U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-282; 50-306
License Nos:	DPR-42; DPR-60
Report No:	50-282/99302(OL); 50-306/99302(OL)
Licensee:	Northern States Power Company
Facility:	Prairie Island Nuclear Generating Plant
Location:	1717 Wakonade Dr. East Welch, MN 55089
Dates:	December 8, 1999
Examiner:	Dell McNeil, Senior Operations Inspector
Approved by:	David E. Hills, Chief, Operations Branch Division of Reactor Safety

EXECUTIVE SUMMARY

Prairie Island Nuclear Station
NRC Examination Report 50-282/99302(OL); 50-306/99302(OL)

A Prairie Island Nuclear Station training department developed, and NRC approved, initial operator licensing retake written examination was administered to one license applicant.

Results:

The applicant passed the retake written examination and was issued a Reactor Operator's license.

Examination Summary:

The written operator licensing examination submitted by the facility licensee was within the range of acceptability expected by the NRC. The examination was prepared and administered in accordance with the guidelines of NUREG 1021, "Operator Licensing Examination Standards for Power Reactors". (Sections O5.1, O5.2)

Report Details

I. Operations

O5 Operator Training and Qualification

O5.1 Pre-Examination Activities

a. Scope

The Prairie Island Nuclear Station training staff used the guidance prescribed in NUREG 1021, "Operator Licensing Examination Standards for Power Reactors", Revision 8, April 1999, to prepare the written examination.

b. Observations and Findings

Outline/Examination Submittal

The licensee submitted the written examination outline and the written examination on schedule. The submitted outline and the proposed examination generally met all the standards of NUREG 1021 and contained all the required knowledge and ability test items necessary to adequately evaluate the applicant. Any changes made to the proposed examination were agreed upon between the NRC and the facility and were in accordance with NUREG-1021, Revision 8.

c. Conclusions

The written operator licensing examination submitted by the facility licensee was within the range of acceptability expected by the NRC.

O5.2 Examination Activities

a. Scope

The NRC authorized the Prairie Island Training Department to administer the retake written examination on December 8, 1999.

b. Observations and Findings

Written Examination

The administration of the written examination was not observed by NRC examiners. However, discussions with the station's examination proctor indicated that the examination was administered in accordance with NUREG 1021 guidelines. The proctor contacted a regional NRC examiner prior to the start of the examination to ensure someone would be available to assist if there were any difficulties with the exam's administration. Shortly before the expiration of the allowed five hours for the examination, the proctor requested an additional 30 minutes for the applicant to complete the examination. The request was granted, and the applicant completed the examination in approximately five hours, ten minutes.

The examination did not involve use of the site specific simulator; therefore, no simulation facility report was necessary.

c. Conclusions

The examination was administered in accordance with the guidelines in NUREG 1021.

O5.3 Post Examination Activities

a. Examination Scope

The NRC examiner graded the applicant's written examination in accordance with the guidelines contained in ES-403 of NUREG 1021.

b. Observations and Findings

The NRC examiner did not identify any significant concerns with the applicant's performance on the written examination. The NRC examiner did not evaluate the overall quality of the licensee's training program due to the small sampling size taking the written examination.

c. Conclusions

The examiner did not identify any significant issues during the post examination activities.

V. Management Meetings

X1 Exit Meeting Summary

The chief examiner presented his observations and findings to the Superintendent of Operations Training via telecommunications on December 14, 1999. The superintendent acknowledged the findings presented and indicated that no proprietary information had been identified during the review nor administration of the examination.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Kempkes, Training, Operations Instructor
D. Westphal, Superintendent, Operations Training

NRC

S. Ray, Senior Resident Inspector, Prairie Island

INSPECTION PROCEDURES USED

None

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
DRS	Division of Reactor Safety
JPM	Job Performance Measure
NRC	Nuclear Regulatory Commission
OL	Operator Licensing
RO	Reactor Operator

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

Applicant Information	
Name: MASTER EXAMINATION	Region: III
Date: DECEMBER 8, 1999	Facility/Unit: PRAIRIE ISLAND
License Level: RO	Reactor Type: W
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

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

_____
Applicant's Signature

Results		
Examination Value	100.0	Points
Applicant's Score	_____	Points
Applicant's Grade	_____	Percent

QUESTION: 001 (1.00)

Which of the following occur if the detector voltage to 1N51 fails to 0 volts?

a. A loss of detector voltage annunciator will alarm on the control board.

b. A loss of detector voltage alarm will come in on ERCS.

c. The N51 plasma display will turn off.

d. A non-operate light on the rack mounted signal processor will illuminate.

QUESTION: 002 (1.00)

If one Intermediate Range Compensated Ion Chamber Detector is UNDER-COMPENSATED, then:

a. A reactor trip will occur during startup because P-6 does not energize and the source range high flux trip cannot cannot be blocked.

b. P-6 may not energize after a reactor trip.

c. P-6 energizes much sooner than normal during a reactor startup.

d. P-6 de-energizes much sooner than expected after a reactor trip from power operation.

QUESTION: 003 (1.00)

Which of the following trends would indicate that natural circulation has NOT yet been established?

a. Subcooling based on core exit T/C's increasing.

b. Incore T/C's slowly decreasing.

c. Steam generator pressures stable at 1005 psig.

d. Cold leg temperatures stable with hot leg temperatures increasing.

QUESTION: 004 (1.00)

Unit 1 reactor trips from 100% power due to a spurious signal from the reactor protection system. At step 2 of 1E-0, Reactor Trip and Safety Injection, the operator notes that none of the turbine stop, control, or intercept valves have closed.

If left uncorrected, this malfunction is likely to result in a(n):

a. Loss of condenser vacuum, resulting in the loss of condenser steam dumps.

b. Uncontrolled cooldown of the RCS, resulting in SI on low PRZR pressure.

c. Auto closure of both MSIV's, isolating steam flow to the turbine.

d. Generator lockout, followed by overspeed of the main turbine and possible damage.

QUESTION: 005 (1.00)

Plant conditions:

- Unit 1 is operating at 100% power.
- 1CV-31255 (Letdown Isolation Valve) has a broken instrument air supply line.
- 1R-9 Letdown Monitor reads 15 R/hr.
- Pressurizer level is 41% and is going up at 1% every 3 minutes
- Maintenance reports it will take about 30 minutes to repair the air line.

Which of the following actions should be taken with respect to the letdown system problem?

a. Repair the valve and reestablish normal letdown.

b. Establish an alternate letdown path to the PRT.

c. Stop all charging pumps to stabilize pressurizer level.

d. Place excess letdown in service with return to VCT.

QUESTION: 006 (1.00)

The following plant conditions exist:

- Steam Generator A steam flow: 0.005 E6 lbm/hr and stable
- Steam Generator B steam flow: 0.9 E6 lbm/hr and decreasing
- Steam Generator A WR level: 70% and stable
- Steam Generator B WR level: 40% and decreasing
- Turbine Driven AFW pump: running
- Motor Driven AFW pump: running
- Average RCS temperature: 516 degrees F and decreasing
- Containment pressure: 5 psig and increasing

If no operator action has been taken, which of the following indicates the status of the main steam isolation valves (MSIV's)?

	MSIV A	MSIV B
a.	open	open
b.	open	shut
c.	shut	open
d.	shut	shut

QUESTION: 007 (1.00)

Which of the following is a situation allowing safety tags to be removed from equipment?

a. A partial restoration is requested on a work order cross-referenced to another work order.

b. The method for doing a temporary lift and the requirements for rehanging the tags are included in the procedure.

c. With a temporary restoration, the equipment can be returned to service while awaiting parts to complete the job.

d. With a temporary restoration, the system can be restored while the workers are leaving for the weekend.

QUESTION: 008 (1.00)

The following plant conditions exists:

- Reactor power: 8% and stable
- Turbine rolling: 1800 RPM
- 11 Main Feedwater Pump: running
- 12 Main Feedwater Pump: off
- 11 Condensate Pump: running
- 12 Condensate Pump: off
- 13 Condensate Pump: off in standby

Lube oil pressure to 11 Main Feedwater Pump decreases to 5 psig. Which of the following will result?

a. 12 MFP automatically starts to maintain feed flow.

b. Turbine trip due to both MFP's off, reactor trip on turbine trip.

c. Turbine trip due to both MFP's off, reactor remains at power.

d. Reactor trip on steam generator low level, resulting in turbine trip.

QUESTION: 009 (1.00)

Given the following plant conditions for Unit 2:

- Unit 2 is at 100% power.
- 21 RCP LEVEL STANDPIPE HI/LO is alarming
- RCDT level is increasing
- Seal injection flow to both RCP's is 8 gpm
- 21 RCP #1 seal leakoff flow has decreased from 2.1 gpm to 1.3 gpm
- 21 RCP vibration has increased approximately 1 mil above normal

Which of the following would cause the above conditions?

a. Failure of #3 seal.

b. Failure of #2 seal.

c. Failure of #1 seal.

d. Leakby on RCP standpipe RMU makeup valve.

QUESTION: 010 (1.00)

The Unit 1 Shift Supervisor has decided to evacuate the control room due to hostile environmental conditions. You are the Unit 1 RO and time permits for actions to be taken before leaving. Your initial actions are to:

a. Trip the reactor, close the MSIV's, then proceed to the Auxiliary Building.

b. Verify reactor trip, turbine trip, safeguards power and no Safety Injection, then proceed to the Hot Shutdown Panels.

c. Verify reactor trip, turbine trip, safeguards power and no Safety Injection, then proceed to the Auxiliary Building.

d. Trip the reactor, close the MSIV's, then proceed to the Hot Shutdown Panels.

QUESTION: 011 (1.00)

Following a LOCA on Unit 1, 11 Hydrogen Recombiner was placed in service per FR-Z.1. You observe the following time/temperature trend with constant heater input: (see attached chart of time vs. temperature)

Based on this indication, hydrogen recombination:

a. has not begun

b. began at point 'A'

c. began at point 'B'

d. began at point 'C'

QUESTION: 012 (1.00)

Use the appropriate heat transfer equation (see the Equations and Conversion hand-out) to calculate reactor power. Obtain data for this problem from the attached ERCS display "FW1". Assume RCP heat input and ambient heat losses are negligible.

a. 42%

b. 44%

c. 83%

d. 88%

QUESTION: 013 (1.00)

Which of the following describes the qualifications necessary to authorize changes to the fuel transfer logs?

a. Two Nuclear Engineers

b. One SRO and one Nuclear Engineer

c. Two SRO's

d. One Nuclear Engineer and one member of plant management staff

QUESTION: 014 (1.00)

Given the following plant conditions:

- Unit 1 at 60% power, Unit 2 at 100% power
- Four Circulating Water pumps running
- Four Cooling Tower pumps running
- All Cooling Towers in operation
- Condenser inlet cross connect open on both units

11 Circulating Water pump trips with no operator action. The result is:

a. Unit 1 turbine will immediately trip.

b. One Cooling Tower pump trips to keep number of CW and CT pumps equal.

c. Unit 1 turbine will exceed its backpressure limitation.

d. All four Cooling Tower pumps trip on low bay level.

QUESTION: 015 (1.00)

The following plant condition exists:

- The plant has experienced a main steamline rupture
- Operators have entered FR-P.1, "Response to Imminent Pressurize Thermal Shock"

Which of the following reflects the intent of major actions taken in FR-P.1, "Response to Imminent Pressurized Thermal Shock"?

a. Reduce RCS cooldown rate and maintain RCS pressure.

b. Reduce RCS cooldown rate and decrease RCS pressure.

c. Increase RCS cooldown rate and maintain RCS pressure.

d. Increase RCS cooldown rate and decrease RCS pressure.

QUESTION: 016 (1.00)

A repetitive and expected alarm due to maintenance or testing....

a. must be acknowledged after each receipt.

b. can remain flashing until the evolution is complete.

c. may remain unacknowledged only with shift supervisor permission.

d. requires informing the duty control room operator each reflash.

QUESTION: 017 (1.00)

You are briefing an operator who will be performing an SP in a contaminated area. He asks if he can leave the procedure outside the contaminated area stepoff pad.

He can....

a. Not do this with any procedure level of use

b. Do this if it is a Continuous use procedure

c. Do this if it is a Reference use procedure

d. Do this with any procedure level of use

QUESTION: 018 (1.00)

Which of the following is the reason for depressurizing the Steam Generators at the maximum rate during ECA-0.0, "Loss of All AC Power"?

a. To enhance restoration of SG level from the AFW pumps.

b. To prevent inadvertant reactor restart.

c. To minimize RCS inventory loss.

d. To prevent lifting pressurizer PORVs.

QUESTION: 019 (1.00)

During a plant heatup, one RCP has a high stator temp alarm. Stator temperature indicates 265 degrees F and rising. Which of the following is the correct response?

a. Align another FCU in fast speed to the gap.

b. Reduce the CC HX outlet temperature controller setpoints to 60 degrees F.

c. Trip the RCP immediately.

d. Trip the RCP if stator temperature exceeds 300 degrees F.

QUESTION: 020 (1.00)

Per the Abnormal Operating Procedures for rod control malfunctions, the following four indications occurring concurrently are symptomatic to a misaligned RCCA.

Which indication would not be present if the problem is a stuck RCCA?

a. Abnormal power distribution indicated.

b. Movement shown on the suspect rod RPI.

c. RPI and Group Step Counter in disagreement.

d. Movement shown on the suspect rod Group Step Counter.

QUESTION: 021 (1.00)

An twenty (20) year old employee has the following exposure as of November 1:

- 50 mRem for the month of October.
- 1250 mRem for the first 3 quarters.

Which of the following is the MAXIMUM exposure the new employee may receive without PI management permission?

a. None

b. 700 mRem

c. 1200 mRem

d. 3700 mRem

QUESTION: 022 (1.00)

The Unit 2 Component Cooling system is being operated in its normal full power lineup with 21 CC pump running and 22 CC pump in standby when the following sequential events occur:

- 21 CC pump outboard pump bearing fails.
- 21 CC pump RPM's start to rapidly decrease due to increased friction.
- 22 CC pump autostarts.

The direct cause of 22 CC pump autostart is:

a. Low discharge header pressure

b. CC heat exchanger high temperature

c. Low system flow signal

d. 21 CC pump breaker lockout

QUESTION: 023 (1.00)

Which of the following identifies the three things that can change the stable SI pump discharge pressure following a small break loss of coolant accident?

a. Location of break, DP from RCS to SGs, number SI pumps in operation.

b. RCS cooldown rate, number of SI pumps in operation, break size.

c. RCS cooldown rate, SG pressures, break size.

d. RCS cooldown rate, number of SI pumps in operation, SG pressures.

QUESTION: 024 (1.00)

Which of the following is a violation of Containment Integrity when Containment Integrity is required?

a. A containment vacuum breaker will not function for vacuum relief.

b. One MSIV fails closed due to failed seals on actuator arm.

c. A CFCU cooling water supply valve fails open.

d. A containment purge blind flange fails its LLRT.

QUESTION: 025 (1.00)

Unit 2 is operating at 50% power with both feedwater pumps on when the following events occur:

- Unit 2 reactor trips on loss of Train 'B' DC power
- Unit 2 turbine trips
- Steam generator levels decrease to 17% NR

The crew notes that SG levels are starting to increase. This is due to:

a. Both feedwater pumps are not running and both AFW pumps are running.

b. Both feedwater pumps running from 2R sources

c. 21 feedwater pump is running from 2R source, 22 feedwater pump breaker is closed but bus 22 is deenergized

d. 22 feedwater pump is running from 2R source, 21 feedwater pump breaker is open.

QUESTION: 026 (1.00)

The following conditions exist:

- A large earthquake has occurred
- The Spent Fuel Pool level is decreasing
- A station blackout condition exists

Which of the following sources should be used to supply makeup to the Spent Fuel Pool?

a. CVCS Holdup tanks

b. Fire Protection header

c. CVCS BA blender

d. RWST

QUESTION: 027 (1.00)

Both units are at 100% power with 22 Diesel Cooling Water Pump OOS for maintenance and 121 Cooling Water Pump aligned as a safeguards replacement per C35 and Technical Specifications. The cooling water system is in a normal summer lineup.

- Unit 1 has 11 SI pump OOS, Unit 2 has 22 RHR pump OOS.
- A second CC pump is started on Unit 1.
- Cooling water header pressure drops to 78 psig.
- Twenty seconds later, 121 Cooling Water Pump is manually started to restore system pressure.
- 12 Cooling Water Pump remains in standby.

Which of the following states all Safeguards Cooling Water pumps which are inoperable?

a. 121 and 22

b. 12, 121 and 22

c. 12 and 22

d. 22

QUESTION: 028 (1.00)

The sequence of events following an R-31 Spent Fuel Pool Area radiation monitor failed high includes:

a. R-31 ESF signal opens 122 Spent Fuel Special Exhaust Damper CD-31009. That damper open signal starts 122 Spent Fuel and In-service Purge Exhaust Fan. The fan start opens 122 Spent Fuel Special and In-Service Purge Exhaust Damper MD-32007.

b. R-31 ESF signal opens 122 Spent Fuel Special Exhaust Damper CD-31009 and 122 Spent Fuel Special and In- Service Purge Exhaust Damper MD-32007. Both damper open signals starts 122 Spent Fuel and In-service Purge Exhaust Fan.

c. R-31 ESF signal starts 122 Spent Fuel and In-service Purge Exhaust Fan and opens 122 Spent Fuel Special Exhaust Damper CD-31009. That fan start opens 122 Spent Fuel Special Exhaust Damper CD-31009.

d. R-31 ESF signal starts 122 Spent Fuel and In-service Purge Exhaust Fan. That fan start opens 122 Spent Fuel Special Exhaust Damper CD-31009 and 122 Spent Fuel Special and In-Service Purge Exhaust Damper MD-32007.

QUESTION: 029 (1.00)

A log entry needs to be made for an equipment start that occurred at 2210. It is now 2250 and another entry has already been made at 2230. The entry will be made by placing the entry on the next available line with an entry in the time column of....

a. 2250 and the time 2210 in the text. An "L.E." is placed in the left hand column next to the 2230 entry.

b. 2210 and the "L.E. 2250" to start the text.

c. 2250 and the time 2210 in the text. An "L.E." is placed in the left hand column next to this entry.

d. 2210 and an "L.E." is placed in the left hand column next to the next to the 2230 entry.

QUESTION: 030 (1.00)

Given the following power range NI readings:

N-41	N-42	N-43	N-44
10%	8%	9%	8%

Subsequently, a slight transient occurs, resulting in the following readings:

N-41	N-42	N-43	N-44
11%	8%	10%	8%

No additional operator action is taken. What is the status of the IR high flux reactor trip and the PR high flux low setpoint reactor trip?

	IR Hi Flux Trip	PR Hi Flux Lo Setpt Trip
a.	Unblocked	Blocked
b.	Blocked	Blocked
c.	Unblocked	Unblocked
d.	Blocked	Unblocked

QUESTION: 031 (1.00)

Which of the following fire extinguishers is used exclusively on combustible material fires (i.e. wood, paper)?

a. Dry Chemicals.

b. Pressurized water.

c. Carbon Dioxide.

d. Halon

QUESTION: 032 (1.00)

With the RCS at normal operating pressure and temperature, what is the condition of the steam entering the PRT if a PORV opens? (ASSUME: PRT is at 100 degrees F, 5 psig and an ideal thermodynamic process.)

Saturated steam-water mixture at:

a. 213 degrees F

b. 228 degrees F

c. 235 degrees F

d. 250 degrees F

QUESTION: 033 (1.00)

Which of the following conditions exceeds a Safety Limit?

a. Thot is at 652 degrees F.

b. RCS pressure is 2485 psig.

c. RCS flow is 107% of that assumed in the analysis.

d. Reactor power is 105% with Tavg at 563 degrees F.

QUESTION: 034 (1.00)

Which of the following is the basis for terminating SI flow when the criteria are satisfied during the performance of E-3, "Steam Generator Tube Rupture"?

a. Prevent depletion of the RWST inventory.

b. Prevent overfilling the ruptured SG.

c. Prevent overcooling the RCS.

d. Prevent solid plant operation.

QUESTION: 035 (1.00)

The probability of a complete loss of the Unit 2 RED instrument bus #212 is reduced since a failure of the normal inverter regulated output will result in an automatic transfer to:

a. Regulated output from Inverter 27

b. Interruptible bus Panel 117

c. Unregulated supply from MCC 2AC2

d. Interruptible bus Panel 217

QUESTION: 036 (1.00)

Which of the following is the basis for isolating the feedwater to a faulted SG?

a. To prevent thermal shock to the SG tubes and minimize the potential for a SG tube rupture.

b. To maximize the energy release from the faulted SG.

c. To maximize the cooldown capability from the non- faulted SG and minimize the RCS cooldown.

d. To minimize the potential for overfilling the faulted SG.

QUESTION: 037 (1.00)

Given the following conditions:

- Unit 2 is at 100% power.
- The containment isolation (CI) actuation circuitry for train 'A' is in test.
- During the performance of the test, unit 2 experiences a loss of coolant accident generating a valid automatic SI signal.

Which of the following is correct concerning CI ? Train 'A' CI will...

a. Be actuated regardless of the system being in test.

b. Not actuate until the actuation circuitry is removed from test.

c. Not actuate until either manual 'CI' switch is rotated to the actuate position.

d. Be actuated by the train 'B' CI actuation signal.

QUESTION: 038 (1.00)

Which of the following conditions would require a red path transition to FR-C.1 if core exit T/C temperatures are >700 degrees F?

a. Dynamic range RVLIS <59 % with BOTH RCP's running.

b. Full range RVLIS <41 % with NO RCP running.

c. Dynamic range RVLIS <59 % with ONE RCP running.

d. Upper range RVLIS <41 % with NO RCP running.

QUESTION: 039 (1.00)

While performing FR-C.1, "Response to Inadequate Core Cooling", which of the following describes the basis for directing RCP restart after they have been previously tripped?

a. Provides mixing of the SI flow to protect the reactor vessel from cold water.

b. Provides for cooling of the core when secondary depressurization has not alleviated inadequate core cooling conditions.

c. Allows for restoration of pressurizer pressure control using normal spray valves.

d. Once subcooling is established, restarting the RCP's helps to collapse voids that may have formed in the reactor vessel head.

QUESTION: 040 (1.00)

Unit 1 is at 50% power and Unit 2 is at 10% power when a thunderstorm causes lockouts of 345 KV Bus 1. All equipment operates as designed and both units remain at power.

The safeguards electrical buses are now being supplied by:

	Bus 15	Bus 16	Bus 25	Bus 26
a.	1R	1R	CT12	CT12
b.	1R	CT11	2R	CT12
c.	1R	1R	2R	CT12
d.	1R	CT11	2R	2R

QUESTION: 041 (1.00)

The reactor is at 8% power when instrument bus 112 (Red bus) fails. Which of the following best describes plant response?

a. A reactor trip occurs because the RPS input relays from N36 will deenergize.

b. A reactor trip occurs due to the trip breaker UV coils deenergizing.

c. A reactor trip occurs because the RPS input relays from N35 will deenergize.

d. The reactor does not trip.

QUESTION: 042 (1.00)

Prior to a normal reduction in power using boration, which of the following is the reason that all pressurizer heaters are energized?

a. Ensures spray valves are not closed for faster response to pressure changes.

b. Equalize the RCS and pressurizer boron concentrations.

c. Equalize spray line temperatures.

d. Limit pressurizer pressure drop during the power change.

QUESTION: 043 (1.00)

With Unit 1 operating normally at 100% power, two out of four OTdT channels rise to within 3 percent of the reactor trip setpoint for 100 seconds. How much will turbine load be reduced?

a. 10%

b. 15%

c. 20%

d. 25%

QUESTION: 044 (1.00)

During performance of 1C1.2, Unit 1 Startup, one condensate pump is required to be in service prior to placing which of the following systems in service:

a. Circulating water

b. Cylinder heating

c. Hogger air ejectors

d. Gland steam

QUESTION: 045 (1.00)

A release of 123 GDT is in progress during the summer with releases for 124 and 125 tanks approved and waiting. Which of the following actions should be taken if the MET tower data link fails during a release of 123 GDT?

a. Do not release the next tank until met tower information is available.

b. Contact the National Weather Service periodically for wind conditions.

c. Contact Lock and Dam #3 periodically for wind conditions.

d. Direct the aux building operator to stop the release of 123 GDT.

QUESTION: 046 (1.00)

Which of the following would alarm the "Rod at Bottom" annunciator?

a. Shutdown bank "A" demand <35 and a shutdown bank "A" IRPI <35.

b. Control bank "D" demand <35 and a control bank "D" IRPI <20.

c. Control bank "A" demand <35 and a control bank "A" IRPI <20.

d. Control bank "B" demand <35 and a control bank "B" IRPI <35.

QUESTION: 047 (1.00)

The following plant conditions apply:

- OPPS is disabled.
- RCS temperature is 318 degrees F
- Plant is cooling down on RHR when the running RHR pump trips
- RCS pressure increases and stabilizes at 500 psig

What has caused pressure to stabilize at 500 psig?

a. RHR Discharge Relief Valve, OPENED

b. RHR Suction Relief Valve, OPENED

c. Loop A/B Hot Leg to RHR pump valves, CLOSED

d. RHR to Loop B Cold Leg Isolation, CLOSED

QUESTION: 048 (1.00)

The following conditions exit:

- Unit 1 and Unit 2 are operating at 100% power
- Spent Fuel movement is in progress in the SFP area
- You are operating the SFP bridge crane with an NLO and an SRO in charge

While performing movement of a spent fuel assembly, the assembly strikes a storage rack. Gas bubbles are seen rising from the assembly, but no radiation monitors are in alarm. Which action is required?

a. Direct the control room to actuate SFP Special Ventilation and notify Access Control.

b. Notify the SRO, recommend initiating an evacuation of the SFP area through the nearest exit.

c. Notify the control room of the mishandling and lower the assembly into the nearest rack location.

d. Do not move the assembly and contact the Nuclear Engineer for assistance.

QUESTION: 049 (1.00)

A SGTR has occurred.

- The RCS has been cooled down and depressurized to stop primary-to-secondaryleakage using E-3.
- The operators are performing recovery actions using backfill per ES-3.1.
- The RCS boron concentration is adequate for CSD.
- A cooldown rate of 50 degrees F/hr was commenced and the RCS is being depressurized as directed by ES-3.1.
- The SR count rate indication begins to increase unexpectedly by a factor of 3.
- The high flux at shutdown alarm comes in.

Which of the following describes the probable root cause of this unexpected SR increase?

a. The colder water in the RCS is causing increased neutron leakage to be seen at the source range NIS.

b. Water is flowing into the RCS from the ruptured S/G, diluting the RCS.

c. The RCS cooldown is adding positive reactivity to the core.

d. The SR instruments are responding to the radioactivity that is being added back into the RCS from the ruptured S/G water.

QUESTION: 050 (1.00)

While operating at 100% power with the Pressurizer Level Control Switch in its normal position (2-3), a pressurizer level instrument failure caused the following SEQUENTIAL plant events (with NO operator action):

- Charging flow was reduced to minimum in automatic.
- Pressurizer level decreased.
- Letdown flow secured and heaters turned off.
- Pressurizer level increased until a high level reactor trip occurred.

Which ONE of the following instrument failures occurred?

a. LT-427 (white) failed high.

b. LT-427 (white) failed low.

c. LT-428 (blue) failed high.

d. LT-428 (blue) failed low.

QUESTION: 051 (1.00)

Given the following Unit 2 plant conditions:

- Power increase on hold at 70% power
- Rods in MANUAL
- Pressurizer level 30% and stable
- Tavg at 555 degrees F

Without operator action, what will be the effect on pressurizer level if Loop B cold leg temperature detector fails LOW?

Pressurizer level will.....

a. decrease to 21% and stabilize

b. remain unchanged and stable

c. increase to 33% and stabilize

d. increase to 50% and stabilize

QUESTION: 052 (1.00)

Given the following plant conditions:

- Unit 1 is at 100% power.
- CCW surge tank level has increased 5" since the last log reading.
- 1R-39 CC System Liquid Monitor is alarming high.

These conditions describe the results of a:

a. Seal water return heat exchanger tube leak.

b. RCP thermal barrier cooling coil leak.

c. Residual heat exchanger tube-to-shell side leak.

d. Failure of CC heat exchanger cooling water outlet valve.

QUESTION: 053 (1.00)

Which of the following describes the operation of containment spray components DIRECTLY from the 'P' signal?

a. Spray pumps start, CA valves open and RWST to CS suction valves open.

b. Spray pumps start, CA valves open and CS discharge valves open.

c. Spray pumps start, CS discharge valves open and RWST to CS suction valves open.

d. CA valves open, CS discharge valves open and RWST to CS suction valves open.

QUESTION: 054 (1.00)

Which of the following areas normally has a locked access and is considered a VERY HIGH radiation area?

a. VCT room.

b. Thimble Chase.

c. Spent fuel pool.

d. Pressurizer vault.

QUESTION: 055 (1.00)

The following plant parameters exist while performing E-1, "Loss of Reactor or Secondary Coolant":

- Both SG pressures: 800 psig and stable
- Both SG levels: controlled at 15% narrow range (65% wide range)
- Pressurizer level: offscale low
- Containment pressure: 8 psig and increasing
- RWST level: 30%
- RCS pressure: 150 psig and stable
- RHR pump total flow: 3000 gpm

Given the above conditions, you would transition to:

a. FR-Z.1, "Response to High Containment Pressure".

b. ES-0.2, "SI Termination".

c. ES-1.2, "Transfer to Recirculation".

d. ES-1.1, "Post-LOCA Cooldown and Depressurization".

QUESTION: 056 (1.00)

A short term release is in progress on Unit 1 per C19.2. Which of the following radiation monitors failing high will cause an automatic isolation of the Containment Purge system in operation on Unit 1?

a. 2R-11

b. 1R-50

c. 1R-37

d. R-25

QUESTION: 057 (1.00)

With Unit 1 operating normally at 100% power, a loss of 'A' train DC power occurs. Which of the following will occur in response to this loss?

a. Reactor trip will occur and D1 auto starts.

b. Reactor trip will occur and control power for D1 is lost.

c. Reactor remains at power and D1 auto starts.

d. Reactor remains at power and control power for D1 is lost.

QUESTION: 058 (1.00)

Which of the following sets of Normal and Alternate power supplies provide the indicated DC panel power?

	Panel	Normal	Alternate
a.	DC Panel 14	DC Panel 22	None
b.	DC Panel 18	DC Panel 22	DC Panel 12
c.	DC Panel 17	DC Panel 21	DC Panel 11
d.	DC Panel 16	DC Panel 11	None

QUESTION: 059 (1.00)

You are about to take the duty with the RCS cooling down in accordance with 1C1.3, Unit 1 Shutdown.

- One reactor operator is controlling the cooldown with the steam dump controller in MANUAL and AFW flow control to the SG's.
- Another reactor operator is controlling RCS pressure with manual spray flow and heaters.
- SI was blocked with RCS temperature at 530 degrees F.

You look back at the last hour's trends:

Time	RCS Temperature	Pzr WaterTemp	Pzr Vapor Temp	RCS Pressure
0430	528	633	633	1945
0445	525	633	637	2005
0500	511	633	633	1942
0515	486	625	625	1824

If current trends continue with no other operator action, which of the following will result?

a. RCS cooldown limits will be violated.

b. Safety injection will actuate.

c. Subcooling will not be maintained >50 degrees F.

d. Pressurizer cooldown limits will be violated.

QUESTION: 060 (1.00)

The following Unit 1 plant conditions exist:

- Reactor power is 95%.
- All systems are in automatic.
- Control bank "D" rods are at 220 steps.
- The rod control P-A converter has failed as is.

The Unit experiences a loss of 11 main feedwater pump, and the operator performs a rapid power reduction stabilizing turbine load at 300 MW. Which of the following describes the response of the "Control Bank Lo-Lo Limit" annunciator?

Annunciator will...

a. not actuate until control bank C rods begin to move.

b. not actuate throughout the transient.

c. actuate when rods are at the low insertion setpoint.

d. actuate when rods are 20 steps below the low insertion setpoint.

QUESTION: 061 (1.00)

Which of the following statements is correct concerning verbal communications?

a. Acknowledgments shall be accomplished with verbatim repeatbacks.

b. All communications with the system control operators require verbatim repeat back of instructions.

c. All verbal communication with the control room operator requires complete repeatbacks.

d. Do not paraphrase when repeating an instruction.

QUESTION: 062 (1.00)

Which of the following could result from CLOSED drain line valves from 11 TD AFW Pump Turbine?

a. Corrosion of governor parts due to condensate passing through the governor valve.

b. Turbine overspeed upon startup due condensate buildup.

c. Thermal stress cracking of pump casing due to buildup of cool condensate.

d. Pump failure due to buildup of condensate plugging steam lines.

QUESTION: 063 (1.00)

Both units are operating at 100% power.

- 11 and 21 motor driven CL pumps are running.
- An SI occurs on Unit 1.
- One minute later, an SI occurs on Unit 2.
- All equipment operates as designed.

The cooling water alignment is:

a. 11 and 21 motor driven CL pumps running
12 and 22 diesel driven CL pumps running
121 motor driven CL pump off and aligned to Loop A cooling water

b. 11 and 21 motor driven CL pumps off
12 and 22 diesel driven CL pumps running
121 motor driven CL pump on and aligned to Loop B cooling water

c. 11 and 21 motor driven CL pumps off
12 and 22 diesel driven CL pumps running
121 motor driven CL pump on and aligned to Loop A cooling water

d. 11 and 21 motor driven CL pumps running
12 and 22 diesel driven CL pumps running
121 motor driven CL pump off and isolated

QUESTION: 064 (1.00)

FR-H.2, Response to Steam Generator Overpressure, may be implemented when SG pressure is above _____ psig because this is above the _____ setpoint.

Select the answer which correctly completes the above statement.

a. 1005, steam dump controller

b. 1050, SG PORV controller

c. 1077, lowest SG safety

d. 1131, highest SG safety

QUESTION: 065 (1.00)

Due to a leak in the sprinkler header, fire header pressure drops rapidly to 75 psig. All fire header pumps are in automatic. Which of the following describes the plant conditions one minute later (header pressure rises to 95 psig)?

a. 121 motor driven fire pump is maintaining fire header pressure.

b. 121 screenwash pump has started and is maintaining fire header pressure through bypass valve CV-31986.

c. 121 motor driven and 122 diesel driven fire pumps are maintaining fire header pressure and 121 screenwash pump is supplying the screenwash header.

d. 121 motor driven and 122 diesel driven fire pumps and 121 screenwash pump are maintaining fire header pressure.

QUESTION: 066 (1.00)

Unit 1 tripped due to a loss of instrument air. Ten minutes later, in an attempt to establish natural circulation with the MSIV's closed, the reactor operator attempts to open "B" SG PORV and it fails to operate. You have been directed to manually open the PORV. To do this, you will proceed to _____ and open the valve by _____ .

a. Aux building 755 level, turning valve handwheel counterclockwise until open.

b. Aux building 735 level, turning valve handwheel counterclockwise until open.

c. Aux building 755 level, turning valve handwheel clockwise until open.

d. Aux building 735 level, turning valve handwheel clockwise until open.

QUESTION: 067 (1.00)

Given the following conditions on Unit 1:

- The reactor is shutdown.
- Decay heat is being removed by natural circulation.
- RCS pressure is 1050 psig.
- Average core exit thermocouple temperature is 450 degrees F.

How much subcooling exists in the RCS for the above conditions?

a. 98 degrees F

b. 100 degrees F

c. 102 degrees F

d. 104 degrees F

QUESTION: 068 (1.00)

Which one of the following is the maximum allowable internal pressure in Containment without exceeding a Tech Spec limit?

a. 1.2 psig

b. 1.8 psig

c. 17 psig

d. 46 psig

QUESTION: 069 (1.00)

As the core operates from BOC to EOC, the amount of acid required to insert 100 pcm of negative reactivity:

a. Becomes less because more acid is required to change boron by 1 ppm.

b. Becomes less due to lower competition with other absorbers.

c. Becomes more because core flux shifts to higher energy levels that make boron less effective.

d. Remains the same regardless of core age.

QUESTION: 070 (1.00)

The following conditions exists:

- Instrument air pressure was lost due to a header break on Unit 1
- Unit 1 reactor was tripped
- One charging pump is running
- Two control rods have stuck out at 220 and 50 steps respectively; remaining rods are on the bottom

If boration is commenced at the highest rate allowed by procedures and plant conditions, which of the following is the minimum time expected to add the required amount of boric acid?

a. 6 min

b. 12 min

c. 21 min

d. 42 min

QUESTION: 071 (1.00)

Which of the following discharges DIRECTLY to the Pressurizer Relief Tank (PRT)?

a. RCP #1 Seal Water Return Header Relief Valve

b. SI Accumulator Vent Valve

c. Reactor Vessel Flange Leakoff

d. Charging Pump Relief Valve

QUESTION: 072 (1.00)

With the plant operating normally at 70% power, the following symptoms occurred:

- Increasing steam generator pressures.
- Increasing pressurizer pressure.
- Tavg greater than Tref.
- Reactor power increasing

Which of the following would cause the above symptoms?

a. Turbine stop valve closure

b. Turbine control valve CV-1 failed open

c. Dropped control rod

d. Uncontrolled rod withdrawl

QUESTION: 073 (1.00)

Which of the following normally discharges to the Reactor Coolant Drain Tank (RCDT).

a. Accumulator drain valves

b. Excess Letdown Heat Exchanger discharge

c. RCP #1 Seal leakoff

d. RHR relief valve discharge

QUESTION: 074 (1.00)

One of the instrument air to containment valves has failed closed. As a result, which of the following is true?

a. Letdown containment isolation valve CV-31339 fails closed.

b. Pressurizer spray valves will not open on demand.

c. Pressurizer PORV's will not open on demand.

d. Running charging pumps fail to minimum speed.

QUESTION: 075 (1.00)

Given the following Unit 1 plant conditions:

- The unit was operating at 75% steady state power.
- All systems are in automatic control.
- Main turbine control is in IMP IN with the valve position limiter set at 95%.

Which of the following describes the plant response to 12 SG PORV failing open? Assume no operator action is taken.

a. Control rods initially insert then withdraw to maintain reactor power at 75%.

b. Turbine load decreases by 5%, reactor power remains at 75%.

c. Reactor power stabilizes at 80% with no rod motion.

d. Control rods withdraw and reactor power increases to 80%.

QUESTION: 076 (1.00)

An operator is preparing to perform a task in a radiation area. The task will take two (2) hours to complete. There is a point radiation source located five feet from the worksite that results in a dose rate of 80 mr/hr to the operator without shielding. Shielding is available, but at the following dose to install:

Shielding Layer	Dose to Install/Remove	Shielding factor (DRinit/DRfinal)
1st shield	100 mrem	4
2nd shield	40 mrem	4
3rd shield	10 mrem	5

How many shields should be used to minimize the total dose for the job?

a. 0

b. 1

c. 2

d. 3

QUESTION: 077 (1.00)

The following conditions exist at 100% power:

- 52/BYA racked in and closed for testing.
- 52/RTA is tripped open.

Which of the following describes the response if 52/BYB is racked in and its "CLOSE" pushbutton is depressed?

a. 52/BYB will close and immediately trip open.

b. 52/BYB will not attempt to close with a trip signal in.

c. 52/RTB will immediately trip open.

d. All breakers remain closed except 52/RTA.

QUESTION: 078 (1.00)

A small break LOCA is in progress on Unit 1. All equipment functions as designed except 11 SI pump failed to start and is started after RCS pressure stabilized. Compared to before 11 SI pump started, the new equilibrium RCS pressure will be _____ than before and break flow will be _____ than before.

a. higher; higher

b. lower; lower

c. lower; higher

d. higher; lower

QUESTION: 079 (1.00)

A startup is in progress in accordance with 1C1.2, "Unit 1 Startup Procedure". The final approach to criticality shows the actual critical rod position will differ from the estimated critical rod position by 650 pcm. Which of the following describes the procedural requirements concerning the startup's status?

a. The startup may continue provided an inverse count rate (1/m) plot is initiated.

b. The startup may continue as long as critical rod position remains above the rod insertion limit.

c. Rod withdrawal must be stopped and the ECP recalculated before the startup may be resumed.

d. All control rods must be inserted and the ECP recalculated before the startup can be re-initiated.

QUESTION: 080 (1.00)

Following the complete failure of a #1 RCP seal, the #1 seal leakoff SHOULD;

a. Be isolated to ensure adequate lubrication of the #2 seal

b. NOT be isolated to prevent over pressurizing the VCT.

c. Be isolated to prevent flashing of CCW in the thermal barrier heat exchanger.

d. NOT be isolated to ensure radial bearing cooling.

QUESTION: 081 (1.00)

During full power steady state operation with two charging pumps running and two 40 gpm orifices in service, the letdown divert valve to holdup tank fails to the divert position. With no operator action:

a. The divert valve will maintain VCT level between 56 and 78%.

b. Charging pump suction will swap to the RWST.

c. Auto makeup will maintain VCT level between 17 and 28%.

d. There will be no effect on VCT level.

QUESTION: 082 (1.00)

Which of the following is the MAXIMUM valid core exit temperature capable of being indicated by the core exit thermocouples (T/Cs)?

a. 2000 degrees F

b. 2300 degrees F

c. 2600 degrees F

d. 2900 degrees F

QUESTION: 083 (1.00)

The following plant conditions exist:

- A tube leak has been qualitatively confirmed in 12 SG.
- Actions are being taken per C4 AOP2, Steam Generator Tube Leak.

Which of the following represents steam generator tube leakage that will require reactor shutdown to hot standby within one hour?

a. 120 gpd and increasing at a rate of 30 gpd/hr for 15 minutes.

b. 40 gpd and increasing at a rate of 75 gpd/hr for 15 minutes.

c. 1440 gpd and stable

d. 160 gpd and increasing at a rate of 10 gpd/hr for 15 minutes.

QUESTION: 084 (1.00)

Which of the following is the NORMAL supply to 23 Charging Pump and the ALTERNATE source if 480V buses are crosstied?

a. Bus 211 and 21A transformer

b. Bus 212 and 22A transformer

c. Bus 221 and 22A transformer

d. Bus 222 and 21A transformer

QUESTION: 085 (1.00)

Which of the following is the reason for the ECCS acceptance criterion which specifies a maximum peak cladding temperature of 2200 degrees F?

a. Above this temperature, thermal conductivity of the clad decreases significantly.

b. This is 500 degrees F below the clad melt point of 2700 degrees F.

c. This is the temperature above which the zircalloy-water reaction is greatly accelerated.

d. This is 1000 degrees F below the fuel melt point of 3200 degrees F.

QUESTION: 086 (1.00)

A small break LOCA is in progress.

- RCS pressure is 1720 psig
- Containment pressure is 7 psig
- Containment radiation is 7 R/hr

Which of the following should be used for checks of RCS pressure in the EOP's?

a. Narrow range RCS pressure

b. RCS wide range pressure

c. ICCM wide range pressure

d. SI pump discharge pressure

QUESTION: 087 (1.00)

Unit 1 was at 5% power prior to placing the generator on line. One MFP was supplying both SGs with Feedwater Regulating Bypass Valves (FRBVs) in AUTOMATIC. A reactor operator trainee under your supervision placed 12 FRBV in MANUAL. The trainee was not able to control steam generator level. You observe that:

- 12 SG level is currently 70% NR
- 12 FRBV is closed but manual FRBV output demand is at 20%.
- The turbine has tripped.

You are directed to to reestablish MFW flow to 12 SG with control in automatic. In order to accomplish this as quickly as possible, you would:

a. Start one MFP, place 12 FRBV controller in "AUTOMATIC," wait until 12 SG level is <67% then depress 12 SG bypass reset pushbuttons.

b. Place 12 FRBV controller in "AUTOMATIC."

c. Depress the 12 SG bypass reset pushbuttons, start one MFP, then place 12 FRBV controller in "AUTOMATIC."

d. Wait until 12 SG level is <67%, then depress 12 SG bypass reset pushbuttons and place 12 FRBV in "AUTOMATIC."

QUESTION: 088 (1.00)

Which of the following actions would, if done in time, prevent a reactor trip as a result of the controlling pressurizer pressure channel failing high?

a. Turn all pressurizer backup heaters ON.

b. Place the pressurizer pressure master controller in manual with an output < 60%.

c. Manually close one PORV.

d. Place the pressurizer pressure master controller in manual with an output of 100%.

QUESTION: 089 (1.00)

A reactor trip has occurred. During the SS read-through of E-0 Step 3, an Orange Path condition on a Critical Safety Function (CSF) Status Tree occurs.

Transition to the Orange Path procedure should take place:

a. at the discretion of the SS.

b. immediately after the SS completes the read through of the immediate action steps.

c. when transitioning to an E-series procedure.

d. immediately after confirming the Orange Path condition.

QUESTION: 090 (1.00)

E-0 has been entered on Unit 1 due to an automatic initiation of safety injection and a reactor trip. The following plant conditions were observed:

- RCS pressure is 1970 psig and stable.
- The safety injection and RHR pumps are aligned to the RWST.
- 11 RHR PUMP SUMP LEVEL HI/LO alarm is in.
- RWST level is 95%
- Containment pressure is 0.1 psig and stable.
- Steam generator levels are 20% NR and stable with 100 gpm AFW flow per SG
- CAM alarms and steam are reported on the 695' level of Unit 1 Auxiliary Building.

The above plant conditions would result in a direct transition from E-0 into which of the following procedures?

a. ECA-1.2, LOCA outside containment

b. ES-0.2, SI Termination

c. ECA-1.1, Loss of Emergency Coolant Recirculation

d. E-1, Loss of Reactor or Secondary Coolant

QUESTION: 091 (1.00)

During operation at 100% power, impulse pressure channel (PT-486) failed LOW. Which of the following describes the response of the steam dump control system to this failure and why?

a. The loss of impulse pressure would only have an effect on the steam dump if it was operating in the steam pressure mode.

b. The steam dump valves remain closed but are "armed" due to a loss of load condition being sensed.

c. The dump valves modulate open due to a Tavg/Tref deviation generated by the loss of impulse pressure.

d. The steam dump valves trip open on a turbine trip signal being generated by the loss of impulse pressure.

QUESTION: 092 (1.00)

While responding to a Loss of All AC Power event on Unit 1, the following conditions exist:

- 11 AFW pump is running.
- SG's depressurizing at maximum rate with SG pressures currently at 125 psig.
- CST level is 4000 gallons and CST LO-LO LEVEL alarm is in.
- Flow to each SG is approximately 150 gpm and is oscillating.

What action is required to ensure AFW flow is maintained?

a. Cross-tie the Unit 1 and Unit 2 CSTs

b. Align cooling water to the suction of the TDAFP.

c. Align condenser spray to pump the condenser hotwell to the CST

d. Place the pump in MANUAL to bypass the low suction and discharge pressure trips

QUESTION: 093 (1.00)

Performance of ES-1.1, "Post LOCA Cooldown and Depressurization", is in progress. What is one reason for starting one RCP after depressurizing the RCS?

a. To cool down the upper head region of the reactor vessel.

b. To prevent mixing of boron in the RCS.

c. To restore subcooling >20 degrees F (80 degrees F) using forced flow.

d. To allow use of auxiliary spray for pressure control.

QUESTION: 094 (1.00)

Given the following Unit 2 plant conditions:

- The unit is in Cold Shutdown with the RCS solid.
- RHR flow has been lost and CANNOT be restored.
- Wide Range level in both steam generators is 55% and steady.
- All other systems and components are available.

In accordance with E-4, which of the following is the preferred method of removing the core's decay heat?

a. Establish flow from the RWST via a charging pump and CVCS letdown.

b. Align AFW to at least one SG and open the respective SG PORV.

c. Gravity drain from the RWST through RHR and open the pressurizer PORVs.

d. Establish flow from the RWST via an SI pump and open the pressurizer PORVs.

QUESTION: 095 (1.00)

Given the following Unit 1 conditions:

- Reactor power 100%
- Gland Seal Steam 3.5 psig
- Hotwell temp 140 degrees F
- Condenser vacuum is 25.1" on A, 27.7" on B
- Barometric pressure is 29.2"

Which of the following actions is required?

a. Place the standby air ejector jet in service to condenser 'A'.

b. Trip the reactor, trip the turbine

c. Adjust circulating water recirculation flow to lower hotwell temperature.

d. Increase Gland Sealing steam to approximately 5 psig.

QUESTION: 096 (1.00)

SI logic testing is in progress on train 'A' when then reactor trips and safety injection actuates. During performance of E-0, the following conditions are observed:

- RCS pressure is 1950# and stable
- RCS temperature is 535 degrees F and stable
- SI flow is 220 gpm
- Containment pressure is 0.5 psig and increasing
- Pressurizer level is 60% and increasing
- SG pressures are 11- 940# and 12- 960#
- SG wide range levels are 11- 56% and 12- 58%
- R-7 is in alarm

Based on these indications, the most likely cause of the safety injection was:

a. A steam leak in containment from 11 SG.

b. A failed open pressurizer safety valve.

c. An inadvertant Safety Injection.

d. A tube rupture in 12 SG.

QUESTION: 097 (1.00)

The following plant conditions exist:

- Source Range (SR) N-31 indicates: 3E+4 cps, +0.10 DPM SUR steady
- Source Range (SR) N-32 indicates: 2E+4 cps, +0.15 DPM SUR steady
- Control Bank D rod at 100 steps: NO rod motion

If Control Rod F-6 (Bank B) stationary gripper fuse blows, which of the following describes the response of SR NI's? Source Range Nuclear Instrument count rates will:

a. will decrease and then increase until blocked at P-6 due to Xenon effects.

b. decrease and then level out at a lower level since the reactor will become subcritical.

c. continue to increase until blocked at P-6 since rod F-6 will not get a rod motion signal.

d. continue to increase until blocked at P-6 since only rod F-6 rod position indication is affected.

QUESTION: 098 (1.00)

Given the following Unit 1 conditions:

- The unit has tripped from 100% due to a small break LOCA.
- Conditions have stabilized and operators are evaluating SI termination criteria.
- Containment pressure is currently 5.8 psig after peaking at 10.2 psig.
- Containment radiation is 3.4 R/hr after peaking at 6.2 R/hr.

Which of the following conditions would preclude SI termination per ES-1.1, Post LOCA Cooldown and Depressurization?

a. AFW flow is 220 gpm.

b. RCS subcooling is 88 degrees F.

c. Pressurizer level is 9%.

d. Pressurizer pressure is 2050 psig.

QUESTION: 099 (1.00)

The following has occurred on Unit 2:

- A large break LOCA has occurred.
- Offsite power has been lost and Bus 25 is locked out.
- RCS pressure is 160 psig.
- RWST level is 30%.

Which of the following further component failures would PREVENT the establishment of long term decay heat removal? Assume NONE of the above failures can be fixed before long term cooling is required.

a. Inside containment Sump B to 22 RHR pump MOV sticks closed

b. 22 Safety Injection Pump

c. 22 Component Cooling Pump

d. Loss of air to 22 RHR Heat Exchanger CC outlet valve

QUESTION: 100 (1.00)

The following conditions exist:

- Unit 2 is operating at 100% power
- Pressurizer pressure control is in automatic
- Pressurizer backup heaters Group A and B are ON
- RCS pressure is at 2235 psig

The selected controlling pressurizer pressure channel input fails to 2000 psig over 5 seconds. Which of the following describes the plant response to this event? ASSUME NO OPERATOR ACTION TAKEN.

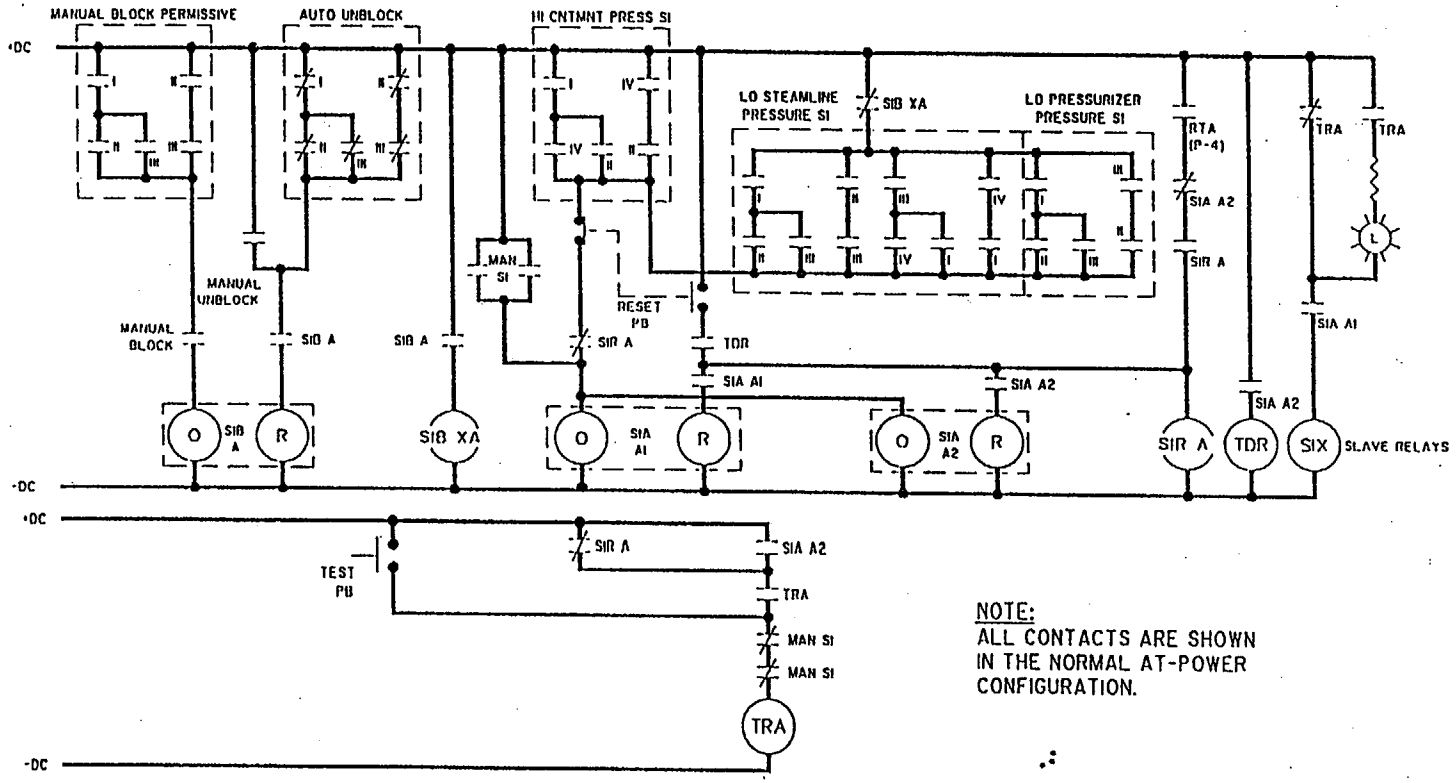
a. Control bank heaters energize; pressurizer pressure increases; spray valves open to maintain pressure constant at 2235 psig.

b. Both spray valves close; pressurizer pressure increases to 2335 psig; PORV PCV-430 opens and cycles to control pressure.

c. Both spray valves close; pressurizer pressure increases to 2385 psig resulting in a reactor trip signal initiation.

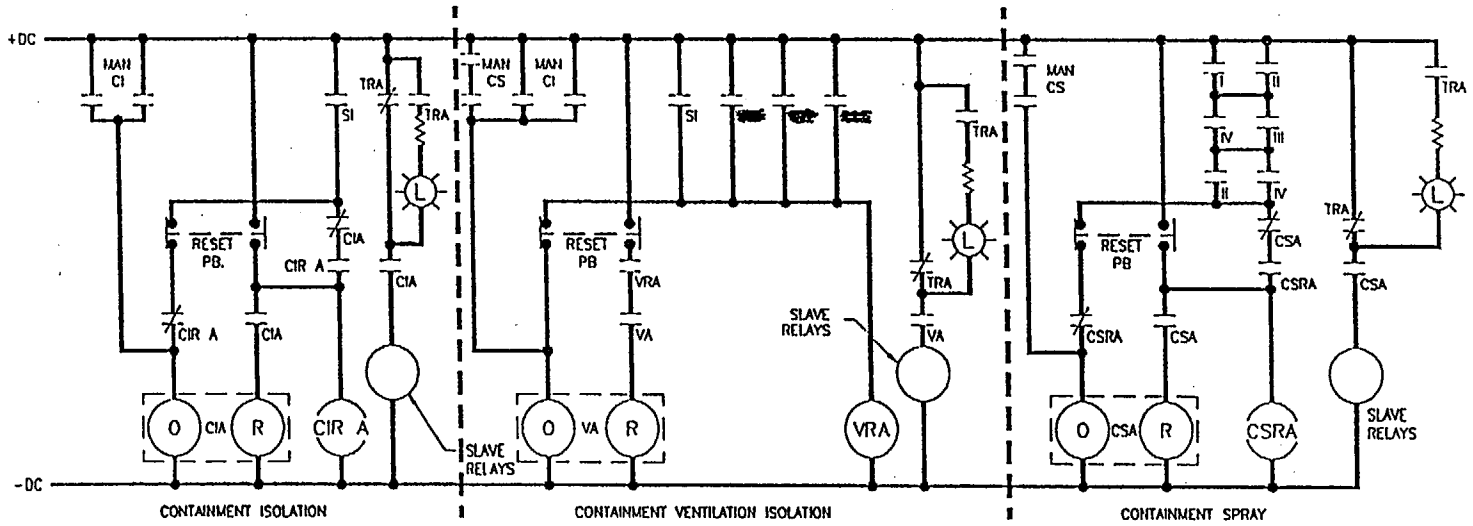
d. Control bank heaters energize; spray valves close; control bank heaters maintain pressure constant at 2235 psig.

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



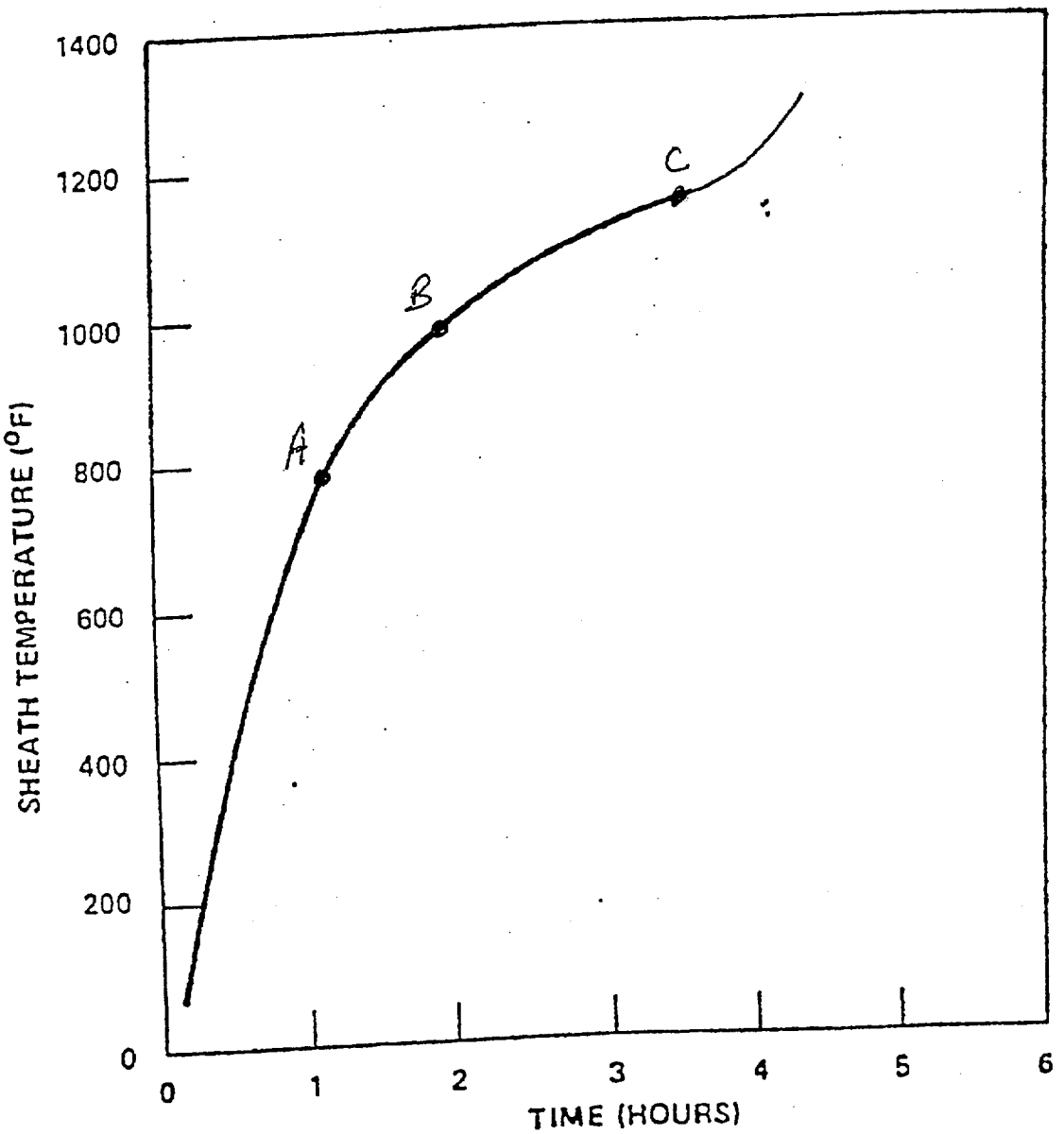
NOTE:
ALL CONTACTS ARE SHOWN IN THE NORMAL AT-POWER CONFIGURATION.

Northern States Power Company Prairie Island Training Center	Safety Injection Actuation Circuitry	REV: 5 7/14/94	B18C-06 Reviewed By:



NOTE:
ALL CONTACTS ARE SHOWN IN THE NORMAL AT-POWER CONFIGURATION.

Northern States Power Company Prairie Island Training Center	Containment Isolation, Ventilation Isolation and "P" Signals	REV: 4 7/15/94	B18C-07 Reviewed By:


1400
1200
1000
800
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SHEATH TEMPERATURE (°F)
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TIME (HOURS)

SELECT FUNC. KEY OR TURB-DR CODE

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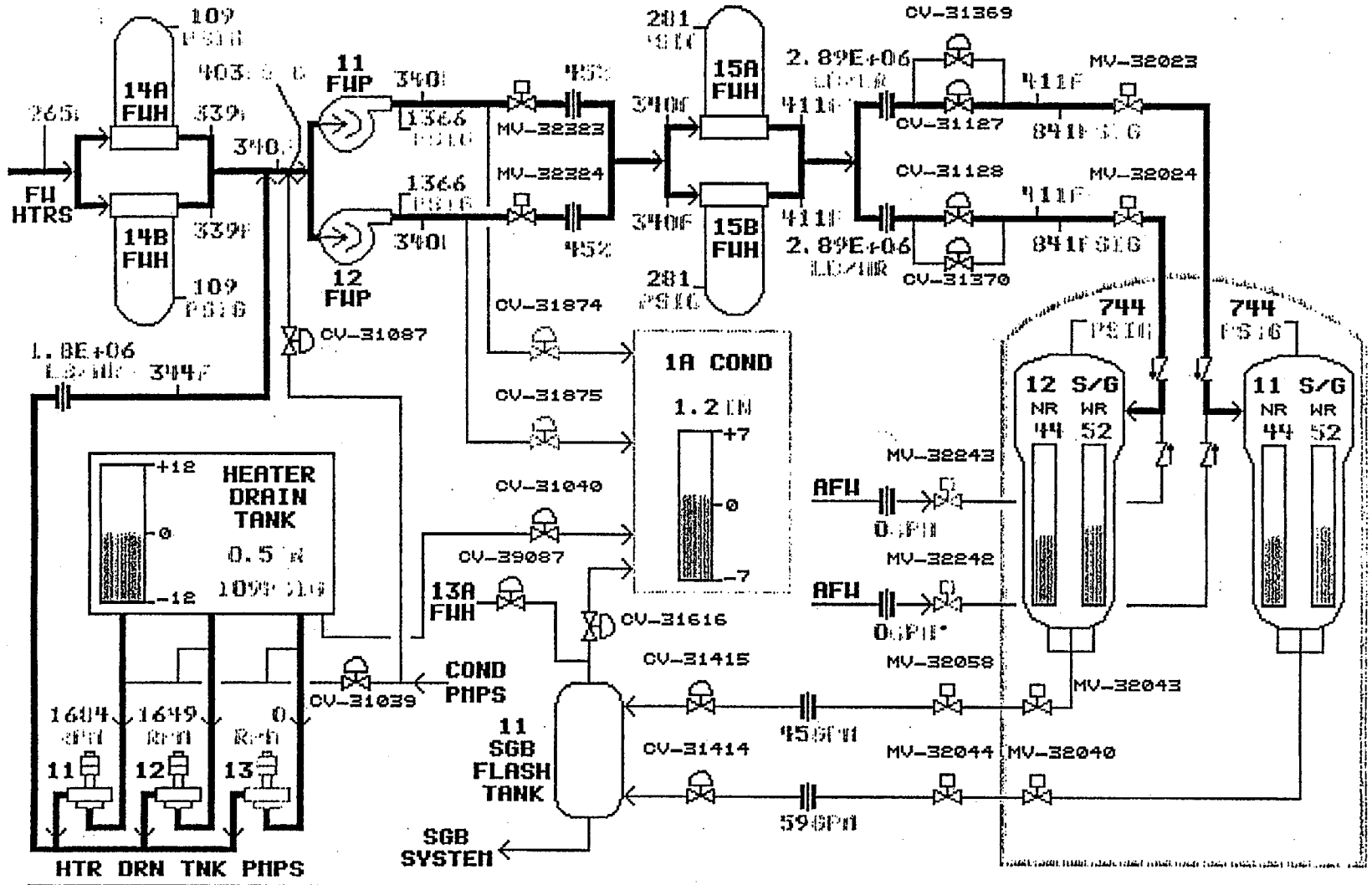
FW1 - FEEDWATER SYSTEM PAGE 1 OF 1



F1= F2= F3= F4= F5= F6=

KBD= NORMAL

MODE= FULL POWER

S1-A8

$P = P_o\ 10^{SUR(t)}$

$P = P_o\ e^{t/T}$

$SUR = 26 / T$

$SUR = 26\ (\bar{\lambda}\rho) / (\bar{\beta}_{eff} - \rho)$

$\rho = (k_{eff} - 1) / k_{eff}$

$\rho = (l^* / T) + \bar{\beta}_{eff} / (1 + \bar{\lambda}\ T)$

$\Delta\rho = (\ k_2 - k_1\ ) / k_2 k_1$

$P = P_o \bar{\beta}_{eff} / (\bar{\beta}_{eff} - \rho)$

Neutron production rate $= S/(\ 1 - k_{eff}\ )$

$CR_1(1 - k_{eff})_1 = CR_2(1 - k_{eff})_2$

Shutdown margin $= (1 - k_{eff}\ ) / k_{eff}$

$\dot{Q} = \dot{m}\ c_p\ \Delta T$

$\dot{Q} = U\ A\ \Delta T$

$\dot{Q} = \dot{m}\ \Delta\ h$

Carnot efficiency $= (T_h - T_c) / T_h$

1 MW $= 3.41 \times 10^6$ BTU/hr

Notes:

1. $\bar{\beta}_{eff}$ is the average effective delayed neutron fraction.
2. l^* is the prompt neutron lifetime.
3. $\bar{\lambda}$ is the average decay constant.
4. Examinees may also use calculators, steam tables, Mollier diagrams, and graph paper during the examination.

ANSWER: 001 (1.00)
d.
REFERENCE:
P8184L-006
015K601 ..(KA's)

ANSWER: 002 (1.00)
c.
REFERENCE:
C1.3, P8184L-002

015K502 ..(KA's)

ANSWER: 003 (1.00)
d.
REFERENCE:
ES-0.1 ATT A

002A402 ..(KA's)

ANSWER: 004 (1.00)
b.
REFERENCE:
E-0

007K103 ..(KA's)

ANSWER: 005 (1.00)
b.
REFERENCE:
C12.1

076K306 ..(KA's)

ANSWER: 006 (1.00)
b.
REFERENCE:
E-0

013K403 ..(KA's)

ANSWER: 007 (1.00)
b.
REFERENCE:
5AWI 3.10.0

2.2.13 ..(KA's)

ANSWER: 008 (1.00)
c.
REFERENCE:
B28A, B23

059A207 ..(KA's)

ANSWER: 009 (1.00)
b.
REFERENCE:
C3AOP3

003A110 ..(KA's)

ANSWER: 010 (1.00)
b.
REFERENCE:
C1.3AOP1

068K318 ..(KA's)

ANSWER: 011 (1.00)
d.
REFERENCE:
P8180L-008

028A201 ..(KA's)

ANSWER: 012 (1.00)
c.
REFERENCE:
FW1 ENCLOSED

015A101 ..(KA's)

ANSWER: 013 (1.00)
b.
REFERENCE:
D5.2

2.2.28 ..(KA's)

ANSWER: 014 (1.00)
b.
REFERENCE:
C47001-0103, LOGICS
075A202 ..(KA's)

ANSWER: 015 (1.00)
b.
REFERENCE:
FR-P.1

ANSWER: 016 (1.00)
b.
REFERENCE:
SWI-0-10

2.4.31 ..(KA's)

ANSWER: 017 (1.00)
c.
REFERENCE:
5AWI 1.5.9

2.1.20 ..(KA's)

ANSWER: 018 (1.00)
c.
REFERENCE:
ECA-0.0

055K302 ..(KA's)

ANSWER: 019 (1.00)
d.
REFERENCE:
C47015:0506

015A209 ..(KA's)

ANSWER: 020 (1.00)
b.
REFERENCE:
C5AOP5

005A201 ..(KA's)

ANSWER: 021 (1.00)
b.
REFERENCE:
F2

2.3.4 ..(KA's)

ANSWER: 022 (1.00)
a.
REFERENCE:
LOGICS, P8172L-002 P. 11

008K401 ..(KA's)

ANSWER: 023 (1.00)
b.
REFERENCE:
P8197L-012

009A101 ..(KA's)

ANSWER: 024 (1.00)
d.
REFERENCE:
C19.1, T.S. 3.6

069K203 ..(KA's)

ANSWER: 025 (1.00)
d.
REFERENCE:
B28A

054A202 ..(KA's)

ANSWER: 026 (1.00)
b.
REFERENCE:
C16AOP1

033A203 ..(KA's)

ANSWER: 027 (1.00)
a.
REFERENCE:
C35, T.S. 3.3.D.2

2.1.12 ..(KA's)

ANSWER: 028 (1.00)
a.
REFERENCE:
C7, LOGIC NF-40762-2

072A301 ..(KA's)

ANSWER: 029 (1.00)
c.
REFERENCE:
SWI-0-25

2.1.18 ..(KA's)

ANSWER: 030 (1.00)
c.
REFERENCE:
B8

012K406 ..(KA's)

ANSWER: 031 (1.00)
b.
REFERENCE:
F5

067A108 ..(KA's)

ANSWER: 032 (1.00)
b.
REFERENCE:
STEAM TABLES

002K105 ..(KA's)

ANSWER: 033 (1.00)
a.
REFERENCE:
T.S. 2.1 FIGURE TS.2.1-1

2.2.22 ..(KA's)

ANSWER: 034 (1.00)
b.
REFERENCE:
E-3

038K309 ..(KA's)

ANSWER: 035 (1.00)
c.
REFERENCE:
FIG ED-322A, ED-321

062K410 ..(KA's)

ANSWER: 036 (1.00)
c.
REFERENCE:
E-0

054A202 ..(KA's)

ANSWER: 037 (1.00)
b.
REFERENCE:
B18C-06, B18C-07

103A301 ..(KA's)

ANSWER: 038 (1.00)
b.
REFERENCE:
F-0

2.4.6 ..(KA's)

ANSWER: 039 (1.00)
b.
REFERENCE:
FR-C.1

074K307 ..(KA's)

ANSWER: 040 (1.00)
a.
REFERENCE:
C20, DWG ED-318

064A301 ..(KA's)

ANSWER: 041 (1.00)
c.
REFERENCE:
C51, DWG NI-014

057A203 ..(KA's)

ANSWER: 042 (1.00)
b.
REFERENCE:
C1.4, C12.1

004K601 ..(KA's)

ANSWER: 043 (1.00)
c.
REFERENCE:
C23AOP1

045K412 ..(KA's)

ANSWER: 044 (1.00)
d.
REFERENCE:
B28A, C1.2

2.1.23 ..(KA's)

ANSWER: 045 (1.00)
d.
REFERENCE:
C21.3-10.3

071A207 ..(KA's)

ANSWER: 046 (1.00)
c.
REFERENCE:
DWG B06-01

014K403 ..(KA's)

ANSWER: 047 (1.00)
b.
REFERENCE:
P8180L-003

005A202 ..(KA's)

ANSWER: 048 (1.00)
b.
REFERENCE:
D5.2AOP4

036K303 ..(KA's)

ANSWER: 049 (1.00)
b.
REFERENCE:
ES-3.1

038A139 ..(KA's)

ANSWER: 050 (1.00)
c.
REFERENCE:
C51

011A210 ..(KA's)

ANSWER: 051 (1.00)
b.
REFERENCE:
B7-19

011A104 ..(KA's)

ANSWER: 052 (1.00)
b.
REFERENCE:
C14AOP1, B3

026A105 ..(KA's)

ANSWER: 053 (1.00)
b.
REFERENCE:
B18D

026A301 ..(KA's)

ANSWER: 054 (1.00)
b.
REFERENCE:
F2

2.3.1 ..(KA's)

ANSWER: 055 (1.00)
c.
REFERENCE:
E-1 INFORMATION PAGE

011A111 ..(KA's)

ANSWER: 056 (1.00)
a.
REFERENCE:
LOGICS, P8180L-009E

029K101 ..(KA's)

ANSWER: 057 (1.00)
b.
REFERENCE:
C20.9AOP1

058K301 ..(KA's)

ANSWER: 058 (1.00)
b.
REFERENCE:
DWG B20.9-02

063K201 ..(KA's)

ANSWER: 059 (1.00)
b.
REFERENCE:
C1.3, P-SOE-83-3

013K412 ..(KA's)

ANSWER: 060 (1.00)
b.
REFERENCE:
P8184L-005

014K302 ..(KA's)

ANSWER: 061 (1.00)
b.
REFERENCE:
5AWI3.15.6

2.1.17 ..(KA's)

ANSWER: 062 (1.00)
b.
REFERENCE:
C28.1

061K111 ..(KA's)

ANSWER: 063 (1.00)
d.
REFERENCE:
CL-049

076K402 ..(KA's)

ANSWER: 064 (1.00)
d.
REFERENCE:
FR-H.2

ANSWER: 065 (1.00)
c.
REFERENCE:
B31A

086A202 ..(KA's)

ANSWER: 066 (1.00)
c.
REFERENCE:
ES-0.2

2.1.30 ..(KA's)

ANSWER: 067 (1.00)
c.
REFERENCE:
STEAM TABLES

002K509 ..(KA's)

ANSWER: 068 (1.00)
b.
REFERENCE:
T.S. 3.6.I

103K302 ..(KA's)

ANSWER: 069 (1.00)
b.
REFERENCE:
FIG C1-11A

001K528 ..(KA's)

ANSWER: 070 (1.00)
d.
REFERENCE:
C12.5AOP1, ES-0.1

024A108 ..(KA's)

ANSWER: 071 (1.00)
a.
REFERENCE:
FLOW DIAGRAM B4A-8

007K103 ..(KA's)

ANSWER: 072 (1.00)
d.
REFERENCE:
C5AOP1

001A205 ..(KA's)

ANSWER: 073 (1.00)
a.
REFERENCE:
FLOWS, B21B-7

068K107 ..(KA's)

ANSWER: 074 (1.00)
b.
REFERENCE:
C34AOP1

065K303 ..(KA's)

ANSWER: 075 (1.00)
d.
REFERENCE:
C51

035K602 ..(KA's)

ANSWER: 076 (1.00)
b.
REFERENCE:
F2

2.3.10 ..(KA's)

ANSWER: 077 (1.00)
a.
REFERENCE:
X-HIAW-1-236

001K603 ..(KA's)

ANSWER: 078 (1.00)
a.
REFERENCE:
FIGURE EOP-28

006K506 ..(KA's)

ANSWER: 079 (1.00)
b.
REFERENCE:
C1.2 APP C

2.2.1 ..(KA's)

ANSWER: 080 (1.00)
c.
REFERENCE:
C3AOP3

003A201 ..(KA's)

ANSWER: 081 (1.00)
b.
REFERENCE:
B12

004A413 ..(KA's)

ANSWER: 082 (1.00)
b
REFERENCE:
P8107L-001A P. 30

017K403 ..(KA's)

ANSWER: 083 (1.00)
b.
REFERENCE:
C4AOP2

2.4.4 ..(KA's)

ANSWER: 084 (1.00)
c.
REFERENCE:
B12

004K203 ..(KA's)

ANSWER: 085 (1.00)
c.
REFERENCE:
USAR SECTION 14

006K302 ..(KA's)

ANSWER: 086 (1.00)
b.
REFERENCE:
F-0

022K302 ..(KA's)

ANSWER: 087 (1.00)
c.
REFERENCE:
C47011:0104, B7-28

059A412 ..(KA's)

ANSWER: 088 (1.00)
b.
REFERENCE:
C51.3

027A215 ..(KA's)

ANSWER: 089 (1.00)
c.
REFERENCE:
SWI-O-10

2.4.16 ..(KA's)

ANSWER: 090 (1.00)
a.
REFERENCE:
E-0, ECA-1.2

ANSWER: 091 (1.00)
b.
REFERENCE:
C51

041K414 ..(KA's)

ANSWER: 092 (1.00)
b.
REFERENCE:
C28.1 AOP2

061A104 ..(KA's)

ANSWER: 093 (1.00)
a.
REFERENCE:
ES-1.1

ANSWER: 094 (1.00)
b.
REFERENCE:
C15AOP1, E-4

025K101 ..(KA's)

ANSWER: 095 (1.00)
b.
REFERENCE:
C1.4, FIG C1-20

051A202 ..(KA's)

ANSWER: 096 (1.00)
b.
REFERENCE:
E-0

009A202 ..(KA's)

ANSWER: 097 (1.00)
b.
REFERENCE:
C5AOP1

003K103 ..(KA's)

ANSWER: 098 (1.00)
c.
REFERENCE:
ES-1.1

ANSWER: 099 (1.00)
a.
REFERENCE:
ECA-1.3

ANSWER: 100 (1.00)
b.
REFERENCE:
B7, DIAG B7-14
010K601 ..(KA's)

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

ANSWER KEY

001	d	026	b	051	b	076	b
002	c	027	a	052	b	077	a
003	d	028	a	053	b	078	a
004	b	029	c	054	b	079	b
005	b	030	c	055	c	080	c
006	b	031	b	056	a	081	b
007	b	032	b	057	b	082	b
008	c	033	a	058	b	083	b
009	b	034	b	059	b	084	c
010	b	035	c	060	b	085	c
011	d	036	c	061	b	086	b
012	c	037	b	062	b	087	c
013	b	038	b	063	d	088	b
014	b	039	b	064	d	089	c
015	b	040	a	065	c	090	a
016	b	041	c	066	c	091	b
017	c	042	b	067	c	092	b
018	c	043	c	068	b	093	a
019	d	044	d	069	b	094	b
020	b	045	d	070	d	095	b
021	b	046	c	071	a	096	b
022	a	047	b	072	d	097	b
023	b	048	b	073	a	098	c
024	d	049	b	074	b	099	a
025	d	050	c	075	d	100	b

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