Final Submittal
(Blue Paper)

1. Senior Operator Written Examination

MCGUIRE JUNE 2003 EXAM
50-369/2003-301 AND
50-370/2003-301

JUNE 16 - 30, 2003

U.S. Nuclear Regulatory Commission
Site-Specific
SRO Written Examination

Applicant Information	
Name:	
Date: June 30,2003	Facility/Unit: McGuire
Region: II	Reactor Type: Westinghouse
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with a 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require an 80.00 percent to pass. You have eight hours to complete the combined examination, and three hours if you are only taking the SRO portion.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results	
RO / SRO-Only / Total Examination Values	____ / ____ / ____ Points
Applicant's Scores	____ / ____ / ____ Points
Applicant's Grade	____ / ____ / ____ Percent

1 Pt. Given the following conditions:

- Unit 1 is in a refueling outage.
- Fuel movement is in progress.
- The Spent Fuel Pool Level Low computer alarm has actuated.
- Initially 1EMF 17 (SPENT FUEL BLDG. REFUEL. BRDG) was reading radiation 7 mrem/hr.
- After 20 minutes 1EMF-17 is 18 mrem/hr.

Which one (1) of the following describes the operator response to the current conditions?

A. Begin makeup to the pool from the Boric Acid Tank to restore level.

B. Move the fuel transfer cart to the reactor side and close 1KF-122 (*Fuel Transfer Tube Block Valve*).

C. Move the fuel transfer cart to the spent fuel (pit) side and close 1KF-122 (*Fuel Transfer Tube Block Valve*).

D. Place the weir gate in position and inflate the seals.

1 Pt. Unit 1 is in mode 4.

Given the following conditions:

(1) Surveillance testing has been recently completed on the ice condenser
(2) The surveillance test was not satisfactory as described below

Which one (1) of the following situations meets the requirements for a one hour Tech Spec LCO?

A. The ice condenser door position monitoring system was declared inoperable when one door did not indicate in the open position during a surveillance test. The door was left in the open position.

B. The ice bed was declared inoperable when it was determined that it failed a surveillance test based on total ice weight less than 2,099,790 pounds at a 95% level of confidence.

C. The Ice Bed Temperature Monitoring System was declared inoperable when it failed a Tech Spec surveillance test - channel check failure.

D. The ice condenser intermediate deck door was declared inoperable when it was discovered to be obstructed from opening by ice and debris.

1 Pt. Unit 1 is preparing for a reactor start up following a refueling outage. Given the following conditions:

- T_{avg} = 515 °F
- Plant heatup in progress using NCPs

At 0200, a Station Engineer reports that a mistake had been made in analyzing the containment Appendix J Leak Rate Test results that were conducted prior to exceeding 200 °F in mode 5. Reanalysis indicated that the combined containment leak rate (Type A) had exceeded 1.0 L_a.

Which one of the following actions are required by Tech Specs in response to this situation?

REFERENCES PROVIDED

A. Commence a plant cooldown to reach mode 5 within 36 hours.

B. Commence a plant cooldown to reach mode 5 within 37 hours.

C. Commence a plant cooldown to reach mode 5 within 42 hours.

D. Commence a plant cooldown to reach mode 5 within 43 hours.

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1 Pt

Which one of the following statements complies with the requirements of OMP 4-3 (*EP/AP Implementation Guidelines*) regarding the rules of usage for abnormal procedures (APs) when the emergency procedures (EPs) have been implemented?

A. APs may not be implemented when EPs have been entered.

B. Only one AP at a time may be implemented when EPs have been implemented. Concurrent implementation of APs when EPs are in use is not allowed.

C. APs may be implemented concurrently with EPs. However, the APs were written assuming that SI has not actuated and operators must be careful when using APs if SI has occurred.

D. APs may be implemented concurrently with EPs with the exception of events where SI has actuated. APs were written assuming the SI had not occurred and cannot be used if SI has actuated.

5

1 Pt. *Unit 2 is operating at 100% power. 2NI-59 (Cold Leg Accumulator Check Valve) begins to leak at 0200. Given the following accumulator indications:*

Time	**0200**	**0300**	**0400**	**0500**
Level (%)	21%	31%	41%	51%
Pressure (psig)	586	611	636	661
Boron (ppm)	2500	2490	2480	2470

When does the accumulator first exceed a limiting condition for operation?

REFERENCES PROVIDED:

A. 0200

B. 0300

C. 0400

D. 0500

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1 Pt.

Unit 1 was operating at 100% when a large break LOCA with loss of offsite power occurs. One diesel generator fails to start. The operators are entering E-1 *(Loss of Reactor or Secondary Coolant).*

Given the following critical safety function status indications:

- Core Cooling – RED
- Subcriticality – GREEN
- Containment – RED
- Inventory - GREEN
- Heat Sink – RED
- Integrity – RED

Which one of the following describes the highest priority problem, and the appropriate operator action?

A. **Integrity; Transition to FR-P.1, *(Response to Imminent Pressurized Thermal Shock).***

B. **Core cooling; Transition to FR-C.1, (*Response to Inadequate Core Cooling).***

C. **Heat Sink; Transition to FR-H.1, *(Response to Loss of Secondary Heat Sink).***

D. **Containment; Transition to FR-Z.1, *(Response to High Containment Pressure).***

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1 Pt. Unit 1 is operating at 100% power when the OAC registers a low spent fuel pool level alarm. Given the following events and conditions:

- The operators read –2.1 ft SFP level and stable on the main control board.
- The operating KF pump has tripped.
- An NLO reports a large leak in the auxiliary building has stopped.
- Normal SFP makeup is not available.

Which one of the following statements correctly describes the corrective action for this event?

A. **Implement AP/1/A/5500/41 (*Loss of Spent Fuel Cooling or Level*), find and isolate the leak on the KF discharge piping.**

B. **Implement AP/1/A/5500/41 (*Loss of Spent Fuel Cooling or Level*), find and isolate the leak on the KF suction piping.**

C. **Implement AP/1/A/5500/21 (*Loss of KC or KC System Leakage*), and initiate assured makeup due a leak on the discharge piping.**

D. **Implement AP/1/A/5500/21 (*Loss of KC or KC System Leakage*), and initiate assured makeup due to a leak on the suction piping.**

8

1 Pt. Unit 2 is operating at 100 % power. Given the following events and conditions:

- "B" essential train components are in service.

The Test Group Supervisor comes to you the Control Room SRO and wants to perform valve stoke testing.

Which one of the following valves would you ***NOT*** allow testing?

A. **0RN-1 (*LLI Supply to RN*)**

B. **2RN-40A (*Train A to Non- Ess Hdr Isol*)**

C. **0RN-7A (*Train 1A & 2A SNSWP Supply*)**

D. **2RN-64A (*AB Non-Ess Return Isol*)**

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1 Pt. Which one of the following is a correct list of SAFETY LIMITS?

A. Thermal Power, RCS Highest Loop Tave and Pressurizer Pressure.

B. Thermal Power, AFD, Pressurizer Pressure.

C. AFD, QPTR and Reactor Power.

D. Linear Heat Generation Rate, Thermal Power and QPTR.

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1 Pt. Unit 1 has experienced a 50% load rejection which resulted in Control Bank "D" Group 1 being greater than 12 steps misaligned from its associated step counter. Tech Spec 3.1.4 Rod Control Group Alignment Limits states:

"All shutdown and control rods shall be OPERABLE; with all individual indicated rod positions within12 steps of their group step counter demand position".

Which one of the following is the bases for this Tech Spec?

A. Ensure SDM limits are maintained and QPTR is maintained within limits.

B. Ensure power distribution and SDM limits are preserved.

C. Ensure QPTR is maintained within limits and rod alignments are correct.

D. Ensure AFD is maintained and limit power distribution.

11

1 Pt. Unit 1 is operating at 100% power when the following occurs:

- LOCA outside containment
- The leak can not be isolated
- Containment Sump Level is Normal
- FWST level is 178"
- FWST has not ruptured

Which of the following procedures would be used to MITIGATE the event?

A. ECA-1.1 (*Loss of Emergency Coolant Recirc*)

B. ECA-1.2 (*LOCA Outside Containment*)

C. ES-1.2 (*Post LOCA Cooldown and Depressurization*)

D. ES-1.3 (*Transfer to Cold Leg Recirc*)

12

1 Pt. Given the following conditions:

- Pressurizer Level Channel 1 is at 28% level
- Pressurizer Level Channel 2 associated bistables are in the tripped condition due to surveillance testing
- Pressurizer Level Channel 3 fails high.
- N-41 is 8%
- N-42 is 10%
- N-43 is 9%
- N-44 is 9%
- Impulse pressure channel 1 is 11%
- Impulse pressure channel 2 is 9%
- No reactor trip has occurred

Which of the following describes the proper operator response?

A. Trip the reactor and enter E-0 (*Reactor Trip or Safety Injection*)

B. Trip the reactor and enter FR-S.1 (*Response Nuclear Power Generation/ATWS*)

C. Do not trip the reactor because thermal power is less than P-7

D. Do not trip the reactor. Initiate unit shutdown.

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1 Pt. Given the following conditions on Unit 1:

- A steam leak has occurred on the main steam header
- Unit 1 reactor has been tripped and safety injection has actuated
- The MSIVs will not close
- 20 minutes into the event lowest loop NC Tcold is 305 degrees

Based on the above conditions which one of the following is the correct procedure flowpath?

A. **From E-0 *Reactor Trip or Safety Injection* GO TO FR-P.2 (*Response to Anticipated Pressurized Thermal Shock)***

B. **From E-0 go directly to ECA 2.1, (*Uncontrolled Depressurization of all Steam Generators)***

C. **From E-0 GO TO FR-P.1, (*Response to Imminent Pressurized Thermal Shock)***

D. **From E-0 GO TO E-2, (*Faulted Steam Generator Isolation)* and then to ECA 2.1**

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1 Pt. Given the following conditions on Unit 1:

- Chemistry had confirmed two leaking fuel rods
- A large break LOCA occurs
- E-0 *Reactor Trip or Safety Injection* is complete
- ES-1.3 *Transfer to Cold Leg Recirc* is complete
- E-1 *Loss of Reactor or Secondary Coolant* is complete
- ES-1.2 *Post LOCA Cooldown and Depressurization* is in effect.
- All Red and Orange Paths have been addressed
- 1EMF 51A is reading 39R/HR
- Pressurizer level is 0%

The SRO is currently considering implementing Yellow Path procedures. Which one of the following describes proper procedure implementation?

A. Go to FR-I.3, (*Response to Voids in the Reactor Vessel)* and exit ES-1.2

B. Stay in ES-1.2 and implement FR-I.3 concurrently

C. Go to FR-Z.3, (*Response to High Containment Radiation Level)* and exit ES-1.2

D. Stay in ES-1.2 and implement FR-Z.3 concurrently

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1 Pt(s) Given the following conditions on Unit 1:

- Mode 3
- NC System is at 1700 psig and 450 degrees
- In process of cooling down and depressurizing the NC System
- Safety Injection has occurred
- NC Pressure going down in an uncontrolled manner
- Containment pressure going up in uncontrolled manner

Which one of the following describes the proper procedures to mitigate the above?

A. Enter AP/35 (*ECCS Actuation During Plant Shutdown*) and then go to E-0 (Reactor Trip or Safety Injection).

B. Enter E-0 and then go to AP/35

C. Enter AP/35 and then go to AP/34 (Shutdown LOCA)

D. Enter E-0 and then go to E-1 (*Loss of Reactor or Secondary Coolant*).

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1 Pt

Given the following conditions on Unit 1:

- Unit 1 is at 100% power.
- 'A', 'B', and 'C' VL AHU are running
- 'A' and 'C' VL AHUs have tripped and will not restart
- Attempts to start 'D' VL AHU were unsuccessful
- Average temperature in lower containment for past 365 days has been 105 degrees.
- Maintenance indicated it will take two days to repair the VL AHUs.
- Containment lower compartment temperature is 126 degrees and steady.

Which one (1) of the following describes the required Technical Specification actions to address the high containment temperature?

Reference Provided

A. Restore temperature to within limits in 8 hours.

B. Reduce temperature to <125 degrees in 72 hours.

C. No action is required to address high containment temperature.

D. Be in Mode 3 in 14 hours.

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1 Pt. Given the following conditions on Unit 1:

- In Mode 5 cooling down for a refueling outage.
- The '1B' ND pump tripped due to an electrical fault.
- The '1A' ND pump has been started per AP/1/A/5500/19 (*Loss of ND or ND System* Leakage) Encl. 14 (*Startup of ND Pumps*)
- NC temperature before the pump trip was 150 degrees
- NC temperature has increased to 207 degrees.
- AP/1/A/5500/19 (*Loss of ND*) is in effect

The SRO instructs the RO to cooldown to the pre-event temperature.

Which one (1) of the following describes the maximum cooldown rate and minimum flow rate allowed to cooldown?

REFERENCES PROVIDED

A. Maximum cooldown rate of 50 degrees/hr and minimum flow rate of 1500 gpm.

B. Maximum cooldown rate of 75 degrees/hr and minimum flow rate of 1000 gpm

C. Maximum cooldown rate of 50 degrees/hr and minimum flow rate of 2000 gpm.

D. Maximum cooldown rate of 75 degrees/hr and minimum flow rate of 1500 gpm.

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1 Pt. As a result of thunderstorms Unit 2 has experienced a Loss of Offsite Power and Reactor trip. E-0 (*Reactor Trip or Safety Injection*) was implemented and the crew has transitioned to ES-0.1 (*Reactor Trip Response*).

The SRO asks the RO to check NC temperatures.

Which one (1) of the following would the RO use to describe the response of the NC system?

A. NC Tave STABLE or trending to 557 degrees

B. NC T hots STABLE or trending to 553 degrees

C. NC T colds STABLE or trending to 557 degrees

D. NC Tave STABLE or trending to 553 degrees.

19

1 Pt. Radwaste is in the process of releasing WGDT 'A'. 1EMF -36 L is *inoperable due to PM. Trip 2 is received on* 0EMF-50 (*Waste Gas Discharge*). The gaseous waste release is secured as a result of 1WG-160 closing. Radwaste calls the control room SRO and reports 0EMF-50 has been purged and is ready to reinitiate the release.

Which one (1) of the following describes the actions of the control room SRO?

A. The SRO can authorize up to two (2) restarts without re-sampling.

B. The SRO has Radwaste terminate the release and existing GWR paperwork, and generate new paperwork.

C. The SRO can authorize one (1) restart without re-sampling.

D. The SRO can authorize Radwaste to jumper control actions of 0EMF-50, restart release and take grab samples once per four (4) hours during release.

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1 Pt. Given the following conditions on Unit 1:

- SGTR in the '1A' S/G
- E-0 (*Reactor Trip or Safety Injection*) complete
- E-3 (*Steam Generator Tube Rupture*) implemented.
- Cooldown is secured due to operator exceeding Main Steam Isolation set point.

Which one (1) of the following describes how the operator continues to cooldown?

A. Go to Bypass Interlock on steam dumps and continue cooldown with steam dumps.

B. Reset Main Steam Isolation, open MSIVs and continue cooldown with steam dumps.

C. Reset Main Steam Isolation and PORVs and continue cooldown using PORVs in manual.

D. Reset Main Steam Isolation and PORVs and continue cooldown using PORVs in automatic.

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1 Pt. Given the following:

- Both Units operating at 100% power.
- 'A' train RN is operating on both units.
- Operations Test Group is performing 'B' train RN valve stroke timing.
- SRO is instructed to evaluate the consequences of stroking 0RN-284B (*Train 1B and 2B Discharge to RC*)

Which one of the following describes the consequences of allowing the technician to test this valve?

A. No consequences due to 'A' Train RN running on both units.

B. Closing 0RN-284B will isolate the RN non-essential header return from Unit 2.

C. Closing 0RN-284B will isolate the RN non-essential header return from Unit 1.

D. Closing 0RN-284B will isolate RV pump discharge.

1 Pt. Which one of the following describes the bases for prioritizing Critical Safety Functions (CSF)?

A. The CSFs are prioritized to address challenges to the boundaries that protect the general public from exposure to radiation.

B. The CSFs are prioritized to address design bases accidents that are described in the USFAR.

C. The CSFs are prioritized to ensure the proper optimal response procedure is implemented.

D. The CSFs are prioritized to address challenges to parameters that would affect operation of Engineered Safeguard Features equipment.

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1 Pt(s) After Channel 1 7300 Process Control Cabinet Channel Operability Test was completed the Unit 1 Pressurizer level master malfunctions causing it to demand full output while in automatic.

Which one of the following statements correctly describes the basis for the McGuire limit on flow?

A. **Letdown flow rates in excess of 135 gpm are limited to ensure proper demineralizer operation and adhere to the design limits of the letdown piping.**

B. **Letdown flow rates in excess of 120 gpm exceed the design limits of the letdown orifice valves and induce resonance vibration.**

C. **Charging flow rates in excess of 100 gpm during normal operation can induce vibration in the regenerative heat exchanger tubes.**

D. **Charging flow rates between 65 gpm and 100 gpm total charging flow will cause flashing in the regenerative heat exchanger.**

24

1 Pt(s) As an SRO working on a 'Complex Maintenance Plan' you are asked to evaluate four possible work teams who must repair filter housing in a 1500 mRem/hr radiation field.

Which one of the following work teams would maintain station ALARA?

A. **A qualified male worker who has previously performed this task. He can complete this job in 20 minutes. This worker has exceeded his 'Alert' level for exposure and will require a dose extension.**

B. **Two male workers who are qualified to perform the task. Together they can perform the task in 15 minutes. Both workers have already accumulated 325 mRem this year.**

C. **A team of a female worker who is qualified to perform the task and a male worker who needs to qualify to this task. The female is a declared pregnant worker. The team will need 15 minutes to complete the task. The female has no dose and the male worker has 200 mRem for the year.**

D. **A team of a male and female both are qualified to the task but will take 20 minutes to complete the task. Each has less than 100 mRem this year.**

1 Pt(s)

The following conditions exist on Unit 1:

- Reactor power is 100%
- 1A CA Pump is running with 1CA-60A (1A CA Pump Disch to 1A S/G Control) and 1CA-56 (1A CA Pump Disch to 1B S/G Control) closed for post maintenance testing.
- N/R level in 1B S/G increases to 84% due to 1CF-23 (1B S/G Control Valve) failing open.

Which one of the following statements correctly describes the response of the CA system to the above conditions?

A. **1A CA Pump remains running**
1B CA pump auto starts
1CA-60A and 1CA-56A fail open
1CA-44B (1B CA Pump Disch to 1C S/G Control) and 1CA-40B (1B CA Pump to Disch to 1D S/G Control) do not reposition.
Depressing the MD CA Modulating Valve Reset Train 'A' pushbutton will cause 1CA-60A and 1CA-56A to close.

B. **1A CA Pump remains running**
1B CA pump auto starts
1CA-60A and 1CA-56A remain closed.
1CA-44B and 1CA-40B fail closed.
Depressing the MD CA Modulating Valve Reset Train 'A' pushbutton will cause 1CA-60A and 1CA-56A to open

C. **1A CA Pump trips**
1B CA pump remains off
1CA-60A and 1CA-56A remain closed.
1CA-44B and 1CA-40B do not change position.
Depressing the MD CA Modulating Valve Reset Train 'A' pushbutton will cause 1CA-60A and 1CA-56A to open.

D. **1A CA Pump trips**
1B CA Pump remains off
1CA-60A and 1CA-56A fail open
1CA-44B and 1CA-40B fail open.
Depressing the MD CA Modulating Valve Reset Train 'A' pushbutton will cause 1CA-60A and 1CA-56A to close.

ANSWER KEY REPORT

for McGuire SRO Upgrade test Test Form: 0

#	ID	Points	Type	Answers
1	ANSWER_KEY 1	1.00	MCS	C
2	ANSWER_KEY 2	1.00	MCS	D
3	ANSWER_KEY 3	1.00	MCS	B
4	ANSWER_KEY 4	1.00	MCS	C
5	ANSWER_KEY 5	1.00	MCS	C
6	ANSWER_KEY 6	1.00	MCS	B
7	ANSWER_KEY 7	1.00	MCS	A
8	ANSWER_KEY 8	1.00	MCS	A
9	ANSWER_KEY 9	1.00	MCS	A
10	ANSWER_KEY 10	1.00	MCS	B
11	ANSWER_KEY 11	1.00	MCS	A
12	ANSWER_KEY 12	1.00	MCS	D
13	ANSWER_KEY 13	1.00	MCS	D
14	ANSWER_KEY 14	1.00	MCS	D
15	ANSWER_KEY 15	1.00	MCM	A (1.00) D (1.00)
16	ANSWER_KEY 16	1.00	MCS	C
17	ANSWER_KEY 17	1.00	MCS	D
18	ANSWER_KEY 18	1.00	MCS	C
19	ANSWER_KEY 19	1.00	MCS	B
20	ANSWER_KEY 20	1.00	MCS	C
21	ANSWER_KEY 21	1.00	MCS	B
22	ANSWER_KEY 22	1.00	MCS	A
23	ANSWER_KEY 23	1.00	MCS	C
24	ANSWER_KEY 24	1.00	MCS	A
25	ANSWER_KEY 25	1.00	MCS	A
SECTION 1 (25 items)		**25.00**		