TOPIC: 292004
KNOWLEDGE: K1.01 [3.2/3.2]
QID: B252

The moderator temperature coefficient describes a change in __________ resulting from a change in __________.

A. reactivity; moderator temperature

B. K_{eff}; moderator temperature

C. moderator temperature; reactivity

D. moderator temperature; K_{eff}

ANSWER: A.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B651

A reactor is currently near the end of its fuel cycle and will be refueled next month. In comparison to the current moderator temperature coefficient (MTC), the MTC after refueling will be...

A. less negative at all coolant temperatures.

B. more negative at all coolant temperatures.

C. less negative below approximately 350°F coolant temperature and more negative above approximately 350°F coolant temperature.

D. more negative below approximately 350°F coolant temperature and less negative above approximately 350°F coolant temperature.

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B752

A reactor is operating at 100 percent power immediately following a refueling outage. In comparison to the moderator temperature coefficient (MTC) at 100 percent power just prior to the refueling outage, the current MTC is...

A. more negative below approximately 350°F coolant temperature and less negative above approximately 350°F coolant temperature.

B. less negative below approximately 350°F coolant temperature and more negative above approximately 350°F coolant temperature.

C. more negative at all coolant temperatures.

D. less negative at all coolant temperatures.

ANSWER: C.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B852

Which one of the following conditions will cause the moderator temperature coefficient (MTC) to become more negative? (Consider only the direct effect of the indicated change on MTC.)

A. Control rods are inserted from 50 percent rod density to 75 percent rod density.

B. Fuel temperature decreases from 1,500°F to 1,200°F.

C. Recirculation flow increases by 10 percent.

D. Moderator temperature decreases from 500°F to 450°F.

ANSWER: A.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B1152

Which one of the following describes the change in the moderator temperature coefficient (MTC) of reactivity over core life? (Assume 100 percent power for all cases.)

A. Control rod withdrawal results in increased thermal neutron utilization, which results in a less negative MTC at end of fuel cycle (EOC).

B. Fission product poison buildup results in decreased thermal neutron utilization, which results in a more negative MTC at EOC.

C. Burnup of U-235 results in decreased thermal neutron utilization, which results in a more negative MTC at EOC.

D. Decreased voiding in the core results in increased thermal neutron utilization, which results in a less negative MTC at EOC.

ANSWER: A.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B1253

The moderator temperature coefficient of reactivity generally becomes ___________ negative over core life because the utilization of thermal neutrons ___________.

A. more; decreases

B. less; decreases

C. more; increases

D. less; increases

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B1752

Which one of the following describes the overall reactivity effect of a decrease in moderator temperature in an undermoderated reactor?

A. Negative reactivity will be added partially because more neutron leakage will occur.

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

C. Positive reactivity will be added partially because less neutron leakage will occur.

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

ANSWER: C.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B2052

A reactor is shut down with the reactor vessel head removed for refueling. The core is covered by 23 feet of refueling water with a temperature of 100°F.

Which one of the following could increase <u>or</u> decrease K_{eff} depending on core burnup?

A. A spent fuel assembly is removed from the core.

B. Refueling water temperature is decreased to 95°F.

C. A fresh neutron source is installed in the core.

D. Movable incore source range instrumentation is repositioned to increase source range count rate.

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B2252

Under which one of the following conditions is a reactor most likely to have a positive moderator temperature coefficient?

A. Low coolant temperature at the beginning of a fuel cycle.

B. Low coolant temperature at the end of a fuel cycle.

C. High coolant temperature at the beginning of a fuel cycle.

D. High coolant temperature at the end of a fuel cycle.

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B2452 (P951)

During a reactor vessel cooldown, positive reactivity is added to the core if the moderator temperature coefficient is negative. This is partially due to...

A. a decreasing thermal utilization factor.

B. an increasing thermal utilization factor.

C. a decreasing resonance escape probability.

D. an increasing resonance escape probability.

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B2652 (P2650)

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

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

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 while slowing down.

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

ANSWER: C.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B2853

Which one of the following describes the change in the moderator temperature coefficient (MTC) of reactivity over core life while operating at a constant 100 percent power level?

A. MTC becomes less negative because as U-238 depletes, a 1°F increase in moderator temperature results in fewer neutrons escaping resonance capture.

B. MTC becomes less negative because as control rods are withdrawn from the core, the increase in the number of neutrons leaking from the core for a 1°F increase in moderator temperature decreases.

C. MTC becomes more negative because as U-235 depletes, a 1°F increase in moderator temperature permits more neutrons to leak out of the core.

D. MTC becomes more negative because as fission product poisons build up, the increase in the number of neutrons being absorbed by fission product poisons for a 1°F increase in moderator temperature increases.

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B2952

Which one of the following describes the initial reactivity effect of a moderator temperature increase in an overmoderated reactor?

A. Negative reactivity will be added because more neutron leakage will occur.

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

C. Positive reactivity will be added because less neutron leakage will occur.

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

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B3152

How does control rod withdrawal affect the moderator temperature coefficient in an undermoderated reactor?

A. The initially negative MTC becomes more negative.

B. The initially negative MTC becomes less negative.

C. The initially positive MTC becomes more positive.

D. The initially positive MTC becomes less positive.

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B3652 (P3650)

Which one of the following describes the initial reactivity effect of a moderator temperature increase in an undermoderated reactor?

A. Negative reactivity will be added because more neutrons will be absorbed by U-238 at resonance energies while slowing down.

B. Negative reactivity will be added because more neutrons will be captured by the moderator while slowing down.

C. Positive reactivity will be added because fewer neutrons will be absorbed by U-238 at resonance energies while slowing down.

D. Positive reactivity will be added because fewer neutrons will be captured by the moderator while slowing down.

ANSWER: A.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B4226

A reactor is shut down with the reactor vessel head removed. The core is covered by 23 feet of refueling water at a temperature of 100°F.

Which one of the following will increase K_{eff} if the reactor is at the end of core life, but will decrease K_{eff} if the reactor is at the beginning of core life?

A. A fresh neutron source is installed in the core.

B. Refueling water temperature is increased to 105°F.

C. A spent fuel assembly is replaced with a new fuel assembly.

D. Movable incore source range instrumentation is repositioned to increase source range count rate.

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B6526

Consider a one month period of 100 percent power operation near the beginning of a fuel cycle.

During this period of operation, the depletion of U-235 in the fuel tends to make the moderator temperature coefficient __________ negative; and the incremental withdrawal of control rods tends to make the moderator temperature coefficient __________ negative.

A. less; less

B. less; more

C. more; less

D. more; more

ANSWER: A.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B6926 (P6926)

Which one of the following 10 percent reactor power level changes produces the largest amount of negative reactivity from the fuel temperature coefficient? (Assume that each power level change produces the same increase/decrease in fuel temperature.)

A. 30 percent to 40 percent

B. 30 percent to 20 percent

C. 80 percent to 90 percent

D. 80 percent to 70 percent

ANSWER: A.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B7608

A reactor is shut down near the end of a fuel cycle with the shutdown cooling system in service. The initial reactor vessel water temperature is 100°F. In this condition, the reactor is overmoderated.

Then, a heatup and pressurization is performed to bring the reactor to normal operating temperature and pressure. The reactor remains subcritical.

During the heatup, K_{eff} will…

A. increase continuously.

B. decrease continuously.

C. initially increase, and then decrease.

D. initially decrease, and then increase.

ANSWER: C.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B7637 (P7637)

Which one of the following describes a situation where an increase in moderator temperature can add positive reactivity?

A. At low moderator temperatures, an increase in moderator temperature can reduce neutron leakage from the core sufficiently to add positive reactivity.

B. At low moderator temperatures, an increase in moderator temperature can reduce neutron capture by the moderator sufficiently to add positive reactivity.

C. At high moderator temperatures, an increase in moderator temperature can reduce neutron leakage from the core sufficiently to add positive reactivity.

D. At high moderator temperatures, an increase in moderator temperature can reduce neutron capture by the moderator sufficiently to add positive reactivity.

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.02 [2.5/2.6]
QID: B7667

A reactor is shut down near the middle of a fuel cycle with the shutdown cooling system in service. The initial reactor vessel water temperature is 160ºF. In this condition, the reactor is undermoderated.

Then, a heatup and pressurization is performed to bring the reactor to normal operating temperature and pressure. The reactor remains subcritical.

During the heatup, Keff will…

A. increase continuously.

B. decrease continuously.

C. initially increase, and then decrease.

D. initially decrease, and then increase.

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.03 [2.6/2.7]
QID: B753 (P1950)

Factors that affect the probability of resonance absorption of a neutron by a nucleus include...

A. excitation energy of the neutron, kinetic energy of the nucleus, and kinetic energy of the neutron.

B. kinetic energy of the neutron, excitation energy of the nucleus, and excitation energy of the neutron.

C. excitation energy of the nucleus, excitation energy of the neutron, and kinetic energy of the nucleus.

D. kinetic energy of the nucleus, kinetic energy of the neutron, and excitation energy of the nucleus.

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.03 [2.6/2.7]
QID: B1052

As fuel temperature increases, the 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

ANSWER: A.

TOPIC: 292004
KNOWLEDGE: K1.03 [2.6/2.7]
QID: B3153 (P3150)

Which one of the following has the smallest microscopic cross section for absorption of a thermal neutron in an operating reactor?

A. Uranium-235

B. Uranium-238

C. Samarium-149

D. Xenon-135

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B652 (P1650)

Which one of the following contains the pair of nuclides that are the most significant contributors to the total resonance capture in the core near the end of a fuel cycle?

A. U-238 and Pu-239

B. U-238 and Pu-240

C. Pu-239 and U-235

D. Pu-239 and Pu-240

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B1553

A nuclear power plant is operating at steady-state 70 percent power. Which one of the following will result in a less negative fuel temperature coefficient? (Consider only the direct effect of the change in each listed parameter.)

A. Increase in Pu-240 inventory in the core.

B. Increase in moderator temperature.

C. Increase in fuel temperature.

D. Increase in void fraction.

ANSWER: C.

TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B1852

Which one of the following is a characteristic of Doppler broadening?

A. As reactor coolant temperature increases, less moderator molecules will be present in the core to thermalize neutrons.

B. As reactor fuel temperature increases, neutrons from a wider energy spectrum will be captured in the fuel.

C. As moderator void percentage increases, neutrons will travel farther in the core before being absorbed or scattered.

D. As control rods are withdrawn, additional reactor fuel will be exposed and result in a power increase.

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B1952 (P650)

Which one of the following isotopes is the <u>most</u> significant contributor to the resonance capture of fission neutrons in a reactor at the beginning of a fuel cycle?

A. U-238

B. U-233

C. Pu-240

D. Pu-239

ANSWER: A.

TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B3352 (P2050)

Which one of the following isotopes is the most significant contributor to the resonance capture of fission neutrons in a reactor at the end of a fuel cycle?

A. U-235

B. U-238

C. Pu-239

D. Pu-240

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B3753 (P3750)

Refer to the drawing of a curve showing the neutron absorption characteristics of a typical U-238 nucleus at a resonance neutron energy (see figure below). The associated reactor is currently operating at steady-state 80 percent power.

During a subsequent reactor power decrease to 70 percent, the curve will become __________; and the percentage of the core neutron population lost to resonance capture by U-238 will __________.

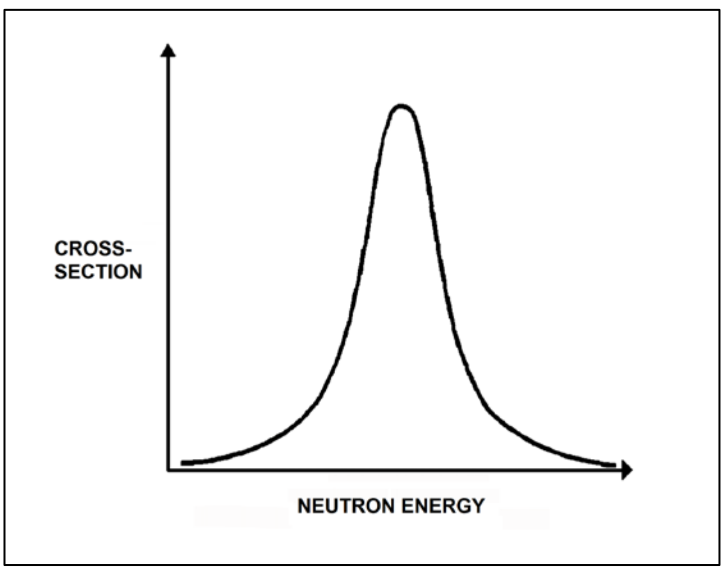
A. shorter and broader; increase

B. shorter and broader; decrease

C. taller and more narrow; increase

D. taller and more narrow; decrease

ANSWER: D.



TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B3852 (P3850)

Refer to the curve of microscopic cross section for absorption versus neutron energy for a resonance peak in U-238 in a reactor operating at 80 percent power (see figure below).

If reactor power is decreased to 60 percent, the height of the curve will __________; and the area under the curve will __________.

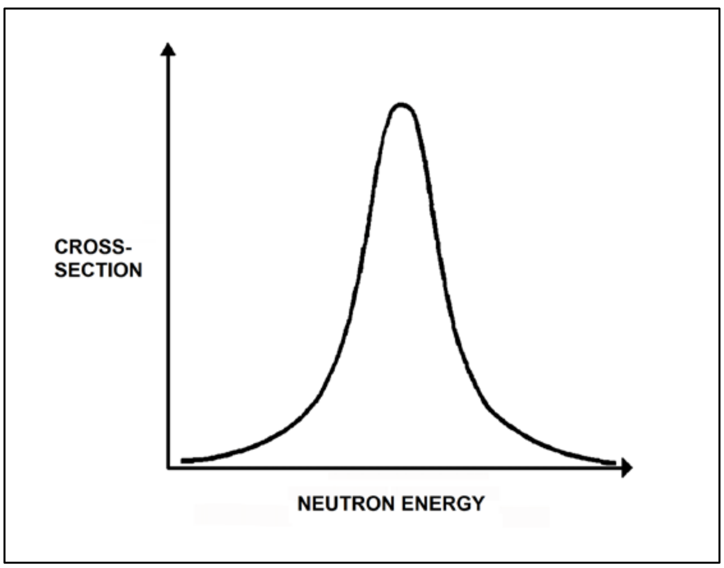
A. increase; increase

B. increase; remain the same

C. decrease; decrease

D. decrease; remain the same

ANSWER: B.



TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B4826 (P4826)

If the average temperature of a fuel pellet decreases by 50°F, the microscopic cross-section for absorption of neutrons at a resonance energy of U-238 will __________; and the microscopic cross-sections for absorption of neutrons at energies that are slightly higher or lower than a U-238 resonance energy will __________.

A. increase; increase

B. increase; decrease

C. decrease; increase

D. decrease; decrease

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B6627 (P6626)

If the average temperature of a fuel pellet increases by 50°F, the microscopic cross-section for absorption of neutrons at a resonance energy of U-238 will __________; and the microscopic cross-sections for absorption of neutrons at energies that are slightly higher or lower than a U-238 resonance energy will __________.

A. increase; increase

B. increase; decrease

C. decrease; increase

D. decrease; decrease

ANSWER: C.

TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B7648 (P7648)

Refer to the drawing of a curve showing the neutron absorption cross-section for U-238 at a resonance energy (see figure below). The reactor associated with the curve is operating at 80 percent power.

If reactor power is increased to 90 percent over the next few hours, the curve will become ________; and the percentage of the core neutron population lost to resonance capture by U-238 will ________.

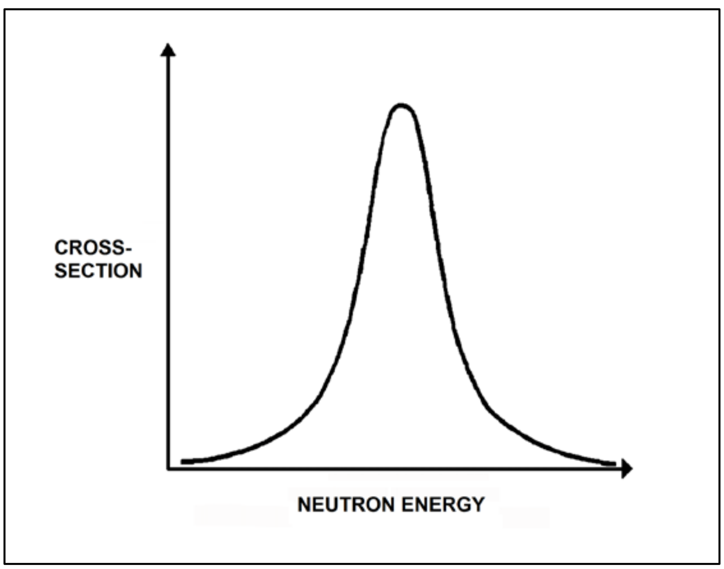
A. shorter and broader; increase

B. shorter and broader; decrease

C. taller and more narrow; increase

D. taller and more narrow; decrease

ANSWER: A.



TOPIC: 292004
KNOWLEDGE: K1.04 [2.6/2.7]
QID: B7678 (P7678)

A reactor has an initial effective fuel temperature of 800EF. If the effective fuel temperature increases to 1,000EF, the fuel temperature coefficient will become __________ negative; because at higher effective fuel temperatures, a 1EF increase in effective fuel temperature produces a __________ change in Doppler broadening.

A. less; greater

B. less; smaller

C. more; greater

D. more; smaller

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.05 [2.9/2.9]
QID: B452 (P2251)

Which one of the following pairs of isotopes is responsible for the negative reactivity associated with a fuel temperature increase near the end of core life?

A. U-235 and Pu-239

B. U-235 and Pu-240

C. U-238 and Pu-239

D. U-238 and Pu-240

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.05 [2.9/2.9]
QID: B552

Which one of the following describes how the magnitude of the fuel temperature coefficient of reactivity is affected over core life?

A. It becomes more negative, due to the buildup of Pu-240.

B. It becomes less negative, due to the buildup of fission products.

C. It becomes more negative initially due to gadolinium burnup, then less negative due to fuel depletion.

D. It remains essentially constant.

ANSWER: A.

TOPIC 292004
KNOWLEDGE: K1.05 [2.9/2.9]
QID: B1353

Compared to the beginning of a fuel cycle, at the end of a fuel cycle the fuel temperature coefficient is __________ negative due to __________. (Assume the same initial fuel temperature throughout the fuel cycle.)

A. less; burnup of U-238

B. less; buildup of fission products

C. more; burnup of gadolinium

D. more; buildup of Pu-240

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.05 [2.9/2.9]
QID: B2053

Compared to operating at a low power level, the fuel temperature coefficient of reactivity at a high power level is __________ negative due to __________. (Assume the same core age.)

A. less; buildup of fission product poisons

B. more; improved pellet-to-clad heat transfer

C. less; higher fuel temperature

D. more; increased neutron flux

ANSWER: C.

TOPIC: 292004
KNOWLEDGE: K1.05 [2.9/2.9]
QID: B2152 (P2151)

Which one of the following contains the nuclides responsible for most of the resonance capture of fission neutrons in a reactor at the beginning of the sixth fuel cycle? (Assume that each refueling process replaces one-third of the fuel.)

A. U-235 and Pu-239

B. U-235 and U-238

C. U-238 and Pu-239

D. U-238 and Pu-240

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.05 [2.9/2.9]
QID: B2453 (P2352)

Refer to the curve of microscopic cross section for absorption versus neutron energy for a resonance peak in U-238 (see figure below).

If fuel temperature increases, the area under the curve will __________; and negative reactivity will be added to the core because __________.

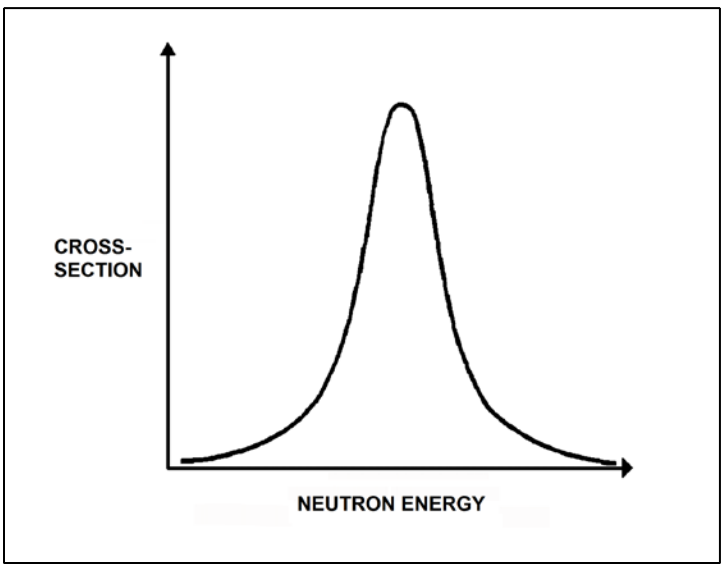
A. increase; neutrons of a wider range of energies will be absorbed by U-238

B. increase; more neutrons will be absorbed by U-238 at the resonance neutron energy

C. remain the same; neutrons of a wider range of energies will be absorbed by U-238

D. remain the same; more neutrons will be absorbed by U-238 at the resonance neutron energy

ANSWER: C.



TOPIC: 292004
KNOWLEDGE: K1.05 [2.9/2.9]
QID: B2553 (P2651)

In a comparison of the fuel temperature coefficient at the beginning and end of a fuel cycle, the fuel temperature coefficient is more negative at the ___________ of a fuel cycle because ___________. (Assume the same initial fuel temperature throughout the fuel cycle.)

A. end; more Pu-240 is in the core

B. end; more fission product poisons are in the core

C. beginning; more U-238 is in the core

D. beginning; less fission product poisons are in the core

ANSWER: A.

TOPIC: 292004
KNOWLEDGE: K1.05 [2.9/2.9]
QID: B2753 (P2751)

Refer to the curve of microscopic cross section for absorption versus neutron energy for a 6.7 electron volt (eV) resonance peak in U-238 for a reactor operating at 50 percent power (see figure below).

If fuel temperature decreases by 50°F, the area under the curve will __________; and positive reactivity will be added to the core because __________.

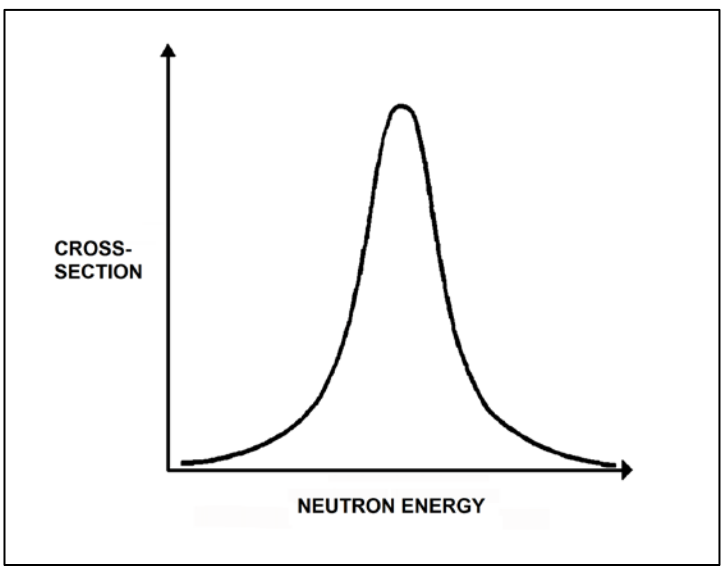
A. decrease; fewer neutrons will be absorbed by U-238 overall

B. decrease; fewer 6.7 eV neutrons will be absorbed by U-238 at the resonance energy

C. remain the same; fewer neutrons will be absorbed by U-238 overall

D. remain the same; fewer 6.7 eV neutrons will be absorbed by U-238 at the resonance energy

ANSWER: C.



TOPIC: 292004
KNOWLEDGE: K1.05 [2.9/2.9]
QID: B2852 (P2850)

Refer to the curve of microscopic cross section for absorption versus neutron energy for a resonance peak in U-238 in a reactor operating at 80 percent power (see figure below).

If reactor power is increased to 100 percent, the height of the curve will __________; and the area under the curve will __________.

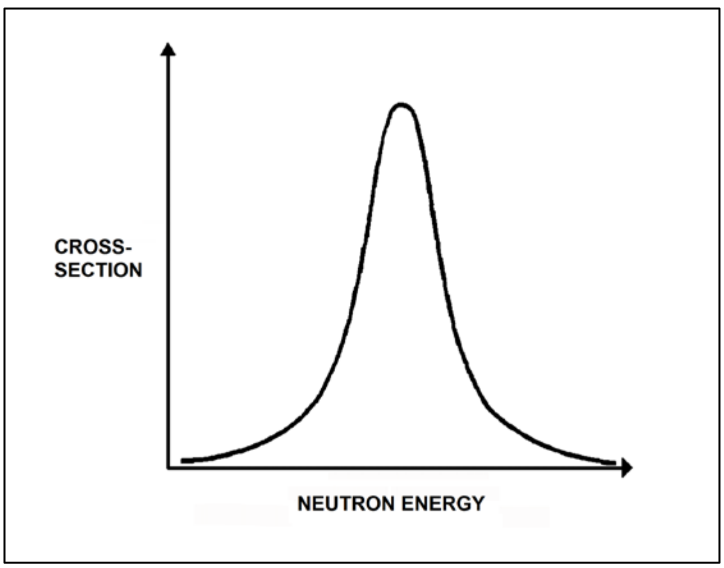
A. increase; increase

B. increase; remain the same

C. decrease; decrease

D. decrease; remain the same

ANSWER: D.



TOPIC: 292004
KNOWLEDGE: K1.10 [3.2/3.2]
QID: B125

Which one of the following will cause the void coefficient to become less negative? (Consider only the direct effects of the indicated changes.)

A. Core void fraction increases.

B. Fuel temperature decreases.

C. Gadolinium burns out.

D. Control rods are partially inserted.

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.10 [3.2/3.2]
QID: B354

Which one of the following is the primary reason the void coefficient becomes less negative toward the end of a fuel cycle?

A. The thermal neutron flux increases.

B. The thermal diffusion length decreases.

C. The fuel centerline temperature increases.

D. The control rod density decreases.

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.10 [3.2/3.2]
QID: B2153

Which one of the following describes why more power is produced in the lower half of a reactor core (versus the upper half) that has been operating at 100 percent power for several weeks near the beginning of a fuel cycle?

A. Xenon-135 concentration is smaller in the lower half of the core.

B. The moderator-to-fuel ratio is smaller in the lower half of the core.

C. Control rods are adding less negative reactivity in the lower half of the core.

D. The void coefficient is adding less negative reactivity in the lower half of the core.

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.11 [2.5/2.6]
QID: B953

Which one of the following describes how and why the void coefficient of reactivity changes as void fraction increases during a control rod withdrawal at 80 percent power?

A. Becomes less negative, due to the increased absorption of neutrons by U-238.

B. Becomes less negative, due to a greater fraction of neutrons lost to leakage from the core.

C. Becomes more negative, due to the reduction in the fast fission contribution to the neutron population.

D. Becomes more negative, due to a greater fractional loss of moderator for a one percent void increase at higher void fractions.

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.11 [2.5/2.6]
QID: B7717

A reactor is operating at 60 percent power with the core coolant flow consisting of 80 percent water by volume and 20 percent steam by volume. In this condition, the core void fraction is __________ percent; and if the core void fraction increases by 5 percent, the void coefficient of reactivity will become __________ negative.

A. 20; less

B. 20; more

C. 25; less

D. 25; more

ANSWER: B.

TOPIC: 292004
KNOWLEDGE: K1.14 [3.3/3.3]
QID: B253

During a reactor startup with the reactor coolant at 520°F, excessive control rod withdrawal results in a 10-second reactor period with reactor power low in the intermediate range. Without any further operator action, which one of the following coefficients of reactivity will respond first to reduce the rate of power increase?

A. Pressure

B. Void

C. Moderator

D. Doppler

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.14 [3.3/3.3]
QID: B272

During a reactor power increase from steady-state 20 percent to steady-state 100 percent, the smallest addition of negative reactivity will be caused by the change in…

A. void content.

B. fuel temperature.

C. xenon concentration.

D. moderator temperature.

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.14 [3.3/3.3]
QID: B1653

Which one of the following lists the moderator temperature coefficient (MTC), fuel temperature coefficient (FTC), and void coefficient (VC) left to right from most negative to least negative for a reactor at 50 percent power in the middle of a fuel cycle?

A. FTC, VC, MTC

B. FTC, MTC, VC

C. VC, FTC, MTC

D. VC, MTC, FTC

ANSWER: D.

TOPIC: 292004
KNOWLEDGE: K1.14 [3.3/3.3]
QID: B2353

During a reactor power decrease from steady-state 100 percent to steady-state 20 percent, the smallest addition of positive reactivity will be caused by the change in...

A. void percentage.

B. fuel temperature.

C. xenon concentration.

D. moderator temperature.

ANSWER: D.