UNITED STATES NUCLEAR REGULATORY COMMISSION
BOILING WATER REACTOR GENERIC FUNDAMENTALS EXAMINATION
SEPTEMBER 2005--FORM A

Please Print

Name: _____

Facility: _____

Docket No.: _____

Start Time: _____ Stop Time: _____

INSTRUCTIONS TO APPLICANT

Answer all the test items using the answer sheet provided, ensuring a single answer is marked for each test item. Each test item has equal point value. A score of at least 80% is required to pass this portion of the NRC operator licensing written examination. All examination papers will be collected 3.0 hours after the examination starts. This examination applies to a typical boiling water reactor (BWR) nuclear power plant.

SECTION	QUESTIONS	% OF TOTAL	SCORE
COMPONENTS	1 - 22		
REACTOR THEORY	23 - 36		
THERMODYNAMICS	37 - 50		
TOTALS	50		

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

))))))))))))))))))))))))))))))))))))
Applicant's Signature

RULES AND GUIDELINES FOR THE NRC
GENERIC FUNDAMENTALS EXAMINATION

During the administration of this examination the following rules apply:

NOTE: The generic term "control rod" refers to the length of neutron absorber material that can be positioned by the operator to change core reactivity.

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

2. Fill in the name of your facility.

3. Fill in your individual docket number.

4. Fill in your start and stop times at the appropriate time.

5. Two aids are provided for your use during the examination:

   (1) An equations and conversions sheet contained within the examination copy, and

   (2) Steam tables and Mollier Diagram provided by your proctor.

6. Place your answers on the answer sheet provided. Credit will only be given for answers properly marked on this sheet. Follow the instructions for filling out the answer sheet.

7. Scrap paper will be provided for calculations.

8. Cheating on the examination will result in the automatic forfeiture of this examination. Cheating could also result in severe penalties.

9. Restroom trips are limited. Only **ONE** examinee may leave the room at a time. In order to avoid the appearance or possibility of cheating, avoid all contact with anyone outside of the examination room.

10. After you have completed the examination, sign the statement on the cover sheet indicating that the work is your own and you have neither given nor received any assistance in completing the examination.

11. Turn in your examination materials, answer sheet on top, followed by the examination booklet, then examination aids - steam table booklets, handouts, and scrap paper used during the examination.

12. After turning in your examination materials, leave the examination area, as defined by the proctor. If after leaving you are found in the examination area while the examination is in progress, your examination may be forfeited.

GENERIC FUNDAMENTALS EXAMINATION
EQUATIONS AND CONVERSIONS HANDOUT SHEET

EQUATIONS

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

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

$\dot{Q} = UA\Delta T$

$\dot{Q} \propto \dot{m}^3_{Nat\ Circ}$

$\Delta T \propto \dot{m}^2_{Nat\ Circ}$

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

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

$SUR = 26.06/\tau$

$$\tau = \frac{\bar{\beta} - \rho}{\lambda_{eff}\ \rho}$$

$$\rho = \frac{R^*}{\tau} + \frac{\bar{\beta}}{1 + \lambda_{eff}\tau}$$

$R^* = 1 \times 10^{-4}$ sec

$\lambda_{eff} = 0.1\ sec^{-1}$ (for small positive ρ)

$DRW \propto \varphi^2_{tip}/\varphi^2_{avg}$

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

$P = P_o e^{(t/\tau)}$

$A = A_o e^{-\lambda t}$

$CR_{S/D} = S/(1 - K_{eff})$

$CR_1(1 - K_{eff1}) = CR_2(1 - K_{eff2})$

$1/M = CR_1/CR_X$

$A = \pi r^2$

$F = PA$

$\dot{m} = \rho A \bar{v}$

$\dot{W}_{Pump} = \dot{m} \Delta P \upsilon$

$E = IR$

$P = IE$

Eff. = Net Work Out/Energy In

$$\frac{g(z_2 - z_1)}{g_c} + \frac{(\bar{v}_2^2 - \bar{v}_1^2)}{2g_c} + \upsilon(P_2 - P_1) + (u_2 - u_1) + (q - w) = 0$$

$g_c = 32.2$ lbm-ft/lbf-sec^2

CONVERSIONS

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1 Mw	= 3.41×10^6 Btu/hr	1 Curie	= 3.7×10^{10} dps
1 hp	= 2.54×10^3 Btu/hr	1 kg	= 2.21 lbm
1 Btu	= 778 ft-lbf	1 gal_{water}	= 8.35 lbm
EC	= (5/9)(EF - 32)	1 ft^3_{water}	= 7.48 gal
EF	= (9/5)(EC) + 32		

QUESTION: 1

Which one of the following statements describes the operation of reactor pressure vessel safety valves?

A. An open safety valve will close when reactor pressure decreases enough for gravity and spring tension to overcome the effect of reactor pressure on the main valve disk.

B. An open safety valve will close when the pilot valve senses a reduced reactor pressure and isolates reactor pressure to the main valve disk.

C. When reactor pressure reaches the lift set point, the safety valve begins to open and will modulate to a position that is directly proportional to reactor pressure.

D. When reactor pressure reaches the lift set point, a pilot valve closes to create a ΔP across the main valve disk which overcomes gravity and spring tension to open the valve.

QUESTION: 2

Which one of the following statements describes the flow rate characteristics of a typical globe valve in an operating water system?

A. The first 25% of valve disk travel in the open direction will produce a smaller change in flow rate than the last 25% of valve disk travel.

B. The first 25% of valve disk travel in the open direction will produce a greater change in flow rate than the last 25% of valve disk travel.

C. The first 25% of valve disk travel in the open direction will produce approximately the same change in flow rate as the last 25% of valve disk travel.

D. A globe valve that has been opened to 25% of valve disk travel will result in approximately 25% of full flow rate.

QUESTION: 3

In a comparison between ball valves and butterfly valves in the same liquid process system application, the valves that typically are more leak-tight when fully closed and under high differential pressure are _____ valves; and the valves that typically result in the higher system pressure drop when fully open are _____ valves.

A. ball; butterfly

B. ball; ball

C. butterfly; butterfly

D. butterfly; ball

QUESTION: 4

Refer to the drawing of a reactor vessel differential pressure (D/P) level detector (see figure below).

A nuclear power plant uses several differential pressure detectors like the one below to provide multiple channels of reactor vessel water level indication. A hot channel was calibrated when the reactor vessel was at normal operating temperature. A cold channel was calibrated when the reactor vessel was at 160EF.

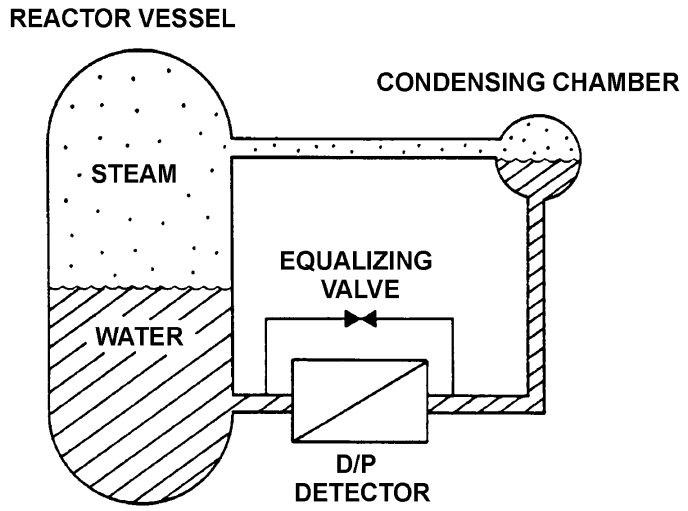
How do the two reactor vessel level indication channels compare when the reactor vessel is at normal operating temperature?

A. The cold channel will indicate higher than the hot channel due to the difference in water density in the reactor vessel at the two calibration temperatures.

B. The cold channel will indicate lower than the hot channel due to the difference in water density in the reactor vessel at the two calibration temperatures.

C. The cold channel will indicate higher than the hot channel due to the difference in water density in the reference legs at the two calibration temperatures.

D. The cold channel will indicate lower than the hot channel due to the difference in water density in the reference legs at the two calibration temperatures.



REACTOR VESSEL DIFFERENTIAL PRESSURE LEVEL DETECTOR

QUESTION: 5

What is the most common type of sensor used to provide remote position indication of a valve that is normally either fully open or fully closed?

A. Limit switch

B. Reed switch

C. Servo transmitter

D. Linear variable differential transformer

QUESTION: 6

A reactor scrammed due to a loss-of-coolant accident one hour ago. To verify adequate reactor vessel water level, the source range monitors (SRMs) were inserted. As the SRMs entered the core, source range count rate increased and then became relatively stable as the SRMs continued upward into the water-filled region of the core.

If the SRMs enter a voided section of the core, count rate will suddenly...

A. decrease due to decreased fast fission.

B. decrease due to increased neutron leakage.

C. increase due to increased neutron migration length.

D. increase due to decreased moderator neutron absorption.

QUESTION: 7

A nuclear power plant has been shutdown for one month. A portable gas-filled radiation detector is needed to monitor shutdown reactor core neutron level from a location outside the reactor vessel. The detector must be able to distinguish between ionizations caused by gamma and neutron radiation.

Which region(s) of the gas-filled detector characteristic curve is/are acceptable for operation of the detector?

A. Geiger-Mueller, Ionization, and Proportional regions are all acceptable.

B. Proportional region is acceptable, and Ionization region also may be usable.

C. Ionization region is acceptable, and Geiger-Mueller region also may be usable.

D. Geiger-Mueller region is acceptable, and Proportional region also may be usable.

QUESTION: 8

The water level in a tank is being controlled by an automatic level controller and is initially at the controller setpoint. A drain valve is then opened, causing tank level to decrease. The decreasing level causes the controller to begin to open a makeup water supply valve. After a few minutes, a new steady-state tank level below the original level is established, with the supply rate equal to the drain rate.

The controller in this system uses _____ control.

A. proportional integral, and derivative

B. proportional and integral

C. proportional only

D. bistable

QUESTION: 9

Refer to the drawing of four bistable symbols (see figure below).

A temperature controller uses a bistable that turns on to actuate a warning light when the controlled temperature reaches a high setpoint. The bistable turns off to extinguish the warning light when the temperature decreases to 5EF below the high setpoint.

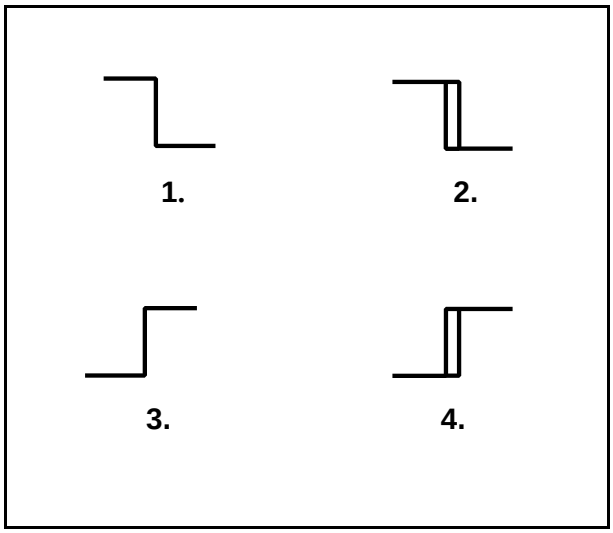
Which one of the following bistable symbols indicates the characteristics of the bistable?

A. 1.

B. 2.

C. 3.

D 4.



QUESTION: 10

If a centrifugal pump is started with the discharge valve fully open, versus throttled, the possibility of pump runout will _____ and the possibility of pump cavitation will _____.

A. increase; decrease

B. increase; increase

C. decrease; decrease

D. decrease; increase

QUESTION: 11

Gas binding in a centrifugal pump can be prevented by _____ prior to pump start.

A. venting the pump

B. lowering suction pressure

C. throttling the discharge valve

D. shutting the discharge valve

QUESTION: 12

A centrifugal pump is needed to take suction on a hot water storage tank and deliver high pressure hot water to a water spray system. To minimize axial thrust on the pump shaft, the pump should have _____ stage(s); and to maximize the available NPSH at the impeller inlet, the pump should be _____ suction.

A. a single; single

B. a single; double

C. multiple opposed; single

D. multiple opposed; double

QUESTION: 13

Which one of the following is at a relatively high value when a centrifugal pump is operating at shutoff head?

A. Pump motor current

B. Pump volumetric flow rate

C. Available net positive suction head

D. Required net positive suction head

QUESTION: 14

A cooling water pump is being driven by an ac induction motor. Which one of the following describes how and why pump motor current will change if the pump shaft shears?

A. Decreases due to decreased pump work

B. Decreases due to decreased counter electromotive force

C. Increases due to increased pump work

D. Increases due to decreased counter electromotive force

QUESTION: 15

Refer to the pump performance curves for a centrifugal cooling water pump (see figure below). The pump is being driven by a single-speed ac induction motor. Pump flow rate is being controlled by a throttled discharge flow control valve.

The following initial pump conditions exist:

Pump motor current:	50 amps
Pump flow rate:	400 gpm
Pump suction temperature:	70EF

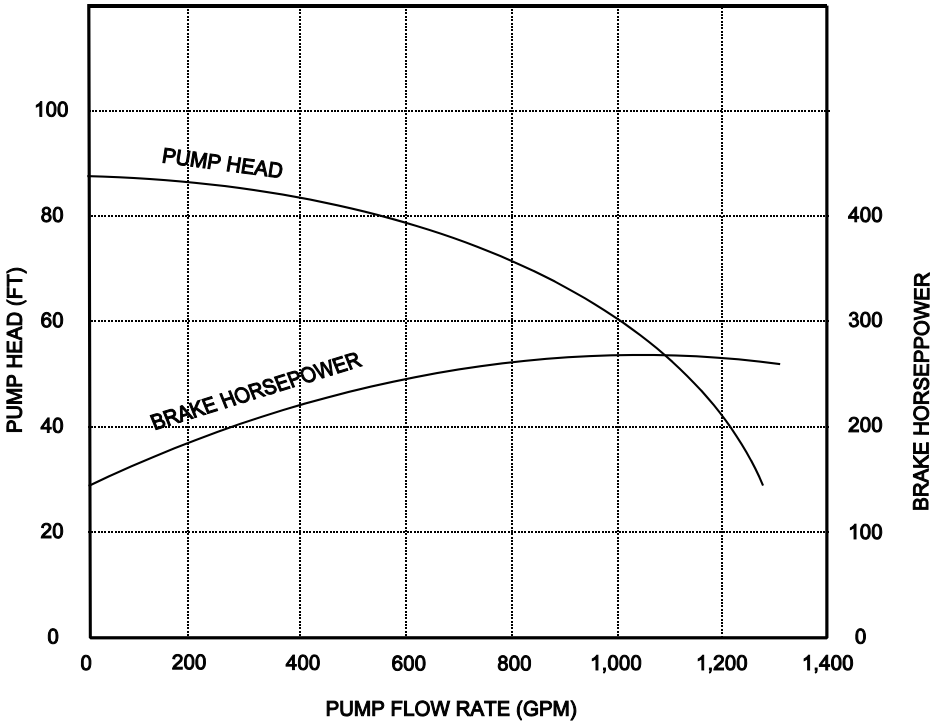
If the flow control valve is repositioned such that pump flow rate is now 800 gpm, what will be the approximate new pump motor current?

A. Less than 100 amps

B. 200 amps

C. 400 amps

D. More than 500 amps



QUESTION: 16

Refer to the drawing of an operating water cleanup system (see figure below).

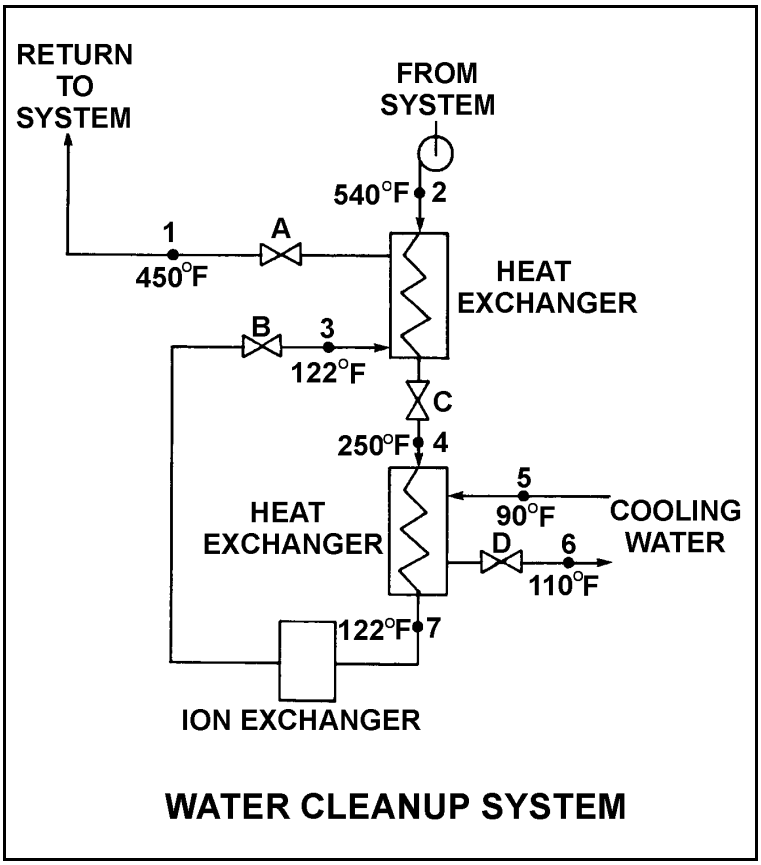
Valves A, B, and C are fully open. Valve D is 80% open. All temperatures are as shown. If valve D is then throttled to 50%, the temperature at point...

A. 6 will decrease.

B. 5 will increase.

C. 4 will increase.

D. 3 will decrease.



QUESTION: 17

Which one of the following describes the state of water at 160 psig and 372EF?

A. Saturated liquid

B. Subcooled liquid

C. Superheated vapor

D. Mixture of saturated liquid and vapor

QUESTION: 18

A main turbine-generator is operating at 80% load with the following initial steady-state temperatures for the main turbine lube oil heat exchanger:

$T_{oil\ in}$ = 174EF
$T_{oil\ out}$ = 114EF
$T_{water\ in}$ = 85EF
$T_{water\ out}$ = 115EF

After six months of main turbine-generator operation, the following final steady-state lube oil heat exchanger temperatures are observed:

$T_{oil\ in}$ = 179EF
$T_{oil\ out}$ = 119EF
$T_{water\ in}$ = 85EF
$T_{water\ out}$ = 115EF

Assume that the final cooling water and lube oil flow rates are the same as the initial flow rates, and that the specific heat values for the cooling water and lube oil do not change.

Which one of the following could be responsible for the differences between the initial and final heat exchanger steady-state temperatures?

A. The heat exchanger tubes have become fouled with scale.

B. The temperature of the cooling water source has increased.

C. The final main turbine-generator load is higher than the initial load.

D. The final main turbine-generator load is lower than the initial load.

QUESTION: 19

Which one of the following conditions will lead to channeling in an operating demineralizer?

A. Exhaustion of the resin bed due to high conductivity of the demineralizer influent.

B. Suspended solids and insoluble particles forming a mat on the surface of the resin bed.

C. A sudden 10EF decrease in the temperature of the influent to the demineralizer .

D. Operation of the demineralizer with influent flow rate at 10% below design flow rate.

QUESTION: 20

A condensate demineralizer differential pressure (D/P) gauge indicates 4.0 psid at 50% flow rate. Over the next two days plant power changes have caused condensate flow rate to vary between 25% and 100%.

Which one of the following combinations of condensate flow and demineralizer D/P, observed during the power changes, indicates an increased accumulation of corrosion products in the demineralizer?

	CONDENSATE FLOW	DEMINERALIZER D/P (PSID)
A.	100%	15.0
B.	75%	9.0
C.	40%	3.0
D.	25%	1.0

QUESTION: 21

Refer to the drawing of a valve motor control circuit (see figure below) for a valve that is currently fully closed and has a 10-second stroke time. (Note: Limit switch (LS) contacts are shown open regardless of valve position, but relay contacts follow the standard convention for control circuit drawings.)

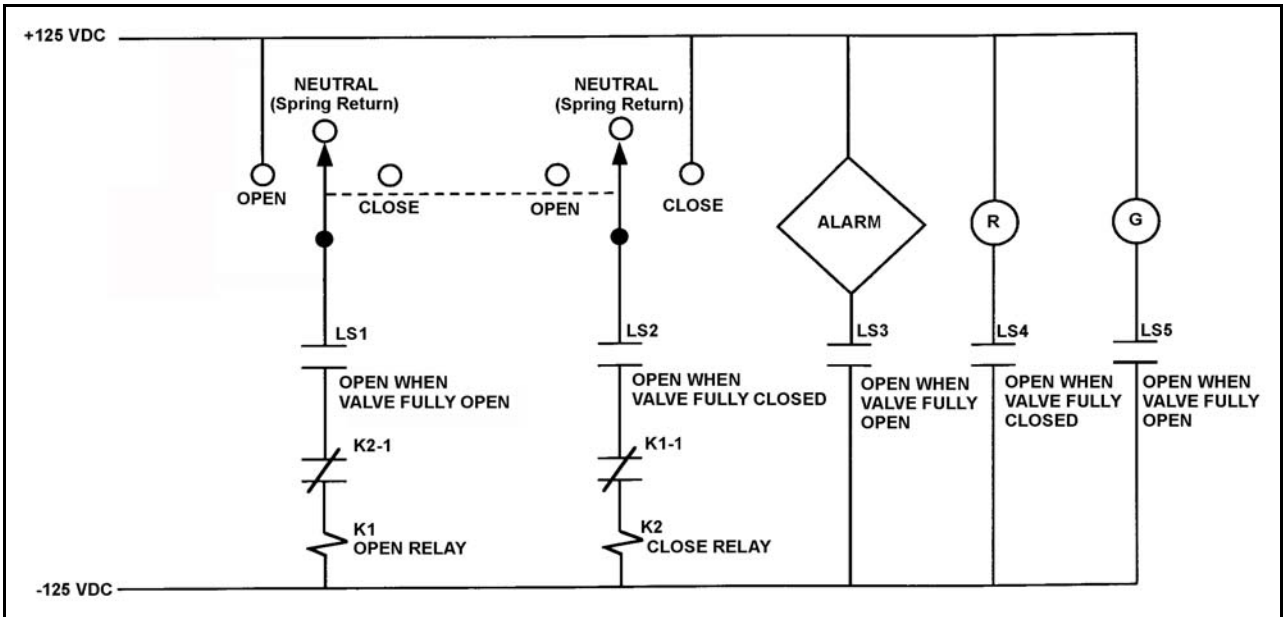
Which one of the following describes the valve response if the control switch is taken to the "Open" position for two seconds and then released?

A. The valve will not move.

B. The valve will open fully.

C. The valve will begin to open and then stop moving.

D. The valve will begin to open and then close fully.



VALVE MOTOR CONTROL CIRCUIT

QUESTION: 22

A 480 Vac motor is supplied power via an electrical disconnect in series with a circuit breaker. Which one of the following describes the proper operation to isolate power to the load?

A. Open disconnect first, then breaker

B. Open breaker first, then disconnect

C. Open the breaker and disconnect at the same time

D. Sequence is not important as long as motor is operating

QUESTION: 23

Neutron moderation describes...

A. a decrease in the core neutron population from thermal neutron absorption.

B. an increase in the neutron multiplication factor due to a reduction in neutron poisons.

C. the loss of fission neutrons from the core by leakage.

D. the reduction of neutron energy due to scattering reactions.

QUESTION: 24

Which one of the following defines K-excess?

A. $K_{eff} + 1$

B. $K_{eff} - 1$

C. $(K_{eff}-1)/K_{eff}$

D. $(1-K_{eff})/K_{eff}$

QUESTION: 25

A nuclear power plant is being cooled down from 500EF to 190EF. Just prior to commencing the cooldown, the readings for all source range nuclear instruments were stable at 32 counts per second (cps). After two hours, with reactor coolant temperature at 350EF, the source range count rate is stable at 64 cps.

Assume that the moderator temperature coefficient remains constant throughout the cooldown, reactor power remains below the point of adding heat, and <u>no</u> reactor protection actions occur.

Without additional operator action, what will be the status of the reactor when reactor coolant temperature reaches 190EF?

A. Subcritical, with source range count rate below 150 cps

B. Subcritical, with source range count rate above 150 cps

C. Exactly critical

D. Supercritical

QUESTION: 26

Which one of the following describes the net reactivity effect of a moderator temperature decrease in an overmoderated reactor core?

A. Positive reactivity will be added because fewer neutrons will be captured by the moderator.

B. Positive reactivity will be added because fewer neutrons will be absorbed at resonance energies while slowing down.

C. Negative reactivity will be added because more neutrons will be captured by the moderator.

D. Negative reactivity will be added because more neutrons will be absorbed at resonance energies while slowing down.

QUESTION: 27

As fuel temperature increases, the effective resonance absorption peaks exhibited by U-238 will _____ in height and will _____ in width.

A. decrease; increase

B. decrease; decrease

C. increase; increase

D. increase; decrease

QUESTION: 28

A notch movement of a control rod represents a rod travel of _____ inches.

A. 2

B. 3

C. 6

D. 12

QUESTION: 29

Rod density is a measure of the...

A. percentage of control rods inserted into the core.

B. percentage of control rods withdrawn from the core.

C. number of control rods fully inserted divided by the number of control rods fully withdrawn.

D. number of control rods fully withdrawn divided by the number of control rods fully inserted.

QUESTION: 30

A nuclear reactor has been operating at 100% power for two weeks when power is decreased to 10% in 1 hour. Immediately following the power decrease, core xenon-135 concentration will _____ for a period of _____.

A. decrease; 4 to 6 hours

B. increase; 4 to 6 hours

C. decrease; 8 to 11 hours

D. increase; 8 to 11 hours

QUESTION: 31

A nuclear reactor that had been operating at 100% power for about two months was shutdown over a 2-hour period. Following the shutdown, core xenon-135 will reach a long-term steady-state concentration in _____ hours.

A. 8 to 10

B. 20 to 25

C. 40 to 50

D. 70 to 80

QUESTION: 32

Why are burnable poisons installed in a nuclear reactor core?

A. To shield reactor fuel from thermal neutron flux until later in core life

B. To compensate for control rod burnout that occurs over core life

C. To flatten the radial thermal neutron flux distribution at the end of core life

D. To ensure a negative moderator temperature coefficient early in core life

QUESTION: 33

A nuclear reactor is critical in the source range during a reactor startup with a core average delayed neutron fraction of 0.007. The operator then adds positive reactivity to establish a stable 60-second reactor period.

If the core average delayed neutron fraction had been 0.005, what would be the approximate stable reactor period after the addition of the same amount of positive reactivity?

A. 28 seconds

B. 32 seconds

C. 36 seconds

D. 40 seconds

QUESTION: 34

A nuclear reactor startup is in progress and criticality has just been achieved. After recording critical rod height, the operator withdraws control rods for 20 seconds to establish a stable positive 30-second reactor period. One minute later (prior to the point of adding heat) the operator inserts the same control rods for 25 seconds. (Assume the control rod withdrawal and insertion rates are the same.)

During the rod insertion, the reactor period will become...

A. negative during the entire period of control rod insertion.

B. negative shortly after the control rods pass through the critical rod height.

C. negative just as the control rods pass through the critical rod height.

D. negative shortly before the control rods pass through the critical rod height.

QUESTION: 35

A nuclear power plant is initially operating steady-state at 50% power when a steam line break occurs that releases a constant 5% of rated steam flow. Assume no operator or protective actions occur, automatic pressure control returns reactor pressure to its value prior to the break, and feedwater injection temperature remains the same.

How will reactor power respond to the steam line break?

A. Decrease and stabilize at a lower power level.

B. Increase and stabilize at a higher power level.

C. Decrease at first, then increase and stabilize near the initial power level.

D. Increase at first, then decrease and stabilize near the initial power level.

QUESTION: 36

A nuclear power plant is operating at 100% power when one recirculation pump trips. Reactor power decreases and stabilizes at a lower power level. Which one of the following reactivity coefficients caused the initial decrease in reactor power?

A. Void coefficient

B. Pressure coefficient

C. Moderator temperature coefficient

D. Fuel temperature (Doppler) coefficient

QUESTION: 37

A water storage tank is vented to atmosphere. The tank is located at sea level and contains 100,000 gallons of water at 80EF. A pressure gauge at the bottom of the tank reads 9.0 psig. What is the approximate water level in the tank?

A. 13 feet

B. 17 feet

C. 21 feet

D. 25 feet

QUESTION: 38

What is the approximate quality of wet steam leaving a nuclear reactor at 530 psig with an enthalpy of 928.9 Btu/lbm?

A. 25%

B. 37%

C. 63%

D. 75%

QUESTION: 39

Refer to the drawing of a steam-jet air ejector (see figure below) in normal operation with steam reaching supersonic velocities.

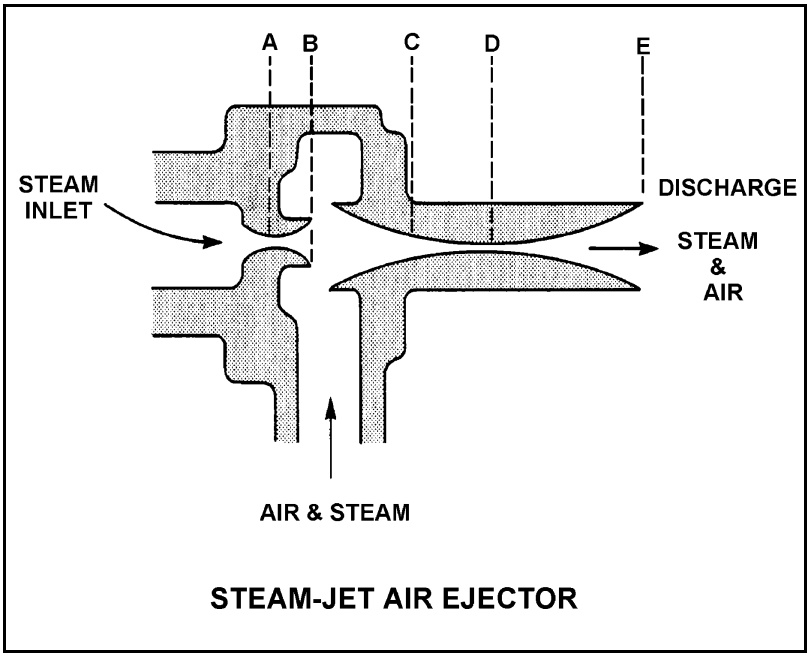
Steam flowing from D to E undergoes a pressure _____ and a velocity _____.

A. decrease; decrease

B. decrease; increase

C. increase; increase

D. increase; decrease



QUESTION: 40

A steam plant main turbine consists of a high-pressure (HP) unit and several low-pressure (LP) units. The main turbine is most likely to experience stress-related failures of the rotor blades in the _____ stages of the _____ unit(s).

A. inlet; HP

B. inlet; LP

C. outlet; HP

D. outlet; LP

QUESTION: 41

Refer to the drawing of two lengths of 6-inch piping, each containing an identical automatic isolation valve. The actual pipe lengths are proportional to their symbols in the drawing

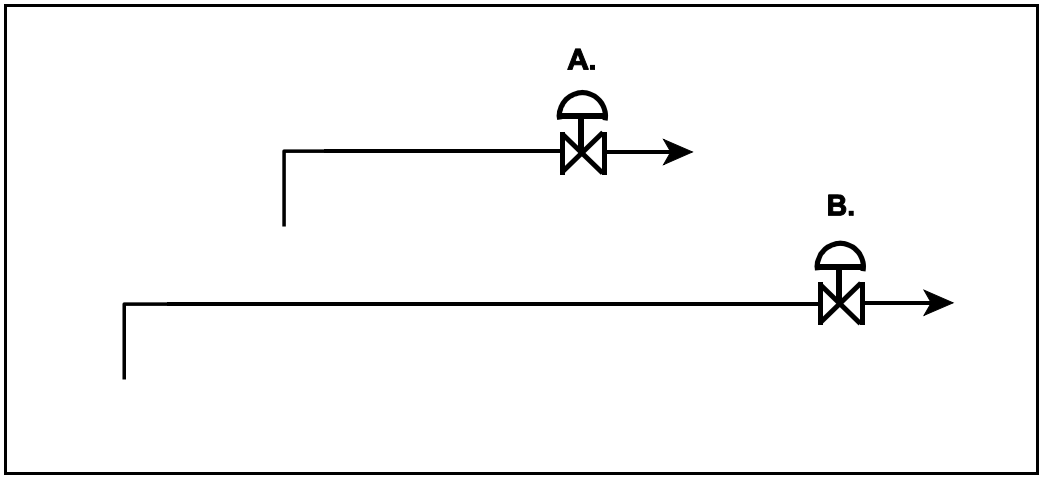
Water at 65EF is flowing at 1,000 gpm through each pipe. If the isolation valves suddenly and simultaneously close, valve A and its associated piping will experience a maximum pressure that is _____ the maximum pressure experienced by valve B and its associated piping. The pressure spike will dissipate quicker in the _____ length of pipe.

A. equal to; shorter

B. equal to; longer

C. less than; shorter

D less than; longer



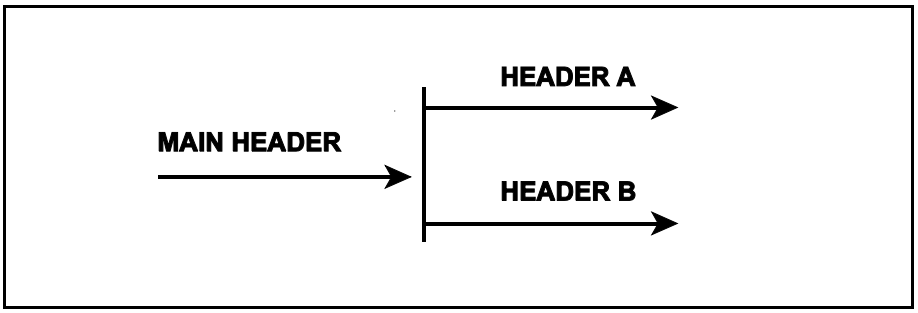
QUESTION: 42

Refer to the drawing of a main water header that splits into two parallel headers (see figure below).

Header A has a 2-inch diameter and header B has a 3-inch diameter. The velocity of the water in both headers is the same.

If the main water header has a flow rate of 500 gpm, what is the approximate flow rate in each of the parallel headers?

	HEADER A (gpm)	HEADER B (gpm)
A.	125	375
B.	154	346
C.	200	300
D.	222	278



QUESTION: 43

The power range nuclear instruments have been adjusted to 100% based on a calculated heat balance. Which one of the following will result in indicated reactor power being greater than actual reactor power?

A. The feedwater temperature used in the heat balance calculation was higher than actual feedwater temperature.

B. The reactor recirculation pump heat input term was omitted from the heat balance calculation.

C. The feedwater flow rate used in the heat balance calculation was lower than actual feedwater flow rate.

D. The steam pressure used in the heat balance calculation was higher than actual steam pressure.

QUESTION: 44

Refer to the drawing of a hypothetical fuel coolant channel (see figure below).

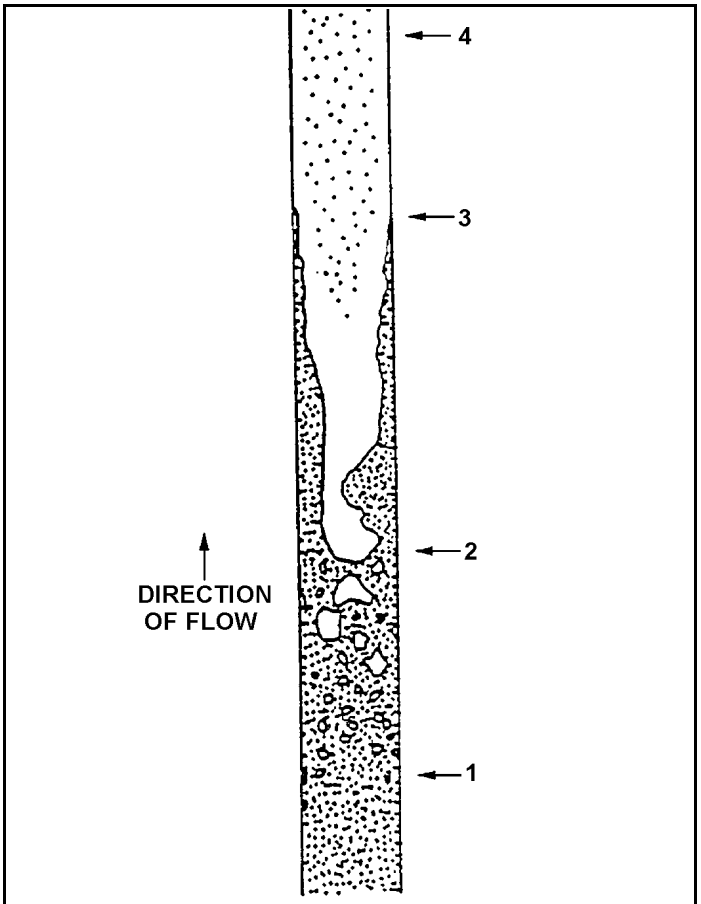
For the hypothetical fuel coolant channel shown below, at what point along its length does transition boiling begin?

A. 1

B. 2

C. 3

D. 4



HYPOTHETICAL FUEL COOLANT CHANNEL

QUESTION: 45

Given the following conditions:

10 lbm mixture of vapor and liquid
Steam quality = 20%
Pressure = 1,000 psia

Which one of the following is the approximate void fraction?

A. 42%

B. 48%

C. 84%

D. 96%

QUESTION: 46

After operating at high power for several weeks, a nuclear reactor was shut down yesterday and cooled down to repair a steam line leak. Shutdown cooling water pumps are being used to maintain reactor temperature and pressure. The pumps will be stopped in 30 minutes to commence a 4-hour test.

What action, if any, should be taken to enhance natural circulation cooling during the test, and why?

A. No action necessary; the increase of density in the downcomer and the reduction of density in the core region will easily support circulation.

B. No action necessary; the density of the mixture in the core region increases, thereby allowing liquid in the downcomer to enter the core.

C. Raise vessel pressure to allow vessel relief valves to lift and create a heat sink for decay heat while control rod drive flow maintains inventory.

D. Raise vessel water level above the bottom of the steam separators to provide a liquid flow path from the inside to the outside of the core shroud.

QUESTION: 47

If a nuclear reactor is operating with the minimum critical power ratio (MCPR) at its transient limit (or safety limit), which one of the following is indicated?

A. None of the fuel rods are experiencing critical heat flux.

B. A small fraction of the fuel rods may be experiencing critical heat flux.

C. All radioactive fission products are being contained within the reactor fuel.

D. All radioactive fission products are being contained within either the reactor fuel or the reactor vessel.

QUESTION: 48

Which one of the following is most likely to result in fuel failure due to pellet-clad interaction?

A. Increasing reactor power from 20% to 50% near the beginning of a fuel cycle.

B. Increasing reactor power from 20% to 50% near the end of a fuel cycle.

C. Increasing reactor power from 70% to 100% near the beginning of a fuel cycle.

D. Increasing reactor power from 70% to 100% near the end of a fuel cycle.

QUESTION: 49

A nuclear power plant is operating at 60% reactor power. Which one of the following will result in the lowest critical power ratio? (Assume core neutron flux distribution does not change.)

A. 25% power increase using only control rods.

B. 25% power decrease using only control rods.

C. 25% power increase using only recirculation flow.

D. 25% power decrease using only recirculation flow.

QUESTION: 50

Which one of the following comparisons will result in a higher probability of brittle fracture of the reactor vessel?

A. A high reactor gamma flux rather than a high neutron flux.

B. A high reactor vessel material strength rather than a high material ductility.

C. A high reactor coolant oxygen content rather than a low oxygen content.

D. A rapid 100EF reactor cooldown at a high temperature rather than a low temperature.

***** FINAL ANSWER KEY *****

SEPTEMBER 2005 NRC GENERIC FUNDAMENTALS EXAMINATION
BOILING WATER REACTOR - ANSWER KEY

FORM A	FORM B	ANS.	FORM A	FORM B	ANS.
1	15	A	26	40	C
2	16	B	27	41	A
3	17	A	28	42	C
4	18	B	29	43	A
5	19	A	30	44	D
6	20	B	31	45	D
7	21	B	32	46	A
8	22	C	33	47	D
9	23	D	34	48	D
10	24	B	35	49	C
11	25	A	36	50	A
12	26	D	37	1	C
13	27	C	38	2	C
14	28	A	39	3	D
15	29	A	40	4	D
16	30	C	41	5	A
17	31	C	42	6	B
18	32	A	43	7	B
19	33	B	44	8	C
20	34	C	45	9	C
21	35	C	46	10	D
22	36	B	47	11	B
23	37	D	48	12	D
24	38	B	49	13	A
25	39	D	50	14	B