Facility: 2010 Browns Ferry Date of Examination: 6/7/2010

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

Target Date*	Task Description (Reference)	Chief Examiner's Initials
-180	1. Examination administration date confirmed (C.1.a; C.2.a and b)	
-120	2. NRC examiners and facility contact assigned (C.1.d; C.2.e)	
-120	3. Facility contact briefed on security and other requirements (C.2.c)	
-120	4. Corporate notification letter sent (C.2.d)	
[-90]	[5. Reference material due (C.1.e; C.3.c; Attachment 3)]	
{-75}	6. Integrated examination outline(s) due, including Forms ES-201-2, ES-201-3, ES-301-1, ES-301-2, ES-301-5, ES-D-1's, ES-401-1/2, ES-401-3, and ES-401-4, as applicable (C.1.e and f; C.3.d)	
{-70}	{7. Examination outline(s) reviewed by NRC and feedback provided to facility licensee (C.2.h; C.3.e)}	
{-45}	8. Proposed examinations (including written, walk-through JPMs, and scenarios, as applicable), supporting documentation (including Forms ES-301-3, ES-301-4, ES-301-5, ES-301-6, and ES-401-6, and any Form ES-201-3 updates), and reference materials due (C.1.e, f, g and h; C.3.d)	
-30	9. Preliminary license applications (NRC Form 398's) due (C.1.l; C.2.g; ES-202)	5/10/10
-14	10. Final license applications due and Form ES-201-4 prepared (C.1.l; C.2.i; ES-202)	
-14	11. Examination approved by NRC supervisor for facility licensee review (C.2.h; C.3.f)	
-14	12. Examinations reviewed with facility licensee (C.1.j; C.2.f and h; C.3.g)	
-7	13. Written examinations and operating tests approved by NRC supervisor (C.2.i; C.3.h)	
-7	14. Final applications reviewed; 1 or 2 (if >10) applications audited to confirm qualifications / eligibility; and examination approval and waiver letters sent (C.2.i; Attachment 5; ES-202, C.2.e; ES-204)	
-7	15. Proctoring/written exam administration guidelines reviewed with facility licensee (C.3.k)	
-7	16. Approved scenarios, job performance measures, and questions distributed to NRC examiners (C.3.i)	

* 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.

Facility: Date of Examination:

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

	Printed Name/Signature	Date
a. Author	DANIEL Z. GLINSKI	3-17-2010
b. Facility Reviewer (*)	KEITH W. BENEFIELD	3-17-10
c. NRC Chief Examiner (#)	PHILIP G. CAPEHART	4-9-10
d. NRC Supervisor	MALCOLM T. WIDMANN	04/12/10

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

HLT 0810

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 6/7-18/2010 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 6/7-18/2010 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	MONTE MCANDREW	OPS SUPERINTENDENT		3/26/10		6/21/10	
2	Emily J. Cole	Reactor Operator		04/05/10		06/17/10	
3	RICKY GIVENS	UNIT SUPERVISOR		4-5-10		6-22-10	
4	Chris Winton	Reactor Operator		4-5-10		6-22-10	
5	Ashley S. Fann	Reactor Operator		4-5-10		6/21/10	
6	WALTON MILLER	UNIT SUPERVISOR		4/5/10		6/21/10	
7	TROY GILPIN	UNIT OPERATOR		4/5/10		6/17/10	
8	RAYMOND B. SANSFIELD	Unit Supvr		4-12-10		6-22-10	
9	Joseph S Germain	Unit Superviser		4/12/10		6/24/10	
10	Dale Jennings	Instructor		4/22/10		6-21-10	
11	GREGORY L. SMITH	UNIT SUPERVISOR		5-11-10		6-17-10	
12	BRIAN MARZ	UNIT SUPERVISOR		5/17/10		6/25/10	
13	Robert Konstetter	Unit Operator		5/18/10		6/28/10	
14	JOHN HOLLIDAY	UNIT SUPERVISOR		5/19/10		6/24/10	
15	JEFFREY S RAMLER	UNIT SUPERVISOR		6-1-10		6-21-10	

NOTES:

HLT 0810

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 **6/7-18/2010** 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 **6/7-18/2010**. 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.	Patrick J Arendt	Sim Sup		1/22/10		6/21/10
2.	Thomas S. Albright	Sim Sys		1/22/10		6/22/10
3.	Don Owen	Sim Ld		1-25-10		6-24-10
4.	Rebecca Morris	RO		1-29-10		6/23/10
5.	JEFF A MORRIS	TRAINING DIRECTOR		2/1/2010		6/21/10
6.	PATRICK SCOTT STEELE	OPS		2/19/2010		6/25/2010
7.	James A. Johnson	OPS		2/19/10		6/22/10
8.	DOUGLAS G. HALENEWERTH	OPS VALIDATION		2-22-10		6-28-10
9.	Michael L Belcher	OPS		2-22-10		6/22/10
10.	Joseph Jeffries	OPS		2/22/10		6/17/10
11.	Joseph S Ellis	OPS		2/26/10		6/21/10
12.	Charles A Thrasher	OPS		2/26/10		6/22/10
13.	Timothy D Boland	OPS		2/24/10		6-17-10
14.	DAVID A. MALINOSKI	TRAINING		3/11/10		6/21/10
15.	TODD VANDER WARP	CORP OPS TRAINING MGR.		3/12/10		6/21/10

NOTES:

Facility: Browns Ferry NPP Date of Examination: 6/7/2010

Examination Level: RO Operating Test Number: 1006

Administrative Topic (see Note)	Type Code *	Describe activity to be performed
Conduct of Operations	N	2.1.5 Evaluate Work Schedule against guidelines of SPP 1.5 Fatigue Management and Work Hour Limits (jpm551)
Conduct of Operations	N	2.1.36 Complete SRM operability surveillance and determine if acceptance criteria is met for core alterations. (jpm554)
Equipment Control	N	2.2.41 Determine the isolation boundary for PCS Head Tank Pump 2B (jpm561)
Radiation Control	P/M	2.3.12 Locked High Radiation Area Entry requirements (jpm548)
Emergency Plan		

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

* Type Codes & Criteria:

(C)ontrol Room

(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)

(N)ew or (M)odified from bank (≥ 1)

(P)revious 2 exams (≤ 1; randomly selected)

(S)imulator

1. Evaluate Work Schedule for compliance with new fatigue management guidelines
   - New
   - SPP 1.5 Fatigue Management and Work Hour Limits
   - 2.1.5 Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. Importance RO 2.9

2. Complete SRM operability surveillance and determine if acceptance criteria is met for core alterations.
   - New
   - 1-SR-3.3.1.2.4 Source Range Monitor System Count Rate and Signal to Noise Ratio Check
   - 2.1.36 Knowledge of procedures and limitations involved in core alterations. Importance RO 3.0

3. Determine the isolation boundary for PCS Head Tank Pump 2B
   - New
   - Drawings 2-47E814-1, 2-45E779-19, 2-47E610-71-1, 2-45E2750-4, and 2-47E751-3 and 5
   - 2.2.41 Ability to obtain and interpret station electrical and mechanical drawings. Importance RO 3.5

4. Locked High Radiation Area Entry requirements
   - Previous/Modified
   - Handout JPM 548 RWP and Survey Map
   - SPP 5.1 Radiological Controls
   - 2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. Importance RO 3.2

Facility: Browns Ferry NPP Date of Examination: 6/7/2010

Examination Level: SRO Operating Test Number: 1006

Administrative Topic (see Note)	Type Code *	Describe activity to be performed
Conduct of Operations	N	2.1.5 Evaluate Work Schedule against guidelines of SPP 1.5 Fatigue Management and Work Hour Limits (jpm551sro)
Conduct of Operations	N	2.1.18 NRC Event Notification due to Reactor Scram (jpm553)
Equipment Control	N	2.2.40 Controlling a containment penetration to meet the isolation requirements of TS 3.6.1.3 (jpm555)
Radiation Control	P/M	2.3.12 Locked High Radiation Area Entry requirements (jpm548)
Emergency Plan	N	2.4.44 Protective Action Recommendation Evaluation (jpm552)

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

(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)

(N)ew or (M)odified from bank (≥ 1)

(P)revious 2 exams (≤ 1; randomly selected)

(S)imulator

1. Evaluate Work Schedule for compliance with new fatigue management guidelines
   - New
   - SPP 1.5 Fatigue Management and Work Hour Limits
   - 2.1.5 Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. Importance SRO 3.9

2. NRC Event Notification due to Reactor Scram
   - New
   - SPP 3.5 Regulatory Reporting Requirements
   - 2.1.18 Ability to make accurate, clear, and concise logs, records, status boards and reports. Importance SRO 3.8

3. Controlling a containment penetration to meet the isolation requirements of TS 3.6.1.3
   - New
   - Technical Specification 3.6.1.3
   - Drawing 2-47E811-1
   - SPP 10.2 Clearance Procedure to Safely Control Energy
   - 2.2.40 Ability to apply Technical Specifications for a system. Importance SRO 4.7

4. Locked High Radiation Area Entry requirements
   - Previous / Modified
   - Handout JPM 548 RWP and Survey Map
   - SPP 5.1 Radiological Controls
   - 2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. Importance SRO 3.7

5. Protective Action Recommendation Evaluation
   - New
   - EPIP-1 and 5 Emergency Classification Procedure and General Emergency
   - Completed Notification Handout
   - 2.4.44 Knowledge of emergency plan protective action recommendations. Importance SRO 4.4

Facility: Browns Ferry NPP Date of Examination: 6/7/2010

Exam Level: RO Operating Test No.: 1006

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	**Type Code***	**Safety Function**
a. Control Rod Exercise SR 3.1.3.2 (U2/U3)	M, A, S	1
b. Place a 2nd/3rd RFPT in service (U2/U3)	N, S	2
c. Close MSIV's during Power Operation (U2/U3)	N, S	3
d. Loss of Shutdown Cooling (U2/U3)	N, L, A, S	4
e. Returning an IRM to service from Bypass (U2/U3)	N, L, S	7
f. Return DW CAM to service after isolation (U2/U3)	N, S	9
g. Drywell sprays w/Fire Protection Unit 1 and 2 actions	EN, N, C	5
h. Generator Synchronization and Load (U2/U3)	N, A, S	6
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Shutdown Unit 3 'A' DG at 4 KV Shutdown Board	N, E, A	6
j. Suppression Pool Water Inventory Removal App 18 (U1)	N, R, E	5
k. 0-SSI-2-1, ATTACHMENT 2	D, E, A	8

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

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

Control Room Systems:

a. Control Rod Exercise SR 3.1.3.3 (80)

- **M**odified / **S**imulator / **A**lternate Path
- 3-SR 3.1.3.3, Control Rod Test for Withdrawn Control Rods Rev. 28
- 3-AOI-85-5 Rod Drift In Rev 9
- 201002 Reactor Manual Control System A2.02 Ability to (a) predict the impacts of the following on the REACTOR MANUAL CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Rod Drift Alarm IMPORTANCE: RO 3.2 SRO 3.3

b. Place RFPT 3C in Service (202)

- **N**ew / **S**imulator
- 3-OI-3 Reactor Feedwater System Rev 79, Section 5.7
- 259001 Reactor Feedwater System A4.02 Ability to manually operate and/or monitor in the Control Room: Manually start/control a RFP/TDRFP IMPORTANCE: RO 3.9 SRO 3.7

c. Close MSIV's during Power Operation (203)

- **N**ew / **S**imulator
- 3-OI-1 Main Steam System Rev 29 Section 8.2
- 239001 Main and Reheat Steam System A4.01 Ability to manually operate and/or monitor in the control room: MSIV's IMPORTANCE: RO 4.2 SRO 4.0

d. Loss of Shutdown Cooling (225)

- **N**ew / **L**ow-Power / **S**imulator / **A**lternate Path
- 3-AOI-74-1 Loss of Shutdown Cooling Rev 17
- 3-ARP-9-3D Rev 27
- 295021 Loss of Shutdown Cooling AA1.02 Ability to operate and/or monitor the following as they apply to Loss of Shutdown Cooling: RHR/shutdown cooling IMPORTANCE: RO 3.5 SRO 3.5

e. Returning an IRM to service from Bypass (207)

- **L**ow-Power / **S**imulator / **N**ew
- -OI-92A IRM Rev 15 section 6.2
- 215003 IRM System A2.02 Ability to (a) predict the impacts of the following on the IRM System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: IRM inop condition IMPORTANCE: RO 3.5 SRO 3.7

f. Return DW Cam to Service after isolation (208)

- **N**ew / **S**imulator / **En**gineered Safety Feature
- 3-AOI-100-1 Reactor Scram Rev 51 step 37
- 272000 Radiation Monitoring System A2.10 Ability to (a) predict the impacts of the following on the Radiation Monitoring System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: LOCA IMPORTANCE: RO 3.9 SRO 4.1

g. Spray the Drywell using Fire Protection Unit 1 and 2 CR actions (209)

- **New** / **C**ontrol Room / **En**gineered Safety Feature
- 3-EOI Appendix 17B RHR System Operation Drywell Sprays, Rev 5
- 295024 High Drywell Pressure: EA1.11 Ability to operate and/or monitor the following as they apply to High Drywell Pressure: Drywell Spray: Mark-I&II IMPORTANCE: RO 4.2 SRO 4.2

h. Generator Synchronization and Load (210)

- **N**ew / **A**lternate Path / **S**imulator
- 3-OI-47 Turbine Generator System, Rev. 84, Section 5.5
- 3-ARP-9-7B 3-XA-55-7B Rev 22 Window 32
- 262001 AC Electrical Distribution A4.04 Ability to manually operate and/or monitor in the control room: Synchronizing and paralleling of different AC Supplies IMPORTANCE: RO 3.6 SRO 3.7

In-Plant Systems:

i. Shutdown Unit 3 A DG from the 4KV Shutdown Board (211)

- **N**ew / **E**mergency or Abnormal In-Plant / **A**lternate Path
- 3-OI-82, Standby Diesel Generator System, Rev. 88, Section 7.3 and 7.5
- 264000 Emergency Generators K4.07 Knowledge of Emergency Generators design features and/or interlocks for the following: Local operation and control IMPORTANCE: RO 3.3 SRO 3.4

j. Suppression Pool Water Inventory Removal 1-EOI-Appendix 18 (212)

- **N**ew / **R**CA Entry / **E**mergency or Abnormal In-Plant
- 1-EOI-Appendix 18, Rev. 0
- 295029 High Suppression Pool Water Level EK2.01 Knowledge of the interrelations between High Suppression Pool Water Level and the following: RHR/LPCI IMPORTANCE: RO 3.0 SRO 3.3

k. 0-SSI-2-1, ATTACHMENT 2 (127)

- Bank / **E**mergency or Abnormal In-Plant / **A**lternate Path
- 0-SSI-2-1 Rev 7
- 600000 Plant Fire on Site AA2.16 Ability to determine and interpret the following as the apply to Plant Fire on Site: Vital equipment and control systems to be maintained and operated during a fire IMPORTANCE: RO 3.0 SRO 3.5

Facility: Browns Ferry NPP Date of Examination: 6/7/2010

Exam Level: SRO-I Operating Test No.: 1006

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	**Type Code***	**Safety Function**
a. Control Rod Exercise SR 3.1.3.2 (U2/U3)	M, A, S	1
b. Place a 2nd/3rd RFPT in service (U2/U3)	N, S	2
c. Close MSIV's during Power Operation (U2/U3)	N, S	3
d. Loss of Shutdown Cooling (U2/U3)	N, L, A, S	4
e. Returning an IRM to service from Bypass (U2/U3)	N, L, S	7
g. Drywell sprays w/Fire Protection Unit 1 and 2 actions	EN, N, C	5
h. Generator Synchronization and Load (U2/U3)	N, A, S	6
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Shutdown Unit 3 'A' DG at 4 KV Shutdown Board	N, E, A	6
j. Suppression Pool Water Inventory Removal App 18 (U1)	N, R, E	5
k. 0-SSI-2-1, ATTACHMENT 2	D, E, A	8

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

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

Control Room Systems:

a. Control Rod Exercise SR 3.1.3.3 (80)

- **M**odified / **S**imulator / **A**lternate Path
- 3-SR 3.1.3.3, Control Rod Test for Withdrawn Control Rods Rev. 28
- 3-AOI-85-5 Rod Drift In Rev 9
- 201002 Reactor Manual Control System A2.02 Ability to (a) predict the impacts of the following on the REACTOR MANUAL CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Rod Drift Alarm IMPORTANCE: RO 3.2 SRO 3.3

b. Place RFPT 3C in Service (202)

- **N**ew / **S**imulator
- 3-OI-3 Reactor Feedwater System Rev 79, Section 5.7
- 259001 Reactor Feedwater System A4.02 Ability to manually operate and/or monitor in the Control Room: Manually start/control a RFP/TDRFP IMPORTANCE: RO 3.9 SRO 3.7

c. Close MSIV's during Power Operation (203)

- **N**ew / **S**imulator
- 3-OI-1 Main Steam System Rev 29 Section 8.2
- 239001 Main and Reheat Steam System A4.01 Ability to manually operate and/or monitor in the control room: MSIV's IMPORTANCE: RO 4.2 SRO 4.0

d. Loss of Shutdown Cooling (225)

- **N**ew / **L**ow-Power / **S**imulator / **A**lternate Path
- 3-AOI-74-1 Loss of Shutdown Cooling Rev 17
- 3-ARP-9-3D Rev 27
- 295021 Loss of Shutdown Cooling AA1.02 Ability to operate and/or monitor the following as they apply to Loss of Shutdown Cooling: RHR/shutdown cooling IMPORTANCE: RO 3.5 SRO 3.5

e. Returning an IRM to service from Bypass (207)

- **L**ow-Power / **S**imulator / **N**ew
- 3-OI-92A IRM Rev 15 section 6.2
- 215003 IRM System A2.02 Ability to (a) predict the impacts of the following on the IRM System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: IRM inop condition IMPORTANCE: RO 3.5 SRO 3.7

g. Spray the Drywell using Fire Protection Unit 1 and 2 CR actions (209)

- **N**ew / **C**ontrol Room / **En**gineered Safety Feature
- 3-EOI Appendix 17B RHR System Operation Drywell Sprays, Rev 5
- 295024 High Drywell Pressure: EA1.11 Ability to operate and/or monitor the following as they apply to High Drywell Pressure: Drywell Spray: Mark-I&II IMPORTANCE: RO 4.2 SRO 4.2

h. Generator Synchronization and Load (210)

- **N**ew / **A**lternate Path / **S**imulator
- 3-OI-47 Turbine Generator System, Rev. 84, Section 5.5
- 3-ARP-9-7B 3-XA-55-7B Rev 22 Window 32
- 262001 AC Electrical Distribution A4.04 Ability to manually operate and/or monitor in the control room: Synchronizing and paralleling of different AC Supplies IMPORTANCE: RO 3.6 SRO 3.7

In-Plant Systems:

i. Shutdown Unit 3 A DG from the 4KV Shutdown Board (211)

- **N**ew / **E**mergency or Abnormal In-Plant / **A**lternate Path
- 3-OI-82, Standby Diesel Generator System, Rev. 88, Section 7.3 and 7.5
- 264000 Emergency Generators K4.07 Knowledge of Emergency Generators design features and/or interlocks for the following: Local operation and control IMPORTANCE: RO 3.3 SRO 3.4

j. Suppression Pool Water Inventory Removal 1-EOI-Appendix 18 (212)

- **N**ew / **R**CA Entry / **E**mergency or Abnormal In-Plant
- 1-EOI-Appendix 18, Rev. 0
- 295029 High Suppression Pool Water Level EK2.01 Knowledge of the interrelations between High Suppression Pool Water Level and the following: RHR/LPCI IMPORTANCE: RO 3.0 SRO 3.3

k. 0-SSI-2-1, ATTACHMENT 2 (127)

- Bank / **E**mergency or Abnormal In-Plant / **A**lternate Path
- 0-SSI-2-1 Rev 7
- 600000 Plant Fire on Site AA2.16 Ability to determine and interpret the following as the apply to Plant Fire on Site: Vital equipment and control systems to be maintained and operated during a fire IMPORTANCE: RO 3.0 SRO 3.5

Facility: Browns Ferry NPP Date of Examination: 6/7/2010

Exam Level: SRO-U Operating Test No.: 1006

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	**Type Code***	**Safety Function**
a. Control Rod Exercise SR 3.1.3.2 (U2/U3)	M, A, S	1
d. Loss of Shutdown Cooling (U2/U3)	N, L, A, S	4
g. Drywell sprays w/Fire Protection Unit 1 and 2 actions	EN, N, C	5
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Shutdown Unit 3 'A' DG at 4 KV Shutdown Board	N, E, A	6
k. 0-SSI-2-1, ATTACHMENT 2	D, E, A	8

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

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

Control Room Systems:

a. Control Rod Exercise SR 3.1.3.3 (80)

- **M**odified / **S**imulator / **A**lternate Path
- 3-SR 3.1.3.3, Control Rod Test for Withdrawn Control Rods Rev. 28
- 3-AOI-85-5 Rod Drift In Rev 9
- 201002 Reactor Manual Control System A2.02 Ability to (a) predict the impacts of the following on the REACTOR MANUAL CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Rod Drift Alarm IMPORTANCE: RO 3.2 SRO 3.3

d. Loss of Shutdown Cooling (225)

- **N**ew / **L**ow-Power / **S**imulator / **A**lternate Path
- 3-AOI-74-1 Loss of Shutdown Cooling Rev 17
- 3-ARP-9-3D Rev 27
- 295021 Loss of Shutdown Cooling AA1.02 Ability to operate and/or monitor the following as they apply to Loss of Shutdown Cooling: RHR/shutdown cooling IMPORTANCE: RO 3.5 SRO 3.5

g. Spray the Drywell using Fire Protection Unit 1 and 2 CR actions (209)

- **New** / **C**ontrol Room / **En**gineered Safety Feature
- 3-EOI Appendix 17B RHR System Operation Drywell Sprays, Rev 5
- 295024 High Drywell Pressure: EA1.11 Ability to operate and/or monitor the following as they apply to High Drywell Pressure: Drywell Spray: Mark-I&II IMPORTANCE: RO 4.2 SRO 4.2

In-Plant Systems:

i. Shutdown Unit 3 A DG from the 4KV Shutdown Board (211)

- **N**ew / **E**mergency or Abnormal In-Plant / **A**lternate Path
- 3-OI-82, Standby Diesel Generator System, Rev. 88, Section 7.3 and 7.5
- 264000 Emergency Generators K4.07 Knowledge of Emergency Generators design features and/or interlocks for the following: Local operation and control IMPORTANCE: RO 3.3 SRO 3.4

k. 0-SSI-2-1, ATTACHMENT 2 (127)

- Bank / **E**mergency or Abnormal In-Plant / **A**lternate Path
- 0-SSI-2-1 Rev 7
- 600000 Plant Fire on Site AA2.16 Ability to determine and interpret the following as the apply to Plant Fire on Site: Vital equipment and control systems to be maintained and operated during a fire IMPORTANCE: RO 3.0 SRO 3.5

Facility: **Browns Ferry** Date of Examination: **June 2010** Operating Test Number: **1006**

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

	Printed Name / Signature	Date
a. Author	DANIEL K CIELINSKI / Daniel K Cielinski	4-9-2010
b. Facility Reviewer(*)	Keith W Benefield / Keith W Benefield	4-12-2010
c. NRC Chief Examiner (#)	Phillip G. Capehart / Phillip G. Capehart	5-21-2010
d. NRC Supervisor	MARK A. BATES FOR MALCOLM WIDMAYER / Mark A. Bates	6-01-2010

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

Facility: **Browns Ferry** Date of Exam: **June 2010** Scenario Numbers: **20/21/22/24** Operating Test No.: **HLT 1006**

	QUALITATIVE ATTRIBUTES	Initials a	Initials b*	Initials 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.	DZ	KB	DJC
2.	The scenarios consist mostly of related events.	DZ	KB	DJC
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)	DZ	KB	DJC
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.	DZ	KB	DJC
5.	The events are valid with regard to physics and thermodynamics.	DZ	KB	DJC
6.	Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.	DZ	KB	DJC
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.	DZ	KB	DJC
8.	The simulator modeling is not altered.	DZ	KB	DJC
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.	DZ	KB	DJC
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.	DZ	KB	DJC
11.	All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).	DZ	KB	DJC
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).	DZ	KB	DJC
13.	The level of difficulty is appropriate to support licensing decisions for each crew position.	DZ	KB	DJC

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

Facility: **Browns Ferry NPP** Date of Exam: **June 06 – 19, 2010** Operating Test No.: **HLT 1006**

APPLICANT	EVENT TYPE	Scenarios																TOTAL	MINIMUM (*)		
		1 **(3-20)**			2 **(3-21)**			3 **(3-22)**			4 **(3-24)spare**								R	I	U
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP					
RO ☐	RX																				
SRO-I ☐	NOR	1			1													**2**			1
	I/C	3,4,5,6			3,4,5,6													**8**			2
SRO-U ☑ # 1	MAJ	7			7													**2**			1
	TS	3,6			4,6													**4**			2
RO ☐	RX				2				2,6,7									**2**		1	
SRO-I ☑ # 1	NOR			1	1													**2**		1	
	I/C			3,6	3,4,5,6				5,6									**8**		4	
SRO-U ☐	MAJ			7	7				7,8									**4**		2	
	TS				4,6													**2**		2	
RO ☐	RX					2,6		2										**2**		1	
SRO-I ☑ # 2	NOR			1				1										**2**		1	
	I/C			3,6		4,6		3,4,5,6										**8**		4	
SRO-U ☐	MAJ			7		7		7,8										**4**		2	
	TS							4,6										**2**		2	

Facility: **Browns Ferry NPP** Date of Exam: **June 06 – 19, 2010** Operating Test No.: **HLT 1006**

APPLICANT	EVENT TYPE	Scenarios															TOTAL	MINIMUM (*)		
		1 **(3-20)**			2 **(3-21)**			3 **(3-22)**			4 **(3-24)spare**							R	I	U
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP				
RO ☐	RX					2,6		2									**2**		1	
SRO-I ☑ # 3	NOR			1				1									**2**		1	
	I/C			3,6		4,6		3,4,5,6									**8**		4	
SRO-U ☐	MAJ			7		7		7,8									**4**		2	
	TS							4,6									**2**		2	
RO ☐	RX					2,6		2									**2**		1	
SRO-I ☑ # 4	NOR							1									**1**		1	
	I/C					4,6		3,4,5,6									**6**		4	
SRO-U ☐	MAJ					7		7,8									**3**		2	
	TS							4,6									**2**		2	
RO ☐	RX	2							2,6,7								**2**		1	
SRO-I ☑ # 5	NOR	1															**1**		1	
	I/C	3,4,5,6							5,6								**6**		4	
SRO-U ☐	MAJ	7							7,8								**3**		2	
	TS	3,6															**2**		2	

Facility: **Browns Ferry NPP** Date of Exam: **June 06 – 19, 2010** Operating Test No.: **HLT 1006**

APPLICANT	EVENT TYPE	Scenarios																TOTAL	MINIMUM (*)		
		1 **(3-20)**			2 **(3-21)**			3 **(3-22)**			4 **(3-24)spare**								R	I	U
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP					
RO # 1 ☑	RX		2,3															**1**	1		
SRO-I ☐	NOR						1			1								**2**	1		
	I/C		4,5				3,5			3,4								**6**	4		
SRO-U ☐	MAJ		7				7			7,8								**4**	2		
	TS																				
RO # 2 ☑	RX		2,3															**1**	1		
SRO-I ☐	NOR						1			1								**2**	1		
	I/C		4,5				3,5			3,4								**6**	4		
SRO-U ☐	MAJ		7				7			7,8								**4**	2		
	TS																				
RO # 3 ☑	RX		2,3															**1**	1		
SRO-I ☐	NOR						1			1								**2**	1		
	I/C		4,5				3,5			3,4								**6**	4		
SRO-U ☐	MAJ		7				7			7,8								**4**	2		
	TS																				

Facility: **Browns Ferry NPP** Date of Exam: **June 06 – 19, 2010** Operating Test No.: **HLT 1006**

APPLICANT	EVENT TYPE	Scenarios																TOTAL	MINIMUM (*)		
		1 **(3-20)**			2 **(3-21)**			3 **(3-22)**			4 **(3-24)spare**								R	I	U
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP					
RO ☐	RX	2							2,6,7									**2**		1	
SRO-I ☑ #6	NOR	1																**1**		1	
	I/C	3,4,5,6							5,6									**6**		4	
SRO-U ☐	MAJ	7							7,8									**3**		2	
	TS	3,6																**2**		2	
RO ☐	RX																				
SRO-I ☐	NOR				1													**1**			1
	I/C				3,4,5,6													**4**			2
SRO-U ☑ #2	MAJ				7													**1**			1
	TS				4,6													**2**			2

Facility: **Browns Ferry NPP** Date of Exam: **June 06 – 19, 2010** Operating Test No.: **HLT 1006**

APPLICANT	EVENT TYPE	Scenarios															TOTAL	MINIMUM (*)		
		1 **(3-20)**			2 **(3-21)**			3 **(3-22)**			4 **(3-24)spare**							R	I	U
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP				

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.

ES-301, Rev. 9 **Competencies Checklist** **Form ES-301-6**

Facility: **Browns Ferry** Date of Examination: **June 2010** Operating Test No.: **HLT 1006**

Competencies	APPLICANTS														
	RO					**SRO-I**					**SRO-U**				
	SCENARIO					SCENARIO					SCENARIO				
	20	21	22	24		20	21	22	24		20	21	22	24	
Interpret/Diagnose Events and Conditions	**3,4 6,7**	**3,4 5,6**	**4,6**	**3,4**		**3,4 6,7**	**3,4 5,6**	**4,6**	**3,4**		**3,4 6,7**	**3,4 5,6**	**4,6**	**3,4**	
Comply With and Use Procedures (1)	**1,3**	**1,4,6**	**1,4,6**	**3,5**		**1,3**	**1,4,6**	**1,4,6**	**3,5**		**1,3**	**1,4,6**	**1,4,6**	**3,5**	
Operate Control Boards (2)	**3,4 5,6**	**3,4 5,6**	**3,4 5,6**	**3,4 5,6**		**3,4 5,6**	**3,4 5,6**	**3,4 5,6**	**3,4 5,6**						
Communicate and Interact	**5,6,7**	**6,7,8**	**7,8**	**7,8**		**5,6,7**	**6,7,8**	**7,8**	**7,8**		**5,6,7**	**6,7,8**	**7,8**	**7,8**	
Demonstrate Supervisory Ability (3)						**5,6,7**	**6,7,8**	**7,8**	**7,8**		**5,6,7**	**6,7,8**	**7,8**	**7,8**	
Comply With and Use Tech. Specs. (3)						**3,6**	**4,6**	**4,6**	**3,5**		**3,6**	**4,6**	**4,6**	**3,5**	

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.

Facility:	Browns Ferry NPP	Date of Exam: June 07 – 23, 2010	ILT-10-06

Tier	Group	RO K/A Category Points												SRO-Only Points			
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total
1. Emergency & Abnormal Plant Evolutions	1	4	3	3	N/A			4	3	N/A		3	20	3	4	7
	2	1	1	1				2	1			1	7	1	2	3
	Tier Totals	5	4	4				6	4			4	27	4	6	10
2. Plant Systems	1	3	2	2	3	1	2	3	2	3	3	2	26	2	3	5
	2	1	1	1	1	1	1	1	1	2	1	1	12	0 / 1	2	3
	Tier Totals	4	3	3	4	2	3	4	3	5	4	3	38	3	5	8

3. Generic Knowledge and Abilities Categories	1	2	3	4	10	1	2	3	4	7
	3	3	2	2		1	2	2	2	

Notes:

1. Ensure that at least two topics from every 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 (IR) 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. Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (RO / SRO)							Form ES-401-1	
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**	**#**
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4						1	**G2.1.7** (10CFR 55.41.5) Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
295003 Partial or Complete Loss of AC / 6						1	**G2.1.27** (10CFR 55.41.7) Knowledge of system purpose and/or function.	3.9	2
295004 Partial or Total Loss of DC Pwr / 6				1	*1*		**AA1.03** (10CFR 55.41.7) Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: ♦ A.C. electrical distribution	3.4	3
							AA2.01 (10CFR 55.43.2 - SRO Only) *Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF LOSS OF D.C. POWER:* ♦ *Cause of partial or complete loss of D.C. power*	*3.6*	*76*
295005 Main Turbine Generator Trip / 3					1		**AA2.08** (10CFR 55.41.10) Ability to determine and/or interpret the following as they apply to MAIN TURBINE GENERATOR TRIP: ♦ Electrical distribution status	3.2	4
295006 SCRAM / 1			1				**AK3.03** (10CFR 55.41.5) Knowledge of the reasons for the following responses as they apply to SCRAM: ♦ Reactor pressure response	3.8	5

SRO only K/As shown in italics

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (RO / SRO)							Form ES-401-1	
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**	**#**
295016 Control Room Abandonment / 7				1	*1*		**AA1.08** (10CFR 55.41.7) Ability to operate and/or monitor the following as they apply to CONTROL ROOM ABANDONMENT: ♦ Reactor pressure	4.0	6
							AA2.05 (10CFR 55.43.5 - SRO Only) *Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT:* ♦ *Drywell pressure*	*3.9*	*77*
295018 Partial or Total Loss of CCW / 8			1			*1*	**AK3.07** (10CFR 55.41.5) Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: ♦ Cross-connecting with backup systems	3.1	7
							G2.1.27 (10CFR 55.43.5 - SRO Only) *Knowledge of system purpose and/or function.*	*4.0*	*78*
295019 Partial or Total Loss of Inst. Air / 8					1		**AA2.02** (10CFR 55.41.10) Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: ♦ Status of safety-related instrument air system loads (see AK2.1 – AK2.19)	3.6	8

SRO only K/As shown in italics

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (RO / SRO)						Form ES-401-1	
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**	**#**
295021 Loss of Shutdown Cooling / 4		1				*1*	**AK2.01** (10CFR 55.41.7) Knowledge of the interrelations between LOSS OF SHUTDOWN COOLING and the following: ♦ Reactor water temperature	3.6	9
							G2.4.47 (10CFR 55.43.5 - SRO Only) *Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.*	*4.2*	*79*
295023 Refueling Acc / 8				1		*1*	**AA1.03** (10CFR 55.41.7) Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS: ♦ Fuel handling equipment	3.3	10
							G2.1.7 (10CFR 55.43.5 - SRO Only) *Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.*	*4.7*	*80*
295024 High Drywell Pressure / 5	1					*1*	**EK1.01** (10CFR 55.41.9) Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE: ♦ Drywell integrity: Plant-Specific	4.1	11
							G2.1.31 (10CFR 55.43.5 - SRO Only) *Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.*	*4.3*	*81*
295025 High Reactor Pressure / 3			1				**EK3.01** (10CFR 55.41.5) Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE: ♦ Safety/relief valve opening	4.2	12

SRO only K/As shown in italics

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (RO / SRO)						Form ES-401-1	
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**	**#**
295026 Suppression Pool High Water Temp. / 5					1		**EA2.01** (10CFR 55.41.10) Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: ♦ Suppression pool water temperature	4.1	13
~~295027 High Containment Temperature / 5~~	–	–	–	–	–	–	N/A for BFN – K/A for Mark III Containments ONLY----------	------	------
295028 High Drywell Temperature / 5		1			*1*		**EK2.01** (10CFR 55.41.5) Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: ♦ Drywell spray: Mark-I&II	3.7	14
							EA2.06 (10CFR 55.43.5 - SRO Only) *Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE:* ♦ *Torus/suppression chamber air space temperature: Plant-Specific*	*3.7*	*82*
295030 Low Suppression Pool Wtr Lvl / 5	1						**EK1.02** (10CFR 55.41.8) Knowledge of the operational implications of the following concepts as they apply to LOW SUPPRESSION POOL WATER LEVEL: ♦ Pump NPSH	3.5	15
295031 Reactor Low Water Level / 2	1						**EK1.03** (10CFR 55.41.10) Knowledge of the operational implications of the following concepts as they apply to REACTOR LOW WATER LEVEL: ♦ Water level effects on reactor power	3.7	16
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1		1					**EK2.13** (10CFR 55.41.7) Knowledge of the interrelations between SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN and the following: ♦ Alternate boron injection methods: Plant-Specific	3.4	17

SRO only K/As shown in italics

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 1 (RO / SRO)							Form ES-401-1
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**	**#**
295038 High Off-site Release Rate / 9						1	**G2.4.9** (10CFR 55.41.10) Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.	3.8	18
600000 Plant Fire On Site / 8	1						**AK1.02** (10CFR 55.41.5) Knowledge of the operational implications of the following concepts as they apply to PLANT FIRE ON SITE: ◆ Fire fighting	2.9	19
700000 Generator Voltage and Electric Grid Disturbances / 6				1			**AA1.03** (10CFR 55.41.10) Ability to operate and/or monitor the following as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: ◆ Voltage regulator controls	3.8	20
K/A Category Totals: **(RO)**	4	3	3	4	3	3	Group Point Total: **(RO)**		20
*K/A Category Totals: **(SRO)***					3	4	*Group Point Total: **(SRO)***		7

SRO only K/As shown in italics

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (RO / SRO)						Form ES-401-1	
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**	**#**
295002 Loss of Main Condenser Vac / 3		1					**AK2.02** (10CFR 55.41.10) **OPERATING EXPERIENCE** Knowledge of the interrelations between LOSS OF MAIN CONDENSER VACUUM and the following: ♦ Main turbine	3.1	21
~~295007 High Reactor Pressure / 3~~	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	------	------
~~295008 High Reactor Water Level / 2~~	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	------	------
295009 Low Reactor Water Level / 2	1						**AK1.05** (10CFR 55.41.10) Knowledge of the operational implications of the following concepts as they apply to LOW REACTOR WATER LEVEL: ♦ Natural circulation	3.3	22
295010 High Drywell Pressure / 5				1		*1*	**AA1.06** (10CFR 55.41.7) Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE: ♦ Leakage detection systems	3.3	23
							G2.2.4 (10CFR 55.43.5 - SRO Only) *(multi-unit license) Ability to explain the variations in control board/control room layouts, systems, instrumentation, and procedural actions between units at a facility.*	*3.6*	*83*
~~295011 High Containment Temp / 5~~	--	--	--	--	--	--	N/A for BFN – K/A for Mark III Containments ONLY----------	------	------
~~295012 High Drywell Temperature / 5~~	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	------	------
~~295013 High Suppression Pool Temp. / 5~~	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	------	------

SRO only K/As shown in italics

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (RO / SRO)							Form ES-401-1	
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**	**#**
295014 Inadvertent Reactivity Addition / 1					*1*		***AA2.01 (10CFR 55.43.5 - SRO Only)*** *Ability to determine and/or interpret the following as they apply to INADVERTENT REACTIVITY ADDITION:* ♦ *Reactor power*	*4.1*	*84*
~~295015 Incomplete SCRAM / 1~~	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	------	------
~~295017 High Off-site Release Rate / 9~~	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	------	------
~~295020 Inadvertent Cont. Isolation / 5 & 7~~	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	------	------
295022 Loss of CRD Pumps / 1						1	**G2.2.38** (10CFR 55.41.10) Knowledge of conditions and limitations in the facility license.	3.6	24
295029 High Suppression Pool Wtr Lvl / 5			1				**EK3.03** (10CFR 55.41.10) Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL WATER LEVEL: ♦ Reactor SCRAM	3.4	25
~~295032 High Secondary Containment Area Temperature / 5~~	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	------	------
295033 High Secondary Containment Area Radiation Levels / 9						*1*	***G2.3.13 (10CFR 55.43.2 - SRO Only)*** *Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.*	*3.8*	*85*
295034 Secondary Containment Ventilation High Radiation / 9				1			**EA1.02** (10CFR 55.41.7) Ability to operate and/or monitor the following as they apply to SECONDARY CONTAINMENT VENTILATION HIGH RADIATION:	3.9	26

SRO only K/As shown in italics

ES-401	BWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1/Group 2 (RO / SRO)							Form ES-401-1	
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**	**#**
							♦ Process radiation monitoring system		
~~295035 Secondary Containment High Differential Pressure / 5~~	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	------	------
295036 Secondary Containment High Sump/Area Water Level / 5					1		**EA2.01** (10CFR 55.41.10) Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL: ♦ Operability of components within the affected area	3.0	27
~~500000 High CTMT Hydrogen Conc. / 5~~	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	------	------
K/A Category Totals: **(RO)**	1	1	1	2	1	1	Group Point Total: **(RO)**		7
K/A Category Totals: ***(SRO)***					*1*	*2*	*Group Point Total:* ***(SRO)***		*3*

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 1 (RO / SRO)											Form ES-401-1		
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
203000 RHR/LPCI: Injection Mode							2	*1*				**A1.01** (10CFR 55.41.5) Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: ♦ Reactor water level	4.2	28
												A1.04 (10CFR 55.41.5) Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: ♦ System pressure	3.6	29
												A2.09 (10CFR 55.43.5 - SRO Only) *Ability to (a) predict the impacts of the following on the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:* ♦ *Inadequate system flow*	*3.4*	*86*
205000 Shutdown Cooling			1									**K3.05** (10CFR 55.41.7) Knowledge of the effect that a loss or malfunction of the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) will have on the following: ♦ Fuel pool cooling assist: Plant-Specific	2.6	30
206000 HPCI		1										**K2.02** (10CFR 55.41.7) Knowledge of electrical power supplies to the following: ♦ System pumps: BWR-2,3,4	2.8	31
~~207000 Isolation (Emergency) Condenser~~	–	–	–	–	–	–	–	–	–	–	–	N/A for BFN – No Isolation Condenser(s)----------	------	------

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 1 (RO / SRO)												Form ES-401-1	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
209001 LPCS	1											**K1.08** (10CFR 55.41.7) Knowledge of the physical connections and/or cause-effect relationships between the LOW PRESSURE CORE SPRAY (LPCS) SYSTEM and the following: ◆ A.C. electrical power	3.2	32
~~209002 HPCS~~	--	--	--	--	--	--	--	--	--	--	--	N/A for BFN – No HPCS System----------	------	------
211000 SLC									1		*1*	**A3.01** (10CFR 55.41.7) Ability to monitor automatic operations of the STANDBY LIQUID CONTROL SYSTEM including: ◆ Pump discharge pressure: Plant-Specific	3.5	33
												G2.1.7 (10CFR 55.43.5 - SRO Only) *Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.*	*4.7*	*87*
212000 RPS								1				**A2.09** (10CFR 55.41.5) Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM (RPS); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: ◆ High containment/drywell pressure	4.1	34

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 1 (RO / SRO)											Form ES-401-1	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
215003 IRM										2		**A4.04** (10CFR 55.41.7) Ability to manually operate and/or monitor in the control room: ◆ IRM back panel switches, meters, and indicating lights	3.1	35
												A4.05 (10CFR 55.41.7) Ability to manually operate and/or monitor in the control room: ◆ Trip bypasses	3.4	36
215004 Source Range Monitor											1	**G2.2.2** (10CFR 55.41.7) Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.6	37
215005 APRM / LPRM				1								**K4.01** (10CFR 55.41.7) Knowledge of AVERAGE POWER RANGE MONITOR / LOCAL POWER RANGE MONITOR (APRM / LPRM) SYSTEM design feature(s) and/or interlocks which provide for the following: ◆ Rod withdrawal blocks	3.7	38
217000 RCIC						1						**K6.04** (10CFR 55.41.7) Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC): ◆ Condensate storage and transfer system	3.5	39

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 1 (RO / SRO)											Form ES-401-1		
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
218000 ADS				2								**K4.02** (10CFR 55.41.7) Knowledge of AUTOMATIC DEPRESSURIZATION SYSTEM (ADS) design feature(s) and/or interlocks which provide for the following: ♦ Allows manual initiation of ADS logic	3.8	40
												K4.03 (10CFR 55.41.7) Knowledge of AUTOMATIC DEPRESSURIZATION SYSTEM (ADS) design feature(s) and/or interlocks which provide for the following: ♦ ADS logic control	3.8	41
223002 PCIS/Nuclear Steam Supply Shutoff	2											**K1.04** (10CFR 55.41.7) Knowledge of the physical connections and/or cause-effect relationships between the PRIMARY CONTAINMENT ISOLATION SYSTEM (PCIS) / NUCLEAR STEAM SUPPLY SHUT-OFF and the following: ♦ High pressure coolant injection: Plant-Specific	3.5	42
												K1.08 (10CFR 55.41.7) Knowledge of the physical connections and/or cause-effect relationships between the PRIMARY CONTAINMENT ISOLATION SYSTEM (PCIS) / NUCLEAR STEAM SUPPLY SHUT-OFF and the following: ♦ Shutdown cooling system/RHR	3.4	43
239002 SRVs		1										**K2.01** (10CFR 55.41.7) Knowledge of electrical power supplies to the following: ♦ SRV solenoids	2.8	44

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 1 (RO / SRO)											Form ES-401-1	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
259002 Reactor Water Level Control											1	**G2.2.40** (10CFR 55.41.10) Ability to apply technical specifications for a system.	3.4	45
261000 SGTS							1				*1*	**A1.01** (10CFR 55.41.5) Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM (SGTS) controls including: ♦ System flow	2.9	46
												G2.2.4 (10CFR 55.43.5 - SRO Only) *(multi-unit license) Ability to explain the variations in control board/control room layouts, systems, instrumentation, and procedural actions between units at a facility.*	*3.6*	*88*
262001 AC Electrical Distribution					1							**K5.02** (10CFR 55.41.5) Knowledge of the operational implications of the following concepts as they apply to A.C. ELECTRICAL DISTRIBUTION: ♦ Breaker control	2.6	47
262002 UPS (AC/DC)			1									**K3.08** (10CFR 55.41.7) Knowledge of the effect that a loss or malfunction of the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.)will have on the following: ♦ Computer operation: Plant-Specific	2.7	48

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 1 (RO / SRO)											Form ES-401-1		
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
263000 DC Electrical Distribution								1			*1*	**A2.02** (10CFR 55.41.5) Ability to (a) predict the impacts of the following on the D.C. ELECTRICAL DISTRIBUTION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: ♦ Loss of ventilation during charging	2.6	49
												G2.1.28 (10CFR 55.43.5 - SRO Only) *Knowledge of the purpose and function of major system components and controls.*	*4.1*	*89*
264000 EDGs									2			**A3.02** (10CFR 55.41.7) Ability to monitor automatic operations of the EMERGENCY GENERATORS (DIESEL / JET) including: ♦ Minimum time for load pickup	3.1	50
												A3.04 (10CFR 55.41.7) Ability to monitor automatic operations of the EMERGENCY GENERATORS (DIESEL / JET) including: ♦ Operation of the governor control system on frequency and voltage control	3.1	51
300000 Instrument Air										1		**A4.01** (10CFR 55.41.7) Ability to manually operate and/or monitor in the control room: ♦ Pressure gauges	2.6	52

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 1 (RO / SRO)											Form ES-401-1	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
400000 Component Cooling Water						1		*1*				**K6.05** (10CFR 55.41.7) Knowledge of the effect that a loss or malfunction of the following will have on the CCWS: ♦ Pumps	2.8	53
												A2.02 (10CFR 55.43.5 - SRO Only) *Ability to (a) predict the impacts of the following on the CCWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:* ♦ *High/low surge tank level*	*3.0*	*90*
K/A Category Point Totals: **(RO)**	3	2	2	3	1	2	3	2	3	3	2	Group Point Total: **(RO)**		26
K/A Category Point Totals: ***(SRO)***								*2*			*3*	*Group Point Total:* ***(SRO)***		*5*

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 2 (RO / SRO)											Form ES-401-1	
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
~~201001 CRD Hydraulic~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
201002 RMCS								1				**A2.04** (10CFR 55.41.5) Ability to (a) predict the impacts of the following on the REACTOR MANUAL CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: ◆ Control rod block	3.2	54
~~201003 Control Rod and Drive Mechanism~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
~~201004 RSCS~~	--	--	--	--	--	--	--	--	--	--	--	N/A for BFN – BWR 4/5 ONLY----------	-------	-------
~~201005 RCIS~~	--	--	--	--	--	--	--	--	--	--	--	N/A for BFN – BWR 6 ONLY----------	-------	-------
~~201006 RWM~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
~~202001 Recirculation~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
~~202002 Recirculation Flow Control~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
~~204000 RWCU~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
~~214000 RPIS~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
215001 Traversing In-core Probe											*1*	***G2.4.21 (10CFR 55.43.5 - SRO Only)*** Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	*4.6*	*91*

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 2 (RO / SRO)											Form ES-401-1		
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
215002 RBM									1			**A3.04** (10CFR 55.41.7) Ability to monitor automatic operations of the ROD BLOCK MONITOR SYSTEM including: ♦ Verification of proper functioning / operability: BWR-3,4,5	3.6	55
216000 Nuclear Boiler Inst.							1	*1*				**A1.02** (10CFR 55.41.5) Ability to predict and/or monitor changes in parameters associated with operating the NUCLEAR BOILER INSTRUMENTATION controls including: ♦ Removing or returning a (sensor) transmitter to service	2.9	56
												A2.06 (10CFR 55.43.5 - SRO Only) *Ability to (a) predict the impacts of the following on the NUCLEAR BOILER INSTRUMENTATION; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:* ♦ *Loss of power supply*	*3.1*	*92*
219000 RHR/LPCI: Torus/Pool Cooling Mode											*1*	***G2.4.41 (10CFR 55.43.5 - SRO Only)*** *Knowledge of the emergency action level thresholds and classifications.*	*4.6*	*93*
~~223001 Primary CTMT and Aux.~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
~~226001 RHR/LPCI: CTMT Spray Mode~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
230000 RHR/LPCI: Torus/Pool Spray Mode										1		**A4.04** (10CFR 55.41.7) Ability to manually operate and/or monitor in the control room: ♦ Minimum flow valves	3.1	57

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 2 (RO / SRO)											Form ES-401-1		
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
233000 Fuel Pool Cooling/Cleanup		1										**K2.02** (10CFR 55.41.7) Knowledge of electrical power supplies to the following: ◆ RHR pumps	2.8	58

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 2 (RO / SRO)											Form ES-401-1	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
234000 Fuel Handling Equipment					1							**K5.02** (10CFR 55.41.5) Knowledge of the operational implications of the following concepts as they apply to FUEL HANDLING EQUIPMENT: ♦ Fuel handling equipment interlocks	3.1	59
~~239001 Main and Reheat Steam~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
~~239003 MSIV Leakage Control~~	--	--	--	--	--	--	--	--	--	--	--	N/A for BFN ----------	-------	-------
241000 Reactor/Turbine Pressure Regulator						1						**K6.06** (10CFR 55.41.7) Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR / TURBINE PRESSURE REGULATING SYSTEM: ♦ Reactor pressure	3.8	60
~~245000 Main Turbine Gen. / Aux.~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
~~256000 Reactor Condensate~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
~~259001 Reactor Feedwater~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------
268000 Radwaste			1									**K3.04** (10CFR 55.41.5) Knowledge of the effect that a loss or malfunction of the RADWASTE will have on the following: ♦ Drain sumps	2.7	61
~~271000 Offgas~~	--	--	--	--	--	--	--	--	--	--	--	NOT RANDOMLY SELECTED----------	-------	-------

SRO only K/As shown in italics

ES-401	BWR Examination Outline Plant Systems – Tier 2/Group 2 (RO / SRO)											Form ES-401-1	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**	**#**
272000 Radiation Monitoring									1			**A3.02** (10CFR 55.41.7) Ability to monitor automatic operations of the RADIATION MONITORING SYSTEM including: ◆ Offgas system isolation indications	3.6	62
286000 Fire Protection											1	**G2.2.42** (10CFR 55.41.10) Ability to recognize system parameters that are entry-level conditions for Technical Specifications.	3.9	63
~~288000 Plant Ventilation~~	–	–	–	–	–	–	–	–	–	–	–	NOT RANDOMLY SELECTED----------	-------	-------
~~290001 Secondary CTMT~~	–	–	–	–	–	–	–	–	–	–	–	NOT RANDOMLY SELECTED----------	-------	-------
290003 Control Room HVAC				1								**K4.01** (10CFR 55.41.7) Knowledge of CONTROL ROOM HVAC design feature(s) and/or interlocks which provide for the following: ◆ System initiations/reconfiguration: Plant-Specific	3.1	64
290002 Reactor Vessel Internals	1											**K1.12** (10CFR 55.41.6) Knowledge of the physical connections and/or cause-effect relationships between REACTOR VESSEL INTERNALS and the following: ◆ SBLC	3.4	65
K/A Category Point Totals: **(RO)**	1	1	1	1	1	1	1	1	2	1	1	Group Point Total: **(RO)**		12
K/A Category Point Totals: ***(SRO)***								*1*			2	*Group Point Total:* ***(SRO)***		*3*

SRO only K/As shown in italics

Facility: Browns Ferry NPP Date of Exam: June 07 – 23, 2010

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.	**G2.1.25** (10CFR 55.41.10) Ability to interpret reference materials, such as graphs, curves, tables, etc. ***G2.1.41 (10CFR 55.43.6 – SRO Only)*** *Knowledge of the refueling processes.*	3.9	66	*3.7*	*94*
	2.1.	**G2.1.27** (10CFR 55.41.7) Knowledge of system purpose and/or function.	3.9	67	-----	-----
	2.1.	**G2.1.8** (10CFR 55.41.10) Ability to coordinate personnel activities outside the control room.	3.4	68	-----	-----
	~~2.1.~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	~~2.1.~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	~~2.1.~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	Subtotal			3		*1*
2. Equipment Control	2.2.	**G2.2.37** (10CFR 55.41.10) Ability to determine operability and/or availability of safety related equipment. ***G2.2.39 (10CFR 55.43.2 – SRO Only)*** *Knowledge of less than or equal to one hour technical specification action statements for systems.*	3.6	69	*4.5*	*95*
	2.2.	**G2.2.22** (10CFR 55.41.5) Knowledge of limiting conditions for operations and safety limits. ***G2.2.43 (10CFR 55.43.3 – SRO Only)*** *Knowledge of the process used to track inoperable alarms.*	4.0	70	*3.3*	*96*
	2.2.	**G2.2.4** (10CFR 55.41.7) (multi-unit license) Ability to explain the variations in control board/control room layouts, systems, instrumentation, and procedural actions between units at a facility.	3.6	71	-----	-----
	~~2.2.~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	~~2.2.~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	~~2.2.~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	Subtotal			3		*2*

SRO only K/As shown in italics

Facility: Browns Ferry NPP Date of Exam: June 07 – 23, 2010

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
3. Radiation Control	2.3	**G2.3.14** (10CFR 55.41.12) Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. ***G2.3.11 (10CFR 55.43.4 – SRO Only)*** *Ability to control radiation releases.*	3.4	72	*4.3*	*97*
	2.3	**G2.3.5** (10CFR 55.41.11) Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. ***G2.3.13 (10CFR 55.43.4 – SRO Only)*** *Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.*	2.9	73	*3.8*	*98*
	~~2.3~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	~~2.3~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	~~2.3~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	Subtotal			2		*2*
4. Emergency Procedures / Plan	2.4.	**G2.4.20** (10CFR 55.41.10) Knowledge of the operational implications of EOP warnings, cautions, and notes. ***G2.4.40 (10CFR 55.43.5 – SRO Only)*** *Knowledge of SRO's responsibilities in emergency plan implementation.*	3.8	74	*4.5*	*99*
	2.4.	**G2.4.45** (10CFR 55.41.10) Ability to prioritize and interpret the significance of each annunciator or alarm. ***G2.4.45 (10CFR 55.43.5 – SRO Only)*** *Ability to prioritize and interpret the significance of each annunciator or alarm.*	4.1	75	*4.3*	*100*
	~~2.4.~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	~~2.4.~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	~~2.4.~~	NOT RANDOMLY SELECTED----------	-----	-----	-----	-----
	Subtotal			2		*2*
Tier 3 Point Total				10		*7*

SRO only K/As shown in italics

Tier / Group	Randomly Selected K/A	Reason for Rejection
1 / 1	295023 AA1.05	Rejected K/A no fuel transfer system for Browns Ferry, replaced with AA1.03 Fuel handling equipment
1 / 1	295031 EK1.02	Rejected K/A due to overlap with 295009, replaced with EK1.03 water level effects on reactor power
2 / 1	215004 G2.2.4	Rejected due to no significant unit differences for SRMs, replaced with G2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.
2 / 2	272000 A3.01	Rejected due to no auto main steam isolation, replaced with A3.02 Offgas system isolation indications
3	2.2.20	Rejected unsuccessful last exam, replaced with G2.2.37: Ability to determine operability and/or availability of safety related equipment.
2 / 2	215001 G2.4.2	SRO only, rejected due to low probability of success, replaced with G2.4.21: Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.
1 / 2	295033 2.2.39	SRO only rejected due to overlap, replaced with 2.3.13: Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc

Facility: **Browns Ferry** Date of Exam: **June 2010** Exam Level: RO ☒ SRO ☒

Item Description	Initial a	Initial b*	Initial c#
1. Questions and answers are technically accurate and applicable to the facility.	OL	KB	
2. a. NRC K/As are referenced for all questions. b. Facility learning objectives are referenced as available.	OL	KB	
3. SRO questions are appropriate in accordance with Section D.2.d of ES-401	OL	KB	
4. The sampling process was random and systematic (If more than 4 RO or 2 SRO questions were repeated from the last 2 NRC licensing exams, consult the NRR OL program office).			
5. Question duplication from the license screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate: __ the audit exam was systematically and randomly developed; or __ the audit exam was completed before the license exam was started; or __ the examinations were developed independently; or _x_ the licensee certifies that there is no duplication; or __ other (explain)	OL	KB	
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: 33% / 36%; Modified: 28% / 20%; New: 39% / 44%	OL	KB
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: 45% / 24%; C/A: 55% / 76%	OL	KB
8. References/handouts provided do not give away answers or aid in the elimination of distractors.	OL	KB	
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.	OL	KB	
10. Question psychometric quality and format meet the guidelines in ES Appendix B.	OL	KB	
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.	OL	KB	

	Printed Name / Signature	Date
a. Author	DANIEL K. ZIELINSKI / Daniel K. Zielinski	4-9-2010
b. Facility Reviewer (*)	Keith W Benefield / Keith W Benefield	4-12-2010
c. NRC Chief Examiner (#)	Phillip G. Capehart / Phillip G. Capehart	5-27-2010
d. NRC Regional Supervisor	MARK A. BATES FOR MALCOLM WIDMANN / Mark A. Bates	6-01-2010

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.

If more than 20 percent[1] of the submitted test items (with the operating test and RO/SRO written exams assessed separately) required replacement or significant modification, the report shall include a factual description of the test item changes (observations), including the number and types of test items replaced and/or significantly modified as a result of the joint NRC and facility licensee examination review process. The report shall also note that the overall submittal was outside the acceptable quality range expected by the NRC and that future examination submittals should incorporate any lessons learned from this effort.

To be considered a significantly modified question, at least one pertinent condition in the stem and at least one distractor must be changed from the original bank question. Changing the conditions in the stem such that one of the three distractors in the original question becomes the correct answer would also be considered a significant modification

ES-401 **Written Examination Review Worksheet** **Form ES-401-9**

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			
Gen																Before in-office visit (preliminary assessment): [Allowing credit for changes to previously identified Unsat items prior to 4/23/10 submittals; i.e., only tallying Unsat items on the 4/23/10 submittal] # of Unsat RO Items: [9/75 = %] # of Unsat SRO Items: [8/25 = 32%] Overall # of Unsat Items: 21/100 = 21% After in-office visit: # of Unsat RO Items: [XX/75 = XX%] # of Unsat SRO Items: [X/25 = XX%] Overall # of Unsat Items: XX/100 = XX%
Gen																If annunciator(s) referred to in a question, use EXACT nomenclature engraved on Alarm Window (also specified in ARP) followed by parentheses containing the shortest possible abbreviated window location designation that the applicants are familiar with.
Gen																Each question should contain “Which ONE of the following...” in the primary stem of the question. If it is a fill-in-the-blank question, utilize “Which one of the following completes the statement?”
Gen																If providing a reference to the candidate, place a bracketed statement “[REFERENCE PROVIDED]” between the stem and the first possible answer choice.
Gen																Limit the amount of references provided to the candidates to the maximum extent possible.
Gen																In a two-part question format with more than one element contained in each choice, limit the number of elements to two (for each choice).
Gen																Whenever applicable, ensure the phrase “in accordance with….” Is pasted after the stem question. This ensures that there is only one correct answer. In all procedure related questions, ensure that the stem question includes “*in accordance with …[procedure name]”*

If more than 20 percent[1] of the submitted test items (with the operating test and RO/SRO written exams assessed separately) required replacement or significant modification, the report shall include a factual description of the test item changes (observations), including the number and types of test items replaced and/or significantly modified as a result of the joint NRC and facility licensee examination review process. The report shall also note that the overall submittal was outside the acceptable quality range expected by the NRC and that future examination submittals should incorporate any lessons learned from this effort.
To be considered a significantly modified question, at least one pertinent condition in the stem and at least one distractor must be changed from the original bank question. Changing the conditions in the stem such that one of the three distractors in the original question becomes the correct answer would also be considered a significant modification

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																Please submit reference discs (in addition to “selected” procedure references) because this will: 1) Provide the procedures to allow research on questions. For example, a question may have the procedure reference needed to verify the correct answer; however, the procedure needed to validate the distractor is often not provided. 2) Having the other procedures will also facilitate development of alternative suggestions for questions needing replacements.
Gen																Avoid using the word “should” in any test questions because this can often be argued as correct by an applicant.
Gen																SRO-only Clarification Guidance Rev 0, page 12 contains an example of a good SRO-only question that is linked to 10CFR55.43 (5) procedure selection. Also pages 7 & 8 provide clarification in the first bullets by stating that if the question involves prescribing a procedure, then it may be SRO-only. To further clarify*:* One area of SRO-level knowledge (with respect to prescribing or selecting procedures) is *knowledge of the content of the procedure* (SRO knowledge) versus *knowledge of the overall mitigative strategy of the procedure* (RO knowledge). To satisfy the 10CFR55.43.5 topic, the question must be linked to *procedure selection*. The SRO portion of a question may include procedure selection, tech specs, and/or E-plan classification, among the 7 areas listed in 10CFR55.43.
Gen																Ensure that the stem question is followed with a question mark (?) instead of trailing (….)

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To be considered a significantly modified question, at least one pertinent condition in the stem and at least one distractor must be changed from the original bank question. Changing the conditions in the stem such that one of the three distractors in the original question becomes the correct answer would also be considered a significant modification

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).

If more than 20 percent of the submitted test items (with the operating test and RO/SRO written exams assessed separately) required replacement or significant modification, the report shall include a factual description of the test item changes (observations), including the number and types of test items replaced and/or significantly modified as a result of the joint NRC and facility licensee examination review process. The report shall also note that the overall submittal was outside the acceptable quality range expected by the NRC and that future examination submittals should incorporate any lessons learned from this effort.
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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	H	2												N	E S	211000A3.01 Appears to meet the KA. Could someone argue that the relief just lifted and pressure may be decreasing? This could make "D" also correct. Is it better to write out the parameters: SLC Pump Dish Press is 1100 psig and steady? 4/20/10, Reviewed again for draft submittal. Changes were made as noted above. SAT
66	F	3					X							B	U S	G2.1.25 Appears to meet the KA. Could someone argue that "B" & "D" are also correct? The level of 11.5' is the level at which the: A. downcomer vents **begin** to become uncovered. B. HPCI Turb Exhaust begins to be uncovered at 12.75', therefore it is uncovered at 11.5'. D. control room SP NR lvl indication goes off scale at ~13 ft. 11.5' is < all 3 of these choices. Change to say either: "IAW procedure…, line 1 above" or "In the derivation of the PSP curve, line 1 above…" 4/20/10, Reviewed again for draft submittal. Changes were made as noted above. SAT
76	H	3												N	E S	295004AA2.01 Appears to meet the KA. Rewrite the 2nd question to simplify it and contain only 1 sentence. "After manually transferring the 250 VDC RMOV Bd, the Board is considered _____IAW TS 3.8.7." 4/20/10, Reviewed again for draft submittal. Changes were made as noted above. SAT

If more than 20 percent[1] of the submitted test items (with the operating test and RO/SRO written exams assessed separately) required replacement or significant modification, the report shall include a factual description of the test item changes (observations), including the number and types of test items replaced and/or significantly modified as a result of the joint NRC and facility licensee examination review process. The report shall also note that the overall submittal was outside the acceptable quality range expected by the NRC and that future examination submittals should incorporate any lessons learned from this effort.
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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	F	2												B	E E S	295023G2.1.7 Appears to meet the KA. EOI-3, Table 4 shows 1000 mr/hr as MAX SAFE (500 mr/hr is listed as MAX SAFE in the distractor discussion for A & B). Max Normal alarm setpoint is not included with references. Can not tell if "A" is also correct or not, due to insufficient references being available. Reword: "Which ONE of the following identifies: 1.) The EOI-3 MAX NORMAL operating… AND 2.) The required approval….IAW 2-AOI-79-1…" 4/20/10, Reviewed again for draft submittal. Changes were made as noted above. Where did the 500 mr/hr come from? Is it better distractor "2 X Normal Background Radiation level" or maybe "10 X Normal Background"? 5/20/10 Changed the distractor A & B to 72 mr/hr.
87	F	2												N	S	211000G2.1.7 Appears to meet the KA. 4/20/10, Reviewed again for draft submittal. No changes were required. SAT

If more than 20 percent of the submitted test items (with the operating test and RO/SRO written exams assessed separately) required replacement or significant modification, the report shall include a factual description of the test item changes (observations), including the number and types of test items replaced and/or significantly modified as a result of the joint NRC and facility licensee examination review process. The report shall also note that the overall submittal was outside the acceptable quality range expected by the NRC and that future examination submittals should incorporate any lessons learned from this effort.
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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	H	2	X										X	N	U S	400000A2.02 This question is not SRO Only. An RO could determine the answer by using knowledge of the overall mitigative strategy of the procedure. The 1st half of choice B or D can be determined using RO knowledge of Rx trip criteria (i.e. a Rx trip is required for a loss of RBCCW). Only one ARM reading is given; therefore, by knowing that it requires at least 2 ARM readings > Max Safe to ED, distractors C & D can be eliminated (this is knowledge of overall mitigative strategy). From this analysis of RO information the correct answer can be determined as choice B. EOI-3 was not provided for use in evaluating distractor analysis. Could correct by rewording 2nd question to ask what procedure is used to C/D the plant? 4/20/10, Reviewed again for draft submittal. This is not meeting the KA. The impact of the high surge tank level (i.e., the KA) is stated in the stem of the question: "RBCCW is isolated to containment". This should be in the distractor statements as a choice. To make this possible, more bullets need to be added to the stem to reflect the leak is from the RCP seal cooler [rise in 2-RM-90-131(Panel 2-9-10) activity (2-RR-90-131/132 on Panel 2-9-2) or 2-TE-68-54 or 67 temperature (Panel 2-9-21) or a lowering of any Recirc pump seal pressure.]. Does the 2nd question need to broken out? The question could be read to mean that the criteria to scram and initiate the cooldown are contained in the same procedure (in this case that assumption is correct). Would it make the other choices more plausible to break this into two statements? The impact of losing CCW to the drywell is a required scram. However, what is the impact of high/low surge tank level on the CCWS? ES-401, Section D.2.a states that for A2 K/A statements, try to test both aspects of the K/A and if that is not possible without expending an inordinate amount of resources, then limit the scope to the question to that aspect of the K/A statement requiring the highest cog level, i.e., the 2nd portion dealing with using procedures. 5/20/10 Reviewed rewrite onsite. KA is still not being met. Will provide licensee with another KA. 5/25/10 New question written to meet newly selected KA. This question still needs review. Question to rewritten to include 2nd part fo identify proper procedure to use. SAT after review in office. 5/26/10 New question reviewed. SAT.

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93	H	2												N	E S	219000G2.4.41 Appears to meet the KA. Should the entire EPIP-1 or at least the entire section 1 be provided as a reference? Is there any other EPIP EAL that the applicant could erroneously go to instead of the correct one? The wrong EPIP curve is provided as a reference. 1.5-S was provided. Curve 1.2-G is the correct curve for use with this question. 4/20/10, Reviewed again for draft submittal. Changes were made as noted above. SAT
96	F	2												N	E S	G2.2.43 Appears to meet the KA. This 2nd question part has a very low LOD as written. Modify the question slightly to increase the LOD. Modify to ask: "If an Annunciator input (delete "window"). Change "disabled/restored" to "disabled and restored". Add "then" prior to "a separate 10CFR50.59". Delete "for the disablement" at the end of the question. Change distractor (2) to say "is still". 4/20/10, Reviewed again for draft submittal. Changes were made as noted above. SAT
																The questions from here up were submitted for early review and will not count as UNSATs unless they are left uncorrected on the final submittal.
77	H														S	295016AA2.05 Appears to meet the KA.
78	H														E S	295018G2.1.27 Does a qualifier need to be added to assure that the applicant could not argue that the C1 EECW pump be manually aligned and therefore ALL EECW flow has not been lost? (i.e. No correct answer) Add "If no operator actions are taken…"

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			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	H												X		U	295021G2.4.47 Both of these look as if they are RO knowledge level criteria. OPL171.059 for Startup has this shown under an objective for the 100 deg. Heatup limit. This was used on last years NRC exam, verify this is noted on the QA form. I could not locate the question on last years NRC exam. SRO only: SRO-only knowledge cannot be claimed for questions that can be answered *solely* based on knowledge of ≤ 1 hour action statements. ROs are expected to know the LCO statement (TS 3.4.9 RCS Temp & Press Limits), applicability, and any notes; i.e., the information "above the double line separating the actions from the LCO and applicability statements. The knowledge that RCS heatup and cooldown rates are limited to 100F in any 1 hour period is RO knowledge. The knowledge associated with Modes is also RO knowledge. Suggest writing a question testing the applicants' knowledge of WHEN alternate SDC'g is REQUIRED (based on a trend) IAW the AOP and the minimum REQUIRED emergency classification. 5/20/10 Revised question on site. Changed 1st part to derive exact time of mode change and 2nd part to state that the EAL is met.
81	H												X		U S	295024G2.1.31 This does not appear to be SRO Only level knowledge. Can use RO knowledge alone to determine both responses. The OI for manual operation specifies 5K for the setpoint. OPL171.201 Objective V.B.7 requires an RO to know that EOI appendices are used instead of OI when in the EOI arena. Q=KA The proposed test item does not meet the K/A because it does not test the applicants' knowledge of the required lineup for switches/ controls and/or required indications "following a high drywell pressure condition. [The proposed item tests the applicant's knowledge of whether the HPCI controller setpoint is at the required standby lineup setpoint and the required procedure after the EOI high drywell entry condition has been reached.] The HPCI controller setpoint is always true, even if no high drywell pressure condition exists. The question should test the applicants' ability to confirm a switch or indication is lined up correctly following a high drywell pressure actuation. 5/20/10 Rewrite. Added "IAW TS".

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82	F											X			S	295028EA2.06 The answer does not meet the KA criteria but is acceptable if no correlation exist for SC/Torus air temp. Verify with the licensee. 5/20/10 Verified with the licensee on site.
83	F					X									U S	295010G2.2.4 Distractors C&D do not appear plausible. If emergency depressurization is required EOI-1 RCP is not plausible at this point. Suggest a change to the 2nd part of the distractor to a reason why ED is necessary from the basis statement. Part D plausibility is incorrect. 5/20/10 Question is still UNSAT upon onsite review. The 2nd part of the distractors is still missing. (See above in blue). Upon editorial changes being made to the question the question is acceptable even though no explanation is involved. The KA is met via the technical process of understanding the unit difference to arrive at the answer.
84	H											X			~~U~~ S	295014AA2.01 This question does not meet the KA because the applicants' are not being tested on their ability to determine or interpret reactor power because this value is already provided in the stem, i.e., 16%. Instead, the proposed question tests the applicants' knowledge of the applicability of TS 3.1.6, i.e., when rod pattern control is required. If the intent was to require the applicant to interpret reactor power, then provide a disparity between various indicated power levels and test the applicants' knowledge of which indication means power is less than 16%. 5/3/10, Reviewed again for draft submittal. Agreed with licensee's argument. Since the T.S. applicability requires knowledge of the power level, this question is considered as an original SAT.

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85	H		X			X									E S	295033G2.3.13 Distractors A&C justification referenced that EPIP-8 provided this guidance if all TVA EROs were activated. This guidance could not be confirmed. Also EPIP-8 is "Personnel Evacuation & Accountability" not "Dose Assessment". The question is misleading. #/units: Use ONLY the exact titles of procedures in NRC questions, i.e., in "A" and "C". Since the exact title of EPIP-8 makes choices "A" and "C" not plausible, then suggest incorporating another knowledge item to test associated with the required operator actions when a fuel assembly is dropped (in accordance with the AOP). The 2nd portion of the proposed test item is SRO (i.e., E-plan classification) 5/20/10 Add: Based on the above conditions, which ONE…
86	H					X									E S	203000A2.09 Replace distractor A with 1600 (0300 + 13hrs to Mode 3) vs. 1800. This is a more realistic error an operator would make. The applicant is more likely to apply the T.S. 3.5.1 clock start time from the time the ST failed for the 2nd ECCS pump than from the time the 1st pump was tagged out for maintenance. 5/20/10 Revised question per above. SAT.

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88	H												X		U S	261000G2.2.4 SRO-only knowledge cannot be claimed for questions that can be answered *solely* using knowledge of: • any AOP entry condition. • plant parameters that require direct entry to major EOPs; e.g., major Westinghouse EOPs are E0, E1, E2, E3, ECA-0.0, and Red/Orange Functional Restoration Procedures and major General Electric EOPs are Reactor Vessel Control, Primary Containment Control, Secondary Containment Control, and Radioactive Release Control. SRO-only knowledge cannot be claimed for questions that can be answered *solely* using "systems knowledge"; e.g.: • how the system works • flow path • component locations, etc. Suggest re-writing the question to test SRO applicants' knowledge of the 1) preferred location to start SGT and 2) the required LCO actions when one SGT is inoperable and one of the units is in a refueling outage and the other two units are operating at 100% power. 5/20/10 Reworded 1st question to ask what is the preferred lineup IAW OI… Accepted the question to meet the KA because to answer the question the applicant has to understand why he is using U1 or U2 instrumentation and therefore meets the KA.
89	H											X			U S	263000G2.1.28 This question does not match the KA. The question should be asking about the operability of the electrical system not the effect of a loss of the electrical system on RCIC. The question as written is an A2 KA for RCIC not a generic for the DC electrical system. 5/20/10 New question written and reviewed on site. SAT.

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91	H												X		U E S	215001G2.4.21 OPL171.023 Describe the operation of the TIP system, including automatic and manual operation. SRO-only knowledge cannot be claimed for questions that can be answered *solely* using "systems knowledge"; e.g.: • how the system works SRO-only: The proposed question can be answered using RO knowledge of AOP entry conditions and system operation. Q=KA: The proposed question does not test the applicants' ability to determine if a Group 8 signal exists, Instead, the applicant is provided with this information in the stem. Partial: An applicant could successfully argue that "A" is also correct IF OI-94 also provides steps to withdraw the TIP. Job-Link: Is the term "parked" delineated in any procedure? 5/20/10 New question provided to licensee to meet the KA. Reference will be provided with light color indications removed.
92	H											X			U S	216000A2.06 This question does not match the KA. The KA is asking for the effects a loss of power has on instrumentation. This is question is asking for the effects a Recirc pump trip has on instrument indication. Suggest writing a question testing the applicants' knowledge of which drywell pressure instruments are affected by a loss of power, including the required TS actions. 5/20/10. New question written. Reviewed on site. SAT.

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94	H														E S	G2.1.41 Core map for use as a reference with the question was not included. Is moving fuel in the SFP a core alt? If not then there is no reason to stop moving fuel as long as it stays in the SFP. Why not change to have the bundle already on the core side, possibly already a portion of the way down so that the correct answer is to insert it the rest of the way in prior to suspending core alts. 5/20/10 Reviewed on site. SAT.
95	H														S	G2.2.39 Appears to meet the KA & SRO Only criteria. SAT.
97	H														E S	G2.3.11 To clarify, the words, IAW EOI-2 need to be added. Otherwise, the candidate could argue that EOI Appendix allows use of the hardened SP vent and would be successful. Is the candidate required to know the PSP curve from memory? 5/20/10 Distractor D not valid. Doesn't pass logic test. Recommended adding 2nd part to distractors to add part to D and B for plausibility. 5/25/11 Reviewed in office. B & D distractor changed to App 15 vs App 12. SAT.
98	F												X		U S	G2.3.13 This question does not match the KA. The KA is for radiological safety concerns. The question is related to industrial safety. 5/20/10 Wrote new question to meet the KA. Reviewed on site. SAT.
99	F														S	G2.4.40 Appears to meet the KA & SRO Only criteria. SAT

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100	H					X									E S	G2.4.45 No information is provided in the stem of the question that requires the applicant to address a possible loss of fuel clad. One negative response. Why not give enough information so that two barriers lost and then you have enough different choices so to eliminate the NOT distractor. "D" is not a plausible distractor. 5/20/10 Changed stem to include "DW Press Hi" alarm and "GP 1 PCIS Logic A Success light is NOT illuminated" to make distractor D plausible.
1	H														E S	295001G2.1.7 Appears to meet the KA. Is "entering Region 1" needed as part of the question? If you left off it off, is D still plausible? 5/20/10 Verified Region 1 required.
2	F														S	295003G2.1.27 Appears to meet the KA.
3	H														E S	295004AA1.03 Appears to meet the KA. Why not ask the status of 480v SD BD B? It remains energized and is therefore more pertinent to the 4KV to 480v relationship. The question as written is leading. Why would you ask about the other 480v train unless there was a relationship that would cause a loss of power to the bus? If the 480v train is changed to the B train, the candidate might improperly assume it is fed from its own respective 4KV bus and therefore respond that it loses power. This would change the correct answer to "C". 5/20/10. Accepted question as is. SAT.

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4	H														E S	295005AA2.08 Appears to meet the KA. Could this question be rewritten so that it is not necessary to ask a two part question? Power supply choices be USST, CSST, DG, or Main Generator (i.e. give condition to interrupt whether a Main Generator trip will occur or not.) 5/20/10 Rewrote new question per recommendation above.
5	H														E S	295006AK3.03 Appears to meet the KA. No EHC information is given in the stem (Press or Alarms) to address anything other than EHC staying in Rx Press mode. The LOD on part 1 of the question is a 1. 5/20/10. Accepted question as is during review process on site.
6	H														E S	295016AA1.08 Appears to meet the KA. Could this question be rewritten so that it is not necessary to ask a two part question? (i.e., how is Rx press controlled immediately following control room abandonment: TBY in Auto, TBV in Manual, RCIC in press control mode, HPCI in press control mode?) 5/20/10 Accepted as is based upon on site review.
7	H														E S	295018AK3.07 Appears to meet the KA. Add the word “the” to the stem statement following the question. Add the word “are” to choice B to make the sentence grammatically correct. The KA is: “Due to a loss of CCW (could be RBCCW or RCW), what is the reason for cross connecting to the backup system?” The question is convoluted as written. RCW or EECW provide the heat sink for RBCCW. This is why EECW is cross connected. Part of the question for the answer given is: Why does 70-48 go close on low pressure? Could the question be written to ask only the RCW/EECW component instead of asking two questions (i.e., leave out the RBCCW piece)? 5/20/10 Changed distractor C to make more plausible. SAT.

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8	H														E S	295109AA2.02 Appears to meet the KA. Reword the question to state: "Which ONE of the following events explains the receipt of the associated alarms stated above?" 5/20/10 Changes made as noted above. SAT.
9	H					X									~~U~~ E S	295021AK2.01 Appears to meet the KA. Distractors A & D do not appear plausible. Does not pass the logic test. If RCS temp is available, why wouldn't you use it to determine stratification and If RCS temp is not accurate, why would you choose RCS temp indications as a viable method to use to determine if RCS Stratification is occurring? 5/20/10 Reviewed on site and accepted question after a minor rewording in the stem of the question. *Original question needed enhancement only.*
10	H														E S	295023AA1.03 Appears to meet the KA. There is no period at the end of distractor B. This is a bank question; it does not meet the modified criteria. What makes C plausible? All Control Rods are required to be in to move fuel and no info in stem to even address this as a possible scenario? Also, isn't rod withdrawal capability defeated as a prerequisite to moving fuel? Also, wouldn't the bundle need to be raised from the core location 1st? This needs to be added to the answer or made the correct answer. 5/20/10. Changed distractor C to make more plausible. SAT.
11	F														S	295024EK1.01 Appears to meet the KA.
12	F														E S	295025EK3.01 Appears to meet the KA. Why not use the TS Safety Limit LCO for Rx Press Safety Dome of 1325#? 5/20/10. Accepted question as is upon review on site. SAT.

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			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	H														E S	295026EA2.01 Appears to meet the KA. Does the SP temp indicator read as bulk temp? TS uses avg temp. Why does the question use “bulk”? Remove “bulk” unless necessary. 5/20/10. Accepted question with changes noted above.
14	F	1													~~U~~ S	295028EK2.01 This is a generic fundamentals question. Not appropriate for this portion of the exam. LOD=1 Upon review on site with licensee, this is a basis document question. Several misses were noted on this question due to concept errors. *Also this is to be credited as SAT and not added to the total.*
15	H?	1													U S	295030EK1.02 This is a generic fundamentals question. Not appropriate for this portion of the exam. LOD=1 Below is an example question. Also, does not pass the logic test. When would NPSH increase on lowering level? 5/25/10 Question was rewritten to require use of ECCS curves. Reviewed in office. SAT
16	F?					X									U S	295031EK1.03 1st part of A & C does not pass the logic test. If temp is decreased (maximize subcooling), how would this reduce reactor power? 2nd part of C & D implies that there is a Rx Water Level interlock for reopening the MSIVs? 5/20/10 New A&C distractor written. SAT.
17	F														S	295037EK2.13 Appears to meet the KA. Ensure that this is not double jeopardy w/ Q#13. Double jeopardy verified to be OK.

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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	H					X						X			~~U~~ S	295038G2.4.9 Does not meet the KA. Question is not dependent on low power or shutdown condition. Distractor A does not pass the logic test. 5/20/10 Reviewed on site w/licensee. Upon further review w/licensee and based on validation results from licensee this question is satisfactory as is.
19	H														E S	600000AK1.02 Appears to meet the KA. Information in the stem of the question is confusing. How much time has passed? Suggest a rewrite to include a chronological time log. Also, no information is given as to what Rx press or level is. Choice B is only dependent on DW press in the stem. Is this realistic? Listed as modified. Original question is not included. 5/20/10 Enhanced as noted above. SAT.
20	H	1	X			X									U S	700000AA1.03 Appears to meet the KA. EHC does not change generator voltage with the VR in AUTO. Also, cap banks are not used for high voltage conditions (GFES). This question was used on the last NRC exam HLT0801 Q20 (not noted on your 401-5 form in the "Last NRC Exam" section). Suggest possibly ask a frequency question this time. 5/21/10 Licensee disagrees based on validation. Need further review to determine if question can be used. 5/25/10 Revised question in office to ask what the procedure states relative to cap bank status. SAT.
21	H											X			~~U~~ E S	295002AK2.02 The 1st part of the question does not match the KA. Suggest rewriting the question so that a two part question is not needed. 5/21/10 Question rewritten per suggestion above. SAT.

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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
22	F														S	295009AK1.05 Appears to meet the KA.
23	F													N	S	295010AA1.06 Appears to meet the KA.
24	H													B	E S	295022G2.2.38 Does not appear to be any operational reasoning for the operator to choose 250 degrees F. To make the question more operational valid. Remove the IAW and remove the 1st question. Add a 2nd question to ask whether to isolate the affected CRD HCUs from service or raise drive water flow. 5/21/10 Question modified as noted above. SAT.
25	H													N	S	295029EK3.03 Appears to meet the KA. 5/21/10 This question is overlapped in scenario 3-20. This scenario is designated as the backup scenario. Therefore this question is OK for use on the written exam.
26	H													B	S	295034EA1.02 Appears to meet the KA.
27	H													N	S	295036EA2.01 Appears to meet the KA.
28	H													B	S	203000A1.01 Appears to meet the KA.
29	H													B	S	203000A1.04 Appears to meet the KA.

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			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	H													N	E S	205000K3.05 Appears to meet the KA. Not sure if “C” is plausible? If the line comes in between 2 SDC valves and you have SDC isolation, how would this not cause a loss of SPF cooling? The 2nd part of “B” states you will loose SFP if the tie comes in outside the SDC loop valves, is this plausible? 5/21/10 Reviewed again with same result. Validation showed misses for A & B. No one chose C. May need new KA. 5/25/10 Reviewed in office. Made minor change to wording. Added IAW SDC procedure to stem of question. SAT.
31	F													B	S	206000K2.02 Appears to meet the KA.
32	H													B	S	209001K1.08 Appears to meet the KA.
34	H											X		B	~~U~~/E S	212000A2.09 Appears the correct answer does not meet the KA criteria. With the mode switch in SD, App 1F & 2 would be required w/o regard to the high DW press condition. 5/21/10 Reviewed the question. Will review again on Monday as part of in office review. May need a new KA. 5/25/10 Reviewed in office and made a change to distractor C to “vent to lower DW press. Until DW press. Alarm clears. *Changed original classification to E from U after in office meeting.*
35	F													B	S	215003A4.04 Appears to meet the KA.
36	H													N	S	215003A4.05 Appears to meet the KA.

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			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	H													M	S	215004G2.2.2 Appears to meet the KA. Is this modified? Answer not shown on original question. Difficult to tell what was modified. 5/21/10. Original question provided and modified status determined.
38	H													B	S	215005K4.01 Appears to meet the KA.
39	H													N	E S	217000K6.04 The 1st part of B & D should read the same. B says “press control”. D says “pump to the CST”. Why the difference? The examinee will most likely ask also. 5/21/10 Question revised as noted above. SAT.
40	H											X		M	U S	218000K4.02 Can ADS be armed at your site? The question as written does not meet the KA. The KA is for manual ignition of ADS logic. The question is asking about manual operation of the ADS SRV, which can always be accomplished and auto ADS logic. 5/21/10 This question will be moved to question 41. A new KA will be needed for this question. 5/25/10 New question reviewed in office. Minor modification made to question to ensure it is logic based and not procedure based. SAT.
41	F											X		B	U S	218000K4.03 This inherent trait of the relief valve (valve design) and has nothing to do with ADS input logic. Q#40 could be used to satisfy this KA. 5/21/10 Replaced this question w/ Q#40 and is now SAT.
42	F													N	S	223002K1.04 Appears to meet the KA.

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			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	H					X								B	~~E~~ S	223002K1.08 C & D: 2nd part of each statement is not plausible. If no isolation signal is present, why would you have to reopen either valve? 5/21/10 Upon review with the licensee, this question is SAT.
44	F					X								N	~~U~~/E S	239002K2.01 This question seems convoluted. Not all SRVs have 2 power supplies and not all SRVs have an automatic backup. Therefore, it appears that this could lead to an argument for multiple correct answers. 5/21/10 Changed this question to SAT after on site review w/licensee.
45	H													M	S	259002G2.2.40 Appears to meet the KA.
46	F													N	~~U~~/E S	261000A1.01 This appears to be a repeat Q#88 There was another question regarding the precaution (Z) concerning the fact that all 3 trains of SBGT can be started from Unit 3, it's best to start if from Unit 2 or 2 due to instrumentation availability. 5/21/10 Reviewed Double Jeopardy concern w/licensee on site and agreed to look at changing the 1st half of this question. 5/25/10 Reviewed question in office and provided details for a new question to ensure the KA is being met. *Original question credited as an Enhancement, i.e. NOT UNSAT.* *5/26/10 Reviewed question. SAT.*

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			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
47	F	1				X								B	U S	262001K5.02 No plausibility reason given for an operator to possibly choose choices A, B, or D. D seems especially not plausible. This implies we could never operate a breaker (remotely or locally) on a loss of control power. When would a breaker trip open on a loss of control power? The operator would have to loose sight of what control power is for to even consider this as an option. LOD=1 5/21/10 Review w/licensee. I will discuss their rationale for believing the question is SAT as is with the region and provide feedback. 5/25/10 Reviewed in office. Changes made are OK. Add noun name for the 43 switch. SAT.
48	F													M	S	262002K3.08 Appears to meet the KA.
49	F													M	E S	263000A2.02 This has a low LOD for distractors C & D. Logically you would know that either choice C & D is correct. 5/21/10 Upon review on site, agreed w/licensee decision making process that C & D are plausible. 5/26/10 Changed stem to specify Battery Rooms 1, 2, & 3.
50	F													N	S	264000A3.02 Appears to meet KA.
51	F/H													B	S	264000A3.04 Appears to meet KA. Not sure I would count this as a fundamental. 5/21/10 Changed to H cognitive level.
52	H/F													N	S	300000A4.01 Appears to meet KA. 5/21/10 Changed to F cognitive level.
53	H													B	S	400000K6.05 Appears to meet KA.

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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
54	H													M	S	201002A2.04 Appears to meet KA.
55	F													B	S	215002A3.04 Appears to meet KA.
56	H					X								M	~~E~~ S	216000A1.02 Appears to meet KA. 1st part of the question is a fundamental GFES level (LOD=1). 5/21/10 Reviewed w/licensee onsite. Unable to make a determination at this time. Get branch input upon return to determine if U or just E. 5/25/10 Reviewed in office. Agreed SAT as is. Original question was SAT from original submittal.
57	F													N	S	230000A4.04 Appears to meet KA.
58	H		X	X										N	E S	233000K2.02 Appears to meet KA. Is the lead in statement needed? Is “NORMAL” needed in the 2nd statement for the fill in the blank? Reword: What is the power supply for the PREFERRED pump used for Supplemental Fuel Pool Cooling. 5/21/10 Licensee agreed with the change noted above. SAT
59	H													B	E S	234000K5.02 Appears to meet KA. Distractor B is written to imply that an auto protective function has occurred. (Remove the word “other”) 5/21/10 Licensee agreed with the change noted above. SAT

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			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
60	H													B	E S	241000K6.06 Check to verify that this question is not repeated from a previous one (Q#5). D distractor plausibility is incorrect, should say RX PRESS CONTROL. 5/21/10 Reviewed w/licensee and agreed that this is not a double jeopardy question.
61	H											X		N	U S	268000K3.04 Does not meet the KA. There is no loss or malfunction. 5/21/10 Reviewed new question on site. Appears to be SAT. Review again as part of in office review to verify. 5/25/10 Reviewed again in office. Made minor mod to question. SAT.
62	F													N	E S	272000A3.02 Does the logic require both rad monitors to be HIGH HIGH to cause the trip and isolation? 5/21/10 Reviewed on site w/licensee. Only 1 detector is required to cause a trip & isolation of the MVP. Discussed this w/licensee. Lesson material is out of date and states 2 rad detectors required. U3 mod during the last outage (2 months ago). Lesson material not up to date. SR is to be developed. 5/26/10 Revised question to ask status of MVP OG isolation valves upon receipt of HIGH HIGH condition.
63	F													N	S	286000G2.2.42 Appears to meet the KA.
64	F													N	S	290003K4.01 Appears to meet the KA.
65	F	2												B	S	002K1.12 BANK Analysis for C should state that there is no injection in the outer tube. The outer tube exist only for instrumentation purposes
66																See earlier review.

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			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			
67	F	2					X							B	E S	G2.1.27 Part: The correct answer A is a subset issue. If the actual acceptance criteria are to maintain cladding temperature < 2200 degrees, then it is also to maintain it < 2600 degrees (A). Change to 1800 °F. It's incorrect yet plausible because 1800 degrees is when DNB becomes significant. 5/21/10 Discussed w/licensee on site. With the "equal" statement as part of the answer, this could not be argued as a subset criterion.
68	F	2				X								B	E	G2.1.8 Distractors B/C/D doesn't state coordination requirements. Local supervision doesn't count as coordination. B & C are left open in that they are both correct but not complete. It is not plausible to think that an AUO could manipulate reactivity controls without a licensed operator 'D'. D is correct also if the recirc pump is uncoupled. 5/21/10 Reviewed w/licensee on site. Licensee revised original question. Changed original mark from U to E only. Licensee is still working on revision. Question will be reviewed in office next week. 5/25/10 Reviewed in office. Changes made are OK. SAT.
69	F	3										X		N	~~U~~/E S	G 2.2.37 KA is to determine operability and/or availability of safety related equipment. The question asks TS related jet pump flow mismatch limits. This is not safety related EQUIPMENT availability/operability. Is this RO required knowledge? 5/21/10 Reviewed w/licensee on site. Original question is marked as a E, not a U. Determined that this is safety related equipment. The LOD was determined to be w/i reason for an RO. SAT
70	F	3												B	S	G2.2.22 Appears to meet KA. SAT.
71	F	2										X		N	U S	G2.2.4 Does not meet the KA. The question asks you to "explain" the reason for the unit difference not the unit difference itself. 5/26/10 New question written and reviewed in office. SAT.

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			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	H	2							X					B	S	G2.3.14 Is this minutia? Are operators expected to know this from memory? 5/21/10 Reviewed w/licensee. This is relevant to operations and is sat as written.
73	H	3										X		M	U S	G2.3.5 Does not meet the KA. The KA asks for ability to use radiation monitoring systems. The question asks about using the Turbine Building Ventilation System for an elevated release. 5/21/10 Reviewed w/licensee on site. A new question will be written. 5/26/10 Reviewed new question in office. SAT.
74	F	2				X								M	S	G 2.4.20 Appears to meet KA. SAT.
75	F	2							~~X~~					M	E S	G2.4.45 MOD ~~Minutia: C is confusing as written. Rec: Change C to "is normal for current plant conditions".~~ Distractor D: Is the orange rectangle around EOI-3 entry alarms a magnetic border or a permanent border? If it is permanent, I would consider this distractor not plausible. 5/21/10 Reviewed new distractor D and approved change. SAT.

Facility: BROWNS FERRY Date of Exam: 6-17-2010 Exam Level: RO ☒ SRO ☒

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

	Printed Name/Signature	Date
a. Grader	DANIEL K. ZIELINSKI DJC	6-22-2010
b. Facility Reviewer(*)	Keith W Benefield KWB	6-22-10
c. NRC Chief Examiner (*)	Phillip G. Capehart PJC	7-12-10
d. NRC Supervisor (*)	MALCOLM T. WIDMANN	07/12/10

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