

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 to 5 (easy to difficult) rating scale (questions in the 2 to 4 range are acceptable).
3. Check the appropriate box if a psychometric flaw is identified:
 - a. The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).
 - b. The stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc).
 - c. The answer choices are a collection of unrelated true/false statements.
 - d. The distractors are not credible; single implausible distractors should be repaired, more than one is unacceptable.
 - e. 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:
 - a. 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).
 - b. 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).
 - c. The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).
 - d. The question requires reverse logic or application compared to the job requirements.
5. Check questions that are sampled for conformance with the approved K/A and those that are designated SRO-only (K/A and license level mismatches are unacceptable).
6. Enter question source: (B)ank, (M)odified, or (N)ew. Check that (M)odified questions meet criteria of ES-401 Section D.2.f.
7. Based on the reviewer's judgment, is the question as written (U)nsatisfactory (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
Place the answer letter here
Place the 55.41 or 55.43 item here
8. At a minimum, explain any Unsat ratings (e.g., how the Appendix B psychometric attributes are not being met).

Q#	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
	(F/H)	(1-5)	stem focus	cueing	T/F	cred dist	partial	job link	minutia	# / units	back-ward	K/A	SRO-only	B/M/N	U/E/S	A/B/C/D	55.41x55.43y	
1	H	3												B	S	C	41.4	ON 2017 NRC EXAM. No comments.
2	H	3												N	S	D	41.10	No comments.
3	H	2												N	S	A	41.7	No comments.
4	H	2												B	S	B	41.5	ON 2018 NRC EXAM. No comments
5	F	2				X								N	E	C	41.6	Distractor D appears to be "none of the above". Leave as is, valid distractor, only one distractor can be "reactor trip is not required". It is last because it is the longest distractor. Discuss. Revised D, Q now S
6	H	2												N	S	C	41.3	No comments.

7	H	2		X										N	S	A	41.7	Discuss - may be too close to event 2 in scenario 3. Event 2 in Scenario 3 is a pressure control channel failing low. This question is written on a pressure control channel failing high. Completely different actions. Leave as is.
8	H	2												B	S	C	41.1	ON 2015 NRC EXAM. No comments
9	H	2				X								B	E	D	41.14	ON 2018 NRC EXAM. Discuss - is distractor A assuming student will confuse pressure with temperature? Yes, and agree it is not a good distractor. Changed distractor A to 745 psia. Changed the explanation for distractor A to "This value is the saturation pressure for the existing CET temperature. This distractor would be chosen if 30 °F subcooled is not factored into the answer." Added the calculation required to get the right answer to distractor D OK - Q now S
10	F	2				X	X							B	E	A	41.10	ON 2017 NRC EXAM. Since 230 is less than 380, why is C wrong? Changed the stem to what does OP-902-004 "state" in the procedure. That makes 230°F the wrong answer. Added how 230°F the wrong answer to explanation C and D. Q now S

11	H	2				X								N	E	B	41.10	Discuss why student might consider EFW pump B plausible (distractors A and D) EFW Pump B would be a plausible answer if the applicant determines that EFW Pump B has a greater capacity than EFW Pump AB. Added this plausibility statement to explanations for distractors A and D. Q now S
12	H	3												N	S	D	41.7	No comments
13	H	2	X											N	E	D	41.10	Delete "ONE" in stem. Add "per OP-902-003" after "flow" in stem. Deleted "ONE" in stem and added "per OP-902-003" after "flow" in stem. Q now S
14	F	2				X								N	E	B	41.7	ON 2011 NRC EXAM. Discuss why student would think an ADV opening on a loss of power is plausible (distractors B and D). There are malfunctions where the ADVs fail open off and the off-normal procedures direct the crew to take manual control of the ADVs and close them (such as a failure low of the ADV setpoint or controller output failure). The student could determine that the SUPS failure affects the ADV in this manner or the student may determine that an ADV fails open to maintain cooling to a Steam Generator to prevent opening a MSSV upon an accident. Let's please discuss this. Revised, Q now S
15	H	2												N	S	A	41.7	No comments

16	F	2	X											N	E	C	41.8	Add "MINIMUM" prior to CSP in stem. Added "MINIMUM" prior to CSP in the stem. Put "MINIMUM" in caps Revised, Q now S
17	H	3												N	S	B	41.7	No comments
18	H	3												N	S	C	41.5	No comments
19	F	2												N	S	B	41.10	No comments
20	H	3	X				X							N	U	A	41.10	Distractor C is also correct as written. Restructure stem such that the second part of the question asks what the highest procedurally permissible power level is when the power reduction can be stopped. Changed part 2 to read "The highest permissible power that the down power can be stopped to be in compliance with TS 3.1.3.1 is when reactor power reaches ____ (2) ____ percent." Also, added the title of TS 3.1.3.1 to the stem. Q now S
21	H	2												N	S	C	41.6	No comments
22	H	3				X								B	E	D	41.2	ON 2018 EXAM. Please discuss - explanations are not making sense to me. Will discuss and added words to the explanations to make it more clear. Revised, Q now S
23	H	3	X			X								N	E	A	41.10	Delete "ONE" in stem. Add "ONLY" at the end of C, change "Leak" to "Leakage." Incorporated these three changes. Place "ONLY" in caps. Revised, Q now S
24	F	2												B	S	A	41.4	ON 2014 NRC EXAM. No comments
25	H	2												B	S	D	41.5	ON 2015 NRC EXAM. No comments

26	H	3		X		X								N	U	C	41.4	Close FRV A is in 3 out of four distractors, meaning it's probably in the correct answer. Adjust the startup FRV between 13-21% open is in two distractors while closing it is in one. This cues the answer is very probably C or D without reading the question. Changed distractor A and its explanation to include closing Main Feedwater Regulating Valve A. Discussed changes. Q now S
27	H	2												B	S	C	41.10	ON 2015 NRC EXAM. No comments
28	H	2	X	X		X								N	E	D	41.7	Delete "ONE" in stem. Discuss possibility of changing middle seal parameter to a lower value (around 1950?) to make the question a little more discriminating. Deleted "ONE" in the stem. Changed middle seal pressure to 1950 psig as recommended. Changed all explanations to indicated a degraded seal instead of a failed seal is in progress. A failed seal is indicated by D/P < 100 psid. Added the word pressure to all distractors. Discussed changes Q now S

29	H	2		X										N	U	B	41.7	Appears to be identical to event 3 in scenario 1. This question is identical. Need to replace this question. Replaced this question. The new question uses the Y control channel for PLCs and the revised question will fail this control channel high vise low as written in the scenario. Verified this question does not overlap the audit written or the previous two NRC exams. Discuss, appears that action (2) doesn't change and the scenario would still probably cue them onto this. Revised; Q now S
30	H	2												B	S	D	41.7	ON 2017 NRC EXAM. No comments
31	H	3												N	S	A	41.7	No comments.
32	H	2		X		X								N	U	D	41.7	Stem cues that the HPSI flow curve is not met, making only B and D as plausible distractors. Changed the stem to state "HPSI flow to Cold Leg 1A is zero gpm" instead of "HPSI flow is not meeting the HPSI flow curve." This question is valid because the student must know that if any HPSI flow leg is not meeting the curves than the HPSI curve is considered not met. This is different than the LPSI flow curves which only requires one train to meet the curves. Discuss changes does bullet 4 in stem contradict 5 and 6? Revised, Q now S

38	H	2	X											N	E	C	41.7	FIRST TEN. In stem, change "is" to "should be." Question needs LOD and CFR information. Made all changes as requested. Looks like stem still needs changed. Revised, Q now S
39	F	2												N	S	A	41.7	No comments
40	F	2												N	S	A	41.7	No comments
41	F	2												N	S	C	41.7	No comments
42	F	2	X											N	E	D	41.4	Change "will's" to "should's" in stem. Delete "over a 5 hour span" from stem, as this cues it is a "ramp." Changed "will's" to "should's". Changed "over a 5 hour span" to "begin to open". Q now S
43	H	2				X								N	E	C	41.10	FIRST TEN. Discuss possibility of modifying question to have a Rx trip with no ESD (to make a little more discriminating, as it appeared one need only summarize that a main feedwater isolation occurs to determine the correct answer). Question needs LOD and CFR information. There needs to be an ESD to meet the K/A (ESFAS). Leave as is. The student must first determine that a MSIS has occurred and then determine how it affects the MFW system. Added LOD and CFR information. Discuss; I'd much rather give them indications of an ESD than just flat out tell them there's one if possible Revised, Q now S

44	H	3	X			X							N	E	D	41.4	<p>FIRST TEN. Change "will's" to "should's" in stem. Distractors missing "A" "B" "C" "D." Question appears to employ "impossible physics" - can't fathom why one would believe a loss of heating will cause temperature to rise(?) Question needs LOD and CFR information. Changed "wills" to "should" in the stem. Labeled the distractors. Added LOD and CFR information. Would like to leave as is, the student must use some system knowledge to determine part 2. Could change to "what does reactor power do". Discuss. Revised, Q now S</p>
45	F	2											N	S	B	41.7	
46	H	2				X							B	E	C	41.7	<p>ON 2012 NRC EXAM. Discuss possibilty of modifying A nd B to closer resemble C and D (using manually close instead of verify auto closed)? Changed answers to specify "manual" or "auto"closure. Q now S</p>

47	F	2				X								N	U	A	41.8	Don't understand plausibility of C and D. Why would one think action is necessary in the A switchgear room while the B switchgear room could be ignored? Agreed. Removed the portion of the question concerned with where to send the NAO and replaced it with where the NAO can locate the procedure to strip DC loads upon a Station Blackout. This is important because the location of these procedures are not in the EOP and will not be able to be printed during a SBO. Q now S
48	H	2												B	S	D	41.7	ON 2017 NRC EXAM. No comments
49	F	2				X					X			B	E	A	41.11	ON 2012 NRC EXAM. Please fix grammar in the explanations. Discuss to ensure that D could not be argued correct. Discuss K/A match. Fixed the grammar in the explanations. The flow path to the storm drains do not isolate on a DCT Sump 1 rad monitor high alarm. The flow path is still available but the sump pumps are secured. Distractor D could not be argued as the correct answer. K/A match because the Dry Cooling Towers are part of the CCWS. The sumps used in this question serve the Dry Cooling Towers. Added the reason for the K/A match to the explanation. Discussed Changes Q now S.

50	F	2	X			X					X			N	U	B	41.7	Delete "ONE" in stem. Question asks for something that has happened but explanation says isolation occurs after the alarm. Revise question to correctly match the past and present(?). Discuss how this question meets the K/A (service water) Deleted "ONE" in the stem. Changed the stem to read "Which of the following will occur as a result of the high activity?" W3 does not have a "service water system". To match the K/As, we have always interpreted our Turbine Cooling Water System and Circ Water systems to be "service water". Discuss changes. Change "will" to "should." Revised, Q now S
51	F	2												N	S	A	41.4	No comments
52	H	2												N	S	B	41.7	No comments
53	H	2	X			X								N	U	A	41.7	Delete "one" in stem. Discuss plausibility of B,C, and D as correct answer appears obvious. Deleted "one" in the stem. Added words to the explanations to explain the plausibility of B, C, and D. Seems that "A" is the obvious answer only if you know what the K/A is. Discuss - looks like stem still needs revised. Revised, Q now S
54	F	2												B	S	A	41.8	ON 2015 NRC EXAM. No comments

55	H	2	X			X								N	U	D	41.4	2nd half of B and D are identical, which cues that one of those distractors is probably the correct answer. Re-arranged the swapping of the CEDM fans in the distractors such that the trains are equal between answers and distractors. Q now S
56	F	2	X											N	E	B	41.8	Add "Per TS, the MINIMUM" at beginning of first sentence. Add "procedurally aligned" after "can be" in stem. Added "Per TS, the MINIMUM" at beginning of first sentence. Added "procedurally aligned" after "can be" in stem. Q now S
57	H	3				X								N	E	B	41.4	Distractor C does not appear plausible for the given conditions. Changed reactor power from 50% to 40% in the stem to make distractor C more plausible. The SUFRV has the capacity to provide feedwater up to 22% flow demand. Discussed changes Q now S
58	F	2				X								N	E	A	41.8	Delete "remain below" in distractors. Deleted "remain below" in the distractors. Q now S
59	F	2												N	S	B	41.9	No comments
60	F	2												B	S	C	41.4	ON 2017 NRC EXAM No comments

61	H	3	X			X								N	E	D	41.4	Change "will" to "should" in stem. Where is there direction to potentially throttle CD-1532 (I didn't see any in the references) Changed "will" to "should". The procedure provides the guidance to throttle the condensate polisher bypass valve to maintain D/P. Will provide the reference. Discuss. Reference provided. Q now S
62	F	2												B	S	C	41.13	ON 2020 NRC EXAM No comments
63	F	2												B	S	D	41.10	ON 2017 NRC EXAM. OK, but locations of plant equipment should normally be evaluated during the operating test. OK.
64	F	2												N	S	D	41.10	OK, but locations of in-plant procedures should normally be evaluated during the operating test. OK.
65	F	2	X											N	E	C	41.10	Capitalize MINIMAL in stem. Capitalized MINIMAL in the stem. Q now S
66	F	2												B	S	B	41.10	ON 2017 NRC EXAM No comments
67	F	2												B	S	A	41.10	ON 2012 NRC EXAM No comments
68	F	2												B	S	D	41.11	ON 2014 NRC EXAM No comments
69	F	2				X								N	E	C	41.10	A does not fit with the other distractors and is easily eliminated as a possibility. Discuss modifying times to 15/30, 30/60, 45/75, and 60/90 for A,B,C,and D. Will discuss modifying this question. Believe this question is good "as written". Would like to leave it as is. Revised, Q now S
70	F	2												N	S	C	41.1	No comments
71	F	2												N	S	B	41.1	No comments

72	F	2		X		X								N	U	D	41.1	A is essentially "none of the above" (not allowed). Also, two distractors have "create negative reactivity effect," while both of the others are different, which cues that either C or D is probably the correct answer. Revised the question such that "A" is no longer "none of the above. Revised the distractors such that C and D are no longer cued as the right answer Discuss changes - is FTC always negative at Waterford, even at BOL? Also, want to make sure that no way A could be argued correct. Revised, Q now S
73	H	2	X											N	E	A	41.14	Discuss possibility of stem having a greater connection to a Waterford system. Tried to tie this question to a Waterford system with little success. This is a GEFAS question. Would prefer to leave as is. Let's discuss (this is a program office initiative) Revised, Q now S
74	H	2												N	S	B	41.14	No comments
75	F	2												B	S	C	41.1	No comments
76	H	2	X			X					X			B	U	C	43.5	FIRST TEN. If B(2) or D(2) were correct, then there would be multiple correct answers as >400 is also >350. Add "at a MINIMUM of" prior to (2) in stem. Ensure this meets SRO only criteria. Needs LOD and CFR information. Discuss how this meets the K/A. REPLACED. Q now S. No resolution required. New question is sat.
77	H	2												B	S	D	43.5	ON 2020 NRC EXAM.

78	H	3	X											N	E	C	43.5	<p>FIRST TEN. Change "will" to "should" in stem. What is the definition of "oscillating?" It appears the severity of the "oscillating" could be interpreted quite differently between applicants. Needs LOD information.Revised. Q now S. This question is now SAT. No resolution required.</p>
79	H	3	X			X								N	E	C	43.5	<p>FIRST TEN. Distractors B and D - why would one think that this pump start is optional and not required given a maximum precipitation event is in progress? Are there two pumps, and are you asking if one needs started? Should we mention that standard post trip actions have been completed in the stem? Also, may be a little more discriminating to add that the disturbance was momentary and the grid is now stable. Needs LOD information.Revised. Add "Implementation of" at beginning of last bullet in stem. Added "implementation of" at the beginning of last bullet in the stem Q now S</p>
80	F	3												N	S	D	43.5	No comments

81	F	2	X											B	E	A	43.2	Discuss; In stem, present and predicted voltages are both below the TS limit (why not have current voltage above and predicted voltage below)? Is there a reason why we can't provide actual B31 bus voltage? Not sure that the conditions in C and D are plausible without requiring more than a TRM entry considering they refer to mitigation of a design basis accident and activation of protective relays. Are the reasons in B and D something that could ever actually happen? Replaced this question. Changed this question from an approved question from 2014 NRC SRO Exam that had the same K/A. The previous question required the student to have the voltage from OP-903-066 memorized, which is not expected. REPLACED WITH BANK Q FROM 2014 EXAM. Don't see where reference is for this question. Discuss; is there any way to reword distractors to eliminate "may" from A(2) and C(2) (as almost anything "may" happen)? Distractor C does not appear plausible requiring only a TRM entry when unable to combat a design basis accident? Reworded and reference
82	H	3												B	S	B	43.5	ON 2014 NRC EXAM. No comments
83	F	2												N	S	B	43.5	OK. However, location of equipment in the plant should normally be part of the operating test. OK

84	H	3	X											N	E	B	43.5	<p>FIRST TEN. Change "will" to "should" in stem. "Monitor" seems like the wrong word (verified?). Add", at a MINIMUM," prior to (2). I'm not seeing where (2) answer is in the reference. Is the "2" in "Memory or Fundamental Knowledge" the LOD? New Question: Add "Per procedure OP-010-003" at beginning of last sentence in stem. This is a new question on free review. Added "Per OP-010-003" to the last sentence in the stem. Reference? Rference provided. Q now S</p>
85	H	3												B	S	C	43.5	<p>ON 2018 NRC EXAM. No comments</p>
86	H	3												B	S	A	43.5	<p>ON 2015 NRC EXAM. This is a new question from the UNSAT question on free review. Added "Per OP-010-003" to the last sentence in the stem. No comments</p>

87	H	3											X		B	U	D	43.5	<p>ON 2018 NRC EXAM. Discuss K/A applicability as question does not appear to be very generic to the emergency plan. There is a connection to the Emergency Operating Procedures. Added the following to the explanation to make it clearer. "With no RCPs running, the crew will be required to enter Emergency Operating procedure OP-902-003, Loss of Offsite Power/Loss of Forced Flow Recovery Procedure. The connection to the EOPs is the student must know that all pressurizer heaters energized will not overcome one spray valve open and a reactor trip and EOP entry is required." Q now S</p>
88	H	2					X								N	E	B	43.5	<p>Asking procedure sections without providing the titles to them doesn't seem reasonable, and providing the titles would tend to cue the correct answer. Discuss possibility of deleting the first part of each distractor, as the second part is different in all four anyway. Agree, deleted the first part of each distractor that included the section number. Q now S</p>

89	H	2	X	X										N	E	D	43.5	Discuss possibility of deleting unnecessary information from the stem. Shouldn't the student be able to conclude that a trip is required and the reason for it without cueing that instrument air is lost in the stem? The bullet that instrument air is 70 psig and dropping is required for the question. The offnormal requires a rapid plant power reduction but the fact that the plant is about to reach the instrument air pressure that requires a manual reactor trip (65 psig) means that OP-902-000 is the right answer and not OP-901-212. Would like to leave the question "as is". Let's have discussion as need to better understand why loss of TGB-DC bus doesn't cue the loss of IA. Reworded - Q now S
90	F	2												N	S	B	43.5	No comments.
91	H	3		X										B	U	A	43.5	ON 2015 NRC EXAM. Discuss; Looks too close to scenario 1, event 3. Scenario 1, Event 3 is a pressurizer level control channel failure which requires entry into OP-901-110, Pressurizer Level Control Channel Malfunction. This question is a pressurizer level controller malfunction which requires entry into OP-901-112, Charging and Letdown Malfunction. These are two different events with no similarities. No changes required Probably OK but would like to discuss the differences. Discussed. Q now S

92	H	2												B	S	A	43.5	ON 2015 NRC EXAM. No comments.
93	H	3				X								N	E	C	43.2	REFERENCE PROVIDED. Underline "and" in distractor A. Discuss why references are required. If so, this is essentially an admin JPM. Placing admin JPMs on the written exam should be avoided. Underlined "and" in distractor A. References are required because it is not expected that the student memorize what train the containment purge rad monitors are powered from and to a lesser extent the surveillance requirement. It is still a challenge to the licensed operators to apply the surveillance requirement to actual readings and the setpoints even with a reference provided. Could remove the references for the surveillance requirements if you insist OK as is. Q is S

96	F	2				X								N	U	D	43.2	Plausibility of distractors A and C not making sense to me. Why would constant communication be required if there was a four hour window in which to accomplish the task? Revised - Q now S
97	H	3												N	S	C	43.2	No comments
98	F	2	X											B	E	B	43.4	ON 2018 NRC EXAM. Add "per the TS bases" prior to last sentence in stem. Added "per the TS basis" to the stem. Q now S
99	F	2												N	S	B	43.5	No comments
100	F	2												N	S	A	43.5	No comments

Results Table

RO LOK -H	42		Avg RO LOD	2.17
RO LOK-F	33		AVG SRO LOD	2.48
SRO LOK - H	16		Overall LOD	2.25
SRO LOK - F	9			
		%		%
RO Bank	23	30.67	SRO Bank	10 40
RO Mod	0	0	SRO Mod	0 0
RO New	52	69.33	SRO New	15 60
		%		%
Total Bank	33	33		
Total Mod	0	0		
Total New	67	67		
		%		%
RO Sat	40	53.33	SRO Sat	11 44
RO Unsat	11	14.67	SRO Unsat	5 20
RO Edit	24	32	SRO Edit	9 36
		%		%
Total Sat	51	51	Total Unsat	16 16
Total Edit	33	33		

Flaws

Stem focus	24
Cues	8
T/F	0
Cred Dist	31
Partial	2
job link	0
units	0
minutia	0
backward	0
KA	5
SRO-only	0
LOD = 1	0

10 CFR Distribution

41.1	21	43.1	0
41.2	1	43.2	5
41.3	1	43.3	0
41.4	10	43.4	1
41.5	3	43.5	19
41.6	3	43.6	0
41.7	24	43.7	0
41.8	5		
41.9	1		
41.10	21		
41.11	2		
41.12	0		
41.13	1		
41.14	3		

Answer Dist (in %)

RO-A	19	SRO-A	5
RO-B	17	SRO-B	7
RO-C	21	SRO-C	7
RO-D	18	SRO-D	6

Question Overlap with the Previous Two NRC Exams

QA form ES-401-6 item 4 requires 4 or less questions on RO exam from previous two NRC exams, SRO portion two or less questions from previous two NRC exams*

* if this is exceeded, the region shall call NRR to explain why/reasons.

RO overlap from previous two NRC exams: 1

SRO overlap from the previous two NRC exams: 1

Questions Requiring References to Answer

6-10 questions rule of thumb on SRO portion of exam are allowed to be open reference, while the RO exam is generally none

RO Questions that require hand-outs: 0

SRO Questions that require hand-outs: 1

Stats and Graph

sat	51
edit	33
unsat	16
Stem focus	24
Cues	8
T/F	0
Cred Dist	31
Partial	2
job link	0
units	0
minutia	0
backward	0
KA	5
SRO-only	0
LOD = 1	0

