

**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 on a scale of 1 (easy) to 5 (difficult); questions with a 2 - 4 are acceptable.
3. Check the appropriate box if a psychometric flaw is identified:
  - “Stem Focus” - stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information)
  - “Cues” - stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc)
  - “T/F” - answer choices are a collection of unrelated true/false statements
  - “Cred Dist” - distractors are not credible; single implausible distractors should be repaired, more than one is unacceptable
  - “Part” - 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:
  - “Job Link” - not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational in content)
  - “Minutia” - 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)
  - “# / Units” - contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons)
  - “Backward” - requires reverse logic or application compared to the job requirements
5. Check questions that are sampled for conformance with the approved K/A and those that are *designated SRO-only* (K/A and license level mismatches are unacceptable).
6. Enter question source: (B)ank, (M)odified, or (N)ew. Check that (M)odified questions meet criteria of ES-401 Section D.2.f.
7. Based on the reviewer’s judgment, the question as written is (U)nsatisfactory (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory.
8. At a minimum, explain any “U” status ratings (e.g., how the Appendix B psychometric attributes are not being met).

General Comments:

1. For Student Handout Material, put Question number in file name. Also, if actual title of handout is used in its file name, then exposure to the file name is Exam Security. Consider Q3\_HO1 format. Keep details of reference material and handouts in the worksheet, not in the file name.
2. Remove all numbers in statements like “Which one (1) of the following...”. It should just read “Which one of the following...” Holdover to Navy days I think.
3. Consider adding the statement “The KA is met because...” as the first sentence in the correct answer explanation. For SRO-Only questions, consider adding a second sentence “This question is SRO-Only because...” in the correct answer explanation.
4. Repeat: There are too many question stems that generically state that a transient has occurred or a bus is lost and that operators have entered a procedure. A more effective and operationally valid way to test knowledge is to provide actual plant conditions and parameters and allow the applicants to analyze the integrated plant response.
5. Repeat: Questions need to delve deeper into AOPs and EOPs. Many questions examine basic entry conditions or elementary systems knowledge. These questions do not distinguish between a competent and less-than-competent applicant.
6. Statements of plausibility that say “plausible if applicant doesn’t know the right answer or can’t read P&ID” are of little value. More helpful is a description of a common misunderstanding or OE that would lend the applicant to choose the distractor over the correct answer. Good example – Q14, Explanation A.
7. Order answers from shortest to longest (or with some logic applied).
8. If words appear in every distractor, take out and put in stem. In Q3, “LPCS Pump speed will” and “LPCS Pump Discharge Pressure will” should be in stem. Consider using small matrix for distractors.
9. Providing simplified system flow and/or electrical drawings is highly encouraged whenever a question involves system or electrical lineups. For ease of use to examiners not licensed at RBS, avoid using P&IDs and Elementary Drawings.
10. Whatever acronyms are used, make sure they are consistent in all questions: operator positions (ATC, CRS), system designators (CCP, SSW), locations (MCR, CNTL BLDG), etc. Only use acronyms if their use is common within the Ops Dept and all applicants will understand. Same is true for capitalization – if “Control Room Operators” is used in one question, then don’t use “control room operators” in another question. Be consistent.
11. Repeat: For Modified Bank questions, the original Bank question must also be submitted in order for NRC to evaluate whether modification is adequate. Best solution is to provide a copy of original Bank question in the applicable question’s folder (see Q29).
12. Recommend writing K/A’s in the worksheet just as they appear in the K/A Catalog: add system or EPE/APE at the end of the statement, don’t incorporate it in the middle.
13. In the stem of questions, use bullets to the max extent possible to summarize and simplify data provided. Also, bullets are not full sentences.
14. Annunciators should be quoted verbatim in questions: if “MAIN STEAM LINE DIV I HI-HI RAD OR INOP” then not “MSL Div I Hi-Hi RAD or INOP” – it provides accuracy and helps differentiate what text is part of the Annunciator and what is not.
15. A good exam practice for questions with answers A, A & B, A & B & C is to include the word “ONLY” on distractors where only one option is available. Otherwise, it can be argued successfully that there is more than one correct answer since one is a subset of the other.

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.	Part	Job-Link	Minutia	#/ Unit Ans	Back-ward	Q= K/A	SRO Only				
1	H	4	E										X		N	U E S	CFR 41.7  Rev 3: KA is knowledge of the effect of loss or malfunction of RHR/LPCI in the Injection Mode on Suppression Pool level  Unsat – question doesn't meet intent of KA since there is no injection from RHR/LPCI, so test of effect of loss or malfunction isn't possible.  Also, applicant only needs knowledge of RHR shutoff head (or valve permissive pressure) and effect of RCIC and SRV operation on suppression pool level to answer the question (not part of KA).  Also: Explanation A says RHR B/C – but stem has RHR A/C as overridden Explanation C states distractor is plausible due to the 487 psig valve permissive for RHR injection valves, but the stem states that the RPV pressure is maintained 500-600 psig, which is above the permissive. Is this distractor plausible?  Rev 4 – Editorial corrections Rev 5 - Sat
2	H	3													N	E S	CFR 41.7  Rev 1: Editorial corrections Rev 2: Sat
3	F	3	E	E		E									N	E S	CFR 41.5  Rev 2: Changed focus of stem question, revised answers to 2 x 2 format. Other editorial changes.  Rev 3: Sat

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.	Part	Job-Link	Minutia	#/ Unit Ans	Backward	Q= K/A	SRO Only				
4 Ex	H	3				X	X					C	X	X	N	U E S	CFR 41.5  Rev 1: Unsat. For K/A (a), question asks Backward Logic. Instead of accessing impact of system initiation, question just asks applicant how to initiate system when manually overridden with rising DW pressure. Stem cues applicant that HPCS is overridden and should be started on hi DW pressure.  Unsat. For K/A (b), question does not contain knowledge of use of procedures.  Unsat – 2 correct answers  Answer B is also correct because if both pushbuttons were pushed, HPCS would auto respond (pushing E22A-S6 wouldn't stop auto initiation of HPCS after E22-S7 was depressed)  Also, need to delete words that appear in all answers – “will allow the HPCS system to respond to a high drywell pressure signal” – they are already in the stem.  Rev 2: Editorial – add “initially” or question could have 2 correct answers Rev 3: Sat
5	H	3				X						B			B	E E S	CFR 41.7  Rev 1: Distractor C is not plausible. Since the stem informed the applicant that suction valve for SLC A “failed to open” then using Pump A isn't plausible. If indications had been used instead of end state, then “C” would be more plausible.  Distractor D is only distractor that provides for a reason (“because the “B” Squib valve failed to open). Other distractors state a status only. Recommend deleting the reason from Distractor D to match other distractors. Rev 2: Editorial corrections Rev 3 Sat
6	H	4										C			N	E S	CFR 41.7  Rev 1: Editorial corrections Rev 2: Sat

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.	Part	Job-Link	Minutia	#/Unit Ans	Backward	Q=K/A	SRO Only			
7	F	3				X					B		U	N	U	<p>CFR 41.7</p> <p>Rev 2: Unsat - Question does not test knowledge of parameters and logic used to assess the status of safety functions (usually performed after EOP entry, i.e., reactivity control, heat removal). Although this is an NRC exam bank question (2003), that question was for a different K/A.</p> <p>Also, Distractor C needs grammatical correction – and NO further automatic actions occur (or similar).</p> <p>Rev 3: Replaced question, now Sat.</p>
8	H	3				X					D			N	E S	<p>CFR 41.7</p> <p>Rev 3: Change stem so SRM B hasn't failed, Distractor "D" not acceptable. Other editorial corrections.</p> <p>Rev 4: Sat</p>
9	F	3									B			N	E S	<p>CFR 41.7</p> <p>Rev 2: Editorial corrections</p> <p>Rev 3: Sat</p>
10	H	3									B			N	E E E S	<p>CFR 41.5</p> <p>Rev 1: Editorial corrections</p> <p>Rev 2: Editorial corrections</p> <p>Rev 3: Editorial corrections</p> <p>Rev 4: Sat</p>
11	F	2									B			N	E E S	<p>CFR 41.5</p> <p>Rev 2: Editorial corrections</p> <p>Rev 3: Editorial corrections</p> <p>Rev 4: Sat</p>
12	H	3									A			B	E E E S	<p>CFR 41.2, 9</p> <p>Rev 1: Editorial corrections</p> <p>Rev 2: Editorial corrections</p> <p>Rev 3: Editorial corrections</p> <p>Rev 4: Sat</p>

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.	Part	Job-Link	Minutia	#/ Unit Ans	Back-ward	Q=K/A	SRO Only			
13	F	3				X								N	E E E S	CFR 41.5 Rev 2: Distractor D isn't plausible – is there any combination of SRVs to make applicant think 10 SRVs is plausible? Also, since SRV is defined in stem, use SRV acronym in all distracters. Other editorial corrections. Rev 3: Editorial corrections Rev 4: Combo of answers is awkward. A&B don't match C&D. Also, testing second half of answers doesn't add discriminatory value. Rev 5: Sat
14	F	3		X										N	E E S	CFR 41.7 Rev 1: Distractor D is cueing. It repeats the correct answer of "summation of the feedwater headers flow venture." Remove "summation of the" from all answers. Rev 2: Editorial corrections Rev 3: Sat
15	H	3												B	E S	CFR 41.7 Rev 1: Editorial corrections Rev 2: Sat
16	F	3												B	E S	CFR 41.7 Rev 1: Editorial corrections. "Fancy Point Switchyard" is in all distracters – could move to stem Rev 2: Sat
17	F	4												B	E S	CFR 41.10 Rev 1: Editorial corrections. "All RDAC Panels will be" is in all distracters – could move to stem Rev 2: Sat
18	F	4												B	E S S	CFR 41.7 Rev 1: Editorial corrections. Enhance Explanations Rev 2: Sat Rev 3: Sat (clarified Bank number)

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.	Part	Job-Link	Minutia	#/ Unit Ans	Back-ward	Q=K/A	SRO Only			
19	H	3												B	E E E S	CFR 41.7 Rev 1: Editorial corrections. Better to give actual values of speed/temp to let applicant determine state of condition (not tell them that normal trip values are exceeded). Rev 2: No discrim value with third part of answers. Rev 3: Revise speed of EDG 1A to account for setpoint variance (517-520) Rev 4: Sat
20	F	2												B	S	CFR 41.7 Rev 1: Sat
21	F	3												B	E S	CFR 41.7 Rev 1: Editorial corrections, revised Explanations. Rev 2: Sat
22	H	3												B	E S S	CFR 41.5 Rev 1: Editorial corrections. Rev 2: Sat Rev 3 Sat (revised Short to Long)
23	H	3				X			X					B	U U E S	CFR 41.5 Rev 1: Unsat. Distractors are complicated with unnecessary info. Also LOD=1 Rev 2: Unsat. While distractors have been cleaned up, LOD still =1 as no clarification is given to initial vs final state. Could also argue that there are more than 1 correct answer. Rev 3: Editorial corrections Rev 4: Sat
24	H	3												B	E S	CFR 41.9 Rev 3: Editorial corrections. Rev 4: Sat
25	F	3		X										N	U S	CFR 41.8 Rev 2: Without qualifier (maximum), applicant is cued if they know only one answer can be correct (due to answers being subsets). Rev 3: Sat

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.	Part	Job-Link	Minutia	#/Unit Ans	Backward	Q=K/A	SRO Only			
26	F	2			X									N	U S	CFR 41.7 Rev 1: Unsat – question is a group of True/False statements. Correct answer can be determined by covering up stem and answering True or False to each statement. (See Appendix B) Also, the question defines CCP but not SWP – should be consistent. Rev 2: Sat
27	F	2												B	E E S	CFR 41.7 Rev 2: Realign answers short to long Rev 3: Enhance Explanations Rev 4: Sat
28	H	3												N	E S	CFR 41.6 Rev 1: Editorial corrections. Distractor “C” doesn’t flow with stem. Rev 2: Sat
29	F	2												M	E S	CFR 41.7 Rev 2: Editorial corrections Rev 3: Sat
30	H	3												N	E E S	CFR 41.10 Rev 1: Editorial corrections Rev 2: Editorial corrections on fourth bullet Rev 3: Sat
31	H	3											U	N	U S	CFR 41.7 Rev 1: Unsat. Question does not address the automatic operation of an RHR valve in suppression pool cooling. Rev 2: Sat
32	H	4												M	E N/A E S	CFR 41.10 Rev 3: Editorial corrections Rev 4: Disregard Rev 5: Editorial changes to stem Rev 6: Sat  Note: RBS confirms that this topic is supported by RO JTA (and thus is NOT unsat for being an SRO-Only question)



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			Stem Focus	Cues	T/F	Cred. Dist.	Part	Job-Link	Minutia	#/ Unit Ans	Back-ward	Q= K/A	SRO Only			
33	H	4												B	E N/A S	CFR 41.7 Rev 2: Editorial corrections Rev 3: Disregard Rev 4: Sat
34	H	3												B	E S	CFR 41.7 Rev 1: Editorial corrections Rev 2: Sat
35	F	3										X		B	U S	CFR 41.4 Rev 1: Unsat - question does not test on off gas design feature or interlock that prevents a hydrogen explosion or fire. It is recognized the design feature in the question is related to hydrogen concentration control, however this is not what the question tests on. Recommend crafting the question to something like "what is the purpose of the SJAE low flow isolation." Rev 2: Sat
36	F	2												N	E S	CFR 41.11 Rev 1: Editorial corrections Rev 2: Sat
37	F	2												B	E S	CFR 41.10 Rev 2: Editorial corrections Rev 3: Sat
38 Ex	H	3										X		M	U S	CFR 41.11 Rev 2: Unsat – KA requires knowledge of "operational implications" of airborne contamination control. Question is written on system response due to hi-hi rad signal. What is the <i>operational implication</i> of this system response for airborne contamination control? Also, question format is Unsat. There are 8 different unique bits of info spread across 4 answers. Only knowledge of 3 are required for correct answer. Rev 3: Sat
39	H	3												M	E S	CFR 41.10 Handout Rev 2: Editorial corrections Rev 3: Sat

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.	Part	Job-Link	Minutia	#/Unit Ans	Backward	Q=K/A	SRO Only			
40	H	3												B	E S	CFR 41.8 Rev 2: Editorial corrections. Question is valid 2 x 2 format but should be simplified for the applicant (move as much from distractors to the stem as possible). Question would also benefit from bullets in the stem. Rev 3: Sat
41	H	3												M	E S	CFR 41.7 Rev 1: Editorial corrections Rev 2: Sat
42	H	4												N	E S	CFR 41.10 Rev 1: Editorial corrections Rev 2: Sat
43	F	3												B	E S	CFR 41.7 Rev 1: Editorial corrections Rev 2: Sat
44	H	3												B	E S	CFR 41.4 Rev 1: Editorial corrections. Need to correct word order in B – non regen heat exchangers. Rev 2: Sat
45	F	2												N	E S	CFR 41.7 Rev 2: Editorial corrections Rev 3: Sat
46	F	3												B	E S	CFR 41.10 Rev 1: Editorial corrections Rev 2: Sat
47	F	3												M	E S	CFR 41.11 Rev 3: Editorial corrections Rev 4: Sat

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			Stem Focus	Cues	T/F	Cred. Dist.	Part	Job-Link	Minutia	#/Unit Ans	Backward	Q=K/A	SRO Only				
48	H	3				X					A				N	U S	CFR 41.10 Rev 1: Unsat - None of the distractors are credible with the exception of the correct answer Rev 2: Sat
49	H	3									A				M	E E S	CFR 41.7 Rev 2: Editorial corrections. Question allowed since it addresses function of two systems that are designed for Hi Reactor Pressure EPE's Rev 3: Editorial corrections. Rev 4: Sat
50	H	4									B				N	E S	CFR 41.9 Rev 1: Editorial corrections Rev 2: Sat
51	H	3				X					D				B	U S	CFR 41.10 Rev 2: Unsat – 2 correct answers Rev 3: Sat
52	H	3									C				N	E S	CFR 41.10 Rev 1: Editorial corrections Rev 2: Sat
53	F	4									D				M	E S	CFR 41.9 Rev 1: Editorial corrections Rev 2: Sat
54	F	4									C				N	E S	CFR 41.10 Rev 1: Editorial corrections Rev 2: Sat
55	H	3				X					C				N	U S	CFR 41.10 Rev 2: Unsat – 2 correct answers Rev 3: Sat

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.	Part	Job-Link	Minutia	#/ Unit Ans	Back-ward	Q= K/A	SRO Only			
56	H	3												N	E E S	CFR 41.12 Rev 1: Editorial corrections Rev 2: Editorial corrections Rev 3: Sat
57	H	4												B	E S	CFR 41.7 Rev 1: Editorial corrections Rev 2: Sat
58	H	4												N	E E S	CFR 41.4, 10 Rev 2: Editorial corrections Rev 3: Editorial corrections Rev 4: Sat
59	F	3												B	E S	CFR 41.10 Rev 1: Editorial corrections Rev 2: Sat
60	H	3				X								B	U U S	CFR 41.5 Rev 1: Unsat. Only need to know pressure response to correctly answer question, therefore it doesn't test to the K/A. I recommend deleting pressure response from the answers. It would then meet the K/A because it requires knowledge of reactor power in response to the MSIV failure which causes high reactor pressure. Explanation section for C and D states that 2 of 3 parameters are correct, but 2 of the 3 DON'T match the correct answer, so something needs to be corrected. Also, have to assume no operator actions as the question asks for reactor response, so how does level respond without operator actions? Need a technical reference to show how it will stabilize at a lower level (without operator actions) or need to add more information to the explanation section. Rev 2: Unsat. 2 distractors not plausible. No discriminatory value in second part of each answer. Feedback was to write a 2 x 2 question. Rev 3: Sat
61	H	3				X								M	U S	CFR 41.7 Rev 1: Unsat. "C" and "D" are subsets of "A" and "B" Rev 2: Sat

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			Stem Focus	Cues	T/F	Cred. Dist.	Part	Job-Link	Minutia	#/ Unit Ans	Back-ward	Q=K/A	SRO Only				
62	F	3									A				N	E S	CFR 41.5 Rev 1: Editorial corrections Rev 2: Sat
63	H	3									D				N	E S	CFR 41.9 Rev 1: Editorial corrections Rev 2: Sat
64	F	3									B				M	E S	CFR 41.6 Rev 1: Editorial corrections Rev 2: Sat
65	F	3									C				B	E S	CFR 41.10 Rev 1: Editorial corrections Rev 2: Sat
66	F	3									B				N	E S	CFR 41.10 Rev 1: Editorial corrections Rev 2: Sat
67	F	3									C				N	E S	CFR 41.10 Rev 2: Editorial corrections Rev 3: Sat
68	F	2									C				M	E S	CFR 41.1 Rev 2: Editorial corrections Rev 3: Sat
69	F	2									C				B	E E S	CFR 41.10 Rev 1: Editorial corrections Rev 2: Editorial corrections Rev 3: Sat
70	F	2									A				M	E S	CFR 41.10 Rev 3: Editorial corrections Rev 4: Sat

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.	Part	Job-Link	Minutia	#/ Unit Ans	Back-ward	Q=K/A	SRO Only			
71	H	3												M	E S	CFR 41.5 Rev 3: Editorial corrections Rev 4: Sat
72	F	3												N	S	CFR 41.12 Rev 2: Sat
73	F	2												B	E E S	CFR 41.12 Rev 2: Editorial corrections Rev 3: Editorial corrections Rev 4: Sat  Note: RBS confirms that this topic is supported by RO JTA (and thus is NOT Unsat for being an SRO-Only question)
74	F	3	X											B	U S	CFR 41.10 Rev 0: Unsat – not a Tier 3 type question. Reselect KA Rev 1: Sat
75	F	2												M	E S	CFR 41.10 Rev 0: Editorial corrections. Second part of answers doesn't have discriminatory value since correct answer can be determined by only knowing first part. Rev 1: Sat

	B = 29 (39%)	F = 37 (49%)	E = 58 (77%)	<u>Additional Notes:</u>
<b>RO TOTALS:</b>	M = 14 (18%)	H = 38 (51%)	U = 15 (20%)	
	N = 32 (43%)	S = 2 (3%)		
<b>GENERAL COMMENTS</b>				
1. Bank questions are indicated by <b>B</b> ; Modified are indicated by <b>M</b> ; New questions are indicated by <b>N</b>				

2. Chief Examiner comments are indicated in **black**.

3. Average difficulty is 2.99 on the RO exam.

4. The 10CFR55.41/43 distribution is: RO

41.1 = x

41.2 = x

41.3 =

41.4 = x

41.5 = x

41.6 = x

41.7 = x

41.8 = x

41.9 = x

41.10 = x

41.11 = x

41.12 = x

41.13 =

41.14 =

5. The answer distribution is: RO

A = 16 (21%)

B = 18 (24%)

C = 24 (32%)

D = 17 (23%)

6. There are 1 RO question with handouts provided (Q39).