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

EXAMINATION REPORT NO.: 50-244/89-02 (OL)

FACILITY DOCKET NO.: 50-244

FACILITY LICENSE NO.: DPR-18

LICENSEE: Rochester Gas and Electric Company
49 East Ave
Rochester, NY

FACILITY: Ginna Nuclear Power Station

EXAMINATION DATES: February 6-9, 1989

CHIEF EXAMINER: Edward Yachimiak 3/16/89
Edward Yachimiak, Operations Engineer — Date

APPROVED BY: Peter W. Eselgroth 3/21/89
Peter W. Eselgroth, Chief PWR Section — Date

SUMMARY: Six (6) Senior Reactor Operator (SRO) and three (3) Reactor Operator (RO) license examinations were administered. All candidates successfully completed both the written and operating parts of their respective examinations, with the exception of one (1) SRO applicant, who failed the operating test. Five (5) SRO licenses and three (3) RO licenses were granted.

8903310327 890324
PDR ADOCK 05000244
V PDC

DETAILS

TYPE OF EXAMINATIONS: Replacement

EXAMINATION RESULTS:

	RO Pass/Fail	SRO Pass/Fail
Written	3 / 0	6 / 0
Operating	3 / 0	5 / 1
Overall	3 / 0	5 / 1

1. CHIEF EXAMINER AT SITE:

   E. Yachimiak (NRC)

2. OTHER EXAMINERS:

   D. Silk (NRC)
   B. Hughes (NRC)
   M. Stein (Sonalysts)
   B. Smith (Sonalysts)
   J. Nickolaus (PNL)
   T. Bardell (PNL)

3. Pre-Examination Review:

   Prior to the administration of the Senior Reactor Operator (SRO) and the Reactor Operator (RO) written examinations, two (2) Ginna Station staff members, both under security agreement, were invited to review these examinations at our offices in King of Prussia, Pennsylvania on February 2, 1989. The results of this review can be summarized by the following tables:

SRO/RO Questions Requiring Modification

	Minor Reword	Major Reword	Substitution
SRO	16	8	2
RO	13	2	0

SRO/RO Answers Requiring Modification

	Minor Change	Major Change
SRO	8	5
RO	12	1

Minor Reword: minor rephrasing to make question clearer

Major Reword: question modified significantly

Substitution: question deleted, another NRC question was inserted

Minor Change: partial credit redistribution, additional answers added

Major Change: wrong answers replaced with correct responses

These tables show that most changes were minor and did not significantly alter the exam's original content. For the most part, this review reassured the facility that the NRC examination was operationally oriented and only covered items of safety significance.

In addition, all simulator scenarios were reviewed and tested by two (2) Ginna 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 no major changes to the scenarios.

3. 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

Most candidates performed extremely well on sections 1 and 4 of the written examination. These sections covered fundamental nuclear theory, thermodynamics, and components.

WEAKNESSES

From the grading of the SRO written examination, most candidates did not correctly identify the proper prioritization and use of emergency operating procedures E-0, "Reactor Trip or Safety Injection," and ECA-0.0, "Loss of All AC Power." In addition, it appeared that some individuals were unable to properly prioritize the Functional Restoration (FR) procedures.

4. Simulation Facility Fidelity Report

During the conduct of the simulator portion of these operating tests, no significant malfunctions occurred. With the exception of a computer room cooling system failure, which was corrected within two hours after its occurrence, the simulator performed extremely well.

5. Personnel Present at Exit Meeting:

NRC Personnel

Hughes, B., Operations Engineer (Examiner)
Perry, N., Resident Inspector
Silk, D., Operations Engineer (Examiner)
Yachimiak, E., Operations Engineer

Facility Personnel

Carroll, R., Ginna Training Manager
Hudnut, D., Supervisor Simulator Training
Maciuska, Supervisor License Training
Meier, G., Division Training Manager
Schuler, T., Operations Manager
Wayland, J., Reactor Engineer
Widay, J., Superintendent Ginna Production

Attachments:
1. RO MASTER Written Examination and Answer Key
2. SRO MASTER Written Examination and Answer Key

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

FACILITY: Ginna

REACTOR TYPE: PWR-WEC2

DATE ADMINSTERED: February 6, 1989

CANDIDATE'S NAME Master Key

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 six (6) hours after the examination starts.

CATEGORY VALUE	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE		CATEGORY
26.00	24.55 53			4.	REACTOR PRINCIPLES (7%) THERMODYNAMICS (7%) AND COMPONENTS (10%) (FUNDAMENTALS EXAM)
33.00 ~~33.40~~	31.54 43			5.	EMERGENCY AND ABNORMAL PLANT EVOLUTIONS (33%)
47.00 ~~46.50~~	44.34 ~~43.91~~			6.	PLANT SYSTEMS (30%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (13%)
106.00 ~~105.9~~		FINAL GRADE	%		TOTALS

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

Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.

2. Restroom trips are to be limited and only one candidate at a time may leave. You must avoid all contacts with anyone outside the examination room to avoid even the appearance or possibility of cheating.

3. Use black ink or dark pencil only to facilitate legible reproductions.

4. Print your name in the blank provided on the cover sheet of the examination.

5. Fill in the date on the cover sheet of the examination (if necessary).

6. Use only the paper provided for answers.

7. Print your name in the upper right-hand corner of the first page of each section of the answer sheet.

8. Consecutively number each answer sheet, write "End of Category __" as appropriate, start each category on a new page, write only on one side of the paper, and write "Last Page" on the last answer sheet.

9. Number each answer as to category and number, for example, 1.4, 6.3.

10. Skip at least three lines between each answer.

11. Separate answer sheets from pad and place finished answer sheets face down on your desk or table.

12. Use abbreviations only if they are commonly used in facility literature.

13. The point value for each question is indicated in parentheses after the question and can be used as a guide for the depth of answer required.

14. Show all calculations, methods, or assumptions used to obtain an answer to mathematical problems whether indicated in the question or not.

15. Partial credit may be given. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK.

16. If parts of the examination are not clear as to intent, ask questions of the examiner only.

17. You must sign the statement on the cover sheet that indicates that the work is your own and you have not received or been given assistance in completing the examination. This must be done after the examination has been completed.

18. When you complete your examination, you shall:

a. Assemble your examination as follows:

(1) Exam questions on top.

(2) Exam aids - figures, tables, etc.

(3) Answer pages including figures which are part of the answer.

b. Turn in your copy of the examination and all pages used to answer the examination questions.

c. Turn in all scrap paper and the balance of the paper that you did not use for answering the questions.

d. Leave the examination area, as defined by the examiner. If after leaving, you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION 4.01 (1.00)

The reactor is exactly critical at 10E-8 Amps when a S/G atmosperic relief valve (ARV) fails open. Assuming no operator action and no reactor trip, CHOOSE the answer below that BEST describes the values of Tavg AND nuclear power for the resulting new steady state conditions.

A. Final Tavg greater than the initial Tavg, Final Tavg above POAH.
B. Final Tavg greater than than initial Tavg, Final power at POAH.
C. Final Tavg less than initial Tavg, Final power at POAH.
D. Final Tavg less than initial Tavg, Final power above POAH.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.02 (1.00)

The average effective delayed neutron fraction (Beff) decreases over core life. This is primarily due to the buildup of:

A. Xenon isotopes
B. Samarium isotopes
C. Plutonium isotopes
D. Uranium isotopes

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.03 (2.00)

Fully explain WHY the hot calibrated pressurizer level instruments do not provide accurate level indication when the plant is in cold shutdown. Include in your discussion the direction of this error.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.04 (2.50)

After operation at 100% power for several weeks near the end of cycle, power is reduced to 75% using rods only.

a. Explain HOW and WHY xenon concentration will change over the next 40 hours. (1.50)

b. WHAT rod motion (Insert, Withdrawn, No Change) would be required to maintain the plant at 75% power over the same 40 hours assuming no change in boron concentration? Include applicable time frames. (1.00)

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.05 (2.00)

Xenon oscillations are a concern during PWR operation.

a. WHY and HOW do large xenon oscillation effect the fuel rods? (1.00)

b. HOW (Two ways) can an operator minimize or prevent xenon oscillations from occuring during a power increase from 50% to full power? (1.00)

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.06 (1.00)

The pressure of the RCS during an accident is 1900 psig, and the indicated temperature is 590 degrees F. What is the subcooling in degrees F.?

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.07 (2.00)

State HOW (Increase, Decrease, No Change) an INCREASE in each of the following parameters affects the Departure From Nucleate Boiling Ratio (DNBR). Consider each case separately.

a. RCS temperature
b. RCS pressure
c. RCS flow
d. Reactor power

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.08 (1.00)

WHY is K(Z), the height correction factor, used in the heat flux hot channel factor calculation?

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.09 (3.00)

A Boron Dilution to 750 ppm increases the source range indication to 132 cps. During the dilution xenon concentration changes. Calculate (in pcm) xenon's reactivity contribution (including its direction +/-) during this evolution?

Initial plant conditions:

Hot shutdown, BOL
Boron concentration 900 ppm
Shutdown Margin (SDM) minus 4% delta k/k
source range reading 100 cpm

MAKE ALL NECESSARY ASSUMPTIONS

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.10 (1.00)

Explain HOW and WHY a fuel assembly is adversely effected when actual heat flux exceeds the critical heat flux.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.11 (2.00)

A condensate pump is operating at rated flow. You then start closing down on the discharge valve. HOW (INCREASE, DECREASE or REMAIN THE SAME) will each of the following be affected?

a. Flow
b. Discharge pressure
c. Available NPSH
d. Motor amps

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.12 (2.50)

a. Sketch a pump curve and a system characteristic curve for a centrifugal pump. (1.00)

b. Show on your sketch the system design operating point AND in which direction along the pump curve this point will move when the pump discharge valve is closed (0.50)

c. Identify on your sketch where the pump runout AND shutoff head points are. (1.00)

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.13 (2.00)

a. WHAT are THREE (3) indications of pump cavitation?

b. WHAT are FOUR (4) actions/requirements which are used to prevent pump cavitation?

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.14 (2.00)

The plant is operating at 100% power with RCS Tavg at 573.5 deg. F. and a steam pressure of 780 psig. CALCULATE the new value of Tavg which would be required to maintain a steam pressure of 780 psig at 100% power if 10% of the tubes in each steam generator were plugged. SHOW ALL WORK.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.15 (1.00)

WHICH of the following reasons is the basis for limiting the number of starts a large motor is allowed during a specific time period?

A. winding insulation breaks down at prolonged high temperatures
B. metal fatigue failure of motor components is a function of the number of start/stop cycles
C. initial low oil pressure during the motor start results in excessive bearing wear leading to failure
D. contacts in the motor controller become worn and may overheat and bind

(***** END OF CATEGORY 4 *****)

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

QUESTION 5.01 (1.50)

If PT485 (Turbine First Stage Pressure) fails LOW, WHAT are THREE (3) systems that are affected by this failure?

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

QUESTION 5.02 (1.50)

The MRPI does not match the step counters. WHAT are THREE (3) methods of indication that can be used to discriminate a misaligned rod from a rod position indication malfunction?

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

QUESTION 5.03 (1.00)

According to AP-CCW.2, "Loss of CCW During Power Operation," the CCW surge tank level should be verified locally. WHY must this action be taken?

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

QUESTION 5.04 (1.00)

WHAT non-radiological hazard is associated with handling spilled CCW water? Identify the constituent AND why it is a hazard.

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

QUESTION 5.05 (1.50)

A fire in the control room has forced a rapid evacuation and has severely damaged the control boards.

a. HOW and WHERE are the reactor and main turbine tripped from OUTSIDE the control room? (1.00)

b. To WHAT location does the Control Room Foreman proceed? (0.50)

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

QUESTION 5.06 (2.00)

Immediately following the receipt of an automatic reactor trip signal, neutron flux remains constant on ALL Power Range nuclear instruments. WHAT are FOUR (4) actions that can be taken to shutdown the reactor from the control room?

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

QUESTION 5.07 (2.00)

a. WHAT constitutes adverse containment?

b. WHAT are THREE (3) main control board indications that are affected by adverse containment?

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

QUESTION 5.08 (1.00)

Immediately following a reactor trip caused by a loss of off-site power, the CO is unsuccessful in trying to commence RCS cooldown using condenser steam dumps in steam pressure control mode. EXPLAIN the reason for condenser steam dumps not opening. INCLUDE ALL permissives and interlocks.

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

QUESTION 5.09 (2.00)

If the "Power Range Rod Drop Rod Stop +/- 5% per Seg" (E-28) alarm sounds,

a. WHAT are your operators TWO (2) immediate actions?

b. WHAT are THREE (3) possible causes for this alarm?

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

QUESTION 5.10 (1.50)

From the following list of Emergency Procedures, INDICATE the order of priority for correct usage, during Power Operations.

a. ___	ECA-0.0	Loss of All AC Power
b. ___	E-0	Reactor Trip of Safety Injection
c. ___	FR-C.2	Response to Degraded Core Cooling
d. ___	FR-H.1	Response to Loss of Secondary Heat Sink
e. ___	FR-Z.1	Response to High Containment Pressure

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

QUESTION 5.11 (1.00)

WHAT is the entry condition/symptom for ECA-0.0, "Loss of All AC Power?"

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

QUESTION 5.12 (0.50)

WHY are the main turbine controls (EH) placed in MANUAL following the loss of instrument bus D? Assume no reactor trip occurs.

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

QUESTION 5.13 (2.00)

Alarm B-1, "#1 Seal Out High Temp 190 Deg F," is received. WHAT actions (including applicable time restraints) must be taken if #1 seal flow is found to be 11 gpm?

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

QUESTION 5.14 (1.00)

WHAT are FOUR (4) radiation monitors that can be used to determine if a major radioactive release to the lake has occurred?

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

QUESTION 5.15 (0.50)

WHAT is the principle reason for checking that all control rods are inserted per ES-0.1, "Reactor Trip Recovery?"

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

QUESTION 5.16 (1.00)

In addition to TCs NOT less than 1200 deg F, which ONE (1) of the following also represents a red path for core cooling assuming subcooling condition is below minimum?

	At Least One RCP Running	Core Exit Temperature	RVLIS Vessel Level
A.	no	>700 deg F	>51%
B.	yes	<700 deg F	>51%
C.	no	>700 deg F	<51%
D.	yes	<700 deg F	<51%

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

QUESTION 5.17 (1.00)

WHAT is the principle reason for checking that the main turbine governor valve and stop valves are closed after a reactor trip?

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

QUESTION 5.18 (1.00)

WHAT TWO (2) criteria must be met before tripping the RCPs during a small break LOCA?

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

QUESTION 5.19 (2.40)

WHAT are the FOUR (4) criteria (including setpoints) which must be met before Safety Injection may be terminated?

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

QUESTION 5.20 (1.00)

At WHAT CST level are you required to enter procedure ER-AFW.1, "Alternate Water Supply to the AFW Pumps?"

A. 1 ft
B. 2 ft
C. 5 ft
D. 7 ft

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

QUESTION 5.21 (2.50)

Assume the plant is experiencing a large S/G tube leak.

a. WHAT TWO (2) actions can be taken to stabilize the decreasing pressurizer level? (1.00)

b. WHAT TWO (2) S/G indications can be used to determine which S/G has a tube rupture? (1.00)

c. After SI actuation, WHY is it important to keep pressure in the S/G below the ARVs setpoint? (0.50)

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

QUESTION 5.22 (1.00)

WHAT are TWO (2) reasons for the following caution statement found in ECA-2.1, "Uncontrolled Depressurization of Both Steam Generators?"

"A minimum flow of 25 gpm must be maintained to each S/G with a narrow range level less than 10%"

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

QUESTION 5.23 (1.50)

The Instrument Air (IA) Low Pressure alarm, H-8, is received during your shift. WHAT are your immediate actions for EACH of the following conditions? Assume no other abnormal indications exist.

a. IA pressure is greater than 60 psig and stable

b. IA pressure is greater than 60 psig but decreasing

c. IA pressure is less than 60 psig and stable

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

QUESTION 5.24 (1.00)

HOW (Increase, Decrease, No Change) and WHY can the opening of a pressurizer PORV create a false indication of pressurizer level when the RCS is at saturated conditions?

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

QUESTION 5.25 (1.00)

Using Attachment 1, determine which ONE (1) of the following is a violation of Technical Specifications?

A. spent fuel pool temp is 145 deg F

B. a load of fuel is passed over fuel racks with 90-day-old fuel

C. auxiliary building exhaust fan operating

D. an auxiliary building window is open

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

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

QUESTION 6.01 (1.00)

MATCH the following components with their respective electrical bus supply.

1. ____ 1C Standby Aux Feed Pump	a. Bus 13
2. ____ 1C Charging Pump	b. Bus 14
3. ____ 1C Containment Fan	c. Bus 15
4. ____ 1C Instrument Air Compressor	d. Bus 16

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

QUESTION 6.02 (1.00)

There are TWO (2) breakers in service between Bus 17 and the "B" diesel generator.

a. WHAT is the purpose of the manual (1B3) breaker?

b. WHERE is this manual breaker located?

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

QUESTION 6.03 (1.50)

HOW and WHY will EACH of the following parameters be affected by pressurizer level channel 428 failing HIGH. Assume this is the controlling channel. Include applicable setpoints.

a. charging flow

b. letdown flow

c. Pressurizer heaters

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

QUESTION 6.04 (1.50)

With the rod control system in MANUAL, Explain HOW a dropped rod will affect the Rod Insertion (RIL) setpoint. INCLUDE parameter changes which affect the RIL setpoint. Assume NO reactor trip occurs.

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

QUESTION 6.05 (1.50)

Intermediate Range (IR) compensating voltage is LOW on one of the IR detectors. If the reactor is manually tripped from 10% power AND the IR current (failed detector) does not go below 5 E-5 amps,

a. WHEN can the source range (SR) nuclear instruments be energized?

b. WHAT action must be taken to energize both SR instruments?

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

QUESTION 6.06 (3.50)

a. WHAT changes occur to the Main Feed Water system during an SI? (1.00)

a. WHAT are the TWO (2) automatic start signals for the TDAFW pump? (1.00)

b. WHAT are the THREE (3) automatic start signals for the MDAFW pump? (1.50)

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

QUESTION 6.07 (1.50)

WHAT are the THREE (3) types (grades) of water sources for the S/Gs AND their priority for use?

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

QUESTION 6.08 (1.00)

Using Attachment 2, determine which ONE (1) of the following conditions comply with Technical Specifications.

A. reactor startup with battery 1A out of service

B. reactor at power with battery 1A charger out of service with a 140 amp replacement charger

C. reactor at power with battery 1A charger out of service and the 160 amp replacement charger

D. reactor at power with battery 1A and 1B sharing a battery charger with 250 amp capacity

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

QUESTION 6.09 (1.00)

IF the 1A battery is inoperable, an intertie is provided to:
(SELECT the correct answer)

A. substitute the security battery

B. substitute the TSC battery

C. transfer the load to 1B battery

D. substitute the 1A battery charger

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

QUESTION 6.10 (1.00)

WHAT action must the operator take to regain AUTOMATIC control of the pressurizer BACKUP heaters when pressurizer level returns to greater than the heater cut-off setpoint AFTER having dropped below the heater cut-off setpoint?

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

QUESTION 6.11 (2.00)

MATCH the permissive interlocks in column "A" with their respective functions from column "B".

A	B
a. P-2 ____	1. blocks auto rod withdrawal on a rod drop signal
b. P-6 ____	2. allows loss of single loop without Rx trip
c. P-7 ____	3. permits bypass of IR and Lo pwr PR trips during RX startups
d. P-8 ____	4. permits bypass of SR during RX startups
e. P-10 ____	5. blocks the at power trips below 8% power
	6. blocks auto rod withdrawal at low power
	7. over-power rod stops

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

QUESTION .6.12 (2.00)

Using Attachment 3 AND the below plant operating history, answer the following questions regarding Axial Flux Difference (AFD).

February 1st -- 0000 power 75% for 2 days with AFD @ 0%
-- 0800 AFD @ > -5%
-- 0830 AFD @ < -5%
-- 1200 AFD @ 0%
-- 1500 AFD @ > -5%
-- 1530 power reduced to 49%
-- 2130 AFD @ < -5%
-- 2400 AFD @ 0%

a. WHY was power reduced to 49% @ 1530?

b. At WHAT time can power be restored to > 50%?

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

QUESTION 6.13 (2.00)

If a steam flow instrument fails LOW, describe the effect of this failure as indicated below. Assume NO operator action is taken and NO reactor trip occurs.

a. INITIAL response of this failure on:

   1. feed flow
   2. SG level

b. FINAL effect of this failure on:

   1. feed flow
   2. SG level

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

QUESTION 6.14 (1.00)

Using Attachment 4, determine WHICH ONE (1) of the following complies with Technical Specification 3.3.2.

A. one containment spray pump has been out of service for 96 hours.

B. the level in the spray additive tank has been low for 96 hours.

C. one recirculation cooler unit has been out of service for 96 hours.

D. containment spray valve MOV-860C has been out of service for 96 hours.

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

QUESTION 6.15 (1.00)

WHAT are the TWO (2) design features that facilitate the removal of fission-product iodine from the containment atmosphere during a LOCA?

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

QUESTION 6.16 (1.50)

WHAT are the THREE (3) design features of the spent fuel pit that prevent it from being drained below the top of the fuel racks?

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

QUESTION 6.17 (1.50)

WHAT are THREE (3) criteria that must be met before the 34.5 KV supplied non-vital buses will automatically supply the 19 KV supplied non-vital buses?

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

QUESTION 6.18 (1.50)

A maintenance worker mistakenly shuts the isolation valves from the instrument air receivers. Explain HOW the instrument air (IA) system will respond. Include all IA system components that are affected.

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

QUESTION 6.19 (1.50)

WHAT are THREE (3) containment component cooling loads that are NOT isolated during containment isolation?

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

QUESTION 6.20 (2.00)

WHAT are the FOUR (4) signals that will cause a turbine runback?

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

QUESTION 6.21 (1.00)

WHO must review the bypass of safety function and jumper control besides the Shift Supervisor and job foreman?

A. technical manager

B. nuclear assurance manager

C. maintenance manager

D. USNRC resident inspector

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

QUESTION 6.22 (1.00)

a. WHO of the on-shift staff can authorize a change to the position of a locked valve or breaker?

b. WHO is responsible for keeping the Lock Valve and Breaker Operations Log?

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

QUESTION 6.23 (1.50)

a. According to A-1, "Radiation Control Manual," WHAT is YOUR Quarterly administrative exposure limit for the whole body. (0.50)

b. WHAT TWO (2) individuals can authorize exceeding this administrative limit? (1.00)

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

QUESTION 6.24 (1.00)

According to 10CFR20, which ONE (1) of the following is the MAXIMUM Whole Body dose a woman 21 years of age can receive doing non-emergency work? Assume she has a completed NRC Form-4 AND no previous exposure history.

A. 0.125 Rem per quarter unless shown NOT to be pregnant

B. 3 Rem per quarter not to exceed an annual dose of 5 Rem

C. 7.5 Rem

D. 12 Rem

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

QUESTION 6.25 (1.50)

MATCH the term with the most appropriate phrase/definition.

a. Exclusion area _____

b. Restricted area _____

c. Controlled area _____

d. Radiation area _____

e. Contaminated area _____

1. limited to authorized persons through a control point

2. shall be locked and posted

3. 100 mrem in 5 consecutive days

4. 100 mrem/hr

5. within the station fence

6. greater than 2500 DPM smearable

7. controlled by RG&E

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

QUESTION 6.26 (1.00)

According to A-1.6.4, "Requirements for Work in Confined Spaces," if the shift supervisor deems it necessary to enter a confined space prior to the establishment of proper ventilation, WHAT are TWO (2) precautions which should be taken?

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

QUESTION 6.27 (1.00)

USING Attachment 5, which ONE (1) of the following conditions requires a continuous fire watch?

A. When the number of operable fire detection instruments is less than specified.

B. When specified fire hose stations are out of service

C. When the Halon system for the Relay Room is declared inoperable.

D. When fire barrier penetrations fire seals are not intact.

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

QUESTION 6.28 (1.00)

Due to the importance of an evolution in progress, the onshift HCO worked from 0700 until 2330 on March 17. Shift turnover lasted an additional 1/2 hour.

Did the HCO exceed any of the Ginna overtime restrictions listed in A-52.9? Briefly explain WHY or WHY NOT.

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

QUESTION 6.29 (1.00)

Fill-in-the-blank.

During an emergency response the (a) _____ _____ has the position and authority of (b) _____ _____ until relieved by the Plant Manager.

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

QUESTION 6.30 (1.00)

Which ONE (1) of the following correctly explains the process of checking a locked valve in the CLOSED position?

A. Attempt to move the operator in the closed direction, if no motion, it is OK.

B. Attempt to move the operator in the closed direction, if no motion, attempt to crack it open.

C. Attempt to move the operator in the open position and if some motion, close it until tight.

D. Remove the locking device then attempt to move the operator in the open direction, and if motion occurs, close it.

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

QUESTION 6.31 (1.00)

Which ONE (1) of the following is responsible for maintaining a record of personnel entering and leaving the containment vessel?

A. shift supervisor

B. control room foreman

C. security

D. health physics

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

QUESTION 6.32 (2.00)

Monthly analysis of the spent fuel pit water for boron concentration has been performed as follows:

October 29, 1988
November 28, 1988
January 2, 1989
February 6, 1989

a. Explain WHY Technical Specification SURVEILLANCE requirements have or have not been violated.

b. WHAT is the latest date in March this surveillance can be completed?

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

QUESTION 6.33 (2.00)

a. Upon assigning an Event Classification, WHAT is the MAXIMUM time period allowed for notification of the following? (1.50)

(1) NRC
(2) New York State
(3) Wayne and Monroe Counties

b. Select the lowest level of Event Classification for which Protective Action Recommendations should be reported. (0.50)

(1) Unusual Event
(2) General Emergency
(3) Site Emergency
(4) Alert

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

ANSWER 4.01 (1.00)

D [1.00]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
192008K114 ..(KA's)

ANSWER 4.02 (1.00)

C [1.00]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
192003K104 ..(KA's)

ANSWER 4.03 (2.00)

Pressurizer fluid temperature is much lower in cold shutdown which increases the density of the liquid [0.50]
Level is determined by the comparison of height times weight (density) [0.50] of the pressurizer fluid to that of the reference leg [0.50] Since the cold water is more dense the indicated level will be higher than actual level [0.50]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
193001K103 01100K407 ..(KA's)

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

ANSWER 4.04 (2.50) (4-6)

a. after the power decrease, the production of xenon from fission [0.25] and from decay of iodine [0.25] is greater than the removal by decay of xenon [0.25] and burnout by flux [0.25] after (five hours) the removal rate is greater than production rate [0.25] and positive reactivity will be added to the core [~~0.25~~] ~~[0.50]~~ [0.35]
b. rods will need to be Withdrawn [~~0.25~~] for the first five hours ~~[.25]~~ [0.30] then Inserted [~~0.25~~] for the next 35 hours [0.25]

REFERENCE [0.35] (3c - 4c) (4-6)

RG&E Enabling Objective 1.3
RG&E Lesson Plan RRT06C
192006K106 ..(KA's)

ANSWER 4.05 (2.00)

a. they create thermal flux oscillations [0.50] which cause localized damage to the fuel from overheating [0.50]
b. adherence to AFD limits [0.50]
slow changes in power [0.50]

REFERENCE

RG&E Enabling Objective 1.2
RG&E Lesson Plan RRT09C
192008K118 ..(KA's)

ANSWER 4.06 (1.00)

39.7 +/- 2 degrees F. [1.00]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
193003K125 ..(KA's)

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

ANSWER 4.07 (2.00)

a. Decrease
b. Increase [4 X 0.50]
c. Increase
d. Decrease

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
193008K105 ..(KA's)

ANSWER 4.08 (1.00)

to take into account the delay in refilling the core [0.50]
following a SBLOCA [0.50]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan RHT12C
193009K107 ..(KA's)

ANSWER 4.09 (3.00)

Keff1 = 1/(1 - Rho1) [0.50]
=1/(1 - (-0.04))= 0.9615 [0.25]
CR1 (1 - Keff1) = CR2 (1 - Keff2) [0.50]
100 (1 - 0.9615) = 132 (1 - Keff2)
Keff2=.9709 [0.25]
Rho2 =(.9709 ~~.9716~~-1)/.9709 ≅ -.03 [0.25]
delta Rho = Rho2 - Rho1 = -0.03 - (-.04) = 0.01 = 1000 pcm [0.25]

Assume differential boron worth of -10 pcm/ppm [0.50]

Boron delta Rho = -150 ppm x -10pcm/ppm = 1500pcm [0.25]
Xenon delta Rho = 1000pcm - 1500pcm = -500 pcm [0.25]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
001000K528 192003K102 ..(KA's)

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

ANSWER 4.10 (1.00)

clad failure (melting or burnout) probability is greatly increased [0.50]
because (film boiling) reduces the heat transfer from the fuel [0.50]

REFERENCE

RG&E Enabling Objective 2.4
RG&E Lesson Plan RHT10C
193007K103 193008K105 ..(KA's)

ANSWER 4.11 (2.00)

a. Decrease
b. Increase [4 X 0.50]
c. Increase
d. Decrease

REFERENCE

RG&E Enabling Objective 2.5
RG&E Lesson Plan RHT07C
191001K103 191004K107 ..(KA's)

ANSWER 4.12 (2.50)

```
          ▮ x shut off head  [0.50]
pump      ▮          x sys valve fullopen  [0.50]
head      ▮     <-- sys valve throttled  [0.50]
          ▮
          ▮-------------------x runout  [0.50]
                 flow
```

design operating point

(valve full open)

curve from shutoff head to runout [0.25]
curve from 0 pump head to sys valve full open [0.25]

REFERENCE

RG&E Enabling Objective 2.2
RG&E Lesson Plan RHT07C
191004K114 ..(KA's)

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

ANSWER 4.13 (2.00)

a. loud pump noise
   fluctuating discharge pressure (flow) [3 X 0.33]
   fluctuating pump amps
b. maintain adequate suction pressure (tank level, NPSH) [4 X 0.25]
   adequately vent the system
   properly line up the system
   ensure suction temperature is correct for suction pressure

REFERENCE

RG&E Enabling Objective 2.3
RG&E Lesson Plan RHT07C
191004K101 ..(KA's)

ANSWER 4.14 (2.00)

(Tavg2 - Tsat2) * 0.9Q = (Tavg1 - Tsat1) * Q [0.50]
Tsat1 & Tsat2 @ (780 psig + 15 psig) 795 psia [0.50] = 517.4 [0.50]
Tavg2 = (Tavg1 - Tsat1)* 1/0.9 + Tsat2 = 579.73 deg. F. [0.50]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
Steam Tables
191006K113 193003K125 ..(KA's)

ANSWER 4.15 (1.00)

A. [1.00]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
191005K106 ..(KA's)

(***** END OF CATEGORY 4 *****)

ANSWER 5.01 (1.50)

rod control
RPS (P-interlocks) [3 X 0.50]
S/G level control
steam dumps

REFERENCE

Ginna: RIC-05C, pages 5 and 7
000001K206 ..(KA's)

ANSWER 5.02 (1.50)

quadrant power tilt ratio (ΔI)
incore thermocouples [3 X 0.50]
incore flux map
[illegible] range (min match)

REFERENCE

Ginna: AP-RCC.2, pages 2 and 5
000005A201 000005A204 000005K306 ..(KA's)

ANSWER 5.03 (1.00)

There is no redundant level indication in the control room [1.00]

REFERENCE

Ginna: RAP 02C, page 5
000026K303 ..(KA's)

?

ANSWER 5.04 (1.00)

chromates [0.50] which are mildly toxic [0.50]

REFERENCE

Ginna: RGE-28, page 7
000026G007 ..(KA's)

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

ANSWER 5.05 (1.50)

a. open the reactor trip breakers [0.25] in the Intermediate Bldg [0.25]
manually trip the turbine [0.25] locally at the pedestal [0.25]
b. Tech Support Center [0.50]

REFERENCE

Ginna: AP-CR.1, page 3
000068K202 000068G010 ..(KA's)

ANSWER 5.06 (2.00)

manual trip [0.50]
de-energize buses 13 [0.25] and 15 [0.25]
manually drive rods [0.50]
emergency borate (MOV-350) [0.50]

REFERENCE

Ginna: EOP FR-5.1, page 3
000029K312 ..(KA's)

ANSWER 5.07 (2.00)

a. containment radiation of 1.0 E5 R/hr [0.50]
containment pressure of 4 psig [0.50]
b. RCS press ~~[0.33]~~
SG level ~~[0.33]~~
Pressurizer level ~~[0.33]~~ [3 X 0.33]
2.0 1.5

REFERENCE

Ginna: REP00C, page 8
Ginna: A-503.1.8-3.8.1.1.
000040K306 ..(KA's)

ANSWER 5.08 (1.00)

steam dump permissive not met (P-9) [0.50] because there are no circulating water pumps running [0.50]

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

REFERENCE

Ginna: RGE-45, handout RGE-MS-8
000051K301 ..(KA's)

ANSWER 5.09 (2.00)

a. verify auto rod control [0.50]
check for turbine load decrease [0.50]
b. actual rod drop
~~failed-MRPI~~ ~~[3 X 0.33]~~ [2 X 0.50]
PR NI failure

failed MRPI
not E-28
do not take off
for third answer

REFERENCE

Ginna: AP-TURB.2, page 2
Ginna: 33013-1353, Sheet 15
Ginna: AR-E-28
Ginna: RAP21C, page 4
000003G011 000003G009 ..(KA's)

ANSWER 5.10 ~~(1.50)~~ (1.00)

a. 2
b. 1
~~c. 5~~ ~~[5 X 0.30]~~ [2 X 0.50]
~~d. 3~~
~~e. 4~~

delete c., d., and e.
because of misinformation
during examination

REFERENCE

Ginna: REP 50C, page 12
Ginna: F-0.2
Ginna: F-0.5
Ginna: REC00C, page 2
Ginna: F-0.3
Ginna: A-503.1.7-3.6.
000055K302 000055G012 000007G012 000074G012 ..(KA's)

ANSWER 5.11 (1.00)

neither 480 VAC emergency ~~bus~~ available [1.00]
train of buses

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

REFERENCE

Ginna: REC 002, page 3
000055G011 ..(KA's)

ANSWER 5.12 (0.50)

to stop delta-T runbacks [0.50]

REFERENCE

Ginna: RIC 12C, page 8
000057K301 ..(KA's)

ANSWER 5.13 (2.00)

isolate seal return (AOV-270A) [0.50]
reduce power below 8% [0.50] within 30 minutes [0.50]
then trip the ~~"A" [0.25]~~ RCP ~~[0.25]~~ [0.50]

REFERENCE

Ginna: AP-RCP.1
000015K303 000015A210 ..(KA's).

ANSWER 5.14 (1.00)

R-16 -- containment fan coolers monitor
R-18 -- liquid waste disposal monitor
R-20 -- spent fuel pit monitor [4 X 0.25].
R-21 -- retention tank monitor
R-22 -- high conductivity waste disposal monitor

REFERENCE

Ginna: SC-206, page 1
000059G011 ..(KA's)

ANSWER 5.15 (0.50)

ensure adequate SD margin [0.50]
(to see if emergency boration is required)

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

REFERENCE

Ginna: RES 01C, page 4
Ginna: ES-0.1, page 4
Ginna: RAP06C, page 4
000007K301 000005K301 ..(KA's)

ANSWER 5.16 (1.00)

C. [1.00]

REFERENCE

Ginna: F-0.2, page 1
000074G011 ..(KA's)

ANSWER 5.17 (1.00)

to prevent excessive cooldown of the reactor [1.00]

REFERENCE

Ginna: REP00C, page 5
000007K103 ..(KA's)

ANSWER 5.18 (1.00)

atleast ONE (1) safety injection pump running [+0.3]
AND [+0.2]
RCS/SG differential pressure [+0.3] <165 psi [+0.2]

REFERENCE

Ginna: REP00C, page 16
000008K304 ..(KA's)

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

ANSWER 5.19 ~~(2.40)~~ (2.50)

- RCS subcooling [0.30] based on TC [0.10] greater than minimum ~~[0.10]~~ [0.15]
- feed flow [0.30] to intact S/Gs [0.10] > 200 gpm ~~[0.10]~~ [0.15]
  S/G NR level [0.30] >10% ~~[0.10]~~ [0.15]
- RCS pressure [0.30] >SIP shutoff head [0.10] stable or increasing [0.10]
- pressurizer level [0.30] >6% ~~[0.10]~~ ~~>50%=adverse containment [0.10]~~ [0.15]

REFERENCE

Ginna: E-0, page 17
000008K305 000009K324 ..(KA's)

ANSWER 5.20 (1.00)

C. [1.00]

REFERENCE

Ginna: REC32C, page 15
000037G011 ..(KA's)

ANSWER 5.21 (2.50)

a. isolate letdown (AOV-427) [0.50]
   maximize charging [0.50]
   (start additional charging pumps, increase speed, in manual)
b. rapidly increasing water level in the affected S/G [0.50]
   steam flow/feedwater flow mismatch [0.50]
c. to preclude a direct release path to the environment [0.50]

REFERENCE

Ginna: EOP, E-3, page 4
000003K303 000038A101 000038A203 ..(KA's)

ANSWER 5.22 (1.00)

minimize subsequent thermal shock to S/G components when refilling [0.50]
ensure an adeqaute cooling path for the RCS [0.50]

OR Prevent water hammer in feed line [0.50]

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

REFERENCE

Ginna: LP REC21C, page 14
000054K102 ..(KA's)

ANSWER 5.23 (1.50)

a. no action required [0.50] (start standby compressor or check for leak)
b. start standby compressor [0.50]
c. trip reactor [0.50]

REFERENCE

Ginna: AP-IA.1, page 3
Ginna: RAP10C, page 3
000065G005 000065K308 000065A205 000065A206 ..(KA's)

ANSWER 5.24 (1.00)

(decay heat) combined with RCS depressurization may shift the bubble to the Reactor pressure vessel [0.50]
causing Pressurizer level to Increase [0.50]

REFERENCE

Plant reference not identified
000028K303 ..(KA's)

ANSWER 5.25 (1.00)

D. [1.00]

REFERENCE

Ginna: Technical Specifications, page 3.11-4
000036K101 000036A203 ..(KA's)

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

ANSWER 6.01 (1.00)

1. b.
2. d. ~~[4 X 0.50]~~ (4 X 0.25)
3. d.
4. c.

REFERENCE

Ginna: Drawing 33013-652
Ginna: RGE-16
001000K202 022000K201 078000K201 064000K101 061000K202
..(KA's)

ANSWER 6.02 (1.00)

a. provides protection of "B" D/G from destruction of bus 17 [0.50]
(due to fire or tornado at screenhouse)
b. at the "B" EDG [0.50]

REFERENCE

Ginna: RGE-7, page 5 of 11
Ginna: RO70C
013000K603 064000K606 ..(KA's)

ANSWER 6.03 ~~(1.50)~~ (2.00)

a. charging is reduced [0.50] OR CYCLES
b. letdown is isolated [0.25] when actual level is < 13% [0.25]
c. backup heater energize [0.25] when level > 5% above program [0.25]
all heaters turn off [0.25] when actual level is < 13% [0.25]

REFERENCE

Ginna: 5TXIRFMC, page 3
004000K101 011000K101 ..(KA's)

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

ANSWER 6.04 (1.50)

A dropped rod rod runback will occur [0.50] causing average delta-T to decrease [0.50] which will cause a lower RIL setpoint to be calculated [0.50]

REFERENCE

Ginna: AP-RCC.2, pages 2 and 4
Ginna: RIL Circuits, RGE-29, page 4
Ginna: LP RAP13C, EO 1.1
014000K102 001000K104 001000K510 001000K504 ..(KA's)

ANSWER 6.05 (1.50) (5.0 E-11 or P-6)

a. when the non-failed IR detector decreases to < 1.0 E-10 amps [0.75].
b. both [0.25] P-6 defeat pushbuttons [0.25] must be depressed [0.25]

REFERENCE

Ginna: RIC-09C, RGE-33, and R3301C
015000K401 015000A202 ..(KA's)

ANSWER 6.06 (3.50) (breakers open)

a. both pumps trip ~~[0.30]~~ (0.50) ~~and~~ flow control valves close [0.30] AND ~~when pump breakers open [0.20]~~ discharge MOVs close [0.20]
b. 2/3 [0.125] lo-lo level [0.125] in both S/Gs [0.25]
loss of power to both MFPs (bus 11A/B) ~~[0.50]~~ undervoltage) [0.50]
c. 2/3 [0.125] lo-lo level [0.125] in either S/G [0.25]
both MFP breakers open [0.50]
SI [0.50]

REFERENCE

RG&E Enabling Objectives 4.0, 5.0
RG&E Lesson Plan R4201C
059000K419 061000K402 ..(KA's)

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

ANSWER 6.07 (1.50)

condensate
service water [3 X 0.33] [0.50 for correct priority]
city water

REFERENCE

Ginna: ER-AFW.1:2-3.4.
061000K105 061000K107 ..(KA's)

ANSWER 6.08 (1.00)

C. [1.00]

REFERENCE

Ginna: Technical Specification, pages 3.7-1 and 3.7-2
063000G005 ..(KA's)

ANSWER 6.09 (1.00)

B. [1.00]

REFERENCE

Ginna: Drawing 33013-756, Sheet 1
Ginna: RGE-9
063000K402 ..(KA's)

ANSWER 6.10 (1.00) for proportionals:

turn the heater control switch to the "~~ON~~" "OFF" position [0.50]
then return it to the "AUTO" position [0.50] ---CAF---
or "ON"

REFERENCE

Ginna: REG-19
011000K401 010000K603 ..(KA's)

BACK UPS:
No action
automatically (1.00)
re-energize

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

ANSWER 6.11 (2.00)

a. 6.
b. 4.
c. 5. [5 X 0.40]
d. 2.
e. 3.

REFERENCE

Ginna: RGE-35, pages 20, 21, and 22
012000K610 ..(KA's)

ANSWER 6.12 (2.00)

a. AFD outside of target band for > than 1 hr [1.00]
b. 1930 on February 2nd [1.00]

REFERENCE

Ginna: Technical Specification 3.10.2.10 and 3.10.2.11.
016000G006 016000K503 ..(KA's)

ANSWER 6.13 (2.00)

a. 1. decreases [0.50]
2. decreases [0.50]

b. 1. same as actual steam flow [0.50]
2. returns to normal [0.50]

REFERENCE

Ginna: 5TXIFRMD, page 2
016000K112 ..(KA's)

ANSWER 6.14 (1.00)

C. [1.00]

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

REFERENCE

Ginna: Technical Specification 3.3.2, page 3.3-5
Ginna: Drawing 33013-1261
027000G005 ..(KA's)

ANSWER 6.15 (1.00)

charcoal filters [0.50]
containment spray additive (NaOH) [0.50]

REFERENCE

Ginna: Technical Specifications, pages 3.3-12
027000K501 ..(KA's)

ANSWER 6.16 (1.50)

all penetrations to the SFP are above the racks
siphon breaker on the SFP pump return to the SFP [3 X 0.50]
constructed of welded SS backed by concrete
weir gate design

REFERENCE

Ginna: RGE-36, page 5
033000K401 033000K403 ..(KA's)

ANSWER 6.17 (1.50)

generator trip (86x actuated)
synch check relay energized (no faults, dead or in synch) [3 x 0.50]
breaker 767 (bus 12 normal feed) closed

REFERENCE

Ginna: RGE-6, page 11 and RGE-GT-2
062000K403 045000K301 ..(KA's)

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

ANSWER 6.18 (1.50)

Service air will pick up the load [0.50] when instrument air system pressure becomes less than PCV setpoint (90 lbs) [0.50]

pressure control valve (5251) will open and control pressure [0.50]

REFERENCE (will lose pressure over long term)

Ginna: Drawing 33013-1900
Ginna: RGE-47
079000K401 ..(KA's)

ANSWER 6.19 (1.50)

RCP "A"
RCP "B" > or (leaving oil cooler, thermal barrier)
Excess Letdown Heat exchanger [3 X 0.50]

REFERENCE

Ginna: Drawings 33013-1245 and 33013-1246
Ginna: EOP, E-0, page 27
008000K102 ..(KA's)

ANSWER 6.20 (2.00)

rod bottom
OT delta-T [4 X 0.50]
OP delta-T
nuclear instrument rod drop (rate)

REFERENCE

Ginna: Drawing 33013-1353, Sheet 15
Ginna: 5TXIFRMA
045000K411 ..(KA's)

ANSWER 6.21 (1.00)

A. [1.00]

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

REFERENCE

Ginna: A-1402
194001K102 ..(KA's)

ANSWER 6.22 (1.00)

a. Shift Supervisor [0.50]
b. HCO --OR-- CO [0.50]

REFERENCE

Ginna: A-52.2
Ginna: Technical Specifications, 6.2.2a
194001K102 ..(KA's)

ANSWER 6.23 (1.50)

a. 2 Rem/quarter (not to exceed 5 rem/yr) [0.50]
b. plant (manager) superintendent [0.50]
health physicists [0.50]

REFERENCE

Ginna: A-1, III.C.
194001K103 ..(KA's)

ANSWER 6.24 (1.00)

D. [1.00]

REFERENCE

Generic: 10CFR20
Ginna: A-1, IIIB
194001K103 ..(KA's)

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

ANSWER 6.25 (1.50)

a. 7.
b. 5.
c. 1. [5 X 0.30]
d. 3.
e. 6.

REFERENCE

Ginna: Lesson Plan, RRC05C, 1.5
Ginna: A-1.1
194001K104 ..(KA's)

ANSWER 6.26 (1.00)

require First Aid personnel to be part of the entry team
use appropriate protective clothing [2 X 0.50]
SCBAs should be used

REFERENCE

Ginna: A-1.6.4, Section 3.3.6
194001K114 ..(KA's)

ANSWER 6.27 (1.00)

C. [1.00]

REFERENCE

Ginna: Technical Specifications, 3.14.6.1, 3.14.4.1, 3.14.1.1, and 3.14.5.1
194001K116 ..(KA's)

ANSWER 6.28 (1.00)

No [0.50] an indivdual shall only be permitted to work less than 16 hours straight [0.50] (shift turnover and lunch relief NOT included)

grade according to assumption
16 HR MAX is full credit

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

REFERENCE

RG&E Enabling Objective 7
RG&E Lesson Plan RAD57T page 3
self study ques 7.1
194001A103 ..(KA's)

ANSWER 6.29 (1.00)

a. shift supervisor [0.50]
b. émergency coordinator [0.50]

REFERENCE

Ginna: SC-200:2-3.2.1.
194001K116 ..(KA's)

ANSWER 6.30 (1.00)

A. [1.00]

REFERENCE

Ginna: A 52.2-3.5.1.
194001K101 194001K102 ..(KA's)

ANSWER 6.31 (1.00)

C. [1.00]

REFERENCE

Ginna: A-3, 3.2.5, p. 3.
194000K105 ..(KA's)

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

ANSWER 6.32 (2.00)

a. have not been violated because Technical Specification 4.0 allows +25% for scheduling problems [1.00]

(Jan 2, 1989 + 1-1/4 month = about Feb 9, 1989)

b. (A-1106 has a 3.25 maximum time interval for any three consecutive periods.) This corresponds to about March 10, 1989 [1.00]

REFERENCE

Ginna: Technical Specification 4.0 and Table 4.1-2
Ginna: A-1106:3
194001A102 ..(KA's)

ANSWER 6.33 (2.00)

a. (1) 1 hour
(2) 15 minutes [3 X 0.50]
(3) 15 minutes
b. (3) [0.50]

REFERENCE

SC-201, page 1
SC-240, page 2
194001A116 ..(KA's)

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

QUESTION	VALUE	REFERENCE
4.01	1.00	9000003
4.02	1.00	9000006
4.03	3.00	9000009
4.04	2.50	9000010
4.05	2.00	9000012
4.06	1.00	9000004
4.07	2.00	9000005
4.08	1.00	9000007
4.09	2.00	9000001
4.10	1.00	9000002
4.11	2.00	9000008
4.12	2.50	9000011
4.13	2.00	9000013
4.14	2.00	9000014
4.15	1.00	9000015

	26.00	
5.01	1.50	9000016
5.02	1.50	9000017
5.03	1.00	9000018
5.04	1.00	9000019
5.05	1.50	9000020
5.06	2.00	9000021
5.07	2.00	9000022
5.08	1.00	9000023
5.09	2.00	9000024
5.10	~~1.50~~ 1.00	9000025
5.11	1.00	9000026
5.12	0.50	9000027
5.13	2.00	9000028
5.14	1.00	9000029
5.15	0.50	9000030
5.16	1.00	9000031
5.17	1.00	9000032
5.18	1.00	9000033
5.19	~~2.40~~ 2.50	9000034
5.20	1.00	9000035
5.21	2.50	9000036
5.22	1.00	9000037
5.23	1.50	9000038
5.24	1.00	9000039
5.25	1.00	9000040

	~~33.40~~ 33.00	
6.01	1.00	9000041
6.02	1.00	9000042
6.03	~~1.50~~ 2.00	9000043
6.04	1.50	9000044
6.05	1.50	9000045
6.06	3.50	9000046
6.07	1.50	9000047
6.08	1.00	9000048
6.09	1.00	9000049

QUESTION	VALUE	REFERENCE
6.10	1.00	9000050
6.11	2.00	9000051
6.12	2.00	9000052
6.13	2.00	9000053
6.14	1.00	9000054
6.15	1.00	9000055
6.16	1.50	9000056
6.17	1.50	9000057
6.18	1.50	9000058
6.19	1.50	9000059
6.20	2.00	9000060
6.21	1.00	9000061
6.22	1.00	9000062
6.23	1.50	9000063
6.24	1.00	9000064
6.25	1.50	9000065
6.26	1.00	9000066
6.27	1.00	9000067
6.28	1.00	9000068
6.29	1.00	9000069
6.30	1.00	9000070
6.31	1.00	9000071
6.32	2.00	9000072
6.33	2.00	9000073

	46.50	47.00

	105.9	106.00

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

FACILITY: Ginna

REACTOR TYPE: PWR-WEC2

DATE ADMINSTERED: February 6, 1989

CANDIDATE'S NAME: Master Key

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 six (6) hours after the examination starts.

CATEGORY VALUE	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE		CATEGORY
26.00	25.00			1.	REACTOR PRINCIPLES (7%) THERMODYNAMICS (7%) AND COMPONENTS (11%) (FUNDAMENTALS EXAM)
29.50	28.37			2.	EMERGENCY AND ABNORMAL PLANT EVOLUTIONS (27%)
48.50	46.63			3.	PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (10%)
104.0		FINAL GRADE	%		TOTALS

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

Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.

2. Restroom trips are to be limited and only one candidate at a time may leave. You must avoid all contacts with anyone outside the examination room to avoid even the appearance or possibility of cheating.

3. Use black ink or dark pencil only to facilitate legible reproductions.

4. Print your name in the blank provided on the cover sheet of the examination.

5. Fill in the date on the cover sheet of the examination (if necessary).

6. Use only the paper provided for answers.

7. Print your name in the upper right-hand corner of the first page of each section of the answer sheet.

8. Consecutively number each answer sheet, write "End of Category __" as appropriate, start each category on a new page, write only on one side of the paper, and write "Last Page" on the last answer sheet.

9. Number each answer as to category and number, for example, 1.4, 6.3.

10. Skip at least three lines between each answer.

11. Separate answer sheets from pad and place finished answer sheets face down on your desk or table.

12. Use abbreviations only if they are commonly used in facility literature.

13. The point value for each question is indicated in parentheses after the question and can be used as a guide for the depth of answer required.

14. Show all calculations, methods, or assumptions used to obtain an answer to mathematical problems whether indicated in the question or not.

15. Partial credit may be given. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK.

16. If parts of the examination are not clear as to intent, ask questions of the examiner only.

17. You must sign the statement on the cover sheet that indicates that the work is your own and you have not received or been given assistance in completing the examination. This must be done after the examination has been completed.

18. When you complete your examination, you shall:

a. Assemble your examination as follows:

(1) Exam questions on top.

(2) Exam aids - figures, tables, etc.

(3) Answer pages including figures which are part of the answer.

b. Turn in your copy of the examination and all pages used to answer the examination questions.

c. Turn in all scrap paper and the balance of the paper that you did not use for answering the questions.

d. Leave the examination area, as defined by the examiner. If after leaving, you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION 1.01 (1.00)

The reactor is exactly critical at 10E-8 Amps when a S/G atmosperic relief valve (ARV) fails open. Assuming no operator action and no reactor trip, CHOOSE the answer below that BEST describes the values of Tavg AND nuclear power for the resulting new steady state conditions.

A. Final Tavg greater than the initial Tavg, Final Tavg above POAH.
B. Final Tavg greater than than initial Tavg, Final power at POAH.
C. Final Tavg less than initial Tavg, Final power at POAH.
D. Final Tavg less than initial Tavg, Final power above POAH.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.02 (1.00)

The average effective delayed neutron fraction (Beff) decreases over core life. This is primarily due to the buildup of:

A. Xenon isotopes
B. Samarium isotopes
C. Plutonium isotopes
D. Uranium isotopes

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.03 (2.00)

Fully explain WHY the hot calibrated pressurizer level instruments do not provide accurate level indication when the plant is in cold shutdown. Include in your discussion the direction of this error.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.04 (2.50)

After operation at 100% power for several weeks near the end of cycle, power is reduced to 75% using rods only.

a. Explain HOW and WHY xenon concentration will change over the next 40 hours. (1.50)

b. WHAT rod motion (Insert, Withdrawn, No Change) would be required to maintain the plant at 75% power over the same 40 hours assuming no change in boron concentration? Include applicable time frames. (1.00)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.05 (2.00)

Xenon oscillations are a concern during PWR operation.

a. WHY and HOW do large xenon oscillation effect the fuel rods? (1.00)

b. HOW (Two ways) can an operator minimize or prevent xenon oscillations from occuring during a power increase from 50% to full power? (1.00)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.06 (1.00)

The pressure of the RCS during an accident is 1900 psig, and the indicated temperature is 590 degrees F. What is the subcooling in degrees F.?

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.07 (2.00)

State HOW (Increase, Decrease, No Change) an INCREASE in each of the following parameters affects the Departure From Nucleate Boiling Ratio (DNBR). Consider each case separately.

a. RCS temperature
b. RCS pressure
c. RCS flow
d. Reactor power

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.08 (1.00)

WHY is K(Z), the height correction factor, used in the heat flux hot channel factor calculation?

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.09 (3.00)

A Boron Dilution to 750 ppm increases the source range indication to 132 cps. During the dilution xenon concentration changes. Calculate (in pcm) xenon's reactivity contribution (including its direction +/-) during this evolution?

Initial plant conditions:

Hot shutdown, BOL
Boron concentration 900 ppm
Shutdown Margin (SDM) minus 4% delta k/k
source range reading 100 cpm

MAKE ALL NECESSARY ASSUMPTIONS

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.10 (1.00)

Explain HOW and WHY a fuel assembly is adversely effected when actual heat flux exceeds the critical heat flux.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.11 (2.00)

A condensate pump is operating at rated flow. You then start closing down on the discharge valve. HOW (INCREASE, DECREASE or REMAIN THE SAME) will each of the following be affected?

a. Flow :
b. Discharge pressure
c. Available NPSH
d. Motor amps

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.12 (2.50)

a. Sketch a pump curve and a system characteristic curve for a centrifugal pump. (1.00)

b. Show on your sketch the system design operating point AND in which direction along the pump curve this point will move when the pump discharge valve is closed (0.50)

c. Identify on your sketch where the pump runout AND shutoff head points are. (1.00)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.13 (2.00)

a. WHAT are THREE (3) indications of pump cavitation?

b. WHAT are FOUR (4) actions/requirements which are used to prevent pump cavitation?

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.14 (2.00)

The plant is operating at 100% power with RCS Tavg at 573.5 deg. F. and a steam pressure of 780 psig. CALCULATE the new value of Tavg which would be required to maintain a steam pressure of 780 psig at 100% power if 10% of the tubes in each steam generator were plugged. SHOW ALL WORK.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.15 (1.00)

WHICH of the following reasons is the basis for limiting the number of starts a large motor is allowed during a specific time period?

A. winding insulation breaks down at prolonged high temperatures

B. metal fatigue failure of motor components is a function of the number of start/stop cycles

C. initial low oil pressure during the motor start results in excessive bearing wear leading to failure

D. contacts in the motor controller become worn and may overheat and bind

(***** END OF CATEGORY 1 *****)

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

QUESTION 2.01 (1.50)

In the event of an instrument bus failure, WHAT are the THREE (3) major plant responses, regardless of which instrument bus fails.

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

QUESTION 2.02 (2.00)

a. Describe the THREE (3) precautions taken to prevent a loss of suction on the RHR pumps during low loop operation. (1.50)

b. If RHR flow is lost due to low level in the RCS, HOW is the loop level increased? (0.50)

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

QUESTION 2.03 (2.00)

Reactor coolant leak procedure (AP-RCS.1) describes MCB annunciator alarms which may be symptoms of a reactor coolant leak. WHAT are FIVE (5) alarms that could be indicative of a reactor coolant leak. Setpoints are not required.

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

QUESTION 2.04 (2.00)

WHERE do the HCO and the CO report to during a control room evacuation?

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

QUESTION 2.05 (2.50)

a. WHERE is the control room appendix "R" locker located? (0.50)

b. WHERE does the CO proceed to in the event of a major fire in the control complex? (1.00)

c. WHERE does the HCO proceed to in the event of a major fire in the control complex? (1.00)

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

QUESTION 2.06 (2.00)

WHAT are the TWO (2) adverse containment process parameter values? Include setpoints.

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

QUESTION 2.07 (1.00)

Are the containment Radiation monitors R-11 and R-12 valid after a safety injection? Explain WHY or WHY NOT.

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

QUESTION 2.08 (2.00)

WHAT are the FOUR (4) immediate operator action steps in EOP FR-S.1, "Response to Reactor restart/ATWS "?

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

QUESTION 2.09 (2.00)

In the event of an automatic turbine runback, WHAT are the TWO (2) immediate operator actions?

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

QUESTION 2.10 (2.00)

Prioritize the below list of Critical Safety Functions (CSFs).

a. core cooling
b. integrity
c. containment
d. inventory
e. subcriticality
f. heat sink

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

QUESTION 2.11 (1.50)

WHAT THREE (3) barriers do the CSFs protect from degradation?

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

QUESTION 2.12 (2.50)

You are in the control room and observe the following:

CCW surge tank HI LEVEL alarm
CCW surge tank level at 75% and increasing
CCW RAD Monitor alarm R-17 in alarm condition

a. WHAT automatic action(s) would you expect to occur? (0.50)

b. WHAT are FIVE (5) possible sources of in leakage? (2.00)

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

QUESTION 2.13 (1.00)

IF all charging is lost, HOW can immediate boration be performed?

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

QUESTION 2.14 (2.50)

For the following immediate action steps of procedure E-0, "Reactor Trip or Safety Injection," state HOW the actions are completed by the operator.

a. verify reactor trip (2 indications) (0.50)
b. verify power to both trains of emergency ac buses (4 indications) (1.00)
c. verify containment spray not required (1 indication) (0.25)
d. verify service water systems operation (2 indications) (0.50)
e. check if SI is actuated (1 indication) (0.25)

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

QUESTION 2.15 (1.00)

In attachment A of E-0, the conditions for natural circulation flow are listed. In addition, it says that the following equipment should be operating to support natural circulation and cooling:

BOTH Control Rod Shroud Fans running
Pressurizer Heaters energized
Reactor Compartment Cooling (RCC) Fans running

Describe WHY the Control Rod Shroud Fans are important in this situation?

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

QUESTION 2.16 (2.00)

Answer the following questions as they apply to EOP FR-S.1 "Response to Reactor Restart/ATWS."

a. WHAT action should the operator take if the reactor will not MANUALLY trip? (0.50)

b. If the reactor still has not tripped AFTER the above action is taken, WHAT operator action should then be taken? (0.50)

b. WHAT TWO (2) action(s) should the operator take if the Main Turbine has not automatically tripped, will not manually trip, and will not run back? (1.00)

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

3. PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (10%)

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

QUESTION 3.01 (1.00)

A secondary calorimetric is performed and the power range nuclear instrumentation was adjusted accordingly. Afterwards it is dicovered that the recorded values of main feedwater flow were higher than actual. WHY are the power range readings in error AND in WHAT direction?

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

QUESTION 3.02 (1.50)

WHAT are SIX (6) Rod Control components/indicators that reset when the rod control startup pushbutton is depressed?

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

QUESTION 3.03 (2.00)

During refueling the instrument supervisor requests the removal of TWO (2) of the power range drawers for overhaul at the shop. As the Head Control Operator (HCO) would you allow this? EXPLAIN in detail Why or why not?

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

QUESTION 3.04 (2.50)

a. Briefly describe the steam generator level program used at Ginna. (1.00)

b. WHAT are THREE (3) reasons/basis for the steam generator program described in part a. (1.50)

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

QUESTION 3.05 (3.00)

a. What are TWO (2) reasons for using letdown when in solid plant, cold shutdown conditions? (1.00)

b. WHAT are THREE (3) flowpaths that charging flow can be directed to after the regenerative heat exchanger? (1.00)

c. WHY is the low pressure letdown control valve (PCV-135) necessary for normal at power letdown operations? (0.50)

d. Electrical power is lost to the heat tracing lines from the boric acid tanks to the suction of the charging pumps. Why is this a concern? (0.50)

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

QUESTION 3.06 (3.00)

For EACH of the following Radiation Monitoring System detectors, state FOUR (4) automatic actions (not including annunciators) which occur upon a HIGH level alarm.

a. R-11 or R-12, containment particulate or gas monitors

b. R-14, auxilliary building Particulate or gas monitors with auxilliary building filters "in "

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

QUESTION 3.07 (1.50)

Answer EACH of the following questions concerning the Reactor Protection System:

a. Assuming a loop flow instrument is failed HIGH, WHAT are the THREE (3) other methods the Reactor Protection System uses to sense a loop low flow condition? (setpoints not required)

b. If the reactor is critical in the source range and RCP A and B both trip, will the reactor trip? Explain your answer and include any applicaple setpoints, permissives, and coincidences. Assume NO operator action is taken.

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

QUESTION 3.08 (2.00)

Answer the following questions concerning the Steam Dump system.

a. If the reactor trips from 100% power, HOW will the steam dump control system respond to the trip COINCIDENT with a failed High Tavg channel? Assume no operator action is taken and steamdumps are in AUTO/AUTO control. Setpoints are not required.

b. Describe HOW the steam dumps are used to cooldown the plant after a reactor trip to below the no-load Tavg setpoint. Include ALL major operator actions.

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

QUESTION 3.09 (2.50)

a. HOW do the main steam isolation valves (MSIVs) fail on a: (1.00)

(1) loss of air
(2) loss of DC

b. WHAT THREE (3) signals will auto close the MSIVs? (1.50)

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

QUESTION 3.10 (1.00)

a. WHICH containment air handling units can be routed through the charcoal filter units prior to the distribution header?

b. WHERE besides the control room can the air handling units be operated from?

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

QUESTION 3.11 (2.50)

Answer EACH of the following questions concerning the rod control system:

a. WHICH FOUR (4) rod control system Rod Stops apply in both automatic and manual control? Setpoints not required. (1.00)

b. Assume the reactor is at 100% power with bank D @ 190 steps. If a rod control system Urgent Failure Alarm occurs due to a phase failure in cabinet 1AC, determine whether the Rods can respond when the Bank Selector Switch is in each of the following positions listed below. EXPLAIN your answer for each of your responses. Setpoints are not required and a reactor trip is not considered rod motion.

(1) AUTO
(2) MANUAL
(3) CONTROL BANK D (1.50)

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

QUESTION 3.12 (2.00)

For EACH of the following symptoms of RCP seal malfunctions, STATE which seal has failed (1, 2, or 3).

a. No. 1 Seal D/P low pressure alarm at 200 psig

b. No. 2 seal standpipe low water level

c. Labyrinth Seal low D/P

d. No. 2 seal standpipe high level alarm

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

QUESTION 3.13 (2.50)

HOW (OPEN, CLOSED, AS IS, REMAINS OPERABLE) do the following valves respond on a complete loss of instrument air. Assume the plant is at 100% power with all systems in automatic.

a. AOV-3411, steam generator atmospheric relief valve
b. FCV-110B, reactor makeup to charging pump suction flow control valve
c. FCV-135, letdown line pressure control valve
d. LCV-112B, RWST to charging pump suction level control valve
e. RCV-014, gaseous waste release valve

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

QUESTION 3.14 (1.50)

Describe THREE (3) methods of protection which prevent overpressurization of the reactor vessel when the RCS cold legs are less than 330 degrees F. DO NOT include RHR components.

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

QUESTION 3.15 (2.00)

a. WHAT are TWO (2) plant conditions that will start and load the diesel generator automaticaly.

b. Name SIX (6) diesel generator trips AND identify THREE (3) that are bypased by the SI signal.

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

QUESTION 3.16 (2.50)

Answer EACH of the following question concerning the Rod Control System:

a. Assuming the reactor is at 70% steady-state power, indicate the response of the automatic rod control system with EACH of the following instrument failures. Assume no operator action, no reactor trip, and consider each case separately. Limit your answer to RODS IN, RODS OUT, or NO ROD MOTION. (1.50)

(1) PR channel 44 fails HIGH
(2) Tavg channel fails HIGH
(3) Impulse pressure channel 485 fails LOW

b. During a reactor startup with control bank C at 60 steps, would the Rod Bottom/Rod Drop Annunciator be alarming? Explain WHY or WHY NOT. INCLUDE any applicable setpoints, permissives and coincidences. (1.00)

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

QUESTION 3.17 (2.50)

a. WHAT are the TWO (2) automatic start signals for the TDAFW pump? (1.00)

b. WHAT are the THREE (3) automatic start signals for the MDAFW pump? (1.50)

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

QUESTION 3.18 (1.50)

WHAT are the THREE (3) types (grades) of water sources for the S/Gs AND their prioity for use?

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

QUESTION 3.19 (2.00)

a. WHAT THREE (3) plant parameters are used to determine if an RCP No. 1 seal bypass valve can be OPENED?

b. WHEN and WHY is the No. 1 seal bypass valve is required to be OPENED? Setpoint not required.

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

QUESTION 3.20 (1.00)

When preparing the main generator for maintenance, WHAT prevents an explosive mixture from forming inside the main generator?

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

QUESTION 3.21 (1.00)

WHAT are FOUR (4) components/locations in the containment building that could be considered confined spaces during maintenance activities?

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

QUESTION 3.22 (1.00)

Describe in detail HOW to verify the position of a locked, safety-related valve. Include ALL requirements which must be observed during this process.

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

QUESTION 3.23 (1.00)

WHEN, if at all, may BOTH the Head Control operator and the Control Operator go behind the control board?

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

QUESTION 3.24 (2.00)

a. WHO maintains the "official record"? (0.50)

b. WHAT are FIVE (5) examples of items which should be included in the "official record"? (1.50)

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

QUESTION 3.25 (1.00)

WHAT are the daily (administrative) radiation dose limits for whole body exposure during the times:

a. normal operating conditions

b. outage periods

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

QUESTION 3.26 (1.00)

Due to the importance of an evolution in progress, the onshift HCO worked from 0700 until 2330 on March 17. Shift turnover lasted an additional 1/2 hour.

Did the HCO exceed any of the Ginna overtime restrictions listed in A-52.9? Briefly explain WHY or WHY NOT.

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

QUESTION 3.27 (1.50)

a. Procedural steps which are proceeded by bullets "o" should be performed in what order?

b. Which indication take priority during an accident the SAS or Main Control Board indications?

c. HOW are immediate action steps in Abnormal procedures identified?

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

ANSWER 1.01 (1.00)

D [1.00]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
192008K114 ..(KA's)

ANSWER 1.02 (1.00)

C [1.00]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
192003K104 ..(KA's)

ANSWER 1.03 (2.00)

Pressurizer fluid temperature is much lower in cold shutdown which increases the density of the liquid [0.50]
Level is determined by the comparison of height times weight (density) [0.50] of the pressurizer fluid to that of the reference leg [0.50] Since the cold water is more dense the indicated level will be higher than actual level [0.50]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
193001K103 01100K407 ..(KA's)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

(4-6)

ANSWER 1.04 (2.50)

a. after the power decrease, the production of xenon from fission [0.25] and from decay of iodine [0.25] is greater than the removal by decay of xenon [0.25] and burnout by flux [0.25] after five hours the removal rate is greater than production rate [0.25] (and positive reactivity will be added to the core) ~~[0.25]~~ [0.50]
b. rods will need to be Withdrawn ~~[0.25]~~ for the first five hours [0.25] then Inserted [0.25] for the next 35 hours [0.25]

(30-40) (4-6)

REFERENCE

RG&E Enabling Objective 1.3
RG&E Lesson Plan RRT06C
192006K106 ..(KA's)

ANSWER 1.05 (2.00)

a. they create thermal flux oscillations [0.50] which cause localized damage to the fuel from overheating [0.50]
b. adherence to AFD limits [0.50]
slow changes in power [0.50]

REFERENCE

RG&E Enabling Objective 1.2
RG&E Lesson Plan RRT09C
192008K118 ..(KA's)

ANSWER 1.06 (1.00)

39.7 +/- 2 degrees F. [1.00]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
193003K125 ..(KA's)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

ANSWER 1.07 (2.00)

a. Decrease
b. Increase [4 X 0.50]
c. Increase
d. Decrease

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
193008K105 ..(KA's)

ANSWER 1.08 (1.00)

to take into account the delay in refilling the core [0.50]
following a SBLOCA [0.50]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan RHT12C
193009K107 ..(KA's)

ANSWER 1.09 (3.00)

Keff1 = 1/(1 - Rho1) [0.50]
=1/(1 - (-0.04))= 0.9615 [0.25]
CR1 (1 - Keff1) = CR2 (1 - Keff2) [0.50]
100 (1 - 0.9615) = 132 (1 - Keff2)
Keff2=.9709 [0.25]

Rho2 =(.9716-1)/.9709 = -.03 [0.25]
delta Rho = Rho2 - Rho1 = -0.03 - (-.04) = 0.01 = 1000 pcm [0.25]

ensure correct units
cps to cpm
then subtr. accordingly

Assume differential boron worth of -10 pcm/ppm [0.50]

Boron delta Rho = -150 ppm x -10pcm/ppm = 1500pcm [0.25]
Xenon delta Rho = 1000pcm - 1500pcm = -500 pcm [0.25]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
001000K528 192003K102 ..(KA's)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

ANSWER 1.10 (1.00)

clad failure (melting or burnout) probability is greatly increased [0.50]
because (film boiling) reduces the heat transfer from the fuel [0.50]

REFERENCE

RG&E Enabling Objective 2.4
RG&E Lesson Plan RHT10C
193007K103 193008K105 ..(KA's)

ANSWER 1.11 (2.00)

a. Decrease
b. Increase [4 X 0.50]
c. Increase
d. Decrease

REFERENCE

RG&E Enabling Objective 2.5
RG&E Lesson Plan RHT07C
191001K103 191004K107 ..(KA's)

ANSWER 1.12 (2.50)

```
          ▮ x shut off head  [0.50]        design operating point
pump      ▮          x sys valve fullopen  [0.50]
head      ▮     <-- sys valve throttled  [0.50]
          ▮
          ▮-----------------x runout  [0.50] (valve full open)
                  flow
```

curve from shutoff head to runout [0.25]
curve from 0 pump head to sys valve full open [0.25]

REFERENCE

RG&E Enabling Objective 2.2
RG&E Lesson Plan RHT07C
191004K114 ..(KA's)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

ANSWER 1.13 (2.00)

a. loud pump noise
   fluctuating discharge pressure (~~flow~~) [3 X 0.33]
   fluctuating pump amps
b. maintain adequate suction pressure (tank level, NPSH) [4 X 0.25]
   adequately vent the system
   properly line up the system
   ensure suction temperature is correct for suction pressure

REFERENCE

RG&E Enabling Objective 2.3
RG&E Lesson Plan RHT07C
191004K101 ..(KA's)

ANSWER 1.14 (2.00)

(Tavg2 - Tsat2) * 0.9Q = (Tavg1 - Tsat1) * Q [0.50]
Tsat1 & Tsat2 @ (780 psig + 15 psig) 795 psia [0.50] = 517.4 [0.50]
Tavg2 = (Tavg1 - Tsat1)* 1/0.9 + Tsat2 = 579.73 deg. F. [0.50]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
Steam Tables
191006K113 193003K125 ..(KA's)

ANSWER 1.15 (1.00)

A. [1.00]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
191005K106 ..(KA's)

(***** END OF CATEGORY 1 *****)

ANSWER 2.01 (1.50)

1. delta-T runback and withdrawal rod stop
2. dropped rod runback& withdrawal rod stop [3 X 0.50]
3. Tavg (average Tavg) deviation auto rod stop

REFERENCE

RG&E Enabling Objective 1.1
RG&E Lesson Plan RIC12C
062000A201 000057K301 ..(KA's)

ANSWER 2.02 (2.00)

a. flow guidelines are utilized
admin controls recording RCS levels [3 X 0.50]
vent RHR suction once every 24 hours
b. Swap the suction of the refueling water purification pump to the RWST
OR
Swap the RHR suction to the RWST per ~~AP-RHR-2~~. [0.50]
(MOU-956)

REFERENCE

RG&E Enabling Objective 1.3
RG&E Lesson Plan RAP25C
000005A15 000005K111 ..(KA's)

ANSWER 2.03 (2.00)

F-14 charging pump speed alarm
A-2 vct level
E-16 PRM hi
E-24 ARM hi [5 X 0.40]
F-4 PZR level deviation
F-10 PZR lo press
F-11 PZR lo level
C-12 Containment sump "A" pump "AUTO" start

REFERENCE

RG&E Enabling Objective 1.1
RG&E Lesson Plan RAP15C
000002K106 000002K405 ..(KA's)

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

ANSWER 2.04 (2.00)

HCO will go to the local operating stations in the intermediate building clean side basement by the motor driven AFW pumps [1.00]

CO will go to the local operating station in the charging pump room [1.00]

REFERENCE

RG&E Enabling Objective 2.1
RG&E Lesson Plan RAP04C
000068K318 ..(KA's)

ANSWER 2.05 (2.50)

a. the "R" locker is located just outside the control room [0.50]
b. the CO proceeds to the intermediate bldg main steam header area [1.00]
c. the HCO proceeds to the battery room [1.00]

REFERENCE

RG&E Enabling Objective SC-3.30
RG&E Lesson Plan
000068K312 ..(KA's)

ANSWER 2.06 (2.00)

vc press [0.50] greater than [0.25] 4 psig [0.25]
vc rad levels [0.50] greater than [0.25] 10 E-5 R/hr [0.25]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
000011K312 ..(KA's)

ANSWER 2.07 (1.00)

NO [0.50] R-11/R-12 are isolated during an SI [0.50]

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

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
103000A203 ..(KA's)

ANSWER 2.08 (2.00)

verify reactor trip
verify turbine
check AFW pumps running [4 X 0.50]
initiate emergency boration of the RCS

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
000029K312 ..(KA's)

ANSWER 2.09 (2.00)

verify auto rod control
check turbine load decreased [2 X 1.00]

REFERENCE

RG&E Enabling Objective 1.2
RG&E Lesson Plan RAP21C
AP-TURB.2
012000G014 ..(KA's)

ANSWER 2.10 (2.00)

e
a
f [6 X 0.33]
b
c
d

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

REFERENCE

RG&E Enabling Objective 1.13
RG&E Lesson Plan REP50C
000007A202 ..(KA's)

ANSWER 2.11 (1.50)

fuel clad
RCS pressure boundary [3 X 0.50]
containment vessel/building

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan REP50C page 3 of 12
000074K303 ..(KA's)

ANSWER 2.12 (2.50)

a. RCV-017 surge tank vent closes [0.50]
b. RCP thermal barrier
NRHX
Excess letdown heat exchanger
RHR pump or heat exchanger [5 X 0.40]
running SI or CS pump
sample heat exchangers

NOTE: Tank make up is not a RAD increase

REFERENCE

RG&E Enabling Objective 1.2, 1.4, 2.1
RG&E Lesson Plan RAP01C page 3 of 9
008000K104 008000A204 ..(KA's)

ANSWER 2.13 (1.00)

manually initiate SI [0.50] and decrease RCS pressure below shutoff head of the SI pumps [0.50]

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

REFERENCE

RG&E Enabling Objective 1.3
RG&E Lesson Plan RAP06C page 1 of 10
AP-CVCS.2 page 3 of 8
000024A109 ..(KA's)

ANSWER 2.14 (2.50)

a. one train of RX trip breakers open [0.25]
   neutron flux decreasing [0.25]
b. bus 14 and 18 [0.25] @ 480 volts [0.25]
   bus 16 and 17 [0.25] @ 480 volts [0.25]
c. containment pressure [0.125] < 28 psig [0.125]
d. SW pumps running [0.25]
   pressure > 40 psig [0.25]
e. SI signal present [0.25]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan EOP E-0
000007G010 ..(KA's)

ANSWER 2.15 (1.00)

they improve upper head cooling [1.00]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
002000K513 ..(KA's)

ANSWER 2.16 (2.00)

a. de-energize bus 13 and 15 [0.50]
b. manually insert control rods [0.50]
c. close the MSIVs [0.50] and their bypasses [0.50]

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

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
000029G010 ..(KA's)

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

ANSWER 3.01 (1.00)

Power range NIS indicate higher than actual [0.50] the higher value of feed flow used in the calorimetric yielded a higher than actual heat transfer rate across the steam generator [0.50]

REFERENCE

RG&E Enabling Objective 2.5
RG&E Lesson Plan RHT10C
193007K106 ..(KA's)

ANSWER 3.02 (1.50)

1. master cycler
2. slave cycler
3. bank demand counter
4. bank overlap unit
5. pulse to analog converter [6 X 0.25]
6. cleared urgent failure alarms

REFERENCE

RG&E Enabling Objective 3.1c
RG&E Lesson Plan R3001C
001000K403 001000K404 ..(KA's)

ANSWER 3.03 (2.00)

NO [0.50] 2/4 power ranges deenergized will allow P-10 to come in [0.50] this prevents source range high voltage from energizing [0.50] 2 source range detectors are required during refueling [0.50]

OR

YES , only if the above actions/events are defeated

REFERENCE

RG&E Enabling Objective 4.1
RG&E Lesson Plan R3301C
IE Notice 86-105
000015A201 ..(KA's)

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

ANSWER 3.04 (2.50)

a. 39 to 52% [0.50]
   0% to 20% power [0.50]
b. 1. Limits vc pressure on a steam break inside containment [0.50]
   2. Limits RCS cooldown & reactivity addition during steambreaks [0.50]
   3. Limits shrink & swell during plant transients no trips or excessive moisture carryover [0.50]

REFERENCE

RG&E Enabling Objective 1.2
RG&E Lesson Plan R4401C
035010K401 035010A301 ..(KA's)

ANSWER 3.05 (3.00)

a. RCS purification [0.50]
   pressure control [0.50]
b. RCS coldleg OR normal charging
   RCS hot leg OR alternate charging [3 X 0.33]
   Pressurizer OR aux spray
c. prevents coolant flashing at the letdown orifices [0.50]
d. boron precipitation (which may block BA flow) [0.50]

REFERENCE

RG&E Enabling Objective 2.1 2.4
RG&E Lesson Plan R1601C
004020A103 004020K612 004020A304 ..(KA's)

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

ANSWER 3.06 (3.00)

a. Containment Ventilation Isolation

vc purge supply units trip
vc purge exhaust units trip
vc depressurization (mini-purge) valves close [4 X 0.375]
vc air test valves close
vc RMS sample valves close
R-11/12 sample pump trips

b. aux building exhaust fan (1F) trips
intermediate building exhaust fan 1A or 1B trips [4 X 0.375]
intermediate building exhaust fan 1C trips
radioactive gas release valve ROV-14 (R-14 ONLY) closes

REFERENCE

RG&E Enabling Objective 3.2
RG&E Lesson Plan R3901C
072000K202 072000K401 072000K403 ..(KA's)

ANSWER 3.07 (1.50)

a. 1. RCP bus under voltage
2. RCP bus under frequency [3 X 0.25]
3. RCP breaker position

b. NO reactor trip will occur [0.25] the two loop low flow reactor trip is bypassed [0.25] with power less than P-7 [0.25]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
012000K604 012000K603 ..(KA's)

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

ANSWER 3.08 (2.00)

a. ALL the steamdumps will pop open [0.25] due to arming of relay 20 [0.25], the turbine trip controller initially will see a large temp error greater than 16 degrees F. [0.25] and stay open until the Tavg error is reduced [0.25]

b. Cooldown from no-load Tavg is accomplished by placing the mode selector switch in manual (press control) [0.50] and using HC-484 in auto [0.25] and lowering the setpoint to maintain the desired cooldownrate [0.25]

CP Manual

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan System Description RGE-45
041020K418 041020K417 ..(KA's)

ANSWER 3.09 (2.50)

a. (1) closed [0.50]
(2) as is [0.50]

b. 1. SI with hi-hi steam flow
2. SI with hi steam flow & lo Tavg [3 X 0.50]
3. hi hi containment pressure

REFERENCE

RG&E Enabling Objective 3.1
RG&E Lesson Plan R4001C
039000K405 ..(KA's)

ANSWER 3.10 (1.00)

a. units 1A [0.25] & 1C [0.25]
b. intermediate building coldside in the AFW pump area [0.50]
--CAF--

REFERENCE

RG&E Enabling Objective 2.2
RG&E Lesson PlanR2201C
029000K105 ..(KA's)

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

ANSWER 3.11 (2.50)

a. power range nuclear overpower
intermeadiate range nuclear overpower [4 X 0.25]
OP DELTA T
OT DELTA T

b. (1) No control over Rod motion [0.25] becuase the lift coil is de-energized OR the stationary and movable grippers are energized [0.25]
(2) Same as part (1) [0.50]
(3) Rods will move [0.25] because only the groups with the failure (control banks A and C) are inhibited [0.25]

REFERENCE

RG&E Enabling Objective 3.1,3.3
RG&E Lesson Plan R3001C
00100K402 001000K403 001000A403 ..(KA's)

ANSWER 3.12 (2.00)

a. 1
b. 3 OR 2 [4 X 0.50] ---CAF---
c. 1
d. 2

(if candidate states failure mode "closed")

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
004000K104 ..(KA's)

ANSWER 3.13 (2.50)

a. REMAINS OPERABLE
b. CLOSED
c. OPEN [5 X 0.50]
d. CLOSED
e. CLOSED

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

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
RG&E P&IDS
078000K302 ..(KA's)

ANSWER 3.14 (1.50)

a.
1. two porvs armed (LTOP in service) ~~[and charging]~~
2. no more than 1 SI pump operable [3 X 0.50]
3. a vent path >= 1.1 sguare inch (PORV removed)
4. TTS 3.4.1.K RCP Start criteria

for RHR per T/S 3.2.4

NOT RCS

REFERENCE

RG&E Enabling Objective 3.4 2.3
RG&E Lesson Plan R1901c R1401C
010000K403 ..(KA's)

ANSWER 3.15 (2.00)

a. Under voltage ~~[0.50]~~ [1.00] OR SI w/ undervoltage
~~SI [0.50]~~
b. overcrank
lo oil pressure
overspeed
manual stop [6 X 0.11 for trips]
overcurrent SI bypass [3 X 0.13 for SI bypass]
reverse power SI bypass
local stop switch SI bypass

REFERENCE

RG&E Enabling Objectives 2.1, 2.2, 2.3
RG&E Lesson Plan R0801C
000055A102 064000K402 ..(KA's)

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

ANSWER 3.16 (2.50)

a. (1) RODS ~~OUT~~ IN
   (2) NO ROD MOTION [3 X 0.50]
   (3) RODS IN
b. The rod bottom/rod drop annunciator is not alarming [0.50] because the alarm is bypassed (for control banks B, C, and D) [0.25] when the associated bank is less than ~~35~~ 24 steps [0.25] ---CAF---

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
015000K302 014000K403 001000A102 ..(KA's)

ANSWER 3.17 (2.50)

a. 2/3 [0.125] lo-lo level [0.125] in both S/Gs [0.25]
   loss of power to both MFPs (bus 11A/B) [0.50]
b. 2/3 [0.125] lo-lo level [0.125] in either S/G [0.25]
   both MFP breakers open [0.50]
   SI [0.50]

REFERENCE

RG&E Enabling Objectives 4.0, 5.0
RG&E Lesson Plan R4201C
061000K402 061000A301 ..(KA's)

ANSWER 3.18 (1.50)

condensate
service water [3 X 0.33] [0.50 for correct priority]
city water

REFERENCE

RG&E Enabling Objective 3.0
RG&E Lesson Plan R4201C
ER-AFW.1

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

ANSWER 3.19 (2.00)

a. RCS pressure
No. 1 seal leakoff [3 X 0.33]
seal injection flow
b. during low RCP seal flow conditions (seal inlet OR leakoff temperature approaching alarm setpoint) [0.50]
to ensure adequate cooling [0.25] to the lower radial bearing [0.25]

REFERENCE

RG&E Enabling Objective 5.8
RG&E Lesson Plan R1301C
003000A201 ..(KA's)

ANSWER 3.20 (1.00)

CO2 [0.50] is used as a purge [0.50]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
SC-3.30
194001K115 ..(KA's)

ANSWER 3.21 (1.00)

PZR
PRT
S/G [4 X 0.25]
RCDT
A&B sumps
accumulators

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
A-1.64
194001K114 ..(KA's)

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

ANSWER 3.22 (1.00)

remove the locking device [0.125] attempt to move the handwheel or operator in the closed position [0.25] if the valve is in the closed position no movement will occur [0.25] reinstall the locking device [0.125] then have a second person independently verify the locking device installation [0.25] .

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan
A-52.2
194001K101 ..(KA's)

ANSWER 3.23 (1.00)

verify receipt of an alarm [0.50] or initiate corrective action [0.50]

REFERENCE

RG&E Enabling Objective 7.3
RG&E Lesson Plan RAD51T
194001A103 ..(KA's)

ANSWER 3.24 (2.00)

a. the HCO [0.50]

b. 1. all status lights that do not reflect normal status
2. changes of the operating mode ? [5 X 0.30]
3. start and completion of power level changes
4. events such as reactor trips, isolations, bypasses, jumpers installed
5. time of criticality
6. Status changes to safety related and other major plant equipment
7. time start and completion of specific jobs
8. major equipment failures or suspected equipment malfunctions
9. time start of PTs, RSSPs, STs
10. fire reportable events
11. Shift complement

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

REFERENCE

RG&E Enabling Objectives 2.0, 2.1, 3.2
RG&E Lesson Plan RAD59T
194001A106 ..(KA's)

ANSWER 3.25 (1.00)

a. 100 mRem [0.50]
b. 200 mRem [0.50]

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan RAD62T
194001K103 ..(KA's)

ANSWER 3.26 (1.00)

No [0.50] an indivdual shall only be permitted to work less than 16 hours straight [0.50] (shift turnover and lunch relief NOT included)

REFERENCE

grade according to assumption (16 HR max required)

RG&E Enabling Objective 7
RG&E Lesson Plan RAD57T page 3
self study ques 7.1
194001A103 ..(KA's)

ANSWER 3.27 (1.50)

a. any order
b. Main Control Board [3 X 0.50]
c. by circles around the step number

REFERENCE

RG&E Enabling Objective
RG&E Lesson Plan A-503.1
194001A102 ..(KA's)

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

QUESTION	VALUE	REFERENCE
1.01	1.00	9000003
1.02	1.00	9000006
1.03	3.00	9000002
1.04	2.50	9000010
1.05	2.00	9000012
1.06	1.00	9000004
1.07	2.00	9000005
1.08	1.00	9000007
1.09	2.00	9000001
1.10	1.00	9000009
1.11	2.00	9000008
1.12	2.50	9000011
1.13	2.00	9000013
1.14	2.00	9000014
1.15	1.00	9000015

	26.00	
2.01	1.50	9000016
2.02	2.00	9000017
2.03	2.00	9000018
2.04	2.00	9000019
2.05	2.50	9000020
2.06	2.00	9000021
2.07	1.00	9000022
2.08	2.00	9000023
2.09	2.00	9000024
2.10	2.00	9000025
2.11	1.50	9000026
2.12	2.50	9000027
2.13	1.00	9000028
2.14	2.50	9000029
2.15	1.00	9000030
2.16	2.00	9000031

	29.50	
3.01	1.00	9000051
3.02	1.50	9000032
3.03	2.00	9000033
3.04	2.50	9000034
3.05	3.00	9000035
3.06	3.00	9000036
3.07	1.50	9000037
3.08	2.00	9000041
3.09	2.50	9000046
3.10	1.00	9000047
3.11	2.50	9000048
3.12	2.00	9000049
3.13	2.50	9000050
3.14	1.50	9000052
3.15	2.00	9000053
3.16	2.50	9000054
3.17	2.50	9000056
3.18	1.50	9000057

QUESTION	VALUE	REFERENCE
3.19	2.00	9000058
3.20	1.00	9000038
3.21	1.00	9000039
3.22	1.00	9000040
3.23	1.00	9000042
3.24	2.00	9000043
3.25	1.00	9000044
3.26	1.00	9000045
3.27	1.50	9000055

	48.50	

	104.0	