Facility: Crystal River Date of Examination: Sept. 2011

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

Target Date*	Task Description (Reference)	Chief Examiner's Initials
-180	1. Examination administration date confirmed (C.1.a; C.2.a and b)	
-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)	
-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.

2011 Crystal River NRC Exam

Facility: **Crystal River Unit #3**	Date of Exam: **09/12/11 thru 09/23/11**

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

	Printed Name / Signature	Date
a. Author	Alan Kennedy	06-27-11
b. Facility Reviewer (*)	Mark VanSicklen	06-27-11
c. NRC Chief Examiner (#)	MARK A. BATES	07-06-2011
d. NRC Supervisor	MALCOLM T. WIDMANN	07/12/11

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

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 **09/12/11 thru 10/05/11** 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 **09/12/11 thru 10/05/11**. 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.	ALAN KENNEDY	SNOI / AUTHOR		12/16/10		09/22/11
2.	Guy McCallum	SRO / VALIDATION		1-21-11		10-04-11
3.	Jim Gregitus	SNOI / AUTHOR		3-15-11		9/22/11
4.	A. Lee Linton	Sim Eng / Maint.		3/31/11		9/22/11
5.	TRUC DUONG	Sim ENG /		3/31/11		9/22/11
6.	Mark Van Sickle	SOT / VALIDATION APPROVAL		4/4/11		9/22/11
7.	Daniel Bacon	Sim Engineer		4/4/11		9/22/11
8.	Doug Blackburn	NO / Validator		4-20-11		10/10/-11

NOTES:

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	PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE	NOTE
1.	Ronald Tyrie	Supt, OPS SUPT. NRC / VALIDATOR	RDTyrie	5/3/11	RDTyrie	9/24/11	
2.	Brandon Webster	CNO / VALIDATOR		5.3.11		9.22.11	
3.	Leon A. Gagne	Senior Nuclear Ops Spec	Leon A. Gagné	5/5/11	Leon A. Gagné	10/17/11	
4.	Robert Bolin	BNP Fleet Reviewer	Robert Bolin	5/10/11	Bob Bolin per email	9-29-11	
5.	Jeffrey Smith	RNP Fleet Reviewer		5/10/11	Jeffrey Smith per email	9-29-11	
6.	MOFFATT, Larry	Shift Technical Advis		5/18/11		9/25/11	
7.	John D Taylor	Supv. System Engineering		6/1/11		11/5/11	
8.	Randy OATES	Sr. Nucl Ops Spec	Stuart R. Oates	4/9/11	Stuart R. Oates	10/24/11	

NOTES:

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	PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE	NOTE
1.	RUSSELL GERHARDT	CNO		6-13-11		9-26-11	
2	Christopher Yavashevich	STA		6/15/11		9/26/11	
3.	Cathy Hobbs	Admin	Cathy Hobbs	6/21/11	Cathy Hobbs	9/22/11	
4.	Michael S. Kelly	Mgr Shf Ops		6/25/11		9/22/11	
5.	BRYAN WOOTEN	STA		7/7/11		10/10/11	
6.	Rick Virgin	CRS		7-7-11		9/26/11	
7.	R. Llewellyn	SOCT		7-14-11		9-22-11	
8.	Rod Johnson	RO		7-15-11		10/7/11	

NOTES:

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	PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE NOTE
1.	WA Krehely	STA	WA Krehely	7.18.11	WA Krehely	10.10.2011
2.	WF Kisner Jr	STA	William F Kisner Jr	7-18-11	WF Kisner Jr	9/26/11
3.	S.E. Chapin	EP	Stephen E Chapin	7/26/11	Stephen E Chapin	9/26/11
4.	RE. RAWLS	STA		7/26/11		10/4/11
5.	T.L. Clark	Clerk		7/29/11		9/26/11
6.	J.A. FRANKE	VP		8/12/11		9/22/11
7.	S L Betts	RO	S L Betts	9/27/11	S L Betts	9/26/11
8.	A.M. Barnes	CRS	A M Barnes	9-1-11	A M Barnes	10-3-11

NOTES:

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	PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE NOTE
1.	D. McAtee	CRS / OPS		9.6.11		9.29.11
2.	Christopher A. Bell	SoIT		9/11/11		9/22/11
3.	Gregory Sutter	SNOTI		9-12-11		9-26-11
4.	Jason Cook	SS Instructor		9/12/11		9/26/11
5.	Phyllis Dixon	CR3 Trng Mgr		9/12/11		9/26/11
6.	Gary Sanford	Instructor / Booth		9/12/11		9/22/11
7.	Blair Wunderly	Operations Mgr.		9/13/11		10/3/11
8.	Steve Carter	Instructor		9/12/11		9-22-11

NOTES:

Facility:	Crystal River Unit #3	Date of Exam:	09/12/11 thru 09/29/11
Examination Level:	RO ☒ SRO ☒	Operating Test Number:	1 **(NRC)**

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R	**RO & SRO** – (CO1) – Perform an RCS boron change calculation. *K/A – G2.1.37 RO 4.3 SRO 4.6* OP-304
Conduct of Operations	D, R	**RO & SRO** – (CO2) – Calculate SDM with a misaligned rod. *K/A – G2.1.7 RO 4.4 SRO 4.7* **SRO Only** – After completing the SDM calculation determine required ITS actions, if any. *K/A – G2.2.40 SRO 4.7* SP-421
Equipment Control	M, R	**RO & SRO** – (EC1) – Perform a QPTR calculation. *K/A – G2.2.12 RO 3.7 SRO 4.1* **SRO Only** – After completing the QPTR calculation determine required ITS actions, if any. *K/A – G2.2.40 SRO 4.7* SP-303
Radiation Control	D, R	**RO & SRO** – (RC1) – Determine stay times using survey maps. *K/A – G2.3.4 RO 3.2 SRO 3.7* DOS-NGGC-0004
Emergency Procedures / Plan	D, P, R	**SRO Only** – (EP1) – Determine Emergency Action Level and Protective Action Recommendations. *K/A – 2.4.41 SRO 4.6* *K/A – 2.4.44 SRO 4.4* EM-202

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

* Type Codes & Criteria:

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

Facility: Crystal River Unit #3	Date of Exam: 09/12/11 thru 09/23/11
Exam Level: RO ☒ SRO-I ☒ SRO-U ☒	Operating Test Number: 1 **(NRC)**

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.	CRDS – Perform actions of AP-504 K/A – 001A4.15 RO 3.1 SRO 3.1 (AP-504)	**[RO]**	D, S	1
b.	ESFAS – Respond to an ES Actuation K/A – BW/E03EA1.1 RO 4.1 SRO 3.8 (EOP-3)	**[SRO-U]** **[RO, SRO-I]**	A, EN, N, S	4 Primary
c.	PPCS – Respond to a stuck open PZR spray valve K/A – 010A4.01 RO 3.7 SRO 3.5 (AP-520)	**[RO, SRO-I]**	A, D, L, P, S	3
d.	EFW – Establish Auxiliary Feedwater flow K/A – 061G2.1.20 RO 4.6 SRO 4.6 (EOP-04)	**[RO, SRO-I]**	N, S	4 Secondary
e.	CSS – Initiate Reactor Building Spray K/A – 026A3.01 RO 4.3 SRO 4.5 (EM-225C)	**[SRO-U]** **[RO, SRO-I]**	A, L, M, S	5
f.	EDG – Synchronize Off-Site Power with EDG-1A K/A – 064A4.09 RO 3.2 SRO 3.3 (AP-770)	**[RO, SRO-I]**	D, S	6
g.	CWS – Start CWP-1C While at Power K/A – 075G2.1.31 RO 4.2 SRO 3.9 (OP-604)	**[SRO-U** **[RO, SRO-I]**	A, D, P, S	8
h.	WGS – Respond to a Waste Gas Header leak K/A – 060AA2.05 RO 3.7 SRO 4.2 (AP-250)	**[RO, SRO-I]**	A, D, S	9
SPARE	MU – Restart a MUP following an RCS leak isolation K/A – 002A2.01 RO 4.3 SRO 4.4 (AP-520)		D, S	2

In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)*

i.	ECCS – Respond to a CFT Low Pressure condition K/A – 006A1.13 RO 3.5 SRO 3.7 (AP-404)	**[SRO-U]** **[RO, SRO-I]**	D, E, L, R	3
j.	HRPS – Place a Hydrogen Analyzer in Service K/A – 028A4.03 RO 3.1 SRO 3.3 (EOP-14)	**[RO, SRO-I]**	A, D, E, L	5
k.	WGDS – Perform a Waste Gas Release to the RB K/A – 071G2.3.11 RO 3.8 SRO 4.3 (OP-412A)	**[SRO-U]** **[RO, SRO-I]**	D, R	9
SPARE	FS/OTSG – Transfer excess secondary inventory to FST K/A – 038EK3.06 RO 4.2 SRO 4.5 (EOP-14, Enc. 9)		D, E	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	(control room system)	- / - / ≥ 1
(L)ow Power / Shutdown		≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1 (A)		≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	(randomly selected)	≤ 3 / ≤ 3 / ≤ 2
(R)CA		≥ 1 / ≥ 1 / ≥ 1
(S)imulator		

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

2011 Crystal River NRC Exam

Facility: **Crystal River Unit 3** Date of Exam: **09/12/11 thru 09/23/11** Operating Test No: **1**

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

		Printed Name / Signature	Date
a.	Author	Alan Kennedy	07/25/11
b.	Facility Reviewer(*)	Mark VanSicklen	07/26/11
c.	NRC Chief Examiner (#)	Phillip G Capehart	8/25/11
d.	NRC Supervisor	MALCOLM T. WIDMANN	09/09/11

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

Facility: Crystal River Unit #3	Date of Exam: **09/12/11 thru 09/23/11**
Scenario Numbers: 1 / 2 / 3 / 4	Operating Test Number: 1 **(NRC)**

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

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

Facility: **Crystal River #3** Date of Exam: **09/12/11 thru 09/23/11** Operating Test No.: 1

APPLICANT	EVENT TYPE	Scenarios – **SRO-I3, SRO-I4, RO-5**												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I **I-3** ■ SRO-U ☐	RX	4				6								2	1	1	0
	NOR														1	1	1
	I/C	1/5/8				5/8		3/4/7			2/5/8			11	4	4	2
	MAJ	7				7		5			6			4	2	2	1
	TS	2/3						1/2			1/4			6	0	2	2
RO ☐ SRO-I **I-4** ■ SRO-U ☐	RX		4		6							5		3	1	1	0
	NOR				1									1	1	1	1
	I/C		1/5/6		4/5/10					1/3/4/7		2/3/8		13	4	4	2
	MAJ		7		7					5		6		4	2	2	1
	TS				2/3									2	0	2	2
RO **RO-5** ■ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR						1						5	2	1	1	1
	I/C			2/3/8			4/9/10		1/4/6				1/4/7	12	4	4	2
	MAJ			7			7		5				6	4	2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

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

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

Facility: **Crystal River #3** Date of Exam: **09/12/11 thru 09/23/11** Operating Test No.: 1

APPLICANT	EVENT TYPE	Scenarios – **SRO-I1 & I2, RO-1, RO-2, RO-3 & RO-4**												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I **I1 & 2** ■ SRO-U ☐	RX	4			6									2	1	1	0
	NOR				1									1	1	1	1
	I/C	1/5/8			4/5/10				1/4/6		2/5/8			12	4	4	2
	MAJ	7			7				5		6			4	2	2	1
	TS	2/3			2/3						1/4			6	0	2	2
RO **RO-1 & 3** ■ SRO-I ☐ SRO-U ☐	RX		4		5							5		3	1	1	0
	NOR						1							1	1	1	1
	I/C		1/5/6				4/9/10					2/3/8		9	4	4	2
	MAJ		7				7					6		3	2	2	1
	TS														0	2	2
RO **RO-2 & 4** ■ SRO-I ☐ SRO-U ☐	RX					6								2	1	1	0
	NOR												5	1	1	1	1
	I/C			2/3/8		5/8				1/3/4/7			1/4/7	12	4	4	2
	MAJ			7		7				5			6	4	2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

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

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

Facility: **Crystal River #3** Date of Exam: **09/12/11 thru 09/23/11** Operating Test No.: 1

APPLICANT	EVENT TYPE	Scenarios – **SRO-U1 & SRO-U2**												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I ☐ SRO-U ■	RX														1	1	0
	NOR														1	1	1
	I/C							3/4/7			2/5/8			6	4	4	2
	MAJ							5			6			2	2	2	1
	TS							1/2			1/4			4	0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

3. 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.

4. 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.

2011 Crystal River NRC Exam

ES-301 **Competencies Checklist** **Form ES-301-6**

Facility: Crystal River #3	Date of Exam:09/12/11 thru 09/23/11	Operating Test No.: 1

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

Notes:

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

Instructions:

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

Facility:	**Crystal River Unit #3**	Date of Exam:	**September, 2011**

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**				N/A					N/A			**18**	3		3		**6**
	2												**9**	2		2		**4**
	Tier Totals												**27**	5		5		**10**
2. Plant Systems	**1**												**28**	3		2		**5**
	2												**10**		2	1		**3**
	Tier Totals												**38**	5		3		**8**
3. Generic Knowledge and Abilities Categories		**1**		**2**		**3**		**4**					**10**	**1**	**2**	**3**	**4**	**7**
														2	2	1	2	

Note:

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

ES-401 PWR Examination Outline Form ES-401-2

Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR
007 (BW/E02 & E10) Reactor Trip – Stabilization – Recovery - 1					X		007EA2.04 - Ability to determine or interpret the following as they apply to a reactor trip: If reactor should have tripped but has not done so, manually trip the reactor and carry out actions in ATWS EOP **(not linked to 10CFR55.43)**	4.6
008 Pressurizer Vapor Space Accident / 3								
009 Small Break LOCA / 3								
011 Large Break LOCA / 3								
015/17 RCP Malfunctions /4								
022 Loss of Rx Coolant Makeup / 2								
025 Loss of RHR System / 4								
026 Loss of Component Cooling Water / 8								
027 PZR Pressure Control System Malfunction / 3								
029 ATWS / 1								
038 Steam Generator Tube Rupture / 3						X	038EG2.4.20 - Knowledge of operational implications of EOP warnings, cautions, and notes: Steam Generator Tube Rupture	4.3
040 (BW/E05) Steam Line Rupture – Excessive Heat Transfer / 4					X		BW/E05EA2.1 - Ability to determine and interpret the following as they apply to Excessive Heat Transfer: Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	4.2
054 Loss of Main Feedwater / 4								

ES-401 PWR Examination Outline Form ES-401-2

Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR
055 Station Blackout / 6								
056 Loss of Offsite Power / 6								
057 Loss of Vital AC Instrument Bus / 6					X		057AA2.06 - Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: AC instrument bus alarms for the inverter and alternate power source.	3.7
058 Loss of DC Power / 6								
062 Loss of Nuclear Services Water / 4 (Raw Water/RW)						X	062AG2.2.36 - Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations: Loss of Nuclear Services Water (RW)	4.2
065 Loss of Instrument Air / 8								
BW/E04 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4								
077 Generator Voltage and Electric Grid Disturbances / 6						X	077AG2.2.37 - Ability to determine operability and/or availability of safety related equipment: Generator voltage and electric grid disturbances	4.6
K/A Category Totals					3	3	Group Point Total	18/6

ES-401 PWR Examination Outline Form ES-401-2

Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR
001 Continuous Rod Withdrawal / 1								
003 Dropped Control Rod / 1					X		003AA2.02 - Ability to determine and interpret the following as they apply to the Dropped Control Rod: Signal inputs to rod control system	2.8
005 Inoperable/Stuck Rod / 1								
024 Emergency Boration / 1								
028 PZR Level Malfunction / 2								
032 Loss of Source Range NI / 7								
033 Loss of Intermediate Range NI / 7								
036 (BW/A08) Fuel Handling Accident / 8								
037 Steam Generator Tube Leak / 3								
051 Loss of Condenser Vacuum / 4					X		051AA2.02 - Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: Conditions requiring reactor and/or turbine trip	4.1
059 Accidental Liquid RadWaste Rel. / 9								
060 Accidental Gaseous Radwaste Rel. / 9								
061 ARM System Alarms / 7								

ES-401 PWR Examination Outline Form ES-401-2
Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR
067 Plant Fire On-site / 8								
068 (BW/A06) Control Room Evac. / 8								
069 Loss of CTMT Integrity / 5								
074 Inad. Core Cooling / 4								
076 High Reactor Coolant Activity / 9								
BW/A01 Plant Runback / 1								
BW/A02&A03 Loss of NNI-X/Y / 7								
BW/A04 Turbine Trip / 4								
BW/A05 Emergency Diesel Actuation / 6						X	BW/A05AG2.2.12 - Knowledge of surveillance procedures: Emergency Diesel actuation	4.1
BW/A07 Flooding / 8								
BW/E03 Inadequate Subcooling Margin / 4								
BW/E08 LOCA Cooldown - Depress. / 4						X	BW/EO8EG2.4.18 - Knowledge of the specific bases for EOPs: LOCA Cooldown / Depressurization	4.0
BW/E09 Natural Circ. / 4								
K/A Category Totals					2	2	Group Point Total	9/4

ES-401 **PWR Examination Outline** **Form ES-401-2**
Plant Systems – Tier 2 / Group 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
003 Reactor Coolant Pump / 4													
004 Chemical and Volume Control / 1 & 2													
005 Residual Heat Removal / 4													
006 Emergency Core Cooling / 2 & 3													
007 PZR Relief/Quench Tank / 5													
008 Component Cooling Water / 8											X	008G2.4.41 - Knowledge of the emergency action level thresholds and classifications: SW / DC cooling	4.6
010 Pressurizer Pressure Control / 3								X				010A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Heater failures	3.6
012 Reactor Protection / 7													
013 Engineered Safety Features Actuation / 2													
022 Containment Cooling / 5								X				022A2.02 - Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Fan motor vibration	2.6

ES-401	PWR Examination Outline Plant Systems – Tier 2 / Group 1	Form ES-401-2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR
026 Containment Spray / 5								X				026A2.08 - Ability to (a) predict the impacts of the following malfunctions or operations on the BSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Safe securing of containment spray, when it can be done	3.7
039 Main and Reheat Steam / 4													
059 Main Feedwater / 4											X	059G2.1.25 - Ability to interpret reference materials, such as graphs, curves, tables, etc.: Main Feedwater	4.2
061 Auxiliary / Emergency Feedwater / 4													
062 AC Electrical Distribution / 6													
063 DC Electrical Distribution / 6													
064 Emergency Diesel Generator / 6													
073 Process Radiation Monitoring / 7													
076 Service Water / 4													
078 Instrument Air / 8													
103 Containment / 5													
K/A Category Totals								3			2	Group Point Total	28/5

ES-401	PWR Examination Outline Plant Systems – Tier 2 / Group 1	Form ES-401-2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR
034 Fuel Handling Equipment / 8													
035 Steam Generator / 4													
041 Steam Dump/Turbine Bypass Control / 4													
045 Main Turbine Generator / 4													
055 Condenser Air Removal / 4													
056 Condensate / 4													
068 Liquid Radwaste / 9													
071 Waste Gas Disposal / 9											X	071G2.2.38 – Knowledge of conditions and limitations in the facility license: Waste Gas disposal	4.5
072 Area Radiation Monitoring / 7													
075 Circulating Water / 8													
079 Station Air / 8													
086 Fire Protection / 8													
K/A Category Totals								2			1	Group Point Total	10/3

ES-401	PWR Examination Outline Plant Systems – Tier 2 / Group 2	Form ES-401-2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR
001 Control Rod Drive / 1													
002 Reactor Coolant / 2 & 4													
011 Pressurizer Level Control / 2													
014 Rod Position Indication / 1													
015 Nuclear Instrumentation / 7								X				015A2.05 - Ability to (a) predict the impacts of the following malfunctions or operations on the NIS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Core void formation	3.8
016 Non-nuclear Instrumentation / 7													
017 In-core Temperature Monitor / 7													
027 Containment Iodine Removal / 5													
028 Hydrogen Recombiner and Purge Control / 5													
029 Containment Purge / 8								X				029A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Maintenance or other activity taking place inside containment	3.6
033 Spent Fuel Pool Cooling / 8													

SRO – 2011 – Crystal River 3

Facility:	Crystal River Unit #3		Date of Exam:	September, 2011		
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.15	Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, Operations memos, etc. (not linked to 10CFR55.43)			3.4	1
	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup. (not linked to 10CFR55.43)			4.3	1
	Subtotal					**2**
2. Equipment Control	2.2.7	Knowledge of the process for conducting special or infrequent tests.			3.6	1
	2.2.19	Knowledge of maintenance work order requirements.			3.4	1
	Subtotal					**2**
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.			3.7	1
	Subtotal					**1**
4. Emergency Procedures / Plan	2.4.8	Knowledge of how abnormal operating procedures are used in conjunction with EOPs.			4.5	1
	2.4.34	Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects.			4.1	1
	Subtotal					**2**
Tier 3 Point Total				10		**7**

Facility:	**Crystal River Unit #3**	Date of Exam:	**September, 2011**

Tier	Group	RO K/A Category Points											SRO-Only Points		
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	TOTAL	A2	G*	TOTAL
1. Emergency & Abnormal Plant Evolutions	**1**	3	3	3	N/A			3	3	N/A		3	**18**			**6**
	2	2	2	1				2	1			1	**9**			**4**
	Tier Totals	5	5	4				5	4			4	**27**			**10**
2. Plant Systems	**1**	2	3	3	3	2	2	3	2	3	3	2	**28**			**5**
	2	1	1	1	1	1	1	0	1	1	1	1	**10**			**3**
	Tier Totals	3	4	4	4	3	3	3	3	4	4	3	**38**			**8**

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

Note:

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

ES-401	PWR Examination Outline	Form ES-401-2

Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR
007 (BW/E02 & E10) Reactor Trip – Stabilization – Recovery – 1			X				007EK3.01 - Knowledge of the reasons for the following as they apply to a reactor trip: Actions contained in EOP for reactor trip	4.0
008 Pressurizer Vapor Space Accident / 3			X				008AK3.02 - Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: Why PORV or code safety exit temperature is below RCS or PZR temperature	3.6
009 Small Break LOCA / 3	X						009EK1.01 - Knowledge of the operational implications of the following concepts as they apply to the Small Break LOCA: Natural circulation and cooling, including reflux boiling	4.2
011 Large Break LOCA / 3		X					011EK2.02 - Knowledge of the interrelations between the Large Break LOCA and the following: Pumps	2.6
015/17 RCP Malfunctions /4						X	015/017AG2.4.46 - Ability to verify that the alarms are consistent with the plant conditions: RCP malfunctions	4.2
022 Loss of Rx Coolant Makeup / 2								
025 Loss of RHR System / 4	X						025AK1.01 - Knowledge of the operational implications of the following concepts as they apply to Loss of Decay Heat Removal System: Loss of DH System during all modes of operation	3.9
026 Loss of Component Cooling Water / 8								
027 PZR Pressure Control System Malfunction / 3					X		027AA2.15 - Ability to determine and interpret the following as they apply to the Pressurizer Pressure Control Malfunctions: Actions to be taken if PZR pressure instrument fails high	3.7

ES-401	PWR Examination Outline	Form ES-401-2
	Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1	

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR
029 ATWS / 1		X					029EK2.06 - Knowledge of the interrelations between the ATWS and the following: Breakers, relays and disconnects	2.9
038 Steam Generator Tube Rupture / 3				X			038EA1.32 - Ability to operate and monitor the following as they apply to a SGTR: Isolation of a ruptured S/G	4.6
040 (BW/E05) Steam Line Rupture – Excessive Heat Transfer / 4						X	040AG2.4.3 – Ability to identify post-accident instrumentation: Steam Line Rupture.	3.7
054 Loss of Main Feedwater / 4				X			054AA1.04 - Ability to operate and /or monitor the following as they apply to the Loss of Main Feedwater (MFW): HPI, under total feedwater loss conditions	4.4
055 Station Blackout / 6			X				055EK3.01 - Knowledge of the reasons for the following responses as the apply to the Station Blackout: Length of time for which battery capacity is designed	2.7
056 Loss of Offsite Power / 6	X						056AK1.04 - Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power: Definition of saturation conditions, implication for the systems	3.1
057 Loss of Vital AC Instrument Bus / 6								
058 Loss of DC Power / 6						X	058AG2.4.9 - Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of DH) mitigation strategies: Loss of DC Power	3.8
062 Loss of Nuclear Services Water / 4					X		062AA2.02 - Ability to determine and interpret the following as they apply to the Loss of Raw Water: The cause of possible RWS loss	2.9
065 Loss of Instrument Air / 8					X		065AA2.01 - Ability to determine and interpret the following as they apply to the Loss of Instrument Air: Cause and effect of low pressure instrument air alarm	2.9

ES-401	PWR Examination Outline							Form ES-401-2
Emergency and Abnormal Plant Evolutions – Tier 1 / Group 1								
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**
BW/E04 Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4		X					BW/E04EK2.2 - Knowledge of the interrelations between the (Inadequate Heat Transfer) and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	4.2
077 Generator Voltage and Electric Grid Disturbances / 6				X			077AA1.03 – Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: Voltage regulator controls	3.8
K/A Category Totals	3	3	3	3	3	3	Group Point Total	18

ES-401	PWR Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2						Form ES-401-2
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**
001 Continuous Rod Withdrawal / 1								
003 Dropped Control Rod / 1			X				003AK3.06 - Knowledge of the reasons for the following responses as they apply to the Dropped Control Rod: Reset of relative position indication to zero	2.7
005 Inoperable/Stuck Rod / 1	X						005AK1.06 - Knowledge of the operational implications of the following concepts as they apply to Inoperable / Stuck Control Rod: Bases for power limit for rod misalignment	2.9
024 Emergency Boration / 1								
028 PZR Level Malfunction / 2				X			028AA1.02 - Ability to operate and / or monitor the following as they apply to the Pressurizer Level Control Malfunctions: MU & P System	3.4
032 Loss of Source Range NI / 7		X					032AK2.01 - Knowledge of the interrelations between the Loss of Source Range Nuclear Instrumentation and the following: Power supplies, including proper switch positions **(Electrical interlocks - PR or IR failures de-energizing SR OK per MAB, 2-23-11)**	2.7
033 Loss of Intermediate Range NI / 7								
036 (BW/A08) Fuel Handling Accident / 8								
037 Steam Generator Tube Leak / 3								
051 Loss of Condenser Vacuum / 4								
059 Accidental Liquid RadWaste Rel. / 9								

ES-401	PWR Examination Outline	Form ES-401-2
Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2		

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR
060 Accidental Gaseous Radwaste Rel. / 9								
061 ARM System Alarms / 7								
067 Plant Fire On-site / 8								
068 (BW/A06) Control Room Evac. / 8								
069 Loss of CTMT Integrity / 5		X					069AK2.03 - Knowledge of the interrelations between the Loss of Reactor Building Integrity and the following: Personnel access hatch and equipment access hatch	2.8
074 Inad. Core Cooling / 4								
076 High Reactor Coolant Activity / 9								
BW/A01 Plant Runback / 1								
BW/A02&A03 Loss of NNI-X/Y / 7				X			BW/A02AA1.2 - Ability to operate and / or monitor the following as they apply to the Loss of NNI-X: Operating behavior characteristics of the facility.	3.4
BW/A04 Turbine Trip / 4								
BW/A05 Emergency Diesel Actuation / 6								
BW/A07 Flooding / 8	X						BW/A07AK1.2 - Knowledge of the operational implications of the following concepts as they apply to Flooding: Normal, abnormal and emergency operating procedures associated with Flooding.	3.3

ES-401	PWR Examination Outline						Form ES-401-2	
Emergency and Abnormal Plant Evolutions – Tier 1 / Group 2								
E/APE # / Name / Safety Function	**K 1**	**K 2**	**K 3**	**A 1**	**A 2**	**G**	**K/A Topic(s)**	**IR**
BW/E03 Inadequate Subcooling Margin / 4					X		BW/E03EA2.2 - Ability to determine and interpret the following as they apply to Inadequate Subcooling Margin: Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	3.5
BW/E08 LOCA Cooldown - Depress. / 4								
BW/E09 Natural Circ. / 4						X	BW/E09EG2.4.6 - Knowledge of EOP mitigation strategies: Natural Circulation	3.7
BW/E13&E14 EOP Rules and Enclosures								
K/A Category Totals	2	1	2	2	1	1	Group Point Total	9

ES-401	PWR Examination Outline Plant Systems – Tier 2 / Group 1											Form ES-401-2	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**
003 Reactor Coolant Pump / 4									X			003A3.01 - Ability to monitor automatic operation of the RCPS including: Seal injection flow.	3.3
004 Chemical and Volume Control / 1 & 2 (MU & P System)	X											004K1.35 – Knowledge of the physical connections and/or the cause-effect relationships between the MU & P system and the following system: Understanding of interface with the LRS (Liquid Radwaste System)	2.5
							X					004A1.03 – Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MU & P controls including: RCS pressure	3.8
005 Residual Heat Removal / 4							X					005A1.01 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the DHR system controls including: Heatup / cooldown rates	3.5
										X		005A4.05 - Ability to manually operate and/or monitor in the control room: Position of BWST recirculation valve (locked when not in use, continuously monitored when in use).	2.8
006 Emergency Core Cooling / 2 & 3				X								006K4.18 - Knowledge of ECCS design feature(s) and/or interlock(s) which provide for the following: Valves normally isolated from their control power	3.6
007 PZR Relief/Quench Tank / 5 (RCDT)					X							007K5.02 - Knowledge of the operational implications of the following concepts as they apply to the RCDT: Method of forming a steam bubble in the PZR	3.1
008 Component Cooling Water / 8		X										008K2.02 - Knowledge of bus power supplies to the following: SW / DC pump, including emergency backup	3.0

ES-401	PWR Examination Outline Plant Systems – Tier 2 / Group 1											Form ES-401-2	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**
(SW & DC)			X									008K3.01 - Knowledge of the effect that a loss or malfunction of the SWS / DCS will have on the following: Loads cooled by SWS / DCS	3.4
010 Pressurizer Pressure Control / 3							X					010A1.07 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR PCS controls including: RCS pressure.	3.7
012 Reactor Protection / 7						X						012K6.04 - Knowledge of the effect of a loss or malfunction of the following will have on the RPS: Bypass-block circuits	3.3
013 Engineered Safety Features Actuation / 2					X							013K5.02 - Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Safety system logic and reliability.	2.9
022 Containment Cooling / 5		X										022K2.01 - Knowledge of power supplies to the following: Reactor Building cooling fans	3.0
026 Containment Spray / 5	X											026K1.01 - Knowledge of the physical connections and/or cause-effect relationships between the BSS and the following systems: ECCS	4.2
				X								026K4.02 - Knowledge of BSS design feature(s) and/or interlock(s) which provide for the following: Neutralized boric acid to reduce corrosion and remove inorganic fission product iodine from steam (TSP) in reactor building spray	3.1
039 Main and Reheat Steam / 4								X				039A2.03 - Ability to (a) predict the impacts of the following malfunctions or operations on the MRSS; and (b) based on predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Indications and alarms for main steam and area radiation monitors (during SGTR)	3.4

ES-401	PWR Examination Outline Plant Systems – Tier 2 / Group 1											Form ES-401-2	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**
059 Main Feedwater / 4									X			059A3.06 - Ability to monitor automatic operation of the MFW, including: Feedwater isolation	3.2
061 Auxiliary / Emergency Feedwater / 4		X										061K2.01 - Knowledge of bus power supplies to the following: EFW system MOVs	3.2
062 AC Electrical Distribution / 6			X									062K3.03 - Knowledge of the effect that a loss or malfunction of the AC distribution system will have on the following: DC system	3.7
063 DC Electrical Distribution / 6			X									063K3.02 - Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: Components using DC control power	3.5
				X								063K4.01 - Knowledge of DC electrical system design feature(s) and/or interlock(s) which provide for the following: Manual/automatic transfers of control	2.7
064 Emergency Diesel Generator / 6									X			064A3.02 - Ability to monitor automatic operation of the ED/G system, including: Minimum time for load pickup **(MCB indications / MVAR loading limits / how to adjust if outside of limits. OK per MAB, 02-23-11)**	3.4
						X						064K6.08 - Knowledge of the effect that a loss or malfunction of the following will have on the ED/G system: Fuel oil storage tanks	3.2
073 Process Radiation Monitoring / 7										X		073A4.03 - Ability to manually operate and/or monitor in the control room: Check source for operability demonstration (same KA as 2009 NRC)	3.1
											X	073G2.4.3 – Ability to identify post-accident instrumentation: Process radiation monitoring system	3.7

ES-401	PWR Examination Outline Plant Systems – Tier 2 / Group 1											Form ES-401-2	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**
076 Service Water / 4 (RW / CW)											X	076G2.1.28 - Knowledge of the purpose and function of major system components and controls: RW / CW system	4.1
078 Instrument Air / 8										X		078A4.01 - Ability to manually operate and/or monitor in the control room: Pressure gauges	3.1
103 Containment / 5								X				103A2.05 - Ability to (a) predict the impacts of the following malfunctions or operations on the reactor building system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Emergency reactor building entry	2.9
K/A Category Totals	2	3	3	3	2	2	3	2	3	3	2	Group Point Total	28

ES-401	PWR Examination Outline Plant Systems – Tier 2 / Group 2											Form ES-401-2	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**
001 Control Rod Drive / 1					X							001K5.88 – Knowledge of the following operational implications as they apply to the CRDS: Effects of boron on the temperature coefficient. **(Effects of temperature change on boron concentration (makeup demins) / relationship to rod movement. OK per MAB, 02-23-11)**	2.9
002 Reactor Coolant / 2 & 4													
011 Pressurizer Level Control / 2			X									011K3.03 - Knowledge of the effect that a loss or malfunction of the PZR LCS will have on the following: PZR PCS	3.2
014 Rod Position Indication / 1				X								014K4.06 - Knowledge of RPIS design feature(s) and/or interlock(s) which provide for the following: Individual and group misalignment.	3.4
015 Nuclear Instrumentation / 7													
016 Non-nuclear Instrumentation / 7													
017 In-core Temperature Monitor / 7										X		017A4.01 - Ability to manually operate and/or monitor in the control room: Actual in-core temperatures	3.8
027 Containment Iodine Removal / 5													
028 Hydrogen Recombiner and Purge Control / 5													
029 Containment Purge / 8	X											029K1.04 - Knowledge of the physical connections and/or cause-effect relationships between the Containment Purge System and the following systems: Purge System **(Interlocks between purge valves/purge fans / containment rad monitors OK per MAB, 02-23-11)**	3.0

ES-401	PWR Examination Outline Plant Systems – Tier 2 / Group 2											Form ES-401-2	
System # / Name	**K 1**	**K 2**	**K 3**	**K 4**	**K 5**	**K 6**	**A 1**	**A 2**	**A 3**	**A 4**	**G**	**K/A Topic(s)**	**IR**
033 Spent Fuel Pool Cooling / 8													
034 Fuel Handling Equipment / 8								X				034A2.03 - Ability to (a) predict the impacts of the following malfunctions or operations on the Fuel Handling System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Mispositioned fuel element	3.3
035 Steam Generator / 4													
041 Steam Dump/Turbine Bypass Control / 4									X			041A3.05 - Ability to monitor automatic operation of the Turbine Bypass Valves, including: Main steam pressure	2.9
045 Main Turbine Generator / 4											X	045G2.4.6 - Knowledge of EOP mitigation strategies: Main turbine generator	3.7
055 Condenser Air Removal / 4													
056 Condensate / 4													
068 Liquid Radwaste / 9						X						068K6.10 - Knowledge of the effect of a loss or malfunction on the following will have on the Liquid Radwaste System: Radiation monitors	2.5
071 Waste Gas Disposal / 9													
072 Area Radiation Monitoring / 7													
075 Circulating Water / 8		X										075K2.03 - Knowledge of bus power supplies to the following: Emergency / essential RW System pumps	2.6
079 Station Air / 8													
086 Fire Protection / 8													
K/A Category Totals	1	1	1	1	1	1	0	1	1	1	1	Group Point Total	10

RO – 2011 – Crystal River 3

Facility:	Crystal River Unit #3		Date of Exam:	September, 2011		
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.6	Ability to manage the control room crew during plant transients.	3.8	1		
	2.1.19	Ability to use plant computers to evaluate system or component status.	3.9	1		
	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.3	1		
	Subtotal			**3**		
2. Equipment Control	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.6	1		
	2.2.17	Knowledge of the process for managing maintenance activities during power operations.	2.6	1		
	2.2.21	Knowledge of pre- and post-maintenance operability requirements.	2.9	1		
	Subtotal			**3**		
3. Radiation Control	2.3.7	Ability to comply with radiation work permit requirements during normal or abnormal conditions.	3.5	1		
	2.3.11	Ability to control radiation releases.	3.8	1		
	Subtotal			**2**		
4. Emergency Procedures / Plan	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.5	1		
	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	4.2	1		
	Subtotal			**2**		
Tier 3 Point Total				**10**		7

RO – 2011- Crystal River 3

Tier/ Group	Randomly Selected K/A	Reason for Rejection
1/1	027AA2.14	Not applicable to CR3. PZR PCS has no effect on RCP seal injection flow. NRC randomly selected 027AA2.15 to use as a replacement. – MAB 3/7/2011
1/1	038EA1.44	Too close to SRO 038EG2.4.20. Only NOTES in EOP applicable to SRO level knowledge deal with OTSG level limits. NRC randomly selected 038EA1.32 to use as a replacement. – MAB 3/7/2011
1/1	040AG2.4.35	Not possible to prepare a psychometrically sound question related to this KA. Only SPO/PPO tasks dealing with a steam line rupture are to de-energize EFW and CFT valves. NRC randomly selected 040AG2.4.3 to use as a replacement. – MAB 3/7/2011
1/1	058AG2.4.1	Not applicable to CR3. No EOP entry conditions or immediate actions steps for loss of DC power. NRC randomly selected 058AG2.4.9 to use as a replacement. – MAB 3/7/2011
1/2	069AK3.01	Not applicable to CR3. No RO EOP guidance for loss of RB integrity. NRC randomly selected 069AK2.03 to use as a replacement. – MAB 3/7/2011
1/2	BW/E09EG2.4.30	Not possible to prepare a psychometrically sound question related to this KA. Not an RO knowledge requirement at CR3 to make reports to external agencies due to plant being on Natural Circulation. NRC randomly selected BW/E09EG2.4.6 to use as a replacement. – MAB 3/7/2011
2/1	005A1.06	Not applicable to CR3. No surveillance test for isolating DH suction valves. NRC randomly selected 005A1.01 to use as a replacement. – MAB 3/7/2011
2/1	059A3.03	Not applicable to CR3. No automatic actions based on MFWP suction pressure. NRC randomly selected 059A3.06 to use as a replacement. – MAB 3/7/2011
2/2	027G2.4.6	Not applicable to CR3. No EOP guidance for containment iodine removal. NRC randomly selected 045G2.4.6 to use as a replacement. – MAB 3/7/2011
2/1	007A1.03	Not possible to prepare a psychometrically sound question related to this KA. NRC randomly selected 004A1.03 to use as a replacement. – MAB 6/22/11
2/1	073G2.4.3	Not applicable to CR3. No post-accident process radiation monitors. NRC randomly selected 073G2.4.11 to use as a replacement. – PC 08/25/11

SRO – 2011 – Crystal River 3

Tier/ Group	Randomly Selected K/A	Reason for Rejection
1/2	003AA2.05	Not an SRO duty at CR3. Reactor engineering performs this function. Replaced with 003AA2.02 per MAB, 03-31-11.
1/2	005AG2.4.18	Not possible to prepare a psychometrically sound question related to this KA. Only one EOP step that deals with inoperable/stuck control rods with the action to borate the RCS. All operators know that ensuring adequate SDM is the reason for this step. Replaced with BW/E08EG2.4.18 per MAB, 04-01-11.
2/1	026A2.09	Not applicable to CR3. RB Spray pumps take a suction from the BWST / RB sump and spray into containment. There is no recirc path back to the BWST to create a radiation hazard. Replaced with 026A2.08 per MAB, 03-31-11.
2/2	029A2.01	Not applicable to CR3. NRC randomly selected 029A2.03 to use as a replacement. – PC 08/25/11

2011 Crystal River NRC Exam

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

Facility: **Crystal River Unit 3** Date of Exam: **09/12/11 thru 09/23/11** Exam Level: RO [■] SRO [■]

Item Description				Initial a	Initial b*	Initial c#
1.	Questions and answers are technically accurate and applicable to the facility.			AK	MVS	
2.	a. NRC K/As are referenced for all questions. b. Facility learning objectives are referenced as available.			AK	MVS	
3.	SRO questions are appropriate in accordance with Section D.2.d of ES-401			AK	MVS	
4.	The sampling process was random and systematic (If more than 4 RO or 2 SRO questions were repeated from the last 2 NRC licensing exams, consult the NRR OL program office).					
5.	Question duplication from the license screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate: __ the audit exam was systematically and randomly developed; or __ the audit exam was completed before the license exam was started; or __ the examinations were developed independently; or __ the licensee certifies that there is no duplication; or __ other (explain)			AK	MVS	
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: 42 / 10	Modified: 0 / 0	AK	MVS	
		New: 33 /15				
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: 36 / 8	C/A: 39 / 17	AK	MVS	
8.	References/handouts provided do not give away answers or aid in the elimination of distractors.			AK	MVS	
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.			AK	MVS	
10.	Question psychometric quality and format meet the guidelines in ES Appendix B.			AK	MVS	
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.			AK	MVS	

	Printed Name / Signature	Date
a. Author	Alan Kennedy	07/25/11
b. Facility Reviewer (*)	Mark VanSicklen	07/26/11
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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.

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. 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?
7. At a minimum, explain any "U" ratings (e.g., how the Appendix B psychometric attributes are not being met).

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
1	H	2												S	001K5.88 New
2	H	2	X											S	003A3.01 New Licensee to verify that on a loss of NNI-X, other valves/equipment failures will NOT result in a change in seal injection flow. CR3 – No change in seal injection flow. Verified on simulator 8-21-11.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
3	F	2				X								S	003AK3.06 New Cred Dist: A & B Not plausible because nothing was changed to parameters that give the lamp/alarm. CR3 – Dist A: RPI provides the input for the Sequence Inhibit indication/lamp. It seems plausible that resetting RPI to match API could clear this alarm/lamp. CR3 – Dist B: Plausible misconception since a 7 inch delta is required for this alarm. Resetting RPI to match API removes this delta. C should include some part of the TS. "ensure that API and RPI agree with the limit specified in the COLR" CR3 – Dist C: Modified C as recommended
4	F	2				X								S	004A1.03 New Cred Dist: A & C, 273 degrees would be much more plausible as it is the temperature stated in OP 209. A & B licensee explain why it would be plausible to assume that all of the MUPs would be secured at this point. CR3 –All MUP knife switches are opened in Mode 5. Do MUVs 23/24/25/26 constitute ALL HPI valves? Step 4.2.3.5 states that these are the valves that are tagged. CR3 – These are the only 4 HPI valves. CR3 – Modified stem and first part of all distracters.
5	H	2	X			X								S	004K1.35 New Stem Focus: Does a LOOP always result in a loss of power to the MUDM isolation valves. Is the reactor still at power? C could be the correct answer if on-site power is still there. CR3 – A LOOP always results in a loss of power to the MUDM isolation valves, until the EDGs load on the bus, and a reactor trip. Cred Dist: C. If LD is not isolated, why would I think that there would be a release path created? B. If LD is isolated, why would I think that a relief would not be lifting? Is there an interface between the MU&P system and the LRS without going through the AB sump….that you could write a question to? CR3 – No other interface between the MU & P system and the LRS. CR3 – Following discussion no changes made to question.
6	F	2												S	005A1.01 Bank

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
7	F	2												S	005A4.05 New
8	F	2				X								S	005AK1.06 Bank Cred Dist: Explain why 60% and minimize local fuel temperature gradients are plausible. 3.1.4 states 60% as a power limit. Is this where the 60% comes from? CR3 – 60% is the power limit with 4 RCPs running, 45% is the limit with 3 RCPs running. Recommend: "to ensure DNB limits are not exceeded. CR3 – Changed 2nd part of distracters A & B to "peaking due to Xenon oscillations".
9	F	1/2				X								**S**	006K4.18 New Cred Dist: Having to choose between a LBLOCA or a SBLOCA for CFT requirement makes the SBLOCA not plausible. Stem Focus: "energized in the open position" doesn't make a lot of sense the way it is written. Recommend having when the valves are to be de-energized and then maybe the tagging requirements for the valves. CR3 – Completely re-worded stem and all choices.
10	H	3				X								S	007EK3.01 Bank Cred Dist: D second part not plausible since the control rods are out now and Xenon will take hours to build in. CR3 – Second part of distractor reworded to remove Xenon. C second part is not plausible with the stated conditions (no steam leak). CR3 – The RCS lowers approximately 25 degrees post trip. If the NI's don't indicate shutdown (they should) the IAs would have you borate. With the information provided in the stem (or lack of), A may be correct. Need more information in the stem to eliminate A. CR3 – A is incorrect because the reason for an RCS Boration during the performance of the Immediate Actions is to shutdown the reactor, not to ensure adequate SDM. CR3 – Added NI indication to stem to ensure "A" distractor can be eliminated.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
11	F	2				X								S	007K5.02 New Cred Dist: D, if level is 290", then I already have a bubble. CR3 – Don't always have a steam bubble with this level. Change C to "From a solid condition, the PZR is heated…" CR3 – This will change the symmetry of the distracters. CR3 – Following discussion no changes made to question.
12	F	1												S	008AK3.02 Bank LOD: GFES question. Make ½ of this question plant specific. Give conditions that indicate a leak in the top of the PZR and ask for procedure…something like that. CR3 – Modified stem and first part of A & B distractors.
13	H	3				X								S	008K2.02 New Cred Dist: B there are no actions taken. With the conditions stated, it doesn't seem that taking no action is plausible. Would like to see each answer with just actions (dump the ensure….). Licensee to walk through this question. CR3 – B distractor would be correct if the BEST was lost. CR3 – Modified all distractors.
14	H	3												S	008K3.01 Mod
15	H	2				X								S	009EK1.01 Bank Cred Dist: D, at 455 psig, LPI is not plausible (if pressure were 225 psig… maybe. Something closer to LPIP shutoff head) CR3 – Lowered RCS pressure in stem. With respect to RCPs, what is considered adequate subcooling margin. At what subcooling margin are RCPs required to be secured? Reflux boiling should be not correct because your 3 degrees subcooled. The analysis states that it could be correct later in the accident. If conditions degraded I would agree. If you assume that at 3 degrees, I am effectively saturated, and without additional information in the stem, how can you say that you don't currently have reflux boiling? CR3 – Modified all stem conditions and added reference.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
16	H	2	X			X	X							S	010A1.07 New Cred dist: C & D RCS pressure lowering not plausible on SASS output failing low. A may not be correct. Manual control of PZR heaters are not required if spray is used. There is not enough information in the stem to eliminate spray being used. Part: B could be correct. The stem doesn't limit the actions to a procedure. Operation of the PORV and spray will prevent a high pressure trip. The stem of this question needs more information to help make the selected correct answer black and white. CR3 – Modified stem and all distractors.
17	H	3												S	011EK2.02 Bank Licensee to walk through in procedure CR3 – Following discussion no changes made to question.
18	H	2	X											S	011K3.03 Bank Stem Focus: The stem should state that Pzr is at the program level for 100% or something that will make sure that they could not challenge the initial level. CR3 – Following discussion no changes made to question.
19	F	2	X											S	012K6.04 New Stem Focus: Do I need ONLY? Is bypassing A & C turbine trip bypass bistables a condition that I would procedurally be allowed to do? CR3 – Following discussion no changes made to question.
20	H	2												S	013K5.02 Bank
21	F	3												S	014K4.06 Mod
22	H	2												S	015/017AG2.4.46 Bank
23	F	1/2												S	017A4.01 Bank

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
24	F	2												S	022K2.01 New Are Ventilation MCC 3A and 3B normally powered from the 480V Turbine Aux Buses? CR3 – Yes CR3 – Following discussion no changes made to question.
25	H	2				X	X							S	025AK1.01 Bank Cred Dist: D Even with not much information in the stem, BWST gravity feed is not plausible. Part: A Do the DH system pumps serve as LPI pumps? Assuming the suction is from the RCS during DH mode you can assume that RCS pressure is somewhat higher but just going into the DH mode is not specific enough? Would like to see a pressure or the status of RCPs. I assume they have to come off at a set pressure/curve. B For HPI cooling, does there have to be an open vent path or just a path available. AP 404 reads as if you just vent with the PORV as necessary to prevent exceeding the LTOP limit. While it should be obvious that cooling with the OTSGs is preferred, its not obvious from reading the stem that A or B is incorrect. Get with licensee to shore up the stem of the question to ensure that there is only ONE correct answer and replace D. CR3 – Added "IAW AP-404" to stem and replaced D distractor.
26	H	3				X								S	026K1.01 Bank Cred Dist: A/ With one train bypassed/reset and nothing done to the other train, both trains not starting is not plausible. C/ If nothing is done to the B train equipment, ONLY A train starting is not plausible. Nothing was done to the B train equipment so an answer that doesn't include the B train equipment starting doesn't seem plausible. CR3- Modified stem to state that both ES trains were bypassed per Rule 2.
27	F	2				X								S	026K4.02 Bank Cred Dist: C & D/ Since these are design features and not really a parameter that is controlled, they don't seem plausible. Picking chemicals and addition methods could be a way to go for a 2/2 taken twice. i.e. Boron or TSP added by staging in the sump or added via chem. Add…something like that. CR3 – Modified question as recommended.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
28	H	2				X								S	027AA2.15 Bank Cred Dist: A & C/ Tripping the reactor may be a required action but stating that it will stop the pressure decrease is not plausible. Just swapping in different action would make this question SAT. CR3 – Modified second part of distractors A & C as recommended.
29	H	3	X											S	028AA1.02 Bank Stem Focus: The stem states that the Pzr level xmitter fails mid-scale. The analysis for the correct answer states what happens when the xmitter fails low. Licensee to clarify. Can licensee verify this actually happens on the simulator? Would you expect the applicants to know that while Pzr level will increase, it won't increase enough to cause a high pressure trip? CR3 – Question verified correct on simulator. Following discussion no changes made to question.
30	F	2				X								S	029EK2.06 Bank Cred Dist: A & C/ Contacts opening when in parallel with contacts that are closed will not cause a reactor trip. CR3 – Modified all distractors following discussion.
31	F	2				X								S	029K1.04 Bank Cred Dist: B/ Having a fan operating with its discharge valve/damper closed is not plausible. This is effectively the discharge valve for AHF-6A/6B is it not? Are there any vent fans at CR that will stay operating if their discharge damper closes? CR3 – These fans have recirc dampers and are normally started with this valve closed. Following discussion no changes made to question.
32	F	3												S	032AK2.01 Bank
33	H	2				X								S	034A2.03 New Cred Dist: C & D/ To have a TS action required when the TS LCO is not being violated is not plausible. CR3 – Second part of C & D are NOT TS required actions. Second part of C is required per FP-203. Second part of D is a reasonable action to take if a fuel assembly is placed incorrectly. CR3 – Modified stem and slightly modified distractors for clarity.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
34	H	3	X											S	038EA1.32 Bank Stem Focus: The step asks what criteria satisfied prior to implementing TRACC. Assuming that implementing means initiating Enclosure 12, ensuring that RCS pressure is performed after TRACC is implemented (step 12.2). Is this stated in the EOP before implementing Enclosure 12? If not, the stem needs to be modified to reflect this. CR3 – Modified stem for clarity.
35	H	2												S	039A2.03 New Need to verify on conversion table. CR3 – Verified on conversion table. No changes made to question
36	H	2	X											S	040AG2.4.3 New Is it enough to state that a steam line rupture inside containment has occurred. Is A correct if ACC conditions do not exist yet. The stem needs to be more detailed in that A has to be correct and D is not. CR3 – "A" always correct for most reliable *post accident* information. No changes made to question.
37	F	2	X											S	041A3.05 Bank Stem Focus: Is being at 870 psig operationally valid? Would I ever be here? What was my original setpt. CR3 - Following discussion no changes made to question.
38	F	2												S	045G2.4.6 New
39	F	2	X											S	054AA1.04 New Stem Focus: Try to work in MUV-26 (4) into the answers or there is no reason to have it in the stem. A (1&2) or (3&4) and either 5 or 6 B (1&3) or (2&4) and either 5 or 6 C (1&2) or (3&4) and (5&6) D (1&3) or (2&4) and (5&6) Something to this effect. CR3 – Modified D distractor as recommended.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
40	F	2												S	055EK3.01 New Licensee to discuss designed vs required. It is designed for 2 hr per TS bases. It is required for 4 hours per EOP 12. CR3 – Modified stem as recommended.
41	H	3	X									X		S	056AK1.04 New Stem Focus: The 2nd part seems disconnected from the 1st part. If Tc is rising toward where it should be going to, why would you open the ADV? I understand what it will do, it just seems like its something you wouldn't do under the current conditions. KA: Don't think this defines saturated conditions and implications on systems. CR3 - Following discussion no changes made to question.
42	H	3												S	058AG2.4.9 New
43	H	3												S	059A3.06 New Cred Dist: C / Don't think that the B MFWP running is plausible. Discuss just the A MFWP and valve. CR3 – Modified stem slightly and all distractors.
44	F	2												S	061K2.01 Bank
45	H	3	X											S	062AA2.02 Bank Stem Focus: Is there a ES 4160V lockout at this time? The analysis hints at it. If it's a lockout, you would have to reset it manually correct. Need to discuss. CR3 – There is an ES 4160V lockout for this condition but this lockout does not affect the status of the RWPs. CR3 - Following discussion no changes made to question.
46	H	3												S	062K3.03 New
47	F	2												S	063K3.02 Bank

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
48	F	2					X							S	063K4.01 New Part: D & C/ A kirk-key is a mechanical interlock which makes C a subset of D. i.e. if it were a kirk-key interlock, I could pick C and still be correct. Need to distinguish C as different than a Kirk Key interlock. CR3 – Modified C and D distractors.
49	F	1/2												S	064A3.02 New Are the applicants required to know the KW and MVAR acceptance criteria? A & D are GFES. Having 2600 kW and 1.4 MVAR would seem to be more discriminating. Will discuss. CR3 – Changed VAR loading to +2.0
50	F	2										X		S	064K6.08 Bank K/A: Declaring the DGs INOP is not really an effect on the system. How about the TS as half and how long the DGs could run as the other half? CR3 - Following discussion no changes made to question.
51	H	2				X								S	065AA2.01 New Cred Dist: C & D/ Its not plausible to think that the alarm would be in with one compressor running and not in with no compressors running. This is sort of a subset issue. The analysis explains why “only one” compressor is plausible for the electrical configuration but not why its plausible to have a low pressure alarm with one compressor running. CR3 – Modified stem and all distractors.
52	F	2												S	068K6.10 New
53	F	2				X								S	069AK2.03 Bank Cred Dist: A/ No action in Mode 4 is not plausible. Rec: Must immediately verify the outer door is closed. This would mean a change to B to eliminate a subset issue. Must verify the outer door is closed any time within the next hour. Something like that. CR3 - Following discussion no changes made to question.
54	F	2												S	073A4.03 Bank 2009 NRC If there are some RMs at CR that have an electronic check source, I’m ok with it. CR3 – Hi range detectors use an electronic check source. CR3 - Following discussion no changes made to question.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
55	55	F	2									X		S	073G2.4.3 New KA: The KA asks for a process radiation monitor and the question is written for an area radiation monitor. I did not see any process rad monitors listed in the TS Bases table 3.3.17-1. Rec New KA. CR3 – New KA provided by examiner. 073G2.4.11 CR3 – Replaced question.
56	56	F	3				X							S	075K2.03 Bank Cred Dist: Why is A plausible? If power were < 80%, would A be correct? CR3 – Yes, if the stem didn't state which transformer was feeding the Unit buses. CR3 - Following discussion no changes made to question.
57	F	2												S	076G2.1.28 New
58	F	2												S	077AA1.03 New
59	59	F	½											S	078A4.01 New
60	60	F	2				X							S	103A2.05 New Cred Dist: A&B/ radio notification may plausible unless (in this case) your comparing it to containment evacuation alarm. B&D/ opening a containment door against dp as an interlock doesn't sound plausible. CR3 – Modified stem and second part of all distractors.
61	61	F	2											S	BW/A02AA1.02 New
62	62	F	3	X			X							S	BW/A07AK1.2 Mod Stem Focus: C&D/ they don't read correctly with the stem. Cred Dist: D/ Tripping the turbine before the reactor – Not plausible CR3 – Modified C & D distractors and re-ordered.
63	63	H	3	X										S	BW/E03EA2.2 Bank NRC 2009 Exam Stem Focus: Should have trend on RCS pressure. CR3 – Added trend to stem as recommended.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
64	64	F	1											S	BW/E04EK2.2 Bank LOD: GFES knowledge CR3 - Following discussion no changes made to question.
65	65	F	2				X							S	BW/E09EG2.4.6 Bank Cred Dist: A/ Not plausible that inventory would be an issue when cooling down at the Natural Circ rate. Not plausible that maintaining DT is a basis for cooldown rate. CR3 - Following discussion no changes made to question.
66	F	2				X								S	G2.1.19 Mod Cred Dist: Using avg NI would give you 717 MW th which would seem more plausible than using MWe in A. Using the lowest NI power is not conservative and not plausible. CR3 – Modified as recommended.
67	H	3												S	G2.1.23 Bank 2009 NRC
68	L	1												S	G2.1.6 Bank LOD: I have a hard time calling this a 2. CR3 – Replaced question.
69	L	2				X								S	G2.2.17 Bank Cred Dist: B&D/ Explain why + 36 hr and + 48 hr are plausible. CR3 – Modified stem and 2 distractors.
70	H	2												S	G2.2.2 Bank
71	F	2												S	G2.2.21 New
72	H	2	X											S	G2.3.11 Bank 2009 NRC Stem Focus: Add to the question a part about which procedure is used. ….from the RB and which procedure will be used to direct these actions. As the question is now, D also looks correct because it would describe actions necessary to terminate the release. CR3 – Slightly modified stem and each distractor for clarity.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
73	L	1/2				X								S	G2.3.7 Bank LOD: Plant Access training Cred Dist: Change C to 80 minutes based on staying at the spot long enough to get 100 mr. CR3 – Modified C distractor as recommended.
74	H	2				X								S	G2.4.4 Mod Cred Dist: At 70%, there is little doubt that you will trip…not plausible. Would the answer be the same if power were 35%, what about 25%. CR3 - Following discussion no changes made to question.
75	H	2	X			X								S	G2.4.47 Bank Cred Dist: A&C / leak not plausible based on the stated conditions. Stem Focus: Is there a relief in any of the systems that may lift if temperature were to get too high…… There needs to be more in the stem to make A & C more plausible or find a different ½ distractor. CR3 – Replaced question.

Generic Comments

1. If the stem of the question has the word “correctly” in it, please remove it from the question.
2. When writing questions, should it be Unit One or Unit 1?
3. Need to establish a convention concerning how to emphasize adjectives. For example, underline, bold, bold and underline, etc.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
SRO ONLY Questions															
76B (1)														S	003AA2.02 This question is labeled as MOD at the top and listed as NEW at the bottom. Which is it? If Modified, where is the original question it’s modified from? Licensee clarified that all mod questions should be labeled as bank. No questions on the exam were modified. Either bank or new. This question is stated as “reactor power **must** be reduced”. TS 3.1.4 provides the operator with an option to verify SDM or lower power level. Stem should be reworded to say that the lowering power option is the choice selected. This question is similar to question 10 on the RO exam. Verify there is no double jeopardy. CR3 – TS 3.1.4 requires verifying SDM within 1 hour AND reducing power to 60% of allowable. CR3 – Verified NO double jeopardy.
77B (2)						X								S	007EA2.04 Need to reword 1st two distractors to make symmetrical with the final two choices to improve plausibility. In the stem of the question, you state that the PORV opened and operated “as designed”. With this statement there, why is ‘B’ plausible. CR3 – Discussed with Chief Examiner. NO changes made.
78N (3)														S	008G2.4.41 Verify DCP terminology. Are these DC panels? It so, it does not match the terminology used in the DC LP (i.e. DPDP-1A, DPDP-1B) CR3 – “DCP” is the acronym for “Decay Heat Closed Cycle Cooling Pump”.

79N (4)														S	010A2.01 Should C say "Normal PZR. Heater…" and D say "Emergency PZR heater…"? CR3 – Discussed with Chief Examiner. NO changes made.
80N (5)														S	015A2.05 Could "lower" be argued as also being correct. Is the time of voiding limited enough to rule out that indicated NI level has not started to decrease? Change to say "starts to rise". CR3 – Change made to question and reviewed with Chief Examiner.
81N (6)						X								S	022A2.02 Are A & B plausible? You can use logic to deduce that using the OP will always provide guidance to isolate the system and is therefore the correct answer. 8/10/11 Reviewed w/ licensee on phone conference. Licensee agreed to look at rewording question to make A & B plausible. CR3 – Change made to "A" & "B" distracters to address use of another OP instead of the AR.
82B (7)														S	026A2.08 Check this KA. It does not match the sample plan. The sample plan shows this as 026A2.09. Did not see a rejected KA list. CR3 – Verified to be correct K/A IAW sample plan.

83B (8)												X		S	029A2.01 Does not match the KA. The reference provided suggests the entire EM-0225 will be given. This will make the question a direct lookup. Licensee asked for another KA to be selected. Could replace with 029A2.03 or 029A2.04. Found a previous bank question for KA 029A2.01 (QID 20179, 10/29/2001 Byron): The following conditions exist on Unit 1: - Unit 1 is in MODE 1. - All RCFCs are in HIGH speed. - Containment air sample results require a purge of containment to allow maintenance. - Containment release package has appropriate approvals. - Mini-Flow Purge Exhaust Isolation Valves (1VQ005A, B and C) are OPEN. - Mini-Flow Purge Supply Isolation Valves (1VQ004A, and B) are OPEN. The operator takes the control switch for the Mini-Flow Purge Supply Fan to "START" and then IMMEDIATELY releases the switch to the "NAC" position. The Mini-Flow Purge Supply fan . . . A: Does NOT Start. The operator must hold the start switch in the start position until the suction damper, 1VQ01Y, is OPEN. D1: Does NOT Start. The operator must start the Mini-Flow Purge Exhaust fan first. D2: Starts … CR3 – New question developed tied to K/A 029A2.03 and reviewed with Chief Examiner.
84B (9)						X								S	038EG2.4.20 It does not appear that the current cooldown rate is needed to answer the question? Is there a time when you ONLY steam the nonaffected SG? Why not raise the B SG lvl and change two of the distractors to say this, otherwise why are A & C plausible? Why would you choose to steam a LLL SG over a SG that has a high level? CR3 – Discussed with Chief Examiner. NO changes made.
85N (10)														S	051AA2.02 Reword C &D to match A &B. i.e. Ensure the SG/RX Demand station in “HAND” or “AUTO” and Concurrently… CR3 – “C” & “D” distracters re-worded to match “A” & “B”.
86N (11)														S	057AA2.06 Need comma “With the alarm still in, ….” Question is poorly constructed. You are asking for what alarm “should” be in based on the given plant conditions. CR3 – Question modified to address construction issues and reviewed with Chief Examiner.
87N (12)														S	059G2.1.25 Why 10 min. later? Following the MFT trip, FW temp is expected to stabilize at ____. CR3 – Replaced “10 min later” with “stabilize” in question stem.

88N (13)														S	062AG2.2.36 Need to be walked through the 3.0.3 conditions. I do not see them. Also, you are only given out the 3.8.1 TS as a reference. If the other 3.0.3 condition is due to 3.7.9 it would need to be given also. CR3 – Question modified and reviewed with Chief Examiner. Question no longer addresses LCO 3.0.3 and no longer requires a reference.
89B (14)						X								S	071G2.2.38 Distractor A does not make sense. You say it can not be repaired in the stem of the question. Then in choice A you say it must be repaired. Change A to say once an indicated flow measurement can be established. CR3 – Removed statement from question stem concerning inability to repair the release flow monitor. Also, re-ordered answers shortest to longest in length. "A" is now the correct answer.
90N (15)														S	077AG2.2.37 This is another 3.0.3 question. Q# 3 & 13 are also 3.0.3 questions. CR3 – Discussed with Chief Examiner. Question #13 no longer addresses LCO 3.0.3.
91N (16)						X								S	BW/A05AG2.2.12 B & D not plausible. Subset issue. . 20 seconds is a subset of 35 seconds therefore if 20 sec. is correct, 35 sec. is always correct. Why is the 2nd part of the question not asking the 67 second criteria for HPI w/ a LOOP? The time setpoints could then be 35 or 67 seconds CR3 – Added "maximum" to question stem to address subset issue. Discussed plausibility of 20 seconds with Chief Examiner.
92B (17)												X		S	BW/E05EA2.1 Does not meet the KA. The correct response has to be associated with the Excessive Heat Removal EOP. Can't meet the KA by not being in the EOP. CR3 – Question replaced with one that has EOP-05 as the correct answer and reviewed with Chief Examiner.
93N (18)														S	BW/E08EG2.4.18 Looks OK.

94B (19)														S	G2.1.15 The wording of 'D' seems to overly imply that it is not implausible. Why in "ONLY" needed. If it is not, remove it to make the sentence structure the same as 'C'. CR3 – Modified "D" and reviewed with Chief Examiner.
95N (20)														S	G2.1.31 Is the 1st sentence necessary? Seems to be teaching. CR3 – Discussed with Chief Examiner. NO changes made.
96N (21)														S	G2.2.19 Looks OK
97N (22)														S	G2.2.7 Looks OK
98B (23)														S	G2.3.4
99N (24)														S	G2.4.34 Shouldn't it state that levels are above "their minimum levels". CR3 – Modified "B" and "C" to state "NAT CIRC setpoint". Re-ordered answers shortest to longest in length.
100B (25)														S	G2.4.8 Change this question to give an actual event that mandates the use of an AP in conjunction with an EOP. CR3 – Question replaced with one addressing an actual event using EOPs/APs and reviewed with Chief Examiner.

ES-403, Rev. 9 | **Written Examination Grading Quality Checklist** | Form ES-403-1

Facility: Crystal River	Date of Exam: 9/22/2011	Exam Level: RO/SRO

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

	Printed Name/Signature	Date
a. Grader	Daniel Bacon / Daniel M. Bacon	10/11/11
b. Facility Reviewer(*)	NA	
c. NRC Chief Examiner (*)	Phillip Capehart / P Capehart	10/11/11
d. NRC Supervisor (*)	Bruno Caballero / Bruno Caballero	10/11/11

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