	3.5	4.4	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Required actions if more than one rod is stuck or inoperable
060AG2.2.37	Accidental Gaseous Radwaste Rel. / 9	3.6	4.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to determine operability and/or availability of safety related equipment
061AA2.02	ARM System Alarms / 7	2.9	3.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Normal radiation intensity for each ARM system channel
069AG2.2.25	Loss of CTMT Integrity / 5	3.2	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits.

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / SRO)											Form ES-401-2		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump								R				R 003 A2.02		
004 Chemical and Volume Control					R			R				R 004 A2.13 R 004 K5.26		
005 Residual Heat Removal							R					R 005 A1.08		
006 Emergency Core Cooling											R	R 006 G2.1.30		
007 Pressurizer Relief/Quench Tank				R							R S	R 007 G2.1.20 R 007 K4.01		
008 Component Cooling Water									R			R 008 A3.08		
010 Pressurizer Pressure Control						R R						R 010 K6.01, R 010 K6.03		
012 Reactor Protection				R								R 012 K4.02		
013 Engineered Safety Features Actuation		R								R		R 013 A4.01 R 013 K2.01		
022 Containment Cooling										R		R 022 A4.03		
025 Ice Condenser	←				N/A							→		
026 Containment Spray			R				R					~~R 026 A1.04~~ Replaced w/ A1.05 ~~R 026 K2.02~~		☆
039 Main and Reheat Steam								~~R~~ S				R 039 A2.01 S 039 A2.03	Replaced w/ A2.04	☆
059 Main Feedwater				R								R 059 K4.02		
061 Auxiliary/Emergency Feedwater					R		R					R 061 K5.05 R 061 A1.01		
062 AC Electrical Distribution		R						S				R 062 K2.01 S 062 A2.11		
063 DC Electrical Distribution			R						R		S	R 063 A3.01 S 063 G2.2.40 R 063 K3.02		
064 Emergency Diesel Generator						R						R 064 K6.08		
073 Process Radiation Monitoring										R		R 073 A4.02		
076 Service Water	R							S				R 076 K1.01 S 076 A2.01		
078 Instrument Air			R									R 078 K3.01		
103 Containment	R										S	R 103 K1.05 S 103 G2.2.22		
K/A Category Point Totals:	2	2	3	3	2	3	3	3	2	3	2	Group Point Total:		28/5

3 2

(RO)

ES-401, REV 9 **T2G1 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:
003A2.02	Reactor Coolant Pump	3.7	3.9	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP
004A2.13	Chemical and Volume Control	3.6	3.9	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Low RWST
004K5.26	Chemical and Volume Control	3.1	3.2	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Relationship between VCT pressure and NPSH for charging pumps
005A1.05	Residual Heat Removal	3.3	3.3	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Detection of and response to presence of water in RHR emergency sump
006G2.1.30	Emergency Core Cooling	4.4	4.0	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to locate and operate components, including local controls.
007G2.1.20	Pressurizer Relief/Quench Tank	4.6	4.6	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to execute procedure steps.
007K4.01	Pressurizer Relief/Quench Tank	2.6	2.9	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Quench tank cooling
008A3.08	Component Cooling Water	3.6	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Automatic actions associated with the CCWS that occur as a result of a safety injection signal
010K6.02	Pressurizer Pressure Control	3.2	3.5	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	PZR
010K6.03	Pressurizer Pressure Control	3.2	3.6	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	PZR sprays and heaters
012K4.02	Reactor Protection	3.9	4.3	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Automatic reactor trip when RPS setpoints are exceeded for each RPS function; basis for each

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
013K2.01	Engineered Safety Features Actuation	3.6	3.8	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	ESFAS/safeguards equipment control
022A4.03	Containment Cooling	3.2	3.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	Dampers in the CCS
026A1.04	Containment Spray	3.1	3.3	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	Containment humidity
	Replaced w/ A1.05														
026K3.02	Containment Spray	4.2	4.3	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Recirculation spray system
039A2.01	Main and Reheat Steam	3.1	3.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Flow paths of steam during a LOCA
	Replaced w/ A2.04														
059K4.02	Main Feedwater	3.3	3.5	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Automatic turbine/reactor trip runback
061A1.01	Auxiliary/Emergency Feedwater	3.9	4.2	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	S/G level
061K5.05	Auxiliary/Emergency Feedwater	2.7	3.2	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Feed line voiding and water hammer
062K2.01	AC Electrical Distribution	3.3	3.4	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Major system loads
063A3.01	DC Electrical Distribution	2.7	3.1	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Meters, annunciators, dials, recorders and indicating lights

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
073A4.02	Process Radiation Monitoring	3.7	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	Radiation monitoring system control panel
076K1.01	Service Water	3.4	3.3	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	CCW system
078K3.01	Instrument Air	3.1	3.4	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Containment air system
103K1.03	Containment	3.1	3.5	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Shield building vent system

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
039A2.03	Main and Reheat Steam	3.4	3.7	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Indications and alarms for main steam and area radiation monitors (during SGTR)
062A2.11	AC Electrical Distribution	3.7	4.1	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Aligning standby equipment with correct emergency power source (D/G)
063G2.2.40	DC Electrical Distribution	3.4	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to apply technical specifications for a system.
076A2.01	Service Water	3.5	3.7	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Loss of SWS
103G2.2.22	Containment	4.0	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of limiting conditions for operations and safety limits.

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO / SRO)												Form ES-401-2	
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
001 Control Rod Drive														
002 Reactor Coolant														
011 Pressurizer Level Control		R										R011 K2.02		
014 Rod Position Indication														
015 Nuclear Instrumentation			R									R 015 K3.01		
016 Non-nuclear Instrumentation								R				R 016 A2.02		
017 In-core Temperature Monitor											S	S 017 G2.1.7		
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control						R		S				R 028 K6.01 S 028 A2.02		
029 Containment Purge														
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment											R	R 034 G2.4.31		
035 Steam Generator														
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator														
055 Condenser Air Removal														
056 Condensate														
068 Liquid Radwaste								S				S 068 A2.04		
071 Waste Gas Disposal					R							R 071 K5.04		
072 Area Radiation Monitoring									R			R 072 A3.01		
075 Circulating Water	R											R 075 K1.01		
079 Station Air										R		R 079 A4.01		
086 Fire Protection				R								R 086 K4.02		
K/A Category Point Totals:	1	1	1	1	1	1	0	1	1	1	1	Group Point Total:		10/3

2 1

(RD)

ES-401, REV 9 **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:
011K2.02	Pressurizer Level Control	3.1	3.2	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	PZR heaters
015K3.01	Nuclear Instrumentation	3.9	4.3	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	RPS
016A2.02	Non-nuclear Instrumentation	2.9	3.2	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Loss of power supply
028K6.01	Hydrogen Recombiner and Purge Control	2.6	3.1	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Hydrogen recombiners
034G2.4.31	Fuel Handling Equipment	4.2	4.1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of annunciators alarms, indications or response procedures
071K5.04	Waste Gas Disposal	2.5	3.1	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Relationship of hydrogen/oxygen concentrations to flammability
072A3.01	Area Radiation Monitoring	2.9	3.1	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	Changes in ventilation alignment
075K1.01	Circulating Water	2.5	2.5	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	SWS
079A4.01	Station Air	2.7	2.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	Cross-tie valves with IAS
086K4.02	Fire Protection	3.0	3.4	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Maintenance of fire header pressure

KA	NAME / SAFETY FUNCTION:	IR RO	IR SRO	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	TOPIC:
017G2.1.7	In-core Temperature Monitor	4.4	4.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior and instrument interpretation.
028A2.02	Hydrogen Recombiner and Purge Control	3.5	3.9	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	LOCA condition and related concern over hydrogen
068A2.04	Liquid Radwaste	3.3	3.3	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Failure of automatic isolation

Facility: Harris Date of Exam: September 2013

Category	K/A #	Topic	RO IR	RO #	SRO-Only IR	SRO-Only #
1. Conduct of Operations	2.1.13	Facility req'ts for vital/controlled access	2.5			
	2.1.15	Temporary Mgmt Directives	2.7			
	2.1.19	Use plant computer	3.9			
	2.1.					
	2.1.41	Knowledge of refueling processes			3.7	
	2.1.					
	Subtotal		(3)		(1)	
2. Equipment Control	2.2.20	Process for troubleshooting	2.6			
	2.2.39	less than or equal to 1 hr TS actions	3.9			
	2.2.					
	2.2.13	Tagging and Clearance procedures			4.3	
	2.2.40	Apply Tech Specs for a system			4.7	
	2.2.					
	Subtotal		(2)		(2)	
3. Radiation Control	2.3.11	Control radiation releases	3.8			
	2.3.12	Radiological principles wrt licensed duties	3.2			
	2.3.					
	2.3.4	Rad exposure limits during normal/emerg			3.7	
	2.3.14	Radiation/Contamination hazards - N, A, or E			3.8	
	2.3.					
	Subtotal		(2)		(2)	
4. Emergency Procedures / Plan	2.4.22	Basis for prioritizing safety functions	3.6			
	2.4.27	Fire in the plant procedures	3.4			
	2.4.29	E-plan Knowledge	3.1			
	2.4.					
	2.4.40	SRO responsibilities in E-plan implementation			4.5	
	2.4.46	Verify alarms consistent w/ plt conditions			4.2	
	Subtotal		(3)		(2)	
Tier 3 Point Total			10	10	7	7

ES-401, REV 9

RD

T3 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:
G2.1.13	Conduct of operations	2.5	3.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of facility requirements for controlling vital / controlled access.
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.
G2.1.19	Conduct of operations	3.9	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to use plant computer to evaluate system or component status.
G2.2.20	Equipment Control	2.6	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the process for managing troubleshooting activities.
G2.2.39	Equipment Control	3.9	4.5	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of less than one hour technical specification action statements for systems.
G2.3.11	Radiation Control	3.8	4.3	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to control radiation releases.
G2.3.12	Radiation Control	3.2	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiological safety principles pertaining to licensed operator duties
G2.4.22	Emergency Procedures/Plans	3.6	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations.
G2.4.27	Emergency Procedures/Plans	3.4	3.9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of "fire in the plant" procedures.
G2.4.29	Emergency Procedures/Plans	3.1	4.4	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the emergency plan.

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
G2.2.13	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.
G2.3.14	Radiation Control	3.4	3.8	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities
G2.3.4	Radiation Control	3.2	3.7	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of radiation exposure limits under normal and emergency conditions
G2.4.40	Emergency Procedures/Plans	2.7	4.5	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Knowledge of the SRO's responsibilities in emergency plan implementation.
G2.4.46	Emergency Procedures/Plans	4.2	4.2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Ability to verify that the alarms are consistent with the plant conditions.

ES-401 **Record of Rejected K/As** **Form ES-401-4**

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO		
T1G2	037 AG2.4.34	The only HNP RO tasks outside of the MCR are addressed by AOP-004, Main Control Room Evacuation. Unable to write a question for this K/A due to the lack of an RO task for the original K/A. Replace with randomly selected K/A 037 AG2.4.31 by Bruno Caballero 4/18/2013
T1G1	040 AK3.03	The Main Steam Supply system at HNP is not designed with in-line Non-return check valves. Unable to write a question for this K/A due to the lack of Non-return check valves in this system at HNP. Replace with randomly selected K/A 040 AK3.02 by Bruno Caballero 6/13/2013
T2G1	026 A1.04	The Containment Spray system at HNP is operated independent of the humidity level of Containment. Unable to write a question for this K/A due to the lack procedural actions or an RO task for the original K/A. Replace with randomly selected K/A 026 A1.05 by Bruno Caballero 6/13/2013
T2G1	039 A2.01	The original K/A overlaps with RO Q#24 (074-Inadeq CC-EA2.03) because the same knowledge of how LOOP affects steam dump availability is being tested. (double jeopardy). Replace with randomly selected K/A 039 A2.04 by Bruno Caballero 8/20/2013
SRO		None

Neid 9/5/13

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

Facility: Shearon Harris - Test No. 05000400/2013301 Date of Exam: 09-25-2013 Exam Level: RO ■ SRO ■

Item Description					Initial a	Initial b*	Initial c#
1.	Questions and answers are technically accurate and applicable to the facility.				C	H	BH
2.	a. NRC K/As are referenced for all questions. b. Facility learning objectives are referenced as available.				C	H	BH
3.	SRO questions are appropriate in accordance with Section D.2.d of ES-401				C	H	BH
4.	The sampling process was random and systematic (If more than 4 RO or 2 SRO questions were repeated from the last 2 NRC licensing exams, consult the NRR OL program office).						BH
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 X the licensee certifies that there is no duplication; or __ other (explain)				C	H	BH
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 27 / 9	Modified 6 / 0	New 42 / 16	C	H	BH
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 30 / 6	C/A 45 / 19		C	H	BH
8.	References/handouts provided do not give away answers or aid in the elimination of distractors.				C	H	BH
9.	Question content conforms with specific K/A statements in the previously approved examination outline and is appropriate for the tier to which they are assigned; deviations are justified.				C	H	BH
10.	Question psychometric quality and format meet the guidelines in ES Appendix B.				C	H	BH
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.				C	H	BH

	Printed Name / Signature	Date
a. Author	Richard (JR) Horton /	9/04/2013
b. Facility Reviewer (*)	Simon Schwindt /	9/04/2013
c. NRC Chief Examiner (#)	BRUNO CABALLERO / B Caballero	9-16-13
d. NRC Regional Supervisor	MALCOLM T. WIDMANN /	09/16/13

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

Revised 9/5/13

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
																7-8-13: Licensee contacted regarding the high number of unacceptable items in the first 30 RO test items.
Gen																7-16-13: The ES-401-9 worksheet for the 75 RO questions was transmitted to the licensee. The RO exam was *PRELIMINARILY* determined to NOT meet the NUREG 1021 acceptability range based on the following 22 ~~23~~ test items (29.3% ~~30.66%~~) being unacceptable in accordance with ES-401. . • Cred Dist: 5, 11, ~~14~~, 15, 17, 18, 19, 20, 21, 22, 23, 25, 33, 46, 47, 50, 52, 55, 63, 66 • Q=K/A: 26, 37, 71 Questions with *more than one correct answer* , *LOD = 1*, or *LOD = 5* were rated as "enhancements"; however, these items must still be repaired. The final determination on the RO exam quality will be made following any post-exam comments in accordance with ES-501. Additionally, any items listed above that may eventually require K/A replacement or were misunderstood by the Chief Examiner will be credited.

FINAL ANALYSIS (10-30-13)

Non Plausible (17)

RO: 5, 11, 15, 17, 20, 21, 22, 23, 25, 31, 47, 52, 55, 63
SRO: 91, 97, 99

SRO-only (3)

92, 94, 93

Q ≠ K/A (2)

RO: 26
SRO: 84

Multiple Unacceptable flaws (6)

RO: 67, 71
SRO: 79, 83, 86, 89

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
Gen																7/23/13: The ES-401-9 worksheet for the 25 SRO questions was provided to the licensee. The SRO exam was *PRELIMINARILY* determined to NOT meet the NUREG 1021 acceptability range based on the following 12 test items (48%) being unacceptable in accordance with ES-401 (underlined items had two flaws): • Cred Dist: 79, 83, 86, 87, 89, 90, 93, 94, 97, 99 • Q=K/A: 79, 83, 84 • SRO-only: 92, 93, 94 Questions with more than one correct answer, LOD = 1, or LOD = 5 were rated as "*enhancements*"; however, these items must still be repaired. The final determination on the SRO exam quality will be made following any post-exam comments in accordance with ES-501. Additionally, any items listed above that may eventually require K/A replacement or were misunderstood by the Chief Examiner will be credited.
Gen																Unless otherwise noted, Column 2 (LOD) is acceptable, that is, in the 2 – 4 range. Column 2 will be finalized after the final exam submittal. Questions are flagged as LOD = 1 or LOD = 5 in Column 2 must be repaired.
Gen																Column 1 will be completed after the final versions of the exam questions are submitted by the licensee.
Gen																The SRO applicants should be provided with the applicable Tech Spec whenever they are required to apply an action statement ≥ 1 hour because memorization of Tech Specs is borderline minutia and the question is vulnerable to post-exam appeals and could be deleted from the exam.
Gen																Every question which refers to a Tech Spec should include the name and number of the Tech Spec within the stem.

Instructions

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

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

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
1		2	x			x		x				x		B	E	007 EK2.02, T1G1 1. Job-Link and/or Q=K/A: The stem isn't clear as to plant (procedural) status (E-0, ES-0.1, GP-004, OP-104, Section 5.3.2.3??); normally, the reactor trip breakers are (procedurally) closed during *startup*, which does not meet the intent of the Tier 1/Group 1 emergency/abnormal topic. What is the status of the plant at this time? IF the plant status involves the implementation of E-0 or ES-0.1, then this question may meet the intent of the Tier 1/ Group 1 topic; however, this plant status information should be added to the stem. The question must test some aspect of the emergency/abnormal (Tier 1, Group 1) category. If the reactor trip breakers are being closed during a startup (see OP-104, Section 5.3.2.3), then the Tier 1, Group 1 aspect of the K/A isn't being met. 2. Cred Dist: Steam Generator low water level trips are never bypassed, which makes Choices A/B borderline plausible. Consider making the SG level at 30%. 3. Stem Focus: The phrase "assuming all other conditions are met for closing the Reactor Trip Breakers" is vague.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
2			x	x			x				x			N	E	008 AK2.02, T1G1 1. Cue: The 3rd bullet unnecessarily cues the applicants that a pressurizer vapor space accident has occurred instead of testing their ability to identify this based on given indications. 2. Partial: Choice D can be successfully argued as correct because the OAC's interpretation of "primary cause" (vs secondary?) for reporting (to the CRS) is subjective. 3. Stem Focus: The 2nd bullet is too vague. 4. Stem Focus: Avoid the use of the phrase "would be" in the WOOTF stem question because it is subjective. 5. Backwards Logic: The stem question requires the applicants' to go back in time and think of the reason why the OAC has already reported something to the CRS. Suggest providing temperature/level indications/containment parameters and then test the applicants' knowledge of the size/location of an RCS leak.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
3			x	x			x							M	E	009 EK2.03, T1G1 1. Partial: An applicant can successfully argue that Choice D is also correct because the 2nd part of the fill-in-the-blank statement is not specific to EOP-ES-1.2, Step 10.f. That is, an applicant can justify that the SGs are not really "required" (condenser available) since the fill-in-the-blank statement does not ask the applicant whether the "Condenser-Available-Requirements" listed in Step 10.f are met. The 2nd part of the fill-in-the-blank statement is too subjective because it doesn't tie the applicant to EOP-ES-1.2 requirements. 2. Stem Focus: The question is confusing because it combines two separate points in time with one fill-in-the-blank statement. The 1st part of the fill-in-the-blank statement implies that the crew is implementing E-0 and the 2nd part of the fill-in-the-blank statement implies that the crew is (will be?) implementing EOP-ES-1.2, Step 10.f. What procedure is the crew implementing right *now*? Suggest telling the applicants where the crew is with respect to procedure implementation and then split out the fill-in-the-blank sentence into two sentences - - one part will ask what is required *now*, and the other part will be to predict what is used when the crew implements ES-1.2, Step 10.f. 3. Cue: The 1st bullet in the stem is not necessary to elicit the correct response. 4. Stem Focus: The word "should" (in the 1st part of each choice) is too subjective. (Is the word should being used to look backward in time?) Modify the 1st part of the fill-in-the-blank statement to test the applicants' knowledge of what is required/is not *required*. 5. The 1st part of this question tests the following E-0 foldout criteria and overlaps with RO Q# 4. **FOLDOUT** • **RCP TRIP CRITERIA** **IF both of the following occur, THEN stop all RCPs:** • **SI flow - GREATER THAN 200 GPM** • **RCS pressure - LESS THAN 1400 PSIG** 6. Ensure no overlap with scenarios' critical tasks.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
4			x				x							N	E	011 EG2.4.47 1. This question overlaps with RO Q#3 because it tests the following E-0 foldout criteria (again). **FOLDOUT** • **RCP TRIP CRITERIA** **IF both of the following occur, THEN stop all RCPs:** • **SI flow - GREATER THAN 200 GPM** • **RCS pressure - LESS THAN 1400 PSIG** Suggest testing the applicants' knowledge of what to do with the RHR pumps in accordance with E-1, Step 8, "Check RHR Status" and one other piece of knowledge (that requires the applicant to recognize a trend, etc.). 2. Partial: The stem question does not include "in accordance with….."; therefore, an applicant could potentially argue more than one correct answer. 3. Stem Focus: The word "alignment" is misspelled. 4. Stem Focus: Re-word each of the four choices as follows (to be more precise). ***A. Stop RCPs; Leave RHR Pumps running*** *B. Leave RCPs running; Stop RHR Pumps* *C. Stop RCPs and RHR pumps* *D. Leave RCPs and RHR pumps running* Explore the possibility of adding ALB-004, Window 2-2 in alarm (*not* window 2-4)

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
5			x			x								N	U	015 AK1.02, T1G1 1. Cred Dist: Choices B/C (stop power increase) can be (correctly) eliminated solely based on the fact that the stem does not indicate a power increase was in progress. 2. Cred Dist: Choice C (continue raising power) is not plausible because raising power with annunciators alarming is never a conservative action. 3. Stem Focus: Choices B/C should be streamlined to eliminate the "investigate" wording items. 4. Stem Focus: The 3rd bullet is a cryptic way of saying that the pump has tripped. Just tell the applicants that the A RCP has tripped. Alternatively, re-work the question to test a situation where the pump has a sheared shaft event. Suggest re-working the question to provide the alarms (in the stem) and then test the applicants' ability to diagnose a RCP has tripped (instead of telling them) versus some other plausible malfunction; and the required action (trip the reactor or perform a normal plant shutdown) in accordance with ALB-10, 6-3A.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
5			x			x	x									Comments on revised question received from licensee on 8/5/13 1. Partial: Choice A (stop power increase) is the same thing as Choice D (commence an orderly shutdown. 2. Cred Dist: Choice C (continue raising power after an RCP has tripped) is not plausible because something bad has happened in the plant and raising power after something bad has happened is never a good idea. Also, it is the only choice that says to raise power. 3. Stem Focus: The 3rd bullet should simply state that the RCP has tripped. Suggest the following, but add another element associated with the required actions. (Hint: Wouldn't the crew have to place the spray valve in manual and close it so that the B loop spray wouldn't backward flow into the A loop? This is one idea for the 1st part of the following suggest. What procedure addresses closing the loop A spray valve once the pump tripped?) *WOOTF identifies the required action in accordance with APP-ALB-010, 6-3A?* *A. 1st part;Trip Reactor, Go to E-0* *B. 1st part; Trip Reactor, Go to E-0* *C. 1st part; Commence a plant shutdown IAW GP-006* D. *1st part; Commence a plant shutdown IAW GP-006*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
6			x					x						B	E	022 AA1.08, T1G1 1. Job-Link: The premise of the question is that the auto-makeup function was (partially?) disabled (in accordance with OP-107.1, Attachment 2, Mode 6 Inadvertent Dilution Component Lineup) and then VCT level began to lower. Is the AOP-003 entry required??? Need to understand how VCT level is normally maintained in Mode 6 when OP-107.1, Attachment 2 lineup has been performed. 2. Stem Focus: Streamline the choices as follows, in order to be symmetric. ***A. From the MCB: open CS-291 & 292 (title) and close CS-165 & 166 (title)*** *B. Locally: open CS-278 (title) and CS-274 (title)* *C. From the MCB: Start one boric acid pump, open CS283 (title), CS-156 (title), and CS-151 (title)* *D. Locally: open CS-287 (title) and CS-274 (title)* 3. Stem Focus: Which one of the four choices reflects the normal (at power) lineup to restore VCT level? 4. Stem Focus: Re-word the stem question as follows, to clarify attachment and streamline: *WOOTF is required in accordance with AOP-003, Malfunction of Reactor Makeup Control, Attachment 5, Manual Makeup in Modes 5 & 6?*
7		1												M	E	026 AA1.05, T1G1 [NRC 2012 EXAM, RO-5] 1. LOD=1: The question can be solely answered using GFES knowledge because the first sign of cavitation (at 12:18) is also the correct answer.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
8			x			x		x						N	E	029 EK1.01, T1G1: These comments only pertain to the Early Submittal Sample Question [5-21-13]; see next line for replacement/repair comments. 1. Job-Link: The FR-S.1 background document description for the Condition II transient (Loss of Load and/or Turbine Trip) states on page 11 that the analysis for this event assumes a loss of condenser vacuum, which is different than the premise of the proposed question. Consequently, there may be no correct answer to this question. Need to verify on the simulator that the SG Safeties still lift (following a 100% power ATWS turbine trip) when the steam dumps and SG PORVs operate (condenser remains available). Provide results to Chief Examiner. 2. Cred Dist: The 2nd part of Choice B (PZR PORVs & SG Safeties don't lift) is not plausible for two reasons: • The PZR PORVs are included in the fill-in-the-blank statement. It's not plausible that nothing lifts, especially given the 1st part of Choice B is reactor power rising. By eliminating the PZR PORV from the fill-in-the-blank statement, this Choice becomes plausible. • The grammar ("*raise*") in the 1st part of Choices A/B doesn't flow with the wording of the fill-in-the-blank statement. This can be used (successfully) to eliminate these two choices. 3. Stem Focus: The 3rd bullet ("*The automatic & manual reactor trip attempts have failed*") should be replaced with the control panel indications that the applicant would see if this were the case, instead of telling them. 4. Stem Focus: The word "reactor power" in the fill-in-the-blank statement should be specific as to what indication is being used, power range NI? 5. Stem Focus: The 2nd bullet can be streamlined as "*A leak on the DEH system caused a turbine trip.*" 6. Stem Focus: Add another bullet to the stem to indicate that the Steam Dumps are in the Tavg mode.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
8			x			x								N	E	029 EK1.01, T1G1: Second version received 7-1-13 1. Cred Dist: The plausibility of the 1st part of Choices A/B (reactor power will rise after a turbine trip & ATWS) is borderline because all reactors have a negative moderator temperature coefficient. 2. Stem Focus: The 3rd bullet can be streamlined to only say "*A turbine trip occurs.*" 3. Stem Focus: Re-work the fill-in-the-blank statement (to eliminate the need for the sentence above it) as *Before the actions of FR-S.1 are completed, Power Range Channel indications will _____ and SG Safety valves will ____.* To address Comment #1, explore keeping the 2nd part of the question and re-working the 1st part to test the applicants knowledge of FR-S.1 requirements for (when) subcriticality has been achieved. That is, power range channels less than 5% (versus another plausible distracter). 4. Need to verify the safety valve response on the simulator and provide results to chief examiner.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
9						x		x						N	U	040 AK3.03, T1G1: Early Submittal Sample Question [5-21-13]. These comments only pertain to the Early Submittal Sample Question [5-21-13]; see next line for replacement/repair comments. 1. Cred Dist: The first part of Choices C/D (non-return valves automatically open) is not plausible because non-return valves (check valves) do not <u>*automatically*</u> open. In other words, the wording of the fill-in-the-blank phrase "*non-return valves are expected to automatically …to prevent.*." does not lend itself to choosing "open." An applicant can successfully eliminate Choices C/D solely based on the wording of the fill-in-the-blank phrase. 2. Job-Link: There are some Westinghouse designs that incorporate check valves downstream of the MSIVs; these check valves limit the steam flow from intact steam lines (via the crossover piping) backwards thru a steam line with a break. (reason) At Harris, the main steam lines do not include non-return valves; however, there are MSR non-return valves, which prevent energy in the turbine from back flowing into the MSR causing a turbine overspeed condition (different reason) The wording of the K/A seems to target the Westinghouse designs that incorporate check valves downstream of the MSIVs, that is, the K/A seems to target <u>*main steamline*</u> non-return valves , which are NOT the same as MSR non-return valves. Suggest replacing the K/A.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
9				x		x				x				N	E	040 AK3.02, T1G1: Second submittal with new K/A 1. Cue: The stem has the capitalized words "*Steam Line Break* occurs…", and this is also the correct ESFAS signal that occurs. (This flaw also makes the plausibility for the 1st part of Choices C/D very borderline- even with containment pressure rising.) If an applicant had no idea which ESFAS signal auto-initiated, he/she can (correctly) eliminate Choices C/D because the stem *says* "Steam Line Break." 2. Cred Dist: Choice A (MSL Isolation occurs to prevent uncontrolled SG "*level*") is not plausible because the reason listed doesn't correlate with why a MSIV auto-closes. Additionally, this reason is not grammatically correct, that is, the word "level" doesn't include something after it, like "transient." [Hint: In order to hit a "reason" K/A, an RO question can be written in such a way that the applicant has to identify the signal(s) that are causing the actuation to occur. In other words, the "reason" piece of the question doesn't necessarily have to be words; it also could be a set point/plant condition/etc. that is the "reason" for why the stem conditions exist.] 3. #/units: The 4th bullet (RCS temperature) is not clear with respect to whether this is the value of Tavg, including which control panel indication from where this value was obtained. Suggest re-working the question to 1) eliminate the cue and 2) make the 1st part of the choices: *A. MSL Isolation ONLY* *B. MSL Isolation and MFW Isolation* *C. MSL Isolation ONLY* *D. MSL Isolation and MFW Isolation*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
10			x			x								N	E	054 AA2.02, T1G1 1. Cred Dist: Choice B (both feed pumps keep running) is not plausible because an (inadvertent) SI signal will cause something to happen, that is, an inadvertent SI causes a MFIS signal, which trips MFW Pumps. Suggest modifying this choice to be: *No Main FW pump trip initially generated; Both MFW pumps will trip when Tavg lowers to < 564°F.* 2. Stem Focus: Clarify in Choice D: *B Main FW pump will trip; A Main FW pump continues to run until Tavg lowers to < 564°F.* 3. Stem Focus: Modify Choice A: *Both Main FW pumps immediately trip.* 4. Stem Focus: Avoid the use of the words "would" or "should" in the stem question. Consider the following: *The unit is operating at 100% power.* *An inadvertent Train B SI signal actuation occurs.* *WOOTF predicts the Main FW Pump response?* Another suggestion (if the changes above aren't acceptable) is to re-work the question (to eliminate comment #1) by testing the applicants' ability to predict whether both MFW pumps trip (or just "B" MFW Pump) and the required procedure actions during this abnormal/emergency topic.
11				x		x								N	U	056 AG2.4.45, T1G1 1. Cred Dist: Choices A, B, & C are not plausible because the stem tells the applicants that (the root cause of the plant problem is) a LOOP occurred. Choices A, B, & C can be eliminated solely based on the logic that these choices merely reflect symptoms of the loss of offsite AC power. 2. Cue: The stem tells the applicant that a LOOP occurred instead of providing the applicants with control room indications.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
11		1														Comments on revised question received from licensee on 8/5/13 1. LOD=1: After the repairs to this question, it will provide no discriminatory value on the exam because the loss of the Startup Transformer and DG outweigh everything else. Suggest keeping Choice B (AOP-12) and Choice D (AOP-025), but adding a seal leak off value to the stem for plausibility. 2. After making the suggestion (see above), the 4th, 5th, and 8th bullets can be eliminated because they are expected conditions following a loss of both Startup Transformers.
12		5		x		x								M	E	058 AA2.01, T1G1 1. LOD = 5 / Partial: The proposed questions tests the (RO) applicants' ability to make an operability determination, which is typically an SRO responsibility. Even though TS 3.8.3.1 above-the-line info says: *"118 volt AC Vital Bus 1DP-1A-SIII energized from its associated inverter connected to 125-volt D.C. Bus DP-1B-SA*"*, Furthermore, this is a "gray" operability call, because the only thing wrong is the Channel III UPS Trouble annunciator (ALB-15-4-5) alarming, which indicates a problem with the DC source. This does not necessarily mean that Vital Bus 1DP-1A isn't still "*connected*" to 125-volt D.C. Bus DP-1B-SA. Therefore, an applicant could (successfully) argue that there is no correct answer. 2. Cred Dist: Choice C (inverter still operable even though AC and DC both lost) is not plausible because an inverter won't function when its AC and DC sources are lost. 3. Cue: The 4th bullet *tells* the applicant the status of a (local?) switch instead of requiring them to know the normal plan alignment for the switch. 4. Cue: The 1st fill-in-the-blank statement includes the phrase "*input has lost ___*", instead of : *The 7.5 KVA Channel III Inverter _____ .*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
13						x								B	E	062 AA2.01, T1G1 [2012 NRC Exam] 1. Cred Dist: Choices A/B can be (correctly) eliminated solely by choosing the header with the lowest pressure at 11:40.
14							x							N	E	065 ~~AK3.08~~, T1G1: Early Submittal Sample Question [5-21-13]. These comments only pertain to the Early Submittal Sample Question [5-21-13]; see next line for replacement/repair comments. 1. Partial: Choice D (PZR PORVs equipped with instrument air accumulators) is also correct because the pressurizer PORV accumulators (1A-SA, 1B-NNS, and 1C-SB) are supplied with nitrogen *or* instrument air for motive power to the actuators (see page 11 of Pzr Press Ctl Rev. 6 Student Text).
14						x								N	~~U~~ E	065 AK3.08, T1G1: Second submittal 1. Cred Dist: Choices ~~A/C~~ (nitrogen gas as the *primary* pneumatic source) is not plausible because generally nitrogen is used as a *backup* pneumatic source because it costs money to replenish. 2. Ensure the question does not overlap with RO Q# 54, Choice D, loss of instrument air effects on PZR PORVs. Explore the possibility of testing the reason for EOP actions involving a LOIA as follows (2nd part may need work): *Given the following plant conditions:* - *The crew is implementing E-3* - *Train A, Phase A valves cannot be reset* *WOOTF completes both statements?* *The required RCS depressurization will be accomplished with _____.* *The E-3 RCS depressurization termination criteria, when PZR Normal Sprays are used, _____ termination criteria listed for when PORVs are used to depressurize the RCS.* *A. Normal PZR sprays; is NOT the same* *B. Normal PZR sprays; is exactly the same* ***C. PZR PORVs; is NOT the same*** *D. PZR PORVs; is exactly the same*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
14															S	Comments on revised question received from licensee on 8/5/13 1. In the 2nd fill-in-the-blank statement, consider using the word "is" (just before the blank) instead of "are." Webster's allows the singular form of the word criteria. 2. In the 2nd fill-in-the-blank statement, insert commas before and after the phrase "..when using the PZR Spray Valves."
15						x								B	U	077 AG2.4.4 1. Cred Dist: Choice A (reducing load will fix a low frequency condition) is not plausible because raising load raises frequency. This is GFES 2. Cred Dist: Choice B (raising excitation will fix a low frequency condition) is not plausible because raising excitation only raises VARS. This is GFES. 3. Cred Dist: Choice C (perform a slow controlled normal shutdown) is not plausible because keeping the generator tied to the system while lowering load will subject the plant safety busses to a low frequency condition.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
15																Comments on revised question received from licensee on 8/5/13 1. Partial: An applicant can successfully argue that Choice B (59 hz) and Choice C (58.5 hz) are correct because after 5 minutes the generator must be taken offline (*immediately*). Also, 59 hz is right on the line as far as the wording of Step 2 in AOP-028, which could be construed as minutia. Suggest the following: *The plant is operating at 100% power.* *WOOTF completes the following statements in accordance with AOP-028, Grid Instability?* *One of the entry condition set points listed in the AOP is frequency less than _____.* *The highest frequency at which an automatic reactor trip, as well as a trip of all RCPs, will occur is _____.* *A. 60 hz; 58.4 hz* *B. 60 hz; 57.5 hz* ***C. 59.5 hz; 57.5 hz*** *D. 59.5 hz; 58.4 hz* Note to exam reviewers: If an under frequency condition (57.5 Hz) exists on two (2/3) Auxiliary Buses 1A, 1B, 1C, AND power is above P-7, a reactor trip will occur, as well as a trip of all RCPs.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
16			x				x							N	E	WE04 EK3.2, T1G1 1. Stem Focus: Modify the 2nd bullet and the stem question as follows: *A LOCA has occurred in the RAB and the crew is implementing ECA-1.2, LOCA Outside Containment, Step 6 – Check Break Isolated.* *WOOTF identifies a parameter trend, which is used to confirm that the break is isolated, including the reason for the trend?* 2. Stem Focus: The second part of each choice can be streamlined as follows: *A. RCS Pressure rising; SI Flow is filling up RCS* *B. PZR Level rising; SI Flow is filling up RCS* *C. SI Flow lowering; break is isolated* *D. RAB Rad Levels lowering; break is isolated*
17						x								B	U	WE05 EK1.2, T1G1 1. Cred Dist: Choice D (50 kpph is AFW's capability) is not plausible because the stem (2nd bullet) says that AFW feed capability has been restored. 2. Cred Dist: Choice C (50 kpph is to prevent pressure control problems) is not plausible because RCS pressure will RISE when feed water flow is severely restricted, which is a pressure control problem. 3. Cred Dist: Choice B (50 kpph is to minimize RPV stresses) is borderline not plausible because the extreme challenge (i.e., RED priority) of FR-H.1 means significant core uncovery and potential core damage will follow. Therefore, RPV stress concerns are not plausible at a time when bleed & feed is in progress.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
17																Comments on revised question received from licensee on 8/5/13 1. LOD=5: The proposed repair asks the RO applicants for the EOP basis, which is borderline SRO knowledge. There is a potential that an RO applicant can appeal the question based on LOD = 5. In order to hit the K/A (implication of the EOP procedure during Loss of Heat Sink) within the RO knowledge realm, suggest the following: *Given the following plant conditions:* - *Bleed & Feed was in progress* - *Main Feed water is now available* - *No AFW pumps are available* - *Core Exit Thermocouple temperatures are stable* - *All SG wide range levels are 10%* *WOOTF completes both statements in accordance with FRP-H.1, Attachment 1, Guidance on Restoration of Feed Flow?* *Feed one intact SG at no more than _____.* *Feed flow may be raised to maximum rate as soon as wide range level rises to greater than _____.* *A. 50 kpph; 15%* *B. 50 kpph; 25%* ***C. the lowest controllable rate; 15%*** *D. the lowest controllable rate; 25%*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
18			x			x	x							N	U	WE11 EA1.3, T1G1 1. Cred Dist: The 1st part of Choices C/D (CT pump was manually stopped to minimize the rise in containment sump level) is not plausible because the containment sump level will always rise (and continue to rise) during a LOCA and is not a concern. [Note: The licensee's question submittal explanation described that the plausibility of these two Choices was that stopping the CT pump somehow "conserved" the amount of NaOH available, which ensured that the correct amount of NaOH would eventually be injected to the containment sump by the single CT pump that remained in operation. This is not plausible because the amount of NaOH reserved for a LOCA is a fixed volume.] 2. Stem Focus: The 3rd bullet says that CL Recirc was implemented (fully?); however, the 4th and 5th bullets provide conflicting information with respect to pumps running with suction aligned to RWST. 3. Partial: An applicant can (successfully) argue that there is no correct reason listed for why the CT pump was secured because if the applicant assumed that Cold Leg Recirc was previously in service per ES-1.3, Step 11, then CT pumps are already aligned to the sump. Since the stem is vague (see 3rd bullet) as to what caused the loss of CL recirc, an applicant could (justifiably) assume that the CT pumps are already running aligned to the sump.
																Comments on revised question received from licensee on 8/5/13 1. Cred Dist: Same issue. The 1st part of Choices C/D (CT pump was manually stopped to minimize the rise in containment sump level) is not plausible because the containment sump level will always rise (and continue to rise) during a LOCA and is not a concern.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
19			x			x								N	U	001 AA2.01, T1G2 1. Cred Dist: The 1st part of Choices A/B (reactor is tripped) is not plausible because the 4th bullet in the stem says that CBD rods are continuing to withdraw. The reactor can never be tripped if rods are coming out. 2. Stem Focus: The grammar of the fill-in-the-blank statement *"...means a there is a possible.." is incorrect.* Suggest re-working to a two-part question that tests the applicants' AOP-001 knowledge (of when a reactor trip is required) and their ability to interpret the before and after pictures of the reactor trip breakers.
19															S	Comments on revised question received from licensee on 8/5/13 1. Stem Focus: Move the pictures to the stem before the WOOTF stem question.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
20						x								B	U	036 AK2.01, T1G2 1. Cred Dist: Choice C (LOOP will affect SR & IR indications) is not plausible because the stem does not include any information related to the status of the 120VAC Instrument busses/inverters and because the term "reactivity condition" is vague. 2. Cred Dist: Choice D (LOOP will affect the containment rad monitors) is not plausible because the stem does not include any information related to rad monitor status and/or its power supply status. 3. Cred Dist: Choice A (LOOP will affect the ability to add water to the cavity) is borderline plausible because (of DGs) the stem does not include any information related to makeup/DG equipment status. The stem of the question (including the lead-in sentence right before the choices) "points" the applicant to the correct answer because the distracter plausibility suffers since the stem doesn't contain information which could potentially make the distracter plausible. Suggest writing a question for a situation where, when moving a fuel assembly, the load cell fluctuated outside the 100 lb allowable tolerance band. Then test the applicants' knowledge of one/all of the following RO learning objectives while the crew is performing the required action listed in FHP-020, Attachment 12 - Movement of Binding Assemblies. 5. IDENTIFY associated remote and local instrumentation, indications, alarms, and controls for the FHS. 6. STATE the interlocks, permissive, and automatic control functions of the FHS, and the basis for each. 7. DESCRIBE how the Fuel Handling and Storage is used in the response to, and mitigation of, events as described in the applicable AOPs and EOPs.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
20																Comments on revised question received from licensee on 8/5/13 1. Cue: The stem question *specifically* asks for the LOOP affect. The repairs to the question (adding Instrument Busses and EDG) don't make the choices plausible. 2. Cred Dist: Choice C (monitor "reactivity" of the core) is vague; therefore, it is not plausible. 3. Cred Dist: Choice D (monitor rad levels inside cnmt) is vague; therefore, it is not plausible. 4. Cred Dist: Choice A (add makeup water to cavity) is not plausible because another DG is still available. 5. Stem Focus: There are two competing issues going on in the stem: 1) cavity level lowering and 2) LOOP, which is disjointed. 6. Q=K/A: The question should focus on one fuel handling incident and the AOP-13 and/or FHP-020 response to the incident. The question is only testing the applicants' knowledge of the power supply to the manipulator. Suggest writing a question for a situation where, when moving a fuel assembly, the load cell fluctuated outside the 100 lb allowable tolerance band. Then test the applicants' knowledge of one/all of the following *RO* learning objectives while the crew is performing the required action listed in FHP-020, Attachment 12 - Movement of Binding Assemblies.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
21						x	x							B	U	037 G2.4.31, T1G2 1. Cred Dist: Choices A/C are not plausible because (unlike Choices B/D) they do not include an end-state benefit. For example, in Choice C (depressurize the ruptured SG below the unaffected SG pressures in order to???). Similarly, in Choice A (remove sensible heat from the ruptured SG in order to ??). By not including the end-state benefit, these choices can be eliminated solely based on psychometrics. 2. Partial: Choice A (the reason B SG HL temp is lowered is to remove heat) can be successfully argued as correct because: 1) the stem question doesn't include the qualifying phrase "*in accordance with the basis document for AOP-016*" and 2) by removing heat from the SG HL, a release to the environment, in turn, is minimized since the SG PORV set point won't be reached. 3. Cred Dist: Choice D (minimize the likelihood of a "later" PTS event) is not plausible because: 1) PTS concerns are exacerbated by cooling down the RCS and 2) the use of the word "later" is a poor grammar choice, which detracts from credibility. This K/A statement lends itself to several other possibilities for RO test items. The proposed question (once repairs are made) could potentially be used as Q#23 (accidental liquid radwaste release).
22						x			x					N	U	051 AA1.04, T1G2 1. Cred Dist: Choices A/B (generator output rises during a loss of condenser vacuum) is not plausible because: 1) MWe always goes down when vacuum goes away and 2) the stem does not include any information related to the generator controls (Imp-In or Imp-out status). 2. Minutia: How do the applicants know that Tavg doesn't rise by more than 1.5°F? Verify with Operations Management that this is not testing minutia. Suggest re-working the question to test the applicants' knowledge of the set point for BANK LOW INSERTION LIMIT (or BANK LOW-LOW INSERTION LIMIT using a reference) during a situation where rods are in auto and condenser vacuum is continuing to lower.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
23			x	x										N	E	059 AK3.04, T1G2: Early Submittal Sample Question [5-21-13]. These comments only pertain to the Early Submittal Sample Question [5-21-13]; see next line for replacement/repair comments. 1. Stem Focus: The 2nd part of the stem question (what's the reason *for the evaluation required in the procedure*) is vague; the word "evaluation" is too vague. IF the word "evaluation" is replaced with "reason for de-energizing RHR and Containment Spray Pumps and isolating CSIPs from the RWST", then this makes the 2nd part of B/D not plausible. 2. Cue: The last portion of the 1st bullet (*"...and has just been shut down at the start of an outage.."*) is not necessary to elicit the correct response since the RO applicants should know that Mode 3 represents ≥ 350°F, which precludes shutdown cooling operation. 3. Stem Focus: The 1st part of the stem question uses the word "should." This should be replaced with "required." 4. Stem Focus: The 3rd bullet should include values for actual and indicated levels. Suggest re-working the 2nd part of this question ("reason for an action in the AOP) because of comment #1 listed above. IF there is not a good AOP question to test this K/A, another possibility exists with respect to how the EOP directs the crew to position the SG PORV controller on the ruptured SG and why. This may be able to hit the k/A for reasons for action in EOP related to accidental liquid release.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
23			x			x								N	U	059 AK3.04, T1G2: Second submittal 1. Cred Dist: The 2nd part of Choices B/D (the reason to de-energize affected equipment is to prevent RHR pumps from getting air entrained) is not plausible because shutdown cooling suction is from the RCS (not the RWST). 2. Stem Focus: The 2nd part of Choices B/D can be streamlined to "*before RWST level is low enough to cause air entrainment in the RHR pump suction.*" 3. Stem Focus: To raise the plausibility of the 1st part of Choices C/D (AOP-20 is required for falling RWST level), add pressurizer level on a lowering trend to the stem. As previously suggested on 5-21-13 (see above), another possibility for this question is when the EOP directs the crew to position the SG PORV controller on a ruptured SG to prevent an accidental (liquid-steam) release. You may be able to use RO Q# 21 (once it's repaired) to hit this K/A.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
24			x	x										N	E	074 EA2.03, T1G2: Early Submittal Sample Question [5-21-13]. These comments only pertain to the Early Submittal Sample Question [5-21-13]; see next line for replacement/repair comments. 1. Cues: The 2nd part of Choices A/C (steam dumps *to the condenser*) includes a phrase that is not needed to elicit the correct response. 2. Cue: Instead of *telling* the applicants that a loss of offsite power has occurred, provide information indicative of a loss of offsite power. For example, an 86 Lockout occurs on both SUTs, followed by the current plant conditions = LOOP. Alternatively, provide the status of BOP bus (sses), which will required the applicant to deduce the availability of the main condenser. 3. Stem Focus: The 1st fill-in-the-blank statement is vague because of the phrase "can be described as." Recommend rewording the 1st fill-in-the-blank statement to test the applicants' knowledge of which procedure is required (FR-C.1 or FR-C.2). Based on the SRO clarification guidance document, RO knowledge includes red/orange path critical safety function status trees. 4. Stem Focus: In the 2nd bullet, the phrase "*following the Reactor trip and Safety Injection*" is not needed since the plant conditions provided already indicate this information. 5. Stem Focus: The stem question asks for WOOTF completes (one) sentence. Modify to say "WOOTF completes both statements?"
24			x	x										N	E	074 EA2.03, T1G2: Second submittal 1. Cue: The last phrase in the 1st bullet (*...when a LOCA occurred*) is not necessary to elicit the correct response. 2. Stem Focus: Lower the containment pressure to 3.5 psig. 3. This question may overlap with RO Q#44 (039-MRSS, A2.01) because the same knowledge of how LOOP affects steam dump availability is being tested.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
25						x	x							B	U	WE03 EK1.1, T1G2 It appears that the explanation provided with the proposed question (including the distracter analysis) is not associated with the CLAs. 1. Cred Dist: Choice B (RCS pressure can't be lowered to less than 300 psig if CLAs aren't isolated) is not plausible because the operator can always lower reactor pressure manually and the CLAs can't keep the RCS system pressure high forever with the RCS break in progress. 2. Cred Dist: Choice D (CLAs are isolated to save their inventory in case we need it later) is not plausible because the isolation valves are being closed, which could preclude getting the CLAs back again if a MOV failure occurred. 3. Partial: An applicant can (successfully) argue that Choice A is correct because the phrase "in accordance with WOB ES-1.2, Background document.." is not included in the stem question. Suggest the following: *A small break LOCA occurred.* *The crew is performing ES-1.2, Post LOCA Cooldown & Depressurization and reaches the following step:* *Check If SI Accumulators Should Be Isolated During RCS Depressurization:* *WOOTF identifies 1) the parameter used to determine whether the CLAs are required to be isolated, and 2) an operational implication if the crew fails to isolate the CLAs in accordance with the bases document for ES-1.2?* ***A. Reactor pressure < 1000 psig; exact verbatim reason from bases*** *B. Reactor pressure < 1000 psig; another plausible reason* *C. RVLIS Upper Range > 94%; exact verbatim reason from bases* *D. RVLIS Upper Range > 94%; another plausible reason*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
26												x		N	U	WE14 EA1.1, T1G2 1. Q=K/A: Based on CSFSTs, a high containment pressure condition, i.e.,close to 10 psig, is not being tested; therefore, the K/A is not being met. 2. Q=K/A: The proposed question *solely* tests Tier 2 (Plant Systems) aspects of a Phase A/B signal on the containment isolation system (See K/A Catalog excerpt below for 103 AA2.03,below) because it can be answered solely by knowing the containment pressure threshold for a Phase A/B signals and the valves required to auto-isolate for these signals. Even though the 1st and 3rd bullets say that the crew is implementing, E-0 Attachment 3 during a small break LOCA, the question does not test the applicants' ability to monitor/operate components during the implementation of the emergency/abnormal procedure associated with high containment pressure, such as AOP-23 (Loss of Containment Integrity) or EOP-FR.Z-1 (Response to High Containment Pressure), which is the required Tier 1 aspect. **A2 Ability to (a) predict the impacts of the following malfunctions or operations on the containment system- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations** (CFR: 41.5 / 43.5 / 45.3 / 45.13) A2.01 Integrated leak rate test ..... 2.0* 2.6* A2.02 Necessary plant conditions for work in containment ..... 2.2 3.2* A2.03 Phase A and B isolation ..... 3.5* 3.8* A2.04 Containment evacuation (including recognition of the alarm) ..... 3.5* 3.6* A2.05 Emergency containment entry 2.9 3.9

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
27			x				x							N	E	E15 (Cnmt Flooding) WE15, EK3.1, T1G2 1. Partial: <u>ANY</u> of the choices can be (successfully) argued as correct (that is, question would be deleted during a post-exam appeal) because of the (loose) stem phrase "*sources of water.....that are evaluated for operational concern,...*" and the wording of FR-Z.2, Step 1: **1. Identify Unexpected Source Of Water To Sump:** **a. Check the following parameters:** ☐ • **ESW booster pump flows AND pressures - NORMAL** ☐ • **CCW surge tank level - STABLE** ☐ • **RWST level - NORMAL DEPLETION** ☐ • **CST level - NORMAL DEPLETION** ☐ • **CNMT fan coolers flow - NORMAL** ☐ • **NSW discharge pressure - NORMAL** That is, CST, ESW, RCS, RWST are <u>ALL</u> evaluated for "operational concern" during FR-Z.2. 2. Stem Focus: The stem question should say "in accordance with Westinghouse Owner's Group (WOG) Background Document for FR-Z.2" instead of "in accordance with FR-Z.2."

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
28			x	x			x		x					N	E	003 (RCP) A2.02, T2G1 1. Minutia: The 2nd portion of the fill-in-the-blank statement ("*operator required to stop the RCP in accordance with ___*") seems to target the applicants' knowledge of <u>*where the wording exists*</u> which says to stop the RCP, which may be minutia. GP-007, Section 4.22 (Precaution & Limitation), states: "*When the #1 RCP Seal differential pressure is below 200 psid or when VCT pressure is below 15 psig, the RCP must not be operated.*" 2. Cue: The fill-in-the-blank statement <u>*tells*</u> the applicants that a limit has been exceeded. 3. Stem Focus: The 1st bullet is vague because it does not provide the plant status (why is the unit being shutdown, Tavg, RCS pressure) and procedure being implemented to accomplish the plant cool down. 4. Stem Focus: The stem does not indicate which thrust bearing (upper or lower?) temperatures are being trended.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
29			x	x								x		N	E	004 (CVCS) A2.13 1. Cue: 1RH-1 is a shutdown cooling suction valve from RCS Loop A. Because 1RH-1 (and its title) are included in the fill-in-the-blank statement, the answer to the 1st portion of the fill-in-the-blank statement can be deduced by knowing that shutdown cooling is not desired at this time, that is, the answer to the 1st part of fill-in-the-blank statement *has* to be CLOSED since 1RH-1 is listed. In other words, the 1st part of Choices C/D (open the 1RH-1) is not plausible because the stem says that a large break LOCA has occurred. 2. Cue: The wording of the stem question's phrase "....*to establish the A CSIP suction source for....*" is a cue that the answer to the 2nd part of the fill-in-the-blank statement is 1RH-25 SA, *SUCTION* from RHR Heat Exchanger A-SA. (1SI-340 is not a suction valve.) 3. Q=K/A: The applicant's ability to implement the ES-1.3 valve alignment requirements and/or the 1RH-25 & 1CS-746 valve interlock logic feature is not being tested because of the cues provided in the stem. (See comment #'s 1 & 2 above). ES-401 clarifies for A2 k/a statements that if the 1st part of the statement (ability to predict the impacts of low RWST level) cannot be tested without an extraordinary amount of effort, then the intent of the k/a statement can still be met if the 2nd portion of the k/a statement (use procedures to correct, control, mitigate) is tested. However, in this case, the k/a statement is not being tested. 4. Cue: The 2nd bullet is not necessary to elicit the correct response. 5. Stem Focus: None of the information before the stem question is required to answer the question.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
30			x				x							N	E	004 (CVCS) K5.26, T2G1 1. Partial: An applicant can (successfully) argue that Choice D (CSIP gas binding can occur at 15% VCT level) because the only warning provided in ALB-007-4-3 or AOP-003 is the following statement: *"Low VCT level is a precursor to gas binding the CSIPs."* 2. Partial: An applicant can (successfully) argue that there is no correct answer because neither ALB-007-4-3 nor AOP-003 specify the exact level at which gas binding of the CSIP will occur. 3. Stem Focus: It is not clear that LT-115 has failed high. [Note: The intent of the Chief Examiner comment provided to the licensee before the draft exam submittal was to keep the K/A (since the licensee had difficulty writing a question for VCT pressure effects on charging pump NPSH) and attempt to write a question related to VCT level because it also (indirectly) affects charging pump NPSH (suction pressure). For example, if the licensee's procedures included specific VCT level values at which gas intrusion occurred.] Suggest testing OP-107 precautions and limitations (P&L) associated with VCT pressure and/or level. For example, consider P&L 4.0. #51: *RCP Seal Return is normally aligned to the top of the VCT to reduce the potential for hydrogen gas returning to the CSIP suction. (Reference SOER 97-1 and 2.6.9)* and/or P&L 4.0. #16: *VCT pressure is limited to between 20 and 30 psig for the automatic makeup mode of operation.*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
31						x								N	E	005 (RHR) A1.05, T2G1 1. Cred Dist: The 2nd part of Choices B/D (reason for level is to pH control) is *borderline* plausible because the stem asks for the minimum sump level *to put cold leg recirc in service*. Therefore, adequate level in the sump is always a common sense choice when compared to sump chemistry. 2. Cred Dist: The question analysis did not indicate why 137.5 inches is a plausible value. Discuss with the licensee. Suggest incorporating a fill-in-the-blank as follows: *WOOTF completes the statement in accordance with ES-1.3, Transfer to Cold Leg Recirculation, Attachment 1, Evaluation of Degraded Recirculation Sump Performance?* *A minimum of 142 inches indicated on the _____ ensures the recirc sump strainers are completely submerged.* *A wide range containment sump level indication of _____ correlates to the bottom of the recirc sump.* *A. Containment Sump Wide Range Level Indicators; 0%* ***B. Containment Sump Wide Range Level Indicators; 54 inches*** *C. Containment Recirc Sump Narrow Range Level Indicators; 0%* *D. Containment Recirc Sump Narrow Range Level Indicators; 54 inches*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
32			x	x										N	E	006 (ECCS) G2.1.30, T2G1 1. Cue: The 1st and 2nd fill-in-the-blank statements include a description of the switch, that is, the fill-in-the-blank statements call it a "*manual transfer*" switch. Therefore, an applicant can eliminate Choices A/C solely because these choices provide a description of a different switch, that is, Choices A/C describe a *control power knife* switch. 2. Stem Focus: The stem question should refer to Attachment 5 of OP-107. 3. Stem Focus: The grammar of the 1st fill-in-the-blank statement (in the RAB 236/286) can be improved as in the RAB on elevation 236/286. Suggest the following: *WOOTF completes both statements in accordance with OP-107, CVCS, Attachment 5, Replacing B CSIP with C CSIP?* *To align the C CSIP to 1B-SB, a transfer switch located in the RAB, on elevation _____ , must be operated.* *First, the B Train Kirk Key Lock Switch must be rotated, then _____ must be closed.* *A. 236', just south of the CSIP A room, the transfer switch, which is a knife switch,* ***B. 236', just south of the CSIP A room, a handle must be placed into the handle casting and the transfer switch*** *C. 286', in the switchgear room, the transfer switch, which is a knife switch,* *D. 286', in the switchgear room, a handle must be placed into the handle casting and the transfer switch*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
33						X								N	U	007 (PRT) G2.1.20 1. Cred Dist: Choice A (*venting* the PRT to remedy a high *level* condition) is not plausible because venting is performed at the top of a tank/reservoir whereas draining is always performed at the bottom of a tank/reservoir. Venting the PRT to lower level does not make sense, that is, physics are not correct. 2. Cred Dist: Choice D (draining the PRT to remedy a high pressure condition) is not plausible because draining will affect the PRT LEVEL, which, in turn, would/could cause the LEVEL band to be in an alarm condition.
34		1												B	E	007 (PRT) K4.01 1. LOD = 1: Follow this (psychometric) logic: Choices C/D are presenting the same strategy (drain & fill strategy); *they can't be both be right*, so these choices must be incorrect. PRT is RCS (contaminated) water so Choice B (service water) can't be right because that goes back out to the environment. Suggest the following: *WOOTF completes both statements in accordance with OP-100, RCS?* *Per the OP-100 precautions and limitation, Pressurizer Relief Tank (PRT) temperature should be maintained less than _____.* *A rapid cool down of the PRT can be performed by draining the PRT and providing makeup water to the spray header from the _____.* *A. 120°F; Reactor Coolant Drain Tank (RCDT)* ***B. 120°F; Reactor Makeup Water Storage Tank (RMWST)*** *C. 150°F; RCDT* *D. 150°F; RMWST*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
35							x							B	E	008 (CCWS) A3.08, T2G1 1. Partial: The word "DIRECTLY" is always subjective. Therefore, an applicant can (successfully) argue that Choices B/C/D are also correct since an SI signal triggers a Phase A, which causes 1CC-176 auto-closure. Suggest re-working the question to test something similar to the following: *A reactor trip occurred and the following conditions currently exist:* • *PZR level: 0%* • *PZR press: 1800 psig* • *SG levels: 50%* • *Containment press: 2 psig* *WOOTF predicts the status of the CCW supply to the Letdown Heat Exchanger and the RCPs?*
36			x			x								B	E	010 (PZR PCS) K6.02, T2G1 1. Cred Dist: (Borderline) For Choices A/C, the word "*until*" in the fill-in-the-blank statement implies that the PORVs will close when a safety injection occurs, which makes Choices A/C not plausible. 2. Stem Focus: Add a 3rd bullet that clarifies that the PORV handswitches are aligned as they are normally aligned with the unit at 100% power (All 3 PORVs in AUTO). Suggest the following: *WOOTF completes both statements to predict the response of the PZR Pressure Control System with no operator action?* *____(1)_____ PZR PORV(s) will automatically OPEN.* *A pressurizer low pressure safety injection system actuation ____(2) occur. (will / will not)*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
37						x	x					x		B	U	010 (PZR PCS) K6.03, T2G1 1. Q=K/A: The proposed question does not test the applicants' knowledge of how a *loss* of sprays/heaters affects the pressure control system OR how a *malfunction* of sprays/heaters affects the pressure control system. The proposed question tests the applicants' knowledge of how a set point adjustment affects the pressure control system. 2. Cred Dist: Choice D (PORV will "cycle") is not plausible because the PORV 444B is designed to either be fully open or fully closed, that is, it will not "maintain" pressure. 3. Partial: An applicant could contend that the word "slowly" (in the 3rd bullet) meant over a period of 4 days, which could yield no correct answer.
38			x				x							N	E	012 (RPS) K4.02, T2G1 1. Partial: Choice A (high level trip prevents over-pressurizing RCS) can also be argued as correct because the level trip is a backup feature for the pressure trip. 2. Stem Focus: Ensure that there are two level channels indicating 92% (instead of just one). 3. Stem Focus: Ensure the stem question includes the phrase *"...and the basis for the automatic trip in accordance with tech specs."*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
39			x				x							B	E	013 (ESFAS) A4.01, T2G1 1. Partial: Because the stem is not precisely worded for a specific point in time, an applicant can argue that sequencer program B & C previously ran (during the LB LOCA) and that verification that the CSIPs & RHR Pump auto-started is still appropriated. 2. Stem Focus: For choices C/D, clarify the word "start" by changing to "auto-start." Suggest the following: *The crew was responding to a LOCA in accordance with E-1, Loss of Reactor Or Secondary Coolant and the following actions were taken:* • *SI and Phase A have been reset* • *Instrument Air & Nitrogen have been restored to containment* • *RHR Pumps are running* *Subsequently, a loss of offsite power occurs.* *WOOTF identifies the sequencer program that auto-initiated after the LOSP occurred whether the RHR pumps received an auto-start signal after the sequencer program was completed?* *A. Program A; RHR Pumps will auto-start* ***B. Program A; RHR Pumps must be manually started*** *C. Program B; RHR Pumps will auto-start* *D. Program B; RHR Pumps must be manually started*
40			x											B	E	013 (ESFAS) K2.01, T2G1 1. Stem Focus: The wording of the fill-in-the-blank statement can be streamlined as follows: *Instrument Busses _____ and _____ provide power to the ESFAS Slave Relays.*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
41				x								x		M	E	022 (CCS) A4.03, T2G1 [NRC 2012 Exam] 1. Q=K/A: Does the control room panel include position indication or control switches for the <u>*post-accident dampers*</u>? The K/A requires testing the applicants' ability to operate and/or monitor dampers <u>*in the control room*</u>. Is there an annunciator for the post-accident dampers? We may need to re-work the question to test the fan dampers (instead of the post-accident dampers), since the fan dampers <u>*DO*</u> have control panel indications. 2. Cue: The 2nd and 3rd bullets are not necessary to elicit the correct response.
42							x							B	E	026 (Cont Spray) A1.05, T2G1 1. Partial: To eliminate the possibility of a sub-set issue (Choice D also correct), suggest the following re-phrasing of the stem question: *WOOTF completes the statement?* *Following a containment spray actuation signal, containment spray chemical addition valves 1CT-11 and 1CT-12 will auto-close when the containment spray additive tank level first lowers to _____ .*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
43			x				x							N	E	026 (Cont Spray) K3.02, T2G1 1. Stem Focus: Using the (1) and (2) numbers in parenthesis is very confusing, especially since the choices have valve numbers. For this question, consider not using the numbered values in parenthesis for the fill-in-the-blank statement. 2. Stem Focus: The CT pump A initial status (running & aligned to RWST) should be provided in the stem. 3. Partial: The choices where there is only one valve need to use the word ONLY to preclude sub-set issues. *Given the plant conditions* - *The plant was operating at 100% power* - *A LOCA occurred and the crew is implementing E-1, Loss of Reactor Or Secondary Coolant* - *The CT Pump "A" tripped while aligned to the RWST* *WOOTF completes both statements if RWST Level subsequently lowers to the Low-Low set point?* *When RWST level reaches the Lo-Lo level set point, recirc sump suction valve(s) _____ will automatically open.* *After the recirc suction valve(s) reach(es) the full-open position, RWST _____ will automatically close.* *[provide noun names]* ***A. 1CT-102 ONLY; 1CT-71 ONLY*** *B. 1CT-102 & 1CT-105; 1CT-71 ONLY* *C. 1-CT-102 ONLY; 1CT-26 & 1CT-71* *D. 1CT-102 & 1CT-105; 1CT-26 & 1CT-71*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
44														B	E	039 (MRSS) A2.01, T2G1 1. This question overlaps with RO Q#24 (074-Inadeq CC- EA2.03) because the same knowledge of how LOOP affects steam dump availability is being tested. (double jeopardy) The K/A should be changed. Contact Chief Examiner.
45						x								B	E	059 (MFW) K4.02, T2G1 [2012 NRC Exam] 1. Cred Dist: Choice B can be (correctly) eliminated solely based on psychometrics, that is, it doesn't make sense that a reactor trip is required if a runback is initiated because the purpose of the runback is to prevent a reactor trip; it's the way the plant is designed. In order for a reactor trip to be plausible, the stem should contain another piece of information that could potentially be misconstrued as the need for a reactor trip. 2. Ensure SRO Q#79 stem conditions do not provide a cue to this question. Suggest the following: *WOOTF completes both statements?* *An automatic turbine runback will occur if _____ .* *During the turbine runback, the turbine _____ will close.* *A. the Tavg-Tref mismatch is 16°F; governor valves only* *B. the Tavg-Tref mismatch is 16°F; governor & intercept valves* ***C. one steam generator feed pump trips when generator load is above 60%; governor valves only*** *D. one steam generator feed pump trips when generator load is above 60%; governor and intercept valves*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
46						x	x							N	U	061 (AFW) A1.01, T2G1 1. Cred Dist: Choice B (open SG PORVs to) is not plausible because the EOPs never direct this action to raise SG inventory. 2. Cred Dist: Choice D (do nothing but monitor) is not plausible because SG levels are dropping; therefore, something must be required. 3. Partial: Based *only* on the information in the stem, can an applicant correctly assume that AFW flow cannot be raised > 160 kpph? If so, then Choice A is also correct. The answer choices should not be used to clarify the stem conditions. For example, is there a correct answer to the following revised question pertaining to FR-H.1 entry? *Given the following plant conditions:* - *The crew has been implementing ECA-0.0, Loss of All AC Power, for several minutes* - *The TDAFW Pump is running in automatic and AFW flow is currently 160 kpph* - *All SG NR levels are 9% and lowering* *WOOTF identifies the required action in accordance with the EOPs?* *A. FR-H.1 is required; [some other item]* *B. FR-H.1 is NOT required; [some other item]* *C. FR-H.1 is required; [some other item]* *D. FR-H.1 is NOT required; [some other item]*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
47				x		x								B	U	061 (AFW) K5.05, T2G1 [2012 NRC Exam] Note: <u>One</u> operational implication of receiving the SG A, B, C Back leakage High Temp alarm (aka feed line voiding & water hammer) <u>is</u> that the implementation of AOP-10, Section 3.3 (SG Back leakage) and Attachment 9, Cooling AFW Pumps & Piping may be required. 1. Cred Dist: Choice C (Initiation of AFW flow while back leakage annunciator alarm ing can cause corrosion) is not plausible because corrosion takes place over a long period of time. 2. Cred Dist: Choice B (Initiation of AFW flow while back leakage annunciator alarming can cause thermal binding) is not plausible because fluid flow doesn't cause thermal binding, and the stem question deals with flow (not cool down). 3. Cue: The word "rapid" is not needed to elicit the correct response. Suggest the following replacement question: *The plant is operating at 100% power and the following alarm is received:* - *SG A, B, C BACKLEAKAGE HIGH TEMP (ALB-014, 7-4)* *Because of elevated TDAFW pump piping temperatures, the crew is implementing AOP-10, Feed water Malfunctions, Attachment 9, Cooling AFW Pumps & Piping.* *The reason this condition occurred is because a SG _____.* *During the implementation of Attachment 9, the TDAFW Pump will _____.* *A. steam supply piping check valve is leaking; be inoperable due to the required valve alignment* *B. steam supply piping check valve is leaking; remain operable* ***C. feed water piping check valve is leaking; be inoperable due to the required valve alignment*** *D. feed water piping check valve is leaking; remain operable*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
48														B	S	062 (AC Distribution) K2.01, T2G1
49			x			x	x							B	E	063 (DC Distribution) A3.01, T2G1 1. Partial: There may be no correct answer because the OP-156.01 caution deals with a *steadily decreasing* charger output voltage (indicative of an internal charger fault) whereas the stem indicates that voltage has stabilized. 2. Cred Dist: Choice D (take out the A charger to remedy low voltage) is not plausible because the stem already says that the A charger is being removed from service; therefore, this choice cannot be an additional "required" action. 3. Stem Focus: The wording of the 2nd bullet is not clear, that is, "...swapped to 1B-SA in service.." is confusing. Add the section/title of OP-156.01 to this bullet. *WOOTF completes both statements in accordance with OP-156.01, Section 8.2. Rotation of 125 VDC NNS Battery Chargers?* *When placing the 125VDC battery charger in service, its _____ breaker is closed first.* *A low DC Volt alarm _____ expected after this first breaker is closed.* *A. DC output; is NOT* ***B. DC output; is*** *C. AC input; is NOT* *D. AC input; is*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
50		1				x								B	U	063 (DC Distribution) K3.02, T2G1 1. LOD=1: The proposed question can be answered solely using GFES knowledge [See PWR Catalog Section 191008: Breakers, Relays, & Disconnects, K1.03, Loss of power supply circuit breaker indicator lights and capability in remotely open and close.] This is the *plant specific* portion of the written exam; therefore, the k/a requires testing the applicants' knowledge of how a loss of the DC system will affect a component that uses DC power *at Harris*. 2. Cred Dist: The 1st part of Choices A/C (the MDAFW pump breaker can still be operated with DC control power lost) is not plausible because DC control power is required to operate all AC breakers.
51			x							x				B	E	064 (EDG) K6.08, T2G1 1. Stem Focus: In the 1st bullet, add a zero before .835. 2. #/units: IF the storage tank level indication system provides "gallons" then, the proposed question is acceptable; however, if the storage tank level reads out in percent, then the applicants should also be provided another curve. Discuss with the licensee. 3. Stem Focus: The stem can be streamlined (less reading burden) as follows: *Given the following EDG Fuel Oil data:* *- Both Day Tanks' specific gravity: 0.835* *- Day Tank A: 47%* *- Storage Tank A: 90,000 gallons* *- Day Tank B: 42%* *- Storage Tank B: 110,000 gallons* *WOOTF identifies the status of the EDGs in accordance withTech Spec 3.8.1.1, Electrical Power Systems - AC Sources?* *[Reference Provided]*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
52						x						x		B	U	073 (PRM) A4.02, T2G1 1. Cred Dist: Choices C/D (vent rad monitors) can be (correctly) eliminated *solely* based on the title of AOP-20, that is, *Reactor Coolant* System activity. Since Choices C/D are not associated with reactor coolant, they can be eliminated. 2. Q=K/A: The k/a requires testing the applicants' ability to operate the rad monitor controls *OR* test their ability to "monitor" the rad monitor controls. Since the stem *tells* the applicants that a high alarm exists (versus requiring them to analyze indications, values, etc.), the proposed question is borderline for hitting the k/A. Suggest re-working the question to test the applicants' ability to operate one of the rad monitors in accordance with OP-118. Alternatively, a question can be written to test the applicants' ability to operate/monitor any of the rad monitors in the student text.
53			x											B	E	076 (SWS) K1.01, T2G1 1. Stem Focus: Enhance the 1st bullet by describing what power lines, transformers, or busses were lost instead of telling the applicants that a LOOP occurred.
54			x			x	x	x						N	E	078 (IAS) K3.01, T2G1 1. Cred Dist: Choice C (all pneumatically operated valves at Harris are unreliable when IAS pressure is 85 psig) is not plausible because many valves have backup nitrogen supplies, etc. 2. Partial: Choice A (FW flow control valves "will be" closing) can (successfully) be argued as correct because the stem says that IA pressure is slowly lowering and Choice A is a future prediction because of the words "will be." 3. Ensure this question (specifically, Choice D) does not overlap with RO Q# 14 (effects of LOIA on PORVs) 4. Stem Focus: The 2nd bullet is not necessary. 5. Stem Focus: The 1st part of Choice B ("Containment instrument air system pressure will cause...") is not necessary.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
55						x								B	U	103 (Cont Sys) K1.03, T2G1 1. Cred Dist: Choice B (cooling required for RCPs when no RCPs are in service) is not plausible because the stem states that no RCPs are running; therefore, the "reason" is not plausible. 2. Cred Dist: Choice A (rx support fans purpose is to cool Nis) is not plausible because the name of the fan (that is, reactor support cooling fan) provides its intended purpose; therefore, the "reason" is not plausible. Suggest the following: *WOOTF completes both statements?* *The Primary Shield Cooling sub-system consists of _____ fans.* *These fans are located in the Containment Building at elevation _____.* ***A. Two; 221'*** *B. Two; 236'* *C. Four; 221'* *D. Four; 236'*
56														B	S	011 (PZR LCS) K2.02, T2G2

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
57			x											B	E	015 (NIS) K3.01, T2G2 1. Stem Focus: The 4th bullet is not necessary. 2. Stem Focus: Incorporate time line to clarify the "when" in Choices A/B. 3. Stem Focus: To ensure Choice C remains plausible and add discriminatory value, provide status of P-10 permissive light (instead of providing reactor power at 8%) , which is indicative of reactor power, but tests the applicants' knowledge of when the light is supposed to be on/off. Suggest the following: *Given the following plant conditions:* - *Startup is in progress* - *The power range > 10% (P-10) block permissive light is EXTINGUISHED* - *IR N35 is inoperable and its Level Trip Switch is in the BYPASS position per OWP-RP-21, Reactor Protection* - *The following events occur:* *@ 12:00: N35 instrument fuses blow* *@ 12:15: N35 control power fuses blow* *WOOTF identifies the status of the Reactor Trip Breakers, including the reason?* *A. OPENED at 12:00, instrument fuses blew* ***B. OPENED at 12:15, control power fuses blew*** *C. CLOSED at 12:15 because the IR channels are BLOCKED at this time in accordance with the Startup procedure* *D. CLOSED at 12: 15 because N35 Level Trip Switch is in BYPASS*
58														N	S	016 (NNIS) A2.02, T2G2

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
59		5				x	x							N	E	028 (HRPS) K6.01, T2G2 1. LOD = 5: The proposed question tests the (RO) applicants' knowledge of the FSAR design bases Section 6.2.5, which is beyond the scope of RO knowledge. This question is vulnerable to being deleted during a post-exam appeal. 2. Cred Dist: Choice D (high moisture content in the air) is not plausible because the stem does not include any humidity values. 3. Partial: Choice B should include the word "only", that is, "be maintained < 4% only with purge inservice." 4. Ensure no overlap with SRO Q#92. Consider the following suggestion; the "loss or malfunction" being tested is that recombiner operation beyond 4% [H2] exceeds the capability of the recombiner. *WOOTF completes the following statement in accordance with OP-125, Post Accident Hydrogen System?* *Containment H2 Recombiners should NOT be operated when containment _____ because _____.* *A. purge is placed in service; the purge filter train flow will exceed recombiner capability* *B. purge is placed in service; the purge system vents 100 cfm of the containment atmosphere to the plant vent stack.* ***C. H2 concentration is ≥ 4%; excessive heat will be generated in the recombiner*** *D. H2 concentration is ≥ 4%; the 480 V MCC supply breaker to the recombiner will trip* Alternatively, consider using SRO Q#92 to repair this question.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
60						x	x							B	E	034 (FHES) G2.4.31 1. Partial: The term "*primary* means of returning...cart" is undefined; therefore, it is subjective. 2. Cred Dist: Choice D (redundant roller chain) is not plausible because the stem uses the phrase "*primary* means" and then also indicates that the roller chain has broken. In other words, the primary means of moving the cart *IS* the roller chain, and it is now broken, which means that a redundant roller chain can't be the *primary* means of returning the cart. 3. Cred Dist: Choice A (using divers) is borderline plausible because a fuel bundle is loaded on the cart and divers are only used as a last resort. The stem question uses the term "*primary* means of returning the cart..", which makes Choice A (divers) not plausible. Suggest the following: *A traverse drive system (roller chain) failure has occurred on the fuel transfer system conveyor while the cart was in the horizontal position and loaded with a fuel bundle.* *WOOTF identifies how the conveyor car must be returned to the desired position in accordance with FHP-020, Refueling Operations [and some other piece of knowledge]?* *A. A cable is connected to the fuel assembly handle; [some other knowledge]* *B. A cable is connected to the pusher arm; [some other knowledge]* *C. Etc.* *D. Etc.*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
61		1	x				x							N	E	071 (WGDS) K5.04, T2G2 1. Partial: An applicant can (successfully) argue that there is no correct answer because OP-120.07 P&L #3 *only* identifies an *OXYGEN* limit downstream of the recombiners (2%). P&L #17 (provided in the explanation with the proposed question) only discusses the lower flammability limit of hydrogen. Therefore, an applicant can argue that OP-120.07 does not provide guidance on the allowable hydrogen concentration downstream of the recombiners. 2. LOD=1: This question will not provide any discriminatory value because 4% is the universal flammability limit of hydrogen in air. 3. Stem Focus: The stem is missing the phrase "*in accordance with…*".
62							x							B	E	072 (ARM) A3.01, T2G2 1. Partial: The phrase "*directly caused*", in the stem question, is subjective. Therefore, Choice D (CPPMU Fans AH-81A/B trip) can successfully be argued as correct because these fans receive a trip signal when the CPPE Fans 1D1 E-5 trip. 2. Please provide Chief Examiner with set point for 3561A thru D, and the associated annunciator that will alarm when this set point is exceeded. 3. This question provides a cue to SRO Q#84.
63				x		x								N	U	075 (Circ Wtr) K1.01, T2G2 1. Cred Dist: Choices B/C are not plausible because the combinations presented for backpressure/flow defy the physics of fluid flow. 2. Cue: The phrase "*…caused by the Cooling Tower risers..*" (in the fill-in-the-blank statement) is not necessary to elicit the correct response.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
64			x	x		x	x			x				B	E	079 (SAS) A4.01, T2G2 1. Partial: Depending on the location of the leak, an applicant could potentially argue no correct answer exists or potentially argue another correct answer exists because *the stem doesn't specify where the IA pressure value was obtained*. Modify the stem to include the MCB pressure instrument #/unid where the IA header pressure is being observed or the annunciators in alarm at this time 2. Cue: The trend on the 3rd bullet is not necessary to elicit the correct response. 3. Cred Dist: Choice A (SA isolation valve is OPEN even though low IA pressure alarm exists) is not plausible because the SA isolation valve should always be closed when a low IA pressure condition exists. 4. Stem Focus: The 2nd bullet is not necessary to elicit the correct response. 5. #/units: The noun name of 1SA-506 appears to be "SA Header Isol. Valve", not "Instrument Air from Service Air Isolation Valve."
65			x			x								B	E	086 (FP) K4.02, T2G2 1. Cred Dist: Choice C (motor pump OFF; diesel pump ON) is not plausible because the stem did not provide any information which potentially be misconstrued to mean that the motor pump was unavailable, etc. Most all plants are designed such that the motor pump auto-starts before the diesel pump; therefore, Choice C is not plausible. 2. Stem Focus: Discuss whether the 1st bullet is necessary.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
66						x	x							B	U	G2.1.13, T3 1. Cred Dist: An applicant can correctly eliminate Choices A/B solely because the 1st part of these choices is grammatically incorrect with the fill-in-the-blank statement. "The Security Master Key is located in a locked *box in SM* desk." 2. Cred Dist: An applicant can correctly eliminate Choice B (the box in the SM desk is controlled by security) solely because the box is in the SM's desk, and *desks* are typically controlled by the owner of the desk. 3. Partial: The fill-in-the-blank statement does not mirror the statement in OMM-001, Section 5.1.7.6. Therefore, an applicant can successfully argue that Choice C is also correct because the word "controlled" (in the fill-in-the-blank statement) is subjective. For example, the key is located in the Main Control Room for use by operations personnel in an emergency to afford access to plant vital areas. This, in effect, is "controlled" by the Shift Manager, which makes Choice C correct.
67		1				x	x							B	E	G2.1.15, T3 1. Cred Dist: Choices C (SI's can be used in place of procedures) is not plausible because procedures are required for plant operation in accordance with the operating license. 2. Partial: Choice A (SI's are instructions or information of long-term significance) is also correct because "*instructions or information of long-term significance*" is equivalent to "*guidance in dealing with various types of plant problems to assure consistency between shifts.*" 3. Partial: Choice B (SIs are instructions to allow departure/deviation from a procedure) can potentially be correct because of a situation where an SI was used to communicate a significant plant problem or event which involved departure/deviation from a procedure. 4. LOD=1: This question will provide no discriminatory value. Suggest writing a question to test an actual Standing Instruction that exists in the plant. Please provide Harris Standing Instructions.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
68												x		B	E	G2.1.19, T3 1. Scenario 1, Event 3 overlaps with this question because it also is LT-112 failing high. The applicants will already be tested on their ability to use the computer to identify this failure. 2. Q=K/A: In order to test the K/A (Ability to use plant computer), the stem should include a picture of a computer display, etc., that the applicants would have to navigate/use. Instead, the proposed question provides the information (ERFIS ID point values), which is not testing the K/A.
69		5	x				x							B	E	G2.2.20, T3 1. LOD=5: For the RO applicant, the proposed question may be too difficult. We may need to select another K/A if a discriminating question at the RO level cannot be written. 2. Stem Focus/Partial: P&L # 7 states: Troubleshooting activities are preferably performed on equipment removed from service *or tagged out* so the troubleshooting activity does not adversely affect plant operation or safety (i.e., no risk). There are circumstances that require troubleshooting on equipment that is in service, thereby presenting a degree of risk. This procedure should be utilized in both circumstances. An applicant could potentially argue that there are multiple correct answers in a situation where a clearance is used. Suggest the following: *WOOTF identifies an example of a troubleshooting activity in accordance with AP-929, Troubleshooting Guide?* ***A. Pulling an annunciator card*** *B. Replacing failed components on circuit boards* *C. Temporary M&TE "Test point/jack" connections* *D. Installing gags on valves*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
70		5	x											N	E	G2.2.39, T3 1. LOD=5: The 2nd part of the question is beyond the scope of RO knowledge because it tests tech spec *bases* . (This question can be (justifiably) deleted from the exam during the post-exam appeal process. RO's are responsible for ≤ 1 hour action statements; however, the bases of the tech spec action statement is beyond the scope of RO knowledge. [See SRO clarification guidance document] 2. Stem Focus: The stem question does not include the phrase "*in accordance with the bases for Tech Spec 3.5.1.*" The SIS lesson plan, Objective #10 does not support testing the RO applicants' knowledge of Tech Spec bases. Suggest re-working the question to test the RO applicants' knowledge of the allowable range for which parameter, if outside the allowable range, requires an action statement of ≤ 1 hour [choose between pressure (correct) or boron concentration (incorrect) AND whether the accumulators are / are not required to be operable in Mode 3.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
71				x		x						x		B	U	G2.3.11, T3 1. Q=K/A: The proposed question does not test the *applicants'* ability to control a release. [The proposed question *tells* the applicants the AOP-5 required action and then tests the applicants' knowledge of how the Fuel Handling Ventilation System will *automatically align* following a high radiation auto-initiation signal.] Instead, the proposed question (inappropriately) targets the APE 036 Fuel Handling Incidents topic (see k/a's below), whereas the intent of this Tier 3 K/A is to test the applicants' ability to *control* releases. AK2.02: Knowledge of the interrelations between the Fuel Handling Incidents and Radiation monitoring equipment (portable and installed) AA1.02: Ability to operate and / or monitor the following as they apply to the Fuel Handling Incidents: ARM system. 2. Cred Dist: The 2nd part of Choices A/B (NORMAL dampers are OPEN) is not plausible because the 2nd bullet tells the applicants that AOP-5 requires the emergency lineup. Normal dampers are never OPEN in an emergency lineup. 3. Cue: The 2nd bullet is not necessary to elicit the correct response. Suggest testing the applicants' ability to perform an evolution in OP-120.07 or knowledge of a P&L in this procedure that pertains to controlling releases. For example, any of the following items may be applicable to this K/A: *The contents of two WGDTs _____ crosstied during a release as long as the combined content of the tanks is less than _____ curies.* *Normally, no waste gas decay tanks are released until the contents are held up for a minimum of ____ days.* *The amount of radioactivity contained in each Gas Decay Tank shall be limited to less than or equal to equivalent _____ curies.*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
72		1												M	E	G2.3.12, T3 [2012 NRC Exam, Q#70] 1. LOD=1: The proposed question tests General Employee Training (GET) knowledge associated with the definition of a locked high rad area (LHRA) and the required postings for a LHRA. The K/A requires testing radiological safety principle pertaining to *licensed operator duties*. The proposed question solely tests GET knowledge required for all plant personnel. Suggest writing a question to test AP-545, Containment Entries, requirements.
73						x								B	E	G2.4.22, T3 1. Cred Dist: Choice A (go to core cooling C.2) is not plausible because the stem doesn't list the status of the core cooling CSFST. Replace Choice A with FR-P.1 since this item is already listed in the stem.
74								x						B	E	G2.4.27, T3 1. Job-Link: For the RO applicant, the proposed question should be written to test the AOP-36 *procedure* instead of testing the bases document. Suggest the following: *Given the following plant conditions:* - *AOP-036, Safe Shutdown Following a Fire, is being implemented.* - *Main Control Board CST Level indicators LI-9010A1-SA and LI-9010B1-SB are not available.* *WOOTF completes the following statement?* *In accordance with AOP-36.02, Fire Area 1-A-BAL-A, 1-A-BAL-G, 1-A-BAL-H, the alternate method of checking CST level greater than 10% is to use _____.* *A. the local CST level indicator* ***B. a graph of AFW Pump Suction pressure vs. CST level*** *C. a graph of Condensate Transfer Suction pressure vs. CST level.* *D. the CONDENSATE STORAGE TANK LOW MINIMUM LEVEL annunciator (ALB-017, 5-5)*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
75		5	x			x								B	E	G2.4.29, T3 1. LOD = 5: The proposed (RO) question tests the applicants' knowledge of the North Carolina and NRC notification time requirements during an emergency declaration. 2. Cred Dist: Choice C is not plausible because a UE and ALERT always both require state and NRC notification. 3. Stem Focus: Only the 3rd and 6th bullets are necessary in the stem. 4. Stem Focus: In the 3rd and 6th bullets, the phrase *"...by the SEC"* is not required to elicit the correct response. 5. Clarify whether this question is significantly modified or bank question; exam submittal explanation explained that the times were changed. Suggest testing the RO applicants' knowledge of PEPs as follows: *WOOTF completes both statements In accordance with PEP-230, Control Room Operations?* *During an event including an Alert or higher all NLO watch stations should report to the _____ promptly after putting work in a safe condition.* *The _____ must be informed when assigning additional duties to people who were already dispatched to perform another duty and have not yet returned from the first duty assignment.* *A. Operations Support Center; Plant Operations Director* *B. Operations Support Center; Site Emergency Coordinator* *C. Control Room; Emergency Communicator* ***D. Control Room; Plant Operations Director***

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
76			x			x		x						N	E	025 (Loss RHR) AA2.05, T1G1 1. Cred Dist: (This is a typographical error; thus the question graded as enhancement.) The 2nd part of Choices B/D can be eliminated solely based on the grammar, that is, the word "pumps" (instead of singular "pump") because the stem says only one pump is running. 2. Stem Focus: The 2nd bullet is not necessary. 3. Job-Link: Verify that two train RHR in operation does not conflict with normal operations when the cavity is flooded because, normally, when the refueling cavity is flooded, one train of RHR may be removed from service. Verify with GP and OP. 4. Stem Focus: The 4th and 5th bullets can be clarified with respect to past and present tense as follows: "*Both RHR Pumps were operating in the Shutdown Cooling mode when the "B" RHR Pump tripped.*" 5. Stem Focus: The 2nd part of Choices B/D should be streamlined to eliminate wordiness and be proportionately the same length as Choices A/C. 6. Stem Focus: Suggest re-wording the stem question to ensure no partially correct answers as follows: *Given the following plant conditions:* - *The plant is in Mode 6* - *Refueling Cavity Level is 23'6"* - *Both RHR Pumps were operating in the Shutdown Cooling mode when the "B" RHR Pump tripped.* *WOOTF completes both statements in accordance with Tech Spec 3.4.9.8, Refueling Operations – RHR and Coolant Circulation?* *The surveillance requirement for Tech Spec 3.4.9.8 requires the RHR flow rate for this condition to be at least _____.* *The basis for this flow rate, in accordance with Tech Specs, is to _____.* *A. 900 gpm; reduce the possibility of cavitation* *B. 900 gpm; minimize the effect of a boron dilution incident* *C. 2500 gpm; reduce the possibility of cavitation* ***D. 2500 gpm; minimize the effect of a boron dilution incident***

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
77						x	x							B	E	029 (ATWS) EA2.09, T1G1 1. Cred Dist: The 2nd part of Choice A (return to E-0 when an ATWS exists) is not plausible because nothing is ever more important than subcriticality. 2. Partial: Choice D (TDAFW Pump has tripped; continue in S.1) could potentially be correct if the stem conditions don't specifically preclude a loss of FW ATWS scenario. Nothing in the stem indicates that the MDAFW Pumps are running, nor does the stem preclude the applicant from assuming the worst case analyzed transient of loss of FW ATWS. [Loss of FW ATWS scenario is worst case analyzed transient where the turbine is already tripped and the only thing feeding the SG is the TDAFW Pump]. 3. Hint: It's not necessary to write a question to hit the "main turbine trip" portion of the K/A; the "reactor trip" portion is good enough. Suggest writing the question to hit the "reactor trip" portion of the K/A in the following fashion. • For the 1st part of the question, test the applicants' ability to identify the occurrence of a reactor trip *after* the local actions in FR-S.1 (Step 9 RNO) have been performed. In other words, what are ways that the crew in the control room may first identify that a reactor trip has finally occurred during an ATWS? [RO knowledge] • For the 2nd part of the question, test the SRO applicants' ability to determine whether to immediately exit FR-S.1 *OR* to stay in FR-S.1 until a certain step/evolution is completed, despite the fact that the reactor trip finally occurred. (*procedure selection*) (Make the correct answer to be a point in FR-S.1 that requires staying in FR-S.1 even though the reactor trip finally occurred.)

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
78			x	x		x								N	E	038 (SGTR) EG2.4.30, T1G1 [EALClassification] The explanation summary provided with the proposed question indicated no reference provided to the applicants; however, the actual proposed question indicates a reference is provided to the applicant. 1. Cue: The last phrase in the stem question *("....of an emergency release in progress.")* is not necessary to elicit the correct response. To allow deleting this phrase, change the 2nd part of Choice B to 7:10. 2. Cred Dist: Choice C (6:00 classification w/ 6:35 notification time requirement) is not plausible because North Carolina always must be notified within 15 minutes for emergency classifications. Change the 2nd part of Choice C to 6:15. This will test the applicants' knowledge of identified vs unidentified leakage. 3. Stem Focus: For the 2nd part of the stem question, add the words "earliest required" before the word time.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
79			x	x			x						x	N	U	054 AG2.4.47, T1G1: Early Submittal Sample Question [5-21-13]. These comments only pertain to the Early Submittal Sample Question [5-21-13]; see next line for replacement/repair comments. 1. SRO-only: Both parts of the question can be answered with RO knowledge. The 1st part of the question (AOP 10 vs AOP 15) can be deduced using RO knowledge that the *root cause* of the transient is a loss of feed water. The 2nd part of the question (Rapid down power vs Normal plant shutdown) can be deduced based on RO knowledge of the urgency of SG levels dropping (not enough time to do a normal plant shutdown). 2. Cue/Partial: The 2nd part of Choices A/B ("Refer to..") cues the applicant that these choices are incorrect because the stem question asks for a requirement. On the other hand, it is never incorrect to refer to any procedure (even if it's the wrong procedure); therefore, an applicant can successfully argue that Choice A is also correct. 3. Stem Focus: The last part of the stem question ("the reason why..") is not required to meet the K/A; each of the four choices contains 3 parts (unnecessary). The "reason" is not required to elicit the correct response since the first two parts of the question are all that's required. Suggest writing a question to test the SRO applicants' ability to analyze a trend associated with FW (heat sink) to make an emergency classification (provided the EALs).

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
79						x						x		N	U	054 (MFW) AG2.4.47, T1G1 [EAL Classification] 1. The stem condition (turbine runback) in this question provides a cue to RO # 45. 2. Q=K/A: The loss of FW *K/A* must be tested at the SRO level. The proposed question does not test the applicants' ability to diagnose or trend the loss of FW *at the SRO level*. The SRO piece of the question (EAL classification for loss of annunciators) doesn't test the loss of FW *K/A* at the SRO level. The proposed question tests the applicants' knowledge that a turbine runback is a transient, which is RO knowledge. 3. Cred Dist: Choices A/B (evacuate the site when a loss of annunciators occurs and a transient is in progress) are not plausible because the core is not being jeopardized; therefore, a site evacuation is not realistic. 4. Cred Dist: Choice D (UE based on losing annunciators for 15 minutes) is not plausible because the stem does not include *how long* the annunciators were lost. Suggest writing a question to test the SRO applicants' ability to analyze a FW trend (loss of heat sink CSFST FW parameters is one example) to make a *procedure selection* (be careful, Red/Orange paths are RO knowledge items) *OR* to make an *emergency classification* associated with loss of heat sink.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
80							x					x		B	E	055 (SBO) EA2.04, T1G1 The K/A is very difficult to hit at the SRO level; this question is graded as an enhancement. 1. Q=K/A: The K/A is not being tested because the ability to determine *WHICH* instruments or controls remain available during a SBO is not being tested. 1MS-70 *is* a control; however, the choices don't test the applicants' knowledge of whether this valve has power. 2. Partial: Choice D is also correct. Suggest the following: *The unit was operating at 100% power when a SBO occurred.* *The ASI system is supplying RCP seal injection.* *The crew has progressed to ECA-0.0, Step 29, to initiate a cool down to control pressurizer level using the SG PORVs.* *WOOTF completes both statements in accordance with ECA-0.0?* _____ *SG PORVs can be operated from the control room.* *The cool down is required to be stopped when* _____. *A. All three; all cold leg temperatures reach 400°F* ***B. ONLY the "C"; all cold leg temperatures reach 400°F*** *C. All three; the CLAs inject to the RCS* *D. ONLY the "C"; CLAs inject to the RCS* Explanation: Even though the 2nd part of the question doesn't involve selecting a procedure (always preferred), it does require detailed knowledge of the SBO procedure (Step 30) and the answer cannot be deduced using knowledge of the overall ECA-0.0 mitigative strategy. The 2nd part of the question does involve interpretation of the instruments that remain available during the SBO event. (CL temps + accumulator pressures) The 1st part of the question hits the K/A because it tests which controls are available when only DC power exists. Tough K/A.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
81		1	x	x		x								N	E	058 (Loss DC) AG2.4.3, T1G1 1. LOD=1: Since the EALs will be provided to the SRO applicants as a reference (for Q#'s 78, 79, & 91), the 1st part of the question (the SRO part) is a direct lookup. 2. Cue: The phrase "*during an accident*" is not necessary to elicit the correct response. 3. Stem Focus: The 3rd and 4th bullets are not necessary. 4. Stem Focus: Split the fill-in-the-blank statement into two separate thoughts (see below). 5. Cred Dist: To provide plausibility to an instrument being available/not available, add another condition to the stem for an instrument bus being de-energized. As an alternative to addressing comments 1 thru 5 above: The *SubCooling Monitor is a Post Accident Instrument*. Suggestion: Test the SRO applicants' ability to apply Tech Spec 3.3.3.6 following a loss of the wide range RCS Hot Leg temperature inputs to the *SubCooling Monitor*. (Subcooling Monitor is inoperable as well as the RCS WR RCS Hot Leg temps). This will also allow testing the SRO applicants' knowledge of Tech Spec 6.8.4.d.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
82		5				x								B	E	005 (inop/stuck rod) AA2.03, T1G2 1. LOD=5: The proposed question requires the applicants to memorize an action statement ≥ 1 hour. This question is vulnerable to post-exam appeals and could be deleted from the exam. Provide the Tech Spec 3.1.3.1 to the applicants as a reference and re-work the question to not be a direct-lookup. 2. Cred Dist: Choices C/D can be (correctly) eliminated solely because these choices allow the rod misalignment to remain. Suggest deleting the 6th bullet and then re-working the question to test the applicants' knowledge of whether the two Bank D rods are still "trippable", in accordance with AOP-001, Attachment 5. Re-work the choices to only indication the required Action Statement identifier (for example, Action A. or Action D.3.a, etc.)
83						x						x		N	U	060 (accidental gas release) AG2.2.37, T1G2 Note to NRC reviewers: The WPB Stack 5 monitor is a P-I-G (however, the gas only portion is used) and also a WRGM. 1. Cred Dist: Choices A/B are not plausible because the 1st part of Choices A/B (REM 3546 is Operable) contradicts with the 2nd part of Choices A/B (required ODCM action statements). Additionally, the 1st part of Choices A/B are not plausible because 1) the 2nd bullet says the WRGM portion is inoperable, and, 2) the readings for the P-I-G portion are cyan, which indicates a problem. (green is always good). 2. Q=K/A: The *accidental* gaseous radwaste release topic (AOP-09) is not being tested in the proposed question. 3. Stem Focus: It appears that either the 4th or 5th bullet is unnecessary. Why does the 4th bullet have to tell the applicants the color (cyan) of the readings IF the screen is telling the applicants that the color is cyan? Provide color screen print to applicants. Suggest re-working the question to test an event involving AOP-09, where the applicant is implementing Step 6 (Refer to ODCM) when an ODCM gaseous release limit was exceeded.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
84		5										x		B	U	061 (ARM) AA2.02, T1G2 1. Q=K/A: The proposed question does not test the applicants' ability to determine or interpret the normal *intensity* of the CVI rad monitors because the 1st part of the question can be answered solely by knowing the units (mRem/hour vs µCi/ml). 2. LOD=5: The proposed question requires the applicants to memorize an action statement ≥ 1 hour. This question is vulnerable to post-exam appeals and could be deleted from the exam. Provide the Tech Spec 3.3.3.1 to the applicants as a reference and re-work the question to not be a direct-lookup. 3. RO Q#62 provides a cue to this question. Suggest re-working the question to test 1) the applicants' knowledge of the normal reading for the containment *high* range rad monitors (324 ' elev) and 2) their ability to apply the post accident monitoring tech spec when one rad monitor was previously inoperable and the second rad monitor is inoperable. This is Tech Spec 3.3.3.6, Action c (initiate the pre-planned alternate method of monitoring). What is the pre-planned alternate method of monitoring at Harris when no containment high range rad monitors are operable?

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
85						x	x							N	U	069 AG2.2.25, T1G2: Early Submittal Sample Question [5-21-13]. These comments only pertain to the Early Submittal Sample Question [5-21-13]; see next line for replacement/repair comments. 1. Cred Dist: The 1st part of Choices A/C is not plausible because the stem says that the inner door failed, that is, an applicant can guess that using the inner door to fulfill Tech Specs is wrong (and he/she would be right). 2. Partial: Choice B is also correct because the 2nd part of the stem question is vague with respect to "Containment Integrity Tech Spec." Since the Tech Spec number/title is not provided, an applicant could assume the stem question is referring to either 3.6.1.1 (Prim Containment Integrity), 3.6.1.3 (Containment Air Locks), or 3.6.1.6 (Containment Vessel Integrity). If the applicant assumes 3.6.1.6, then Choice B is also correct. Suggest re-working the question to provide the applicants with a copy of TS 3 /4 6.1.3 (as an exam reference) and pose a situation where the personnel outer door broke on Day 1/time and the equipment inner door broke on Day 3/time. Test the applicants' ability to 1) predict the date/time when the 7 day entry/exit allowance in Note 2 will expire and 2) assess whether only tech spec related activities/surveillances can be performed in containment (during the 7 day grace period) or whether any/all activities can be performed in the containment. (See Bases page B 3/4 6-1 for explanation.)

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
85	H	3	x											N	E	069 (Loss Cnmt Integrity) AG2.2.25, T1G2 1. Stem Focus: The initial conditions do not include the current plant MODE. To streamline the question, and to ensure clarity, re-word as follows: *Given the following plant conditions:* - *The plant is operating in Mode 3* - *At 0900 on Sept 1st, the Personnel Air Lock inner door inner seal fails* - *At 0800 on Sept 3rd, the Emergency Air Lock inner door seal fails* *WOOTF completes both statements in accordance with Tech Spec 3.6.1.3, Containment Air Locks, and Tech Spec Bases?* *Given these conditions, the LATEST day/time that either of the airlocks can be used for entry/exit, under administrative controls, is ____.* *During this period of time, the use of the airlock to perform non-Tech Spec required activities or repairs on non-vital plant is equipment is _____.* *(Reference provided)* *A. 0900 on Sept 8th; allowed* *B. 0900 on Sept 8th; NOT allowed* ***C. 0800 on Sept 10th; allowed*** *D. 0800 on Sept 10th; NOT allowed*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
86			x			x		x						B	U	039 (MRSS) A2.03, T2G1 [2011 NRC SRO Q#13] The proposed question overlaps with Scenario #3 events. 1. Cred Dist: The 1st part of Choices A/C (leave MS-70 open when B SG is rupture/faulted) is not plausible because the TDAFW Pump has *two* steam supplies. 2. Partial: Choice B (E-2 will direct closure of MS-70) is also correct because the applicant could justifiably argue that there is no SGTR. (see comment #3) 3. Stem Focus: There should be at least one other item in the stem indicative of a tube rupture. 4. Stem Focus: The 2nd bullet is not grammatically correct. 5. Stem Focus: The 3rd bullet should be the first item because this was an initial condition before anything else happened. 6. Job-Link: The 2nd bullet is vague. Why did the crew trip the reactor and initiate safety injection? Was it solely due to the B MSL Rad Monitor in High Alarm? This does not seem to be operationally valid. Suggest re-working the question to test another item for the 1st part of the question (due to comment #1 above) and then, in the 2nd part of the question, test the applicants' knowledge of which procedure progression is required. Specifically, .. *E-0 → E2 → ECA-2.1 → E3 → ECA-3.1* [correct] OR *E-0 → ECA-2.1 → E3 → ECA-3.1* [wrong]

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
87			x			x								N	U	062 (AC Dist) A2.11, T2G1 1. Cred Dist: The 1st part of Choices A/C (go to cold leg recirc) is not plausible because 1) small break LOCAs don't lead to cold leg recirc and 2) the stem does not include anything that could be potentially misconstrued to indicate RWST level issues 2. Stem Focus: The 3rd and 5th bullets can be eliminated. Suggest the following: (discuss status of RHR pumps when exiting E-1 to ES-1.2 with licensee) *Given the following plant conditions:* • *The unit was operating at 100% power* • *A small break LOCA occurred* • *RCS Pressure: 1175 psig, slowly lowering* • *Safety Injection has been reset* • *Subsequently, a LOOP occurs* *In accordance with ES-1.2, Post LOCA Cool down and Depressurization, WOOTF identifies:* *1) the required procedure for equipment, and* *2) whether /when [some other knowledge of ES-1.2]?* ***A. E-0, Attachment 6, Safeguards Equipment Realignment Following a LOOP; [correct 2nd portion]*** *B. E-0, Attachment 8, Response to LOOP to AC Emergency After SI Actuation; [correct 2nd portion]* *C. E-0, Attachment 6, Safeguards Equipment Realignment Following a LOOP; [incorrect 2nd portion].* *D. E-0, Attachment 8, Response to LOOP to AC Emergency After SI Actuation; [incorrect 2nd portion].* The 2nd portion of the question should test the SRO applicants' knowledge of ES-1.2.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
88		1	x											B	E	063 (DC Distr) G2.2.40, T2G1 1. LOD=1: This is a direct lookup question. 2. Stem Focus: The stem question does not need to include the parenthesis information the (Reference Provided) is already included in the stem. Suggest converting the question into a 2-part question. The 1st part of the question choices should be either OPERABLE or INOPERABLE for the 1A-SA Battery Status. For the 2nd part of the question, present a situation where the 1A-SB battery was also previously inoperable, concurrent with the pilot cell situation on the 1A-SA battery. One of the choices can be associated with Tech Spec 3.0.3 requirements. Alternatively, use another question associated with an electrical panel/bus to test the applicants' ability to apply the electrical distribution LCO required actions, which could potentially include a loss of safety function determination. What procedure does Harris use to perform loss of safety function determinations? Please provide.
89						x	x						x	B	U	076 (SWS) A2.01, T2G1 1. Cred Dist: The 2nd part of Choices C/D (keep the unit on-line by aligning equipment) is not plausible because the stem says the NSW leak is "*a large volume of water gushing and is inaccessible*." Choices C/D can be eliminated <u>*solely*</u> on conservative decision making because it's not conservative to keep the unit on-line with an inaccessible leak this large. 2. SRO-only: Immediate trip criteria (AOP-022, Section 3.2, Step 1) is RO knowledge. 3. Partial: The terms "isolable" and "unisolable" are subjective. An applicant could assume that the leak <u>*is*</u> isolable (if the NSW pumps are stopped and their discharge valves are closed) since the ESW portion of the system has auto-isolated. Therefore, there may be no correct answer. Suggest using another question that tests the SRO applicants' ability to apply a tech spec action statement (that is not a direct lookup).

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
90		5	x										x	N	U	103 G2.2.22, T2G1: Early Submittal Sample Question [5-21-13]. These comments only pertain to the Early Submittal Sample Question [5-21-13]; see next line for replacement/repair comments. 1. LOD = 5: An applicant can appeal a question that tests greater than 1 hour action statement information from memory. However, in this case, providing the TS 3.6.1.5 reference will make this question a direct lookup. 2. SRO-only: The 1st part of the question (LCO requirements for containment temperature/pressure) is RO knowledge. The 2nd part of the question can be deduced using "test taking logic." Since the SRO applicants know that less than or equal to 1 hour Tech Spec action statements are required RO knowledge, Choices A/C can be (correctly) eliminated. 3. Stem Focus: The containment temperature value should list the instrument number and/or title of the point value. What control room instrument provides indication for the primary containment *AVERAGE* air temperature? Suggest writing a question that tests the applicants' ability to apply Tech Specs for ANY Containment LCO (Containment cooling, Containment Isolation Valves, Containment Vacuum Relief System, etc.), such that the question is not a direct lookup (if a reference is provided) or such that the question tests Tech Spec Bases knowledge during the application of the Tech Specs.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
90			x			x								N	U	103 (Cnmt) G2.2.22, T2G1 The explanation summary provided with the proposed question indicated no reference provided to the applicants; however, the actual proposed question indicates a reference is provided to the applicant. 1. Cred Dist: The 2nd part of Choice A is not plausible because *any* required action to remedy exceeding the LCO temperature limit won't affect the number of pumps, fans, coolers (e.g. the word "*availability*") which are available. The phrase "*ensures..capability will be available*" is not congruent with the TS 3.6.1.5 required action because the required action is to reduce the temperature. Reducing temperature doesn't ensure the availability of containment cooling equipment. 2. Cred Dist: The 2nd part of Choice C is not plausible because the stem conditions indicate a failed open containment isolation valve; therefore, any required action must be to *isolate* the penetration. Isolating something will never raise the availability of cooling capability. The phrase "*ensure availability of cooling capability*" is not congruent with the TS 3.6.1.7 required action because the required action is to *isolate* something. The purpose of TS 3.6.1.7 is *isolation*. 3. Cred DIst: The 2nd part of Choice D is not plausible because the stem conditions indicate a failed open containment isolation valve; therefore, any required action must be to *isolate* the penetration. Isolating purge will never lower the containment temperature. The premise of not exceeding the containment safety analysis value is not congruent with the TS 3.6.1.7 required action because the required action is to isolate something. Most likely, containment temperature is going to be *higher* when a normal containment purge penetration is isolated. The purpose of TS 3.6.1.7 is *isolation*. 4. Stem Focus: the 2nd and 3rd bullets do not make sense. That is, a steam leak in containment can't cause the normal purge inlet and discharge damper failures. Suggest writing a question that tests the applicants' ability to apply Tech Specs for ANY Containment LCO (Containment cooling, Containment Isolation Valves, Containment Vacuum Relief System, etc.), such that the question is not a direct lookup (if a reference is provided) or such that the question tests Tech Spec Bases knowledge during the application of the Tech Specs.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
91				x									x	N	U	017 G2.1.7, T2G2: Early Submittal Sample Question [5-21-13]. These comments only pertain to the Early Submittal Sample Question [5-21-13]; see next line for replacement/repair comments. 1. SRO-only. The overall mitigative strategy for a SGTR is to dump steam from the intact steam generators to the condenser (if available) to achieve a target CET (to ensure adequate subcooling) before depressurizing the RCS to minimize tube leak flow. This is RO knowledge being tested in the proposed question; the question does not include procedure selection or any other topic in 10CFR55.43(b). 2. Cue: The last bullet (ERFIS-NOT available) is a cue; the stem should include the indications that the crew would see on ERFIS instead of telling them that it is not available. There are several ways to fix this question. One option is to write a question that tests the Fission Product Barrier Matrix classification(s) associated with core exit thermocouples. Another option is to write a question that tests the transition point to SAMGs in the Core Cooling Tree. (See page 243 of 296 in EP-EAL.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
91			x			x							x	N	E	017 (ITM) G2.1.7, T2G2 [EAL Classification] Note: Since questions 78 & 79 also pertain with EAL classifications, the applicants will have the entire EAL charts (not just Table F-1). 1. Cred Dist: Since the applicants will have the EAL charts, Choice B is not plausible because the 2nd part of this choice doesn't match the criterial listed above the fission product table. In other words, two "potential losses" can never be a GE. 2. SRO-only: : In order to test the applicants knowledge of the EOP-USERS-GUIDE, change the A08 thermocouple reading to 1201 °F. The knowledge of Red/Orange CSFSTs is RO knowledge. The ability to calculate subcooling is RO ability. To ensure the question does not test at the RO level, the applicant should be required to know the rules of how many thermocouples are required to make the E-plan call. 3. Stem Focus: Also, remove all the "rising slowly" items to prevent an applicant from using the "Judgment" section of Table F-1. 4. Stem Focus: To streamline the stem, replace the last two bullets with *"the SPTOP and CSFSTs are not available on the computer."* 5. Stem Focus: Clarify which temperature indicator is being used to provide RCS temperature. 6. Stem Focus: Appears there are two typos (name of E-1 and word before NCAL).

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
92													x	N	U	028 (HRPS) A2.02, T2G2 1. SRO-only: The proposed question solely tests the operation of the hydrogen recombiners in accordance with the operating procedure. The proposed question is not linked to any of the 7 topics in 10CFR55.43 (b). [This question could potentially be used to repair RO Q#59.] 2. Ensure no overlap with RO Q#59. Suggest the following: *Given the following conditions:* - *The hydrogen monitoring system and recombiners were placed in service in accordance with E-1, Loss of Reactor or Secondary Coolant and OP-125, Post Accident Hydrogen System.* - *Due to a malfunction of the recombiners , the containment hydrogen concentration is now greater than 4%.* - *A General Emergency has been declared.* *WOOTF completes both statements regarding the hydrogen in containment?* *The containment hydrogen monitoring system is designed with an intermittent cycle of hydrogen indication for ____ different sample points in containment.* *The required Protective Action Recommendation is to evacuate a _____ mile radius.* *(Reference Provided: Page 21 of 31 in PEP-110, PAR Process)* *A. Three; 5* ***B. Six; 5*** *C. Three; 2* *D. Six; 2* Explanation: , The K/A is being tested because a failure of the recombiner system to maintain hydrogen less than 4% occurred due to either operator error or equipment malfunction.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
93						x							x	B	U	068 (LRS) A2.04, T2G2 1. Cred Dist: Choice B (release is terminated) is not plausible because the stem says the discharge FLOW is still 28 gpm. 2. Cred Dist: Choices C/D (release may continue) are not plausible because anytime an auto-actuation failed to occur, the manual action is required to be performed. 3. SRO-only: The proposed question is not linked to any of the 7 topics in 10CFR55.43 (b) because, although each choice has a procedure listed, the answer can be deduced solely with the RO knowledge that failure of an auto-actuation requires a manual action to ensure the actuation. Suggest providing the actual release permit for Hot Shower Tank A (including tank curie content and required set point for REM 1WL-3540 to the SRO applicants …and then test their knowledge of (or ability to implement) any of the following: • CRD-851, ODCM Software Instruction & Documentation • PEP-310, Notification & Communication • PLP-500, Radioactive Release Notification & Oil Spill Notification • AP-617, Reportability Determination & Notification • ODCM 3.11.1.4, 3.11.1.3

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
94						x							x	N	U	G2.1.41, T3 1. Cred Dist: Choices B/D are not plausible because they don't include item 2, specifically, "*stopping any action deemed potentially unsafe or detrimental to plant equipment or fuel*", is *always* a responsibility of the SRO-Fuel Handling, and everyone, especially during refueling. 2. SRO-only: The difference between Choices A/C can be deduced using RO knowledge of "who keeps the LCO books" and where the SRO-Fuel Handling is located. Suggest writing a question to test the SRO applicants' knowledge of something to do with the refueling process and possibly a tech spec associated with section 3.9. Alternatively, write a question to test the SRO applicants' knowledge of an important refueling item and their ability to select a procedure. For example, any other the following items might be used to support a two-part question related to a 10CFR55.43(b) topic: • OSTs used during refueling (may need another part for this idea) • Cautions associated with leaving 1PP-427, Fuel Transfer Tube Gate Valve, open when no fuel movement is occurring (need another part for this idea) • Whether the RWST remains operable during the performance of OP-116.01, Section 8.20. (may need another part for this idea).

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
95						x	x							B	E	G2.2.13, T3 1. Partial: An applicant can potentially argue that there is no correct answer to the first part of the question because it is not supported by OPS-NGGC-1301 wording. OPS-NGGC-1301, Section 9.9.12 refers to equipment checklist authorization; however, this section does not specifically state that the SRO is required to authorize the installation of grounding devices. Section 9.10 deals with ground installation/removal; however, Section 9.10 does not specifically state that the SRO is required to authorize the installation of grounding devices. [SAF-SUBS-00048, Protective Grounding Guidelines, was not included with the reference disk and may provide more information on specifically who may authorize the installation of grounding devices.] 2. Cred Dist: Borderline plausibility with using independent verification to install grounding device. Suggest splitting up the fill-in-the-blank statement to two separate items to preclude mixing concepts associated with who authorizes the equipment checklists and who authorizes installation of grounding devices. Nevertheless, Section 9.9.12 is not crystal clear on authorizing grounding devices. Alternatively, there are many other items to write questions for Tier 3 SRO exam in OPS-NGGC-1301.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
96			x											B	E	G2.2.40, Tier 3 1. Stem Focus: Every question which refers to a Tech Spec should include the name and number of the Tech Spec within the stem. 2. Stem Focus: The wording of the fill-in-the-blank statement should be more precise, to ensure the SRO portion (2nd portion) is being tested and no partially correct answer exists. The 1st portion of the question is RO knowledge. Suggest the following: *WOOTF completes both statements in accordance with Tech Spec 3.1.1.1, Shutdown Margin (SDM) – Modes 1 and 2?* *When in Mode 1 or Mode 2, with Keff ≥ 1, at least once every 12 hours, the SDM is determined to be ≥ 1770 pcm by _____.* *In accordance with the bases for Tech Spec 3.1.1.1, in Modes 1 and 2, the most restrictive condition for SDM is associated with a postulated _____ accident.* *A. OST-1036, Shutdown Margin Calculation; steam line break* ***B. OST-1021, Daily Surveillance Requirements Mode 1, 2; steam line break*** *C. OST-1036, Shutdown Margin Calculation; inadvertent boron dilution* *D. OST-1021, Daily Surveillance Requirements Mode 1, 2; inadvertent boron dilution*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
97			x				x	x					x	N	E/U	G2.3.14, T3: Early Submittal Sample Question [5-21-13]. These comments only pertain to the Early Submittal Sample Question [5-21-13]; see next line for replacement/repair comments. 1. Stem Focus: <u>*A lot*</u> of the stem information can be eliminated using the following fill-in-the-blank statement: *In accordance with AOP-013, Fuel Handling accident, _____ is the primary radiological concern for fuel off-loaded more than 6 months ago because it will NOT be detected by personal dosimetry or area radiation monitors.* 2. Job-Link: The 6th bullet in the stem says that the crew evacuated the FHB as a precautionary measure even though Step 3.1 3.a requires an evacuation even when the FHB ARMs alert/high alarms are cleared. Not sure why the phrase "as a precautionary measure" was included in the 6th bullet. 3. Partial: An applicant can argue that there is no correct answer because of the way the stem question is worded. That is, the stem question asks for a personal "non-detectable" rad exposure hazard. Even a beta-emitter can be detected using the proper radiation detector/mode. An applicant can argue that Kr-85 can be detected. 4. SRO-only: This a borderline question because it is not clearly linked to one of the 7 topics listed in 10CFR55.43(b). The pedigree provided indicates that the proposed question is linked to topic #6 (fuel handling equipment); however, this is questionable since the SRO applicant is not being tested on fuel handling equipment. Suggest re-working the question to test the SRO applicants on radiation/coolant/contamination readings that require NRC notification (4 hour, 8 hour, 1 hour, etc) OR an emergency classification.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
97						x								N	U	G2.3.14, T3 1. Cred Dist: The 2nd part of Choices B/D (NRC doesn't have to be notified following fuel bundle damage and transport of a contaminated individual to a hospital) is not plausible because the applicant can conservatively guess (correctly) that NRC notification should always be required for this type of incident. [Previous early sample suggestion (see above) to test the SRO applicants on radiation/coolant/contamination readings that require NRC notification (4 hour, 8 hour, 1 hour, etc) OR an emergency classification not incorporated.] Alternatively, suggest the following: *Given the following conditions:* - *An accident occurred while moving fuel in the spent fuel pool and spent fuel was damaged.* - *An employee was injured and contaminated.* - *The employee's radiation exposure due to the incident was 200 mrem; previous exposure for quarter was 150 mrem.* - *The employee was transported to the hospital before he was de-contaminated.* *WOOTF completes both statements?* *In accordance with AOP-013, Fuel Handling Accident, _____ is the primary radiological concern for fuel off-loaded more than 6 months ago, and will NOT be detected by personal dosimetry or area radiation monitors.* *In accordance with AP-617, Reportability Determination, the NRC is required to be notified within _____.* *(Reference Provided)* *A. Iodine 131; 1 hour* *B. Iodine 131; 8 hours* *C. Krypton 85; 1 hour* ***D. Krypton 85; 8 hours***

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
98			x											B	E	G2.3.4, T3 1. Stem Focus: The fill-in-the-blank statement wording and procedure reference should exactly mirror what the procedure says. (procedure says "should") Suggest the following: *WOOTF completes both statements in accordance with PEP-330, Radiological Consequences, Attachment 1, Limitations for Lifesaving and Emergency Reentry/Repair Actions?* *Exposure in excess of 5 Rem TEDE shall not be permitted unless specifically authorized by the _____.* *Emergency worker exposures during a lifesaving effort should be limited to _____ rem TEDE.* *A. Site Emergency Coordinator; 15* *B. Emergency Response Manager; 15* ***C. Site Emergency Coordinator; 25*** *D. Emergency Response Manager; 25* (plausibility of 15 rem is dose to the eye is limited to 3 x the 5 rem limit) (previously used bank question can be easily modified using Emergency Response Manager instead of Radiological Control Director)

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
99						x								N	U	G2.4.40, T3 1. Cred Dist: Choices C/D (SEC is allowed to delegate classifying the emergency to someone else) is not plausible. Suggest the following: *WOOTF completes both statements in accordance with the plant emergency procedures (PEPs)?* *The Emergency Response Organization (ERO) activation process shall start within _____ of an emergency declaration which requires the emergency response facility activation.* *The SEC's task of making Protective Action Recommendations _____ be delegated to another qualified member of the ERO.* ***A. 5 minutes; cannot*** *B. 5 minutes; can* *C. 15 minutes; cannot* *D. 15 minutes; can*

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
100			x											B	E	G2.4.46, T3 The explanation summary provided with the proposed question indicated no reference provided to the applicants; however, the actual proposed question indicates a reference is provided to the applicant. 1. This question exactly overlaps with SRO Admin JPM A.2. One or the other must be replaced. 2. Stem Focus: The 2nd bullet is not necessary. 3. Stem Focus: The 1st part of the stem question should say WOOTF identifies an expected alarm. If the JPM is replaced, then this question can be repaired with the following suggestion. Suggest *telling* the applicants the Tech Spec required action (no reference provided) and then test their knowledge of the technique for determining *how far* to reduce power, as follows: *Given the following plant conditions:* - *The plant is operating at 97% power.* - *Rod H2 is misaligned 6 steps.* - *QPTR is 1.07* - *The SRO has entered the Tech Spec 3.2.4, QPTR, Action A.2, which requires reducing thermal power within 2 hours.* *WOOTF completes both statements?* _____ *is an expected alarm for these plant conditions.* *In order to implement the QPTR Action statement, reactor power must be reduced to _____.*

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

Facility: Harris Date of Exam: 9/2013 Exam Level: RO ☑ SRO ☑

Item Description	Initials a	b	c
1. Clean answer sheets copied before grading	MB	N/A	BL
2. Answer key changes and question deletions justified and documented	MB		BL
3. Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations)	MB		BL
4. Grading for all borderline cases (80 ±2% overall and 70 or 80, as applicable, ±4% on the SRO-only) reviewed in detail	MB		BL
5. All other failing examinations checked to ensure that grades are justified	MB		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	MB	N/A	BL

	Printed Name/Signature	Date
a. Grader	MARK A. BATES / Mark A. Bates	10/17/2013
b. Facility Reviewer(*)	N/A	N/A
c. NRC Chief Examiner (*)	BRUNO CABALLERO / B. Caballero	10/18/13
d. NRC Supervisor (*)	MARK FRANKE	10/22/13

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