

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

Applicant Information

Name: MASTER

Date: May 10, 2004

Facility/Unit: Davis Besse U1

Region: III

Reactor Type: BW

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 0.0 / 25.0 / 25.0 Points

Applicant's Scores _____ / _____ / _____ Points

Applicant's Grade _____ / _____ / _____ Percent

PART A - GENERAL GUIDELINES FOR TAKING NRC EXAMINATIONS

1. **[Read Verbatim]** Cheating on any part of the examination will result in a denial of your application and/or action against your license.
2. If you have any questions concerning the administration of any part of the examination, do not hesitate asking them before starting that part of the test.
3. SRO applicants will be tested at the level of responsibility of the senior licensed shift position (i.e., shift supervisor, senior shift supervisor, or whatever the title of the position may be).
4. You must pass every part of the examination to receive a license.
5. The NRC examiner is not allowed to reveal the results of any part of the examination until they have been reviewed and approved by NRC management. Grades provided by the facility licensee are preliminary until approved by the NRC. You will be informed of the official examination results about 30 days after all the examinations are complete.

PART B - WRITTEN EXAMINATION GUIDELINES

1. **[Read Verbatim]** After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received nor given assistance in completing the examination.
2. To pass the examination, you must achieve a grade of 80.00 percent or greater; grades will not be rounded up to achieve a passing score. Every question is worth one point.
3. For an initial examination, the nominal time limit for completing the examination is six hours; extensions will be considered under extenuating circumstances.
4. You may bring pens, pencils, and calculators into the examination room. Dark pencil should be used to facilitate machine grading.
5. Print your name in the blank provided on the examination cover sheet and the answer sheet. You may be asked to provide the examiner with some form of positive identification.
6. Mark your answers on the answer sheet provided. Use only the answer sheets provided. If you decide to change your original answer, erase your selected answer completely and enter the desired answer. If the examiner is unable to determine which of the marks on your answer sheet is your selected answer because of poor erasure, the question will be marked incorrect and no credit will be given.
7. If you have any questions concerning the intent or the initial conditions of a question, do *not* hesitate asking them before answering the question. Ask questions of the NRC examiner or the designated facility instructor *only*. When answering a question, do *not* make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question. For example, you should not assume that any alarm has activated unless the question so

states or the alarm is expected to activate as a result of the conditions that are stated in the question. Finally, answer all questions based on actual plant operation, procedures, and references. If you believe that the answer would be different based on simulator operation or training references, you should answer the question based on the *actual plant*.

8. Restroom trips are permitted, but only one applicant at a time will be allowed to use the restroom.
9. When you complete the examination, assemble a package including the examination cover sheet you have to sign and the answer sheets. Give it to the NRC examiner or proctor. Remember to sign the statement on the examination cover sheet indicating that the work is your own and that you have neither given nor received assistance in completing the examination. Your examination will be turned over to the station's training department for review/retention/destruction.
10. After you have turned in your examination, leave the examination area as defined by the proctor or NRC examiner. If you are found in this area while the examination is still in progress, your license may be denied.
11. Do you have any questions?

QUESTION: 001 (1.00)

The following plant conditions exist:

- The plant is at 100% power.
- All systems are in a normal lineup.
- The RCS pressure input signal to the heaters, spray and PORV spiked, causing the PORV to temporarily lift. No change occurred to actual RCS pressure to cause the spike.
- Quench tank level is increasing at a rate equivalent to 15 gpm.
- No operator action has been taken.

Which one of the following Limiting Conditions for Operation is required to be entered?

- a. Technical Specification 3.4.3, Safety Valves and PORV - Operating
- b. Technical Specification 3.4.6.2, RCS Operational Leakage
- c. Technical Requirements Manual 3.4.9, Pressurizer
- d. Technical Requirements Manual 3.4.11, RCS Vents

QUESTION: 002 (1.00)

The following plant conditions exist:

- The plant is at 100% power.
- CCW surge tank level is slowly decreasing.
- All other plant parameters are normal.

Which one of the following annunciator responses would require a power reduction in order to stop one of the RCPs? (Assume in each case that the only plant parameter that is abnormal is the one causing the alarm.)

- a. 6-5-C SEAL INJ FLOW LO
- b. 6-6-B AIR CLR CCW LEAK
- c. 11-1-A CCW RETURN RAD HI
- d. 11-3-A CCW SURGE TK LVL LO

QUESTION: 003 (1.00)

The following plant conditions exist:

- The plant is at 100% power.
- CC1411A, CCW TO CTMT, has failed closed and cannot be opened.

The _____ will reach upper temperature limit(s) that will require the reactor to be tripped in accordance with _____.

- a. Control Rod Drive Motors
DB-OP-02523, Component Cooling Water System Malfunctions
- b. Reactor Coolant Pump Motors
DB-OP-02515, Reactor Coolant Pump and Motor Abnormal Procedure
- c. Letdown Coolers
DB-OP-02512, Loss of RCS Makeup
- d. Pressurizer Quench Tank
DB-OP-02513, Pressurizer System Abnormal Operation

QUESTION: 004 (1.00)

The following plant conditions exist:

- A tube rupture has developed in SG2.
- The reactor has been tripped.

Which one of the following is the basis for reducing RCS pressure prior to beginning a cooldown?

- a. Increase HPI flow to raise boron concentration, thus raising Shutdown Margin.
- b. Decrease the leak rate to limit the boron corrosion of carbon steel in the secondary plant.
- c. Increase HPI flow to prevent the formation of a reactor head steam bubble.
- d. Decrease the leak rate to minimize the radioactivity released to atmosphere.

QUESTION: 005 (1.00)

The following plant conditions exist:

- The plant is at 100% power.
- An electrical failure has caused the loss of status indication for B Bus source breakers and D2 Bus breakers.

The plant has experienced a loss of _____. Breaker control power can be restored by transferring B Bus and D2 Bus control power to _____.

- a. Y4; Y2
- b. NNI X-AC; NNI Y-AC
- c. DBN; DBP
- d. YBU; YAU

QUESTION: 006 (1.00)

The following plant conditions exist:

- The plant was at 100% power.
- A seismic event occurred causing a service water pipe break in the TPCW header.

Action is required to isolate the break. This action will help prevent the loss of _____.

- a. Ultimate Heat Sink inventory
- b. Motor Driven Feed Pump suction supply
- c. Emergency Instrument Air Compressor cooling
- d. Cooling Tower makeup

QUESTION: 007 (1.00)

The following plant conditions exist:

- The plant is at 100% power.
- Annunciator 2-2-C, MU TK LVL LO, is in alarm.
- Annunciator 6-5-C, SEAL INJ FLOW LO, is in alarm.
- Annunciator 6-6-C, SEAL INJ TOTAL FLOW, is in alarm.
- Pressurizer level is stable at 220 inches.
- Makeup Tank level is lowering at one inch per minute.

Actions are in progress to isolate the leak using DB-OP-02522, Small RCS Leaks. Which one of the following additional procedures is required to be referenced when the leak is isolated?

- a. DB-OP-02504, Rapid Shutdown
- b. DB-OP-02512, Loss of RCS Makeup
- c. DB-OP-02513, Pressurizer System Abnormal Operation
- d. DB-OP-02515, Reactor Coolant Pump and Motor Abnormal Operation

QUESTION: 008 (1.00)

The following plant conditions exist:

- The plant is at 95% power.
- Control rod drive exercise testing is in progress.
- Group 2 has been inserted to 97%.
- Rod 2-3 remained at 97% when the rest of the group was withdrawn to 100%.
- I&C has determined a problem exists with a connector in the patch panel.

Control Rod 2-3 is . . .

- a. operable, since shutdown margin is greater than 1% $\Delta K/K$
- b. operable, since the rod is misaligned by less than 6.5%
- c. inoperable, since the rod is untrippable
- d. inoperable, since the rod is not fully withdrawn

QUESTION: 009 (1.00)

The following plant conditions exist:

- RCS temperature is 165°F.
- RCS pressure is 190 psig.
- C1 bus is de-energized for cleaning.
- Shutdown margin is determined to be less than 1%.

Which one of the following equipment combinations is acceptable for the required emergency boron flowpath?

- a. BWST to the RCS via DH Pump 2.
- b. BAAT 1 via BA Pump 2 to the RCS via DH Pump 1.
- c. BAAT 1 via BA Pump 2 to the RCS via MU Pump 2.
- d. BWST to the RCS via MU Pump 1.

QUESTION: 010 (1.00)

While operating at 50% power, BOTH intermediate range NI detectors fail LOW. Which one of the following actions must be performed? (Assume that repairs will take approximately 48 hours to complete.)

- a. Power operation may continue but the crew must trip the reactor if power drops below 5%.
- b. Power operation may continue but the Gamma-Metrics Neutron Flux Monitoring System must be operable.
- c. Within one hour, take action to place the unit in Mode 5.
- d. Within one hour, take action to place the unit in Mode 3.

QUESTION: 011 (1.00)

The following plant conditions exist:

- The plant was at 100% power.
- A serious Control Room fire has forced the evacuation of the Control Room
- A natural circulation cooldown at 50°F/hr. is in progress in order to comply with Tech. Specs.
- T_{hot} is 550°F.
- T_{cold} is 518°F.
- RCS pressure is 1400 psig.
- Due to a sudden increase in pressurizer level, the Shift Manager has determined a reactor vessel head bubble has formed.

Which one of the following actions should the Shift Manager direct or perform?

- a. Increase cooldown rate to restore adequate subcooling margin.
- b. Establish letdown flow to lower pressurizer level.
- c. Raise RCS pressure to restore adequate subcooling margin.
- d. Lower makeup flow to lower pressurizer level.

QUESTION: 012 (1.00)

The following plant conditions exist:

- The plant is at 100% power.
- The following alarms are received:
 1. Computer Point P945, SW HDR1 PRESS
 2. Computer Point Z997, SW ISO VLV TO CLNG WTR, 1399
 3. Computer Point L386, ECCS SUMP 1 LVL SMP PMP RUNNING for both ECCS Room 1 sump pumps

Procedure _____ should be implemented because _____.

- a. RA-EP-02880, Internal Flooding; the flooding will cause an unmonitored release
- b. DB-OP-02511, Loss of Service Water Pumps/Systems; a service water non-seismic pipe rupture is the cause of the flooding
- c. RA-EP-02880, Internal Flooding; the flooding could affect safe shutdown capability
- d. DB-OP-02511, Loss of Service Water Pumps/Systems; cooling has been lost to the ECCS Room coolers

QUESTION: 013 (1.00)

The plant was at 100% power. A Small Break LOCA has led to a loss of Subcooling Margin. Guidance for controlling Makeup Tank level is contained in . . .

- a. DB-OP-06001, Boron Concentration Control.
- b. DB-OP-02512, Loss of RCS Makeup.
- c. DB-OP-02000, RPS, SFAS or SFRCS Trip or SG Tube Rupture.
- d. DB-OP-02001, Letdown/Makeup Alarm Panel 2 Annunciators.

QUESTION: 014 (1.00)

The plant is at 100% power. Due to a vapor space leak on the Pressurizer, the following parameters have changed over a 10-minute time period:

- Pressurizer level has risen from 220 inches to 225 inches.
- Makeup Tank level has decreased from 80 inches to 65 inches.
- RCS pressure has decreased from 2155 psig to 2050 psig.
- MU32 demand has decreased from 20% open to 0%

Which one of the following is the consequence of the vapor space leak's effect on Pressurizer control systems?

- a. Level rise has resulted in closure of MU32, causing entry into Tech. Spec. 3.1.2.2, Boron Injection Flowpath.
- b. Energy loss has resulted in RCS pressure drop beyond the capacity of Pressurizer heaters to compensate, causing entry into Tech. Spec. 3.2.5, DNB Parameters.
- c. Level rise has exceeded the capacity for letdown to compensate causing entry into Tech. Spec. 3.4.4, Pressurizer.
- d. Energy loss has resulted in RCS pressure drop and resulting Pressurizer cooldown rate causing entry into Tech. Requirements Manual 3.4.9, Pressurizer.

QUESTION: 015 (1.00)

A steam leak has occurred inside Containment (CTMT), resulting in SFAS actuation due to high CTMT pressure. The Unit Supervisor (US) directs a Reactor Operator (RO) to verify proper operation of Containment Air Coolers (CACs), per DB-OP-02000, Table 3, CTMT Monitoring and Control. The RO reports back that the overload light is lit on CAC 1. What is the proper course of action?

- a. Block and stop CAC 1
- b. Block and switch CAC 1 to FAST speed
- c. Notify the TSC to determine whether or not the CAC should remain running.
- d. Leave CAC 1 running. Continue to monitor CAC motor and bearing temperatures.

QUESTION: 016 (1.00)

A LOCA has led to a loss of Subcooling Margin. SFRCS has tripped on low steam generator pressure due to HPI cooling. The basis for DB-OP-02000, RPS, SFAS or SFRCS Trip or SG Tube Rupture, direction to restore AFW to the isolated steam generator is to _____.

- a. minimize tube to shell differential temperature of the isolated steam generator.
- b. eliminate the need to route to the Lack of Heat Transfer section of DB-OP-02000.
- c. allow Makeup and HPI to be throttled sooner than if only one steam generator was available.
- d. maintain the capability of both steam generators for heat removal.

QUESTION: 017 (1.00)

Following a Turbine TRIP on HIGH EXHAUST HOOD TEMPERATURE, the Reactor Operator notices that the Generator Output breakers are still closed. Which one of the following actions should be taken, and why?

- a. MANUALLY trip the breakers immediately to prevent generator damage due to motoring.
- b. Initiate opening of the generator disconnects to prevent generator damage due to motoring.
- c. Wait until annunciator alarm 16-6-C, GEN REV PWR/ANTI MTR TRIP, is received to prevent turbine damage due to overspeed, then MANUALLY trip the breakers.
- d. MANUALLY trip the breakers immediately to prevent turbine damage due to overspeed.

QUESTION: 018 (1.00)

The following conditions develop while operating at 100% power:

- Annunciators
- 9-3-E, STA AIR HDR PRESS LO
- 9-1-F, INSTR AIR HDR PRESS LO
- PI 810, IA header pressure reads 88 psig and dropping.
- PI 811, SA header pressure reads 93 psig and dropping.
- The plant is reported as stable by the secondary RO.

Which ONE of the following identifies correct procedure routing given the above conditions?

- a. Enter DB-OP-02528, Loss of Instrument Air, and route to Section 2.1, Severe Loss of Instrument Air Symptoms.
- b. Enter DB-OP-02528, Loss of Instrument Air, and route to Section 2.2, Instrument Air Dryer Switching Failure Symptoms.
- c. Enter DB-OP-02528, Loss of Instrument Air, and route to Section 2.3, Air Compressor Trip Symptoms.
- d. Enter DB-OP-02528, Loss of Instrument Air, and route to Section 2.4, Stable Low Instrument Air Header Pressure Symptoms.

QUESTION: 019 (1.00)

The plant was at 100% power. Main Feed Pump Turbine (MFPT) 1 has tripped due to an oil leak. ICS is running back the plant. The Shift Manager should provide oversight . . .

- a. at the MFPT to ensure Immediate Action Maintenance is being properly performed.
- b. in the Control Room to ensure E-Plan notifications are made in a timely manner.
- c. at the MFPT to ensure unsafe behaviors are identified and stopped.
- d. in the Control Room to ensure correct implementation of procedures.

QUESTION: 020 (1.00)

The following plant conditions exist:

- 100 % power
- DH Pump 1 is out of service for motor bearing replacement

An EO reports the EDG 2 lube oil temperature is 83°F, which according to DB-OP-06316, Diesel Generator Operating Procedure, makes the EDG inoperable. Which one of the following Technical Specifications applies to these conditions?

- a. Enter T. S. 3.9.8.2 - Decay Heat Removal and Coolant Recirculation.
- b. Enter T. S. 3.0.3
- c. Enter T. S. 3.0.5
- d. Enter T. S. 3.1.2.5 - Reactivity Control System: Decay Heat Pump

QUESTION: 021 (1.00)

The plant is in Mode 5. The RCS is drained to 80 inches. Decay Heat Removal Pump 1 is running. A Shutdown Safety Contingency Plan is required if _____ is(are) removed from service for maintenance.

- a. The Motor Driven Feed Pump
- b. Spent Fuel Pool Cooling Pump 1
- c. Decay Heat Removal Pump 2
- d. The Condensate Storage Tanks

QUESTION: 022 (1.00)

Which ONE of the following procedures directs the use of emergency dosimetry when entering the Radiologically Restricted Area through the Emergency Entrance?

- a. DB-OP-02508, Control Room Evacuation
- b. DB-OP-02519, Serious Control Room Fire
- c. DB-OP-02530, Fuel Handling Accident
- d. DB-OP-02535, High Activity in the RCS

QUESTION: 023 (1.00)

The following plant conditions exist:

- Radiation Protection has detected a Hot Spot on an elbow in the discharge piping of MU Pump 2.
- A Shielding Request has been initiated to hang lead blankets from the MU Pump 2 recirculation line to reduce the dose rate.

The Shielding Request _____.

- a. can be authorized by the Shift Manager.
- b. requires a temporary modification prior to implementation.
- c. requires an Engineering Evaluation prior to implementation.
- d. can be authorized by the Manager-Radiation Protection.

QUESTION: 024 (1.00)

When using DB-OP-02000, RPS, SFAS, SFRCS Trip or SG Tube Rupture following a Reactor Trip, the first symptom checked is _____.

- a. SG Tube Rupture, to ensure all three fission product barriers are intact.
- b. SG Tube Rupture, to ensure radiation releases will be rapidly minimized.
- c. Adequate Subcooling Margin to ensure sufficient heat transfer from the core will occur.
- d. Adequate Subcooling Margin to ensure PTS concerns are addressed.

QUESTION: 025 (1.00)

The plant is at 100% power. Security reports that the site has received a credible threat specific to Davis-Besse. Which ONE of the following procedures should be implemented in addition to DB-OP-02544, Security Event or Threats?

- a. DB-OP-02504, Rapid Shutdown
- b. DB-OP-02508, Control Room Evacuation
- c. RA-EP-01500, Emergency Classification
- d. RA-EP-02870, Station Isolation

(***** END OF EXAMINATION *****)

ANSWER: 001 (1.00)
b.
REFERENCE:
DB-OP-02513, Step 4.7.4
New
Higher
000008-AA1 ..(KA's)

ANSWER: 002 (1.00)
b.
REFERENCE:
DB-OP-02006, 6-6-B
New
Higher
2.4.31 000017 ..(KA's)

ANSWER: 003 (1.00)
b.
REFERENCE:
DB-OP-02515, step 4.3.2;
OS-021, sh. 2
New
Higher
000026-AA2 ..(KA's)

ANSWER: 004 (1.00)
d.
REFERENCE:
DB-OP-02000, TBD, Vol. 3,
III.E-2
New
Higher
000038-EK1 ..(KA's)

ANSWER: 005 (1.00)
c.
REFERENCE:
DB-OP-02540, Attachment 3
New
Higher
000058-AA2 ..(KA's)

ANSWER: 006 (1.00)
a.
REFERENCE:
DB-OP-02511, Caution 4.4.1
Bank
Higher
2.1.32 000062 ..(KA's)

ANSWER: 007 (1.00)
d.
REFERENCE:
AB Discussion for
DB-OP-02522, Section 4
DB-OP-02522, Steps 4.4.1,
4.4.6, and 4.4.15
Modified
Higher
000022-AA2 ..(KA's)

ANSWER: 008 (1.00)
d.
REFERENCE:
Tech. Spec. 3.1.3.5
New
Higher
000005-AK2 ..(KA's)

ANSWER: 009 (1.00)
c.
REFERENCE:
DB-SP-03382, Step 4.1
Bank
Higher
000024-AA1 ..(KA's)

ANSWER: 010 (1.00)
d.
REFERENCE:
Technical Specifications LCO
3.3.1.1, Table 3.3-1
Technical Specifications LCO
3.0.3
Bank
Higher
000033-AA2 ..(KA's)

ANSWER: 011 (1.00)
c.
REFERENCE:
DB-OP-06903, Step 8.5
New
Higher
000067 2.1.7 ..(KA's)

ANSWER: 012 (1.00)
c.
REFERENCE:
RA-EP-02880, Step 5.0
New
Higher
BW/A07-AA2.2

ANSWER: 013 (1.00)
c.
REFERENCE:
DB-OP-02000, Att. 13
New
Higher
004-A4.13 ..(KA's)

ANSWER: 014 (1.00)
b.
REFERENCE:
Tech. Spec. 3.2.5
New
Higher
010-K6.02 ..(KA's)

ANSWER: 015 (1.00)
d.
REFERENCE:
DB-OP-02000, Table 3
DB-OP-06016, Section 5.1
New
Higher
2.1.20 022 ..(KA's)

ANSWER: 016 (1.00)
d.
REFERENCE:
DB-OP-02000 Basis and
Deviation Document, step 5.7
New
Higher
039-A2.01 ..(KA's)

ANSWER: 017 (1.00)

c.

REFERENCE:

DB-OP-02500, step 4.1.5

DB-OP-02500 Discussion

Modified

Higher

045-A2.15 ..(KA's)

ANSWER: 018 (1.00)

a.

REFERENCE:

DB-OP-02528: Symptoms

Modified

Higher

2.4.4 079 ..(KA's)

ANSWER: 019 (1.00)

d.

REFERENCE:

DBBP-OPS-0001, pg 93

New

Higher

2.1.6 ..(KA's)

ANSWER: 020 (1.00)

c.

REFERENCE:

T. S. 3.0.5 basis

Bank

Higher

2.1.33 ..(KA's)

ANSWER: 021 (1.00)

c.

REFERENCE:

DB-OP-06904, Att. 3

New

Higher

2.2.18 ..(KA's)

ANSWER: 022 (1.00)

b.

REFERENCE:

DB-OP-02519, Att. 3

New

Higher

2.3.5 ..(KA's)

ANSWER: 023 (1.00)

c.

REFERENCE:

DB-HP-01802, step 3.1.1

Bank

Higher

2.3.10 ..(KA's)

ANSWER: 024 (1.00)

c.

REFERENCE:

B&W Technical Basis

Document, Vol. 3, page II.A-3

New

Higher

2.4.22 ..(KA's)

ANSWER: 025 (1.00)

c.

REFERENCE:

DB-OP-02544, step 4.3.2

New

Higher

2.4.28 ..(KA's)

(***** END OF EXAMINATION *****)

A N S W E R K E Y

001 b	009 c	017 c
002 b	010 d	018 a
003 b	011 c	019 d
004 d	012 c	020 c
005 c	013 c	021 c
006 a	014 b	022 b
007 d	015 d	023 c
008 d	016 d	024 c
		025 c

(***** END OF EXAMINATION *****)