Instructions

	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
Q#	(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	55.41(b)x	Explanation
1	H	3												M	E	C	41.7	See comments below and revision history of question
2	H	3												B	E	D	41.7	See comments below and revision history of question
3	H	3												B	E	A	41.10	See comments below and revision history of question
4	H	3												B	E	D	41.8	See comments below and revision history of question
5	F	2												B	E	A	41.5	See comments below and revision history of question
6	H	4												N	E	D	41.7	See comments below and revision history of question
7	H	3												N	S	B	41.7	
8	H	3												N	E	D	41.7	See comments below and revision history of question
9	F	2												N	S	D	41.7	
10	H	4												B	E	B	41.6	See comments below and revision history of question
11	F	2												M	E	C	41.8	See comments below and revision history of question
12	H	3												N	S	D	41.10	
13	F	2												N	E	B	41.7	See comments below and revision history of question
14	H	3												N	E	C	41.10	See comments below and revision history of question
15	H	3												B	E	D	41.4	See comments below and revision history of question
16	H	3												M	E	A	41.5	See comments below and revision history of question
17	F	3												M	E	A	41.7	See comments below and revision history of question
18	H	3												N	S	C	41.10	
19	H	3												B	S	B	41.10	
20	H	3												N	E	B	41.5	See comments below and revision history of question

	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
Q#	(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	55.41(b)x	Explanation
21	H	3												N	S	B	41.8	
22	H	3												M	E	A	41.7	See comments below and revision history of question
23	F	2												B	E	B	41.7	See comments below and revision history of question
24	F	2												B	E	D	41.7	See comments below and revision history of question
25	H	3												B	E	B	41.10	See comments below and revision history of question
26	H	3												N	S	D	41.10	
27	H	2												B	S	D	41.8	
28	H	3												N	E	A	41.5	See comments below and revision history of question
29	F	2												N	E	A	41.7	See comments below and revision history of question
30	H	3												B	E	A	41.7	See comments below and revision history of question
31	H	3												N	E	C	41.7	See comments below and revision history of question
32	H	3												M	E	C	41.5	See comments below and revision history of question
33	H	3												N	S	C	41.7	
34	H	4												N	E	C	41.5	See comments below and revision history of question
35	F	2												B	S	A	41.7	
36	F	2												N	E	B	41.5	See comments below and revision history of question
37	H	2												B	S	C	41.7	
38	F	2	X			X								M	U	A	41.10	See comments below and revision history of question
39	F	2												N	E	C	41.7	See comments below and revision history of question
40	F	2												B	S	A	41.2	
41	F	2												B	S	B	41.7	

	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
Q#	(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	55.41(b)x	Explanation
42	H	2												N	E	C	41.5	See comments below and revision history of question
43	F	2												B	S	C	41.7	
44	H	3												N	E	D	41.5	See comments below and revision history of question
45	H	3	X				X							B	U	B	41.5	See comments below and revision history of question
46	F	2												N	S	B	41.7	
47	H	3												B	S	B	41.7	
48	F	3												B	S	C	41.10	
49	F	3												N	S	C	41.7	
50	H	3												B	E	B	41.2	See comments below and revision history of question
51	H	4												B	E	A	41.5	See comments below and revision history of question
52	H	4												B	E	A	41.7	See comments below and revision history of question
53	F	3										X		B	U	C	41.7	See comments below and revision history of question
54	F	2												B	E	B	41.9	See comments below and revision history of question
55	H	3												M	E	D	41.5	See comments below and revision history of question
56	F	2												N	S	B	41.2	
57	F	2												N	S	C	41.7	
58	H	3												N	E	C	41.5	See comments below and revision history of question
59	H	2												B	E	B	41.5	See comments below and revision history of question
60	H	3												M	S	A	41.7	
61	H	3												N	E	C	41.10	See comments below and revision history of question
62	H	3												B	E	B	41.7	See comments below and revision history of question

	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
Q#	(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	55.41(b)x	Explanation
63	H	3												N	E	B	41.5	See comments below and revision history of question
64	F	2												N	E	B	41.7	See comments below and revision history of question
65	H	3												B	E	A	41.7	See comments below and revision history of question
66	F	2												N	E	C	41.10	See comments below and revision history of question
67	H	2												N	E	C	41.10	See comments below and revision history of question
68	F	2												B	E	B	41.1	See comments below and revision history of question
69	F	2												B	E	C	41.10	See comments below and revision history of question
70	F	2												N	E	D	41.5	See comments below and revision history of question
71	F	2												B	E	B	41.10	See comments below and revision history of question
72	F	3												B	E	C	41.12	See comments below and revision history of question
73	F	2												N	S	D	41.12	
74	F	2												B	E	A	41.10	See comments below and revision history of question
75	F	2												N	S	B	41.10	

	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
Q#	(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	55.41(b)x	Explanation

Results Table

RO LOK-H	43	**Avg RO LOD**	2.64
RO LOK-F	32		
Total	75		

	#	%
RO Bank	33	44
RO Mod	9	12
RO New	33	44

		%
RO Sat	23	21.3
RO Unsat	3	4.0
RO Edit	49	65.3

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

Answer Dist		
A	16	21.3 %
B	23	30.7 %
C	22	29.3 %
D	14	18.7 %

10 CFR Distribution	
41.1	1
41.2	3
41.3	0
41.4	1
41.5	16
41.6	1
41.7	30
41.8	4
41.9	1
41.10	16
41.11	0
41.12	2
41.13	0
41.14	0
	75

	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
Q#	(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	55.41(b)x	Explanation
									Total =	75								

AN1-2017-06 FINAL RO Retake Written Exam Comments

General Comments:

1. Distractor formatting should be consistent as possible long to short or short to long.
2. In general, provide noun name of pumps/valves in the questions - not just P4C or SW-5.
3. 6 of 10 Tier 3 RO questions having correct answer of "B" is excessive. Also, 5 questions with "B" in a row is not acceptable.
4. CFR mix for RO exam does not sample all of attributes.
5. Answer distribution for RO exam favors C and D - not even.
6. Low CFR distribution on SRO portion of exam.
7. Number of same answer in a row shouldn't exceed 3.
8. Add “IAW Procedure xxxx.yyy, Title” to stem whenever possible to minimize possible appeals.

Q1

Need to bound when the condition is occurring in the question. While actual PZR level will rise due to a steam space leak, without knowing the size of the leak the pressurizer heaters may be able to compensate for the loss of inventory and the actual level will find a new equilibrium level. Then since the indicated level is higher than program and make-up flow lowers, will not the actual level then begin to lower?

Disagree. It is not just a steam space leak but a leak on the upper tap of the controlling PZR level transmitter. These two transmitters have a “condensing pot” adjacent to the top of the upper instrument tap with the DP cell at the bottom. The reference leg is thus filled with condensed liquid and is equivalent to a “full” PZR level. The DP thus becomes less as actual level rises. If the upper instrument sensing line were to break, the DP would drop and indicated level would rise, quite rapidly. This will send a signal to the PZR makeup flow control valve, it will close, and makeup flow will lower. Since this is a steam space leak, actual PZR level will swell (rise). If it was simply a steam space leak and not on the upper tap of the PZR level instrument, then yes the heaters would probably compensate for the leak after a certain amount of time.

Would you like us to add “Within the first 5 minutes”, or just state “Initially…” as an Enhancement?

Q2

Distractor C is not credible - being close to a number is not the same as being credible. A better distractor would be to "Verify EFW CNTRL valves operate to establish and maintain 20 to 40 inches." This would be the correct answer for a normal trip with adequate sub cooling and RCP's running.

Revised as suggested. We disagree with the designation of “U” for this question. One non-credible distractor does not make a question “unsat”, it takes two non-credible distractors for a question to be “unsat”. Please change the designation to “E”.

Post-meeting comment: This change would create two correct answers. Since RCPs are not tripped due to >2 minutes elapsed, then RCPs are running and the required level in Table 1 in step 6 of RT-5 would be 20 to 40”. Changed Distractor C back to previous revision.

Q3

Not a LOD 4, the loss of bus has no real bearing in the correct answer selection. Make the Loss of A1 bus relevant by changing the flow rate to 2900 gpm and change the stem to read HPI flow rate is 275 gpm and LPI flow is 2900 gpm. This will test the ability of the applicants to determine that only one LPI pump is running and they will need to differentiate between the 2800 or 3050 flow in the procedure. By making this change, Distractor A would then be the correct answer. This would also change the question from Bank to Modified.
Removed the "B" from the stem.
Left the flows alone, if flow was lower than required then "C" would also be a correct answer.
Arrange answers from short to long.
Done, this makes the correct answer A instead of B

Q4

What instruments feed into the RCS flow mismatch signals? Better distractors would be to have those signals fail to have the opposite feedwater response vice having a feed pump trip where no re-ratio occurs. The way it is, Distractor A is not very credible.
Changed A to "Loop B RC Flow fails to 35 X 10E6 lbm/hr"
The re-ration occurs on an RCP trip, if 4 pumps are running the RC flows do not affect the feedwater signal.
This makes the question significantly harder and is now testing the applicant on more than just the selected K/A. He must now understand a specific detail from ICS.
I would recommend leaving as it was.

Q5

Distractor A is not really plausible. If a Westinghouse where charging is actually used to cool letdown it might be ok, but since B&W's design does not use MU flow for this purpose, it is not plausible.
I don't have a better idea for a choice

Q6

Evaluate if this is at RO level. Reorder distractors from short to long.
This is challenging, but it is all above the line in TS
Reordered from longest to shortest (only had to swap C & D)

Q7

No comment.

Q8

This is not a new question - it states that it was written for the 2014 exam, which implies it was in the bank (unless it's been kept under exam security).

This is more of a fundamental level question - system knowledge is all that is required to determine what heaters kick on and what pressure will spray valve cycle. This is a stretch for a Tier 1 question.
OP-1203.015, Pressurizer System Failures would be the procedure used in the event that we had malfunctioning heaters. To be able to diagnose a failure one must know how the system is to operate normally.

Q9

No comment.

Q10

Distractor D - Turbine Trip is not an input into the feedwater subsystem in ICS so that seems not that credible. The reason that was provided for Distractor D being valid also shows that it is not credible. If you have 2 reactor coolant pumps trip, the runback is to ~405 MW, which is below the starting point in the stem. Also, if at 350 MW, would a loss of two RCPs generate a reactor trip?
If power was higher (>43% or ~390 MWe) a turbine trip would cause a reactor trip and would result in the observed condition, so if power is raised above 405 MWe there would be two correct answers if we leave Turbine trip as a choice.
A reactor trip would not occur unless both RCP were in the same loop. Having a loss of H1 will trip one pump in each loop so no reactor trip would occur at 350 MWe.
Arrange answers from short to long.

Q11

Arrange answers from short to long.

Q12

No comment

Q13

Group distractors from short to long.

Q14

Group distractors from short to long.

Q15

Arrange answers from short to long.

Q16

Not acceptable to have a distractor (Distractor C) that is known to be not plausible just to balance out the question – this does constitute a psychometric flaw. If you change Distractor C to " Remain CLOSED due to the loss of IA pressure" it might be more credible if they believe that IA is used to open the valve vice hold it closed.
Disagree, one non-plausible distractor does NOT constitute a psychometric flaw. It requires two non-plausible distractors to be a psychometric flaw. Please change designation to “E”.
Revised Distractor C as suggested.

Q17

Group distractors from short to long.

Q18 (reference provided) NRC 2016

No comment.

Q19

No comment.

Q20

Distractor C and D are not credible. Why would anyone actually believe that ejected rod analysis would be challenged for a dropped rod?
Disagree, because a fully inserted rod has maximum worth and it is therefore assumed that the ejected rod is fully inserted as described in the basis for the ejected rod analysis in the SAR, section 14.2.2.4.1.1, page 14.2-12. It is however, not mentioned in Tech Specs as the reason for ensuring rod alignment stays within specification, and is therefore incorrect.

Q21

No comment.

Q22

Arrange answers from lowest value to highest or vice versa.

Q23

Consider changing Distractor C to "No action necessary, SASS has automatically transferred to "Y" NNI." This would be correct as to what the plant is, yes?
Done and Yes

Q24

Is not the anticipatory trip also a back up to the RPS trip to prevent LHR limits from being approached? Could this also be considered a correct response? Maybe focus the stem to state the Primary purpose of the…
Added “primary” prior to purpose in the stem.

Q25

Knowing when and what peak flood levels will be would not constitute a Reactor Trip. The stem provides information making it appear as if there is time to do something so Distractors C and D are not the most credible.
Note: This is a Bank question and cannot count towards the Unsat total.
You are correct, they are not the most credible but they are credible. One of the ways to construct distractors is to apply a solution which is correct in one situation but is incorrect for the question conditions. In 1203.025, Natural Emergencies, Section 5 – Loss of Dardanelle Reservoir, step 2.I, if low lake level causes degradation of Circ Pump performance, then directions are given to trip the reactor. If the applicant has not studied this AOP in detail, but vaguely recalls that the reactor is tripped on lake level, then they could reason that the reactor trip is valid for a high level as well.
If you would still like changes to these distractors, then we recommend:
C. “ Perform Power Reduction and Plant Shutdown, 1102.016, and cooldown per Forced Flow Cooldown, 1203.040”
D. “ Perform Power Reduction and Plant Shutdown, 1102.016, and cooldown per Plant Shutdown and Cooldown, 1102.010”

Normal shutdown vs Rapid Shutdown or the second half could be the same as A and B if you want a true 2X2.

Q26

No comment.

Q27

No comment.

Q28

This question seems ok, however it is a repeat of Question 4 that tests the concept of re-ratio and Question 22 where total feedwater flow is determined with one MFW pump. It also has a total feedwater flow of 4.5 E6 lbm per min when for the same power 40% on Question 22 it has the correct answer as 4.4 E6 lbm/min - which is correct?
Question 4 asks what will cause a re-ratio while Q28 asks for the values of MFW flow following a runback.
Concerning the comment for MFW flow at 40%: 100% flow is 11 E6 lbm/hr. 11 x .4 = 4.4 1/3 of 4.4 = 1.466666667, this last value was rounded up to 1.5 for simplicity's sake, making the total in Q28 = 4.5. I hope this explains the difference.

Q29

Distractor D does not match the attached reference as to what distractor D is.

Q30

Arrange answers from short to long.

Q31

Decay Heat Vault? Where is this defined?
The DH Vaults are the areas behind the water tight doors and contains the DHR Pump and the RB Spray Pump.

Bullets 2 and 3: If "A" Decay Heat System is in service, can't it be assumed that the RCS is intact?
No, DHR is in service while fuel is in the core, including during fuel handling.

Consider putting "Cooler Outlet (CV-1428)" and "Cooler Bypass (CV-1433)" in the stem of the question since they appear in all answers.

Consider putting "RCS temperature" and "RCS pressure" in the stem of the question since they appear in all answers.

I visualize the following:

What affect would this have on Cooler Outlet (CV-1428) __1__, Cooler Bypass (CV-1433) __2__, RCS Temperature __3__, and RCS Pressure __4__

A. 1. Stays "AS-IS"
   2. Opens fully
   3. rises
   4. rises

B. 1. Opens fully
   2. Closes fully
   3. lowers
   4. lowers

Etc.

With all the blanks and numbers, I worry that it will be more confusing vs the savings of words being read by the applicant. Recommend leaving the formatting alone.

Question qualifies as a New question.

Q32

Consider presenting stem info in bullet format for consistency.
We can discuss, but I like having the tanks grouped together for ease of visualizing the situation.

Q33 (Reference provided - Steam Tables)

No comment.

Q34

Arrange answers short to long unless required for answer distribution.

Q35

No comment.

Q36

Distractor A is not credible. A pressure of 2395 psig is not plausible for a spray valve to open with no malfunctions (or even with a PZR pressure malfunction).
Would you accept 2355?

Q37

No comment.

Q38

Distractor B not plausible simply because RO applicants know they are not responsible to know TS LCOs > 1 hr from memory.
Agree, what would you suggest?

Applicants have probably seen instrument channels being placed in trip 100 times during scenario training. LOD = 1
This is perhaps a misunderstanding due to the way we worded the answer. The instrument channel in this situation is the entire ESAS Analog Channel 2. The wording in the answer is verbatim per the Tech Spec. The KA is about one hour or less Tech Spec for ESFAS (ANO-ESAS). It has an importance of 3.9. ROs are responsible for knowing one hour Tech Specs, there aren't many associated with ESAS, and thus we disagree with your logic. If it is important in the KA catalog, and we think it is important to know, then why is it NOT ok to put on the exam? Are you saying we should have rejected the KA?

Arrange answers short to long unless required for answer distribution.

Q39

B is a subset of A, therefore one of the two cannot be credible.

D is a subset of C, therefore two correct answers.

Disagree, an RO does not need permission to trip the reactor if he notices that a trip setpoint has been exceeded and no trip has occurred. However, an RO does need to request permission from the CRS prior to over-riding ESAS to position a component which did not operate correctly. The statements are not subsets.
This is the only way to write a question about this KA (operating ESAS equipment which fails to actuate) with an importance rating of 4.5.

Is there a Conduct of Operations policy that states if an automatic action fails to occur, then the operator has permission to attempt to make it so? So if the BWST valve fails to open, does the operator have permission to attempt to open the valve? Then the only reason that B is incorrect is because it states you must override ES? No, B is incorrect for two reasons: the RO does not need to override ES to place it in the ES position, and it is not the correct action to take per RT-10. CV-1407 and CV-1408 are long stroke valves and the HPI pump could be damaged by the time it takes the valve to stroke. During validation only one person (of 8) missed this and that person chose D.

Arrange answers short to long unless required for answer distribution.

Q40

No comment.

Q41

No comment.

Q42

Stem focus. With ICS in automatic, a steam leak will cause Rx power to rise and MW to drop initially but ICS should recover power to 100 % in fairly short order if it has been properly tuned. Change the stem from “in the first 5 min” to “initially?” Also, don’t need the “(5)” in stem.

Q43

No comment.

Q44

If you have one steam generator rapidly approaching 410 inches after a reactor trip, is it possible to meet entry conditions of an overcooling event? If so, then two correct answers.

Q45

The actual correct answer as written is not one of the choices. In reality the flow rate that is required per Step 4 is to verify sufficient flow rate to ensure the CETs are not rising and there is continuous flow until in the required band. The question is asking what the automatic feed rate *should be* and there is no way for the applicant to know the answer. In most cases operators will take control of the EFW controller and throttle it back to prevent overcooling and assist in allowing NC to occur (per Step 4). Also, based on RT-12 Table 1, one could argue in appeal that anything within the 2 to 8 inches per min is acceptable making all 4 answers correct as long as CETs are not rising or cooldown is not excessive. May require a change in the way the question is asked, with emphasis on the Figure 6.2.2 in 1105.005
Disagree, step 4.A.1 states that manual control of EFW is only necessary if EFW flow is less than adequate or EFW flow is excessive, then control EFW flow as per your second sentence. The question states that SCM is adequate, so the EFW flow should be verified to be filling at the automatic fill rate with a level band of 300 to 340". The automatic fill rate is designed to prevent overcooling while providing EFW flow to ensure adequate cooling, and there *IS* a way for the applicant to know the answer: the figure you refer to in 1105.005.
Obviously how the fill rate is calculated is being evaluated with this question but EFW is only used during an off-normal situation which is why the question is constructed in this manner. As an Enhancement, we could add "…and system design…" to the stem, since this is after all a Tier 2 question. Also, we could make some of the answer choices have 1" per minute or 9" per minute.

Also, with the KA written as "AFW flow/motor amps" – it looks like the KA is asking for the relationship between AFW flow and AFW motor amps.
Given that the KA is written as shown above, it appeared to us that it could be one or the other or both. Given that EFW P-7B motor amps are not an indication available in the ANO-1 control room, then we can only ask about EFW flow rates. Also, a question about the relationship between flow and motor amps would be a GFE question.

Q46

No comment.

Q47

No comment.

Q48

No comment.

Q49

No comment.

Q50

Q51

Q52

This is a Tier 1 question, not Tier 2. Tier 2 is system based question, more like automatic interlocks and system level knowledge - not procedural requirements. Questions like how do you manually control SW valves after an ESAS actuation or status of SW valves after automatic isolation occurs with a set of given conditions, etc.
Disagree, as per your examples above, this question poses conditions where the SW valves will respond following a Reactor Trip with a Degraded Power condition. The KA concerns the ability to manually operate SW valves and the question evaluates that, the ACW isolation will not automatically close and must be manually closed. ALL operator actions are procedurally driven so it is NOT incorrect to state "…actions are procedurally required…", in fact this ensures focus on required actions, not "what would you do in this situation."

Q53

Service Water System ES valve power supplies is the K/A, not HPI valves.
Agree. We can use the original question instead of the modified one.

Q54

Answers can be simplified:

- Remove “To ensure air from the MSIV backup accumulators” and “due to loss of Instrument air” from all answers and put in stem

- Use ADV for Atmospheric Dump Valve and MSIV for Main Steam Isolation valve since these are both commonly understood acronyms.

Q55

Part 1 of Distractors A & C are subsets of Part 1 of correct answer (D), therefore two right answers (D & A). Need to be “ONLY” at end of Distractors A & C.
Agree, will add ONLY to end of Distractors A & C as suggested.

Q56

No comment.

Q57

No comment.

Q58

Are you allowed to operate at 100% withdrawn on Group 7? Isn’t Group 7 normally around 92%? Question is OK but may want to make it more operationally valid by providing the Group 7 indication closer to what it normally is - or make it a Group 6 rod.

Arrange answers short to long.

Q59

This appears to be a basic setpoint question, not an “Ability to predict and/or monitor changes in parameters” as required by the KA.

The IR distractors (C & D) are not overly discriminatory. If you add the corresponding IR readings in stem of question it would be improved. Not having the IR readings (they should be on scale about 1X10-10 amps) tends to be cueing and helps to eliminate the IR distractors.
Bank question. Will add IR readings per your suggestion.

Q60

No comment.

Q61

Q62

Simply answers by removing “Turbine Bypass Valves open at” and “close when header pressure is less than” from all answers and put in stem.

Q63

Arrange answers short to long.

Q64

Where is the reference material for the 60 psig number?

Simply answers by removing “when Instrument Air pressure lowers to” from all answers and put in stem.

Add “IAW Procedure 1104.025, Service Air System” to stem.

Q65

Arrange answers short to long.

Q66

Arrange answers short to long.

Q67

Arrange answers short to long.

Q68 - NRC 2016

Arrange answers short to long.

Q69 - NRC 2016

Arrange answers short to long.

Q70

Arrange answers short to long.

Q71

Change Distractor A to Keff <= .99 with RCS > 280 degrees (mode 3) and Distractor C to Keff > .99 get rid of the neutron chain reaction.

Arrange answers short to long.

Q72 - NRC 2016

Arrange answers short to long.

Q73

No comment.

Q74

Not RO level knowledge – unless ANO has a specific Learning Objective that says they must know this. Provide copy of LO in ref material. Must also tie it to a 55.41(b) topic.
Question Data Sheet is incorrect but the lesson plan is and there is a specific RO learning objective: EO2 in ASLP-RO-EPLAN. 55.41(b)(8) ok? Or how about 10?

Q75

No comment.

AN1-2017-06 SRO Retake Written Exam Review Worksheet

	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
Q#	(F/H)	(1-5)	stem focus	cue	T/F	cred dist	part	job link	muta	units	back ward	K/A	SRO-only	B/M/N	U/E/S	A/B/C/D	55.43(b)y	Explanation
76	H	3												N	E	A	43.5	See comments below and revision history of question
77	F	3												N	E	C	43.5	See comments below and revision history of question
78	H	3												N	E	A	43.5	See comments below and revision history of question
79	F	3												B	E	A	43.5	See comments below and revision history of question
80	H	3												N	E	B	43.5	See comments below and revision history of question
81	H	4												M	E	D	43.5	See comments below and revision history of question
82	H	2				X								N	U	D	43.4	See comments below and revision history of question
83	H	2												N	E	A	43.5	See comments below and revision history of question
84	H	3												N	E	C	43.5	See comments below and revision history of question
85	H	4												N	E	B	43.5	See comments below and revision history of question
86	H	3												B	E	A	43.5	See comments below and revision history of question
87	H	3												M	E	A	43.5	See comments below and revision history of question
88	H	3												B	E	D	43.2	See comments below and revision history of question
89	H	4												N	E	D	43.5	See comments below and revision history of question
90	H	3												N	E	B	43.5	See comments below and revision history of question
91	F	3												N	E	C	43.6	See comments below and revision history of question
92	F	3												B	E	B	43.2	See comments below and revision history of question
93	H	3	X			X								N	U	A	43.5	See comments below and revision history of question
94	F	2												N	E	A	43.6	See comments below and revision history of question
95	F	3												N	S	D	43.5	

	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
Q#	(F/H)	(1-5)	stem focus	cue	T/F	cred dist	part	job link	muta	units	back ward	K/A	SRO-only	B/M/N	U/E/S	A/B/C/D	55.43(b)y	Explanation
96	F	2												N	S	C	43.3	
97	F	2												N	S	B	43.3	
98	F	3												M	E	B	43.4	See comments below and revision history of question
99	H	3												N	E	C	43.5	See comments below and revision history of question
100	F	3												N	E	A	43.5	See comments below and revision history of question

	1. LOK	2. LOD	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6	7	Ans Letter	CFR	8
Q#	(F/H)	(1-5)	stem focus	cue	T/F	cred dist	part	job link	muta	units	back ward	K/A	SRO-only	B/M/N	U/E/S	A/B/C/D	55.43(b)y	Explanation

Results Table

		AVG SRO LOD	2.92
SRO LOK - H	15		
SRO LOK - F	10		

		%
SRO Bank	4	16
SRO Mod	3	12
SRO New	18	72

	#	%
Total Bank	4	4
Total Mod	3	3
Total New	18	18

		%
SRO Sat	3	12
SRO Unsat	2	8
SRO Edit	20	80

Flaws

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

10 CFR Distribution

43.1	0
43.2	2
43.3	2
43.4	2
43.5	17
43.6	2
43.7	0

Answer Dist (in %)

A	9	36.0%
B	6	24.0%
C	5	20.0%
D	5	20.0%

AN1-2017-06 – SRO Retake Written Exam Comments

General Comments:

- Distractor formatting should be consistent (where possible) from shortest to longest or longest to shortest
- In general, provide noun name of pumps/valves in the questions - not just P4C or SW-5
- Low CFR distribution on SRO portion of exam
- Number of same answer in a row shouldn't exceed 3
- Take periods off the end of all bullets (throughout exam)
- Present parameters in the same manner throughout the exam. Some questions use “is” (Unit 1 is at 90% power) and some use “–“ (PZR level – 50 inches). Seems easier on applicant to use “–“ which is my preference but I’m open to discussion. Definitely don’t use a comma (Q78: Thot, 545 °F and lowering slowly)
- Some questions use “*” for bullets, some use “-“ for bullets. Pick one and be consistent throughout exam
- Attempt to write procedure numbers and titles in a consistent format: number, name. Example: 1202.010, ESAS. Not ESAS (1202.010) or (1202.010), ESAS or 1202.010, “ESAS”
- Future exams – use applicant consistently throughout exam
- While allowed by NUREG 1021, replacing Tech Spec related questions with TRM requirements should only be done by exception, not the rule. This is especially true for Operating Tests. Some Chief Examiners will not allow a substitution, citing the requirement for the exam to be “risk informed” and focus on safety related SSCs and operator actions.
- Bullets are used to minimize amount of words applicants are required to read – they aren’t supposed to be written in full sentences – delete as many “the” as possible since most don’t add any value to understanding

Q76

RO level knowledge only required for entry conditions for the procedure selection which makes distractor C and D not credible. In addition, the question can be answered by solely knowing the overall sequence of events in the AOP.
With Seal Bleed off temperature rising the applicant must prioritize between the two AOPs. Taking the actions within Loss of Reactor Coolant Makeup will correct the immediate problem of a leak. Continued monitoring of the Seal Bleedoff Temperature will determine if entry is required into Reactor Coolant Pump & Motor Emergencies.
There is also a flow path from Loss of Reactor Coolant Makeup AOP into the RCP & Motor Emergencies AOP if cooling from ICW to RCP is not available. Rising Seal Bleed off Temperature makes this a plausible choice.

Explanation A says "With the leak downstream of the HPI Pump" - how is leak location determined?
The area radiation monitor in alarm, the impacts to both seal injection and makeup flow point towards the leak being downstream of the pump.

Distractor B and C sentences don't make sense.

Distractor C - what are the "RCP issues?"
Seal injection flow is about half of the normal rate.
Added Seal Bleed off Temperature 130 °F and slowly rising. (Normal SBO 125 °F)

Is RE-8011 noun name “Makeup Pump Area” or is this a general description? If noun name, why use parenthesis? If not, then considered cueing so replace with noun name.
Makeup Pump Area is the noun name for RE-8011

Q77

Question stem seems complicated to ask the question: If there are insufficient Emergency Powered PZR Heaters, then what is an available alternate?

Starting the question with “Per Technical Specification 3.4.9 bases” is confusing the way the question is presented.

Consider simplifying the stem and phrasing the question "Efforts to restore ES backed PZR heaters have been unsuccessful. An alternate way to maintain subcooling margin listed in TS Bases 3.4.9 is to _____"
Modified the question as suggested

Answer A is the only answer that doesn’t have a “to” part of answer. (cueing)
Added a “to” part for Answer A

Distractor C is not plausible - why would someone choose to use the Unit 2 charging pumps when U1 charging pumps would be available via the emergency diesels? Also, based on the status of the switchgear, Unit 2 would not want to lose their pumps. Also, the procedure to crosstie charging hdrs seems a bit extreme for given circumstances… FLEX procedure, install, fill and vent crosstie header. Not something an operator would do while waiting for Maintenance to check out PZR heaters.
Replaced with “Commence cool down to maintain subcooling margin”

Why is Distractor D plausible? Because it is listed as an alternate source of power in the degraded power AOP? Yes
The wording is wrong – connect diesel ~~to~~ power to A1 bus – has one too many “to”.
Removed the first “to”

What is value of the PZR spray valve failing open in second bullet?
Provides the reason for the cause of low RCS pressure and shows the need to restore the parameter to a normal value.

How does using HPI pumps maintain subcooling margin? Doesn’t it just add water level to the PZR (yes) until the system goes solid (eventually if the problem with the heaters is not corrected)?

Q78

EOP selection based on a symptom check (entry conditions) is RO level knowledge.
The correct answer cannot be derived solely with RO knowledge

Second half of the question is ok because the overall mitigative strategy is to isolate the faulted SG, not necessarily to isolate letdown. Consider changing second half to read "… procedure and a mitigating action…" Testing on one action within the procedure is simple recall, doesn't test to higher level understanding that SRO's should have.
The correct answer requires a transition to an RT which will isolate letdown

Why Thot when procedure uses Tcold for entry condition?
Thot was used for calculating SCM

Step 9 of 1202.003 is not met, therefore CA is performed. Step 9.B states to Actuate EFW, but Note on same page says "…but EFW is not in service SG pressure > 600 psig setpoint. Doesn't this make Step 9.E always "yes" since you just activated it? Therefore, more than one correct answer? Also, Step 11 of 1203 "Check EFW off" – with CA 9.B, isn't EFW "on?"
Step 9 is met, RB Pressure is <17 psia (@15 psia and rising), therefore contingency actions are not taken. Would not take the drastic actions at such a low RB Pressure, continue on with the procedure and monitor for 17 psia

Since determination of SCM is required to rule out distractors, the explanations should identify what SCM is for the given conditions.
Added the SCM value to the explanations for C and D

Is Figure 1, Saturation and Adequate SCM, provided to the applicant? Yes (RO handout)
Or can they just use Steam Tables? Also, Fig 1 doesn't identify whether RCS Temp is Thot or Tcold…which is it? What is the reference? (I noticed in History it says it was changed to Thot)
It is actually based on CET Temperature, however post trip with forced flow the difference between CET and Th in negligible.
Figure 1 is derived from the ATOG screen on SPDS and the SPDS procedure shows that CET Temperatures are the source for the ATOG display.

How big is Unit 1 containment? Would operators expect pressure higher than 15 psia if SG A at 850 psig?
A Steam line break will cause RB pressure to rise.
If large enough a steam line break can cause an ESAS actuation on RB pressure.

Format: use "– " when listing parameters, not a comma. RCS pressure – 1620 psig, Pressurizer level – 60 inches, Thot – 545 F, etc.
Done

Q79

How does knowing what components make up the DC subsystem equate to determining operability or availability? KA Matches statement on worksheet is incorrect. It does make the applicant identify the components but doesn't address operability of subsystem.
In order to determine operable/inoperable you have to know what is required from the basis to meet the specification.

A better question is something happens to a piece of the subsystem and the applicant has to determine whether this makes the system operable. For example, the NLO reports Maintenance cut one of the battery cables so what is the affect? Entry into TS 3.8.4 is required because the cable is considered a required part of the subsystem.

Is the Static Switch considered a part of the Invertor? If so, then not allowed – the switch would be a subset of the invertor.

Also:

- Change Unit One to Unit 1 (make consistent throughout exam)
- Take "s" off of Tech Specifications
- Change "components" to "component(s)" so it applies to one or more than one

Made suggested changes

Q80

Also:

- Remove "AOP" from 4th bullet after procedure name (becomes "Loss of Instrument Air (1203.024) has been entered
  Done
- Remove commas after procedure name in A, B and C
  Done
- How are Continuous Action steps identified in an AOP/EOP?
  For AOP an "Arrow" is used to depict a continuous action step, in the EOP we utilize "Floating Steps" that are contained in the back pages of the EOP.
- In KA Match statement, add "air" after "instrument"
  Done

Q81

Why identify what month (August)? Can't just give ambient outside temp as a parameter?
Not required - removed
What "condition" has not improved after several hours?
The above conditions – Added "above"
Better to combine CBOT reports into one bullet?

- CBOT reports both A3 and A4 bus voltages are ≈ 3750 volts, Startup #1 Transformer voltage is 22.1 KV, and SU #2 Transformer is 160 KV

Or

- CBOT reports:
  - A3 and A4 busses ≈ 3750 volts
  - 22 KV SU1 = 22.1 KV
  - 161 KV SU2 = 160 KV

Used the second format for the CBOT report
Paralleled
Last bullet – if grid voltage and freq are oscillating, then shouldn't this be provided in CBOT reports?
Made the dispatcher report of information look like the CBOT's and added the last bullet to the dispatchers report since it is being caused by grid disturbances.

Shouldn't line "Procedure 1203.037, Abnormal…" be a bullet (as it is on other questions)?
Added a bullet

Procedure 1203.037 implies voltage regulators are operated/fixed by ANO but stem says Dispatcher has control of voltage regulators… which is correct?
The dispatcher controls the voltage regulators in the question; the AOP just provides guidance on how we align our in house equipment to protect it from the abnormal voltages.

Delete "In accordance with" from all answers – they are too long anyway.
Done

Question is two parts – answers can be simplified by separating each part with a semi-colon or put on a separate line. Also, simplify Part 2 of each distractor (delete "available" since you can't start an unavailable DG, combine starting and paralleling the DG, removing "the" where possible).

A. Section 3, Offsite Voltage Abnormal; start and parallel one DG to grid then separate associated ES bus by opening its feeder breaker

D. Section 1, ES Bus Voltage Low; start one DG, de-energize associated ES bus by opening its feeder breaker, then verify DG output breaker closes

Or

A. Section 3, Offsite Voltage Abnormal;
Start and parallel one DG to grid then separate associated ES bus by opening its feeder breaker

D. Section 1, ES Bus Voltage Low;

Start one DG, de-energize associated ES bus by opening its feeder breaker, then verify DG output breaker closes

Chose to use the second formatting method

Also:

- 3rd bullet - remove "that" after "reports"
  Done
- CBOT report – use Startup or SU, use term voltage or not (be consistent). Procedure identifies SU #1 Transformer as 22 KV SU1 and SU #2 Transformer as 161 KV SU2
  Added "voltage" to SU2 bullet
- Changes to question qualify it to be a NEW question, not MODIFIED
  New

Q82 (Reference Provided)

Two distractors not credible. Change "…State or Local…" to "…State and Local…" in Distractors A and B since "or" is not credible. Also remove "the" in Distractor B after "NRC then…" to read "NRC then State and…" so Part 2 of Distractors A and B are the same.
This was a typo (was "and" in all choices in 3/27/17 valildation version). This was not meant to differentiate between correct and incorrect answer choices. Corrected as suggested. FYI, an SRO validator chose "B" with typo in 4/7/17 version.

Explanation for correct answer says EAL is Alert (AA2) in Abnormal Radiological Effluents tab – but in this tab, it appears that EAL is AA1 based on RX-9820 being > 1.8 µCi/cc (although RX-9830, Fuel Handling Area, is highlighted in blue in the reference materials). In the Abnormal Radiation Levels tab, EAL appears to be AA2 based on RE-8017, Fuel Handling.
Corrected explanation so that correct answer explanation refers to Abnormal Radiation Levels tab.

Explanations associate AA2 and AU2 to the Abnormal Radiological Effluents tab where it appears to be the in Abnormal Radiation Levels tab. Not clear why the Basis section of 1903.010 combines the two tabs and shows AA2 (seems it's AA2 for Rad Levels and AA1 for Effluents).
We're not sure either.

Change time for RX-0920 (9820???) to be in alarm to 11 minutes – tests applicant's knowledge of NOTE in AA1 that says "The SM/ED should not wait… has exceeded or will likely to exceed the applicable time." Nothing in the stem indicates to applicant that the release would be terminated in next 4 minutes.
We prefer NOT to do this since we believe this would place the question at the SRO Requal level vs. the initial SRO level.

Explanations don't address Part 2 (order in which authorities are notified).
Disagree, all stated the order was either correct or incorrect per 1903.011-Y.

We'll need to discuss how much of the reference to provide. When done, need to identify exactly what is provided to applicant in the worksheet and include it as an attachment to the question. Revise the provided reference statement to what *is* provided, not what is *not* provided (Provided Reference: 1903.010, EAL Classification, pages 19-68)
Changed References field to state "1903.010 EAL Classification pages 18-68 and 74-180 (EAL tabs plus bases) will be provided as an applicant reference."

Also:

- Change CFR to 43.4 for Radiation hazards
- 1st bullet: "Unit 1 in Refuel outage, core reload in progress"
- 2nd bullet: change "… dropped into the core"
- 4th bullet: "RE-8017, Fuel Handling Area, is in Alarm at 0.5 R/hr and rising slowly"
- 5th bullet: "RX-9820, Containment Purge (SPING Channel 7) has been alarming for 11 minutes…" or whatever the correct format is consistent with others
- Procedure Enhancement Opportunity (PEO): RE-8017 is named Fuel Handling under AA2 but is Fuel Handling Area under AU2 on page 26 of procedure NOTED
- Made all changes except for comment on 5th bullet.

Explanations and History state that ***SM*** can determine the readings are valid… is this question written for a qualified SM or is it a question appropriate for a CRS?
It is appropriate for CRS since they will assume duties of Emergency Director in case the SM becomes incapacitated.

Question – why is the Limit for RX-9820, Cont. Purge (Ch. 7 or 9) "N/A" in Abnormal Radiological Effluents tab, AA1, 2 (page 25)?
We don't know but it doesn't affect this question. We will ask this question after the exam is over.

Q83

Two correct answers. Since the only separation between Unit 1 and 2 is a glass wall that is not a fire barrier, a fire in one control room is surely considered a fire in both control rooms IAW the fire plan. In addition, with the stem stating "heavy smoke has accumulated in Unit 1 control room" is would be an easy argument that the Unit 1 control room would need to be evacuated. Therefore, Control Room Evacuation entry condition of 1203.002 is met.
Disagree, although the Control Room is considered one envelope, a fire on Unit 2 would not be considered a fire on Unit 1 unless the fire involved Unit 1 equipment, i.e., a fire involving Uni1 control room panels or the Unit 1 cable spreading room. However, as an enhancement we suggest going back to the original wording (validation – 1st round) where the reason for evacuation was "…toxic gas of unknown origin...".

Second part of question is simple memory recall and does not test SRO level knowledge.
Disagree, apparently it is not that simple since 2/4 SRO validators chose the wrong valves. The application of ADVs vs. TBVs was chosen for that reason: it is not expected to be committed to memory by ROs. The 950 to 1020 psig SG pressure control band encompasses both TBV and ADV setpoints post-trip.

Q84 (Reference Provided)

Does stem not need a Containment pressure in order for the applicant to evaluate all EALs for Loss or Potential Loss (CNB1)?
No, not in order to arrive at the correct answer. We do not wish them to take too much time with this question by giving a lot of parameters to evaluate. We feel they have enough to evaluate as the question is now.

Is Containment Barrier also Potential Loss from CNB2 (2. CETs > 700 °F)?
No because RVLMS indications are not provided so they cannot choose this one.
Is Fuel Cladding Barrier also Loss from FCB1?
No, those levels are measured on the exterior of containment and that is not given in this question.
Is RCS Barrier also Loss from RCB1?
Yes.

Containment high range monitors (8060 and 8061) should be listed using the consistent method, that is, "RM-8060, Containment High Range Monitor" or whatever (at SA-229?). Do not use the exact wording out of Tab F. Operational validity where possible – identify the instrument as it would be identified in the Control Room.
Revised

We'll need to discuss how much of the reference to provide. When done, need to identify exactly what is provided to applicant in the worksheet and include it as an attachment to the question. Revise the provided reference statement to what is provided, not what is not provided (Provided Reference: 1903.010, EAL Classification, pages 19-68) (same as Q82)
Done.

Also:

- 3rd bullet: "Total HPI flow = 480 gpm"
- Change Distractor B to "Loss of 1 barrier and potential loss of 2nd barrier" for consistency of wording
- Revised as suggested

Q85

Is there a reason natural circulation is being used to conduct the cooldown? Yes, offsite power has been lost (first bullet).

Answer C says "Return to 1202.007" but in the answer block, it says "Go to 1202.007." Per Section 1 of 1203.013, it should be "Go to" so correct C. Disagree, 1202.007 would have been in use at beginning of event due to loss of offsite power. Fourth bullet says 1203.013 is in use now, so it would be "return to."

Explanation for Distractor D says 1202.011 would be in use if there was unisolable steam leak on both S/G's (second bullet on Entry Conditions of 1202.011) but the first bullet of these Entry Conditions is highlighted in blue (pri to sec heat transfer cannot be established AND HPI cooling is inadequate). Which one is it? 1202.007 section for overcooling step 47 (which would have

been used since an MSSV was stuck open on "A" SG – 2nd bullet) has a transition to 1202.011 if both SGs have a fault The wrong entry condition was highlighted.

Q86

Do operators start procedure 1203.031 at Section 1 or do they go straight to whatever section they think is appropriate? They go to whatever section has entry conditions which are met. It is like having 7 AOPs rolled into one since there are 7 sections and each have their own entry conditions. Where is this guidance found? Only in training lesson plans on how to use the AOP. Could an applicant argue that given the plant conditions, the crew would already have been in Section 1 before B RCP seal bleed off temp reached 210°F, so per Section 1, Step 10, they would have already reduced reactor power to within the capacity of the unaffected RCP combination using 1203.045, Rapid Plant Shutdown, then stopped the affected RCP. So the action in Distractors C and D is correct, but none of the answers reference Section 1 so there is NO correct answer? An applicant could argue this but they would be incorrect. If an applicant sees that there is no answer supporting his assumptions, then the applicant should know that his assumptions are likely inaccurate. We always tell applicants not to assume anything that is not there, and if they have a question about the conditions, then ask the proctor. There is a correct answer, it is "A", the conditions given support "A" being correct, thus there is a correct answer and so I don't see how you could argue that there is no correct answer. I don't know how many times an applicant has told me when proctoring an exam that there isn't a correct answer, I just respond that there is, they must choose one, and not to leave any blank.

Can an RCP be tripped from 100% power without a reactor trip with an ICS runback? No, if we are greater than 92% power and we trip any RCP, then the reactor will trip. If so, then NO correct answer (Section 2, Step 2).

Given the conditions in the stem, would this be considered seal degradation or seal failure? Basis? Seal failure - due to seal bleedoff temperature greater than 200 °F with no change in seal injection or ICW flow. Does the operator have to make the call so they know which section of the procedure to enter? Yes.

Attachment A of 1203.031 says if P-32B motor bearing 167°F and continues to rise, then secure the affected RCP per section 4 and/or section 5 of procedure (also in K08 A8 annunciator response procedure). While the seal bleed off temp over 200°F is the more limiting condition (trip criteria vs secure criteria) and Section 2 is required to be entered due to high seal bleed off temp, Section 5 is also applicable, correct? Yes, that is what makes the question a little more difficult, and this is the same as some of the EOP questions where you have conditions meeting more than one EOP entry, and you have to pick the most limiting one. So what directs the applicant in the rules of usage for AOP's to address one section over another if entry conditions are met for both? The applicants are trained to pick the most limiting section. Could an applicant appeal this question based on no guidance? No, if an applicant argues that he should continue to lower power until he can secure an RCP based on a lesser condition instead of tripping the reactor and RCP due to a more severe one, then that would be wrong, wouldn't it?

Reference material has Section 2, Step 2 highlighted in blue with a text box to the side that says this step supports Distractors C and D… how? Distractor D says Section 5 not 2, and the action for C and D is reduce power before tripping the RCP… confusing. Sorry about that, we obviously overlooked that and we will supply more accurate supporting material.

Explanations for C and D not adequate – what is "abnormal shutdown of RCP?" Abnormal shutdown of an RCP is tripping it per 1203.031. Revised explanation to state "trip". What ref identifies the actions taken in C and D? Sections 1, 3, & 7 allow stopping an RCP per the normal operating procedure. Section 5 has the action in C and D but states to do so using Rapid Plant Shutdown procedure. Sections 2 and 5 do not state stop the RCP via the normal operating procedure, which makes C and D incorrect. Added "and stable" to motor bearing temperature in given conditions to ensure D could not also be argued as correct.

In Notes section – the part of the first sentence that reads "… and require the applicant to assess conditions and determine the correct section and action(s) to take" doesn't really support why the distractors are plausible. This is just repeating the question, and could be written for all questions. That statement was meant to explain why this question uses only one procedure and why this still applies to SROs since no transition is made to other procedures. The statement was revised.

Also:

- Need to minimize wording of all answers – I'll provide a markup Can't make changes without seeing it.
- Reference material is missing Section 2, Entry Conditions (page 7) We will provide correct ref.
- Reference material has annunciator page for K08-B6 but not K08-A8 (which is highlighted in blue on Section 5 Entry Conditions) Deleted the page for K08-B6, it was not necessary. K08-A8 is also not necessary to support the question.
- Remove quotation marks from around procedures and sections of procedures (for consistency) Done
- The "°F" at end of 2nd and 3rd bullets are incorrect Corrected
- Please send me Rev 047 of 1203.012G, ANNUNCIATOR K08 CORRECTIVE ACTION, to replace Rev 046 that was on disk sent as ref material. We will gladly do that but it is not necessary as the changes in Rev. 47 did not affect the question. As noted above we deleted the ACA page from the supporting question material.

Section 1 entry conditions – drinking bird? What is that? STM 1-03, Reactor Coolant System, section 2.7.4.3, p. 41, has a description of a drinking bird. You've seen the toy birds that bob up and down on a cup of water? The drinking bird is a cup that collects leakage past the third RCP seal and once it fills to a certain point, becomes unbalanced, and then dumps it's contents into a standpipe. A counter counts each time it dumps and the seal leakage can be calculated based upon the number of times the counter changes in a time period.

Q87

ERV? Electromatic Relief Valve Pressurizer Relief Valve? Yes

There is no way to place RPS Channel A in TEST so as to avoid lifting the ERV? Yes, by hard selected the "Y" NNI RCS pressure instrument. The SM would allow this to happen by authorizing I&C to calibrate the pressure instrument? Yes, since the "Y" NNI RCS pressure instrument would be hard selected. FYI, 1/4 missed in validation. Added fourth bullet that RCS pressure is hard selected to "X" due to failure of the "Y" instrument.

Consider phrasing the question as follows (and delete the "NOW" word):

> "If I&C performs a pressure instrument calibration on RPS Channel "A," which of the following will occur as a result and what actions will the CRS perform?"
> Revised as suggested.

Q88

For Distractor C, remove the "Entry is then required" from the end of the answer. It is implied by the "can be delayed" statement. Also, it's not included on Answer D.
Done
2nd bullet - What does the (1) before "…Emergency Core Cooling System (ECCS) valve…" mean?
a (1) means "a single" valve was not tested
Also:

- 2nd bullet – change "it's" to "its"
  Done
- To align answers shortest to longest, swap C and D – unless D is required for even distribution of answers.
  Done, however the original order took into account the shorter time limit to longer time limit. (Delayed for 24 hours vs delayed until the mid-cycle outage)

Q89

4th bullet – what does "Full HPI flow" mean?
Both trains and all HPI isolation valves open. Flow rate depends on RCS pressure so there isn't a standard flow that equates to full HPI
In Q87, ERV was just ERV. In this question, it's Electromatic Relief ERV Isolation (CV 1000) – pick one for consistency throughout exam
Done
Would RCPs be running with RCS pressure at 800 psig? If not, then would CETs be used instead of Thot?
Yes RCPs are still running at 800 psig as long as SCM is adequate and in this question it is adequate. Thot is appropriate.
Explanations for Part 1 of A and B say remaining in ESAS would be correct if cause of the ESAS actuation was corrected – however, Step 12 of 1202.010 says if cause is corrected, then go to 1202.001, Reactor Trip.
Agree – corrected explanation
Should RB Spray be given in the stem (x gpm or x gpm/train)?

Since the RB Spray flow choice is unique enough from the other choice, no value added by the specific range of spray flow (1050-1200 gpm).
One or the other has to have a flow rate either the stem or the answers. I think there is no value added by putting it into the stem, but the answer is procedurally directed and does add value. The applicant could argue that simply throttling RB Spray flow without giving a value in the correct range means that there is no correct answer.
Also:

- 2nd bullet – change to "1202.010, ESAS, has been entered"
  Done

Q90

Change made to the question. Initially due to the LOCA that caused the trip, the crew entered LOSM EOP, so now the applicant must choose between a transition to ESAS or HPI Cooldown AND must decide which path out of RT-15 (If he chose HPI C/D) or Attachment 1 (If he chose ESAS) to follow based on RB status. The correct choice would be ESAS and Stop both RB Spray pumps.

How long does transfer to RB sump recirc take? Is that directed by the crew IAW Attachment 1 of 1202.010, CSAS? If so, shouldn't the stem indicate that the crew has entered 1202.010?
Per 1015.050, Time Critical Operator Actions Program, once the BWST level reaches 6 feet the operator has 3 minutes to complete the transfer. In order for this to be achievable, preparations IAW Attachment 1 or RT-15 need to be taken prior to reaching 6 feet. For example throttling flows need to be done before reaching 6 feet.

CETs at 330 F after a trip from 100% power seems very low… how much time after reactor trip does it take to reduce CETs to 330 F?
In order for the BWST level to reach 6 feet, we would have been post trip for at least 25 minutes and most likely much longer than that. A CAUTION in 1202.010, ESAS states "Full flow from both trains of HPI, LPI, and RB Spray can reduce BWST level to 6 feet within 25 minutes of ESAS actuation". In reality RCS pressure has to lower enough for LPI injection, therefore it will take more than 25 minutes unless you had a very large LOCA.

Removed CET temperature and added that LOSM is in use

- Also, the stem doesn't provide a trend for CET temp.

Removed

What makes the procedure selection of HPI cooldown credible?

- What does "Primary to Secondary is not effective under these conditions" mean?
  With a LOCA and LOSM the hotlegs could be voided which would prevent natural circulation flow
- Stem doesn't mention HPI pumps. If you are cooling down on LPI but lose the suction source, does any procedure direct initiating HPI?
  With the low RCS pressure and normal LPI flow, the crew would have secured HPI.
  No
- How is an operator trained to determine that primary to secondary heat transfer cannot be established AND HPI cooling is adequate (entry condition to 1202.011)?
  Primary to Secondary heat transfer is indicated by all (3) of the following:
  Tcold tracking SG Tsat
  Thot tracking CET temperature
  Thot / Tcold delta T stable or dropping
  With no RCPs running for forced flow, and saturated conditions, the hotleg voids would prevent primary to secondary heat transfer.
  AND
  HPI flow resulting in lowering RCS temperature independent of SGs.

Question could end after asking how many RB Spray pumps are secured. Adding "and close the associated RB Spray Block valve(s)" doesn't add any discriminatory value.
Removed the portion pertaining to the RB Spray Block Valves

What is value of 2nd bullet under NOW – "RB Flood level is steady?"

Also: It shows that the sump screen is clogged and not that the inventory in the building has somehow been lost

- 3rd bullet under NOW: change "is" to "are" Both LPI Pump discharge pressures are fluctuating…"
  Done

Q91

The way the question is written, it fails to meet SRO-only criteria. Despite the highlighted Figure 2 in ref material, there is no selection of a procedure or section of a procedure to mitigate, recover or with which to proceed. Not sure I've ever seen an A2 KA presented as a Fundamental LOK.

The questions ties directly to CFR 55.43(b)(6) Procedures and limitations involved in initial core loading, alteration in core configurations, control rod programming, and determination of various internal and external effects on core reactivity.

This is also directly related to ANO OE (SOER 84-2) which was a Core Damage From Control Rod Misalignment event that is listed among the events that shaped the industry. Where a misaligned control rod that had been out from the rest of the group for several days, was promptly restored to within the group average, and the resultant xenon oscillations caused fuel damage.

Finally the step is a transitional step of the procedure that forces the applicant to make a decision.

Q92

While the plant might be in compliance with LCO 3.7.10 and TRM 3.9.1, procedure 1502.004 does not say *to be in compliance* with the TS/TRM. It says RE-8017 shall monitor rad levels in RB (with the TRM number given for reference in parenthesis) and that two CREACS are required (with the LCO number given for reference in parenthesis).

- Has the station ever conducted fuel movement with either of these two requirements only met by the LCO required action?
  Not that I am aware of, however prior to starting fuel movement we always install a portable rad monitor on the main bridge just in case RE-8017 becomes inoperable so that fuel movement could continue without interruption.
- Has an Assistant Ops Mgr or higher approved the interpretation of 1502.004 as used for this question?
  See above contingency for RE-8017
  OP-2104.007, Control Room Emergency Air Conditioning & Ventilation, contains the following NOTE on Page 61 of 190.
  "The License Bases are unit dependent (i.e. U1 TSs, SAR, etc. are based on U1 accidents and not Unit 2 accidents) therefore fuel handling on one unit does not constitute fuel handling on the other unit. If equipment required for fuel handling is OOS on the unit handling fuel, then that unit would enter the required actions / conditions as required by the License Bases." It does NOT say that fuel handling must stop.

Add to stem question "In accordance with 1502.004, which of the following…"
Done

Source says “repeat” but should be New – Modified – Bank. History says modified NRC bank question (from the NRC 2014 exam?) so is this a Modified question? If so, submit the original bank question with reference materials.
This is a bank question for this exam.
Distractor D, second part should read “and portable survey instrument is being used to monitor the fuel handling bridge.” The survey instrument isn’t being monitored. Also, the TRM says the portable instrument is to monitor “the area,” not the fuel handling bridge. So are these two equal for exam purposes (no basis for appeals)?
The monitor is always located on the bridge so that the fuel handlers can observe the monitor for changing conditions and it travels all over the core / canal as the bridge moves which will monitor “the area”.
Also:

- Title of 1502.004 isn’t correct

  Corrected

Q93 (Reference Provided)

Two correct answers – B and C. Per TRO 3.7.9 Condition A, Required Action A.2, there is a requirement to “Establish backup fire suppression equipment for the affected area.” The writer’s text box says applicant must know this does not mean *you have to* run hoses to the area. But if the CRS chose to run hoses to the affected area, it would not be wrong and the TRO requirement would be met, correct? Therefore, both Answers B and C are correct. Disagree, with regulatory requirements one takes the least stringent action to comply with the regulations while still maintaining a functional facility. Using the logic above, one could argue it would be a correct conservative action to place the unit in Mode 3 within 6 hours anytime an EDG was inoperable instead of allowing up to 7 days to repair the EDG. In other words, how could “trip the reactor” ever be a wrong answer? If we ran hoses everytime a sprinkler was inoperable due to inoperable detection, then we would create trip hazards everywhere and create industrial safety hazards. If an hourly fire watch was the correct answer for this question, then (using the above logic) how could we ever fault someone for choosing a continuous fire watch?

For Distractor D – not plausible. Since the correct answer is 3.7.9 Cond A, Required Action A.1.1, and there is an OR for action A.1.2, the applicant knows per NUREG 1021 Appendix E that there is only one correct answer, then A.1.2 cannot be correct. Therefore, not plausible.
Disagree, with fire protection and detection one always takes the action which requires the least expenditure of resources. Why establish a continuous fire watch when you have the option of using detection? It is plausible since the option exists within the specification and one must determine with the given conditions which option is appropriate. Any CRS or SM which starts establishing continuous fire watches when detection is available will soon be counseled by Ops and Licensing for mis-allocation of resources. If it is not acceptable in practice, then it should not be acceptable on an exam. Another example of this is TRM 3.7.12, Fire Barriers. TRM 3.7.12 Required Action A.1 has an “OR” between it and A.2 and between A.2 and the two steps of A.3. If a fire barrier is non-functional, then a continuous fire watch can be established per A.1, OR verify detection on both sides of the barrier per A.2, OR verify detection on one side of the barrier AND establish an hourly fire watch.

Worksheet needs to clearly identify exactly what the Handouts will include. From References, it appears it is intended to be complete copies of TRM 3.3.6 (pages 3.3.6-1 to 3.3.6-5) and TRM 3.7.9 (pages 3.7.9-1 to 3.7.9-4). Will correct reference field to specify exactly which pages they will get. The surveillance pages were excluded to reduce the number of reference pages given to the applicant.

For TRM 3.3.6, Condition A – how do you determine how many detectors are in a location so you can know whether there are < 50%? For EFW Pump Room, how many detectors are there so it can be confirmed that Condition A is not applicable (and Distractor A not a correct answer)? TRM 3.3.6 Condition A *is* applicable, any fault anywhere on the detector string will generate a Trouble alarm. A trouble alarm will only come in once on this particular detector string thus it is immaterial how many detectors there are, they are all inoperable. Distractor A is not a correct answer because if the detector string is inoperable then the sprinkler valve can NOT be guaranteed to automatically actuate, and is therefore inoperable. A continuous fire watch is a more stringent requirement than an hourly fire watch and thus the hourly fire watch is incorrect.

5th bullet – what does "No other new alarms are indicated on the C463 panels" mean? Are there "old" alarms? It means no alarms have come in since THIS one.

Remove "Zone 38-Y" from all answers and move to stem. Question could be "Which of the following meets the required action of Technical Requirements Manual for Zone 38-Y?" Done

- Each answer is only one action so change "action(s)" to "action" Done
- Delete "the" before Technical No, it isn't like Tech Specs, it is a manual and "the" is appropriate.
- If the acronym TRM is used elsewhere in the exam, then use it in this question if it is a widely accepted term (which it probably is). Either way, be consistent throughout exam.

Also:

- Remove quotation marks around annunciator alarms Done
- To align answers shortest to longest, swap A and B – unless B is required for even distribution of answers Done
- Change Distractor A to read "Establish a 1-hour roving fire watch" to match TRM Done
- Change LOD from 4 to 3. With Handouts, ????

Q94

Consider combining the Given statement and question to read:

"Per COPD-030, ANO Reactivity Management Program, which of the listed positions determines the Risk Level Classification and Minimum Required Defenses for an activity that is determined to have a Reactivity Management Impact?" Incorporated below comment and combined the two.

Why include in the question both the Risk Level Classification and the Minimum Required Defenses? Because the Ops SRO does both and they are in consecutive steps. Consider picking one or the other, but having both reduces the LOD (which is already a 2). Deleted "Minimum Required Defenses".

Distractor B – not plausible as it does not identify a single person like the other 3 choices. Revise to "Reactor Engineering Supervisor" which is consistent with COPD-030, Step 4.9. Done

Since the WWM completes Section C – Operational Impact Assessment (per EN-WM-101), does this involve determining Risk Level Classification and/or Minimum Required Defenses for

work additions/deletions to the schedule? Can the assessment be considered "equivalent" if an applicant would appeal? No. This is why the WWM is plausible but incorrect. Completing section C is his duty but he does not perform all of the items he is checking off. The ensures the items are completed. In practice the WWM can determine a Risk Level Classification but not if the activity has a Reactivity Impact.

Also:

- Align revised answers shortest to longest, which makes the correct answer B – unless C is required for even distribution of answers (revised order is A-D-B-C) This is needed for even distribution of answers. This is a new question so there is no pressing need to re-arrange.

Spelled out STA, i.e., Shift Technical Advisor

Q95

No comment.

Q96

No comment.

Q97

No comment

Q98

Change Distractor C from "EOF Emergency Plant Manager" to "Emergency Plant Manager" to match the reference procedure. Also, stem specifies the TSC is activated (not the EOF) so having an EOF anything wouldn't be plausible.
Done (if the TSC is activated the EOF would also be activated)
Also:

- Spelling error in the explanation of Answer B (Supeervisor) Fixed
- In ref material, EN-RP-201, page 11 of 16, the writer's text box – there's a math error. 1.4R + 1.7R = 3100 mrem, not 4100 mrem Fixed
- In explanation for Distractor A, change "authorization" to "extension" since Supervisor doesn't approve Done
- Explanation for Distractor C doesn't make sense – "…this limit can be authorized…" – what limit? How does explanation refer to individuals in the distractor?
  Changed to
  "C" is wrong this is the authorization if there is an emergency and an equipment or lifesaving circumstance existed. (10R/25R)
  Also added a sheet to the reference to show the table contained in OP-1903.033

Q99 (Reference Provided)

We'll need to discuss how much of the reference to provide. When done, need to identify exactly what is provided to applicant in the worksheet and include it as an attachment to the question. Revise the provided reference statement to what is provided, not what is not provided (Provided Reference: 1903.010, EAL Classification, pages 19-68) (same as Q82 and Q84)
Will discuss
OAO? Who is this?
Outside Auxiliary Operator
Consider revising stem question: "Per 1903.010, Emergency Action Level Classification, what is the appropriate event classification?"
Done
Explanation for correct answer should include the appropriate EAL (HS1) like all the distractors have.
Done
Why is the ref page for HA4 (page 145 of 1903.010) different than HU4, HS1 and HG1?
Because it is a table contained in HA4 that shows the specific location referenced in the stem of the question. The other sheets are from the first page of the event classification in the procedure.
Added the first page from HA4 book to show you, but was not added to the electronic file.
Also:

- 1st and 2nd bullets – delete the first "that" in each bullet
  Done

Q100

Does the requirement to "reassess" PARs every 15 minutes equate to notifying State and local governments? No, the Technical Advisor in the EOF verifies that plant conditions, release status, evacuation impediments and offsite dose assessment, and wind direction have not changed such that a change to the PAR would be warranted.
We WOULD notify the state if we recommend a change based on the above reassessment.
Not clear in Attachment 6, PARs for GE. Maybe this is why there isn't a statement in the explanation for the correct answer? I don't understand your statement

For Distractors C and D, include the word "BOTH" before each distractor to make them appear similar to A and B.
Done
Explanation for the correct answer A includes a statement of why 30 minutes is a plausible distractor… this goes with the distractors, not the correct answer. A statement as to why the 15 minutes is correct is required in this explanation.
Corrected
In stem (1), revise to read "Protective Action Recommendations (PARs) are required to be provided after declaration of _____." This is more accurate than "during."
Done