ES-401 RB-2018-07

Written Examination Review Worksheet

<i></i>	1.	2.	3	8. Psyc	homet	tric Flaw	/S	4.	Job Con	tent Fl	aws	5. C	Other	6.	7.	8.
Q#	LOK (F/H)	LOD (1-5)	Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
1	н	3												Ν	E S	Modify second part to: "Per OSP-53, Emergency and Transient Response Support Procedure, the crew should verify E12-F042A, RHR PUMP A LPCI INJECT ISOL VALVE, opens when RPV pressure decreases below(2) psig (MAXIMUM)." [RBS 5/9/2018: Modified second part.] [NRC OK]
2	Н	2												Μ	S	Add to explanation for D that D would be correct if RHR HX bypass valve was open and outlet valve closed. [RBS 5/9/2018: Added statement to explanation D.] [NRC OK]
3	F	2												N	S	[NRC OK]
4	F	2												N	S	[NRC OK]
5	Н	3				Х								М	Ē	This counts as a modified question.

Instructions

[Refer to Section D of ES-401 and Appendix B for additional information regarding each of the following concepts.]

1. Enter the level of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level.

2. Enter the level of difficulty (LOD) of each question using a 1 B 5 (easy B difficult) rating scale (questions in the 2 B 4 range are acceptable).

3. Check the appropriate box if a psychometric flaw is identified:

\$ The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).

\$ The stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc).

\$ The answer choices are a collection of unrelated true/false statements.

\$ The distractors are not credible; single implausible distractors should be repaired, more than one is unacceptable.

\$ One or more distractors is (are) partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by stem).

4. Check the appropriate box if a job content error is identified:

\$ The question is not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational in content).

S The question requires the recall of knowledge that is too specific for the closed reference test mode (i.e., it is not required to be known from memory).

S The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).

\$ The question requires reverse logic or application compared to the job requirements.

5. <u>Check questions that are sampled</u> for conformance with the approved K/A and those that are designated SRO-only (K/A and license level mismatches are unacceptable).

6. Enter question source: (B)ank, (M)odified, or (N)ew. Check that (M)odified questions meet criteria of ES-401 Section D.2.f.

7. Based on the reviewer=s judgment, is the question as written (U)nsatisfactory (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?

8. At a minimum, explain any AU@ ratings (e.g., how the Appendix B psychometric attributes are not being met).

0#	1.	2.	3	. Psyc	homet	tric Flaw	/S	4.	Job Con	tent Fl	aws	5. C	Other	6.	7.	8.
Q#	(F/H)	(1-5)	Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation
															S	Distractor D doesn't seem credible for a safety related HPCS pump with its own dedicated DG and SWGR to require manual local UV relay reset in order to manually start from control room on DBA. Replace with "Starts in 2 seconds" which is the timed sequenced start for LPCS pump, and then remove "ONLY" from Distractor C. [RBS 5/9/2018: Labeled as modified question. Removed distractor D and added distractor "starts in 2 seconds." Removed ONLY from C." RBS 6/3/2018: Changed distractor D] [NRC: Edit the distractors as follows: A. Automatically starts immediately B. Automatically starts on a 30-second delay C. OK AS IS D. Automatically starts on a 2-second delay. [RBS 7/11: Changed distractor A, B, and D.] [NRC OK]
6	н	3												В	S	Add ", per EOP-1, RPV Control" to last question in stem. Replace "leak" with "rupture" in stem, due to size. [RBS: Added reference to stem and replaced leak with rupture.] [NRC OK]
7	Н	3												N	S	Specify " and SLC Pump B will start" in Distractor A. Good practice, adding pictures of observed indications to stem of question. Improves comprehension and operational validity. [RBS 5/9/2018: Specified SLC Pump B will start in distractor A.] [NRC OK]

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8	F	3	x								N	E S	Stem says blown fuse is F15E but Figure 7 shows fuse F18E circled as blown. Deconflict. [RBS 5/9/2018: Corrected stem to 18E.] [NRC OK]
9	Н	3									Z	S	Stem: "Which RPS divisions AT A MINIMUM must be manually actuated to achieve a full RPS scram?" Distractor B "Both RPS DIV 1 AND 3" would be more balanced. [RBS 5/9/2018: Re-worded stem and changed distractor B to be more balanced.] [NRC: Edit stem: "Which RPS division(s)"] [RBS 7/11: Edited stem.] [NRC OK]
10	F	2									В	S	NRC DEC 2010 Q35 Add question # for bank NRC questions. [RBS 5/9/2018: Add question numbers for all bank NRC questions.] [NRC OK]
11	F	2				x					в	E S	NRC 2015 GGNS Answers need cleaned up. Distractor A: Same Distractor B: "Fully withdrawn from the core when all IRMs are > 5 on Range 1." Answer C: "Incrementally withdrawn from the core maintaining 10^3 to 10^5 cps." Distractor D: "Fully withdrawn from the core when the first IRM is on Range 2." [RBS 5/9/2018: Cleaned up distractors B, C, and D.] [NRC OK]
12	н	2									N	S	Stem: "Subsequently, a malfunction of APRM A results in the indications shown." [RBS 5/29/2018: Revised stem to "Subsequently, a malfunction of APRM A results in the indications shown."] [NRC OK]
13	F	2	x								N	E	Part (1) – replace with 2 alternating VAC and VDC bus designators. [RBS 6/3/2018: – Replaced 120 VAC and 125 VDC with 2 alternating VAC and VDC bus designators] [NRC: Change C and D to "RPS BUS A and RPS BUS B" In distractor explanation, add the following quote from the RPS STM to clarify that RPS buses supply more loads than just RPS trip system: "In addition to supplying the RPS Trip Systems, the RPS buses supply power to the Nuclear Steam Supply Shutoff System, the Neutron Monitoring System, and the two Process Radiation Monitoring System Main Steam Line Monitor channels."]

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													[RBS 7/11: Changed distractors C and D. Also added information to explanation from STM.] [NRC: Put the above referenced quote in the distracter explanation, not the answer explanation] [RBS 7/11: Moved reference quote to distracter explanation.] [NRC OK] Center the (1) and (2) above the columns.
14		3									N	S	[RBS 5/29/2018: Centered the (1) and (2) above the columns.] [NRC OK]
15	н	3	x			x					В	ES	 NRC DEC 2014 Q43 Split up stem: The plant is in Mode #. I&C is performing STP-058-4201, Containment and Drywell Manual Isolation Actuation LSFT. The Reactor Operator arms and depresses the "A" CRVICS pushbutton on H13-P680, while I&C continues with verifications per the STP. Prior to the isolation signal being reset, the "D" CRVICS pushbutton is [mistakenly?] armed and depressed. Which of the following is the status of the MSIVs and Containment Isolation Valves? Replace Distractor C with "Only the MSIVs are closed." [RBS 6/5/2018: Replaced Distractor C with "ONLY the MSIVs are CLOSED." Split up stem as specified, used modifier "inadvertently" for "mistakenly".]
16	F	3	x								N	ES	Clarify stem: " to prevent entering technical specification 3.6.2.1, Suppression Pool Average Temperature." Is there an administrative temperature limit less than 100F that can be used in lieu of distractor D, 120F? Temp required for implementing SP cooling? [RBS 6/03/2018: Revised distractors to delete 120°F. Used the limit for containment air temperature which is 95° as a plausible distractor for A. Revised explanations to support the question revision. Revised stem to include referenced TS] [NRC: Distractor explanations B and C should read C and D] [RBS 7/11: Labeled explanations C and D.] [NRC OK]
17	F	3	x	x						х	N B	⊎ s	When you submit final exam, delete all the internal revision statements at the top. Include any NRC-DIRECTED or self-imposed revisions that occur AFTER the receipt of these draft written exam comments, on THIS form.

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													Is the excerpt from EOP-1A necessary? Seems like little value added. Block out 51 inches as well.
													Specify in explanation exactly what the band should be.
													This seems like an SRO-only question, as it tests knowledge of bases for actions in the EOP.
													[RBS 6/03/2018: Specified in explanation the band should be . Added in explanation
													Excerpt from EOP-1A necessary because Blocked out 51 inches.]
													[NRC:
													Part (1) distractors: Per the given explanation, the nominal band of -60 to -140 would in fact prevent LPCS and RHR from initiating. I believe that makes C and D implicitly true, even if not the given basis.
													It's still not clear to me if the allowed band is -160 to -140 or -60 to -187. Seems from explanation that -187 is the lowest allowed.
													On further review this seems to me to be a K/A mismatch the K/A is supposed to test the relationship between Reactor Water Level Control system and Feedwater, which I take to be normal reactor feedwater. Under the conditions of this question, feedwater has been isolated PER RLA-13 – only injection sources are boron, CRD and RCIC. I'd like this question to be replaced, if another K/A needs to be sampled use K/A 259002 K5.03 Water level measurement (3.1)] [RBS 7/11: New question written for new K/A.] [NRC OK – ensure final outline is updated] [RBS 7/12: Updated outline and rejected K/A form.]
18	н	3									В	S	NRC DEC 2014 Q46 [NRC OK]
19	н	3				x					N	E S	It would be more discriminatory to edit the stem to say " the Normal xfmr supply breaker(1) be closed locally ", in which case the correct answer would be B. [RBS 5/28/2018: edited the stem to say " the Normal xfmr supply breaker (1) be closed locally ", and revised the correct answer as B. Revised explanation to support the change in the stem and a correct answer of B] [NRC OK]
20	н	3									В	S	NRC DEC 2014 Q47 Shift (1) and (2) in-line with the answers. [RBS 5/28/2018: Shifted (1) and (2) in-line with the answers.] [NRC OK]

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21	F	2									В	S	NRC MAR 2014 Q47 "This condition will be <u>indicated</u> by " [RBS 5/28/2018: Revised stem to "This condition will be indicated by "] [NRC OK]
22	Н	3									Ν	S	[NRC OK]
23	F	2									Ν	S	[NRC OK]
24	F	3				х					N	E S	Make the distractors equal to the setpoint. B = 104 PSIG, C = 113 PSIG, D = 450F [RBS 5/28/2018: Made the distractors equal to the setpoint. B = 104 PSIG, C = 113 PSIG, D = 450F [NRC OK]
25	н	2	x								В	E S	NRC APR 2010 Q53 "In accordance with <u>the associated</u> alarm response procedure, what action <u>should</u> be taken" [RBS 5/28/2018: Revised (2) to read "In accordance with "the associated" alarm response procedure, what action "should" be taken?" [NRC OK]
26	F	3	X			X					Ν	ES	 NRC-provided "510000 Service Water" is a new system added to ES-401-1 in NUREG 1021 Rev 11, with the intent that it will be used when NUREG 1123 Rev 3 K/A catalog is used to draw samples. NUREG 1123 Rev 3 is not yet approved for use; however, ES-401-1 also states that: "Operationally important, site-specific systems/evolutions that are not included on the outline should be added." So, If the station confirms that it believes Service Water is an operationally-important system, the question can appropriately remain as is. If not, request a new system from NRC. Question K/A statement says "CCWS" and "CCW Pressure" but this should say "Service Water" instead. ES-401-1 draft written outline needs to be edited to say service water as well. For consistency, Edit first question to read (1) When the Normal Service Water (NSW) pump has auto-tripped, which light is flashing? Make part (2) low discharge pressure 97 psig. Add a value for low suction pressure trip setpoint to part (2) distractors for consistency, as long as it doesn't cue another question's answer. [RBS 5/28/2018:

ES-4	01		R	B-20)18-0)7				7	7		Form ES-401-9
													Revised K/A to "Service Water" and "Service Water Pressure" instead of "CCWS" and "CCW Pressure" Edited first question to read (1) When the Normal Service Water (NSW) pump has auto-tripped, which light is flashing? Included in part (2) distractors A&B low discharge pressure setpoint 97 psig. Added a value for low suction pressure trip setpoint of 5 psig to part (2) distractors C&D for consistency, Verified that it did not cue another question's answer
													Updated explanation with additional info for suction pressure trip setpoint and characteristics. Updated question references by highlighting info regarding suction pressure trip setpoint and characteristics. Corrected ES-401-1 as needed.] [NRC: For the reason described above, station needs to confirm in writing that service water is an operationally important system in order to use this K/A. Can confirm this in the question explanation or K/A block.] [RBS 7/11: Added safety significance explanation in K/A block to justify use of K/A.] [NRC OK]
27	Н	3									Ν	S	Clarify in explanation why the rod does not settle at 00 after continuous insert to full- in, and the significance of that indication [RBS 5/28/2018: Clarified in explanation why the rod does not settle at 00 after continuous insert to full-in, and the significance of that indication the following: The differential pressure on the CRDM drive piston is created because the scram outlet valve vents the CRDM above piston area to the scram discharge volume which is at atmospheric pressure and the below piston area is supplied by reactor pressure through the scram ports located on the CRDM flange. (See Rod Drift Alarm) Since the scram discharge volume vent and drain valves remain open (since no scram signal is present), the scram discharge volume remains at atmospheric pressure. Since the differential pressure across the CRDM drive piston (causing the control rod to drift in) remains constant, the control rod to remain beyond the full in position. Therefore, when the continuous insert signal is removed, the control rod does not settle at the 00 position.] [NRC OK]
28	н	3									Ν	S	Modify stem to: "Which of the following instrument failures would cause an increase in the allowable notches per rod withdrawal?" [RBS 5/29/2018: Modified stem to: "Which of the following instrument failures would cause an increase in the allowable notches per rod withdrawal?"] [NRC OK]

ES-4	01		R	RB-20)18-0)7				3	3		Form ES-401-9
29	F	3		l							N	S	INRC OK1
30	F	3									N	S	Swap (1) and (2) in stem. Edit to "Which Technical Specification LCO is no longer satisfied?" [RBS 5/26/2018: Swapped (1) and (2) in stem. Edited to "Which Technical Specification LCO is no longer satisfied?"] [NRC OK]
31	F	2									В	S	NRC MAR 2014 Q59 [NRC OK]
32	Н	3				x					В	Ų S	Distractors B and D are weak links to a Control Rod Withdrawal Block. [RBS 5/26/2018: replaced distractors B and D with plausible control rod withdrawal block distractors [NRC OK]
33	Н	3									Ν	S	[NRC OK]
34	Н	2									Ν	S	[NRC OK]
35	Н	4									Ν	S	Modify stem to, " the main generator motoring time limit is(1)" [RBS 5/26/2018: Modified stem to, " the main generator motoring time limit is (1)"] [NRC OK]
36	F	2									N	S	Distractor C, capitalize AND [RBS 5/26/2018: Distractor C, capitalized AND] [NRC OK]
37	н	2	x								Ν	S	Modify stem: "What is current RPV level setpoint, approximately?" Makes distractors more plausible since the answer is the only one right on the value. [RBS 5/26/2018: Modified stem: "What is current RPV level setpoint, approximately?"] [NRC OK]
38	F	3							x		Ν	Ų S	Not clear how this question meets the K/A of "knowledge of parameters used to assess the status of safety functions" What safety function is being tested on? [RBS 6/6/2018: Provided additional information in the K/A match section of the question of the relationship between Plant Ventilation Systems, Standby Gas Treatment System, Reactor Building Annulus Ventilation, and the Radioactive Release Safety Function [NRC OK]
39	Н	4									Ν	S	[NRC OK]

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40	н	3		l							В	S	Should stem say "STX-XNS1B and 1RTX-XSR1 <u>F</u> (not pictured)" instead of 1RTX-XSR1 <u>D</u> ? [RBS 6/3/2018: corrected label nomenclature in the stem 1RTX-XSR1D to 1RTX-XSR1F.] [NRC OK]
41	F	2				x			x		N	₽ S	This question as-written is basically testing on applicant knowledge of the loads on E12A-PS1. Also the correct answer seems too obvious. Question would be better fit by testing on applicant knowledge of step 5.9, "Prior to re-energizing any bus, verify that all loads fed from the bus are de-energized and isolated." Test on whether all loads must be stripped before re-energizing, only some loads stripped e.g. motors, others left as-is, etc [RBS 6/3/2018: Revised question to test knowledge of step 5.9 of AOP 14 to verify that all loads fed from the bus are deenergized and isolated. Distractors are different combinations of load types.] [NRC: Edit stem to " which loads must be deenergized/isolated"] [RBS 7/11: Changed stem to "must be."]
42	н	3									N	S	Should distractor C say "manually shifted" for consistency with D? [RBS 6/3/2018: Revised distractor C to "manually shifted" for consistency with D] [NRC OK]
43	F	2				1				1	В	S	[NRC OK]
44	Н	3									N	S	[NRC OK]
45	н	2									В	S	NRC MAR 2014 Q7 [NRC OK]
46	Н	2	x						x		N	U S	Per NUREG 1021, a negatively phrased question ("would NOT be expected") is discouraged in most cases. Additionally this isn't really testing on the K/A of knowledge of annunciators, it's testing on system knowledge of the FWRVs. [RBS 6/5/2018: Added to the explanation how the question supports the K/A and justification in this case for use of a negatively phrased question [RBS 6/26/2018: [NRC: Modify B to " start drifting closed"] [RBS 7/12: Changed B to "start drifting closed."] [NRC: Eliminate the "will" from "MSIVs will-start drifting closed"] [RBS 7/13: Eliminated "will" from distracter B.] [NRC OK]
47	н	3	x								В	⊑ S	NRC 2003 Q73 Handout Provided Edit the format of the stem. List the 4 options as 1, 2, 3, 4. Make answer choices

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													A. 1 ONLY. B. 1 or 2 ONLY C. 1, 2, OR 3 ONLY D. 1, 2, 3, OR 4 Still counts as bank because only the format is changed . [RBS 6/4/2018: Edited the format of the stem. List the 4 options as 1, 2, 3, 4. Made answer choices to support the change in the format of the stem. [NRC OK]
48	н	3									В	S	NRC DEC 2014 Q9 ([RBS 6/6/2018: Changed Dec 2010 to Dec 2014] [NRC OK]
49	F	3									В	S	NRC MAR 2014 Q11 [NRC OK]
50	F	2									Ν	S	[NRC OK]
51	н	2	x			X					Ν	₩ s	Recorder images should be enlarged for clarity. Add ", minimum" to each of the answers in part (1). Is there a plausible basis for 95F as a distractor? Administrative limit? Add (1) and (2) to the front of the question, not end. Provide Op Aid for review. Should not the operator in fact perform sequential SRV operation, since the stem says SRV being cycled for RX pressure control? If so, not a good distractor [RBS 6/5/2018: Cropped and enlarged recorder images for clarity Added ", minimum" to each of the answers in part (1) Added basis for plausibility for 95F to explanation Relocated (1) and (2) to the front of the question. Revised stem to indicate that sustained opening of SRV D was performed vice "cycled" because of the resulting supp pool heat up. Also, as well SRV D would not be cycled; SRV's would be opened sequentially. Added the following to the explanation for why sequential SRV operation is a plausible discriminating distractor:

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52	н	2	x								Ν	E S	Seems odd to ask for procedure transition requirement for a point in time several minutes in the past. Why not just provide the desired temperature for the question at the current point in time? [RBS 6/5/2018: Deleted Point 1 from picture and deleted reference to Point 1 in the stem. [NRC: sentence for part (1) is incomplete (indications at ? Don't wrap text next to image. Just put text underneath image. There is an inadvertent choice E. The given values for Containment temp are way beyond the 90F EOP-2 entry condition, so as to make C and D implausible. The intent of the original feedback was that you would capture a new chart recorder image with the current values of containment temp equal to was what originally point 1.] [RBS 7/11: removed the wrap text feature and removed "at" in the stem. Removed choice E. Inserted new picture to indicate containment temperature of 98.3 deg F.] [NRC OK]
53	F	1				x					Ν	U S	LOD =1, common test-taking sense that the lowest SP level provided will be one that will directly pressurize the containment air space, even if the exact level is a higher choice. Rephrase question to a version that makes one of the distractors or a new answer the correct choice. [RBS 6/4/2018: Changed A to 12'3" and moved other values down and deleted 21'6"With the revised distractors,[NRC: " <u>at</u> which of the following"] [RBS 7/11: Added "at" to the stem.] [NRC OK]
54	F	2									В	S	NRC MAR 2014 Q16 Add, "Per USAR Section 6.3, the reason " to the stem. [RBS 5/29/2018: Added, "Per USAR Section 6.3, the reason " to the stem. [NRC OK]
55	н	2				x					Ν	Ē	Raising reactor pressure does not seem a plausible distractor under these conditions [RBS 6/4/2018: Deleted raising or lowering reactor pressure from the distractors. Replaced with distractors for whether or not SLC is there is not injecting. Added trends with the given parameters and high drywell pressure to meet Table L-5 conditions. Added details to the explanation to support changes in the stem. [NRC: With RPV level = -95", it does not seem plausible that applicant believes that the lower limit of -140" is being challenged that would result in ECCS initiation, and that level should therefore be raised.

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													Consider changing (2) to "maintained" vice raised – confirm that this is explicitly wrong. Add (1) and (2) above answer columns] [RBS 7/11: Changed (2) to "maintained" and added numbers above column. Also added to the explanation justification for maintained.] [NRC OK]
56	н	3									В	S	NRC 2008 Q18 [NRC OK]
57	F	2									В	S	"A pre-action sprinkler system is comprised of" a network of a set of [RBS 5/29/2018: Revised stem to "A pre-action sprinkler system is comprised of" Added "a" network (A&B) and "a" set(C&D) [NRC OK]
58	Н	3	x								В	E S	NRC DEC 2014 Q20 Add "while paralleled to the grid" after "Generator" to clarify that C is incorrect. C: in-plant motors [RBS 5/26/2018: Added "while paralleled to the grid" after "Generator" to clarify that C is incorrect. Revised C to "in-plant motors". Lowercased A,B,&D.] [NRC OK]
59	н	3									Ν	E S	Would any or all of the distractors cause an initial rise in reactor water level to the high level setpoint, due to initial swell (A and C) or positive feed flow mismatch? Which would make multiple correct answers at that point in time, before stabilization? [RBS 6/4/2018: Changed the stem to indicate that the high water level alarm (which is received at 38 inches) is sealed in. Therefore, distractors A, B, and C would be incorrect because they would not result in a steady-state reactor level 5 inches above the automatic level setpoint. Only the feed flow instrument failure would result in a 5 inch steady-state level rise. [NRC OK]
60	н	2	x			x					N	₽ S	Remove extra "Due to". Evaluate placing the horizontal red setpoint higher out of the green band, at 37 or 38, to make high RPV water level distractor more plausible. [RBS 6/4/2018: Removed extra "Due to". The horizontal red setpoint is a stationary red line across the plastic cover and cannot be adjusted] [NRC OK]

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61	F	1					x				N	U S	Non-discriminatory, the crew will always want to know where the source of the leak is eventually. Also A B or C could all be justifiable reasons for why the CRS would ask the crew to identify the source of the leak, regardless of whether it's directed in the procedure or not. Very appealable [RBS 6/5/2018: NRC assigned a new KA for this question. Replaced question to support the new KA. (KA 295010 AK3.01)] [RBS 6/26/2018: [NRC OK]
62	Н	2					x				N	₽ S	B and C are both good practices anyway and could be considered partially true. Consider something else related to Thermal Hydraulic Instability [RBS 6/6/2018: Revised stem to say "What is the first operator action" to distinguish it as the only correct answer. Replaced distractor C with a distractor based on a supplemental action from AOP-24 Thermal Hydraulic Stability Controls which is discriminating for an applicant believes the indications are the onset of thermal hydraulic instability. Deleted the "if- then" format from distractor D. Paraphrased the answer so does not sound like a cut- and-paste out of a procedure and was consistent with the format of the other distractors.] [RBS 6/26/2018: [NRC OK]
63	Н	2									N	S	[NRC OK]
64	Н	2				x					Ν	E S	Part 1 non-discriminatory, A&B non-credible. The given justification for why entering EOP-1 is plausible is that EOP-3 contains direction in steps SC-13/-14 to enter EOP- 1. Possible edits could be adding additional plant parameters to make EOP-1 AND EOP-3 a consideration, or adding an AOP as a distractor. [RBS 5/27/2018: Revised Part 1 to delete reference to EOP-1. Added AOP as a distractor. AOP added is AOP-3 AUTOMATIC ISOLATIONS. This is a credible distractor since the automatic actions of SGT initiation results in an entry condition to this AOP. Also, revised Part 2 distractors B&D to "Standby Gas Treatment System auto initiates" (previously stated SGT fan A starts). The high radiation condition does cause SGT fan A to start; however, additionally dampers realign and due to a low flow condition (described in the alarm response procedure) SGT fan B also starts. The phrase "Standby Gas Treatment System auto initiates" encompasses the damper realignment and both SGT fans starting. "Standby Gas Treatment System auto initiates" is a cut-and-paste of the auto response given in AOP-3. Revised the explanation to incorporate AOP-3 as a credible discriminatory distractor. With the question revision, the applicant now needs to determine whether the given condition is an EOP-3 entry condition and the correct automatic response to that condition. Added AOP-3 excerpt as a reference to support the revised question.] [NRC OK]

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65	н	3	x								Ν	S	C and D "The Drywell" EDIT stem to: "Per the EOP-2 bases, prior to operating the drywell hydrogen mixing system, RPC pressure must be below the(2) to ensure that any RPV blowdown bypassing " [RBS 5/27/2018:Revised C and D to "The Drywell Edited stem to: "Per the EOP-2 bases, prior to operating the drywell hydrogen mixing system, RPV pressure must be below the(2) to ensure that any RPV blowdown bypassing"] [NRC OK]
66	F	2									В	S	What is the bank source? [RBS 5/27/2018: Added the bank source as "#335 GGNS 2011 NRC Exam Q31] [NRC OK]
67	F	2				x					В	ÆS	Distractor D does not apply to RBS. Distractor A is a gray area because if an operator stood 40 hours of instruction every quarter, he could be argued to be maintaining proficiency if he was also meeting the tour requirement. Make part (1) FIVE 12-hour watches vs SEVEN 12-hour watches, and make part (2) test on the eligible watchstations for maintaining proficiency. BOP and ATC only, vs BOP, ATC, or Work Control RO (some non-control board position filled by an RO at RBS but not creditable for proficiency) [RBS 6/5/2018: Made part (1) FIVE 12-hour watches vs SEVEN 12-hour watches, and made part (2) test on the eligible watchstations for maintaining proficiency. BOP or ATC only, vs BOP or ATC or Work Control] [Does RBS require ROs to stand in BOTH ATC AND BOP positions in a quarter, or can an RO maintain proficiency if standing exclusively ATC or exclusively BOP? If latter, change A and C to "ATC or BOP ONLY"] [RBS 7/11: There is no procedural guidance on standing both ATC or BOP. Changed A and C part (2) to ATC or BOP ONLY.] [NRC OK]
68	F	2	x								Ν	Ē	 Part 1 as written is borderline GFES. Edit stem to "While at 100% power, an unexpected feedwater heater string isolation has occurred." (1) What effect will this change have on reactivity? (2) Per AOP-0007, Loss of Feedwater Heating, which of the following is a potential challenge from this malfunction? [RBS 5/27/2018: Edited stem to "While at 100% power, an unexpected feedwater heater string isolation has occurred." Edit Part 2 to "Per AOP-0007, Loss of Feedwater Heating, which of the following is a potential challenge from this malfunction? [RBS 5/27/2018: Edited stem to "While at 100% power, an unexpected feedwater heater string isolation has occurred." Edit Part 2 to "Per AOP-0007, Loss of Feedwater Heating, which of the following is a potential challenge from this malfunction?"] [NRC: Eliminate extra space between answers C and D.]

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														[RBS 7/11: Removed extra space between C and D.] [NRC OK]
69	F	1		×		x						В	E S	NRC APR 2010 Q94 The stem doesn't give information that would make the applicant think that a plant modification or troubleshooting was in progress, or that A or B were plausible. Limited credibility for the applicants to pick anything other than correct answer. [RBS 6/5/2018: Modified the stem to characterize the TS surveillance as a maintenance activity requiring special instructions to add plausibility to distractors A, B, and D] [NRC: ok]
70	F	1				x	x					В	E S	NRC 2008 Q71 "on-shift" Low discriminatory value, partially correct answers. Is it not expected that any time an LCO is not satisfied / TS action statement entered that an entry is made in the control room log? It is a good practice. While not efficient, an operator could scroll back though the log history to determine active LCOs. Also cueing, the answer A is the only choice with the term LCO Tracking for a question asking about listing LCOs [RBS 6/6/2018:Revised answer to ESOMS instead of ESOMS LCO Tracking module to avoid cueing answer. Replaced distractor D Equipment Out Of Service (EOOS) Monitor to improve plausibility/discrimination.] [NRC: OK]
71	F	2										В	S	NRC 2008 Q72 [NRC: OK]
72	н	3	x							×		В	E S	 NRC 2010 Q72 NUREG 1021 discourages negatively-phrased questions in most cases. Also NUREG 1021 directs that Tier 3 questions should be generic, and not require detailed system knowledge to answer. This question appears to require substantive system knowledge of the distractors. [RBS 5/27/2018: The question originally required detailed procedural knowledge to know which activities would require notification of Radiation Protection personnel. Revised the question to require applicant to recognize which normal evolutions result in an increase in area radiation levels. Although the question requires the applicant to have substantive familiarity with system evolutions, it supports the KA because the applicant needs to recognize that 3 of the 4 distractors do cause an increase in area radiation levels. The question was written as a negatively phrased question because in order to construct a test item with 3 plausible discriminating activities that DO NOT cause an increase in area radiation to have an in-depth knowledge of component internals characteristics such as pump seals. heat

ES-	401		R	(B-20	18-0	17				1	6		Form ES-401-9
ES-	401		R	<u>B-20</u>	18-0	7					6		 Form ES-401-9 exchangers and interfacing system pressures. Therefore, it was written as a negatively phrased question because the answer, swapping RWCU pumps, is a plausible evolution an applicant may incorrectly conclude would cause area radiation levels to rise since RWCU does interface with radioactive systems. The A & D distractors are plausible if the applicant does not recognize the impact of hydrogen water chemistry on area radiation levels when operating RCIC at power and starting up the HWC system. Distractor C is plausible if the applicant does not recognize the high radiation levels associated with demineralizer resin and the transfer route to the rad waste phase separators Added justification for negatively phrase question to explanation J [NRC: In general, the correct answer should support the K/A. By constructing this as a negatively-phrased question, the correct answer is the only one that doesn't support the K/A, i.e. there is no radiation or contamination hazard associated with the activity. Rephrase the question to "Which of the following evolutions would cause significant changes in local area levels," keep B the same as a distractor, keep D as the new correct answer, and replace A and C with distractor evolutions that do not cause significant changes in rad levels.] [RBS 7/12: Removed "not" statement from stem. Changed two distractors and rearranged distractors to be balanced.] [NRC 7/12 – Replace Distractor A. Doesn't fit with the other distractors as it's not an "evolution" it's a malfunction, and as it doesn't seem that the impact on local area radiation levels inside an unoccupied containment at power is a primary concern with a drifting rod. Delete discussion about negatively phrased question in Distractor explanation area it's no longer relevant.]
73	F	2	X								В	ES	explanation.] [NRC OK] Answer B doesn't seem to convey the intent of the answer as-written I believe the intent of the answer is: B: Yes, because while event-specific AOPs may be performed in conjunction with EOPs, EOP actions are prioritized over AOP actions if the objectives conflict. C: No, because due to the event-specific nature of AOPs, AOP actions are prioritized over EOP actions if the objectives conflict, [RBS 5/27/2018: Edited distractors B&C per the above. Also revised explanation by adding: The Area Sump pump control switches would be returned to automatic operation in accordance with the EOPs since "EOP actions are prioritized over AOP actions if the objectives conflict." This hierarchy between EOP's and AOP's is described in the Plant Specific Technical Guidelines (PSTG) as follows:]

ES-4	01		F	RB-20)18-0)7				17		Form ES-401-9
												[NRC: In explanation, cite the reference which contains the explicit quote "EOP actions are prioritized over AOP actions if the objectives conflict."
												Modify A to, "Yes, because chronologically, the EOP action occurred most recently; the most recent chronological action takes precedent when event- specific AOPs are performed in conjunction with EOPs." Modify D to, "No, because chronologically, the AOP action occurred first; the first chronological action takes precedent when event-specific AOPs are performed in conjunction with EOPs." [RBS 7/12: Modified answer A and D. Added to correct answer explanation the requirement from EOP-3, Step SC-9, Isolate all systems discharging in to the area except systems required for damage control and systems required to be operated by EOPs."] [NRC: OK]
												A appears to be true based on highlighted reference, or near enough to true., based on diluting the reactor after boration.
												Clarify / reference the actual step being referred to in stem
												Clarify in explanations what the actual step says not just step number.
												[RBS 5/27/2018: Referenced the actual step being referred to in stem by adding: "During an ATWS, EOP-1A RPV CONTROL ATWS, Step RCA-3 states "Inhibit ADS" to prevent automatic initiation ADS is inhibited to prevent which one of the following?
												Revised distractor A from "boron losses" to "cooldown" revise all of the distractors to be consistent by putting the format of "adverse condition and consequence" (as a result of not inhibiting ADS)]
											F	Added details to the explanation for where the information in distractor A is derived from and why distractor A is wrong.
74	F	2	Х				Х			В	S	Added details to distractor B to document that voiding is a not a precursor neutron flux oscillation.]
												[NRC: The justification for why A is incorrect appears far too nuanced to justify this as an incorrect answer. I don't believe this would hold up as an incorrect answer if appealed – replace distractor A or replace question. If a new KA is needed use KA 2.4.3, Ability to identify post-accident instrumentation. (CFR: 41.6 / 45.4) IMPORTANCE RO 3.7]
												[RBS 7/12: Replaced distractor A and associated explanation.]
												[NRC 7/12: This is the same distractor A as provided in previous Revs. Wrong file?]
												[RBS 7/13: Correct revision updated.]
												[NRC 7/13: Rephrase A to "Erratic indications on Wide Range Reactor Level due to rapid depressurization, which would interfere with effective level power control."
												[RBS 7/13: Rephrased A.]
									_			

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75 H 3		N S	Distractor C explanation doesn't match the distractor [RBS 5/27/2018: Corrected distractor C explanation to the match the distractor. Added additional information to the other distractor explanations to explain the basis of the distractor and support the plausibility of each.] [NRC: OK]
76 Н 3		X B S	 Handout This is not new, it is bank question NRC April 2010 exam, question 82. Give A discreet value for CST level in stem. Partial KA mismatch. Not testing using procedures to correct, control or mitigate the consequences of low Suppression pool level. I think having both suppression pool and CST levels being 13 feet would enhance the question. [RBS 5/25/2018: Changed CST and Suppression pool level to 13 feet. Reclassified as bank NRC April 2010 exam, question 82] [NRC: As originally stated, this is a partial KA mismatch; the question is not using procedures to correct, control, or mitigate the consequences of Low suppression pool level on LPCS] [RBS 7/12: Added (3) to stem and answers to require applicant to determine tech spec completion time for associated action to mitigate the plant conditions.] [NRC: Having 3 choices is a poor psychometric arrangement, and creates the situation where you don't need to know the answer to all three parts to answer the question, and should be avoided. Consider alternating to a two part question as follows: What is the impact on the operability of HPCS and LPCS? This condition requires a 10 CFR 50.72 Non-Emergency report to the NRC within no later than: Both HPCS and LPCS are INOPERABLE / 8 hours HPCS is INOPERABLE and LPCS is INOPERABLE / 4 hours HPCS is INOPERABLE and LPCS is OPERABLE / 4 hours BOTH HPCS and LPCS are INOPERABLE / 4 hours BOTH HPCS and LPCS are INOPERABLE / 4 hours BOTH HPCS and LPCS are INOPERABLE / 4 hours BOTH HPCS and LPCS are INOPERABLE / 4 hours BOTH HPCS and LPCS are INOPERABLE / 4 hours BOTH HPCS and LPCS are INOPERABLE / 4 hours BOTH HPCS and LPCS are INOPERABLE / 4 hours

ES-4	01		F	RB-20)18-0)7				1	9		Form ES-401-9
													Please validate. [RBS 7/13: Part (1) revised to require application of (2). Part (2) is left as the tech spec time requirement. The SROs would not be expected to make the reporting determination from memory and the reference needed to be provided would be the 10CFR50.72 procedure. Similar to A9. I would like to just give Tech Spec 3.5.2 with above the line information grayed out.] [NRC 7/13: Question says only 3.5.2 is a handout but handout packet includes 3.5.1 as well. Applicability states that 3.5.2 is applicable in MODE 5 except with the upper containment fuel pool gate opened and water level > 23 ft over the top of RPV flange. Do stem conditions give enough to tell applicability of 3.5.2? See separately provided edit. [RBS 7/13: Revised question to only include LPCS in answers. Also changed stem to say in mode 4 with an outage in progress.]
77	н	3					x				Ν	U S	Pre-review. This question has too much of an appeal risk. Despite the stated station expectation that HPCS DG is not started due to unnecessary running unloaded, the fact that step RL-1 says to start EDG which should have initiated but did not gives strong argument for appeal. [RBS 5/25/2018: Changed stem of question to include station blackout and RCIC tagged out for maintenance. This requires the EDG to be manually started and changes correct answer to B.] [RBS 6/26/2018: [NRC: OK]
78	Н	3									М	S	Handout [Do not provide Table 3.8.9-1] Worksheet indicates question modified from the 2010 audit exam. It is also modified from the December 2014 NRC exam (question 41). [RBS 5/25/2018: Added reference to December 2014 NRC exam #41. Table 3.8.9-1 is included in TS bases which will not be part of the student handout .] [NRC: OK]
79	F	3	x				x				Ν	E S	Stem needs clarified. Rephrase to something consistent with: Per Technical Specification Bases 3.8.4, DC Sources – Operating, Applicable Safety Analysis, DC Sources are required to be OPERABLE to satisfy the design basis accident analysis for which events? Confirm that ELAP cannot be considered a subset of a loss of all offsite or onsite AC power, such that B is partially correct.

ES-4	401		F	RB-20	018-0)7				2	0		Form ES-401-9
													[RBS 5/25/2018: Rephrased the stem to provide clarification. Further explained ELAP requirements in explanation.] [NRC: OK]
80	н	3									N	S	Pre-review. [NRC: OK]
81	н	3									В	E S	Stem of question states "emergency depressurization <u>must be completed</u> " The stem should read "emergency depressurization <u>is required</u> " to match the verbiage in the EOP. [RBS 5/25/2018: Changed stem to match verbiage in the EOP.] [NRC: OK]
82	н	3									N	S	Pre-review. [NRC: OK]
83	F	3									Μ	E S	Pre-review. On second review, this is not a new question; it is a Modified bank question from Dec 2010 NRC exam, Q99, which was thrown off the exam on appeal due to no correct answer. Review appeal results for possible conflicts. [RBS 6/9/2018: The original question had more specific plant conditions and required additional actions prior to implementing the enclosure. The current question does not contain specific plant conditions except giving the procedure step requiring implementation of the enclosure. EOP-1 Table L-2 lists the enclosure as a method for injecting into the RPV.] [NRC: OK]
84	н	3	x				x				N	ĘS	Pre-review. Distractor C, explain better why this action will not be performed under the given conditions. Does stem need to clarify that Div 2 DG cannot be manually started, or has mechanically failed? I think it is better to have the Division 2 diesel tagged out instead of failing to start. I am afraid that someone could justify C being an additional correct answer, since it will be done prior to reenergizing the Division 2 switchgear, regardless of the statement in the stem about priority. If the diesel is tagged out, you know it won't be coming back. [RBS 5/25/2018: Changed stem to include division 2 diesel generator tagged out.] [NRC: OK]
85	Н	3									N	S	Pre-review. [NRC: OK]
86	Н	3									Ν	S	Handout

ES-4	101		F	<u>₹B-2(</u>	<u> </u>)7		 	 	 2	.1		Form ES-401-9
													Seems that attachment 1 of EIP-2-1 should also be given as a handout to preclude cueing. Is there anything that can be put into the stem to eliminate the possibility that someone could justify Alert being correct under AA3? [RBS 5/25/2018: Added to stem statement that all other building dose rates are reading normal. Also added Attachment 1 to the list of provided references.] [NRC: OK]
87	F	3					x				Ν	E S	Pre-review. Appears that A and B may both be correct. The justification given in the distractor analysis for vent clearing appears to me to be the reason there is a positive differential pressure (Page B 3.6-137). But the limit of 0.3 to 1.2 (Page B 3.6-168) is for both vent clearing and preventing water from being forced over the weir wall. [RBS 5/25/2018: No change required. Added the following to the explanation; The limit of -0.3 to 1.2 is for both of the listed items; however, the positive D/P limit is to prevent vent clearing during normal operation. The negative D/P limit is to prevent water over the weir wall.] [NRC: OK]
88	н	3									В	S	NRC 2008 Q79 This is not new, it is a bank question from the 2008 NRC exam, question 79. [RBS 5/25/2018: changed question source to bank question.] [NRC: OK]
89	F	3								x	В	E S	Question is not fully meeting the requirement of 10cfr55.43.b(5) to select a procedure or section of a procedure, because that information is being provided in stem. Edit the given stem information to require the applicant to determine that EOP-1A ATWS must be entered, and then determine the level band, or otherwise determine what portion of EOP-1A is applicable under given conditions. [RBS 5/25/2018: Changed stem to state reactor scram has occurred, instead of EOP-1A was entered to require the applicant to select the appropriate procedure.] [NRC: OK]
90	Н	3									N	S	Pre-review. [NRC: OK]
91	F	3								x	N	E S	Replace the word "might." Any of those strategies "might" be employed. Question is not fully meeting the requirement of 10cfr55.43.b(5) to select a procedure or section of a procedure. The given correct answer is more of an overall mitigation strategy, and not a discreet, explicit decision point which is typical of an SRO question. [RBS 5/25/2018: Changed the word "might" to "will."

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ES-401	RB-2018-07	22	ded the following to the explanation: RLA20 is a stop sign and conditions is the properly diagnosed by the SRO to direct further actions of the EOP.] RC: 1 still believe this is just knowledge of general mitigation strategy, not sessment of facility conditions and selection of appropriate procedures" required by 10CFR55.43.b(5). There are no facility conditions given in the in to assess, from which to select the appropriate section of a procedure.] SS 7/12: Each distractor is an assessment of different plant conditions and sociated EOP actions. Each distractor is associated with a different section of EOP and requires the SRO to determine the correct action based on the int conditions. An RO would not have knowledge from memory specific EOP p and actions. SROs are required to know what specific RPV levels are gers for actions. SROs are required to know when a certain RPV level is puired to trigger associated actions. SROs are required to know which tigating strategy is needed and the associated recovery actions for those ategies. I have attached a copy of each EOP decision point or associated to this called out for each distractor.] RC 7/13: It Question as follows and verify B still only correct answer: hich of the following strategies will be employed while carrying out e steps of EOP-1A, RPV Control – ATWS? A. After SRVs are opened for Emergency Depressurization, inject with all available injection sources to restore and maintain RPV level above -162 inches minimum.
		With the	 hich of the following strategies will be employed while carrying out e steps of EOP-1A, RPV Control – ATWS? A. After SRVs are opened for Emergency Depressurization, inject with all available injection sources to restore and maintain RPV level above -162 inches minimum. B. After SRVs are opened for Emergency Depressurization AND when RPV pressure has lowered below MSCP, commence and slowly raise injection into the RPV to restore and maintain RPV level above -187 inches minimum. C. With no injection source available, steam cooling is required; delay emergency depressurization until RPV level drops to -200 inches. D. After injection of cold shutdown boron weight has been verified by a Reactor Operator, Exit EOP-1A, RPV Control ATWS and enter EOP-1, RPV Control.

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1													1
													[RBS 7/13: Answers revised as noted.] [NRC: OK]
92	F	3				x					N	ÆS	The word "steam" in distractor B should be capitalized as it is in distractors C and D. Is it possible to have another distractor that is not main steam line related? All three incorrect answers contain "main steam line." [RBS 6/7/2018: Capitalized The word "steam" in distractor B. Replaced distractor B so that there would not be 3 distractors that contain "main steam" Although C & D both contain "main steam line", one is associated with pressure and other is associated with flow which are mutually exclusive.] [NRC: OK]
93	Н	3									N	S	Pre-review. [NRC: OK]
94	F	2									В	S	Pre-review. [NRC: OK]
95	F	2	x								N	E S	Edit stem: Per FHP-1, CONTROL OF FUEL HANDLING AND REFUELING OPERATIONS: Thehas the authority to omit, bypass, or combine steps as necessary providing it is documented, unless it is specifically stated in the procedure for those steps to be followed step by step as written (for actions that do <u>not</u> affect safety systems, limits or functions). [RBS 6/7/2018: Revised stem to combine two sentences into one.] [NRC: OK]
96	н	3	x								В	E S	NRC 2012 Q96 Suggest simplifying stem to just read, "what is the latest time the surveillance may be completed to comply with Tech Specs?" and use the four distinct times already provided. [RBS 6/7/2018: Revised stem to read, "what is the latest time the surveillance may be completed to comply with Tech Specs?"] [NRC: OK]
97	н	2				x					N	E S	Replace "Equipment Functional" with a subset of OPERABLE from EN-OP-104 "OPERABLE-DNC" [RBS 6/7/2018: Replaced "Equipment Functional" with "OPERABLE-DNC" and updated distractor explanation. [NRC: OK]
98	F	3									В	S	[NRC: OK]
99	F	2					Х				В	E	NRC MAR 2014 Q99

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												S	10CFR50.54(x) with parentheses. "Per 10CFR50.54(x)" I believe C could be argued as a subset of B. i.e., preventing a release rate in excess of federally approved operating limits is protecting public health and safety, which would be an additional correct answer [RBS 6/7/2018: Replaced C with "avoid an unnecessary transient, down power, or shutdown" which describes circumstances that could justify application for a Notice of Enforcement Discretion (NOED). [NRC: OK]
100	F	2				x					N	E S	I believe 1 hour would be a more plausible distractor than 15 minutes between notifications, with basis being 10CFR50.72 NRC notification requirements. [RBS 6/7/2018: Replaced 15 minutes with 1 hour in A & C. [NRC: Update Distracter explanation to explain the 1 hour distractor which replaced 15 minutes.] [RBS 7/12: Updated distractor explanation for 1 hour distractor.] [NRC: OK]

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General Con	nments:							

Last 2 NRC RO Written Exams: 2016-09, 2015-05 Last 2 NRC SRO Written Exams: 2016-09, 2014-12 Last 2 NRC Operating Tests: 2016-09, 2014-12

Bank questions from previous exams should specify the question #.

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Results Table

RO LOK -H	41		Avg RO LOD		2.47	Flaws				10 CFR Distribution			
RO LOK-F	34		AVG SRO LOD		2.8	Stem fo	ocus	23		41.1	18	43.1	1
SRO LOK - H	14		Overall LOD		2.55	Cues		2		41.2	5	43.2	6
SRO LOK - F	11					T/F		0		41.3	4	43.3	1
		%			%	Cred Di	st	19		41.4	7	43.4	1
RO Bank	29	38.67	SRO Bank	8	32	Partial		9		41.5	7	43.5	14
RO Mod	2	2.67	SRO Mod	2	8	job link 0		0		41.6	5	43.6	0
RO New	44	58.67	SRO New	15	60	units 0		0		41.7	14	43.7	2
		%				minutia		0		41.8	7		
Total Bank	37	37				backwa	rd	0		41.9	2		
Total Mod	4	4				KA	_	5		41.10	18		
Total New	59	59				SRO-or	nly	3		41.11	3		
		%			%	LOD =	1	4		41.12	2		
RO Sat	41	54.7	SRO Sat	10	40					41.13	1		
RO Unsat	9	12	SRO Unsat	1	4					41.14	0		
RO Edit	25	33.3	SRO Edit	14	56	Answer Dist (%)							
		%			%	RO-A	22		SRO-A	5			
Total Sat	51	51	Total Unsat	10	10	RO-B	20		SRO-B	9			
Total Edit	39	39				RO-C	15		SRO-C	3			
						RO-D	18		SRO-D	8			

RO References Provided: 1 SRO References Provided: 3