KANSAS GAS AND ELECTRIC COMPANY

GLENN L. KOESTER
VICE PRESIDENT - NUCLEAR

October 8, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

KMLNRC 84-179
Re: Docket No. STN 50-482
Ref: 1) Letter dated 5/25/84 from DGEisenhut, NRC, to GLKoester, KG&E
2) Letter KMLNRC 84-094 dated 6/21/84 from GLKoester, KG&E, to HRDenton, NRC
Subj: Operating Shift Staffing

Dear Mr. Denton:

Attached is further information about the Wolf Creek Generating Station shift consultant program that was requested by Reference 1), but was not available at the time of the Reference 2) transmittal.

Included are copies of the written and oral examinations given to the shift consultants, an answer key to the written exam, and test results. One individual failed to receive a passing grade on his written examination. He is presently taking an accelerated retraining program that is scheduled to be complete by November 1, 1984.

Yours very truly,

Glenn L Koester

GLK:bb
Attach
xc:HThompson, w/a
PO'Connor (2), w/a
HBundy, w/a
RDMartin, w/a

M003
1/40

WOLF CREEK GENERATING STATION

SHIFT ADVISOR EXAMINATION

Date Administered_____

Applicant_____

INSTRUCTIONS TO APPLICANT:

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 parenthesis after the question. The passing grade requires at least 70% in each category and a final grade of at least 80%. The total duration of this exam will be four (4) hours.

Category Value	% of Total	Applicant's Score	% of Cat. Value	Category
				6. Plant Systems: Design,
15.35	33	_____	_____	Control and Instruments.
				7. Procedures: Normal,
				Abnormal, Emergency and
14.50	31	_____	_____	Radiological Control
				8. Admin. Procedures,
16.75	36	_____	_____	Conditions & Limitations
46.60	100	_____		TOTALS

FINAL GRADE: _____%

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

_____ Candidate Signature

DO'S AND DONT'S FOR EXAMS

DO'S

1. Read the questions carefully.
2. Note the number of points allotted to each question.
3. Question the examiner if in doubt.
4. Pace yourself--don't spend hours drawing fancy sketches.
5. Show all calculations.
6. Look for any two-part questions which may not be labelled as such.
7. Recognize whether definition or explanation (discussion) is required.
8. List more than two reasons if some or few are requested.

DON'T

1. Leave any blanks.
2. Read hidden meanings into the questions.
3. Show the examiner your answers for his concurrence.

6. Plant Systems: Design, Control and Instrumentation

6.1 The reactor is operating at 100% power with all control systems in automatic. For the following failures, what reactor protection signal will cause the reactor to trip? Assume no operator action and consider each failure independently. BRIEFLY EXPLAIN.

a. CVCS flow rate drops to minimum of 47 gpm. (1.0)

b. A cold leg temperature detector (controlling) fails high. (1.0)

6.2 Use Figure 6.2 to answer the following questions:

Give the flow path for the following modes of operation of the M/U system by indicating which valves are open and which are shut.

a. Dilution (.25)
b. Manual (.25)
c. Immediate borate (.25)
d. Alternate dilute (.25)

6.3 a. Explain the operation of the source range detector. (1.25)

b. Why is gamma compensation not required in the power range? (Two reasons are required.) (1.0)

6.4 a. What is the function of the seal oil system? (.75)

b. What is the function of the steam seal system? (.75)

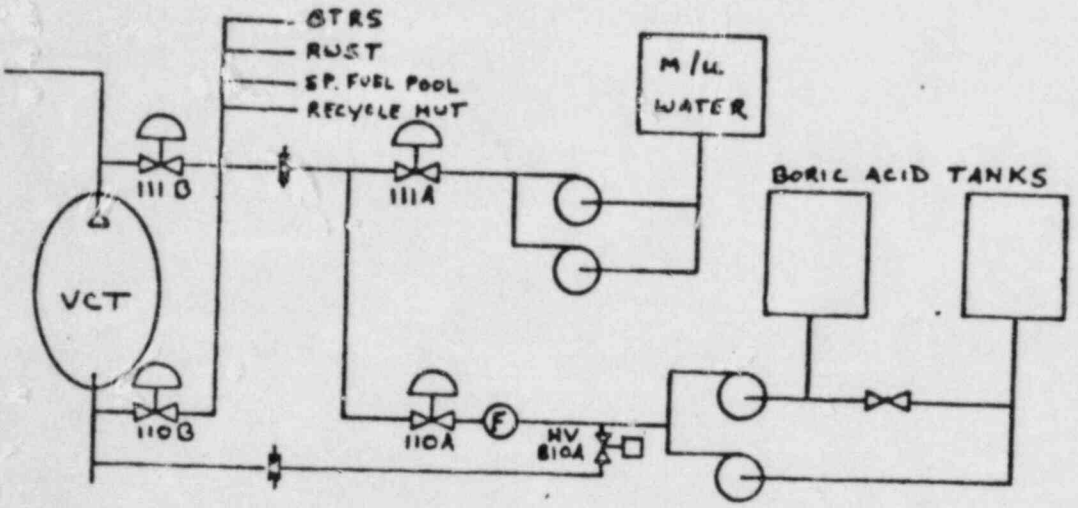
c. State the sources of steam to the steam seal system. (1.25)

6.5 a. What are the TWO conditions that will cause automatic startup of The Emergency Diesel Generators? (0.6)

b. What are FIVE conditions that will cause automatic trip of the Emergency Diesel ENGINES when running in the Emergency Mode? (1.5)

c. What are the TWO conditions that will cause automatic trip of the Emergency Diesel Generator BREAKERS when running in the Emergency Mode? (0.6)

FIGURE 6.2


BTRS
RWST
SP. FUEL POOL
RECYCLE HUT
M/U WATER
BORIC ACID TANKS
111B
111A
VCT
110B
110A
F
HV 810A

6. Plant Systems: Design, Control and Instrumentation

6.6 a. What two conditions will initiate Phase B Containment Isolation. Include logic and setpoints. (1.0)

b. How does Phase B Containment Isolation affect the Component Cooling Water System? Be specific. (1.5)

6.7 Utilizing the attached CVCS drawing, (Figure 6.1), answer the following questions.

a. Where does this valve divert to? (.25)

b. What are the TWO purposes of this valve? (.5)

c. To which position will this valve fail on loss of control air? (.25)

d. In which positions on the Reactor Makeup Control System Mode selector switch is this valve (FCV-1108) enabled to open? (0.4)

f. What are TWO signals that will result in AUTOMATIC closure of these valves (LCV-112B and C)? (No setpoints required). (0.5)

g. Where does this valve divert to? (.25)

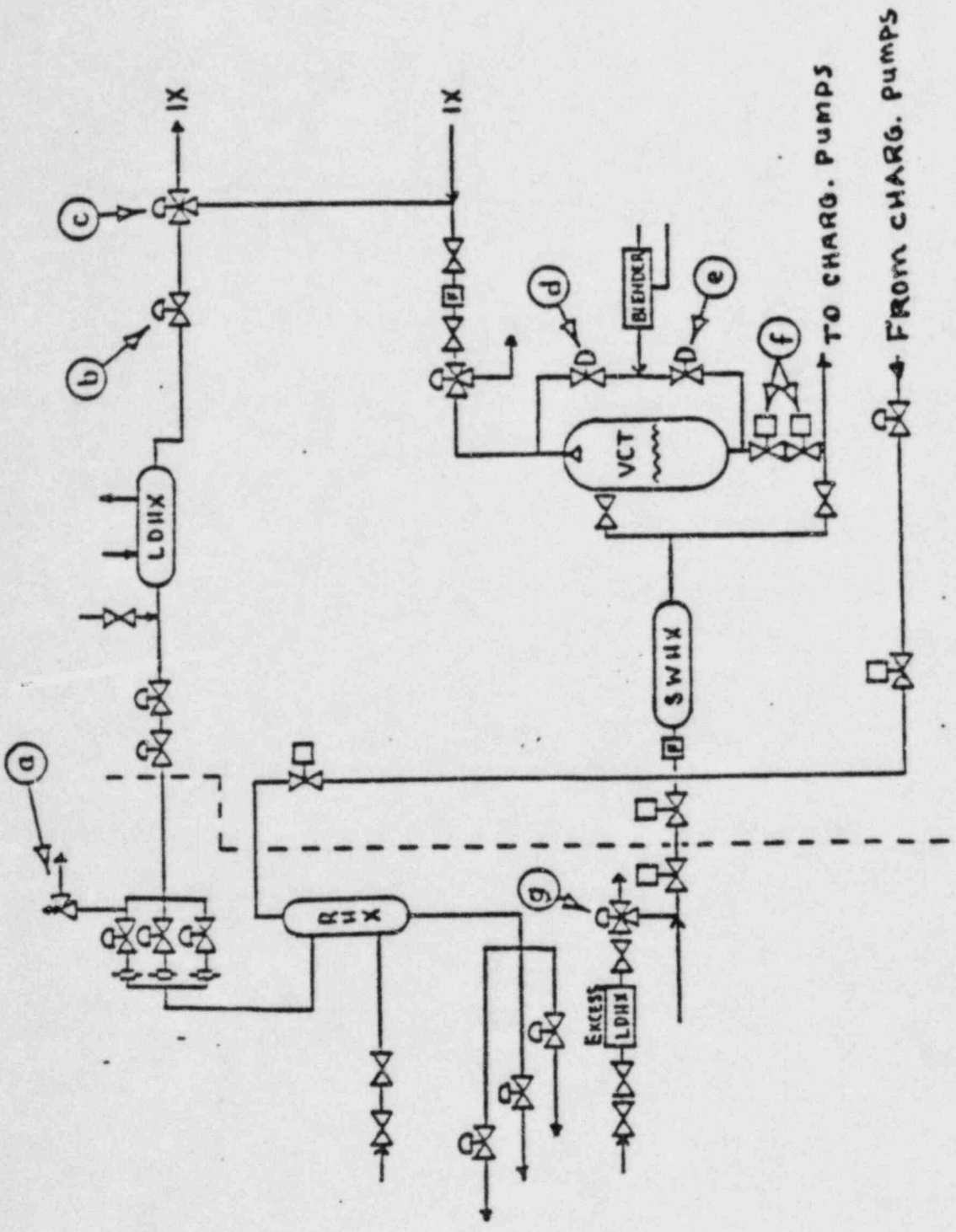

IX
IX
c
b
d
BLENDER
e
f
TO CHARG. PUMPS
FROM CHARG. PUMPS
VCT
LDMIX
SWMIX
a
MIX
g
EXCESS
LDHX

Figure 6.1

7. Procedures: Normal, Abnormal, Emergency and Radiological Control

7.1 The following questions concern Precautions and Limitations in "Hot Standby to Minimum Load" (GEN-00-003).

a. What control action should be taken by the operator before adjusting RCS boron concentration? EXPLAIN WHY. (1.0)

b. While diluting to the Estimated Critical Boron Concentration, one source range channel changes from 8 counts to 17 counts and the other channel changes from 6 to 9 counts. What action is required? (1.0)

c. Tave is lowered to 548 F with the reactor at 2% power due to excessive steam removal. What action is required by Technical Specifications? (0.5)

d. What "Precautions and Limitations" are being challenged if you were performing the following operations?

1. Diluting to the Estimated Critical Boron Concentration with the reactor slightly subcritical? (0.5)

2. Increasing power from P-6 to P-10 with control bank D withdrawal while slowly diluting because control bank D rods are nearly all the way out. (0.5)

7.2 List the Critical safety Functions (CSF) in the order that the Status Trees for the CSFs are to be checked to evaluate the safety state of the plant in accordance with "Critical Safety Function Status Trees (CSFST)", EMG F-0. (1.5)

7.3 Indicate the lowest emergency event classification that requires activation of the following Emergency Centers:

a. Emergency Operation Facility (EOF) (0.5)

b. Technical Support Center (TSC) (0.5)

7.4 Match the trends from Column B that would be indicative of conditions for Column A malfunctions prior to any protective funciton actuations. There may be more than one answer. Place answers on answer sheet (e.g., c-7,8,9)

COLUMN A	COLUMN B
a. Small Breaker LOCA Inside Containment	1. Decreasing Pressurizer Level
b. Steam Leak Inside Containment	2. Decreasing Steam Pressure
	3. Increasing Containment Pressure
	4. Decreasing Tave
	5. Increasing Containment Radiation
	6. Decreasing Pressurizer Pressure

(3.0)

7. Procedures: Normal, Abnormal, Emergency and Radiological Control

7.5 What are the minimum required AC electrical sources which must be operable in Mode 3? (2.5)

7.6 Define the following:

a. Controlled leakage (.75)

b. Axial flux difference (.75)

c. Dose equivalent I-131 (.75)

d. Mode 5: Cold Shutdown (.75)

8. Administrative Procedures, Conditions and Limitations

8.1 As shift supervisor/supervising operator you have the responsibility of ensuring the request of equipment to be removed from service is accurate and complete.

a. What information must be on a Danger - DO NOT OPERATE (DNO) Tag? (1.4)

b. When is it permissible to use a human DNO tag? (1.0)

8.2 Under the RP manual each WCGS supervisor is responsible to aid Health Physics in maintaining ALARA. State four (4) responsibilities you as a supervisor and held accountable. (1.6)

8.3 In accordance with Administrative Procedure ADM 02-001 "Operations", what are the minimum duty shift manning requirements for the following during power operations? Do not consider the two hour exceptions.

1. Licensed Senior Operator. Include the titles for positions held.
2. Reactor Operators. Include license requirements.
3. Nuclear Station Operators. (1.95)

b. What is the minimum number of Fire Brigade members required onsite at all times AND how many of the minimum shift crew are NOT to be included as members of the Fire Brigade? (0.8)

8.4 For each of the following leak locations, give the maximum allowable leak rate AND the basis for each:

a. Unknown location

b. Through a pressurizer code safety valve to the Pressurizer Relief Tank.

c. Through the wall of the line between the pressurizer relief valves and the pressurizer.

d. Total flow to Reactor Coolant Pump seals.

e. TOTAL Steam Generator tube leakage. (4.0)

8.5 During refueling operations involving core alterations:

a. What are the minimum neutron flux monitoring requirements as required by Technical Specifications? Include the monitoring locations and method of monitoring. (0.8)

b. What are the minimum Technical Specification requirements in regard to:

1. Containment Building equipment door?
2. Containment Building airlocks?
3. Each Containment penetration providing access to the outside environment? (1.2)

8. Administrative Procedures, Conditions, and Limitations

8.6 What action must be taken if the Reactor Coolant System Pressure Safety Limit is exceeded, in accordance with Technical Specifications? Consider all MODES. (1.5)

8.7 In the event of a plant emergency requiring implementing the Emergency Plan, who, by title:

a. Initially assumes the duties of the Duty Emergency Director? (0.5)

b. Can relieve the Duty Emergency Director (Both Titles)? (1.0)

c. Initally assumes the responsibilities of the Operations Emergency Coordinator? (0.5)

d. Is the normal relief for the Operations Emergency Coordinator? (0.5)

SHIFT ADVISOR

EXAM KEY

6.1 a) Letdown flow is greater than charging flow which will lead to letdown isolation at 17% level. After this the pressurizer will refill and cause a Reactor Trip due to high Pressurizer level. (1.0)

b) The plant will trip on low Pressurizer Pressure. Tc Failing high will cause Tave to Fail high driving rods in the reduce Tave. This will cause Pressure to decrease faster than Pressurizer heaters can make up for the decrease

REF: NPS-217-6 (1.0)

6.2 a) 111A & 111B open
110A & 110B shut (.25)

b) 111A & 110A open
111B & 110B shut (.25)

c) HV810A open
110A & B, 111A & B shut (.25)

d) 111A & B, 110B open
110A shut (.25)

REF: SNP-21 Rx M/U sys

6.3 a) A neutron enters the detector and interacts with the boron. This reaction causes an alpha to be emitted which causes ionization of the gas. The ion pairs are then collected and utilized as an output pulse to indicate neutron level. (1.25)

b) 1. Gamma flux is proportional to power.
2. Neutron flux is much greater than gamma flux. (1.0)

REF: SNP-36

6.4 a) Prevents air leakage in the H_2 leakage out of the generator. (.75)

b) Prevents air leakage in the steam leakage out of the main turbine. (.75)

c) 1. Main steam
2. Aux steam
3. LP turbine 9th stage extraction
4. HP turbine glands
5. Turbine stop and control valve leak offs

REF: SNP-27 (1.25)

6.5 a)- Safety Injection (0.3)
- Undervoltage on NB bus (0.3)

b)- Overspeed (0.3)
- low lube oil pressure (0.3)
- high crankcase pressure (0.3)
- high jacket water temperature (0.3)
- failure to start (0.3)

6.5 CONT.

c)- Neutral ground overcurrent (0.3)
- differental overcurrent (0.3)

REF: NPS-213-5

6.6 a) - Containment Hi-3 - 27 psig 2/4 (0.5)
- Manual 2/2 (0.5)

b) The phase B signal shuts the CCW supplies (2) and returns (4). This will isolate CCW to the following components:

- RCP motors
- RCP thermal barrier Hx
- Excess letdown Hx
- RCDT Hx

REF: NPS-221-3, 217-5 (1.5)

6.7 a) Pressurizer Reilief Tank (0.25)

b) 1. Prevents steam flashing across orifices (0.25)
2. RCS pressure control during RHR operations (0.25)

c) to bypass the deminerlizer (0.25)

d) Alt. Dilute, Dilute, and Manual (0.3)

e) Automatic, Alt. dilute, Borate, and Manual (0.4)

f) Lo-Lo VCT level and safety injection (0.5)

g) RCDT (0.25)

REF: NPS-217-1

7.1 a) When changing the Reactor Coolant System Boron Concentration, Pressurizer sprays should be utilized to minimize the differential between the Pressurizer and the Loop Boron Concentration to $\leq$ 50 ppm by placing one group of Pressurizer Backup Heaters in Manual-On and leaving Pressurizer Spray Control in Auto. (1.0)

b) If, during any step involving boron dilution, the source range count rate increases by a factor of two, dilution shall be stopped immediately and suspended until core reactivity has been evaluated. (1.0)

c) When the reactor is critical the lowest operating, coolant loop Tave must be maintained $>$ 551°F. If temperature decreases to 551°F, restore to $\geq$ 551°F within 15 minutes or be in hot standby within the next 15 minutes to satisfy technical specification 3.1.1.4. (0.5)

d) 1. Criticality shall not be achieved by boron dilution with the exception of initial criticality and initial criticality after refueling. (0.5)

2. Do not add positive reactivity by more than one controlled method at a time. (0.5)

REF: GEN-00-03

7.2 - Subcriticality
- Core Cooling
- Heat Sink
- Integrity
- Containment
- Inventory

REF: EMG FR-0 (1.5)

7.3 a) Site Emergency (0.5)

b) Alert (0.5)

REF: WCGS E-Plan

7.4 a) 1,3,5,6 (1.5)

b) 1,2,3,4,6 (1.5)

REF: EMG E-0

7.5 1. To physically independent circuits between the offsite transmission network and the Onsite Class 1E Distribution System, and

7.5 CONT.

2. Two separate and independent diesel generators, each with:

   a. A separate day containing a miniumu volume of 390 gallons of fuel,

   b. A spearate Fuel Oil Storage System containing a minimum volume of 85,300 gallons of fuel, and

   c. A separate fuel transfer pump.

REF: Tech. Spec. 3.8.1 (2.5)

7.6 a) That seal water flow from RCP seals. (.75)

b) Difference in normalized flux signal between the top and bottom halves of a two section excore neutron detector. (.75)

c) Dose equivalent I-131 is that concentration of I-131 which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, 132, 133, 134, 135 actually present. (.75)

d) When Keff $<$ .99; 0% rated power; Tave $\leq$ 200°F. (.75)

REF: Tech. Spec. Sec. 1.0

8.1 a) 1. Clearance order number
2. Date/Time
3. Component tagged
4. Component Position
5. Issued by (S.S. name)
6. Tagged by
7. Verified by (1.4)

b) Jobs of a trouble shooting or adjusting nature that required that a component by isolated or deenergized, then restored several times over a short period of time to allow for work and then test. (1.0)

REF: ADM 02-100

8.2 1. All work is performed in accordance with station procedures, rules, and Radiation Work Permits.

2. All personnel receive training and are knowledgable in radiological protection.

3. Adminstrative dose limits are not exceeded by personnel under his supervision.

4. The Health Physics Group is advised of any changes in work procedures, or unusual occurences or incidents where radiological conditions may be influenced.

NOTE: Other responsibilities will be considered at the graders discretion.

REF: RP Manual Pg. 4-5 (1.6)

8.3 a) 1. Shift Supervisor and Supervising Operator

2. 2 Reactor Operators-one must be at the controls during power operations

3. Station Operators - 4 (1.95)

b) Minimum of 5 brigade members. 3 of minimum shift crew may not be included. (0.8)

REF: ADM 02-001

8.4 a) 1 gpm - Sufficiently low to ensure early detection of additional leakage

b) 10 gpm - provides allowance for a limited amount of leakage from known sources and will not interfere with the detection of unidentified leakage.

c) 0 gpm - may be indicative of an impending gross failure of the pressure boundary.

d) 8 gpm per RCP - ensures that SI flow will not be less than assumed in accident analyses.

e) 1 gpm - ensures dose less than 10 CFR 100 limit. (4.0)

REF: Tech. Spec. Bases 3/4 4.7.2

8.5 a) Two source range detectors with indication in the control room. One of which provides audible indication of count rate in containment and in the Control room. (0.8)

b) 1. Must be closed w/minimum of 4 bolts (0.4)
2. At least one airlock door closed (0.4)
3. Access to atmosphere must be locked closed by blank flange or by manual valve or capable of closed by an automatic isolation signal (0.4)

REF: Tech. Spec. 3/4 Sec. 9

8.6 Modes 1 & 2 - Hot standby within 1 hour.

Modes 3,4 & 5 - Restore pressure to within limit within 5 minutes

All - Notify NRC within 1 hour
- V.P. Nuclear and PSRC within 24 hours
- Evaluate and prepare report for PSRC review
- Submitt report to NRC, V.P. Nuclear, and NSRC within 14 days
- Criticality requires NRC approval

REF: Tech. Spec. Sec. 6 (1.5)

8.7 a) Shift Supervisor (0.5)

b) Plant Manager or Duty Call Superintendent (1.0)

c) Supervising Operator (0.5)

d) Operations Superintendent (0.5)

REF: Tech. Spec. Sec. 6

FORM 1177 REV. 1-67

KGE THE ELECTRIC COMPANY

INTEROFFICE CORRESPONDENCE

TO: Paul Turner

FROM: Dale Moses

DATE: July 27, 1984

SUBJECT: Shift Advisor Exam Results

The following are the results of Shift Advisor Training program:

QUIZZES:	#1	#2	#3
Armstrong	86.2	81.5	92.6
Cade	67.8	79.5	86.6
Jurrus	88.5	92.1	90.6
Molpus	86.2	70.0	98.6
Ochs	85.1	75.2	98.6
Rathbone	81.6	88.9	92.6

WRITTEN EXAM:	Sec.6	Sec.7	Sec.8	OVERALL
Armstrong	87.0	92.8	89.9	89.8
Cade	73.3	97.2	94.0	88.2
Jurrus	84.0	91.0	76.1	83.4
Molpus	91.5	89.7	76.4	85.5
Ochs	83.7	71.7	92.8	83.3
Rathbone	58.3*	77.2	85.7	74.0**

SIMULATOR:	ORAL:	OPERATIONS:
Armstrong	Pass	Pass
Cade	Pass	Pass
Jurrus	Pass	Pass
Molpus	Pass	Pass
Ochs	Pass	Pass
Rathbone	Pass	Pass

* - Does not meet 70% passing requirement for category.

** - Does not meet 80% overall passing requirement.

The quizzes, written exams, and simulator exam reports are available upon request for your review and for training record update.

E. Dale Moses

E. Dale Moses

EDM/mls

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: Bob Jurrus

GRADE	QUESTION
S	Why take Rx power to 2% on plant startup?
S	Limitations on rod motion during startup?
S	When is SR turned off?
S	Why is OTDT setpoint so high?
S	Why letdown Regen HX high T alarm?
U	Discussion of CB "D" rod drop effects.
S	Effects of low Tavg due rod drop?
U	How do you know keff 1, now.
S	Why IR indication different.
S	What are effects of CB "D" position on CR mode switch?
S	BOP panel Tech Spec related equipment?

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: Bob Jurrus

GRADE	QUESTION
S	How raise TG power output?
S	What is the expected response of FW reg. system to power increase?
S	What area radiation monitors in Tech Specs.
S	Explain precautions for power increase? (Gen Oper. Curve)

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: Shannon Armstrong

GRADE	QUESTION
S	Discuss purpose and use of L/D pressure CV?
S	Use of power defect curves and nomographs for power ramp?
S	Boration flow paths?
S	T.S. misaligned rods, RIL, AFD?
S	PR Flux deviation alarm, causes, set points?
S	TS on Min. temp for criticality?
S	Demineralizer operation
S	Actions on rod control failure?
S	M.T. turning gear indication, ECC, Sp, Valve Pos. Ind.
S	MW, MVAR, PF Relationship?
S	Runbacks, Setbacks signals?

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: Walt Molpus

GRADE	QUESTION
S	Capacity of start up MFP?
S	Aux feed pump auto start on loss of MFP. How is signal defeated during S.U?
S	Min. temp. for criticality? Why?
S	What is adverse containment?
S	When can you throttle aux feed?
S	Required chem sampling freq?
S	Dilution required for ramp?
M	Tech. procedure for loss of NBO-1?
S	Why use alt. dilute instead of dilute?
S	Load limit with loss of Circ pump?
M	What programs T-Ref. which IMP?

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: Randy Cade

GRADE	QUESTION
MS	Reasons for RIL's - bases for T/S on RIL?
S	Who maintains the various plant logs?
S	T/S on AFD and actions required >90% and <90≥50%
S	What are your actions on the CCW High Surge tank level & how are you diagnosing the leak?
S	What methods of Imm. Boration are available?
S	What causes the PR upper detector flux dev. alarm and why it was in?
S	What are the different modes of operation for the Steam dumps?
S	What SI Signals are there? Can any of these be blocked and where?
S	Extraction Steam Sources and uses- Heating of feedwater and why we heat feedwater and cold reheat steam.
S	Use of S/G PORV's with a loss of air-what is the supply- and what else is the supply used for?
S	Precautions when starting a MFP - how many are required at full power- where do the heater drains tie in to the system?

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: Walt Molpus

GRADE	QUESTION
S	What is program signal for pzr. level?
S	What controls P.D.P. speed?

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: Shannon Armstrong

GRADE	QUESTION
S	Rx trip circuitry?
S	Turbine supervisory inst.
S	Full Arc - Partial arc admission
S	AFW TS, S/U feed system?

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: Randy Cade

GRADE	QUESTION
S	Interlocks associated w/letdown isolation and orifice isolation valves-excess letdown path?
S	CCP operation and mini-flow operation - flow control and inputs from PZR level control?
S	Why are rods banks overlapped?
S	What are the inputs to the rod control system? Discussed Rod control interlocks?
S	What are the effects of various NR RTD failures-What are the indications of these failures-What is Auct High Tavg used for?

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: A.Ochs

GRADE	QUESTION
S	Are + VARS going in or out?
M	What happens to volt as you increase load?
U	First stage pressure feedback control-What does it do?
S	What would happen to load if one Gen bkr. opened?
U	What happens if you loose Circ pump at 100%?
S	Steam dump arming circuits?
S	What is feed pump program DP?
S	What does LoLo limit mean? What is the T/S?
S	How do you verify feed water isol?
S	How much dilution is required for 20 - 50% power change?
S	Program T-Ref?

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: A. Ochs

GRADE	QUESTION
S	Pzr. level program inputs?
S	Pzr. master level controller inputs?
S	What do you do if you violate a tech spec. safety limit?
S	Is the PDP safety related?
S	Reason for partial trip?

WOLF CREEK GENERATING STATION

Simulator Oral Exam Report

CANDIDATE: Bob Rathbone

GRADE	QUESTION
M	Alarm recognition, Why is the Gen of alarm in? How can we clear it?
U	Where do we read eccentricity when on TG?
M	Discuss turning gear ops & ind?
S	Explain shrink & swell?
S	Describe indications of dropped Rod?
M	Discuss T.S. on Min. temp. for criticality?
M	Discuss MW, MVARS, PF?
S	Explain use of L/D pressure control valve?
S	Discuss BKR indications?
S	Discussed feed/condensate, HTR drain pump lineups?
S	TS on electrical busses?
S	Reason for L/D divert?