U.S. NUCLEAR REGULATORY COMMISSION REGION I
OPERATOR LICENSING EXAMINATION REPORT

EXAMINATION REPORT NO.: 50-443/89-11 (OL)

FACILITY DOCKET NO.: 50-443

FACILITY LICENSE NO.: NPF-67

LICENSEE: Public Service Co. of New Hampshire
P.O. Box 330
Manchester, New Hampshire 03105

FACILITY: Seabrook Station

EXAMINATION DATES: November 13-17, 1989

CHIEF EXAMINER: Edward Yachimiak 1/5/90
Edward Yachimiak, Operations Engineer Date

APPROVED BY: Robert M. Gallo for 1/5/90
Peter W. Eselgroth, Chief PWR Section Date

SUMMARY: Eight (8) Senior Reactor Operator (SRO) and Four (4) Reactor Operator (RO) license examinations were administered. All candidates successfully completed the written part of their respective examinations. Three (3) SRO applicants, however, failed the operating portion of their respective examinations. Five (5) SRO licenses and Four (4) RO license were granted.

DETAILS

TYPE OF EXAMINATIONS: Replacement

EXAMINATION RESULTS:

	RO Pass/Fail	SRO Pass/Fail
Written	4 / 0	8 / 0
Operating	4 / 0	5 / 3
Overall	4 / 0	5 / 3

1. CHIEF EXAMINER AT SITE:

   E. Yachimiak (NRC)

2. OTHER EXAMINERS:

   D. Wallace (NRC)
   J. D'Antonio (NRC)
   P. Doyle (NRC)
   T. Guilfoil (Sonalysts)

3. Pre-Examination Review:

   Prior to the administration of the Senior Reactor Operator (SRO) and the Reactor Operator (RO) written examinations, two (2) Seabrook Station staff members, both under security agreement, were invited to review these examinations at our offices in King of Prussia, Pennsylvania on November 2, 1989. The results of this review resulted in a content valid, operationally oriented examination.

   In addition, all simulator scenarios were reviewed and tested by the NRC examination team with the assistance of two (2) Seabrook Station staff simulator instructors, also under security agreement, on site prior to their use during the operating tests. The results of this review resulted in scenarios which were both realistic and operationally oriented.

4. Summary of Generic Strengths and Weaknesses

The following is a summary of generic strengths or deficiencies noted from the administration and grading of the OPERATING and WRITTEN tests. This information is being provided to aid the licensee in upgrading their initial license and requalification training programs. No licensee response is required.

STRENGTHS

Communications during the simulator examinations were clear and succinct. The flow of information between operators was generally smooth and accurate, thus allowing all members of the crew to be equally informed of plant status. This consistency in performance appears to be the result of of well developed and maintained simulator training program.

WEAKNESSES

OPERATING (Simulator)

The examiners noted that, during the performance of the emergency operating procedures (EOPs), a pressurizer PORV failed to reseat after it had opened to relieve pressure. The EOP being implemented when this event occurred did not specifically address any actions to be taken to correct this component malfunction. The operators did not immediately take any action in response to this valve failure, but continued to follow their procedure. After transitioning to another EOP which provided guidance for the open PORV, the operators took appropriate steps to isolate the valve.

The facility's policy on procedural adherence, OPMM Section 2.1, does not give clear guidance for the restoration of equipment failures which may occur during the use of EOPs. The facility should ensure that proper direction is provided in its policy on procedural adherence, consistent with the Westinghouse EOP User's Guide, for the instruction of operators on how to respond to equipment failures.

This item will be reviewed by the NRC during subsequent inspection activities and will be identified as Open Item 50-443/89-11-01.

WRITTEN

Operators generally did not have knowledge of the following:

- the emergency load capacity of the station batteries (2.01/5.01)
- why the RCP seals are locally isolated during ECA-0.0 (2.02)

- when E-0 is not implemented upon a reactor trip (2.04)
- the purpose for adjusting SG ASDV controller to 1125 psig (2.16)
- the RCP thermal barrier cooling system minimum temperature and the reason for this limit (2.20/5.24)
- how generator gas pressure is controlled (3.03)
- the difference between a control rod system urgent and non-urgent failure alarm (3.12)
- control rod system response upon failure of PT-505 (3.13)
- the events which occur during a D/G startup (3.19)
- conditions which allow a non-licensed person to operate the controls which directly affect reactivity (3.35)
- operation of the containment spray system during RWST switchover with and without removal of the "S" signal (3.39)
- hydrogen gas explosive limit (3.47)
- makeup methods to the RCS when a loss of all RHR pumps occurs during shutdown cooling (5.30)

5. Simulation Facility Fidelity Report

During the conduct of the simulator examinations, no significant malfunctions occurred and the overall simulator performance was good. However, the following list of deficiencies are items of concern which need to be addressed so that the simulator's performance remains at a level commensurate with the continuation of effective initial and requalification training:

- Unavailability of component and instrument malfunctions without extensive instructor over-ride input.
- Incorrect or inaccurate modelling of steam generator "Dry-Out" phenomena, Low Temperature Over-Pressurization (LTOP) operation, and containment isolation valve D-point (computer) values.
- RVLIS unavailability.

We are aware of your current activities in the area of simulator performance upgrades, and recognize that your schedule for completion of the above items will be based upon your established priority rating system.

3. Personnel Present at Exit Meeting:

NRC Personnel

Cerne, A., Senior Resident Inspector
McCabe, E., Section Chief, Division of Reactor Projects, RI
Yachimiak, E., Operations Engineer

Facility Personnel

Carlson, L., Operations Training Supervisor
Grillo, J., Operations Manager
Hanley, R., Operations Training Manager
Moody, D., Station Manager
Peterson, J., Assistant Operations Manager
Richardson, P., Training Manager

Attachments:

1. RO Written Examination MASTER Key
2. SRO Written Examination MASTER Key
3. Simulator Scenarios

Nuclear Regulatory Commission
Operator Licensing
Examination

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Official Use Only category on
date of examination.

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U. S. NUCLEAR REGULATORY COMMISSION
REACTOR OPERATOR LICENSE EXAMINATION
REGION 1

FACILITY: Seabrook 1

REACTOR TYPE: PWR-WEC4

DATE ADMINSTERED: 89/11/13

CANDIDATE: _____

INSTRUCTIONS TO CANDIDATE:

Use separate paper for the answers. Write answers on one side only. Staple question sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires at least 70% in each category and a final grade of at least 80%. Examination papers will be picked up 4.5 hours after the examination starts.

CATEGORY VALUE	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE		CATEGORY
~~33.30~~ ~~36.00~~	36.89			2.	EMERGENCY AND ABNORMAL PLANT EVOLUTIONS (27%)
60.60 ~~61.60~~	63.11			3.	PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (10%)
94.10 ~~97.60~~		FINAL GRADE	%		TOTALS

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

_____
Candidate's Signature

* Points deleted due to Post-Exam review.

EY

MASTER COPY

QUESTION 2.01 (1.00)

In the event of a loss of all AC power, how long can the station batteries supply emergency loads on their busses with no load shedding?

A) 30 minutes

B) 2 hours

C) 4 hours

D) 8 hours

ANSWER 2.01 (1.00)

~~B.~~ C.

REFERENCE

125 VDC system description
L10971
K/A 0000055 EK3.01 [3.4]

QUESTION 2.02 (1.00)

ECA 0.0, "Loss of All AC Power", step 8, requires that personnel be dispatched to locally close valves to isolate RCP seals. What is the purpose of this step?

A) Reduce the possibility of VCT overpressurization.

B) Prevent backflow through seal injection lines.

C) Reduce possibility of a loss of coolant accident from seal failure.

D) Prevent loss of RCS inventory from seal leakoff.

ANSWER 2.02 (1.00)

C.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE

K/A 0000055 EK3.02 [4.6]
L1201I

QUESTION 2.03 ~~(1.00)~~ (0.50)

The load ratings for the Emergency Diesel Generators are _____ continuous and ~~a two hour overload rating of _____~~.

ANSWER 2.03 ~~(1.00)~~ (0.50)

6083 KW
~~6697 KW~~

*REFERENC2E

EDE system description

QUESTION 2.04 (1.00)

Under what condition(s) in which the reactor is tripped is E-0 "Reactor Trip or Safety Injection" NOT entered?

ANSWER 2.04 (1.00)

If the reactor is tripped prior to control room evacuation (w/ no SI req'd)
If the reactor is tripped in response to a fire (w/ no SI req'd)

Also accept LOPA if given in addition to above

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE

OS1200.01, OS1200.02

QUESTION 2.05 (1.00)

With the plant at 100% power, WHICH one of the following would best describe the response of Pressurizer Level if the pressurizer spray line were to break at the pressurizer?

A) Rapid level drop due to loss of mass, then increase from safety injection flow.

B) Erratic indication due to turbulence in instrument lines.

C) Increase due to RCS depressurization and steam formation in reactor vessel head.

D) Increase due to boiling and swell in pressurizer water volume, with further increase from safety injection flow.

ANSWER 2.05 (1.00)

C.

REFERENCE

L1203I

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.06 (2.00)

A safety injection has initiated as a result of a small break LOCA. The FOUR conditions that must be satisfied in order to transition to ES-1.1 "SI Termination" are _____, _____, _____, and _____. Include any differences for adverse containment conditions.

ANSWER 2.06 (2.00)

RCS subcooling > 40 deg f (by TC's)
>500 gpm feed flow or >5%[23% adverse] level in one sg
RCS pressure stable or increasing
Pressurizer level >5%[35% adverse]

REFERENCE

L1202I

QUESTION 2.07 (1.50)

Number the following Critical Safety Function Status Tree paths in order of priority.

Core Cooling - Orange ___
Containment - Orange ___
Heat Sink - Red ___
Integrity - Orange ___
Subcriticality - Red ___
Emergency Recirc - Orange ___

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

ANSWER 2.07 (1.50)

3
5
2
4
1
6

REFERENCE

L1196I

QUESTION 2.08 (2.00)

The Immediate actions of FRS-1 "Response to Nuclear Power Generation/ ATWS" are _____, _____, _____, and _____.

ANSWER 2.08 (2.00)

verify reactor trip (.25)
verify turbine trip (.25)
check EFW pumps running (.25)
initiate emergency boration (.25)

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE

FRS-1
L1200I

QUESTION 2.09 (1.00)

A reactor trip has just occurred and a transition to ES-0.1, "Reactor Trip Response" is made. At step 3 of this procedure the Reactor Operator notes that two rods are not fully inserted. What action should be taken?

A) Transition to FR S-1 "Response to Nuclear Power Generation/ ATWS

B) Rapid borate 150 GALLONS for each rod not fully inserted.

C) Initiate manual safety injection.

D) Rapid borate 150 PPM for each rod not fully inserted.

ANSWER 2.09 (1.00)

D.

REFERENCE

ES 0.1

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.10 (1.00)

Which one of the following is NOT an indication of a dropped control rod?

A) control rods stepping out in auto

B) turbine runback

C) T-ave - T-ref deviation

D) decreasing pressurizer level

ANSWER 2.10 (1.00)

B.

REFERENCE

L1185I

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.11 (1.00)

FR-H.1 "Resporse to Loss Of Secondary Heat Sink" requires an immediate trip of RCP's and initiation of feed and bleed cooling if WR level in any 3 Steam Generators is <25%[50% adverse] or PZR pressure is >2385 psig. WHICH of the following best describes the reason for these actions?

A) Prevent SGTR from excessive primary to secondary pressure difference.

B) Prevent challenging RCS pressure integrity.

C) Prevent loss of coolant inventory through PORVs or safeties without makeup from safety injection.

D) Prevent thermal shock damage to SG tubesheets from restoring feed to a hot, dry SG.

ANSWER 2.11 (1.00)

C.

REFERENCE

L1211I

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

delete

QUESTION 2.12 (1.00)

Feed and Bleed cooling has been initiated in response to a loss of all feedwater, but core exit TC's have continued to trend up. WHAT flow rate is called for when any feed capability is restored?

A) at least 500 gpm

B) no more than 100 gpm to any single steam generator

C) maximum available flow to all steam generators

D) maximum available flow to any single steam generator

ANSWER 2.12 (1.00)

D.

REFERENCE

I1420I

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.13 (1.00)

E-3 "Steam Generator Tube Rupture" step 4 requires feed to the ruptured SG be maintained until narrow range level is >5%[25% adverse], then stopped. WHAT is the reason for this requirement?

A) ensure U-tubes are covered for maximum heat transfer capability

B) ensure adequate inventory for RCS backfill

C) prevent depressurization of SG steam space

D) prevent adverse chemical environment on intact U-tubes

ANSWER 2.13 (1.00)

C.

REFERENCE

L1205I

QUESTION 2.14 (1.50)

Three possible methods of detecting a steam generator tube leak are _____, _____, or _____.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

ANSWER 2.14 (1.50)

any three (.5 each)

sample secondary for actvity
sample secondary for boron
condenser offgas monitor
main steamline monitor
blowdown monitor
RCS leak indications(any indications worth only one answer)
steam/feed mismatch

REFERENCE

L1110I

QUESTION 2.15 (1.00)

ON 1242.01 "Loss of Instrument Air" contains three conditions under which the reactor should be tripped. State any TWO.

ANSWER 2.15 (1.00)

60# pressure(or loss of valve control)
PCCW to RCP's lost
can't start any SA compressor
loss of feed reg valves

REFERENCE

ON1242.01
L1194I

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.16 (1.00)

E-3 "Steam Generator Tube Rupture" contains steps to isolate the ruptured steam generator. One of these steps is to "adjust ruptured SG ASDV controller to 1125 psig". WHY is adjustment of the controller setpoint performed instead of manually closing the ASDV?

A) ASDV can modulate to control T-ave

B) ASDV can be isolated if it fails open, thus preventing steam generator depressurization.

C) ASDV can be isolated if it fails open, in order to minimize offsite release.

D) ASDV flowrate is less than that of a safety, thus minimizing offsite release if it opens.

ANSWER 2.16 (1.00)

C.

REFERENCE

L1205I

QUESTION 2.17 (1.50)

State THREE automatic actions that would help isolate a faulted steam generator. Include setpoints.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

ANSWER 2.17 (1.50)

.25 each action, .25 each setpoint

EFW isolation	flow ~~< 450~~ > 425 gpm	
MFW isolation	reactor trip and T-ave low ~~554~~ 564 deg f	
MS isolation	SG press < 585# or negative rate	

HELB actuation 120 °F.

REFERENCE

QUESTION 2.18 (1.00)

The plant is operating at 100% power when the following alarms annunciate:

PZR level low deviation
"A" RCP #1 seal return temperature high
"A" RCP #1 seal leakoff flow high

"A" RCP seal leakoff is also observed to indicate off scale high. WHICH of the following is the most likely cause?

A) failure of #1 seal
B) failure of #2 seal
C) leak on #A seal leakoff piping
D) failure of #1 & #2 seals

ANSWER 2.18 (1.00)

A.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE

ON for RCP failure

QUESTION 2.19 (1.00)

A) The first SG safety will lift at a setpoint of _____ psig.

B) With the plant in hot standby, this setpoint corresponds to T-ave at _____ deg F.

ANSWER 2.19 (1.00)

1185#
567 deg f

REFERENCE

QUESTION 2.20 (1.50)

A) The thermal barrier cooling system minimum temperature is _____ deg f.

B) What is the reason for this limit?

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

ANSWER 2.20 (1.50)

60 deg f (.5)
Brittle fracture requirements of reactor coolant pumps. (1.0)
(Thermal Stress)

REFERENCE

OS1012.08

QUESTION 2.21 (1.00)

FR-C.1, "Response to Inadequate Core Cooling", step 9, requires intact SG levels be kept above the top of the U-tubes. WHAT is the reason for this requirement?

A) To prevent depressurization of the SG steam space.

B) To ensure maximum heat transfer capability.

C) To prevent adverse chemical effects that would occur if U-tubes dry out.

D) To ensure SG inventory adequate to avoid thermal shocking the tubesheet.

ANSWER 2.21 (1.00)

B.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE

L1206I

QUESTION 2.22 (2.50)

A design basis LOCA is in progress. ES-1.3, "Transfer to Cold Leg Recirculation", has just been COMPLETED. On the attached diagram, draw a CIRCLE around ALL motor operated valves that are OPEN and draw an X on ALL motor operated valves that are CLOSED.

ANSWER 2.22 (2.50)

see attached sheet (.05 pts each valve)

REFERENCE

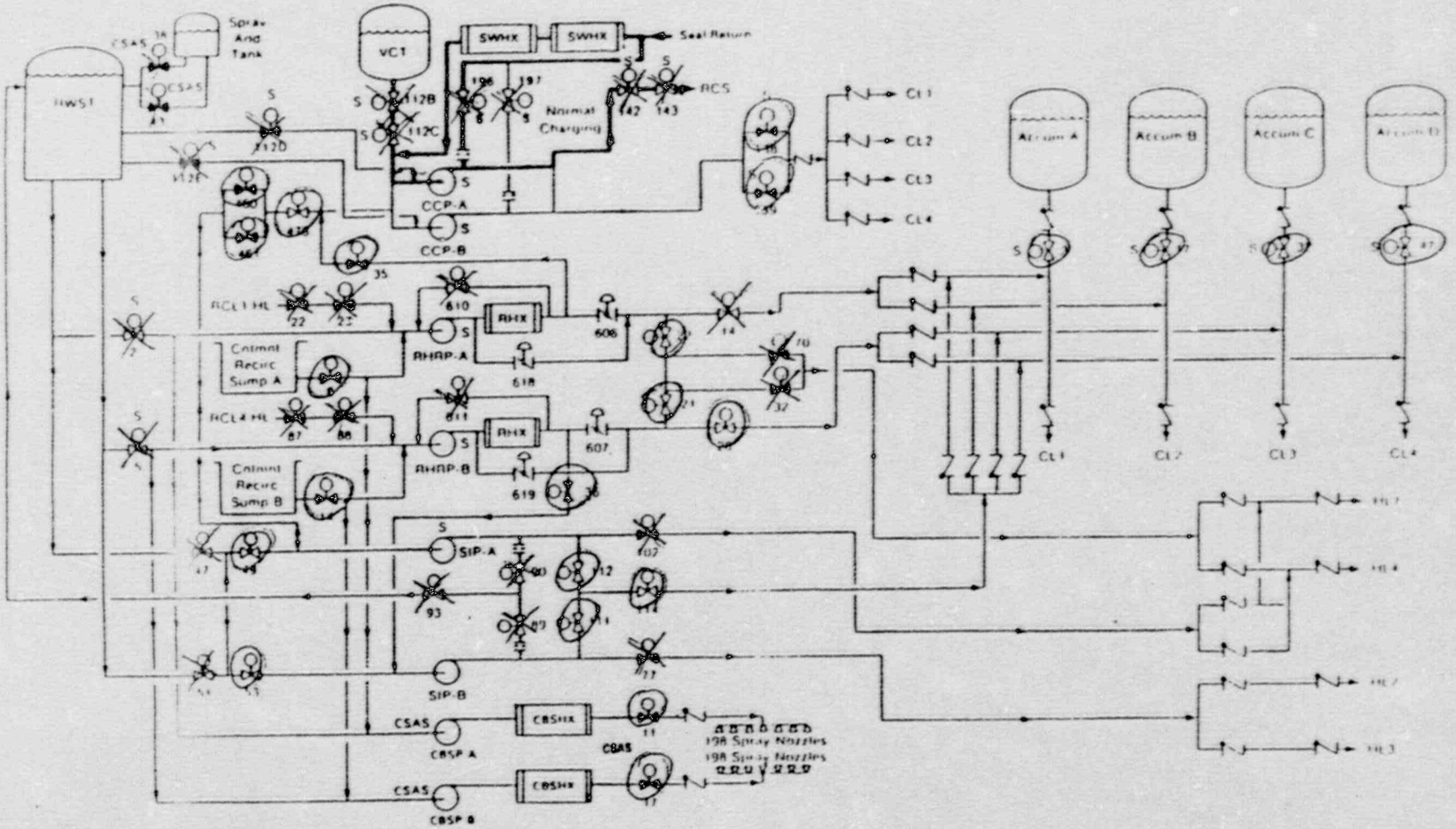
ECCS description

QUESTION 2.23 (1.00)

A spurious Phase B Containment Isolation has just occurred with the plant at 100% power. If it cannot be reset, WHICH of the following will most likely be the first condition to require a reactor trip?

A) RCP high thrust bearing or motor winding temperatures
B) RCP high #1 seal leakoff temperature
C) RCP shaft/frame vibration at danger value
D) 15 minutes without PCCW flow

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)


Spray Add Tank
RWST
VCT
SWHX
SWHX
Seal Return
Normal Charging
RCS
CCP-A
CCP-B
CL1
CL2
CL3
CL4
Accum A
Accum B
Accum C
RHR
SIP-A
SIP-B
CBSHX
CBSHX
CBSP A
CBSP B
CBAS
198 Spray Nozzles
198 Spray Nozzles

ANSWER 2.23 (1.00)

A.

REFERENCE

OS1201.01

delete

QUESTION 2.24 (1.00)

A load reduction is in progress due to decreasing condenser vacuum. If the problem is not corrected, WHEN will a turbine trip be required?

A) load less than 360 MWe
B) vacuum less than 25"
C) load less than 360 MWe OR vacuum less than 25"
D) vacuum less than 5"

ANSWER 2.24 (1.00)

C.

REFERENCE

L11801

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.25 (1.00)

During a Safety Injection, WHAT prevents CCP's and SIP's from exceeding runout flow?

A) residual RCS pressure
B) pumps are designed so that runout is not possible
C) flow restricting orifices in pump discharge piping
D) throttle valves in injection lines

ANSWER 2.25 (1.00)

D.

REFERENCE

ECCS description

QUESTION 2.26 (1.00)

WHICH one of the following (A-D) correctly orders the steps listed which are performed in order to establish normal letdown following a controlling pressurizer level instrument failing low?

1) Open letdown line isolation valves: LCV-459, LCV-460, CD-V145

2) Slowly open one letdown flow control valve

3) Close letdown flow control valves: HCV-189, HCV-190

A) 3,1,2 B) 3,2,1 C) 1,3,2 D) 2,1,3

ANSWER 2.26 (1.00)

A (1.0)

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE

OS 1201.07, PZR Level Instrument Failure

QUESTION 2.27 (1.00)

WHICH one of the following Reactor Vessel level heights is the criteria for determining whether adequate level exists in the Reactor Vessel during operations involving partial draining of the RCS?

A) > -85.5 inches

B) > -100.5 inches

C) > -125.5 inches

D) > -160.5 inches

ANSWER 2.27 (1.00)

A (1.0)

REFERENCE

OS 1213.01, Loss of RHR During Shutdown Cooling

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.28 (1.00)

WHICH one of the following correctly describes system functions related to maintaining 120 VAC Vital Instrumentation Power?

A) Upon a loss of the 480 VAC Bus feeding Vital Instrument Panel PP-1E, Vital Battery BC-1E would singly supply power to PP-1E via the Uninteruptible Power Supply.

B) Vital Instrument Panel PP-1F receives its battery backup from a Vital Battery supplying two (2) vital instrument panels.

C) If a Vital Instrument Panel Static Transfer Switch shifts to Alternate Power, no automatic transfer will occur when the UPS is again functioning properly.

D) When the Alternate Power Supply Breaker is closed during an operation to align alternate power to a Train A vital instrument bus, the normal input breaker for that bus will automatically open.

ANSWER 2.28 (1.00)

B (1.0)

REFERENCE

120 VAC Distribution System Description

QUESTION 2.29 (1.50)

LIST five (5) channel bistables that must be verified to be tripped when a pressurizer pressure channel is inoperable.

ANSWER 2.29 (1.50)

high pressure reactor trip (five of the following at .30 each)
low pressure reactor trip
low pressure SI trip
P-11 permissive trip
OTdeltaT reactor trip
OTdeltaT rod stop and turbine runback

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE

Pressurizer Pressure and Level Control System, PPLC-43

QUESTION 2.30 (1.00)

WHICH one of the following locations would be the safest place for an irradiated fuel assembly during a loss or refueling cavity water?

A) In the transfer canal with refueling machine mast fully extended.

B) In the RCCA change fixture.

C) In the upender and vertical.

D) On the fuel transfer cart.

ANSWER 2.30 (1.00)

D (1.0)

REFERENCE

OS 1215.05, Loss of Refueling Cavity Water.

(***** END OF CATEGORY 2 *****)

QUESTION 3.01 (1.00)

During a reactor startup you observe intermediate range channel I to provide the P-6 permissive about 1/2 decade below the source range high flux trip. As you raise power, intermediate range channel II indicates approximately 1 decade lower than channel I. WHAT is the problem?

A) IR channel I is overcompensated

B) IR channel I is undercompensated

C) IR channel II is overcompensated

D) IR channel II is undercompensated

ANSWER 3.01 (1.00)

C.

REFERENCE

L1164I

QUESTION 3.02 (1.50)

STATE the TWO automatic blocks of steam dump operation. Include setpoints and coincidence.

ANSWER 3.02 (1.50)

condenser vacuum(C-9) 2/3 < 25" (.5) → two circ pumps
1/3 circ bkrs
low low t-ave(P-12) 2/4 t-ave < 550 deg f (.5)

REFERENCE

L11291
steam dumps system description

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.03 (1.00)

In the event that both the main AND emergency seal oil pumps fail, generator gas pressure will decrease to WHAT value?

A) 8 psig

B) 12 psig

C) 8 psig less than turbine bearing oil supply pressure

D) turbine bearing oil supply pressure

ANSWER 3.03 (1.00)

D

REFERENCE

system description

QUESTION 3.04 (1.00)

WHY was the GAMMA-METRICS flux monitoring system installed?

A) The advanced design allows use of 1 detector for the full desired range

B) Westinghouse NI's give false indications under conditions of reduced bus voltage.

C) The system provides an environmentally qualified NI system

D) To provide a diverse, safety grade means of generating low power trip signals

ANSWER 3.04 (1.00)

C.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

NIS description

QUESTION 3.05 (1.00)

The four accident conditions which form the design basis for the ECCS are the _____, _____, _____ and _____.

ANSWER 3.05 (1.00)

.25 each

LOCA
Loss of secondary coolant
SGTR
rod ejection

REFERENCE

ECCS description

QUESTION 3.06 (2.00)

LIST the FOUR conditions which will initiate Safety Injection. Include setpoints and coincidence as applicable.

ANSWER 3.06 (2.00)

.5 each
P-pzr 2/4 < 1865#
P-cont 2/3 > 4.0#
P-stm 2/3 on 1/4 < 585#
manual (1/2)

REFERENCE

ECCS description

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.07 (1.00)

When the containment equipment sump pumps start, to WHAT tank(s) do they pump?

ANSWER 3.07 (1.00)

WL floor drain tanks

REFERENCE

WL prints

QUESTION 3.08 (1.00)

WHICH parameters determine the actual pressure difference signal used for Main Feed Pump speed control?

A) auctioneered high SG inlet pressure - feed header pressure

B) auctioneered high SG steam pressure - feed header pressure

C) steam manifold pressure - feed header pressure

D) average SG inlet pressure - feed header pressure

ANSWER 3.08 (1.00)

C.

REFERENCE

SGWLC system description
L11281

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.09 (1.00)

WHAT plant parameter is used to determine the program value for pressure difference to be maintained by feed pump speed control?

A) steam manifold pressure

B) turbine impulse pressure

C) total steam flow

D) total feed flow

ANSWER 3.09 (1.00)

C.

REFERENCE

L11281
SGWLC desc

QUESTION 3.10 (1.00)

WHAT is the setpoint and coincidence for the power range high flux rod stop?

A) 1/4 > 103%

B) 2/4 > 103%

C) 1/4 within 3% of reactor trip

D) 2/4 within 3% of reactor trip

ANSWER 3.10 (1.00)

A.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

L11131

QUESTION 3.11 (1.00)

WHAT is the setpoint and coincidence for the OP delta T rod stop?

A) 1/4 > 103%

B) 2/4 > 103%

C) 1/4 within 3% of reactor trip

D) 2/4 within 3% of reactor trip

ANSWER 3.11 (1.00)

c. D.

REFERENCE

L11131

QUESTION 3.12 (1.00)

Briefly explain the difference between a rod control urgent failure and a rod control non-urgent failure.

ANSWER 3.12 (1.00)

Urgent failures directly impact the ability of the system to move or hold rods. Non-urgent failures are failures of redundant components, and have no immediate effect on operation.

REFERENCE

L11131

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.13 (1.00)

The plant is at 80% power, with rods in auto at 200 steps. If PT-505 fails high, WHAT is the response of the rod control system?

A) rods step in continuously

B) rods step out continuously

C) rods move in a few steps, then stop

D) rods move out a few steps, then stop

ANSWER 3.13 (1.00)

B

REFERENCE

rod control system description

QUESTION 3.14 (1.00)

WHAT are the automatic control setpoints for CCP minimum flow valves V196 and V197 during an SI?

A) open if CCP flow < 80 gpm, close if flow > 120 gpm

B) open if recirc flow < 60 gpm, close if > 80 gpm

C) open if recirc flow < 80 gpm, close if pump flow > 120 gpm

D) open if CCP flow < 120 gpm, close if flow > 150 gpm

ANSWER 3.14 (1.00)

A.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

CS description
L1105I

QUESTION 3.15 (1.50)

LIST the signals which will cause auto EFW initiation. Include setpoints and coincidence as applicable.

ANSWER 3.15 (1.50)

low-low SG level	2/4 < 14% in 1/4 SG's
SI	1/2 trains
loss of offsite power	

REFERENCE

EFW desc

QUESTION 3.16 (1.00)

WHAT is the basis for the volume of water dedicated to EFW in the CST.

ANSWER 3.16 (1.00)

to enable a cooldown to 350 deg f (and depressurization to 400#)

REFERENCE

EFW desc
TS basis

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.17 (1.00)

The shell volume of the pressurizer is 125 gal per % level. The number used in the RCS leakrate procedure is 61.31 gal per % level. What is the reason for this difference?

A) To account for pressurizer volume not included in the span of the level instruments.

B) To account for increase in water density at normal operating pressure.

C) To account for pressurizer volume taken up by pressurizer heaters, supports, and other internal parts.

D) To account for cold makeup water vs. hot pressurizer water difference in density.

ANSWER 3.17 (1.00)

C. D.

QUESTION 3.18 (1.50)

State FIVE of the SIX conditions that cause an EDG engine trouble shutdown. Setpoints are not required.

ANSWER 3.18 (1.50)

any 5/6, .3 each

low lube oil pressure
engine overspeed
high lube oil temp
high jacket coolant temp
~~gen b/u protective lockout~~
emergency stop

Primary lockout (overcurrent, differential)

86 DP

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

EDM description

QUESTION 3.19 (2.50)

NUMBER the events below in the order in which they occur during a diesel startup.

control air supplied to control valves in engine cooling system _____

alarm delay relay times out _____

air start solenoids deenergize _____

crank time limit relay deenergizes _____

start air shutoff relay energizes _____

ANSWER 3.19 (2.50)

4 (.5 each)
5
~~1~~ 2
3
~~2~~ 1

REFERENCE

EDM system description
L10991 EO 4

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.20 (1.00)

WHICH of the following will cause an EPS to commence the loading sequence?

A) diesel output breaker closed

B) diesel output breaker closed and 70% bus voltage

C) diesel output breaker closed and 95% bus voltage

D) diesel output breaker closed and 1 sec time delay

ANSWER 3.20 (1.00)

P.

REFERENCE

EDE desc

QUESTION 3.21 (2.00)

a) The Emergency Power Sequencers are activated by two levels of undervoltage protection.

(1) First level is less than _____% of nominal voltage for ____ sec.
(2) Second level is less than _____% of nominal voltage for ____ sec.

b) WHAT is the purpose of the time delay in the first level UV protection?

c) WHEN is an EPS activated without this delay?

ANSWER 3.21 (2.00)

70,1.2 (.5)
95,10 (.5) (ω/SI)
allow bus transfer UAT-RAT (.5)
offsite power not available (.5)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

EDE desc
AC Elect desc

QUESTION 3.22 (1.00)

WHICH of the following D/G trips are ACTIVE during an SI/LOP? More than one answer is possible.

A) generator differential current

B) generator overcurrent with voltage restraint

C) loss of field

D) reverse power

E) generator overcurrent

F) low lube oil pressure

G) mechanical overspeed

H) high jacket water temp

I) high lube oil temp

ANSWER 3.22 (1.00)

A,B,F,G

REFERENCE

EDE desc
11001

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.23 (2.50)

WHAT is the setpoint and coincidence for each of the following reactor trips.

a) Single loop low RCS flow

b) RCP undervoltage

c) RCP underfrequency

d) PZR low pressure

e) PZR high level

ANSWER 3.23 (2.50)

2/3 on 1/4 < 90.0%
1/2 on both busses <10.2 kv (70%)
1/2 <55.5 hz on both busses
2/4 < 1945#
2/3 > 92%

REFERENCE

RPS desc

QUESTION 3.24 (1.00)

The plant is operating at 100% power when the controlling steam pressure channel fails high on "A" steam generator. WHAT is the level response?

A) level rises, stabilizes above program

B) level rises, then gradually returns to program

C) level rises above program, drops below program, then gradually returns to program if no trip occurs

D) level rises above program, drops below program, may reach reactor trip setpoint as MFP speed backs down

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER 3.24 (1.00)

B.

REFERENCE

L1183I
L1406I

QUESTION 3.25 (1.50)

Match the PT in column A with its function in column B.

Column A	Column B
1) PT505 _____	a) provided MS pressure for for SD system in pressure mode.
2) PT506 _____	b) provides impulse pressure for T-ref
3) PT507 _____	c) provides impulse pressure for arming SD on load rejection

ANSWER 3.25 (1.50)

B (.5 each)
C
A

REFERENCE

L1406I

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.26 (1.00)

The reactor is at 2% power with steam dumps in auto. The BOP operator notices SG level trending down, and increases startup feed flow. WHICH of the following best describes reactor power response to the additional feed?

A) no effect

B) increases, then levels off

C) increases initially, then returns to original level

D) increases initially, then decreases below original level

ANSWER 3.26 (1.00)

B.

QUESTION 3.27 (1.50)

STATE THREE means by which the RHR system is protected against overpressurization. Include setpoints.

ANSWER 3.27 (1.50)

RHR discharge relief 600# (.5)
RHR suction relief 450# (.5)
RHR suction valve interlock close at 660# RCS (.5)
(open permissive <365#)

LTOP system (.5)

REFERENCE

system description

QUESTION 3.28 (1.00)

The Seabrook administrative exposure limits for personnel WITH complete exposure documentation are _____ per qtr. and _____ per year.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER 3.28 (1.00)

1000 mr, 5000 mr (.5 each)

REFERENCE

L1506I
RP manual

QUESTION 3.29 (2.00)

Oncoming control room personnel are required to review a "Control Room Relief Checklist". List any EIGHT items/areas from at least TWO of the FOUR parts of this checklist.

ANSWER 3.29 (2.00)

checklist attached

REFERENCE

L1505I
OPPM

QUESTION 3.30 (1.00)

WHO may release a tagging order when the individual to whom the tags were issued cannot be reached?

A) A foreman from the same group as the individual to whom the tags were issued, with concurrence of the Unit Shift Supervisor.

B) The Unit Shift Supervisor, with concurrence of the Shift Superintendent

C) Operations Department Manager, with concurrence of an individual from the same group as the individual to whom the tags were issued.

D) Shift Superintendent, with concurrence of a cognizant individual from the same group as the individual to whom the tags were issued.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER 3.30 (1.00)

D.

REFERENCE

MA4.2

QUESTION 3.31 (1.00)

Two closed valves in series should be used, when practicable, to isolate a work area from fluid or gas systems that operate under WHICH of the following conditions?

A) >200 deg F or >500 psig

B) >200 deg F or >1000 psig

C) >200 deg F or radioactive fluid

D) >200 deg F or toxic fluid

ANSWER 3.31 (1.00)

A

REFERENCE

MA4.2

QUESTION 3.32 (1.50)

STATE three (3) methods that a watchstander can use to ensure that the controlled reference information being used is current.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER 3.32 (1.50)

three of the following at .5 each

1. Checking the working procedure against the controlled procedure books
2. Checking the print revision against the print index.
3. Using the Nuclear Records Management System to verify the latest revision.
4. Calling the Document Control Center.
5. Notifying the Unit Shift Supervisor (management action)

REFERENCE

OPMM, Chapter 3, page 3-1.6

QUESTION 3.33 (0.50)

When checking the position of a manual valve, the valve must always be operated in the _____ direction.

ANSWER 3.33 (0.50)

Closed (.5)

REFERENCE

OPMM, Chapter 3, page 3-2.3

QUESTION 3.34 (1.00)

The operator _____ believe instrument indications during abnormal or emergency situations until indication are proven to be _____.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER 3.34 (1.00)

Shall (.5)
False (.5) (inaccurate, erroneous)

REFERENCE

OPMM, Chapter 3, page 3-1.2

QUESTION 3.35 (1.00)

Under What Condition(s) is a non-licensed individual permitted to operate controls that directly affect reactivity?

ANSWER 3.35 (1.00)

Non-licensed individual is in operator training program (.5) and is being directly supervised (.5).

REFERENCE

OPMM, Chapter 3, page 3-1.2

QUESTION 3.36 (1.50)

Under What Two (2) conditions (interpret broadly) is the operator responsible for shutting down the reactor. Do not include direction from a supervisor.

ANSWER 3.36 (1.50)

two of the following:

1) The operator determines the safety of the reactor is in jeopardy, or when such action is deemed necessary to protect the health and safety of the public (.75)

2) When operating parameters exceed any of the RPS setpoints and automatic action has not occured. (.75)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

OPMM, Chapter 3, page 3-1.2

QUESTION 3.37 (1.50)

Under normal conditions, What are three (3) permissives required before a Service Water Pump can be started from the MCB?

ANSWER 3.37 (1.50)

3 of the following at .5 each:

-Associated Service Water Pump Discharge Valve is fully closed
-Associated Cooling Tower Pump Discharge Valve is fully closed
-Pump breaker is in the operate position
-Switchgear lockout relay is reset

(Breaker Permissives Racked-in)

REFERENCE

Service Water, Lic Op Init Training Program, page SW-35

QUESTION 3.38 (1.00)

What are two (2) distinct signals that will automatically isolate Secondary Heat Loads from the Service Water Distribution System?

ANSWER 3.38 (1.00)

two of the following
TA (Tower Actuation) (.5)
S (Safety Injection) (.5)
LOP (.5)

REFERENCE

Service Water, Lic Op Init Training Program, page SW-4

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.39 (1.50)

The following concern operation of the Containment Spray System during a spray actuation:

a) Resetting the "S" signal prior to containment sump switchover _____ remove the "S" signal input to the switchover logic.

b) During switchover from the RWST to the Containment Sump, the CBS pumps _____ be operating.

c) If the "S" signal is reset, the RWST isolation valves (CBS-V-2, CBS-V-5) are _____ shut following switchover.

ANSWER 3.39 (1.50)

a) will not (.5)
b) ~~will~~ may (.5)
c) manually (.5)

REFERENCE

CBS, Lic Op Init Training Program

QUESTION 3.40 (1.00)

The _____ will maintain pneumatic control pressure for the ASDVs following a loss of instrument air.

ANSWER 3.40 (1.00)

Pressurized Nitrogen Bottles (1.0)

REFERENCE

Service and Instrument Air, Lic Op Init Training Program, page AIR-20

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.41 (1.00)

WHICH one of the following will isolate Component Cooling to at least one Containment Air Compressor?

A) Component Cooling Head Tank low-low level

B) T Signal

C) Component Cooling Head Tank low level

D) Component Cooling Radiation Alarm

ANSWER 3.41 (1.00)

A (1.0)

REFERENCE

Service and Instrument Air, Lic Op Init Training Program
Component Cooling System Description, page CC-16

QUESTION 3.42 (2.10)

The following concern Reactor Coolant Pumps:

a) Reactor Coolant CAN flow into each RCP in Three (3) distinct flow paths. The flows are: _____ flow, _____ flow, and _____ flow. (.9)

b) The Four (4) items in each RCP that utilize PCCW are the _____, _____, _____, and _____. (1.2)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER 3.42 (2.10)

a) Through Pump (Pump Suction) (.30)
Seal #1 Injection (.30)
Seal #3 Injection (.30)
(heat exchanger)

b) Thermal Barrier Cooling Coil (.30)
Lower Motor Bearing Cooler (.30)
Motor air cooler (.30)
Upper Bearing Cooler (.30)

REFERENCE

RCP, Lic Op Init Training Program, pages RCP-20 to RCP-23

QUESTION 3.43 (1.00)

Steam Generator Feed Pump Turbines will trip on decreasing condensor vacuum less than _____ inches mercury absolute.

A) 23.4

B) 22.4

C) 15.7

D) 12

ANSWER 3.43 (1.00)

D (1.0)

REFERENCE

Condensate, Lic Op Init Training Program, page CO-43.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.44 (2.50)

Match one actuation from Column II with each VCT Level Indication from Column I.

Column I	Column II
1. 90%	a. Low Level Alarm
2. 83%	b. Auto Makeup Off
3. 50%	c. Auto Makeup On
4. 30%	d. Emergency Makeup Aligned
5. 20%	e. High Level Alarm
	f. Full divert to PDT

ANSWER 3.44 (2.50)

1. e (.5 each)
2. f
3. b
4. c
5. a

REFERENCE

Chemical and Volume Control System, Lic Op Init Training Program, pg CS-50

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.45 (1.00)

WHY does CS-V-145 close when either CS-LCV-459 or 460 leave the full open position?

A) So the Regenerative Heat Exchanger remains full.

B) So the Regenerative Heat Exchanger remains pressurized, preventing damage from flashing.

C) So the Regenerative Heat Exchanger remains full in order to maintain thermal stresses less than design limits.

D) So the Regenerative Heat Exchanger remains pressurized, preventing surge flow when letdown is placed in-service.

ANSWER 3.45 (1.00)

B (1.0)

REFERENCE

Chemical and Volume Control System, Lic Op Init Training Program

QUESTION 3.46 (1.00)

WHICH physical variable is used by the operator to determine the Power Adjust Setting for the Hydrogen Recombiners?

A) Recombiner Operating Temperature

B) Containment Hydrogen Concentration

C) Containment Atmosphere Temperature

D) Containment Pressure

ANSWER 3.46 (1.00)

D (1.0)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

Containment HVAC, Combustible Gas Control System Description, page CHV-54

QUESTION 3.47 (1.00)

Hydrogen gas in concentrations greater than _____% by volume poses an explosive hazard.

ANSWER 3.47 (1.00)

~~4.1 % (4% is acceptable)~~ (1.0) 8 % (explosive)

REFERENCE

Containment HVAC, Lic Op Init Training Program

QUESTION 3.48 (1.00)

During a large break LOCA, the Containment Structure Cooling Fans will be _____, and the Containment Recirculation Filter System in the _____ mode.

ANSWER 3.48 (1.00)

Tripped (.5)
Recirculation (.5)

REFERENCE

Containment HVAC, Lic Op Init Training Program

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.49 (1.00)

WHY should no more than two (2) Containment Structure Cooling Fans be started in any 15 second period?

A) To prevent overloading the substation transformer.

B) To prevent causing an adverse PCCW temperature transient.

C) To prevent a rapid and adverse pressure drop across the cooling unit filters.

D) To prevent an inversion of radioactive gasses in containment which could cause a containment radiation alarm.

ANSWER 3.49 (1.00)

A (1.0)

REFERENCE

Containment HVAC, Lic Op Init Training Program

(***** END OF CATEGORY 3 *****)
(********** END OF EXAMINATION **********)

QUESTION	VALUE	REFERENCE
2.01	1.00	9000124
2.02	1.00	9000125
2.03	1.00	9000126
2.04	1.00	9000127
2.05	1.00	9000128
2.06	2.00	9000129
2.07	1.50	9000130
2.08	2.00	9000131
2.09	1.00	9000132
2.10	1.00	9000133
2.11	1.00	9000134
2.12	1.00	9000135
2.13	1.00	9000136
2.14	1.50	9000137
2.15	1.00	9000138
2.16	1.00	9000139
2.17	1.50	9000140
2.18	1.00	9000141
2.19	1.00	9000142
2.20	1.50	9000143
2.21	1.00	9000144
2.22	2.50	9000145
2.23	1.00	9000146
2.24	1.00	9000147
2.25	1.00	9000148
2.26	1.00	9000149
2.27	1.00	9000150
2.28	1.00	9000151
2.29	1.50	9000152
2.30	1.00	9000153
	36.00	
3.01	1.00	9000154
3.02	1.50	9000155
3.03	1.00	9000156
3.04	1.00	9000157
3.05	1.00	9000158
3.06	2.00	9000159
3.07	1.00	9000160
3.08	1.00	9000161
3.09	1.00	9000162
3.10	1.00	9000163
3.11	1.00	9000164
3.12	1.00	9000165
3.13	1.00	9000166
3.14	1.00	9000167
3.15	1.50	9000168
3.16	1.00	9000169
3.17	1.00	9000170
3.18	1.50	9000171
3.19	2.50	9000172
3.20	1.00	9000173
3.21	2.00	9000174
3.22	1.00	9000175

QUESTION	VALUE	REFERENCE
3.23	2.50	9000176
3.24	1.00	9000177
3.25	1.50	9000178
3.26	1.00	9000179
3.27	1.50	9000180
3.28	1.00	9000181
3.29	2.00	9000182
3.30	1.00	9000183
3.31	1.00	9000184
3.32	1.50	9000185
3.33	0.50	9000186
3.34	1.00	9000187
3.35	1.00	9000188
3.36	1.50	9000189
3.37	1.50	9000190
3.38	1.00	9000191
3.39	1.50	9000192
3.40	1.00	9000193
3.41	1.00	9000194
3.42	2.10	9000195
3.43	1.00	9000196
3.44	2.50	9000197
3.45	1.00	9000198
3.46	1.00	9000199
3.47	1.00	9000200
3.48	1.00	9000201
3.49	1.00	9000202
	61.60	
	97.60	

Nuclear Regulatory Commission
Operator Licensing
Examination

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date of examination.

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U. S. NUCLEAR REGULATORY COMMISSION
SENIOR REACTOR OPERATOR LICENSE EXAMINATION
REGION 1

FACILITY: Seabrook 1

REACTOR TYPE: PWR-WEC4

DATE ADMINSTERED: 89/11/13

CANDIDATE: _____

INSTRUCTIONS TO CANDIDATE:

Use separate paper for the answers. Write answers on one side only. Staple question sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires at least 70% in each category and a final grade of at least 80%. Examination papers will be picked up 4.5 hours after the examination starts.

CATEGORY VALUE	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE		CATEGORY
~~43.50~~ 41.00	43.50			5.	EMERGENCY AND ABNORMAL PLANT EVOLUTIONS (33%)
56.50	56.50			6.	PLANT SYSTEMS (30%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (13%)
~~100.00~~ 97.50		FINAL GRADE	%		TOTALS

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

_____
Candidate's Signature

* Points deleted due to Post-Exam review.

EJ

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QUESTION 5.01 (1.00)

In the event of a loss of all AC power, how long can the station batteries supply emergency loads on their busses with no load shedding?

A) 30 minutes
B) 2 hours
C) 4 hours
D) 8 hours

ANSWER 5.01 (1.00)

~~B.~~ C.

REFERENCE

125 VDC system description
L10971
K/A 0000055 EK3.01 [3.4]

QUESTION 5.02 (1.00)

ECA 0.0, "Loss of All AC Power", step 8, requires that personnel be dispatched to locally close valves to isolate RCP seals. What is the purpose of this step?

A) Reduce the possibility of VCT overpressurization.
B) Prevent backflow through seal injection lines.
C) Reduce possibility of a loss of coolant accident from seal failure
D) Prevent loss of RCS inventory from seal return line relief valve.

ANSWER 5.02 (1.00)

C.

REFERENCE

K/A 0000055 EK3.02 [4.6]
L1201I

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.03 ~~(1.00)~~ (0.50)

The load ratings for the Emergency Diesel Generators are _____ continuous ~~and a two hour overload rating of _____~~.

ANSWER 5.03 ~~(1.00)~~ (0.50)

(A) 6083 KW
~~(B) 6697 KW~~

REFERENCE

EDE system description
K/A 000055 SG7 [3.7]

QUESTION 5.04 (1.00)

Under what condition(s) in which the reactor is tripped is E-0 "Reactor Trip or Safety Injection" NOT entered?

ANSWER 5.04 (1.00)

If the reactor is tripped prior to control room evacuation. (OS1200.02)
If the reactor is tripped in response to a fire. (OS1200.01)
(with no SI required for above acceptable)
Also accept LOPA if given in addition to above

REFERENCE

OS1200.01, OS1200.02
K/A 000067/68 SG11 [4.1]

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.05 (1.00)

With the plant at 100% power which of the following would best describe the response of PRESSURIZER LEVEL if the pressurizer spray line were to break at the pressurizer?

A) Rapid level drop due to loss of mass, then increase from safety injection flow.
B) Erratic indication due to turbulence in instrument lines.
C) Increase due to RCS depressurization and steam formation in reactor vessel head.
D) Increase due to boiling and swell in pressurizer water volume, with further increase from safety injection flow.

ANSWER 5.05 (1.00)

C.

REFERENCE

L1203I
K/A 000008 EK3.01 [4.4]

QUESTION 5.06 (2.00)

A safety injection has initiated as a result of a small break LOCA. The FOUR conditions that must be satisfied in order to transition to ES-1.1 "SI Termination" are _____, _____, _____, and _____.

Include any differences for adverse containment conditions.

ANSWER 5.06 (2.00)

(A) RCS subcooling > 40 deg f (by TC's)
(B) >500 gpm feed flow or >5%[23% adverse] level in one sg
(C) RCS pressure stable or increasing
(D) Pressurizer level >5%[35% adverse]

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

L1202I
000009EA2.11 [4.3]

QUESTION 5.07 (1.50)

Number the following Critical Safety Function Status Tree paths in order of priority.

Core Cooling - Orange __
Containment - Orange __
Heat Sink - Red __
Integrity - Orange __
Subcriticality - Red __
Emergency Recirc - Orange __

ANSWER 5.07 (1.50)

3
5
2
4
1
6

REFERENCE

L1196I
K/A 000009 SG11 [4.4]

QUESTION 5.08 (2.00)

The Immediate actions of FRS-1 "Response to Nuclear Power Generation/ATWS" are _____, _____, _____, and _____.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.08 (2.00)

(A) verify reactor trip (.25)
(B) verify turbine trip (.25)
(C) check EFW pumps running (.25)
(D) initiate emergency boration (.25)

REFERENCE

FRS-1
L1200I
K/A 000029 EK3.12 [4.7]

QUESTION 5.09 (1.00)

A reactor trip has just occurred and a transition to ES-0.1, "Reactor Trip Response" is made. At step 3 of this procedure, the Reactor Operator notes two rods not fully inserted. What action should be taken?

A) Transition to FR-S.1 "Response to Nuclear Power Generation/ ATWS
B) Rapid borate 150 GALLONS for each rod not fully inserted.
C) Initiate manual safety injection.
D) Rapid borate 150 PPM for each rod not fully inserted.

ANSWER 5.09 (1.00)

D)

REFERENCE

ES-0.1
K/A 000029 EK3.11 [4.3]

QUESTION 5.10 (1.00)

Which one of the following is NOT an indication of a dropped control rod?

A) control rods stepping out in auto
B) turbine runback
C) T-ave/T-ref deviation
D) decreasing pressurizer level

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.10 (1.00)

B)

REFERENCE

L1185I
K/A 000003 SG11 [3.8]

QUESTION 5.11 (1.00)

A reactor startup is in progress with reactor power is at 1.0E-8 amps. If intermediate range channel I fails low, WHAT operational limit must be observed?

A) Power must be reduced below the P-6 setpoint within 1 hour.
B) The inoperable channel must be placed in the tripped condition within 1 hour.
C) Power must remain below 10% until the inoperable channel is repaired.
D) All operations involving positive reactivity additions must be suspended immediately.

ANSWER 5.11 (1.00)

C)

REFERENCE

T.S. 3.3
K/A 0000033 SG3 [3.3]

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

delete stet

QUESTION 5.12 (1.00)

FR-H.1, "Response to Loss Of Secondary Heat Sink" requires an immediate trip of RCP's and initiation of feed and bleed cooling if WR level in any 3 Steam Generators is <25% [50% adverse] or if PZR pressure is >2385 psig.

WHICH of the following best describes the reason for these actions?

A) Prevent SGTR from excessive primary to secondary pressure difference.
B) Prevent challenging RCS pressure integrity.
C) Prevent loss of coolant inventory through PORVs or safeties without makeup from safety injection.
D) Prevent thermal shock damage to SG tubesheets from restoring feed to a hot, dry SG.

ANSWER 5.12 (1.00)

C)

REFERENCE

L1211I
K/A 000054 EK3.04 [4.6]

delete

QUESTION 5.13 (1.00)

Feed and Bleed cooling has been initiated in response to a loss of all feedwater, but core exit TC's have continued to trend up. WHAT flow rate is called for when any feed capability is restored?

A) at least 500 gpm
B) no more than 100 gpm to any single steam generator
C) maximum available flow to all steam generators
D) maximum available flow to any single steam generator

ANSWER 5.13 (1.00)

D)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

L1420I
K/A 000054 EK3.05 [4.7]

QUESTION 5.14 (1.00)

E-3, "Steam Generator Tube Rupture" step 4 requires feed to the ruptured SG be maintained until narrow range level is >5% [25% adverse], then stopped.

What is the reason for this requirement?

A) ensure U-tubes are covered for maximum heat transfer capability
B) ensure adequate inventory for RCS backfill
C) prevent depressurization of SG steam space
D) prevent adverse chemical environment on intact U-tubes

ANSWER 5.14 (1.00)

C)

REF [illegible]

L [illegible]052
K/A [illegible]000 3 EK3.06 [4.5]

QUESTION 5.15 (1.50)

Three possible methods of detecting a steam generator tube leak are _____, _____, or _____.

ANSWER 5.15 (1.50)

any three (.5 each)

sample secondary for actvity
sample secondary for boron
condenser offgas monitor
main steamline monitor
blowdown monitor
RCS leak indications (any indications worth only one answer)
stm/feed mismatch

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

L1110I
K/A 000037 SG11 [4.1]

QUESTION 5.16 (1.00)

Tech Spec LCO 3.4.8, "RCS Activity", allows reactor coolant activity to exceed the steady state limit for times as shown in the transient limit graph. WHY is a transient limit permitted?

A) PRA shows insignificant consequences from this limit
B) to allow time for minor fuel leaks to stabilize
C) to allow continued operation with up to 1% failed fuel
D) to allow for iodine spiking from power changes

ANSWER 5.16 (1.00)

D)

REFERENCE

tech spec basis
K/A 000076 SG4 [3.7]

QUESTION 5.17 (1.00)

ON-1242.01, "Loss of Instrument Air" contains three conditions under which the reactor should be tripped. State any TWO.

ANSWER 5.17 (1.00)

60 psig pressure (or loss of valve control) (loss of FRV)
PCCW to RCP's lost
can't start any SA compressor

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

ON-1242.01
L1194I
K/A 000065 EA2.06 [4.1]

QUESTION 5.18 (2.00)

OS-1215.05 "Loss of Refueling Cavity Water" gives direction on what to do with a fuel assembly in transit when cavity level starts dropping. MATCH the assembly locations in column A with the prefered storage method for a loss of cavity level in column B. Assume the loss of level is slow enough to allow action to be taken.

COLUMN A

A) assembly in refueling cavity _____

B) assembly in fuel transfer car _____

C) assembly in RCCA change fixture _____

D) assembly in spent fuel pool _____

COLUMN B

1) Lower assembly to fuel transfer canal floor.

2) Store assembly on reactor side in horizontal position

3) Transfer assembly to SF side and store in the horizontal position

4) Insert assembly in core

5) Insert assembly in spent fuel racks

6) Transfer assembly to core

7) Lower assembly to floor of fuel transfer canal, unlatch

ANSWER 5.18 (2.00)

4
3
6
5

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

OS-1215.05
L1192I
K/A 000036 EK3.03 [4.1]

QUESTION 5.19 (1.00)

E-3, "Steam Generator Tube Rupture", contains steps to isolate the ruptured steam generator. One of these steps is to "adjust ruptured SG ASDV controller to 1125 psig". WHY is adjustment of the controller setpoint performed instead of manually closing the ASDV?

A) ASDV can modulate to control T-ave
B) ASDV can be isolated if it fails open, thus preventing steam generator depressurization.
C) ASDV can be isolated if it fails open, in order to minimize offsite release.
D) ASDV flowrate is less than that of a safety, thus minimizing offsite release if it opens.

ANSWER 5.19 (1.00)

C)

REFERENCE

L1205I
K/A 000038 EK3.02 [4.5]

QUESTION 5.20 (1.00)

Who is responsible for determining whether or not a station fire is contained and under control?

A) Short Term Emergency Director
B) Unit Shift Supervisor
C) Shift Superintendent
D) Fire Brigade Leader

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.20 (1.00)

D)

REFERENCE

K/A 000067 EK3.04 [4.1]

QUESTION 5.21 (1.50)

State THREE automatic actions that would help isolate a faulted steam generator. Include setpoints.

ANSWER 5.21 (1.50)

.25 each action, .25 each setpoint

EFW isolation flow > ~~450~~ 425 gpm
MFW isolation reactor trip and T-ave low 564 deg f
MS isolation SG press < 585# or negative rate
HELB actuation 120°F.

REFERENCE

K/A 000040 EA1.01 [4.6]

QUESTION 5.22 (1.00)

The plant is operating at 100% power when the following alarms annunciate:

PZR level low deviation
"A" RCP #1 seal return temperature high
"A" RCP #1 seal leakoff flow high

"A" RCP seal leakoff is also observed to indicate off scale high. WHICH of the following is the most likely cause?

A) failure of #1 seal
B) failure of #2 seal
C) leak on "A" seal leakoff piping
D) failure of #1 & #2 seals

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.22 (1.00)

A)

REFERENCE

ON for RCP failure
K/A 000015 EA2.01 [3.5]

QUESTION 5.23 (1.00)

A) The first SG safety will lift at a setpoint of _____ psig.

B) With the plant in hot standby, this setpoint corresponds to T-ave at _____ degrees F.

ANSWER 5.23 (1.00)

A) 1185 psig
B) 567 deg f

REFERENCE

K/A 000040 EA1.09 [3.4]

QUESTION 5.24 (1.50)

A) The thermal barrier cooling system minimum temperature is ____ deg F.

B) What is the reason for this limit?

ANSWER 5.24 (1.50)

A) 60 deg F (.5)
B) Brittle fracture requirements of reactor coolant pumps. (1.0)
(thermal stress)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

OS-1012.08
K/A 000026 SG7 [3.5]

QUESTION 5.25 (2.50)

MATCH the leakage categories in column "A" with the leakage limits of Tech Spec L.C.O. 3.4.6.2, "Operational Leakage", in column "B".

COLUMN A		COLUMN B
A) PRESSURE BOUNDARY LEAKAGE	_____	1) 1 GPM
B) UNIDENTIFIED LEAKAGE	_____	2) 5 GPM
C) PRI-SEC LEAKAGE	_____	3) 10 GPM
D) CONTROLLED LEAKAGE	_____	4) .5 GPM/INCH
E) IDENTIFIED LEAKAGE	_____	5) 40 GPM
		6) 0 GPM
		7) 500 GAL/DAY

ANSWER 5.25 (2.50)

6
1
7
5
3

REFERENCE

tech spec LCO 3.4.6.2
K/A 000009 EK3.2 [4.3]

QUESTION 5.26 (1.00)

Reactor vessel flange leakoff would be which of the following types of leakage?

A) identified leakage
B) unidentified leakage
C) controlled leakage
D) pressure boundary leakage

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.26 (1.00)

A)

REFERENCE

TS 3.4.6.2
K/A 000009 EK3.2 [4.3]

QUESTION 5.27 (1.00)

FR-C.1, "Response to Inadequate Core Cooling", step 9, requires intact SG levels to be kept above the top of the U-tubes. WHAT is the reason for this requirement?

A) To prevent depressurization of the SG steam space.
B) To ensure maximum heat transfer capability.
C) To prevent adverse chemical effects that would occur if U-tubes dry out.
D) To ensure SG inventory adequate to avoid thermal shocking the tubesheet.

ANSWER 5.27 (1.00)

B)

REFERENCE

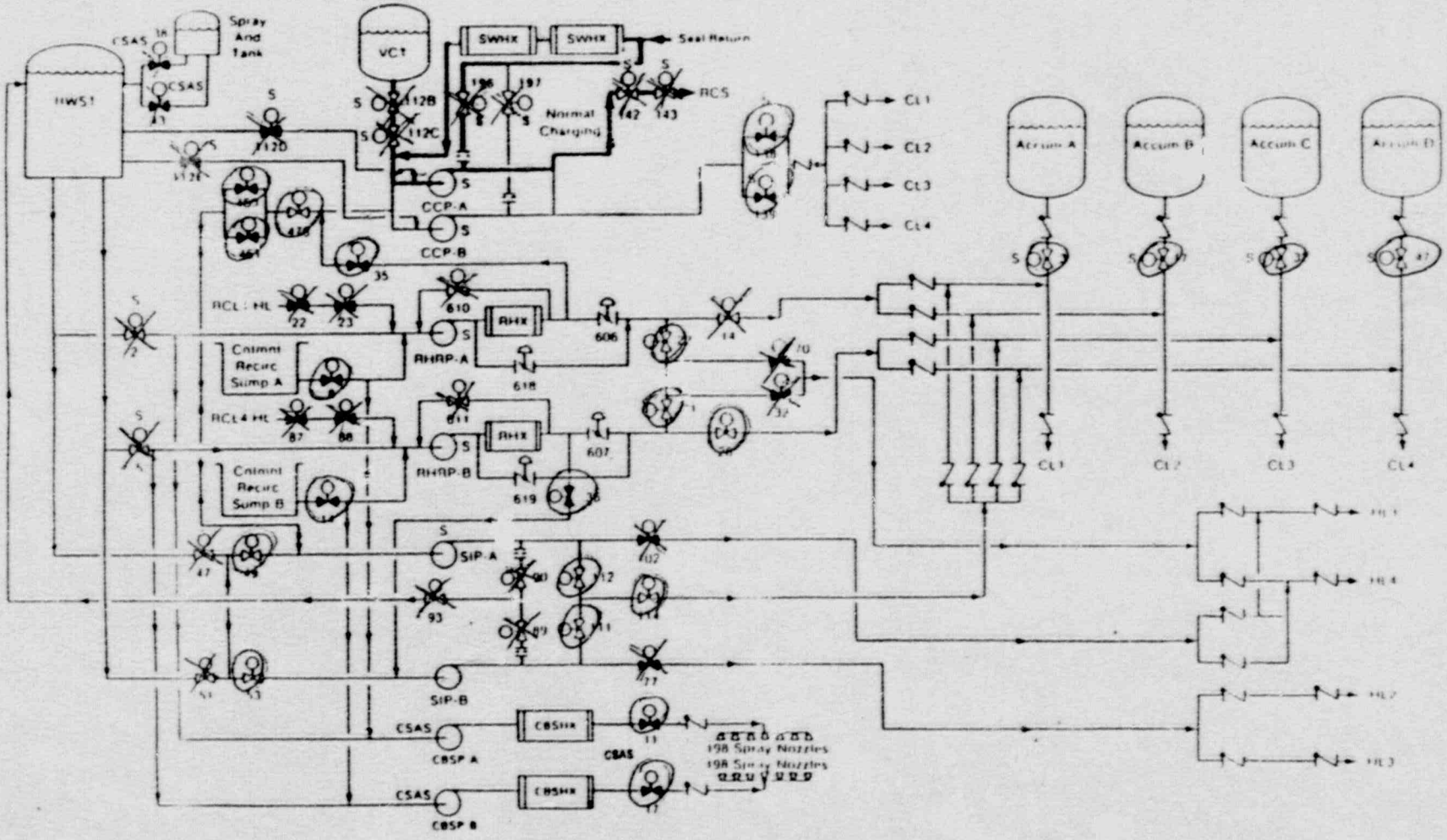
L1206I
K/A 000074 EK1.03 [4.9]

QUESTION 5.28 (2.50)

A design basis LOCA is in progress. ES-1.3, "Transfer to Cold Leg Recirculation", has just been COMPLETED. On the attached diagram, draw a CIRCLE around ALL motor operated valves that are OPEN and draw an X on ALL motor operated valves that are CLOSED.

*ANSWER
see attached sheet (.05 pts each valve)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)


HWST
Spray And Tank
CSAS
VCT
SWHX
SWHX
Seal Return
RCS
Normal Charging
CCP-A
CCP-B
CL1
CL2
CL3
CL4
Accum A
Accum B
Accum C
Accum D
RCL1 HL
RCL4 HL
Cntmnt Recirc Sump A
Cntmnt Recirc Sump B
RHX
RHRP-A
RHRP-B
SIP-A
SIP-B
CBSHX
CBSP A
CBSP B
198 Spray Nozzles
198 Spray Nozzles

REFERENCE

ECCS description
K/A 000011 EK3.08 [4.5]

QUESTION 5.29 (1.00)

Your plant has just completed a 200 day full power run and has entered a refueling outage. The RCS is drained to mid-loop operation for maintenance. If a loss of shutdown cooling occurs, WHEN will the RCS reach saturation?

A) less than 1 hour
B) about 2 hours
C) about 4 hours
C) about 8 hours

ANSWER 5.29 (1.00)

A)

REFERENCE

OS-1213.01
L1175I
K/A 000025 EK1.01 [4.3]

QUESTION 5.30 (1.50)

State THREE possible methods of makeup to the RCS available per OS-1213.01, "Loss of RHR During Shutdown Cooling", if RHR pumps become inoperable in Mode 6.

ANSWER 5.30 (1.50)

.5 each

normal charging from VCT
charging injection from RWST
gravity feed from RWST

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

OS-1213.01
L1175I
K/A 000025 EK3.03 [4.1]

QUESTION 5.31 (2.00)

A) The RCS presssure safety limit is _____ psig.

B) For all modes of operation, state any required actions and time limits if this safety limit is exceeded. Actions with time limit over 1 hour are NOT required.

ANSWER 5.31 (2.00)

A) 2735 psig (1.0)

B) .25 each action below

In modes 1,2: be in HSB, press < limit within 1 hour
notify NRC within 1 hour (or comply with sec 6 requirements)
3,4,5: reduce press < limit within 5 minutes
notify NRC(or comply with sec 6) within 1 hour

REFERENCE

tech specs
K/A 000027 SG6 [3.6]

QUESTION 5.32 (1.00)

A spurious Phase B Containment Isolation has just occurred with the plant at 100% power. If it cannot be reset, WHICH of the following will most likely be the first condition to require a reactor trip?

A) high thrust bearing or motor winding temperatures
B) high #1 seal leakoff temperature
C) RCP shaft/frame vibration at danger value
D) 15 minutes without PCCW flow

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.32 (1.00)

A)

REFERENCE

OS-1201.01
K/A 000015 EK3.02 [3.1]

delete

QUESTION 5.33 (1.00)

A load reduction is in progress due to decreasing condenser vacuum. If the problem is not corrected, WHEN will a turbine trip be required?

A) load less than 360 MWe
B) vacuum less than 25"
C) load less than 360 MWe OR vacuum less than 25"
D) vacuum less than 5"

ANSWER 5.33 (1.00)

C)

REFERENCE

L11801
K/A 000051 EA2.02 [4.1]

QUESTION 5.34 (1.00)

During a Safety Injection, WHAT prevents CCP's and SIP's from exceeding runout flow?

A) residual RCS pressure
B) pumps are designed so that runout is not possible
C) flow restricting orifices in pump discharge piping
D) throttle valves in injection lines

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.34 (1.00)

D)

REFERENCE

ECCS description
K/A 000011 EA1.13 [4.2]

(***** END OF CATEGORY 5 *****)

QUESTION 6.01 (1.00)

During a reactor startup you observe intermediate range channel I to provide the P-6 permissive about 1/2 decade below the source range high flux trip. As you raise power, intermediate range channel II indicates approximately 1 decade lower than channel I. WHAT is the problem?

A) IR channel I is overcompensated
B) IR channel I is undercompensated
C) IR channel II is overcompensated
D) IR channel II is undercompensated

ANSWER 6.01 (1.00)

C.

REFERENCE

L1164I
K/A 000015 A2.02 [3.5]

QUESTION 6.02 (1.00)

STATE the TWO automatic blocks of steam dump operation. Include setpoints and coincidence.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.02 (1.00)

condenser vacuum(C-9)	2/3 ≤ 25"	(.5)
	1/3 circ bkrs	
low low t-ave(P-12)	2/4 t-ave < 550 deg f	(.5)

→ no circ. pumps

REFERENCE

L11291
steam dumps system description
K/A 041020 K6.03 [2.9]

QUESTION 6.03 (1.00)

In the event that both the main AND emergency seal oil pumps fail, generator gas pressure will decrease to WHAT value?

A) 8 psig
B) 12 psig
C) 8 psig less than turbine bearing oil supply pressure
D) turbine bearing oil supply pressure

ANSWER 6.03 (1.00)

D.

REFERENCE

system description
K/A 000045 SG15 [3.2]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.04 (1.00)

Why was the GAMMA-METRICS flux monitoring system installed?

A) advanced design allows use of 1 detector for the full desired range
B) Westinghouse NI's may give false indications if 4.16 KV busses are powered from the diesels.
C) to provide an environmentally qualified NI system
D) to provide a diverse, safety grade means of generating low power trip signals

ANSWER 6.04 (1.00)

C.

REFERENCE

NIS description
K/A 019000 K6.01 [3.2]

QUESTION 6.05 (1.00)

The four accident conditions which form the design basis for the ECCS are _____, _____, _____ and _____.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.05 (1.00)

.25 each

LOCA
Loss of secondary coolant
SGTR
rod ejection

REFERENCE

ECCS description
K/A 000006 SG4 [3.8]

QUESTION 6.06 (2.00)

LIST the FOUR conditions which will initiate Safety Injection. Include setpoints and coincidence as applicable.

ANSWER 6.06 (2.00)

.5 each

P or -pzr 2/4 < 1865#
P-cont 2/3 > 4.0#
P-stm 2/3 on 1/4 < 585#
manual (1/2)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

ECCS description
K/A 013000 K1.01 [4.4]

QUESTION 6.07 (1.00)

When the containment equipment sump pumps start, to WHAT tank(s) do they pump?

ANSWER 6.07 (1.00)

WL floor drain tanks

REFERENCE

WL prints
K/A 068000 K1.07 [2.9]

QUESTION 6.08 (1.00)

WHICH parameters determine the actual pressure difference signal used for Main Feed Pump speed control?

A) auctioneered high SG inlet pressure - feed header pressure
B) auctioneered high SG steam pressure - feed header pressure
C) steam manifold pressure - feed header pressure
D) average SG inlet pressure - feed header pressure

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.08 (1.00)

C.

REFERENCE

SGWLC system description
L11281
K/A 059000 K4.05 [2.8]

QUESTION 6.09 (1.00)

WHAT plant parameter is used to determine the program value for pressure difference to be maintained by feed pump speed control?

A) steam manifold pressure
B) turbine impulse pressure
C) total steam flow
D) total feed flow

ANSWER 6.09 (1.00)

C.

REFERENCE

L11281
SGWLC desc
K/A 059000 K4.05 [2.8]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.10 (1.00)

WHAT is the setpoint and coincidence for the power range high flux rod stop?

A) 1/4 > 103%
B) 2/4 > 103%
C) 1/4 within 3% of reactor trip
D) 2/4 within 3% of reactor trip

ANSWER 6.10 (1.00)

A.

REFERENCE

L11131
K/A 001000 K4.07 [3.8]

QUESTION 6.11 (1.00)

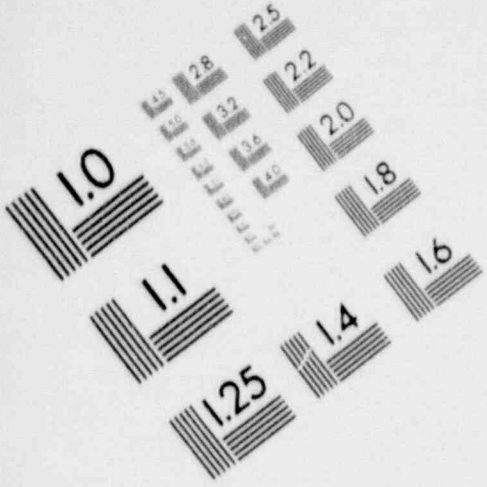
WHAT is the setpoint and coincidence for the OP delta T rod stop?

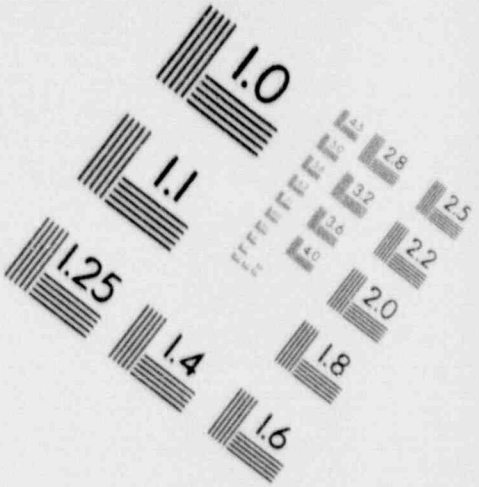
A) 1/4 > 103%
B) 2/4 > 103%
C) 1/4 within 3% of reactor trip
D) 2/4 within 3% of reactor trip

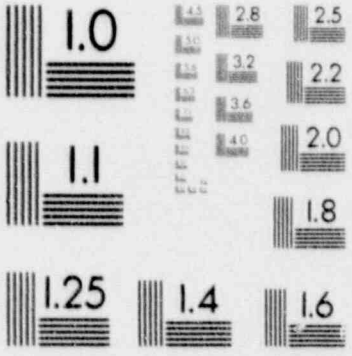
(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

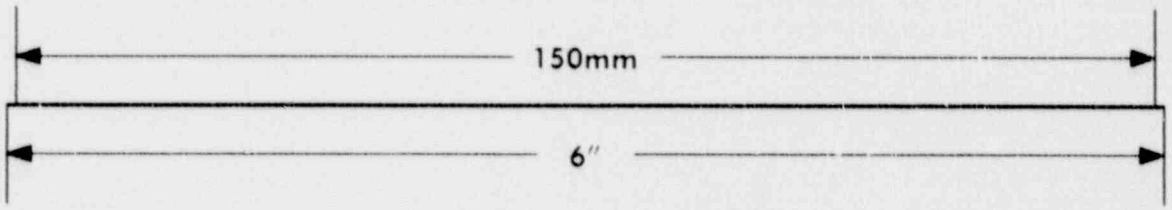
2

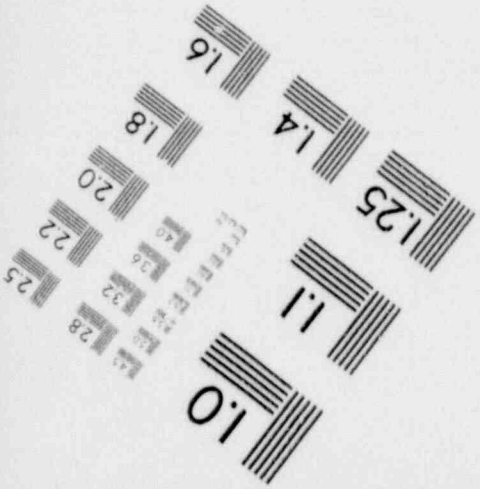
IMAGE EVALUATION TEST TARGET (MT-3)

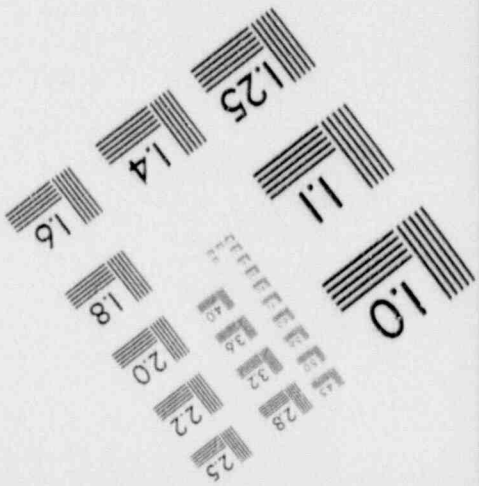












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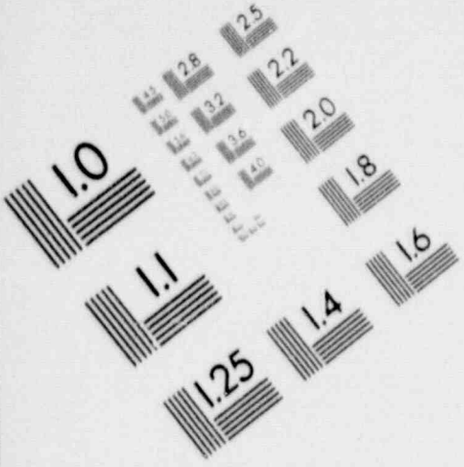

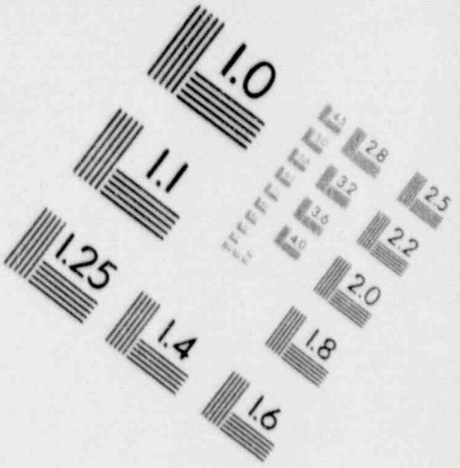

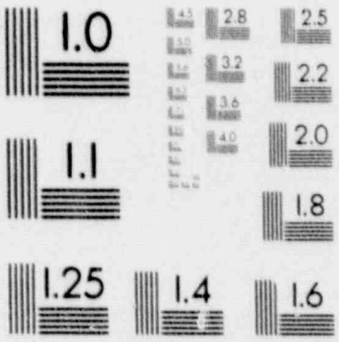

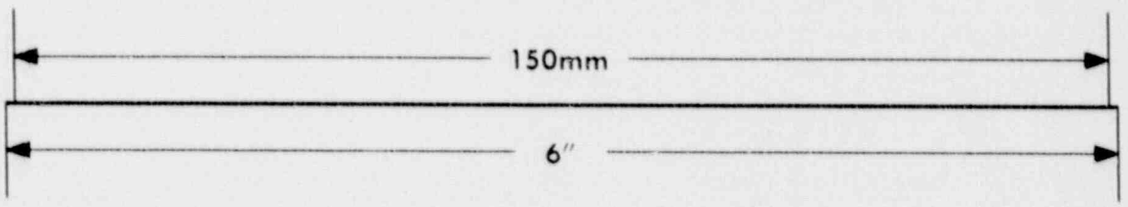

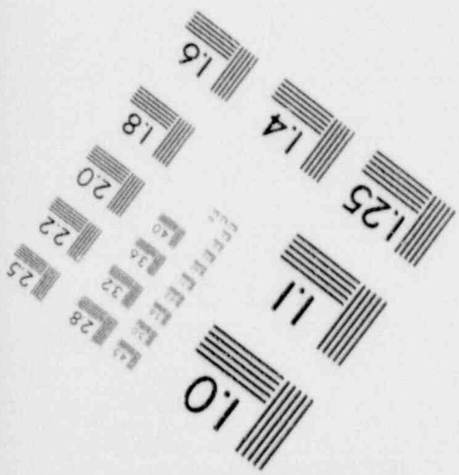

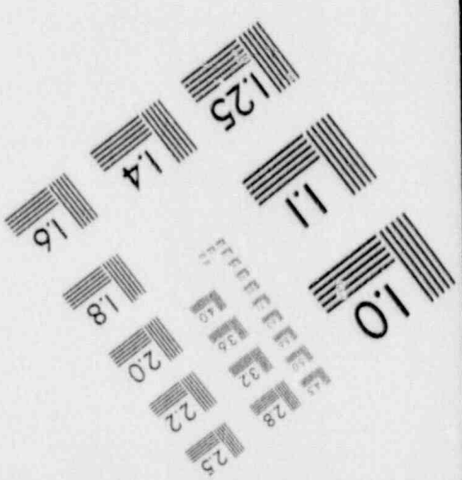

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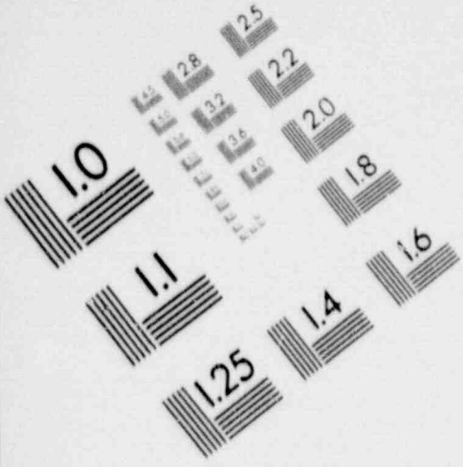

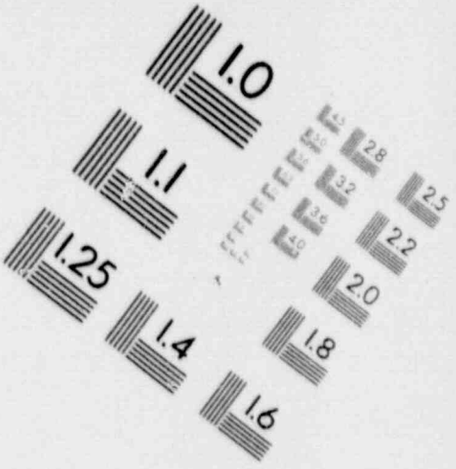

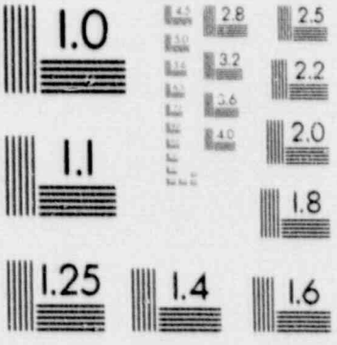

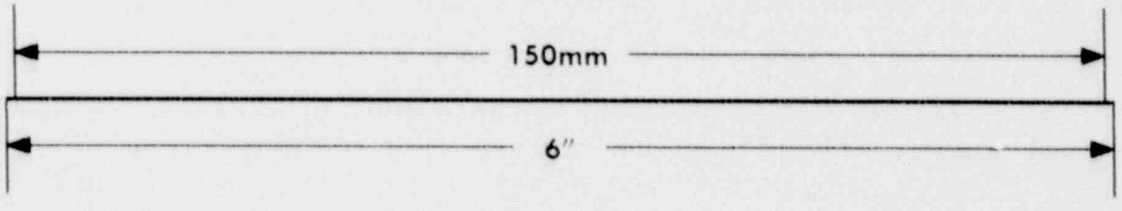

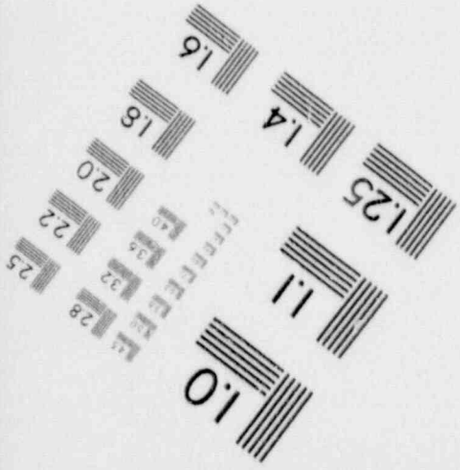

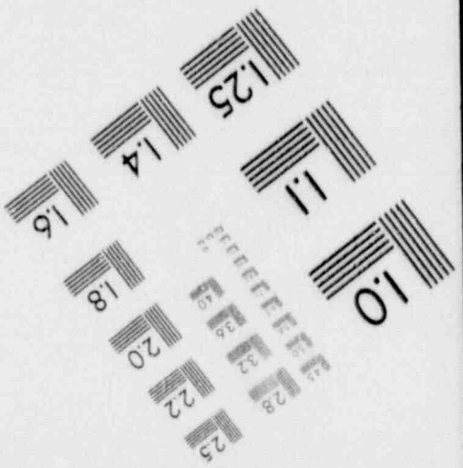

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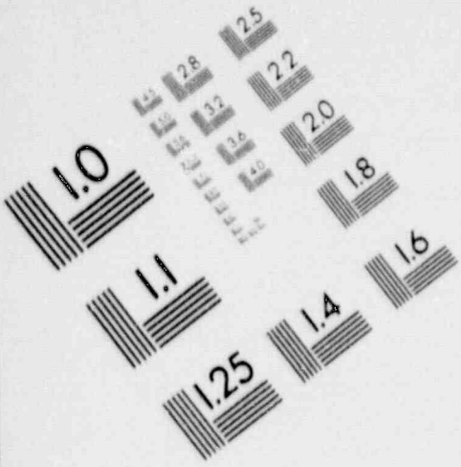
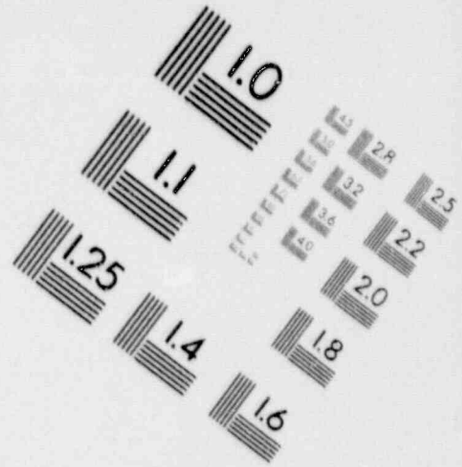
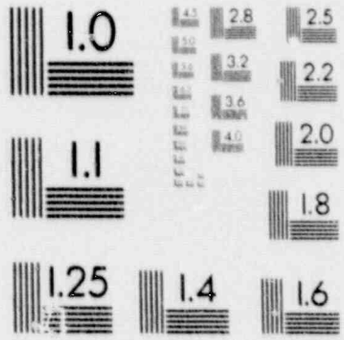
(716) 265-1600

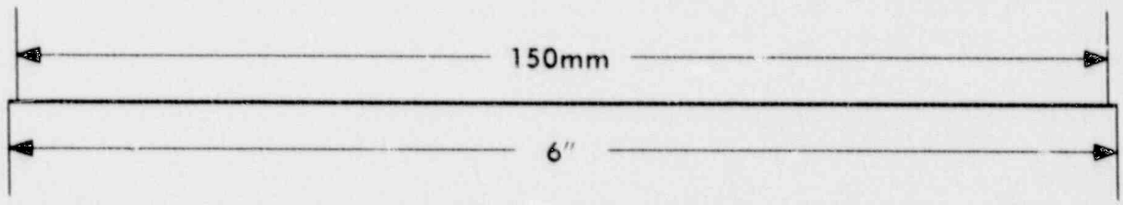
2

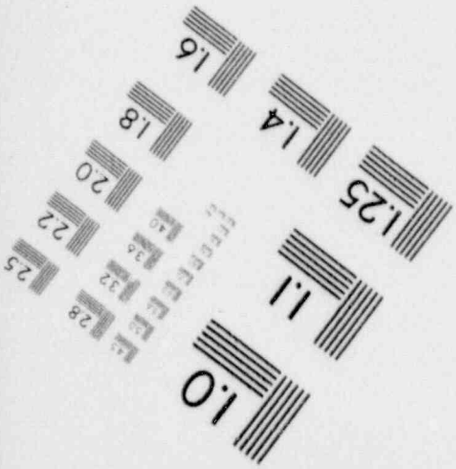
IMAGE EVALUATION TEST TARGET (MT-3)

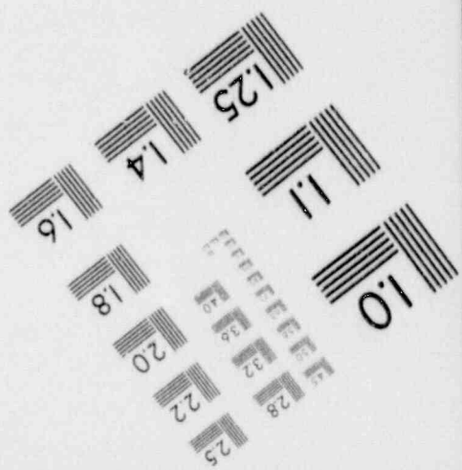












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ANSWER 6.11 (1.00)

~~C~~ D.

REFERENCE

L11131
K/A 001000 K4.07 [3.8]

QUESTION 6.12 (1.00)

Briefly explain the difference between a rod control urgent failure and a rod control non-urgent failure.

ANSWER 6.12 (1.00)

Urgent failures directly impact the ability of the system to move or hold rods. Non-urgent failures are failures of redundant components, and have no immediate effect on operation.

REFERENCE

L11131
K/A 001050 A2.01 [3.9]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.13 (1.00)

The plant is at 80% power, with rods in auto at 200 steps. If PT-505 fails high, WHAT is the response of the rod control system?

A) rods step in continuously
B) rods step out continuously
C) rods move in a few steps, then stop
D) rods move out a few steps, then stop

ANSWER 6.13 (1.00)

B.

REFERENCE

rod control system description
K/A 001000 K6.02 [3.3]

QUESTION 6.14 (1.00)

WHAT are the automatic control setpoints for CCP minimum flow valves V196 and V197 during an SI?

A) open if CCP flow < 80 gpm, close if flow > 120 gpm
B) open if recirc flow < 60 gpm, close if > 80 gpm
C) open if recirc flow < 80 gpm, close if pump flow > 120 gpm
D) open if CCP flow < 120 gpm, close if flow > 150 gpm

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.14 (1.00)

A.

REFERENCE

CS description
L1105I
K/A 004010 K6.06 [3.0]

QUESTION 6.15 (2.50)

LIST TEN valves in the CS system that reposition during an SI or phase A containment isolation. Indicate BOTH the normal position and S/T signal position.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.15 (2.50)

any 10, .25 each

	N	S/T
v142	o	x
v143	o	x
v196	o	x
v197	o	x
lcv112d	x	o
lcv112e	x	o
lcv112b	o	x
lcv112c	o	x
v138	x	o
v139	x	o
v149	o	x
v150	o	x
v167	o	x
v168	o	x

REFERENCE

CS system description
L11051 EO 10
K/A 004000 K1.15

QUESTION 6.16 (1.50)

LIST the signals which will cause auto EFW initiation. Include setpoints and coincidence as applicable.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.16 (1.50)

low-low SG level	2/4 < 14% in 1/4 SG's
SI	1/2 trains
loss of offsite power	

REFERENCE

EFW desc
K/A 061000K4.02 [4.6]

QUESTION 6.17 (1.00)

WHAT is the basis for the volume of water dedicated to EFW in the CST.

ANSWER 6.17 (1.00)

to enable a cooldown to 350 deg f (and depressurization to 400#)

REFERENCE

EFW desc
TS basis
K/A 061000 SG6 [3.8]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.18 (1.00)

The shell volume of the pressurizer is 125 gal per % level. The number used in the RCS leakrate procedure is 61.31 gal per % level. What is the reason for this difference?

A) To account for pressurizer volume not included in the span of the level instruments.
B) To account for increase in water density at normal operating pressure.
C) To account for pressurizer volume taken up by pressurizer heaters, supports, and other internal parts.
D) To account for cold makeup water vs. hot pressurizer water difference in density.

ANSWER 6.18 (1.00)

C. D.

REFERENCE

K/A 011000 A1.04 [3.3]

QUESTION 6.19 (1.50)

State FIVE of the SIX conditions that cause an EDG engine trouble shutdown. Setpoints are not required.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.19 (1.50)

any 5/6, .3 each

low lube oil pressure
engine overspeed
high lube oil temp
high jacket coolant temp
~~gen b/u protective lockout~~
emergency stop

86 DP, primary, (overcurrent differential) lockout

REFERENCE

EDM description
K/A 064000 K4.02 [4.2)

QUESTION 6.20 (2.50)

Number the events below in the order in which they occur during a diesel startup.

control air supplied to control valves in engine cooling system _____

alarm delay relay times out _____

air start solenoids energize _____

crank time limit relay de-energizes _____

start air shutoff relay energizes _____

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.20 (2.50)

4
5
1
3
2

REFERENCE

EDM system description
L10991 EO 4
K/A 064000 K4.05 [3.2]

QUESTION 6.21 (1.00)

WHICH of the following will cause an EPS to commence the loading sequence?

A) diesel output breaker closed
B) diesel output breaker closed and 70% bus voltage
C) diesel output breaker closed and 95% bus voltage
D) diesel output breaker closed and 1 sec time delay

ANSWER 6.21 (1.00)

B.

REFERENCE

EDE desc
K/A 064000 K4.11 [4.0]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.22 (2.00)

A) The Emergency Power Sequencers are activated by two levels of undervoltage protection.

(1) First level is less than _____% of nominal voltage for ____ sec.
(2) Second level is less than _____% of nominal voltage for ____ sec.

B) WHAT is the purpose of the time delay in the first level UV protection?

C) WHEN is an EPS activated without this delay?

ANSWER 6.22 (2.00)

70,1.2 (.5)
95,10 (.5)

allow bus transfer UAT-RAT (.5)

offsite power not available (.5)
(or actual parameter)

REFERENCE

EDE desc
AC Elect desc
K/A 062000 K1.04 [4.2]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.23 (1.00)

WH6ICH of the following D/G trips are ACTIVE during an SI/LOP? More than one answer is possible.

A) generator differential current
B) generator overcurrent with voltage restraint
C) loss of field
D) reverse power
E) generator overcurrent
F) low lube oil pressure
G) mechanical overspeed
H) high jacket water temp
I) high lube oil temp

ANSWER 6.23 (1.00)

A, ~~B~~, F, G

REFERENCE

EDE desc
11001
K/A 064000 K4.02 [4.2]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.24 (2.50)

WHAT are the setpoint and coincidence for the following reactor trips.

A) Single loop low RCS flow

B) RCP undervoltage

C) RCP underfrequency

D) PZR low pressure

E) PZR high level

ANSWER 6.24 (2.50)

2/3 on 1/4 < 90%
1/2 on both busses <10.2 kv(70%)
1/2 <55.5 hz on both busses
2/4 < 1945#
2/3 > 92%

REFERENCE

RPS desc
K/A 012000 K4.06 [3.5]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.25 (2.50)

Match the reactor trip in column A with its purpose in column B.

A		B
1) SR high flux	____	A) protection against DNB from high heat flux
2) PR high flux 109%	____	B) protection against multiple rod drop
3) PR high flux 25%	____	C) protection against DNB for slow transients of pressure, temperature, power
4) PR high flux rate	____	D) non safety grade protection against high SUR at low power
5) OT delta T	____	E) safety grade protection against low power reactivity excursions

ANSWER 6.25 (2.50)

D
A
E
B
C

REFERENCE

RPS desc
K/A 012000 SG4 [4.0]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.26 (1.00)

The plant is running at 100% power If the controlling steam pressure channel fails high on "A" steam generator, WHAT is the level response?

A) level rises, stabilizes above program
B) level rises, then gradually returns to program
C) level rises above program, drops below program, then gradually returns to program if no trip occurs.
D) level rises above program, drops below program, may reach reactor trip setpoint as MFP speed backs down

ANSWER 6.26 (1.00)

B.

REFERENCE

L1183I
L1406I
K/A 035010 A2.03 [3.6]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.27 (1.50)

Match the PT in column A with its function in column B.

A	B
1) PT505 _____	A) provided MS pressure for for SD system in pressure mode.
2) PT506 _____	B) provides impulse pressure for T-ref
3) PT507 _____	C) provides impulse pressure for arming SD on load rejection

ANSWER 6.27 (1.50)

B
C
A

REFERENCE

L1406I
K/A 016000 SG4 [3.3]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.28 (1.00)

The reactor is at 2% power with steam dumps in auto. The BOP operator notices SG level trending down, and increases startup feed flow. WHICH of the following best describes reactor power response to the additional feed?

A) no effect
B) increases, then levels off
C) increases initially, then returns to original level
D) increases initially, then decreases below original level

ANSWER 6.28 (1.00)

B.

REFERENCE

K/A 002000 K5.11 [4.2]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.29 (2.50)

Match PZR pressure in column A with events in column B. More than one response may be required for an item.

A		B
1) 2485 psig	_____	A) PORV lifts
2) 2385 psig	_____	B) PORV shuts
3) 2365 psig	_____	C) P457/P458 interlock
4) 2310 psig	_____	D) control heaters off
5) 2250 psig	_____	E) high press Rx trip
6) 1945 psig	_____	F) low press Rx trip
7) 1865 psig	_____	G) low press SI
8) 2350 psig	_____	H) PORV block valve auto open
9) 2335 psig	_____	I) safeties lift
		J) sprays full open

ANSWER 6.29 (2.50)

.25 each

I
A,E
B
J
D
F
G
H
C

REFERENCE

system desc
K/A 010000 K4.03 [4.1]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.30 (1.00)

A) The C-7A load reduction arming signal for steam dumps is _____ step change or _____ per minute ramp change.

B) Why does the above signal remain sealed in when the load reduction stops?

ANSWER 6.30 (1.00)

10%;5%
To prevent steam dumps from closing if a large mismatch still exists between Rx power and steam demand.

REFERENCE

L11291
SD desc
K/A 041000 K6.03 [2.9]

QUESTION 6.31 (1.50)

STATE THREE means by which the RHR system is protected against overpressurization. Include setpoints.

ANSWER 6.31 (1.50)

RHR discharge relief 600#
RHR suction relief 450#
RHR suction valve interlock close at 660# RCS
(open permissive < 365#)
LTOP system

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

system description
K/A 005000 K4.07 [3.5]

QUESTION 6.32 (1.00)

HOW OFTEN is running equipment rotated per standard operation orders?

A) once per shift
B) once per day
C) once per week
D) as needed for maintenance

ANSWER 6.32 (1.00)

C.

REFERENCE

OPPM
K/A 194000 K1.17 [2.5]

QUESTION 6.33 (1.00)

WHO is responsible for ensuring that emergency plan notifications are made to offsite personnel?

A) Shift Supervisor
B) Shift Superintendent
C) Site Emergency Manager
D) Operations Manager

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.33 (1.00)

B.

REFERENCE

L1505I
OPPM
K/A 194001 A1.16 [4.4]

QUESTION 6.34 (1.00)

The Station Manager must approve exposure extentions greater than _____ per qtr. or _____ per year.

ANSWER 6.34 (1.00)

2500 mr
5 r

REFERENCE

L1506I
RP manual
K/A 194001 K1.03 [3.4]

QUESTION 6.35 (1.00)

The Seabrook administrative exposure limits for personnel WITH complete exposure documentation are _____ per qtr. and _____ per year.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.35 (1.00)

1000 mr, 5000 mr
~~200 mr, 200 mr~~

REFERENCE

L1506I
RP manual
K/A 194001 K1.03 [3.4]

QUESTION 6.36 (1.50)

Complete the attached table of "MINIMUM SHIFT COMPOSITION" in accordance with the OPPM.

ANSWER 6.36 (1.50)

see attached

REFERENCE

L1505I
OPPM
K/A 194000 A1.03 [3.4]

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.37 (1.00)

If an individual required for mimimum crew must leave the station or becomes incapacitated, WHAT is the time limit to obtain a replacement?

A) 1 hour
B) 2 hours
C) 4 hours
D) oncoming shift must have minimum crew

ANSWER 6.37 (1.00)

B.

REFERENCE

L1505I
OPPM
K/A 194001 A1.03 [3.4]

QUESTION 6.38 (1.50)

An ALERT has been declared due to a station fire. Within 15 minutes, notification must be made to _____, _____, and _____.

ANSWER 6.38 (1.50)

NH,MA,NHY ORO dispatchers

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

L1507I
NYRE
K/A 194001 A1.16 [4.4]

QUESTION 6.39 (2.00)

Oncoming control room personnel are required to review a "Control Room Relief Checklist". List any EIGHT items/areas from at least TWO of the FOUR parts of this checklist.

ANSWER 6.39 (2.00)

checklist attached

REFERENCE

L1505I
OPPM
K/A 194001 A1.03 [3.4]

QUESTION 6.40 (1.00)

State THREE conditions in which a licensed operator is expected to manually initiate a reactor trip or engineered safeguards actuation.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.40 (1.00)

Setpoint exceeded with no auto action
Safety of the reactor in jeapordy
Necessary to protect station and public
Approaching a trip setpoint

REFERENCE

L1505I
OPPM
K/A 194001 K1.17 [3.4]

QUESTION 6.41 (1.00)

Who may release a tagging order when the individual to whom the tags were issued cannot be reached?

A) A foreman from the same group as the individual to whom the tags were issued, with concurrence of the Unit Shift Supervisor.

B) The Unit Shift Supervisor, with concurrence of the Shift Superintendent

C) Operations Department Manager, with concurrence of an individual from the same group as the individual to whom the tags were issued.

D) Shift Superintendent, with concurrence of a cognizant individual from the same group as the individual to whom the tags were issued.

ANSWER 6.41 (1.00)

D.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

MA4.2
K/A 194001 K1.02 [4.1]

QUESTION 6.42 (1.00)

Two closed valves in series should be used, when practicable, to isolate a work area from fluid or gas systems that operate under WHICH of the following condiztions.

A) >200 deg f, >500 psig
B) >200 deg f, >1000 psig
C) >200 deg f, radioactive fluid
D) >200 deg f, toxic fluid

ANSWER 6.42 (1.00)

A.

REFERENCE

MA4.2
K/A 194001 K1.02 [4.1]

QUESTION 6.43 (1.00)

Hydrogen gas in concentrations greater than _____% by volume poses an explosive hazard.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.43 (1.00)

~~4. 10 (accept 4%)~~ 8 %

REFERENCE

HVAC description
K/A 194001 K1.15 [3.8]

(***** END OF CATEGORY 6 *****)
(********** END OF EXAMINATION **********)

QUESTION	VALUE	REFERENCE
5.01	1.00	9000246
5.02	1.00	9000247
5.03	1.00	9000248
5.04	1.00	9000249
5.05	1.00	9000250
5.06	2.00	9000251
5.07	1.50	9000252
5.08	2.00	9000253
5.09	1.00	9000254
5.10	1.00	9000255
5.11	1.00	9000256
5.12	1.00	9000257
5.13	1.00	9000258
5.14	1.00	9000259
5.15	1.50	9000260
5.16	1.00	9000261
5.17	1.00	9000262
5.18	2.00	9000263
5.19	1.00	9000264
5.20	1.00	9000265
5.21	1.50	9000266
5.22	1.00	9000267
5.23	1.00	9000268
5.24	1.50	9000269
5.25	2.50	9000270
5.26	1.00	9000271
5.27	1.00	9000272
5.28	2.50	9000273
5.29	1.00	9000274
5.30	1.50	9000275
5.31	2.00	9000276
5.32	1.00	9000277
5.33	1.00	9000278
5.34	1.00	9000279
	43.50	
6.01	1.00	9000203
6.02	1.00	9000204
6.03	1.00	9000205
6.04	1.00	9000206
6.05	1.00	9000207
6.06	2.00	9000208
6.07	1.00	9000209
6.08	1.00	9000210
6.09	1.00	9000211
6.10	1.00	9000212
6.11	1.00	9000213
6.12	1.00	9000214
6.13	1.00	9000215
6.14	1.00	9000216
6.15	2.50	9000217
6.16	1.50	9000218
6.17	1.00	9000219
6.18	1.00	9000220

QUESTION	VALUE	REFERENCE
6.19	1.50	9000221
6.20	2.50	9000222
6.21	1.00	9000223
6.22	2.00	9000224
6.23	1.00	9000225
6.24	2.50	9000226
6.25	2.50	9000227
6.26	1.00	9000228
6.27	1.50	9000229
6.28	1.00	9000230
6.29	2.50	9000231
6.30	1.00	9000232
6.31	1.50	9000233
6.32	1.00	9000234
6.33	1.00	9000235
6.34	1.00	9000236
6.35	1.00	9000237
6.36	1.50	9000238
6.37	1.00	9000239
6.38	1.50	9000240
6.39	2.00	9000241
6.40	1.00	9000242
6.41	1.00	9000243
6.42	1.00	9000244
6.43	1.00	9000245
	56.50	
	100.00	

Attachment 3

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Tuesday - 1

EMERGENCY PROCEDURES UTILIZED: E-0, ECA-0.0, ECA-0.1, ECA-0.2

Examiners:	T. Guilfoil	Candidates: SRO	J. Burson	(I1)
	D. Wallace	RO	E. Spader	(I2)
	P. Doyle	BOP	P. Freeman	(RO)

Initial Conditions:

IC-20, 100% power (EOL), Condenser Tube Leak in Excess of Level II Limits. Operations Manager orders a controlled shutdown per OS1234.02

Malfunctions Inserted Prior to Start of Scenario:

52, condenser tube leak, 10%
119, Loss of "A" Emergency Diesel Generator (D/G) (component failure)

Equipment Out-of-Service:

"B" D/G out-of-service (OOS) since 1200 yesterday, engine driven lube oil pump replacement.

"B" Containment Air Compressor OOS since 0800 today, mechanical overhaul.

MDAFW Pump OOS since 0800 today, motor maintenance.

Time	Event No.	Malf No.	Description
0	1	N/A	Decrease Load (normal evolution)
5	2	38	TCV #4 Fails CLOSED (instrument failure)
15	3	33	RCP "D" Vibration HIGH (coponent failure) (ramp 0-100% over 60 seconds)
15.5	4a	27	RCP "D" Locked Rotor Trip (entry condition)
15.5	4b	19	RCP "D" #1 Seal Failure (component failure) (ramp 0-100% over 5 minutes)
16	5	114	Total Loss of Off-Site Power (main event) (Reactor Trip + 30 seconds)
20.5	6	20	RCP "D" #2 Seal Failure (component failure) (ramp 0-100% over 5 minutes then increased break flow to 300 gpm over 5 minutes)
35	7		Restore Off-Site Power before SI required

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Tuesday - 1

EMERGENCY PROCEDURES UTILIZED: E-0, ECA-0.0, ECA-0.1, ECA-0.2

Examiners:	T. Guilfoil	Candidates: SRO	M. Arsenault	(I1)
	D. Wallace	RO	W. Burnham	(I2)
	P. Doyle	BOP	C. Jarvis	(RO)

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"B" Containment Air Compressor OOS since 0800 today, mechanical overhaul.

MDAFW Pump OOS since 0800 today, motor maintenance.

Time	Event No.	Malf No.	Description
0	1	N/A	Decrease Load (normal evolution)
5	2	38	TCV #4 Fails CLOSED (instrument failure)
15	3	33	RCP "D" Vibration HIGH (coponent failure) (ramp 0-100% over 60 seconds)
15.5	4a	27	RCP "D" Locked Rotor Trip (entry condition)
15.5	4b	19	RCP "D" #1 Seal Failure (component failure) (ramp 0-100% over 5 minutes)
16	5	114	Total Loss of Off-Site Power (main event) (Reactor Trip + 30 seconds)
20.5	6	20	RCP "D" #2 Seal Failure (component failure) (ramp 0-100% over 5 minutes then increased break flow to 300 gpm over 5 minutes)
35	7		Restore Off-Site Power before SI required

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Tuesday - 2

EMERGENCY PROCEDURES UTILIZED: E-0, E-3, ECA-3.1

Examiners: D. Wallace Candidates: SRO E. Spader (I2)

P. Doyle RO P. Freeman (RO)

T. Guilfoil BOP J. Burson (I1)

Initial Conditions:

IC-9, 75% power (BOL)

Malfunctions Inserted Prior to Start of Scenario:

None

Equipment Out-of-Service:

"B" D/G out-of-service (OOS) since 1200 yesterday, engine driven lube oil pump replacement.

"B" Containment Air Compressor OOS since 0800 today, mechanical overhaul.

MDAFW Pump OOS since 0800 today, motor maintenance.

Time	Event No.	Malf No.	Description
0	1	N/A	Increase Load (normal evolution)
5	2	41	"A" S/G Feed Reg Valve Fails OPEN (component failure)
10	3		Controlling PZR Pressure Channel Fails HIGH (instrument failure)
15	4a		"A" Containment Air Compressor Trips (component failure)
15	4b		Containment Air Pressure Leak (entry event)
20	5	163	"B" SGTR on manual RX Trip (main event) (0-35% ramped over 2 minutes)
30	6a		PORV 456A Fails OPEN during Depressurization (component failure)
30	6b		PORV 456A Block Valve Fails OPEN on overcurrent (component failure)

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Tuesday - 2

EMERGENCY PROCEDURES UTILIZED: E-0, E-3, ECA-3.1

Examiners:	D. Wallace	Candidates: SRO	W. Burnham	(I2)
	P. Doyle	RO	C. Jarvis	(RO)
	T. Guilfoil	BOP	M. Arsenault	(I1)

Initial Conditions:

IC-9, 75% power (BOL)

Malfunctions Inserted Prior to Start of Scenario:

None

Equipment Out-of-Service:

"B" D/G out-of-service (OOS) since 1200 yesterday, engine driven lube oil pump replacement.

"B" Containment Air Compressor OOS since 0800 today, mechanical overhaul.

MDAFW Pump OOS since 0800 today, motor maintenance.

Time	Event No.	Malf No.	Description
0	1	N/A	Increase Load (normal evolution)
5	2	41	"A" S/G Feed Reg Valve Fails OPEN (component failure)
10	3		Controlling PZR Pressure Channel Fails HIGH (instrument failure)
15	4a		"A" Containment Air Compressor Trips (component failure)
15	4b		Containment Air Pressure Leak (entry event)
20	5	163	"B" SGTR on manual RX Trip (main event) (0-35% ramped over 2 minutes)
30	6a		PORV 456A Fails OPEN during Depressurization (component failure)
30	6b		PORV 456A Block Valve Fails OPEN on overcurrent (component failure)

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Tuesday - 3

EMERGENCY PROCEDURES UTILIZED: E-0, E-2, FR-H.1, E-1

Examiners:	D. Wallace	Candidates: SRO	F. Spader	(I2)
	T. Guilfoil	RO	J. Burson	(I1)
	P. Doyle	BOP	P. Freeman	(RO)

Initial Conditions:

IC-16, 50% power (MOL)

Malfunctions Inserted Prior to Start of Scenario:

TDAFW Pump Overspeed Trip on Start Signal

Equipment Out-of-Service:

"B" D/G out-of-service (OOS) since 1200 yesterday, engine driven lube oil pump replacement.

"B" Containment Air Compressor OOS since 0800 today, mechanical overhaul.

MDAFW Pump OOS since 0800 today, motor maintenance.

Time	Event No.	Malf No.	Description
0	1	N/A	Increase Load (normal evolution)
5	2	97	NI-41 Fails HIGH (instrument failure)
15	3	135	"B" S/G Level Transmitter Fails HIGH (instrument failure)
20	4a	152	Inadvertent Feedwater Isolation (entry event)
20	4b		TDEFW Pump Trip (component failure) (EFW pumphouse high temperature alarm)
20	4c		Simulated TDAFW Supply Line Break (main event) (OPEN both "A" & "B" S/G safety valves)
	5	56	SUFP Trip - when operator attempts to start (component failure)

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Tuesday - 3

EMERGENCY PROCEDURES UTILIZED: E-0, E-2, FR-H.1, E-1

Examiners:	D. Wallace	Candidates: SRO	W. Burnham	(I?)
	T. Guilfoil	RO	M. Arsenault	(I1)
	P. Doyle	BOP	C. Jarvis	(RO)

Initial Conditions:

IC-16, 50% power (MOL)

Malfunctions Inserted Prior to Start of Scenario:

TDAFW Pump Overspeed Trip on Start Signal

Equipment Out-of-Service:

"B" D/G out-of-service (OOS) since 1200 yesterday, engine driven lube oil pump replacement.

"B" Containment Air Compressor OOS since 0800 today, mechanical overhaul.

MDAFW Pump OOS since 0800 today, motor maintenance.

Time	Event No.	Malf No.	Description
0	1	N/A	Increase Load (normal evolution)
5	2	97	NI-41 Fails HIGH (instrument failure)
15	3	135	"B" S/G Level Transmitter Fails HIGH (instrument failure)
20	4a	152	Inadvertent Feedwater Isolation (entry event)
20	4b		TDEFW Pump Trip (component failure) (EFW pumphouse high temperature alarm)
20	4c		Simulated TDAFW Supply Line Break (main event) (OPEN both "A" & "B" S/G safety valves)
	5	56	SUFP Trip - when operator attempts to start (component failure)

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Thursday - 1

EMERGENCY PROCEDURES UTILIZED: E-0, E-2, E-1

Examiners:	D. Wallace	Candidates: SRO	M. O'Keefe	(U)
	P. Doyle	RO	D. Merrill	(I)
	T. Guilfoil	BOP	E. Momm	(RO)

Initial Conditions:

IC-4, 1E-8 amps (BOL), increase load per OS1000.02, step 7.1.4

Malfunctions Inserted Prior to Start of Scenario:

None

Equipment Out-of-Service:

First-Out Annunciator Horn

Time	Event No.	Malf No.	Description
0	1	N/A	Startup (normal evolution)
5	2		PT-131 Fails LOW causing PCV-131 to Close (instrument failure)
10	3a	142	PT-507 Fails HIGH (instrument failure)
10	3b		Steam Dump Valve Fails OPEN (entry event) (component failure)
15	4	37	"B" MSLB on Reactor Trip (main event)

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Thursday - 1

EMERGENCY PROCEDURES UTILIZED: E-0, E-2, E-1

Examiners:	D. Wallace	Candidates: SRO	R. Kletzien	(U)
	P. Doyle	RO	S. Morrissey	(I)
	T. Guilfoil	BOP	J. Desmond	(RO)

Initial Conditions:

IC-4, 1E-8 amps (BOL), increase load per OS1000.02, step 7.1.4

Malfunctions Inserted Prior to Start of Scenario:

None

Equipment Out-of-Service:

First-Out Annunciator Horn

Time	Event No.	Malf No.	Description
0	1	N/A	Startup (normal evolution)
5	2		PT-131 Fails LOW causing PCV-131 to Close (instrument failure)
10	3a	142	PT-507 Fails HIGH (instrument failure)
10	3b		Steam Dump Valve Fails OPEN (entry event) (component failure)
15	4	37	"B" MSLB on Reactor Trip (main event)

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Thursday - 2

EMERGENCY PROCEDURES UTILIZED: E-0, E-3

Examiners:	P. Doyle	Candidates: SRO	D. Merrill	(I)
	T. Guilfoil	RO	E. Momm	(RO)
	D. Wallace	BOP	M. O'Keefe	(U)

Initial Conditions:

IC-16, 50% (MOL)

Malfunctions Inserted Prior to Start of Scenario:

None

Equipment Out-of-Service:

"B" D/G out-of-service (OOS) since 1200 yesterday, engine driven lube oil pump replacement.

"B" Containment Air Compressor OOS since 0800 today, mechanical overhaul.

MDAFW Pump OOS since 0800 today, motor maintenance.

First-Out Annunciator Horn

Time	Event No.	Malf No.	Description
0	1	N/A	Increase Load (normal evolution)
5	2	138	PZR Level Channel Fails LOW (instrument failure)
10	3	88	Letdown Line Leak (after letdown is restored) (20 gpm ramped over 2 minutes) (component failure)
20	4	164	"D" SGTR (after excess letdown in service) (0-10% ramped over 10 minutes) (0-50% ramped over 2 minutes after manual trip) (main event)

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Thursday - 2

EMERGENCY PROCEDURES UTILIZED: E-0, E-3

Examiners:	P. Doyle	Candidates: SRO	S. Morrissey	(I)
	T. Guilfoil	RO	J. Desmond	(RO)
	D. Wallace	BOP	R. Kletzien	(U)

Initial Conditions:

IC-16, 50% (MOL)

Malfunctions Inserted Prior to Start of Scenario:

First-Out Annunciator Horn

Equipment Out-of-Service:

"A" D/G out-of-service (OOS) since 1200 yesterday, engine driven lube oil pump replacement.

"A" Containment Air Compressor OOS since 0800 today, mechanical overhaul.

Time	Event No.	Malf No.	Description
0	1	N/A	Increase Load (normal evolution)
5	2	138	PZR Level Channel Fails LOW (instrument failure)
10	3	88	Letdown Line Leak (after letdown is restored) (20 gpm ramped over 2 minutes) (component failure)
20	4a		Loss of Bus E-5 (entry event) (after excess letdown in service)
20	4b	164	"D" SGTR (main event) (0-50% ramped over 2 minutes)

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Thursday - 3

EMERGENCY PROCEDURES UTILIZED: E-0, FR-S.1, E-1

Examiners:	D. Wallace	Candidates: SRO	M. O'Keefe	(U)
	T. Guilfoil	RO	E. Momm	(RO)
	P. Doyle	BOP	D. Merrill	(I)

Initial Conditions:

IC-20, 100% (EOL)

Malfunctions Inserted Prior to Start of Scenario:

Main Generator Output Breaker Fails to OPEN

Equipment Out-of-Service:

"B" D/G out-of-service (OOS) since 1200 yesterday, engine driven lube oil pump replacement.

"B" Containment Air Compressor OOS since 0800 today, mechanical overhaul.

MDAFW Pump OOS since 0800 today, motor maintenance.

First-Out Annunciator Horn

Time	Event No.	Malf No.	Description
0	1		Load Dispatcher Requests MVAR Adjustment
5	2	42	"B" MFW Pump Trips (entry event) (component failure)
	3a	155	ATWS (main event)
	3b		Emergency Borate Valve Fails CLOSED (component failure)
	3c		Main Generator Output Breaker Fails to OPEN (component failure)
	4a		PORV 456B Fails OPEN on High Pressure (component failure)
	4b		Block Valve Fails OPEN on overcurrent Trip (component failure)

SCENARIO EVENTS

SIMULATION FACILITY: Seabrook SCENARIO No: Thursday - 3

EMERGENCY PROCEDURES UTILIZED: E-0, FR-S.1, E-1

Examiners:	D. Wallace	Candidates:	SRO R. Kletzien	(U)
	T. Gu[illegible]ol		RO J. Desmond	(RO)
	P. Doyle		BOP S. Morrissey	(I)

Initial Conditions:

IC-20, 100% (EOL)

Malfunctions Inserted Prior to Start of Scenario:

Main Generator Output Breaker Fails to OPEN

Equipment Out-of-Service:

"A" D/G out-of-service (OOS) since 1200 yesterday, engine driven lube oil pump replacement.

"A" Containment Air Compressor OOS since 0800 today, mechanical overhaul.

First-Out Annunciator Horn

Time	Event No.	Malf No.	Description
0	1		Load Dispatcher Requests MVAR Adjustment
5	2	42	"B" MFW Pump Trips (entry event) (component failure)
	3a	155	ATWS (main event)
	3b		Emergency Borate Valve Fails CLOSED (component failure)
	3c		Main Generator Output Breaker Fails to OPEN (component failure)
	4a		PORV 456B Fails OPEN on High Pressure (component failure)
	4b		Block Valve Fails OPEN on overcurrent Trip (component failure)