

USNRC REGION III: 2015 EXAM WRITER WORKSHOP

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WRITTEN EXAMINATION QUESTIONS



CREATE AN OUTLINE

Through the feedback process it was found that some Regions provide the Examination Outline and some Regions allow the Facility Licensee to create their own outlines for the examination. Region III may be required to provide the Written Examination Outlines for upcoming examinations.

**DEVELOP THE EXAM OUTLINE
BEFORE YOU BEGIN DEVELOPING
THE EXAM!**



Facility:		Date of Examination:		
Item	Task Description	Initials		
		a	b*	c#
1. W R I T T E N	a. Verify that the outline(s) fit(s) the appropriate model, in accordance with ES-401 or ES-401N.			
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 or ES-401N and whether all K/A categories are appropriately sampled.			
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.			
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.			
2. S I M U L A T O R	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, technical specifications, and major transients.			
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity, and ensure that each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s), and that scenarios will not be repeated on subsequent days.			
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.			
3. W A L K T H R O U G H	a. Verify that the systems walk-through outline meets the criteria specified on Form ES-301-2: (1) the outline(s) contain(s) the required number of control room and in-plant tasks distributed among the safety functions as specified on the form (2) task repetition from the last two NRC examinations is within the limits specified on the form (3) no tasks are duplicated from the applicants' audit test(s) (4) the number of new or modified tasks meets or exceeds the minimums specified on the form (5) the number of alternate path, low-power, emergency, and RCA tasks meet the criteria on the form.			
	b. Verify that the administrative outline meets the criteria specified on Form ES-301-1: (1) the tasks are distributed among the topics as specified on the form (2) at least one task is new or significantly modified (3) no more than one task is repeated from the last two NRC licensing examinations			
	c. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on subsequent days.			
4. G E N E R A L	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam sections.			
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.			
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.			
	d. Check for duplication and overlap among exam sections.			
	e. Check the entire exam for balance of coverage.			
	f. Assess whether the exam fits the appropriate job level (RO or SRO).			
a. Author _____ b. Facility Reviewer (*) _____ c. NRC Chief Examiner (#) _____ d. NRC Supervisor _____		Printed Name/Signature _____ Date _____		
Note: # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required. * Not applicable for NRC-prepared examination outlines.				

Facility: Monticello Nuclear Generating Plant														Date of Exam: 06-12-2015				
Tier	Group	RO K/A Category Points												SRO-Only Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total		
1. Emergency & Abnormal Plant Evolution	1	4	4	3				3	3				3	20	3	4	7	
	2	1	1	1	N/A			2	1	N/A			1	7	1	2	3	
	Tier Totals	5	5	4				5	4				4	27	4	6	10	
2. Plant Systems	1	2	1	2	3	3	3	2	3	2	2	3	26	2	3	5		
	2	1	1	1	1	0	2	1	1	2	1	1	12	0	1	2		
	Tier Totals	3	2	3	4	3	5	3	4	4	3	4	38	3	5	8		
3. Generic Knowledge and Abilities Categories				1		2		3		4		10		1	2	3	4	7
				3		3		2		2				2	2	1	2	
<p>Note: 1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ± 1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.</p> <p>3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.</p> <p>4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.</p> <p>5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.</p> <p>6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.</p> <p>7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.</p> <p>8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.</p> <p>9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.</p>																		

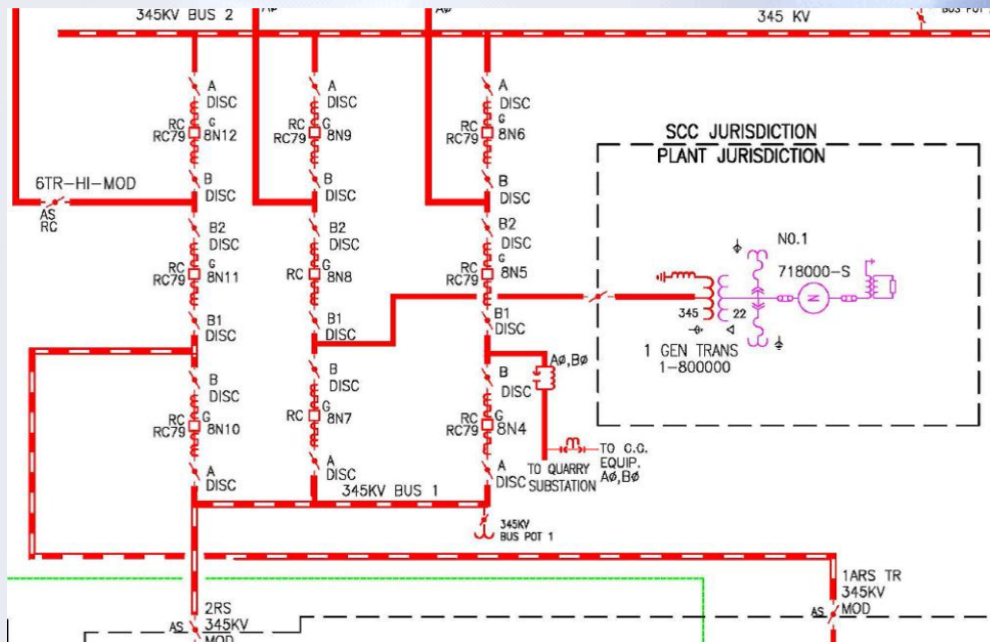
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1		0 2					RO - Knowledge of the interrelations between a reactor trip and the following: Breakers, relays and disconnects.	2.6	1
000008 Pressurizer Vapor Space Accident / 3			0 3				RO - Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: Actions contained in EOP for PZR vapor space accident / LOCA	4.1	2
000009 Small Break LOCA / 3						S	SRO - A2.10: Ability to determine or interpret the following as they apply to a small break LOCA: Airborne activity	3.7	76
000011 Large Break LOCA / 3					0 5		RO - Ability to determine or interpret the following as they apply to a Large Break LOCA: Significance of charging pump operation	3.3	3
000015/17 RCP Malfunctions / 4						R	RO - 2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation.	3.8	4
000022 Loss of Rx Coolant Makeup / 2						S	SRO - 2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.7	77
000025 Loss of RHR System / 4		0 2					RO - Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: LPI or Decay Heat Removal/RHR pumps	3.2	5
000026 Loss of Component Cooling Water / 8			0 3				RO - Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: Guidance actions contained in EOP for Loss of CCW	4.0	6
000027 Pressurizer Pressure Control System Malfunction / 3				0 1		S	RO - Ability to operate and / or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions: Pressure recovery, using emergency-only heaters SRO - A2.04 Ability to determine and interpret the following as they apply to the Pressurizer Pressure Control Malfunctions: Tech-Spec limits for RCS pressure	3.9 3.7	7 78
000029 ATWS / 1					0 5		RO - Ability to determine or interpret the following as they apply to a ATWS: System component valve position indications	3.4	8
000038 Steam Gen. Tube Rupture / 3						R	RO - 2.2.38: Knowledge of conditions and limitations in the facility license..	3.6	9
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4			0 4				SRO - Steam line rupture excessive heat transfer: Actions contained in EOPs for steam line rupture.	4.2	79
000054 (CE/E06) Loss of Main Feedwater / 4	0 1						RO - Knowledge of the operational implications of the following concepts as they apply to Loss of Main Feedwater (MFW): MFW line break depressurizes the S/G (similar to a steam line break)	4.1	10
000055 Station Blackout / 6	0 2						RO - Knowledge of the operational implications of the following concepts as they apply to the Station Blackout: Natural circulation cooling	4.1	11

FROM K/A TO QUESTION

Ability to operate and/or monitor the following as they apply to MAIN TURBINE GENERATOR TRIP:
A.C. electrical distribution

QUESTION # 004

The plant was at rated conditions on 2R Transformer with **8N4 & 8N10** (345KV GCBs) **OPEN** for maintenance. Given the following:



If a relay malfunction results in a Main Turbine Trip and Generator LOCKOUT, what will be the status of the following components? (Assume ALL equipment responds as expected)

<u>Bus 11</u>	<u>Bus 12</u>	<u>1AR Transformer</u>
a. Energized	Energized	Energized
b. Energized	Energized	De-Energized
c. Energized	De-Energized	Energized
d. De-Energized	De-Energized	De-Energized

PICK ANOTHER K/A

038EK1.01 Steam Generator Tube Rupture:
Knowledge of the operational implications of the
following concepts as they apply to the SGTR: **Use of
steam tables.**

QUESTION # 006

Given the following:

- A Steam Generator Tube Rupture has occurred
- The crew is currently in EOP-3, Steam Generator Tube Rupture
- The crew has just completed the RCS cooldown to the target temperature of 495°F based on Core Exit Thermocouples

The OS has just asked you to depressurize the RCS while maintaining a minimum of 35°F subcooling.

At the current RCS temperature, which of the following is the lowest that RCS pressure can be without violating the subcooling requirement?

- a. 900 psig
- b. 885 psig
- c. 871 psig
- d. 651 psig

The Next K/A

K/A: 295016G2.4.34: Control Room Abandonment: Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational affect.

QUESTION # 006

The plant was at rated conditions when a Cable Spreading Room fire forced the crew to enter C.4-C (SHUTDOWN OUTSIDE CONTROL ROOM). All immediate actions have been taken for IMMEDIATE Control Room evacuation and all systems responded as designed.



When the MASTER ASDS TRANSFER SWITCH on the ASDS Panel is taken to the TRANSFER position, which lights in the picture above do you expect to be ON and why?

- a. All lights would remain OFF until S32 is placed in the INSERT position.
- b. ONLY the green light would be LIT because the RX Mode Switch would be in RUN.
- c. The amber AND red lights would be LIT because RX Mode Switch would be in SHUTDOWN.
- d. The green AND amber lights would be LIT because the scram air header would be depressurized.

- **K/A:** 295018K1.01: Knowledge of the operation implications of the following concepts as they apply to a PARTIAL OR TOTAL LOSS OF CCW: Effects on component/system operations.

QUESTION # 007

The plant was operating at rated conditions with the following RBCCW System status:



Given the status of the RBCCW system shown above, what would be the automatic result if RBCCW header pressure lowered due to a leak in the system?

- a. At 30 psig annunciator 6-B-32 (RBCCW LOW DISCH PRESS) **ONLY** would alarm.
- b. At 30 psig annunciators 6-B-32 (RBCCW LOW DISCH PRESS) **AND** 6-B-33 (RBCCW STANDBY PUMP START) would alarm.
- c. At 40 psig annunciator 6-B-32 (RBCCW LOW DISCH PRESS) **ONLY** would alarm.
- d. At 40 psig annunciators 6-B-32 (RBCCW LOW DISCH PRESS) **AND** 6-B-33 (RBCCW STANDBY PUMP START) would alarm.

PICK ANOTHER K/A

K/A: 295020A1.01: Ability to operate and/or monitor the following as they apply to INADVERTENT CONT ISOLATION: PCIS

QUESTION # 024

The plant was operating at rated conditions when an inadvertent containment isolation occurred resulting in following indications:



Which of the following Group Isolations will cause the above indications?

- a. Group 1 ONLY
- b. Group 1 and 2
- c. Group 1 and 3
- d. Group 2 and 3

PICK A NEW K/A

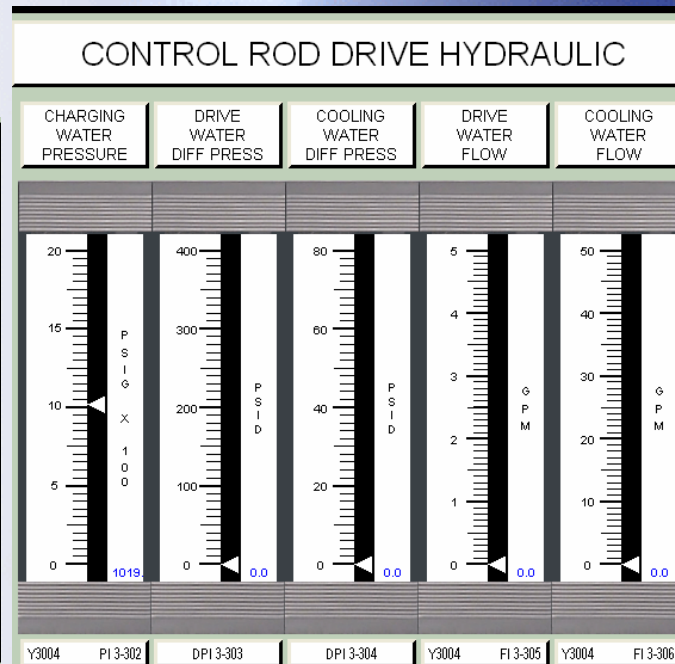
295022A1.01: Ability to operate and/or monitor the following as they apply to LOSS OF CRD PUMP CRD Hydraulic System.

QUESTION # 025

The plant was at rated conditions with 11 CRD Pump in service when the following indications are received:

1	CRD PUMP A HI VIBRATION	2	CRD PUMP B HI VIBRATION	3	REACTOR NEUTRON MONITOR SCRAM TRIP	4	REACTOR AUTO SCRAM CHANNEL A
9	CRD WATER FILTER HI DIF PRESS	10	CRD PUMP 3-16A SUCTION PRESS LO	11	REACTOR VESSEL HI PRESS SCRAM TRIP	12	REACTOR MANUAL SCRAM CHANNEL A
17	CHARGING WATER LO PRESS	18	CRD PUMP 3-16B SUCTION PRESS LO	19	REACTOR VESSEL LO LEVEL SCRAM TRIP	20	CONDENSER LO VACUUM SCRAM TRIP
25	CRD PUMP 3-16A BREAKER TRIPPED	26	CRD PUMP 3-16A OL	27	MAIN STEAM LINE ISOL VLV SCRAM TRIP	28	DRYWELL HI PRESS SCRAM TRIP
33	CRD PUMP 3-16B BREAKER TRIPPED	34	CRD PUMP 3-16B OL	35	TURBINE STOP VALVE CLOSURE SCRAM TRIP	36	GENERATOR FAST CLOSURE SCRAM TEST
41	CRD HI TEMPERATURE	42	CRD SUCTION FILTER HIGH DP	43	MODE SWITCH SCRAM BYPASS	44	
49	MAIN STEAM LINE LOW PRESSURE TRIP BYPASSED	50		51		52	TORUS WTR HI TEMP SPOTMOS TROUBLE

C05-B



Which of the following is the NEXT action that must be taken by the OATC?

- Shift to the STBY CRD flow control valve.
- Attempt to re-start 11 CRD pump.
- Attempt to start 12 CRD pump.
- Insert a manual reactor scram.

PICK ANOTHER K/A

**K/A: 211000K3.01: Knowledge of the effect that a loss or malfunction of the SBLC System will have on the following:
Ability to shutdown the reactor in certain conditions.**

QUESTION # 032

The plant was at rated conditions when an ATWS occurred. The OATC is unaware that the piping at Point A (Picture on the following page) is completely obstructed. The following actions are taken by the OATC:

- The SBLC control switch on C-05 is taken to the SYS 1 position, then through OFF to the SYS 2 position, then back through OFF to the SYS 1 position.

Based on conditions above, complete the following statement describing the #11 SBLC Pumps ability to inject to the RPV? (Assume no other malfunctions have occurred.)

The #11 SBLC Pump...

- a. DID NOT inject to the RPV when the control switch was placed in SYS 1 the first time, but DID inject to the RPV when the control switch was placed in SYS 1 the second time.
- b. DID inject to the RPV when the control switch was placed in SYS 1 the first time, but DID NOT inject to the RPV when the control switch was placed in SYS 1 second time.
- c. DID inject to the RPV when the control switch was placed in SYS 1 both times.
- d. NEVER injected to the RPV.





QUESTION # 045

The SRVs are designed to prevent exceeding the Reactor Coolant System Safety Limit.

Which of the following represents the most limiting maximum transient design pressure for this Safety Limit?

- a. 110% of the RPV design pressure.**
- a. 120% of the RPV design pressure.**
- b. 120% of the design pressure for piping communicating with RPV steam space.**
- c. 120% of the design pressure for piping communicating with RPV vessel bottom.**

The first sentence: “The SRVs are designed to prevent exceeding the Reactor Coolant System Safety Limit.” is considered “training” in the question.

55:43 Written Examination: Senior Operators

- A. Conditions and limitations in the facility license.
- B. Facility operating limitations in the TS and their bases.
- C. Facility licensee procedures required to obtain authority for design and operating changes in the facility.
- D. Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.
- E. Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations. [10 CFR 55.43(b)(5)]
- F. Procedures and limitations involved in initial core loading, alterations in core configuration, control rod programming, and determination of various internal and external effects on core reactivity.
- G. Fuel handling facilities and procedures.



ES-401

Clarification Guidance for SRO-only Questions

Attachment 2

Purpose

The purpose of this document is to promote *consistency* for examiners and licensees when developing and reviewing Senior Reactor Operator (SRO)-only written test items.

SRO-only K/A statements MUST be either an:

- “A2” statement. [All emergency/abnormal “A2” catalog statements are linked to 10 CFR 55.43(b). Plant systems “A2” statements are still valid SRO-only K/A material even though some do not have a 10 CFR 55.43 designator in the catalog.]
 - One exception: In Tier 2, Group 2, selection does not have to be A2 provided it is related to fuel handling facilities and procedures per 10 CFR 55.43(b)(7).

OR

- “G” statement. [in the case of Tier 3, linked to one or more of the 10 CFR 55.43 topics]
[OL Feedback Item 401.29]

**Figure 1: Screening for SRO-only linked to 10 CFR 55.43(b)(2)
(Tech Specs)**

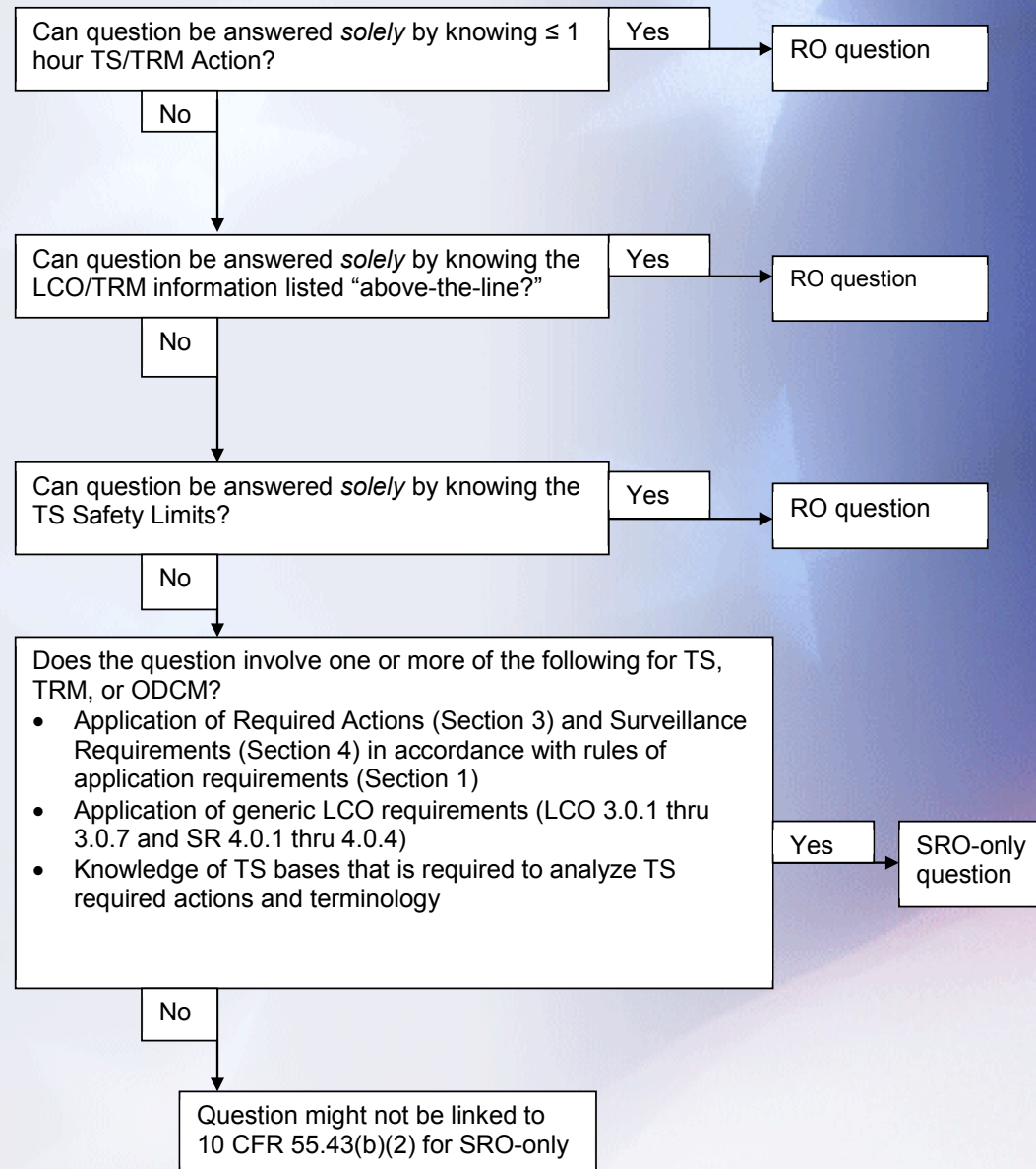
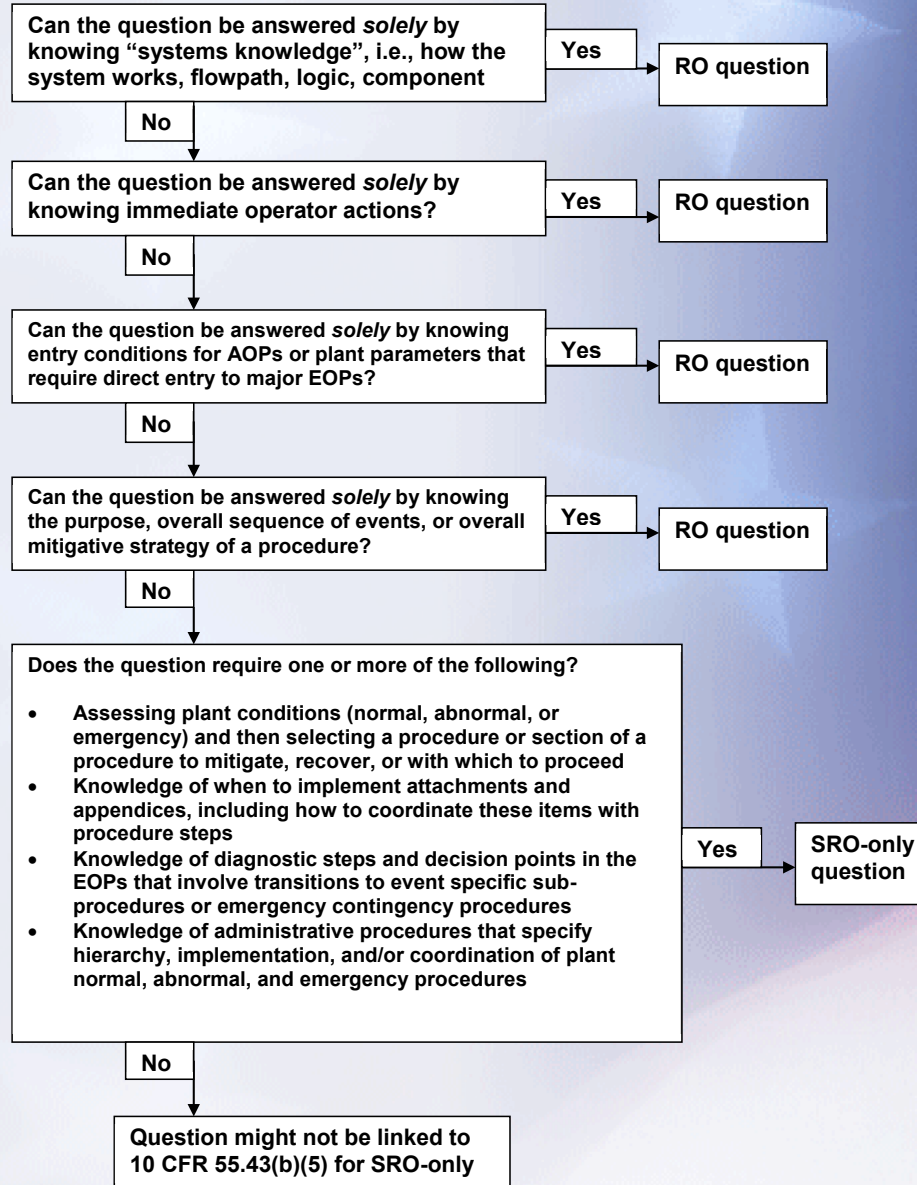


Figure 2: Screening for SRO-only linked to 10 CFR 55.43(b)(5)
(Assessment and selection of procedures)



- **Justification:** A question that is not tied to one of the 10 CFR 55.43(b) items can still be classified as "SRO-only" provided the licensee has documented evidence to prove that the knowledge/ability is *"unique to the SRO position"* at the site.

PICK ANOTHER K/A

K/A:

034G2.1.28 Fuel Handling Equipment System (FHES)

Knowledge of the purpose and function of major system components and controls.

QUESTION # 060

Which of the following describes when the Spent Fuel Bridge Hoist should be placed in 'bypass'?

- a. To allow the bridge to access new fuel elevator.
- b. To bypass the maximum weight limit interlock of the hoist when raising the hoist.
- c. To allow the bridge to use the offset fuel handling tool in the SFP perimeter racks.
- d. To bypass the minimum weight limit interlock of the hoist when lowering the hoist.

Pick a K/A
(for an SRO ONLY Question)

K/A: 295014G2.1.32: Inadvertent Reactivity
Addition: Ability to explain and apply system limits and precautions.

QUESTION # 085

The plant is at rated condition in a normal electrical lineup with the following conditions:

- 11 RBCCW Pump is in service
- Reactor power indicates 2003 MWth
- The EPR Control Position is set at 904 PSI
- The MPR Handwheel Position indicates 914 PSI

An equipment malfunction causes the MCC-142A supply breaker to TRIP OPEN.

For the above conditions, which of the following procedures must be directed, and why?

- a. C.4-B.02.05.A (LOSS OF RBCCW FLOW) for the loss of #11 RBCCW Pump.
- b. C.4-B.09.10.A (LOSS OF A 125 VDC BUS) for a loss of the Division 1 125 VDC Charger.
- c. C.4-K (IMMEDIATE REACTOR SHUTDOWN) for a Pressure Regulator failing downscale.
- d. C.4-B.05.09.B (PRESSURE REGULATOR FAILURE CAUSING INCREASED PRESSURE) to lower reactor power below the license limit.

QUESTION # 085

The plant is at rated condition in a normal electrical lineup with the following conditions:

- Reactor power indicates 2003 MWth
- The EPR Control Position is set at 904 PSI
- The MPR Handwheel Position indicates 914 PSI

An equipment malfunction causes the MCC-142A supply breaker to TRIP OPEN.

For the above conditions:

- 1) Which of the following procedures must be directed?
- 2) Why?
 - a. 1) C.4-K (IMMEDIATE REACTOR SHUTDOWN)
2) To lower reactor power below the license limit.
 - b. 1) C.4-K (IMMEDIATE REACTOR SHUTDOWN)
2) For a Pressure Regulator setpoint failing downscale.
 - c. 1) C.4-B.05.09.B (PRESSURE REGULATOR FAILURE CAUSING INCREASED PRESSURE)
2) To lower reactor power below the license limit.
 - d. 1) C.4-B.05.09.B (PRESSURE REGULATOR FAILURE CAUSING INCREASED PRESSURE)
2) For a Pressure Regulator setpoint failing downscale.

Questions?



ADAMS Accession Number ML15215A702