

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation	
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/units	Backward	Q=K/A	SRO Only			
1	F	1				x							x		U	k/a m/m; non-credible distractors (b & c), rewrite or replace Q
2	F	2													S	
3	H	2													E	add "subsequently" to stem
4	H	3													S	
5	F	2													S	
6	F	2													S	
7	H	3													S	
8	H	3													S	
9	L	2													S	
10	H	2													S	
11	H	3													E	change RPV pressure from 20 to 40 psig
12	H	3													S	
13	H	3													E	modified question (eliminate window dressing), add "msivs closed" to plant conditions, correct typo in choice 'a'
14	L	2													E	add "per T-102 bases" to stem
15	L	2													E	correct typo, add punctuation
16	H	3													E	correct typo in stem
17	L	2													E	add initial count rate, change final count rate to 65 cps
18	L	3											x		U	k/a m/m, rewrite or replace Q
19	H	3						x							U	'b' also correct, add "only" to 'b' and 'c', correct grammar/ typos
20	H	2													E	use "identifies"

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/units	Backward	Q=K/A	SRO Only		
21	L	2			x									U	collection of T/F, rewrite or replace Q
22	L	2												U	no correct answer, provide future conditions to answer Q,
23	H	3												E	modify Q, eliminate window dressing, grammatical changes to choices
24	L	3												E	make "annunciator" plural in stem
25	L	2										x		U	k/a m/m, consider selecting a different k/a
26	H	3												E	Incorporate edits for clarity and punctuation
27	L	3												S	
28	L	1												U	LOD=1, system designed such that single isolation signal isolates all paths
29	H	2												S	
30	H	2												S	
31	H	3												E	eliminate window dressing, matches "operate" part of k/a
32	H	2												E	correct voltage typo, modify Q to eliminate vagueness of "required action"
33	H	3												E	add "if any" to Q stem, fix punctuation
34	H	2												E	clarify Q to ask for current system status
35	H	3												E	add "if any" to Q stem, fix punctuation
36	H	3												S	
37	H	3												E	correct punctuation, add "assume no operator actions"
38	H	2												E	modify plant conditions, correct punctuation, typos
39	H	2						x						U	'c' and 'd' also correct, add "only" to 'c' and 'd', correct punctuation

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/units	Backward	Q=K/A	SRO Only		
40	H	2												E	add "subsequently" and "if any" to question
41	L	2												E	replace "only" with "will illuminate" and change "remains" to "remain" in choice 'd'
42	L	2												E	add noun names for instruments referenced in stem, remove alarm information from Q
43	L	3												E	correct grammar and punctuation
44	H	3												E	add punctuation
45	L	2												E	delete "the expected" from Q
46	L	2												E	eliminate "results in NSSSS isolations" in Q, first half of k/a addressed
47	H	3												S	
48	L	2												E	add "if any" to Q
49	H	3												E	correct punctuation in plant conditions
50	L	2												S	
51	H	3												E	edit handswitch position description
52	L	3												E	add punctuation
53	L	3												E	add "action" to Q
54	H	3												E	delete "the expected"
55	H	2												S	
56	H	3												E	provide explicit time frame versus "long term"
57	L	2												E	correct punctuation and grammar, k/a matches first half
58	L	2												E	change "control pumps" to "control power"

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/units	Backward	Q=K/A	SRO Only		
59	L	2												S	
60	L	2												S	
61	L	4												E	eliminate window dressing, add "automatically" after "DG breaker", use correct case
62	H	3												S	add "and" in choice 'd'
63	H	3				x								U	'c' not credible - rewrite or replace, provide typical LGS value for MWe output
64	L	2										x		U	k/a m/m, rewrite or replace Q
65	H	3												E	replace "is the expected" with "describes subsequent"
66	H	3				x								U	'a' and 'b' not credible, rewrite or replace
67	L	2			x									U	collection of T/F, rewrite or replace
68	L	3												E	correct spelling for choice 'd'
69	H	2												E	change stem condition to "perform an ST"
70	L	2												E	provide plant conditions indicating counts have doubled, change notch bands to eliminate overlap
71	L	3												E	modify choice 'a' to improve plausibility
72	L	2												E	use "shall" throughout choices, clarify that valve in Q is a manually operated valve
73	H	3					x							U	'a' also correct, add "only" to choices 'a' and 'b'
74	L	1												U	LOD=1, rewrite or replace
75	L	2												E	add punctuation, use same phrase in 'c' and 'd' for plant status
76	H	2											x	U	DLU from alarm response and not SRO only, rewrite or replace
77	H	3												E	change "report" to "reports" in Q

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation	
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/units	Backward	Q=K/A	SRO Only			
78	H	4												E	change pool level and pressure parameter values such that applicant must evaluate curve	
79	H	3								x				E	provide correct units in plant conditions	
80	L	4											x	U	DLU, not SRO only, rewrite or replace	
81	H	3											x	U	not SRO only, rewrite or replace	
82	H	3											x	U	not SRO only (applicant given procedure), rewrite or replace	
83	L	2												U	DLU, rewrite or replace	
84	L	3											x	U	not SRO only, rewrite or replace	
85	H	3											x	U	not SRO only, rewrite or replace	
86	H	3											x	U	not SRO only, rewrite or replace	
87	H	3												E	change choice 'c' actions that appear in similar TS LCOs	
88	H	3				x								U	'c' and 'd' not credible, rewrite or replace	
89	H	3				x							x	U	not SRO only, choices 'a' and 'b' not credible, rewrite or replace	
90	H	3				x								U	'a' and 'b' not credible, DLU, rewrite or replace	
91	H	2												E	use correct TS time in choice 'c', provide HPCI flow in plant conditions instead of speed	
92	L	2												S*	question sat, however knowledge already tested on operating exam (admin JPM), select a different k/a	
93	H	3												S		
94	H	3											x	x	U	k/a m/m, not SRO only, rewrite or replace
95	H	3											x		U	k/a m/m, rewrite or replace
96	L	2												E	Cite procedure reference in stem and add punctuation	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation	
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/units	Backward	Q=K/A	SRO Only			
97	H	3											x		U	k/a m/m, rewrite or replace
98	L	2													E	Cite procedure reference in stem, Improve plausibility of distractors, correct spelling in choice 'd'
99	H	3													E	modify Q to describe ... "limitations, if any, regarding fuel loading."
100	H	3								x					E	correct units and grammar in conditions, add punctuation, change choice 'e' to choice 'd'

Control Room Systems

Start Recirc MG Set (minor edits)

1. Plant at 36% power. This is listed as Low Power (L) JPM. ES-301 (pg 14) defines Low Power as criticality to 5%.
2. Step 3 should not be critical. No action required. Already at minimum speed.

Restore RECW, DWCW, PCIG (minor edits)

1. Steps 7a, 7b do not mention RBCW isolation valves. See procedure.
2. Step 9c* has handswitch in AUTO but standard is valve OPEN. Procedure step is to place in AUTO. Standard should reflect this action, with possibly a note that valve will open when handswitch placed in AUTO.

CR Vent High Rad Isolation Reset (needs work)

1. **JPM non-discriminatory.** Essentially only two critical actions; place 4 isolation valve keyswitches in RESET, then place the 4 isolation valve keyswitches in AUTO.

Potential fix: Cue applicant he/she is RO. Initiate isolation on spurious high radiation. Cue with call-in that rad monitor skid accidentally bumped. CRS cue RO to restore system to normal, assuming this requires more than just resetting actuation signals (maybe restarting fans?).

Manually Initiate Core Spray – cannot use, duplicates scenario event

1. Step 7 standard should also state that applicant goes to S52.7.B.
2. **Alt path actions to start 1D Core Spray Pump same as in Scen 3, Event 7.**

Diesel Generator Fast Start (needs work)

1. JPM summary sheet has wrong KA number, importance factor, and JPM number. Looks like LLOJPM0001 used as template and some information not updated for new JPM.
2. JPM does not give needed booth operator instructions to simulate delay in field flash per Step 4.3.14. As written, frequency should indicate normally for up-to-speed generator shortly after start.

3. **JPM non-discriminatory.** Only 2 action steps; start DG, secure DG.

Potential fix (makes alt path): Expand evolution to include paralleling and loading. Then have local EDG alarm indicating condition which *should have* tripped engine such that applicant must recognize trip condition reached, as indicated by ARP, and respond by tripping the EDG.

Placing Alternate Turbine Enclosure Cooling Water Pump in Service (needs work, may not be good system for JPM)

1. JPM setup should specify 1A TECW Pp running, 1B TECW Pp in standby.
2. Step 9* (critical step) has applicant returning degraded pump to standby auto status. Why critical? Would not expect applicant to align for standby auto start because stopped for excessive vibration / noise.
3. **JPM non-discriminatory.** Questionable basis for licensing decision (ES-301 Step D.1.d). Is TECW a safety-related system? JPM applied to Generic KA. No system KA for TECW, unless it can be considered "component cooling".

Removing Reactor Feed Pump From Service (needs work)

1. **JPM non-discriminatory.** Two step JPM; select 2 boxes on computer screen to stop pump.

Potential fix (makes alt path): Have sequence halt automatically with MCR-107, REACTOR, Window D-5 "FWLCS TROUBLE" alarm. Applicant must respond IAW alarm response procedure. Condition should require additional actions allowing applicant to demonstrate understanding of system and ability to control the plant.

In Plant Systems

Start ESW Pump Locally at Breaker Enclosure

1. Task time of 15 minutes seems excessive. Operations at breaker shouldn't take more than 1 minute.

Place Alternate CRD Flow Control in Service (minor edits)

1. JPM tied to KA 201001 A4.14. There is no A4.14 under this system.
2. Cue in Step 5 should say MANUAL, instead of AUTO.
3. JPM step numbering jumps from Step 7 to Step 10.
4. Step 11 standard needs to specify which direction - what button or nob used.
5. Step 17 needs cue information for before as well as after (like Step 11).

MSIV Isolation Bypass Per T-221 (minor edit)

1. Why is Step 1* labeled as critical.

Admin JPMs

Determination of Adequate Shift Staffing (SRO only) (needs work)

1. Initiating cue on page 3 is different from the cue on the last sheet.
2. KA was selected from systems section (295014), instead of from generics section as is specified by ES-301, Section D.3.a.
3. **JPM non-discriminatory.** Could have just asked, "how many ROs are required on-shift with both units at full power to meet minimum requirements." Would expect applicants to be able to answer without use of references.

Potential fix: Add RO to initial staffing for total of 4 (making ops staffing total 18). Have Unit 1 in OPCON 1 and Unit 2 in OPCON 4. Unit 1 CRS and RO1 both become ill. Require the following responses:

- Determine if remaining shift crew composition meets the minimum by Technical Specifications. If no, explain why not. (expected response of 'yes')
- Determine if remaining shift crew composition meets the minimum by Operations Shift Staffing requirements. If no, explain why not. (expected response of 'no', need 17 people minimum).
- Determine what staffing actions are required to address vacancies in CRS1 and RO1 positions. (expected response of 'assign RO4 to RO1 position, transfer CRS2 to CRS1 position, call in SRO to fill CRS2 to re-establish minimum 17 person manning within 2 hours)

Thermal Limit Violation (RO/SRO) (minor edits)

1. Cue will not ensure desired response is obtained. Currently structured to have applicant identify limit exceeded, then further cueing by examiner. Should instead be structured such that applicant has all he/she needs up front. Would like to administer admin JPMs in group classroom setting with multiple sets of all normal plant references available (operating instructions, alarm response, ERPIP, EOP, TRM, TS, administrative procedures, standing orders, surveillances, etc). JPMs should be structured such that applicants don't need to be cued beyond initial cue.

Turbine Bypass Valve Surveillance (RO/SRO) (minor edits)

1. Cueing embedded in JPM steps. Need to structure so that applicant has all necessary information in initial cue. See note under **Thermal Limit Violation** JPM above. Suggest modification of cue to direct completion of Section 4.3 of ST.
2. **Critical Step 4 correct response provided in procedure attachment as an example.** The given initial conditions **exactly** match the ones provided in the surveillance procedure Attachment 3 example. Recommend modification of JPM conditions such that correct OLMCPR value is not a simple direct lookup via the Attachment 3 example. Perhaps initial condition should be at 52% power with 1 recirc pump in operation.
3. Need to specify acceptable values, with bands if appropriate for calculations and data lookups in the surveillance (Step 7-MFLCPR correction factor, Step 8-MCPR from P-1, Step 9-MCPR calculated limit).

Calculate Stay Time (RO/SRO) (minor edits, duplicates written exam question)

1. JPM okay, but given its nature and fact it was used on a previous exam, recommend changing the numbers to result in different maximum stay times for each worker and to result in different conclusion regarding whether work can be completed.
2. Stay time also tested on written exam. Oversamples this knowledge. Keep JPM or question, not both.

Emergency Classification and Reporting (SRO only) (needs work)

1. Does this JPM need to be labeled as "Sensitive Information - Not for Public Release"?
2. This JPM has low discriminatory value as the classification is a single table lookup. Further, this same generic KA, 2.4.41 - "Knowledge of the emergency action level thresholds and classifications", was used as an SRO admin JPM on the last 2 NRC exams. Note that ES-301, Section D.3.d states that examiners should ensure the test does not become predictable and provides the following example of how use of a particular JPM could become predictable: "e.g., repetitive emergency classifications with different events".

Recommend a more complex set of initial plant conditions, which challenge more than one EAL, thereby requiring the applicant to use multiple parts of the table and determine the most significant action level.

Fire Alarm in Inverter Room (RO only)

1. JPM okay. No comments.

Simulator Scenarios

General

1. D-1 scenario summary sheets or scenario summary should be attached to scenarios for quick reference during validation and administration of exam.
2. D-2 sheets often include applicant action of “recognizes that ...”. An example of this is in Scn 1, Event 2, “recognize the 1D Core Spray and RHR pumps are inoperable” [not clear what applicant action is expected]. These defined actions must contain some measurable/observable characteristic. For example, may say “informs CRS that ...”.
3. If possible, give scenarios plant conditions representative of typical conditions/evolutions in progress, that do not telegraph the upcoming malfunctions. Per NUREG-1021, Appendix D, “the initial conditions should be representative of a typical plant status, with various components, instruments, and annunciators out of service.”
4. Many events do not meet requirements for use on an operating exam. NUREG-1021 Appendix D states, “uncomplicated events that require no operator action beyond the acknowledgment of alarms and verification of automatic actions provide little basis for evaluating the operators’ competence and should not be included on the operating test unless they are necessary to set the stage for subsequent events.” Appendix D provides guidance for developing scenarios that will support thorough evaluation of applicant competencies as a licensing basis.

Scenario #1 (needs work)

1. Event #1, “RPV NR LT Fails Low”, cannot be credited as I (RO/CRS) because no substantial actions taken.
2. Event #2, “D14 Bus Overcurrent”, should be credited as C (PRO/CRS), not I (PRO/CRS). Loss of the bus is a component, not an instrument, malfunction.
3. Event #4, “Coolant Leakage in Drywell”, cannot be credited as C (ALL) because no substantial actions taken.
4. Event #6, “HPCI Turbine Trip”, cannot be credited as C (PRO/CRS) because no substantial actions taken.
5. Event #7, “CRD Pump Trip”, cannot be credited as C (RO/CRS) because no substantial actions taken.
6. Event #8, “SLC Pipe Rupture”, cannot be credited as C (RO/CRS) because no substantial actions taken.

Scenario #2 (needs work)

1. Event #1, “RPV PT for RPS Fails Hi”, is repeated as Event #1 in Scenario #4.
2. Event #1, “RPV PT for RPS Fails Hi”, cannot be credited as I (RO/CRS) because no substantial actions taken.

Limerick 2006 Exam - Op Test Review Comments

3. Event #2, "Condensate Pump Trip", cannot be credited as C (ALL) because no substantial actions taken.
4. Event #3 and Event #4 should be listed as one event. Under "Event Type", list C (PRO/CRS) **and** R (RO).
5. Event #5, "Recirc Pump Trip", really has no substance and should just be used as the initiator for the major event. Cannot credit separately as component failure for the single action of the RO tripping the reactor. This is further emphasized by the fact that the RO action does not trip the reactor since following listed event is an ATWS.

Scenario #3 (needs work)

1. Event #3, "Loss of Div I DC", should be credited as a component, not an instrument, malfunction.
2. Event #3, "Loss of Div I DC", cannot be credited for ALL, only for (PRO/CRS), and then **only if** chlorine isolation is a substantive action. What is the consequence of not performing a chlorine isolation? Can improper action here be the basis for a licensing decision?
3. Event #5, "Coolant Leakage in Drywell" cannot be credited because it was already used in Scenario #1, and also because there are no substantive actions.
4. Event #7 substantially repeats actions of a Control Room JPM

Scenario #4 (needs work)

1. Event #1, "RPV PT for RPS Fails Hi", is repeated as Event #1 in Scenario #2.
2. Event #2 and Event #3 should be listed as one event. Can take credit for component malfunction IF substantial actions required of operator. Or, can take credit for reactivity manipulation if actions include adjusting reactivity. However, no applicant can receive credit for both for the same event.
3. Event #5 and #6 should be combined with Event #4. Same system, two valves in series both failing as is should not be two different events. These are all part of the major event.
4. Event #7, "RDCS Failure". Is this post-trip? What is significance of the failure?
5. Event #8, "SRV Fails Closed". What is the significance of the failure?