

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	Backward	Q=K/A	SRO Only			
1	H	3												N	S	(CFR: 41.7)
2	F	2	E			E	U				U			N	U/E	(CFR: 41.5) The references provided use psia as a unit of measure. In the control room, operators will not see psig (?). Using 392psig and the TS requirement of less than or equal to 430psia, someone could argue that C is also a correct answer. Recommend changing stem to focus the answer to the maximum allowable setpoint. Changed answers to reflect PSIA. "C" is incorrect because LTOP relief does not lift at 392 psia.
3	F	2												N	U/E	(CFR: 41.5) Need reference (although it is obvious) for breaker status in Mode 1. Are the applicants required to know from which MCC (bus) the valve is powered? If so then change the distractors. Only SR or Non-SR. Sat with reference.
4	H	3	E											B	E	(CFR: 41.10) The stem has too much needless information. The fact that both HPSI pumps were secured, a LOCA is in progress, and the water level is 10% and lowering is sufficient to elicit the correct answer based on HPSI throttle criteria. Eliminated excess info, changed PZR level in stem, changed distractor "D"
5	F	2												N	S	(CFR: 41.7) changed distractor "B" to match procedure

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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6	F	3				U								N	U	(CFR: 41.5) The fact that the relief valves referenced in distractors A and B are not installed in the equipment is not discriminating. All applicants should know this. Question is sat as is.
7	H	3												N	S	(CFR: 41.7) Simplified and clarified the stem of the question.
8	H	3												B	U/E	(CFR: 41.7) The reason given for distractor C is not correct. X and Y channels are control only. Need better references. Corrected explanations, clarified stem.
9	H	3												B	E	(CFR: 41.6,7) The reasons given for distractors C and D state the same thing, in that the end-point for C and the start point for D are the same. One of these is incorrect. I would have to guess C. Changed question, revised answers/explanations.
10	F	2												N	S	(CFR: 41.7) Clarified stem
11	H	3												N	S	(CFR: 41.7, 10) Eliminated Action Required from stem and answers. Procedure used to determine type of failure. Licensee considered Tech Spec setpoint RO knowledge
12	F	2												B	S	(CFR: 41.7) Changed question and answers to better match the KA
13	H	3		U								U		B	U	(CFR: 41.7) Operation of the switches does not address the ability to locate the switches. This is required for this KA. The Only discriminating part between A/B and C/D is the Relay Room override. The location is not tested even though it is referenced; and may be a que to the applicant. Simplified stem, clarified answers. Question adequately addresses KA.
14	H	3												N	S	(CFR: 41.7) Reworded question, simplified answers.
15	F	2			U							U		N	U	(CFR: 41.14) This is a true/false structured question. This also does not match the KA since the heat tracing from the isolation valve to the TDEFW system, by definition is part of the EFW system, not the MRSS. Replaced KA
16	H	3												B	U	References are lacking any detail. Clarified stem and answers
17	H	3												M	S	(CFR: 41.7) Changed direction of failure (overlap with Op Test) and simplified stem and answers. Question is now a Bank question.
18	F	3												N	U	(CFR: 41.7) The references given used the designators, B3S and A3S as the "direct" power supply to the EFW pumps. Provide reference for 3B supplying B3S. If B3S is 3B, then this question is sat. Clarified stem. B3S is 3B – question is sat.
19	F	3												N	E	(CFR: 41.5) Change B and D to address a specific EDG. It can be deduced from the information in the stem, but 'ONE EDG' and 'the other EDG' seems poor in form. Revised question to match KA.
20	F	2												B	U	(CFR: 41.5,7) Insufficient references. Provide justification for a tripped EDG operating in parallel with the grid and the output breaker failing to open. Will there still be an EDG left? Simplified stem and answers.
21	F	3												B	S	(CFR: 41.5) Revised question and answers due to lack of ref material.

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22	H	3					U							N	U?	(CFR: 41.7) The precaution states that to prevent reverse power, maintain outgoing MVAR AND 0.1 MW load. With a lower EDG voltage, MVAR would be incoming, which would make both C and D correct. "D" is incorrect as voltage does not affect reverse power trip.
23	F	3					U							N	U/E	(CFR: 41.7) This question is very similar in concept to Q22. The governor control is called the Speed Adjust. Need to test how the adjustments are made (ie raise or lower). Reference the actual 4.16KV bus procedure; not diesel ops procedure. Replaced KA (too many EDG KAs)
24	F	2		U										B	U	(CFR: 41.11,12) The fact that Radiation Protection is in the stem, would lead the answer to A, which addresses radiation protection. Revised answers for better plausibility.
25	H	3												B	E	(CFR: 41.5) Clean up distractor C so that the sentence makes sense. Revised "C" and "D" to reflect correct actuation signal (SIAS not reactor trip).
26	F	2												M	S	(CFR: 41.4) Minor revision to stem
27	H	3								U				B	U	(CFR: 41.7) This is a negatively stated question with backward logic. Rewrite to make it positive. Revised to eliminate backward logic.
28	F	3												N	E	(CFR: 41.7) Insert 'Containment' before Vacuum in each answer. Replace 'the specified value' with some number (setpoint is 6.9). Revised answers to match wording in the procedure / system description.
29	F	2		U										N	E	(CFR: 41.6,7) The answer, D, is the longest sentence. Reword to say '...., CEA withdrawal will be permitted in Manual Individual ONLY.' Clarified answers
30	F	2												B	S	(CFR: 41.7) Revised question to address operational implication as required by KA
31	H	3												N	E	(CFR: 41.10) Change in the stem: '...values represents the...' to '...values is the...' AND '...circulation may be...' to '...circulation has been...' Enhancements made.
32	F	2									U			N	U	(CFR: 41.7) This question should be written for monitoring the hydrogen recombiner /purge control, not the hydrogen analyzer. Hydrogen analyzer is part of the HRPS. Question is sat.
33	H	2												N	E	(CFR: 41.10) Replace: '...for subsequent start of the...' with '...to restart the 'A'...' Enhancements made.
34	F	3												N	E	(CFR: 41.11) Remove '... in progress' from the stem. Distractors B, C and D due not address the status of the release. Reword all distractors to make them symmetric and address the release status, or rewrite to elicit status of BM-547 and -549. Enhanced and clarified stem and answers.
35	H	5							U					N	U	(CFR: 41.11) Would the operators be required to recall this level of detail from a procedure in a closed reference exam? This is step 6.4.14 in the procedure, with no notes or cautions addressing the failure. This needs to be rewritten so the applicant

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																can determine the impact of the failure, and identify a procedure to use. Question asks the impact of the failure. Licensee does not consider question too detailed. Question is sat.
36	F	3												N	U/E	(CFR: 41.7) The question is poorly worded and confusing. Reference located with Q59. Question revised for clarity.
37	H	3						U					E	N	U/E	(CFR: 41.7,10) Based on the stem wording, 20 inches and lowering and the procedural reference, the operators have violated OP-901-220 since they should have tripped the reactor before the turbine trip at 20". The stem does not address a loss or malfunction of Circ Water. Tied to Q93. Revised stem to add CW and changed vacuum value.
38	H	2												N	S	(CFR: 41.10)
39	F	2												B	E	(CFR: 41.10) Second bullet needs to be ... neither automatically nor manually. Manually trip the generator needs to be open the generator output breakers in distractors C and D. Clarified stem and answers.
40	H	3												B	U/E	(CFR: 41.14) The stem asks the applicant to determine an SI flow rate. All the answers have the same flow rate. This is obviously NOT discriminating. Remove that portion from the stem and answer; or, put different values into the answers. REFERENCES!! Revised SI flow rate in stem to make plant specific. Flow rates in answers are the same but have less than/greater than discriminators.
41	H	3												N	S	(CFR: 41.10) Simplified stem.
42	H	2				E								N	U/E	(CFR: 41.5,10) Distractor C and D reference charging pumps automatically turning off. This is not discriminating since all operators should know the charging pumps are only affected during ESFAS by SIAS, and any action should turn charging pumps on. Changed Charging Pumps to HPSI Pumps in "C" and "D"
43	H	3												N	U	(CFR: 41.2, 14) Provide justification for the correct answer. There are several variables at play, loop flows and steaming rate of each S/G, time in core life, time after the trip, etc. Replaced KA due to lack of reference material.
44	H	3												N	S	(CFR: 41.7)
45	H	3												B	E	(CFR: 41.10) Change third bullet in stem to 'The following alarms are received:' Revised question to address specific procedure driven action.
46	H	3												N	S	(CFR: 41.10) Minor enhancements.
47	F	3												B	S	(CFR: 41.10) Added specific locations and nomenclature.
48	F	2												B	E	(CFR: 41.5) Change B and D to '...Set output main line load contactors' load contactors is sufficient.
49	H	3												N	E	(CFR: 41.10) Recommend using the ruptured generator pressure in the distractors somewhere. It is unlikely that a candidate will use the intact generator's pressure.

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																Revised stem for clarity. Changed SG pressures and values of subcooling for better discrimination.
50	H	3												B	E	(CFR: 41.7) Change the MS Line pressures to SG pressures. Minor edit on third bullet: change is to are and make pressure plural. NEED BETTER REFERENCES!!! Had to dig in the FSAR to find cross link between MSIS and EFAS. Done
51	H	3												N	S	(CFR: 41.10)
52	H	2												N	E	(CFR: 41.5) Need rated RPM of EDG to verify lower limit on frequency. Changed voltage and frequency on EDG B to make more discriminating.
53	H	4												B	S	(CFR: 41.4) Added valve failure to answers and simplified them.
54	H	3												B	U?	(CFR: 41.10) This one was addressed in the 11/2007 exam, and now contains the reasons for the responses. This is the second 'A' EDG loaded with a loss of A-DC 125VDC bus. (Reference Q20) Recommend changing one or the other. Changed question – too many EDG related questions.
55	H	2												B	S	(CFR: 41.7)
56	F	2												N	S	(CFR 41.10)
57	H	2												N	S	(CFR: 41.2) Minor changes to stem.
58	F	3											U	N	U?	(CFR: 43.2) The way this question is worded, it is a Tech Spec and basis question which is SRO LOK. Reword the question to test the applicants' knowledge of immovable vs. misaligned control rods and the need to verify SDM. This also mirrors Q83. Changed answers to match the question. Licensee stated knowledge is that expected of RO's.
59	F	3												N	U?	(CFR: 41.5) This is almost the same question as Q36, in that the candidate can answer half the question based on Q36. Revise or change Q36 or this one. Replaced KA
60	H	2												M	S	(CFR: 41.11) Corrected stem for 0200.2 rad monitor
61	F	2												N	S	(CFR: 41.11) Minor changes in stem – more in line with ref material
62	H	3												N	S	(CFR: 41.5)
63	H	2												N	U/E	(CFR: 41.10) If loop delta-T is to be less than 58F, then raising the steaming rate will raise loop delta-T. This would make D incorrect. Revise the answers. It seems confusion was made between delta-T and subcooling > 28F. Justification for A is not correct. Should be <58F. Simplified stem, changed wording on "A" and "D" to match procedure. Raising steaming rate will initially raise loop delta-T, but when NC is established, loop delta-T will decrease.
64	H	3												N	E	(CFR: 41.10) Provide justification that water collected in a tank is identified. Added RCP controlled bleedoff flow to stem. Changed amount of power change to make

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																more discriminatory.
65	H	3				E		E						N	E	(CFR: 41.10) What is the expectation of the facility: Trip 2 RCPs at 382F and going down or allow RCS temperature to go down to 370F? This seems to be too far from the point at which action is required. Distractor C makes no sense and is not credible. Why would ALL RCPs be tripped when only ONE is required to be tripped. Changed temp in stem to 380F. Changed distractor "C". Clarified info in stem.
66	H	3												B	E	(CFR: 41.10) Are the candidates required to know this from memory? Yes. Clarified PMC Power info in stem.
67	F	2												B	E	(CFR: 41.5) Justification for B is wrong. Should be 15 minutes, and 1 hour in Modes 1 and 2. Simplified stem, corrected justification for "B"
68	F	2												B	S	(CFR: 41.10) Minor changes to stem, improved explanations
69	F	2										U	B	U?		(CFR: 41.10) Reword stem as indicated on the draft. Done Is the Refuel SRO the same as the fuel handling supervisor (referenced in procedure)? Yes. Also changed one title in distractor "A" to make more plausible. Are the RO's required to know this? Yes
70	F	2												B	S	(CFR: 41.5) Simplified stem.
71	F	3	E											N	E	(CFR: 41.12) Reword the stem so that the applicant knows that they are to provide information about whether the limit can be exceeded. Changed stem to match answers and KA.
72	H	3												N	S	(CFR: 41.13) Clarified stem, simplified answers.
73	F	2												B	E	(CFR: 41.13) REFERENCE needed to justify Contamination levels. Changed stem (and correct answer) to make more discriminating.
74	F	2												N	S	(CFR: 41.10)
75	F	3												B	S	(CFR: 41.5) Removed the "qualifier" portion of the answers.
76	H	3												B	E	(43.5) 6 th bullet in stem: Valve is misspelled Fixed
77	H	3												N	E	(43.2) Add a water level to the stem to ensure that there is no confusion about the applicability of this tech spec. Simplified and clarified stem and answers. Added water level to stem.
78	H	4						U						N	U	(41.5) This is written to RO level. Replaced KA
79	F	2												B	S	(43.5) Minor change to stem.
80	H	4												N	E	(43.5) Distractors A and B, first line: Change is to are. No – this is one safety function. Distractors B and D: Change Function Recovery to Functional Recovery Done.

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81	H	3												N	S	(43.5) Clarified stem, simplified answers
82	H	2				U		U						N	U	(41.5) This is written as an RO question. All the distractors have the same answer for the second part of the question (declare COLSS inop), added, presumably to force this to the SRO level. However, there is no discriminatory value. Changed question to make more discriminatory. Changed answers to eliminate comment.
83	H	2						U						B	U	(43.2) As written, this is RO level of knowledge, since the 15 minute requirement comes from OP-901-102, and CEA alignment effects fall under CFR 55.41(b). Also this is the second question dealing with CEA alignments. Reference Q58. Replaced question
84	H	3												N	S	(43.5) Removed TS operability from stem (not part of KA), added procedure reference
85	H	2							U					N	U	(43.5) Fix the stem so that the sentence is complete and makes sense so the applicants aren't confused. The fact that level is to be established at 50% with voiding in the core does not seem to be a memory recall item. The part of the question that is SRO ONLY knowledge is the EAL classification, and no technical justification is provided. Revised question to eliminate EAL classification (not part of KA), simplified stem to include only required info
86	H	3	E			U								N	U/E	(43.5) The stem should be edited to elicit the actions required if the safety function is not met. C and D are not credible because no contingency actions are required if the safety function is met. The candidates can easily exclude these. Revised question to include a second safety function. Replaced procedure transition with mitigation strategy (better match with KA)
87	H	3												N	E	(43.5) Change 2 nd bullet to All systems are in normal alignments. Eliminated second bullet (not required) Took procedure titles out of answers and put in stem.
88	H	2												N	S	(43.5)
89	H	3												N	E	(43.5) Remove the 'among others' from the second bold bullet. Eliminated entire bullet (not required) See markup concerning the stem. Distractors C and D need to be dressed up to form a complete sentence. Done
90	F	2				U								B	U	(43.5) Distractors C and D have the same procedure name; but, OP-901-212 is Rapid Dn Pwr and OP-901-102 is CEDM malfunction. This is poor distraction. This was changed from an RO level question on the 2007 retake by tagging on the procedures. Changed impact on "B" and "D" to make more discriminating. Removed procedure names from answers and put in stem
91	F	2						U						N	U	(41.5) This is an RO level question. Replaced KA
92	H	3				E								N	E	(43.5) Control channels will not cause a trip (RO knowledge). True – but this is not all of the question. The stem stated that all other level indications were normal, so distractor D is not plausible. Requires system knowledge to rule "D" out. Procedure

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																reference makes this SRO only.
93	H	2												N	U/E	(43.5) Part of the answer to this question is given in Q37 and vice versa. Revised question to remove any overlap with Q37. Simplified answers
94	F	2												B	S	(43.1, 2)
95	F	1						U						N	U	(43.2) This question is asking another HUR/CDR item (RO knowledge), and is not discriminating for this level of operator. Provide a HUR and have the applicant identify the TS and time requirement or change the question. Revised question to include TS implications and basis of the HUR.
96	H	2												N	E	(43.2) See markup for stem. (minor editorial change) Done – also simplified answers
97	F	3												N	S	(43.3) Simplified answers
98	F	2												B	U	(43.4) Provide procedural reference. Could not verify this one. Replaced KA due to lack of ref material.
99	H	3												N	S	(43.5) Removed procedure names from answers and put in stem.
100	H	3												B	S	(43.5) Changed distractor "A" to make more plausible.

RO TOTALS:	B= 28 (37.3%) M= 3 (4%) N= 44 (58.7%)	F= 36 (48%) H= 39 (52%)	E= 21 U= 25	Additional Notes: Fuel handling procedure question was asked to RO's
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SRO TOTALS:	B= 7 (28%) M= 0 N= 18 (72%)	F= 7 (28%) H= 18 (72%)	E= 7 U= 10	Additional Notes: There was no fuel handling question for the SRO's.
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GENERAL COMMENTS:

- Bank questions are indicated by B; Modified are indicated by M; New questions are indicated by N.
- Chief Examiner comments are indicated in *blue*.
- Average difficulty is 2.64 on the RO exam and 2.56 on the SRO exam.
- The 10CFR55.41/43 distribution is: RO / SRO
 41.1 = 0 / 0 43.1 = 0 / 1
 41.2 = 3 / 0 43.2 = 0 / 4
 41.3 = 0 / 0 43.3 = 0 / 1
 41.4 = 2 / 0 43.4 = 0 / 1
 41.5 = 15 / 2 43.5 = 0 / 15

41.6 = 2 / 0 43.6 = 0 / 0
41.7 = 23 / 0 43.7 = 0 / 0
41.8 = 0 / 0
41.9 = 0 / 0
41.10 = 23 / 0
41.11 = 5 / 0
41.12 = 2 / 0
41.13 = 2 / 0
41.14 = 2 / 0

5. The answer distribution is: RO / SRO

A = 20 (26.7%)	/	8 (32%)
B = 18 (24%)	/	6 (24%)
C = 19 (25.3%)	/	4 (16%)
D = 18 (24%)	/	7 (28%)

6. There are 2 questions with attachments provided.