

Facility: Limerick		Date of Exam: 12/18/17		Exam Level: RO <input checked="" type="checkbox"/> SRO <input checked="" type="checkbox"/>		
Item Description				Initial		
				a	b*	c*#
1. Questions and answers are technically accurate and applicable to the facility.				TAB	WHL	F
2. a. NRC K/As are referenced for all questions. b. Facility learning objectives are referenced as available. c. Correct answer explanation and distractor analysis provided (ES-401, D.2.g)				TAB	WHL	F
3. SRO questions are appropriate in accordance with Section D.2.d of ES-401				TAB	WHL	F
4. The sampling process was random and systematic. (If more than four RO or two SRO questions were repeated from the last two NRC licensing exams, consult the NRR/NRO OL program office).				TAB	WHL	F
5. Question duplication from the licensee screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate. <input checked="" type="checkbox"/> The audit exam was systematically and randomly developed, or <input type="checkbox"/> the audit exam was completed before the license exam was started, or <input type="checkbox"/> the examinations were developed independently, or <input checked="" type="checkbox"/> the licensee certifies that there is no duplication, or <input type="checkbox"/> other (explain).				TAB	WHL	F
6. Bank use meets limits (no more than 75% from the bank, at least 10% new, and the rest new or modified); enter the actual RO/SRO-only question distribution(s) at right.		Bank	Modified	New		
		32/8	9/1	34/16	TAB	WHL
7. Between 38 and 45 questions of the questions on the RO exam and at least 13 questions of the questions on the SRO-only portion of the exam are written at the comprehension/analysis level (see ES-401, D.2.c); enter the actual RO/SRO-only question distribution(s) at right.		Memory	C/A			
		31/4	44/21		TAB	WHL
8. References/handouts provided do not give away answers or aid in the elimination of distractors.				TAB	WHL	F
9. Question content conforms to specific K/A statements in the previously approved examination outline and is appropriate for the tier to which they are assigned; deviations are justified.				TAB	WHL	F
10. Question psychometric quality and format meet the guidelines in Appendix B.				TAB	WHL	F
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.				TAB	WHL	F
Printed Name/Signature					Date	
a. Author	Todd A. Byers				10/03/17	
b. Facility Reviewer (*)	William H. Martine				11/24/17	
c. NRC Chief Examiner (#)	Brian Fuller				11/22/17	
d. NRC Regional Supervisor	Donald E. Jackson				11/22/17	
Note: * The facility reviewer's initials or signature are not applicable for NRC-developed examinations. # Independent NRC reviewer initials items in Column "c"; chief examiner concurrence is required.						

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation	
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only				
1	H	2											Y		B	S	
2	H	3											Y		B	S	
3	H	2											Y		N	S	
4	F	3											Y		B	S	
5	H	3											Y		N	S	
6	F	2											Y		M	S	
7	H	2											Y		N	S	
8	F	2											Y		B	S	

Instructions

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

- Enter the level of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level.
- 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).
- 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).
- 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.
- 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).
- Enter question source: (B)ank, (M)odified, or (N)ew. Check that (M)odified questions meet criteria of ES-401 Section D.2.f.
- 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?
- At a minimum, explain any "U" ratings (e.g., how the Appendix B psychometric attributes are not being met).

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			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only			
9	F	2										Y		N	S	
10	H	3										Y		B	S	
11	H	3										Y		N	S	
12	H	2										Y		N	S	
13	F	2										Y		B	S	
14	H	2										Y		N	S	
15	H	3										Y		N	S	
16	H	3										Y		N	S	
17	H	4										Y		N	S	
18	H	3										Y		N	S	
19	F	2										Y		N	S	
20	H	3										Y		M	S	
21	F	2										Y		N	S	
22	F	3										Y		B	S	
23	H	4										Y		M	S	
24	H	3										Y		B	S	
25	H	3										Y		B	S	
26	H	2										Y		N	E	
27	H	3										Y		N	S	
28	F	3										Y		N	S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only			
29	F	2										Y		B	S	
30	F	2										Y		B	S	
31	F	3										Y		N	S	
32	H	3										Y		B	S	
33	H	2										Y		B	S	
34	F	2										Y		N	S	
35	F	2										Y		N	S	
36	F	3										Y		N	S	
37	H	3										Y		B	S	
38	H	3										Y		M	S	
39	H	3										Y		N	S	
40	F	2										Y		M	S	
41	F	2										Y		N	S	
42	F	2										Y		B	S	
43	H	3										Y		N	S	
44	H	3										Y		B	S	
45	H	2										Y		M	S	
46	H	2										Y		B	S	
47	H	3										Y		B	S	
48	H	3										Y		B	S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only			
49	H	3										Y		M	S	
50	H	2										Y		B	S	
51	H	2										Y		B	S	
52	H	2										Y		B	S	
53	H	3										Y		N	S	
54	F	3										Y		N	S	
55	F	2										Y		B	S	
56	H	2										Y		B	S	
57	F	2										Y		B	S	
58	F	3										Y		B	S	
59	F	3										Y		B	S	
60	F	3										Y		N	S	
61	F	2										Y		B	S	
62	H	2										Y		N	S	
63	H	2										Y		N	S	
64	H	2										Y		N	S	
65	F	3										Y		N	S	
66	F	2										Y		B	S	
67	H	2										Y		N	S	
68	F	2										Y		M	S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only			
69	F	2										Y		N	S	
70	F	1										Y		B	U	LOD=1 GET Knowledge, Replaced Q
71	F	2										Y		B	S	
72	H	3										Y		N	S	
73	F	3										Y		M	S	
74	H	2										Y		B	S	
75	H	2				X						Y		B	E	Implausible distracters, enhanced distracters to improve plausibility
76	H	3										Y	Y	N	S	
77	H	3										Y	Y	N	S	
78	H	2										Y	Y	B	E	
79	H	2										Y	Y	N	S	
80	F	2										Y	Y	N	S	
81	H	3										Y	Y	N	S	
82	H	3										Y	Y	N	S	
83	H	2										Y	Y	M	E	
84	H	2										Y	Y	N	E	Doesn't meet SRO only requirement to select a procedure, fixed
85	H	2				X						N	Y	N	U	K/A MM, multiple implausible distracters, fixed
86	H	2				X						Y	Y	N	U	Multiple implausible distracters, fixed
87	H	2										Y	Y	M	S	
88	H	2										Y	Y	B	S	

[illegible]

Question 4 (1740951) – Added Transfer switches do not need to be in the “Emergency” for HPCI key to work.

Question 5 (1741393) – Added more information around bypass flow path to the explanation of the question.

Question 16 (1797416) – changed trips to TRIPs

Question 17 (2029824) – Removed “s” from minutes and changed occurring to occur.

Question 26 (1799092) – Changed question away from asking “Confirming Indication”. Changed from “... what is an additional confirming indication identified by procedure E-2AY185?” to “...what annunciator/indication serves as an additional confirmation identified by procedure E-2AY185?” and changed column 2 header from “Additional confirming indication” to “Additional confirmation”. This was due to the concern that the confirming indication of E-2AY185 is three items and the annunciator listed is only one of the three items.

Question 29 (1799143) – Changed Logic to logic.

Question 35 (2029750) – Added “using 2A RHR” to stem (Suppression Pool Spray is in service)

Question 37 (1799196) – Removed first “is” from distractor D

Question 43 (1799263) – Corrected answer explanation as a result of removing the table from the stem of the question.

Question 45 (1799264) – Added the word “the” to distractor A. “Swap to the 2B...”; added noun name for HV-51-2F009, RHR SHUTDOWN CLG SUCTION INBRD PCIV (INBOARD); and noun name of ON-121, Loss of Shutdown Cooling.

Question 47 (1799329) – made Not all capitals ... NOT in distractor C.

Question 48 (1799332) – Removed, “ Provided reference(s): E-5, Grid Emergency and GP-5 note 3.1.60 (p16 of rev 175)” from the beginning of the answer explanation.

Question 53 (1799469) – Added the basis for the 1st lowering, to clarify the second column distractor.

Question 55 (1801599) – re-structured the last portion of the stem to draw more attention to the annunciator and the SRM count rates

Question 61 (1845774) – Cleaned up explanation and bulleted stem.

Question 62 (1845775) – Change power level to 95% and Circ water temperature to 90 degrees. Changed temp results to 139 (right) and 141 (wrong). Updated explanation. Changed outside air temperature to 87 °F to keep the same 3 ° delta. This was changed at the request of Brian due to plausibility.

Question 67 (1845800) – Updated plausibility explanation for distractors B and C. removed “...or believes that provided 2 SRMs are Operable core alterations can continue regardless of quadrant application (i.e. fails to recall LCO 3.9.2.c)” and replaced with “... incorrectly uses attachment 1 (SRM locations, Fuel Assembly Location, etc.)

Question 70 (1846054) – Question was deemed GET and has been replaced.

Question 73 (1846438) – fixed multiple spelling errors in the explanation section.

Question 75 (1846505) – Some distractors were deemed implausible. Change the distractors to only use volume of Cavity and storage pit as distractor and correct volume. Used flow rate for LPCI (10,000 GPM) and flow rate of a loop of Core Spray (6,350 GPM). Lastly, move starting cavity level to 475”.

Question 76 (1743064) – Added “-” to 2A-Y160 to stem. Changed left column for A and B, to “...Loss of 2A-Y160”. Made “Loss” “loss.” Added “... and unavailable” to the third bullet.

Question 78 (1744190) – Removed some information from TSO portion of stem. Changed from “The TSO notifies LGS that grid disturbances have resulted in a voltage limit violation for the 500 kV Substation with voltage at 497 KV.” To “The TSO notifies LGS that the 500 kV Substation voltage is 497 KV.” Added to the explanation that the voltage in the stem would be the result of a grid disturbance.

Question 80 (1744192) – Added Given S55.1.D and S55.2.A... to the stem. Added “... per S55.1.D” to second column for answer A and C.

Question 83 (2027489) – generated new SRO flow chart and fixed K/A reference based on rejected K/A.

Question 84 (1744249) – Verified words for first column A and B. Added Per T-101 and Per T-112 to the first column. Given: T-101 and T-112 and noun names added.

Question 85 (1740796) – reworked question to eliminate implausible distractors.

Question 86 (1749051) – Removed “1 year = 8760 hours and” and fixed explanation for A and B to less than 10%

Question 87 (1749131) – embedded explanation for the requirement to use the synch switch.

Question 91 (1759803) – Added per T-103 and per ON-102 to answers and added Given:... to the stem.

Question 92 (1763353) – Added per S43.1.A, OT-112 and OT-200 Appendix 1 to the stem and answers.

Question 93 (2029740) – Fixed alarm from Div 4 to Div 3. Change explanation from “misapplies” to “incorrectly recalls.”

Question 96 (Bank Question 555189) – distractor C was deemed not plausible, replaced question with bank question 556506. Removed day 3 of 30-day LCO from the stem and replaced distractor B with a more plausible distractor.

Question 99 (1795598) – added more to tie SE-8 and EALs

Search for “Y160”:

#16 – Loss of 1B-Y160 and its effect on T-221, T-251, and T-245

#21 – 1B-Y160 confirming indication and reason for restoring PCIG

#25 – Power supplies to 1A-Y160 and 1B-Y160

#76 – Loss of 2A-Y160 impact on Shut Down Cooling

Search for “Y185”:

#26 – Two power supplies to 185

#28 – Event procedure for RBM and whether bypassing the RBM is required.