2004 LSROI NRC Exam

1

Appears on:		SRO EXAM
		Tier 1
K/A #	2.4.15	
Importance Rating:	3.00	3.50

Given the following plant conditions:

- The operating LPSI pump on SDC is experiencing flow oscillations.
- The CRS enters the Lower Mode FRP and directs the Reactor Operator to stop the LPSI pump.
- The LSRO moving fuel in the Fuel Bldg orders the SFP machine operator to stop moving fuel when he notices that water level in the Spent Fuel Pool is lowering. The fuel bundle had just been pulled from the SFP storage rack when this event occurred.

The LSRO should immediately inform the Control Room of the lowering SFP level and that he/she will direct…

A. all activities outside the Control Room associated with the Abnormal Operating Procedure(s).

B. all activities outside the Control Room associated with the Abnormal or Emergency Operating Procedure(s) occurring in the Fuel Building.

C. those activities outside the Control Room associated with the Abnormal Operating Procedure(s) limited to those operator actions pertaining to the Fuel Building.

D. those activities outside the Control Room associated with the Abnormal or Emergency Operating Procedure(s) dealing with the SFP machine operator actions for moving fuel.

Answer: D

Learning Objective:

L114514 State to whom the LSRO is directly responsible during Refueling and Emergency Operations

Reference Id:	Q75283	
Difficulty:	2.00	
Time to complete:	2	
10CFR Category:	CFR 55.43 (7)	55.43 (7) Fuel handling facilities and procedures.
Cognitive Level:	Memory	
Question Source:	New	

Comment:

Knowledge of communications procedures associated with EOP implementation.

40DP-9OP02, Conduct of Shift Operations, states that the LSRO is directly responsible to the Shift Manager. Emergency actions relevant to the LSRO job function should be carried out immediately regardless of the procedure referenced. If a hierarchy of procedure issue arises. The SM will provide direction to the LSRO.
Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

2

Appears on: SRO EXAM

Tier 1

K/A # 42026AA103
Importance Rating: 3.60 3.60

Which ONE of the following cooling water systems is used to supply the fuel pool cooling heat exchangers if the normal cooling water supply is lost?

A. Plant Cooling Water

B. Nuclear Cooling Water

C. Turbine Cooling Water

D. Essential Cooling Water

Answer: D

Learning Objective:

L77406 Describe how the PC System interfaces with the following systems:
- Nuclear Cooling Water (NC)
- Essential Cooling Water (EW)

N64134 Describe the interface between the PC system and its support/supported systems.

LS94319 Describe the major steps necessary to mitigate Loss of Spent Fuel Pool Cooling.

Reference Id: Q7311
Difficulty: 2.00
Time to complete: 5
10CFR Category: CFR 55.41 (10) 55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.
Cognitive Level: Memory
Question Source: PV Bank Not Modified
Comment:

Ability to operate and / or monitor the following as they apply to the Loss of Component Cooling Water: SWS as a backup to the CCWS.

Nuclear Cooling Water is the normal cooling medium for the PC Heat Exchangers. Plant Cooling and Turbine Cooling Water are not normally available as backup cooling methods for PC Cooling.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

3

Appears on:		SRO EXAM
		Tier 1
K/A #	42032AK201	
Importance Rating:	2.70	3.10

Given the following plant conditions:

- Refueling is in progress with neutron count rate being monitored using Startup Channel # 1 in containment via the audible count rate indication.
- A spent fuel bundle is lowered half way into the core when you are informed by the Control Room that an electrical disturbance has caused a loss of NNN-D11 and NNN-D12.

What is the status of the Startup and BDAS (Boron Dilution Alarm System) Channels at this time?

A. Neither Channel is OPERABLE.

B. Only Channel # 1 is OPERABLE.

C. Only Channel # 2 is OPERABLE.

D. Both of the Channels are OPERABLE.

Answer: A

Learning Objective:

L82197	Given a failed Startup Channel in Mode 3, 4 or 5 as the LSRO respond to a failed Startup Channel
29843	Determine if a startup channel is operable

Reference Id:	Q10188	
Difficulty:	3.00	
Time to complete:	4	
10CFR Category:	CFR 55.43 (2)	55.43 (2) Facility operating limitations in the technical specifications and their bases.
Cognitive Level:	Comprehension / Anal	
Question Source:	New	

Comment:

Knowledge of the interrelations between the Loss of Source Range Nuclear Instrumentation and the following: Power supplies, including proper switch positions.

Two OPERABLE SRMs and the associated BDAS are required to provide a signal to alert the operator to unexpected changes in core reactivity such as by a boron dilution accident or an improperly loaded fuel assembly. Both NNN D-11 and NNN D-12 must be energized for the Startup & BDAS Channels to be considered OPERABLE.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

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Appears on:		SRO EXAM
		Tier 1
K/A #	42036AA202	
Importance Rating:	3.40	4.10

Given the following plant conditions:

- Plant is in Mode 6.
- SDC Train “A” is in service with Train “B” in standby.
- You are in the process of lowering the last fuel assembly into the Upender.
- There is no fuel left in the reactor vessel.

The Fuel Damage AOP may be entered when which ONE of the following conditions exist?

A. A complete loss of both trains of SDC.

B. Visible damage is observed on the reactor vessel flange.

C. Large bubbles are observed coming from the refueling pool.

D. A spent fuel assembly inadvertently slams into the spent fuel pool wall.

Answer: D

Learning Objective:

L106343 Determine whether or not the Fuel Damage AOP should be executed, per 40AO-9ZZ22.

Reference Id:	Q63551	
Difficulty:	1.00	
Time to complete:	3	
10CFR Category:	CFR 55.43 (5)	55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:

Ability to determine and interpret the following as they apply to the Fuel Handling Incidents: Occurrence of a fuel handling incident.

Irradiated Fuel Damage may be entered when **ANY** of the following conditions exist:

Equipment or component failures resulting in ANY of the following:

- Irradiated Fuel Assembly contacting a solid structure.
- Bubbles emerging from a spent fuel assembly.
- Bent, twisted or warped spent fuel assembly.
- Visible damage to spent fuel pin cladding.

The distractors listed are handled by other procedures such as the Lower Mode Functional Recovery Procedure or by a Normal Operating Procedure. They are not entry criteria for 40AO-9ZZ22, Fuel Damage.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

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Appears on:		SRO EXAM
		Tier 1
K/A #	42061AA101	
Importance Rating:	3.60	3.60

Given the following plant conditions:

- Plant is in Mode 6.
- A radiation release occurs in Containment.
- The RU-1, Containment Building Atmosphere Monitor, was in alarm at the “High” level and has now isolated.

Which ONE of the following signals would have caused this isolation?

A. SIAS

B. CIAS

C. CSAS

D. CPIAS

Answer: B

Learning Objective:

L114080 Given a Radiation Monitor number and name, describe the purposes and sample points of the Radiation Monitors at PVNGS

Reference Id:	Q63288	
Difficulty:	1.00	
Time to complete:	3	
10CFR Category:	CFR 55.41 (12)	55.41 (11) Purpose and operation of radiation monitoring systems, including alarms and survey equipment.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:

Ability to operate and / or monitor the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: Automatic actuation.

Continuously monitors the containment building atmosphere radioactivity levels as an indication of reactor coolant pressure boundary leakage. Isolates on CIAS.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

6

Appears on:		SRO EXAM
		Tier 1
K/A #	42056AA208	
Importance Rating:	2.20	2.30

Given the following plant conditions:

- Refuel Operations are in progress
- A Loss of Offsite Power to Palo Verde occurs

Which ONE of the following describes the effect on the Fuel Building Normal Supply Fans and Normal Exhaust Fans?

A. The Normal Supply and Exhaust Fans both trip on a loss of power.

B. The Normal Supply Fans trips but the Exhaust Fans receive alternate power to assure negative pressure in the Fuel Building.

C. The Normal Exhaust Fans trip but the Supply Fans receive alternate power to assure positive pressure in the Fuel Building.

D. The Normal Supply and Exhaust Fans will automatically swap over to an alternate power source and continue running.

Answer: A

Learning Objective:

L114128 Explain the operation of the Fuel Building Normal Supply and Exhaust Dampers under normal operating conditions.

Reference Id:	Q64321	
Difficulty:	3.00	
Time to complete:	4	
10CFR Category:	CFR 55.41 (7)	55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Memory	
Question Source:	New	

Comment:

Ability to determine and interpret the following as they apply to the Loss of Offsite Power: Operational status of fuel-handling building exhaust fan.

The Fuel Building Normal Supply Fans and Normal Exhaust Fans receive power from Non-class power supply NHN-M04. No alternate power sources automatically align to provide backup power to these buses.

Proposed references to be provided to applicants during examination: NONE

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Appears on:		SRO EXAM Tier 1
K/A #	42058AK101	
Importance Rating:	2.80	3.10

Following a loss of both the normal and backup battery chargers on the DC bus, the DC bus will receive power _____ from _____.

A. automatically, the batteries

B. automatically, the Emergency Diesel Generator

C. upon manual transfer, the batteries

D. upon manual transfer, the Emergency Diesel Generator

Answer: A

Learning Objective:
N79660 Describe the normal operation of the PK system.

Reference Id: Q10168
Difficulty: 3.00
Time to complete: 3
10CFR Category: CFR 55.41 (8) 55.41 (8) Components, capacity, and functions of emergency systems.
Cognitive Level: Comprehension / Anal
Question Source: New
Comment:

Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: Battery charger equipment and instrumentation.

The battery is available as a standby DC source to carry the control center load automatically in case of loss of the charger. The DC bus is provided power automatically from the batteries after a loss of both the normal and backup battery chargers.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

8

Appears on:		SRO EXAM
		Tier 1
K/A #	42062AK302	
Importance Rating:	3.60	3.90

A CREFAS signal will cause an auto start of the associated train Spray Pond because the Spray Pond provides cooling DIRECTLY to...

A. EC, Essential Chill Water

B. NC, Nuclear Cooling Water

C. PW, Plant Cooling Water

D. EW, Essential Cooling Water

Answer: D

Learning Objective:

L114308 Describe the automatic functions / interlocks associated with the SP System.

Reference Id:	Q63574	
Difficulty:	2.00	
Time to complete:	2	
10CFR Category:	CFR 55.41 (7)	55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Memory	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: The automatic actions (alignments) within the nuclear service resulting from the actuation of the ESFAS.

Only EW is related to providing cooling to the CREFAS system. EC, NC, and PW coolers are related to other cooling mediums.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

9

Appears on:		SRO EXAM
		Tier 1
K/A #	2.1.27	
Importance Rating:	2.80	2.90

Given the following conditions on Unit 3:

- Fuel Pool Gate Seal Air Supply Press HI/LO alarm on BO7
- The Area Operator reports that there is a low pressure condition on the Fuel Transfer Canal gate seal.

Based upon these conditions, the operator must…

A. Valve in the backup air bottles.

B. Bypass the normal air supply valve.

C. Unisolate the nitrogen supply valve.

D. Adjust the regulator on the nitrogen supply valve.

Answer: A

Learning Objective:

L114050 Explain the operation of the Fuel Transfer Gates under normal operating conditions.

Reference Id:	Q63274	
Difficulty:	2.00	
Time to complete:	3	
10CFR Category:	CFR 55.41 (7)	55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of system purpose and or function.

Backup air bottles are provided locally to provide a redundant source of air to the gate seals in case the normal air supply via instrument air / nitrogen does not provide sufficient air pressure. The distractors are incorrect in that they assume operator action is required to supply the normal air or nitrogen backup supply.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

10

Appears on:		SRO EXAM Tier 1
K/A #	42069AK203	
Importance Rating:	2.80	2.90

Given the following plant conditions:

- U3 is in MODE 6
- Fuel offload is in progress

Which ONE of the following meets the Containment Penetration requirements for the current plant conditions?

A. The Equipment Hatch is slightly open and can not be closed entirely due to a mechanical defect.

B. The Power Access Purge System's 8 inch supply and exhaust penetration valves are open. The Containment Purge Isolations Actuation Signals are disabled.

C. A 1" piping penetration from the Containment to the outside yard area has two manually isolated valves that are open and are not being administratively controlled.

D. 100' Containment Personnel Air Lock has it's mechanical door interlock mechanism disabled with both doors open. No door closure interference is noted.

Answer: D

Learning Objective:
L94059 Given a set of plant conditions, and access to Tech Specs identify whether or not LCO 3.9.3 is satisfied and any actions that would prevent core alterations

Reference Id:	Q10183	
Difficulty:	5.00	
Time to complete:	5	
10CFR Category:	CFR 55.43 (2)	55.43 (2) Facility operating limitations in the technical specifications and their bases.
Cognitive Level:	Comprehension / Anal	
Question Source:	New	

Comment:

Knowledge of the interrelations between the Loss of Containment Integrity and the following: Personnel access hatch and emergency access hatch.

The containment air locks, which are also part of the containment pressure boundary, provide a means for personnel access during MODES 1, 2, 3, and 4 operation in accordance with LCO 3.6.2, "Containment Air Locks." Each air lock has doors at both ends. The doors are normally interlocked to prevent simultaneous opening when containment OPERABILITY is required. During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, containment closure is required: therefore, the door interlock mechanism may remain disabled, but one air lock door must always remain capable of being closed. The other distractors do not meet their respective containment isolation criteria.

Proposed references to be provided to applicants during examination: Tech Specs and Bases

2004 LSROI NRC Exam

11

Appears on:		SRO EXAM
		Tier 2
K/A #	34005K603	
Importance Rating:	2.50	2.60

Given the following:

- Borated water is flowing through the tubes of the RHR heat exchanger.
- On the shell side, the cooling medium is fresh water.
- The shell side pressure is less than tube side pressure.

What will occur as a result of a tube failure?

A. Shell side pressure will decrease and the RHR system will be diluted.

B. Shell side inventory will be depleted and the RHR system will be diluted.

C. Shell side pressure will decrease and the RHR inventory will be depleted.

D. Shell side water will become borated and RHR system inventory will be depleted.

Answer: D

Learning Objective:

5191006K113	K1.13	Consequences of heat exchanger tube failure	2.8	2.9

Reference Id:	191006Q031	
Difficulty:	2.00	
Time to complete:	3	
10CFR Category:	CFR 55.41 (14)	55.41 (14) Principles of heat transfer thermodynamics and fluid mechanics.
Cognitive Level:	Comprehension / Anal	
Question Source:	INPO Bank Not Modified	

Comment:

Knowledge of the effect of a loss or malfunction on the following will have on the RHRS: RHR heat exchanger.

Tube side pressure represents RCS pressure and is higher than shell side pressure.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

12 MODIFIED DURING EXAM ADMINISTRATION

Appears on:		SRO EXAM
		Tier 2
K/A #	2.2.31	
Importance Rating:	2.20	2.90

Given the following plant condition:

- Unit 3 is in a Refueling Outage
- The Containment LSRO is in the process of loading a fuel bundle into the core
- The audible count rate indication suddenly increases from six to 38

Which ONE of the following is the correct required response to this event?

A. Order an immediate Containment evacuation.

B. Immediately stop fuel movement and observe the counting channels.

C. Immediately withdraw the last inserted fuel assembly and observe the counting channels.

D. Continue fuel movement unless the increase in count rate is confirmed on both Startup Channels.

Answer: C

Learning Objective:

L114347 State whose permission is required to move fuel in containment and to lower fuel into the core.

Reference Id:	Q10189	
Difficulty:	3.00	
Time to complete:	3	
10CFR Category:	CFR 55.43 (3)	55.43 (3) Facility licensee procedures required to obtain authority for design and operating changes in the facility.
Cognitive Level:	Comprehension / Anal	
Question Source:	New	

Comment:

Knowledge of procedures and limitations involved in initial core loading.

At no time shall fuel assemblies or sources be moved within the Containment without the knowledge and approval of the Refueling SRO.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

13

Appears on:		SRO EXAM
		Tier 2
K/A #	38033K504	
Importance Rating:	2.10	2.30

Given the following conditions:

- Unit 1 is in Mode 6
- Core Reload is in progress
- Makeup water has been added to the Spent Fuel Pool (SFP).
- The Auxiliary Operator informs you that he aligned demineralized water to the makeup path instead of borated water.

Which ONE of the following is the expected result from this?

A. Keff will increase and positive reactivity is added.

B. Keff will increase and negative reactivity is added.

C. Keff will decrease and positive reactivity is added.

D. Keff will decrease and negative reactivity is added.

Answer: A

Learning Objective:

6192002K111 Define reactivity.

Reference Id:	Q9230
Difficulty:	2.00
Time to complete:	2
Cognitive Level:	Comprehension / Anal
Question Source:	New

Comment:

Knowledge of the operational implication of the following concepts as they apply to the Spent Fuel Pool Cooling System: K-eff.

Reactivity is the change in neutron population, from one generation to the next, divided by the final neutron population. This KA is rated >2.5 for this facility.

Proposed references to be provided to applicants during examination: Basic formula sheet for GFES Exams.

2004 LSROI NRC Exam

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Appears on:		SRO EXAM
		Tier 2
K/A #	38033A403	
Importance Rating:	2.40	2.90

Normally, the Reactor Operator monitors the _____level from the Control Room and uses it to make up to the Spent Fuel Pool (SFP).

A. Safety Injection Tank

B. Refueling Water Tank

C. Reactor Makeup Water Tank

D. Demineralized Water Storage Tank

Answer: B

Learning Objective:

L114045 Describe how the PC System interfaces with the following systems:
- Chemical and Volume Control System (CH)

Reference Id:	Q8960	
Difficulty:	1.00	
Time to complete:	3	
10CFR Category:	CFR 55.41 (10)	55.41 (10) Administrative, normal, abnormal, and emergency operating procedures for the facility.
Cognitive Level:	Memory	
Question Source:	Modified PV Bank	Old Question: Q63270

Normally, the Refueling Water Tank (RWT) is used to makeup to the Spent Fuel Pool (SFP). If this source is not available, which of the following can be used?

A. Safety Injection Tank

B. Condensate Storage Tank

C. Reactor Makeup Water Tank

D. Concentrate Monitor Tank

Answer: B

Comment:

Ability to manually operate and/or monitor in the control room: Support systems for fill and transfer of SFPCS water.

The CH System via the Refueling Water Tank provides makeup water (borated) to the Spent Fuel Pool. It also provides Refueling Pool water during refueling operations. If the RWT is not available for makeup the Recycle Monitor Tank or the Condensate Storage Tank can be used as the makeup source to the SFP. All of the listed distractors can be monitored from the Control Room except for the Demin Water Tank by the RO.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

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Appears on:		SRO EXAM
		Tier 2
K/A #	38034A301	
Importance Rating:	2.50	3.10

The refueling machine bridge/trolley operates in slow speed when the trolley is:

A. in the “core clear zone”, with the hoist extended.

B. in the "alignment pin zones" with the hoist at the up limit.

C. inside the "trolley index zone", with the hoist at the up limit.

D. inside the "refueling transfer machine zone" (RTMZ), with the hoist at the up limit.

Answer: B

Learning Objective:

L114359 Identify the protective interlocks associated with the refueling machine.

Reference Id:	Q63285	
Difficulty:	3.00	
Time to complete:	3	
10CFR Category:	CFR 55.43 (7)	55.43 (7) Fuel handling facilities and procedures.
Cognitive Level:	Memory	
Question Source:	PV Bank Not Modified	

Comment:

Ability to monitor automatic operation of the Fuel Handling System, including: Travel limits.

The Bridge Speed Control Interlocks allows the bridge to travel at fast speed when: The mast is lined up with the Trolley Indexed Zone, **or** if the Bridge is in the Core Zone and the hoist is at the up limit, or while the machine is in Core Clear Zone. The trolley can be operated at high speed anywhere at the "Up Limit" except in alignment pin zones.

Otherwise the bridge is limited to slow speed to protect the hoist box.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

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Appears on:		SRO EXAM
		Tier 2
K/A #	38034A101	
Importance Rating:	2.40	3.20

Given the following plant conditions:

- U1 is in MODE 6.
- Core Reload is in progress.
- While lowering an assembly into the core you notice that the fuel assembly grid strap is starting to hang up on another adjacent fuel assembly.

If no action is taken;

Which ONE of the following interlocks would provide protection against this?

A. hoist lockout interlock

B. mast bumber interlock

C. hoist underload interlock

D. cable slack load interlock

Answer: C

Learning Objective:

L114359 Identify the protective interlocks associated with the refueling machine.

Reference Id:	Q10184	
Difficulty:	2.00	
Time to complete:	2	
10CFR Category:	CFR 55.43 (7)	55.43 (7) Fuel handling facilities and procedures.
Cognitive Level:	Memory	
Question Source:	New	
Comment:		

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Fuel Handling System controls including: Load limits.

78OP-9FX01, Refueling Machine Operations, Appendix A
Hoist Lockout Interlock: Prevents hoist motion when bridge/trolley is being operated.
Mast Bumper Interlock: Stops bridge and trolley movement if mast driven into an obstruction.
Cable Slack Load Interlock: Prevents hoist down motion when cable tension nearly zero, thereby preventing damage to hoist.
Hoist Underload: In the fuel only region the hoist will stop downward motion if weight indication drops to 150 pounds less than the weight of the fuel and grapple. This is based on protecting the Fuel spacer guides. They are designed withstand 200 pounds of shear stress.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

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Appears on:		SRO EXAM
		Tier 2
K/A #	35103K406	
Importance Rating:	3.10	3.70

Which ONE of the following signals (if any) will automatically stop a Containment Refueling Purge?

A. CIAS ONLY.

B. CPIAS ONLY.

C. CIAS or CPIAS.

D. Neither CIAS nor CPIAS.

Answer: C

Learning Objective:

N64788 Describe the automatic feature associated with the Containment Purge System.

Reference Id:	Q63645	
Difficulty:	3.00	
Time to complete:	2	
10CFR Category:	CFR 55.41 (7)	55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Memory	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of containment system design feature(s) and/or interlock(s) which provide for the following: Containment isolation system.

Purge discharge flow to the plant vent is continuously monitored by two radiation monitoring instruments (RU 37, and RU 38). These instruments will initiate a CPIAS and stop the purge if excessive radiation is detected. A CIAS will also stop the purge.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

18 MODIFIED DURING EXAM ADMINISTRATION

Appears on:		SRO EXAM Tier 2
K/A #	36062A201	
Importance Rating:	3.40	3.90

The OPERABILITY of the minimum AC, DC, and AC vital instrument bus electrical power distribution subsystems during movement of irradiated fuel assemblies (during refueling operations) ensures that:

A. Instrumentation is available to support a worst case single failure.

B. Systems needed to mitigate a Fuel handling accident are available.

C. Systems necessary to maintain the Condenser as a heat sink are available.

D. Power distribution systems remain OPERABLE during accident conditions in the event of an assumed loss of all offsite power.

Answer: B

Learning Objective:
L74295 Describe LCO 3.8.10, Distribution Systems - Shutdown, including it's bases.

Reference Id:	Q10174	
Difficulty:	4.00	
Time to complete:	4	
10CFR Category:	CFR 55.43 (2)	55.43 (2) Facility operating limitations in the technical specifications and their bases.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:
Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Types of loads that, if de-energized, would degrade or hinder plant operation.

The AC, DC, and AC vital instrument bus electrical power distribution subsystems required to be OPERABLE in Modes 5 and 6 and during movement of irradiated fuel assemblies, provide assurance that:
Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;
Systems needed to mitigate a fuel handling accident are available;
Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available;
Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition and refueling condition.

Distracters A & D are related to the bases for 3.8.9 Distribution Systems - Operating
Distracter C would be a viable option for an operating plant also.

Proposed references to be provided to applicants during examination: Tech Specs and Bases.

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Appears on:		SRO EXAM
		Tier 2
K/A #	36063K201	
Importance Rating:	2.90	3.10

A loss of which ONE of the following would result in physically preventing a start of HPSI "A" from the control room?

A. Class 125 VDC power, PKA.

B. Class 120 VAC power, PNA.

C. Non-Class 125V DC power, NKN.

D. Non-Class Instrument AC power, NNN.

Answer: A

Learning Objective:

L114202 Describe the interface between the Safety Injection system and its support/supported systems.

Reference Id:	Q64304	
Difficulty:	2.00	
Time to complete:	2	
10CFR Category:	CFR 55.41 (8)	55.41 (8) Components, capacity, and functions of emergency systems.
Cognitive Level:	Memory	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of bus power supplies to the following: Major DC loads.

Class 125 VDC power (PK)

Provides DC power supply for breaker control and for certain valves that may require operation following a blackout. The problems associated with a bus loss depend upon which bus is lost. For instance, without the “A” or “B” PK busses, important 4.16kV breakers would not be able to be closed/opened remotely.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

20

Appears on:		SRO EXAM
		Tier 2
K/A #	32002K614	
Importance Rating:	2.20	2.80

Which ONE of the core component(s) below has the following functions?

- Alignment of fuel assemblies via the fuel alignment pins.
- Provide guide path for the incore instrumentation.
- Direct coolant into the fuel assemblies.

A. Upper Guide Structure.

B. Core Shroud Assembly.

C. The Lower Support Structure.

D. Outlet Plenum Housing and Hot Leg Penetrations.

Answer: C

Learning Objective:

L114000 Explain the function and construction of the Lower Support Structure and Instrument Nozzle Assembly under normal operating conditions.

Reference Id:	Q63658	
Difficulty:	3.00	
Time to complete:	3	
10CFR Category:	CFR 55.41 (2)	55.41 (2) General design features of the core, including core structure, fuel elements, control rods, core instrumentation, and coolant flow.
Cognitive Level:	Memory	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of the effect or a loss or malfunction on the following RCS components: Core components.

The functions of the lower support structure and instrument nozzle assembly are as follows:

- Alignment of fuel assemblies via the fuel alignment pins.
- Provide guide path for the incore instrumentation.
- Direct coolant into the fuel assemblies via the flow path.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

21

Appears on:		SRO EXAM
		Tier 2
K/A #	32004A403	
Importance Rating:	2.70	3.20

Due to a valving error in the CVCS lineup, an inadvertent dilution occurs. This will result in M, the subcritical multiplication factor _____, resulting in a _____ count rate.

A. increasing lower

B. increasing higher

C. decreasing lower

D. decreasing higher

Answer: B

Learning Objective:

6192003K102 Given a formula sheet, Perform calculations using the simplified formula for subcritical multiplication.

Reference Id:	Q63665	
Difficulty:	2.00	
Time to complete:	2	
10CFR Category:	CFR 55.41 (1)	55.41 (1) Fundamentals of reactor theory, including fission process, neutron multiplication, source effects, control rod effects, criticality indications, reactivity coefficients, and poison effects.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:

Ability to manually operate and/or monitor in the control room: Construction and use of 1/M plots (inverse multiplication, criticality prediction method).

The mathematics associated with changes in neutron population in a subcritical reactor leads to a formula which can be used to calculate the final, stable neutron population.

Proposed references to be provided to applicants during examination: GFES Formula sheet.

2004 LSROI NRC Exam

22

Appears on:		SRO EXAM
		Tier 2
K/A #	38008K406	
Importance Rating:	2.30	2.60

NC-UV-99, the NC priority load isolation valve...

A. auto closes on SIAS.

B. auto closes on CIAS.

C. auto closes on low NC surge tank level.

D. has no automatic features associated with it.

Answer: D

Learning Objective:

L114274 Describe the automatic features associated with the NC/EW Crosstie Isolation Valves.

Reference Id:	Q63615	
Difficulty:	2.00	
Time to complete:	2	
10CFR Category:	CFR 55.41 (7)	55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Memory	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: Auxiliary building CCWS isolation.

NC-UV-99 has NO automatic features associated with it.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

23

Appears on:		SRO EXAM Tier 2
K/A #	2.2.25	
Importance Rating:	2.50	3.70

Two independent and redundant trains of the CREFS are required to be OPERABLE. Total system failure could result in which ONE of the following:

A. A failure to prevent toxic gases from entering the control room from a worst case Chlorine spill.

B. Control Room equipment operating temperature exceeding limits in the event of an accident.

C. The atmospheric release from the Control Building exceeding the required limits in the event of a Design Basis Accident (DBA).

D. A control room operator receiving a dose in excess of 5 rem whole body or its equivalent in the event of a large radioactive release.

Answer: D

Learning Objective:
L30204 State the LCO for the Control Room Essential Filtration (CREFS) System, including its bases.

Reference Id:	Q10178	
Difficulty:	4.00	
Time to complete:	4	
10CFR Category:	CFR 55.43 (2)	55.43 (2) Facility operating limitations in the technical specifications and their bases.
Cognitive Level:	Comprehension / Anal	
Question Source:	New	

Comment:

Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.

The basis for this LCO is:

Two independent and redundant trains of the CREFS are required to be OPERABLE to ensure that at least one is available, assuming that a single failure disables the other train. Total system failure could result in a control room operator receiving a dose in excess of 5 rem whole body or its equivalent in the event of a large radioactive release. The CREFS design is about making the Control Room habitable from a radiological environment perspective. Distracter C concerns releases, B equipment temperatures, and A with toxic gas which is specifically noted in TS Bases to be not relevant to PVNGS.

Proposed references to be provided to applicants during examination: Tech Specs and Bases

2004 LSROI NRC Exam

24

Appears on:		SRO EXAM Tier 2
K/A #	36064A307	
Importance Rating:	3.60	3.70

Any BOP ESFAS signal that automatically starts the Emergency Diesel Generator will also start this system on the load sequencer to ensure proper cooling to the EDG.

A. Essential Chillers

B. Essential Spray Pond Pumps

C. Essential Cooling Water Pumps

D. Diesel Generator Building Essential Exhaust Fans

Answer: B

Learning Objective:
L114308 Describe the automatic functions / interlocks associated with the SP System.

Reference Id:	Q10179	
Difficulty:	3.00	
Time to complete:	3	
10CFR Category:	CFR 55.41 (7)	55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Comprehension / Anal	
Question Source:	New	

Comment:
Ability to monitor automatic operation of the ED/G system, including: Load sequencing.

The Spray Pond pumps will receive an auto-start signal from BOPESFAS when one of the following conditions is present: Diesel Generator running, CREFAS, CRVIAS. LOP, AFAS, SIAS, CSAS.

All of the components listed are started via the BOP ESFAS sequencer. Only the SP pumps provide cooling directly to the EDG.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

25

Appears on:		SRO EXAM
		Tier 2
K/A #	37072K104	
Importance Rating:	3.30	3.50

Given the following plant conditions:

- Plant is in Mode 6.
- RU-37, Power Access Purge Area Monitor, has a High alarm.
- RU-38, Power Access Purge Area Monitor, has an Alert alarm.
- RU-33, Refueling Machine Area Monitor, has an Alert alarm.
- Assume all equipment functions correctly.

Besides the Containment Purge Isolation Actuation System (CPIAS), what other actuation should occur?

A. Safety Injection Actuation System (SIAS)

B. Containment Isolation Actuation System (CIAS)

C. Control Room Essential Filtration Actuation System (CREFAS)

D. Fuel Building Essential Ventilation Actuation System (FBEVAS)

Answer: C

Learning Objective:

69379 Describe the interlocks associated with selected Radiation Monitors.

Reference Id:	Q63286	
Difficulty:	2.00	
Time to complete:	3	
10CFR Category:	CFR 55.41 (12)	55.41 (11) Purpose and operation of radiation monitoring systems, including alarms and survey equipment.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of the physical connections and/or cause effect relationships between the ARM system and the following systems: Control room ventilation.

RU-37 & 38, Located outside the containment between the power access purge exhaust and refueling purge exhaust ducts. These channels monitor the ducts for airborne radioactivity concentrations that could potentially result in an offsite dose exceeding 10CFR100 limits. The primary function of these monitors is to provide engineered safety feature actuation of Containment Purge Isolation Actuation Signal (CPIAS) on HIGH alarm.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

26

Appears on:		SRO EXAM
		Tier 2
K/A #	34076K101	
Importance Rating:	3.40	3.30

What system provides cooling for the Nuclear Cooling Water (NC) heat exchangers?

A. Plant Cooling Water

B. Turbine Cooling Water

C. Essential Chilled Water

D. Essential Cooling Water

Answer: A

Learning Objective:

L114260 Describe how the Nuclear Cooling Water System is supported by the following systems:
- Plant Cooling Water System (PW)
- Demineralized Water System (DW)
- Service Gases System (GA)
- Essential Cooling Water System (EW)
- Radiation Monitoring System (SQ)
- Chemical Waste System (CM)

Reference Id:	Q63242	
Difficulty:	1.00	
Time to complete:	3	
10CFR Category:	CFR 55.41 (4)	55.41 (4) Secondary coolant and auxiliary systems that affect the facility.
Cognitive Level:	Memory	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of the physical connections and/or cause- effect relationships between the SWS and the following systems: CCW system.

The PW System supplies cooling water to the NC heat exchangers.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

27

Appears on:		SRO EXAM Tier 2
K/A #	38086K301	
Importance Rating:	2.70	3.20

One of the Fire Protection subsystems is the Chemical System. It is designed to operate to detect, contain, and extinguish all fires in areas...

A. where Halon use is not allowed and to ensure operability of at least one Safe Shutdown Path.

B. where Nitrogen use is not allowed and to ensure availability of at least one Shutdown Cooling System.

C. where water use is considered problematic and to ensure availability of at least one Safe Shutdown Path.

D. where Carbon Dioxide use is considered problematic and to ensure availability of at least one Shutdown Cooling System.

Answer: C

Learning Objective:
L114321 State the functions of each of the following Subsystems that comprise the Fire Protection System:
- Chemical Fire Protection System
- Water Fire Protection System
- Fire Detection and Alarm System

Reference Id: Q10180
Difficulty: 3.00
Time to complete: 3
10CFR Category: CFR 55.43 (1) 55.43 (1) Conditions and limitations in the facility license.
Cognitive Level: Comprehension / Anal
Question Source: New
Comment:

Knowledge of the effect that a loss or malfunction of the Fire Protection System will have on the following: Shutdown capability with redundant equipment.

The functions of the **Fire Protection - Chemical System** are to:
- Prevent, detect, contain, and extinguish all fires in areas where water use is considered problematic
- Assure availability of at least one safe shutdown path
- Minimize the loss of life and property

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

28

Appears on:		SRO EXAM
		Tier 2
K/A #	32006K302	
Importance Rating:	4.30	4.40

Given the following plant conditions:

- Unit 2 is in MODE 6.
- Refueling is in progress.
- SDC "A" is in service and the refueling pool is at 138'.
- One of the two LTOPs spuriously opens.
- The control room staff closes its upstream and downstream isolation valves to stop the leak.
- The Refuel Pool level stabilizes at 137' 9".

If the defective LTOP is associated with "A" LPSI suction, how will this impact Core cooling?

A. Core cooling is lost but can be restored via "B" SDC loop.

B. Core cooling is lost and can be restored using "A" CS pump.

C. Core cooling is NOT lost because the LTOP automatic bypass will open.

D. Core cooling is lost and cannot be regained until the LTOP is repaired and unisolated.

Answer: A

Learning Objective:

L114209 Describe the flow path of the shut down cooling sub system.

Reference Id:	Q63570	
Difficulty:	3.00	
Time to complete:	3	
10CFR Category:	CFR 55.41 (5)	55.41 (5) Facility operating characteristics during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes, and operating limitations and reasons for these operating characteristics.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of the effect that a loss or malfunction of the ECCS will have on the following: Fuel.

A SDC loop takes suction on an RCS hot leg through three suction isolation valves. Between the second and third isolation valves on each loop is a relief valve used for low temperature over pressure protection (LTOP). From the suction valves, SDC flow enters the LPSI pump. The discharge of the LPSI pump is valved to the SDCHX and returns to the RCS by the LPSI loop injection valves. Flow and temperature is controlled by manipulation of the SDCHX outlet and bypass valves.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

29

Appears on:		SRO EXAM
		Tier 2
K/A #	35022A205	
Importance Rating:	3.10	3.50

A major leak occurs in the Normal Chilled Water System (WC).

What is a possible consequence of loosing the Normal Chilled Water System (WC)?

A. The Containment could exceed temperature limits.

B. The Spent Fuel Pool could exceed its temperature limits.

C. The Pre Access Air Filtration Units will have to be started to cool the Containment.

D. The Fuel Building temperature could rise resulting in an evacuation of the Fuel Building.

Answer: A

Learning Objective:

L114112 Describe how the Containment Building HVAC System is supported by the following systems:
- Nuclear Cooling Water (NC)
- Normal Chilled Water (WC)

Reference Id:	Q63538	
Difficulty:	2.00	
Time to complete:	2	
10CFR Category:	CFR 55.41 (7)	55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:

Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Major leak in CCS.

Normal Chilled Water System (WC):
Provides chilled water to the normal ACUs in the containment building. If WC is lost, the Containment could exceed temperature limits.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

30

Appears on:		SRO EXAM
		Tier 2
K/A #	35026K201	
Importance Rating:	3.40	3.60

Given the following plant conditions:

- Core Off load in progress
- SDC Train "A" is in service
- "A" CS pump is providing SDC flow
- No equipment is out of service

Which ONE of the following failures will cause an unrecoverable loss of Train "A" SDC ("A" SDC can not be used for core cooling)?

A. Loss of offsite power.

B. An "A" LPSI pump bearing fails.

C. PBA-S03 faults and is unusable.

D. "A" EW is cross-tied to provide NC flow.

Answer: C

Learning Objective:

L114219 State the power supplies to the HPSI, LPSI and CS pump.

Reference Id:	Q64242	
Difficulty:	3.00	
Time to complete:	3	
10CFR Category:	CFR 55.41 (7)	55.41 (7) Design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of bus power supplies to the following: Containment spray pumps.

The HPSI, LPSI and CS pumps all receive power from the class 4 .16 kV buses.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

31

Appears on: SRO EXAM

Tier 3

K/A # 2.1.5
Importance Rating: 2.30 3.40

According to 40DP-90P33 "Shift Turnover", shift turnover...

A. can take place at any time.

B. is mostly the responsibility of the oncoming crew.

C. should not be done when a critical evolution is being performed.

D. is formal (written documents) at the SM and CRS levels, but verbal at all other levels.

Answer: C

Learning Objective:
N74430 Identify the general instructions applicable to NLO's for Shift Turnover.

L114542 Describe when shift turnover should take place in accordance with 40DP-9OP33.

Reference Id: Q16586
Difficulty: 2.00
Time to complete: 2
10CFR Category: CFR 55.43 (1) 55.43 (1) Conditions and limitations in the facility license.
Cognitive Level: Memory
Question Source: PV Bank Not Modified
Comment:

Ability to locate and use procedures and directives related to shift staffing and activities.

According to 40DP-9OP33, “Shift turnover should not occur during the performance of critical evolutions or during off-normal activities which require the undivided attention and coordination of the on-shift crew."

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

32

Appears on:		SRO EXAM Tier 3
K/A #	2.1.8	
Importance Rating:	3.80	3.60

Regarding access;

_____ controls access to the refueling machine and _____ controls access to the refueling pool.

A. RP, RP

B. RP, the LSRO

C. The LSRO, the LSRO

D. The LSRO, the Containment Coordinator

Answer: C

Learning Objective:
L114967 State who controls access to the refueling pool and the refueling machine.

Reference Id: Q63445
Difficulty: 2.00
Time to complete: 2
10CFR Category: CFR 55.43 (7) 55.43 (7) Fuel handling facilities and procedures.
Cognitive Level: Memory
Question Source: PV Bank Not Modified
Comment:

Ability to coordinate personnel activities outside the control room.

The Refueling SRO controls access to both the refueling pool and the refueling machine. This is an important safety issue during refueling evolutions because the refueling machine can inflict serious injury or even death to personnel not noticed by the refueling machine operator or LSRO. RP controls access to the Pool.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

33

Appears on:		SRO EXAM
		Tier 3
K/A #	2.2.18	
Importance Rating:	2.30	3.60

Given the following plant conditions:

- Unit 1 is in Mode 6
- The Quick Opening Closure device is OPEN and PCN-V118 is OPEN.
- All of the fuel has been moved from the Core to the Spent Fuel Building.
- It is desirable to move a heavy load in Containment.

Which of the following is true regarding special Containment requirements for heavy loads in MODES 5 and 6?

A. NO heavy load movement is allowed.

B. Normal safe paths for heavy load movement apply.

C. Normal safe paths for heavy load movement need not be followed.

D. Heavy load movement is allowed only after a reactor engineering evaluation of the projected weight path.

Answer: A

Learning Objective:

LS60160 identify the containment heavy load restrictions of 30DP-9MP12 and 31MT-9ZC07.

Reference Id:	Q63432	
Difficulty:	2.00	
Time to complete:	2	
10CFR Category:	CFR 55.43 (5)	55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of the process for managing maintenance activities during shutdown operations.

30DP-9MP12 - Overhead Hoisting Systems, **Special Containment Requirements for Heavy Loads in MODES 5 and 6. (Ref: CRDR 97Q525) (This is repeated in 31MT-9ZC07)**
Prior to performing any heavy lifts, in containment the crane operator and signalman shall determine which condition applies: If the quick operating closure device (QOCD) and PCNV118 are open, **NO HEAVY LOAD** movement is allowed.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

34

Appears on:		SRO EXAM Tier 3
K/A #	2.2.20	
Importance Rating:	2.20	3.30

Given the following plant conditions:

- Core Reload is in progress.
- The Refuel Machine is heading to the RTMZ after unloading the previous bundle.
- The Machine Operator informs you that his indications on the Refuel Console are abnormal for automatic operation.

Which ONE of the following actions is required by 78OP-9FX01, Refueling Machine Operations?

The LSRO should Immediately STOP fuel movement and...

A. Establish communications with the CRS
Perform Appendix M - Event Recovery Checklist

B. Establish communications with the Reactor Engineer
Perform Appendix M - Event Recovery Checklist

C. Establish communications with the CRS
Perform Appendix K - Action Plan for Movement of a Difficult Assembly

D. Establish communications with the Containment Coordinator
Perform Appendix K - Action Plan for Movement of a Difficult Assembly

Answer: A

Learning Objective:
L114360 Identify the precautions and limitations concerning the refuel machine.

Reference Id:	Q10181	
Difficulty:	4.00	
Time to complete:	4	
10CFR Category:	CFR 55.43 (5)	55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Comprehension / Anal	
Question Source:	New	

Comment:

Knowledge of the process for managing troubleshooting activities.

78OP-9FX01, Refueling Machine Operations, precautions and Appendix M provide guidance to the LSRO for any off normal event that is not related to Appendix K.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

35

Appears on:		SRO EXAM
		Tier 3
K/A #	2.3.2	
Importance Rating:	2.50	2.90

What is the maximum height you may access in a radiologically controlled area before you must contact RP?

A. 6 feet.

B. 8 feet.

C. 10 feet.

D. 12 feet.

Answer: A

Learning Objective:

LS69803 The LSRO will demonstrate a knowledge of the facilities ALARA program

Reference Id:	Q63778	
Difficulty:	2.00	
Time to complete:	2	
10CFR Category:	CFR 55.43 (4)	55.43 (4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.
Cognitive Level:	Memory	
Question Source:	PV Bank Not Modified	

Comment:

Knowledge of facility ALARA program.

General Employee Training

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

36

Appears on:		SRO EXAM
		Tier 3
K/A #	2.3.11	
Importance Rating:	2.70	3.20

Given the following plant conditions:

- Core reload is in progress.
- The LSRO reports that the assembly that is currently being lowered into the core is bowed and bent and that he is having difficulty trying to lower the assembly past the grid straps of the adjacent assembly.
- The assembly was bound but has come free and is continuing inward. RU-33 was in ALERT but has gone to HIGH alarm.
- There are bubbles coming through the top of the fuel assembly.

If the radiation levels allow, which ONE of the following actions should be performed first?

A. Attempt to position the fuel assembly in a stable configuration in the core.

B. Request Rad Protection to survey the area for radiation and contamination.

C. Ensure an equal number of Aux Building normal supply and exhaust fans are running.

D. Remove the damaged fuel assembly from the core and place it in the upender for transport to the Spent Fuel Pool.

Answer: A

Learning Objective:

64088	Discuss and explain the actions to be taken for Irradiated Fuel damage.
L106345	Describe, in sequence, the major steps necessary to mitigate a damaged new fuel assembly

Reference Id:	Q15714	
Difficulty:	4.00	
Time to complete:	3	
10CFR Category:	CFR 55.43 (4)	55.43 (4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.
Cognitive Level:	Comprehension / Anal	
Question Source:	PV Bank Not Modified	

Comment:

Ability to control radiation releases.

If radiation levels permit, and the fuel assembly may be moved, then perform both of the following: a. Ensure the fuel assembly is placed in a stable configuration. b. When the fuel assembly is in a stable condition, then direct all [any] remaining personnel to evacuate the area.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

37

Appears on:		SRO EXAM Tier 3
K/A #	2.4.44	
Importance Rating:	2.10	4.00

The Protective Action Recommendations (PARs) associated with the Emergency Plan provide guidance…

A. to prevent radioactive releases from the site from exceeding 10 CFR 100 limits.

B. to prevent plant workers from receiving radiation exposure in excess of 10 CFR 20 limits.

C. for sheltering and evacuation recommendations for protection of the general public.

D. for the EC for determining if potassium iodide tablets should be administered to reduce thyroid dose.

Answer: C

Learning Objective:
17290 The LSRO will demonstrate a knowledge of the emergency plan

Reference Id:	Q10182	
Difficulty:	3.00	
Time to complete:	3	
10CFR Category:	CFR 55.43 (4)	55.43 (4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions.
Cognitive Level:	Memory	
Question Source:	INPO Bank Not Modified	

Comment:
Knowledge of emergency plan protective action recommendations.

From INPO question bank: Q# 25301.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

38

Appears on: SRO EXAM

Tier 3

K/A # 2.4.4

Importance Rating: 4.00 4.30

Which ONE of the following would be an entry condition for 40AO-9ZZ21, Acts of Nature?

A. Wave motion is observed in the Spent Fuel Pool.

B. A Small Stream Flood Advisory is issued for Maricopa County.

C. Tornado warning issued for the Apache Junction, Mesa, and Tempe area.

D. Any earthquake measuring 6.0 or greater on the Richter scale occurs west of the Mississippi River.

Answer: A

Learning Objective:

L55864	Determine whether or not the Act of Nature AOP should be executed.
17308	Determine if the Acts of Nature AOP should be entered and when it may be exited.

Reference Id:	Q8480	
Difficulty:	3.00	
Time to complete:	2	
10CFR Category:	CFR 55.43 (5)	55.43 (5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
Cognitive Level:	Memory	
Question Source:	PV Bank Not Modified	

Comment:

Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

SECTION 4.0, SEISMIC EVENT may be entered when **ANY** of the following conditions exist:

- "SEISMIC OCCURRENCE" (7C14A) in alarm.
- Earthquake felt by the Unit 1 Control room Staff.

Or

- Wave motion observed in the Spent Fuel Pool

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

39

Appears on: SRO EXAM Tier 3

K/A # 5.191006K107
Importance Rating: 2.40 2.60

To control temperature in the SDC System, the mass flow rate through the tube sheet is adjusted.

To lower temperature a bypass valve is throttled _____, which causes the mass flow rate through the Heat Exchanger _____.

A. open increases

B. open decreases

C. closed increases

D. closed decreases

Answer: C

Learning Objective:
67439 Describe how heat exchanger temperatures are normally controlled.

5191006K107 K1.07 Control of heat exchanger temperatures 2.4 2.6

Reference Id: Q10185
Difficulty: 2.00
Time to complete: 2
10CFR Category: CFR 55.41 (14) 55.41 (14) Principles of heat transfer thermodynamics and fluid mechanics.
Cognitive Level: Comprehension / Anal
Question Source: New
Comment:

Control of heat exchanger temperatures.

Using the Shutdown Cooling System as an example. Each of the two heat exchangers have a bypass line and bypass valve that is used to control temperature.

To lower the temperature - the bypass valve is throttled closed. More water passes through the heat exchanger. (Mass flow rate increases) Temperature goes down.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

40

Appears on: SRO EXAM

Tier 3

K/A # 6.192001 K1.05
Importance Rating: 2.00 2.10*

To be considered a good moderator, a material should have a _____ neutron scattering cross section and a _____ fractional neutron energy loss per collision.

A. high high

B. low low

C. low high

D. high low

Answer: A

Learning Objective:
6192001K105 Identify characteristics of good moderators.

Reference Id: Q16019
Difficulty: 2.00
Time to complete: 2
10CFR Category: CFR 55.41 (1) 55.41 (1) Fundamentals of reactor theory, including fission process, neutron multiplication, source effects, control rod effects, criticality indications, reactivity coefficients, and poison effects.
Cognitive Level: Memory
Question Source: New
Comment:

Identify characteristics of good moderators. (This KA statement is rated >2.5 for PVNGS)

Three fundamental properties of a good moderator are:

- Large macroscopic scattering cross section. The moderator material should have a high probability of scattering reactions with neutrons.
- Low macroscopic absorption cross section. The moderator material should have a low probability of absorption reactions with neutrons since absorption by the moderator results in a loss of neutrons available to cause fission.
- Large average fractional energy loss per collision. The greater the fractional energy loss per collision, the more efficiently the neutron is slowed down to thermal energy. This means that less collisions will be required and the total distance traveled by the neutron while slowing down will be shorter.

Proposed references to be provided to applicants during examination: NONE

2004 LSROI NRC Exam

Cognitive Level Summary

Number of questions linked:	40	Percentage
Memory	18	45
Comprehension / Analysis	22	55

Question Source Summary

Number of questions linked to source:	40	Percentage
New		
New	14	35
Modified		
INPO Bank Modified	0	
PV Bank Modified	1	
Total Modified	1	2.5
Bank		
INPO Bank Not Modified	0	
PV Bank Not Modified	25	
Total BANK	25	62.5