TOPIC: 292006
KNOWLEDGE: K1.01 [2.7/2.8]
QID: B558
Fission fragments or daughters that have a substantial neutron absorption cross section and are not fissionable are called...
A. fissile materials.
B. fission product poisons.
C. fissionable nuclides.
D. burnable poisons.
ANSWER: B.

科目： 292006
知能類： K1.01 [2.7/2.8]
序號： B558

具有相當大的中子吸收截面且不是可分裂的分裂產物或子核稱為
A. 易裂（Fissile）材料
B. 分裂產物毒素
C. 可分裂（Fissionable）核種
D. 可燃毒素
答案： B.

科目： 292006
知能類： K1.01 [2.7/2.8]
序號： B1558 (P2858)

A fission product poison can be differentiated from all other fission products because a fission product poison...
A. has a higher microscopic cross section for thermal neutron capture.
B. has a longer half-life.
C. is produced in a greater percentage of thermal fissions.
D. is formed as a gas and is contained in the fuel pellets.
ANSWER: A.

分裂產物毒素能與所有其它分裂產物區別，係因為分裂產物毒素
A. 有較高之熱中子捕獲微觀截面
B. 有較長之半衰期
C. 在較大的熱分裂百分率下所產生
D. 形成為氣體，同時被吸收於燃料丸內
答案： A.

科目： 292006
知能類： K1.01 [2.7/2.8]
序號： B1858 (P858)

Fission product poisons can be differentiated from other fission products in that fission product poisons...
A. have a longer half-life.
B. are stronger absorbers of thermal neutrons.
C. are produced in a larger percentage of fissions.
D. have a higher fission cross section for thermal neutrons.
ANSWER: B.

分裂產物毒素能與其它分裂產物區別，係因為分裂產物毒素
A. 有較長之半衰期
B. 是較強的熱中子吸收體
A. 在較大的熱分裂百分率下所產生
B. 有較高之熱中子分裂截面
答案： B.

科目： 292006
知能類： K1.01 [2.7/2.8]
序號： B2061 (P2058)

A fission product poison can be differentiated from all other fission products in that a fission product poison will...
A. be produced in direct proportion to the fission rate in the core.
B. remain radioactive for thousands of years after the final reactor criticality.
C. depress the power production in some core locations and cause peaking in others.
D. migrate out of the fuel pellets and into the reactor coolant via pinhole defects in the clad.
ANSWER: C.

分裂產物毒素能與所有其它分裂產物區別，係因為分裂產物毒素
A. 其生成與爐心分裂率成正比
B. 在最終反應器臨界後數千年仍維持其放射性
C. 在某些爐心位置會抑制功率，而在其它位置會導致尖峰功率
D. 從燃料丸中散逸出來，並且透過護套上的穿透性針孔而進入反應器冷卻水
答案： C.

科目： 292006
知能類： K1.02 [3.1/3.1]
序號： B55

Which one of the following lists the proper order of substances from the largest to the smallest microscopic cross sections for absorption of thermal neutrons?
A. Gadolinium, U-235, Xe-135, U-238
B. Gadolinium, Xe-135, U-235, U-238
C. Xe-135, U-235, gadolinium, U-238
D. Xe-135, gadolinium, U-235, U-238
ANSWER: D.

由大到小列出熱中子的微觀吸收截面，下列何者正確?
A. 釓（Gd）, U-235, Xe-135, U-238
B. 釓, Xe-135, U-235, U-238
C. Xe-135, U-235, 釓, U-238
D. Xe-135, 釓, U-235, U-238
答案： D.

科目： 292006
知能類： K1.02 [3.1/3.1]
序號： B256 (P2658)

Compared to other poisons in the core, the two characteristics that cause Xe-135 to be a major reactor poison are its relatively _____ absorption cross section and its relatively _____ variation in concentration for large reactor power changes.
A. small; large
B. small; small
C. large; small
D. large; large
ANSWER: D.

與爐心中其它毒素比較，會使Xe-135成為反應器中主要毒素的兩個特徵，一是因為它擁有較_____的吸收截面，二是當反應器功率發生大的變化時，它會產生較_____的濃度變動。
A. 小；大
B. 小；小
C. 大；小
D. 大；大
答案： D.

科目： 292006
知能類： K1.02 [3.1/3.1]
序號： B1058 (P1858)

Which one of the following is a characteristic of xenon-135 in a reactor core?
A. Thermal neutron flux level affects both the production and removal of xenon-135.
B. Thermal neutrons interact with xenon-135 primarily through scattering reactions.
C. Xenon-135 is primarily a resonant absorber of epithermal neutrons.
D. Xenon-135 is produced from the radioactive decay of barium-135.
ANSWER: A.

下列何者是反應器爐心中Xe-135的特徵？
A. 熱中子通量位階對Xe-135的產生與移除均會造成影響
B. 熱中子與Xe-135的交互作用主要是散射反應
C. Xe-135是超熱中子的主要共振吸收物
D. Xe-135乃是由Ba-135的放射衰變所產生
答案： A.

科目： 292006
知能類： K1.02 [3.1/3.1]
序號： B1259

Which one of the following exhibits the greatest microscopic cross section for absorption of a thermal neutron in an operating reactor?
A. Uranium-235
B. Uranium-238
C. Plutonium-239
D. Xenon-135
ANSWER: D.

對於運轉中反應器之熱中子吸收，下列何者具有最大之微觀截面？
A. U-235
B. U-238
C. Pu-239
D. Xe-135
答案： D.

科目： 292006
知能類： K1.02 [3.1/3.1]
序號： B1658 (P2458)

Which one of the following exhibits the greatest microscopic cross section for absorption of a thermal neutron in an operating reactor core?
A. Uranium-235
B. Boron-10
C. Samarium-149
D. Xenon-135
ANSWER: D.

對於運轉中反應器爐心之熱中子吸收，下列何者具有最大之微觀截面？
A. U-235
B. B-10
C. Sm-149
D. Xe-135
答案： D.

科目： 292006
知能類： K1.02 [3.1/3.1]
序號： B3458

Reactors A and B are operating at steady-state 100% power with equilibrium core Xe-135. The reactors are identical except that reactor A is operating at end of core life (EOL) and reactor B is operating at beginning of core life (BOL).
Which reactor has the smaller concentration of core Xe-135?
A. Reactor A (EOL) due to the smaller 100% power thermal neutron flux
B. Reactor A (EOL) due to the larger 100% power thermal neutron flux
C. Reactor B (BOL) due to the smaller 100% power thermal neutron flux
D. Reactor B (BOL) due to the larger 100% power thermal neutron flux
ANSWER: B.

反應器A與B在100%穩態功率下運轉，爐心內的Xe-135皆已達到平衡。兩反應器完全相同，唯反應器A在爐心壽命末期（EOL），而反應器B在爐心壽命初期（BOL）。下列何反應器爐心的Xe-135濃度較小？
A. 反應器A（EOL），因為其100%功率之熱中子通量較小
B. 反應器A（EOL），因為其100%功率之熱中子通量較大
C. 反應器B（BOL），因為其100%功率之熱中子通量較小
D. 反應器B（BOL），因為其100%功率之熱中子通量較大
答案： B.

科目： 292006
知能類： K1.03 [2.9/2.9]
序號： B257 (P1859)

The major contributor to the production of Xe-135 in a reactor that has been operating at full power for 2 weeks is...
A. the radioactive decay of iodine.
B. the radioactive decay of promethium.
C. direct production from fission of U-235.
D. direct production from fission of U-238.
ANSWER: A.

在全功率下運轉兩週的反應器，其Xe-135產生的主要來源為
A. 碘的放射衰變
B. 鉕（Pm）的放射衰變
C. 由U-235分裂直接生成
D. 由U-238分裂直接生成
答案： A.

科目： 292006
知能類： K1.03 [2.9/2.9]
序號： B362 (P358)

Xenon-135 is produced in the reactor by two methods. One is directly from fission, the other is from the decay of...
A. xenon-136.
B. iodine-135.
C. cesium-135.
D. barium-135.
ANSWER: B.

在核子反應器中有兩種方式可產生Xe-135。其中之一直接來自於分裂反應，另外一種是下列何者的衰變？
A. Xe-136
B. I-135
C. Cs-135
D. Ba-136
答案： B.

科目： 292006
知能類： K1.03 [2.9/2.9]
序號： B458 (P1359)

A reactor has been operating at full power for several weeks. Xenon-135 is being directly produced as a fission product in approximately _____% of all fissions.
A. 100%
B. 30%
C. 3%
D. 0.3%
ANSWER: D.

一反應器於全功率下運轉數週。直接產生Xe-135成為分裂產物約佔總分裂的_____。
A. 100%
B. 30%
C. 3%
D. 0.3%
答案： D.

科目： 292006
知能類： K1.03 [2.9/2.9]
序號： B859 (P1559)

Which one of the following lists the production mechanisms of Xe-135 in an operating power reactor?
A. Primarily from fission, secondarily from iodine decay
B. Primarily from fission, secondarily from promethium decay
C. Primarily from iodine decay, secondarily from fission
D. Primarily from promethium decay, secondarily from fission
ANSWER: C.

下列何者為運轉中反應器之Xe-135的產生機制？
A. 主要來自分裂，其次來自碘衰變
B. 主要來自分裂，其次來自鉕（Pm）衰變
C. 主要來自碘衰變，其次來自分裂
D. 主要來自鉕衰變，其次來自分裂
答案： C.

科目： 292006
知能類： K1.03 [2.9/2.9]
序號： B2558 (P2558)

Reactors A and B are operating at steady-state 100% power with equilibrium core Xe-135. The reactors are identical except that reactor A is operating at the end of core life (EOL) and reactor B is operating at the beginning of core life (BOL).
Which reactor has the greater concentration of core Xe-135?
A. Reactor A (EOL) due to the smaller 100% power thermal neutron flux
B. Reactor A (EOL) due to the larger 100% power thermal neutron flux
C. Reactor B (BOL) due to the smaller 100% power thermal neutron flux
D. Reactor B (BOL) due to the larger 100% power thermal neutron flux
ANSWER: C.

反應器A與B在100％穩態功率下運轉，爐心內的Xe-135皆已達到平衡。兩反應器完全相同，唯反應器A在爐心壽命末期（EOL），而反應器B在爐心壽命初期（BOL）。下列何反應器爐心有較大之Xe-135濃度？
A. 反應器A（EOL），因為其100％功率之熱中子通量較小
B. 反應器A（EOL），因為其100％功率之熱中子通量較大
C. 反應器B（BOL），因為其100％功率之熱中子通量較小
D. 反應器B（BOL），因為其100％功率之熱中子通量較大
答案： C.

科目： 292006
知能類： K1.04 [2.9/2.9]
序號： B128

Which one of the following describes the change in core xenon-135 concentration immediately following a power increase from equilibrium conditions?
A. Initially decrease due to the decreased rate of xenon-135 production from fission.
B. Initially decrease due to the increased rate of thermal neutron absorption by xenon-135.
C. Initially increase due to the increased rate of xenon-135 production from fission.
D. Initially increase due to the decreased rate of thermal neutron absorption by xenon-135.
ANSWER: B.

下列何者正確地描述了在平衡狀況下，功率增加後爐心內Xe-135濃度的立即變化？
A. 起初降低，因為由分裂而來的Xe-135產生率降低
B. 起初降低，因為Xe-135的熱中子吸收率增加
C. 起初增加，因為由分裂而來的Xe-135產生率增加
D. 起初增加，因為Xe-135的熱中子吸收率降低
答案： B.

科目： 292006
知能類： K1.04 [2.9/2.9]
序號： B258

The two methods of Xe-135 removal from a reactor operating at full power are...
A. gamma decay and beta decay.
B. neutron absorption and fission.
C. fission and gamma decay.
D. beta decay and neutron absorption.
ANSWER: D.

從全功率運轉下的反應器移除Xe-135的兩種方式為
A. 伽瑪衰變與貝他衰變
B. 中子吸收與分裂
C. 分裂與伽瑪衰變
D. 貝他衰變與中子吸收
答案： D.

科目： 292006
知能類： K1.04 [2.9/2.9]
序號： B359 (P1059)

Xenon-135 undergoes radioactive decay to...
A. iodine-135.
B. cesium-135.
C. tellurium-135.
D. lanthanum-135.
ANSWER: B.

Xe-135進行放射衰變而成為
A. I-135
B. Cs-135
C. Te-135（碲）
D. La-135（鑭）
答案： B.

科目： 292006
知能類： K1.04 [2.9/2.9]
序號： B462 (P460)

Reactor power is increased from 50% to 60% in 1 hour. The most significant contributor to the initial change in xenon reactivity is the increase in xenon...
A. production from iodine decay.
B. production from fission.
C. absorption of neutrons.
D. decay to cesium.
ANSWER: C.

反應器功率在一小時內從50%增加至60%。對於氙反應度最初變化的主要是因為增加的氙
A. 來自於碘衰變的產量
B. 來自於分裂反應的產量
C. 對中子的吸收
D. 衰變成為銫
答案： C.

科目： 292006
知能類： K1.04 [2.9/2.9]
序號： B860

Which one of the following values is the approximate half-life of Xe-135?
A. 19 seconds
B. 6.6 hours
C. 9.1 hours
D. 30 hours
ANSWER: C.

下列何者最接近Xe-135的半衰期？
A. 19 秒
B. 6.6 小時
C. 9.1 小時
D. 30 小時
答案： C.

科目： 292006
知能類： K1.04 [2.9/2.9]
序號： B959

Which one of the following describes the primary method of xenon-135 removal at the indicated steady state power level?
A. Decay of xenon-135 to cesium-135 at full power
B. Decay of xenon-135 to iodine-135 at the point of adding heat
C. Absorption of neutrons by xenon-135 at the point of adding heat
D. Absorption of neutrons by xenon-135 at full power
ANSWER: D.

在以下的穩態功率，何者正確地描述了移除Xe-135的主要方式？
A. 在全功率時，Xe-135衰變成為銫-135
B. 在加熱階段起始點時，Xe-135衰變成為I-135
C. 在加熱階段起始點時，Xe-135吸收中子
D. 在全功率時，Xe-135吸收中子
答案： D.

科目： 292006
知能類： K1.04 [2.9/2.9]
序號： B3358 (P2659)

A nuclear plant has been operating at 100% power for several months. Which one of the following describes the relative contributions of beta decay and neutron capture to Xe-135 removal from the reactor core?
A. Beta decay and neutron capture contribute equally
B. Primary - beta decay; secondary - neutron capture
C. Primary - neutron capture; secondary - beta decay
D. Not enough information given to make a comparison
ANSWER: C.

核能電廠在100％功率下運轉數月。下列何者正確地描述了貝他衰變與中子捕獲，對於從反應器爐心移除Xe-135的貢獻程度？
A. 貝他衰變與中子捕獲的貢獻相同
B. 主要—貝他衰變；次要—中子捕獲
C. 主要—中子捕獲；次要—貝他衰變
D. 資訊不足無法做比較
答案： C.

科目： 292006
知能類： K1.05 [2.9/2.9]
序號： B58 (P61)

A reactor has been operating at 50% power for one week when power is ramped in 4 hours to 100%. Which one of the following describes the new equilibrium xenon concentration?
A. Twice the 50% value
B. Less than twice the 50% value
C. More than twice the 50% value
D. Remains the same because it is independent of power
ANSWER: B.

一反應器在50％功率下運轉一週，此時在四小時內迅速提升至100％功率。下列何者正確地描述了新的氙毒平衡濃度？
A. 等於50％時的兩倍
B. 小於50％時的兩倍
C. 大於50％時的兩倍
D. 維持不變，因為與功率無關
答案： B.

科目： 292006
知能類： K1.05 [2.9/2.9]
序號： B259 (P1459)

Following a two-week shutdown, a reactor is taken critical and ramped to full power in 6 hours. How long will it take to achieve an equilibrium xenon condition after the reactor reaches full power?
A. 70 to 80 hours
B. 40 to 50 hours
C. 8 to 10 hours
D. 1 to 2 hours
ANSWER: B.

在停機兩週後，反應器達於臨界並且在六小時內迅速提升至全功率。在反應器到達全功率後，需要多少時間能達到氙毒的平衡狀態？
A. 70 到 80 小時
B. 40 到 50 小時
C. 8 到 10 小時
D. 1 到 2 小時
答案： B.

科目： 292006
知能類： K1.05 [2.9/2.9]
序號： B658 (P660)

A nuclear reactor has been operating at 100% power for one week when power is ramped in 4 hours to 50%. Which one of the following describes the new equilibrium core xenon-135 concentration?
A. Remains the same because it is independent of power
B. More than one-half the 100% value
C. Less than one-half the 100% value
D. One-half the 100% value
ANSWER: B.

反應器在100％功率下運轉一週，此時功率在四小時內迅速減至50％。下列何者正確地描述了新的氙毒平衡濃度？
A. 維持不變，因為其與功率無關
B. 大於100％時的一半
C. 小於100％時的一半
D. 等於100％時的一半
答案： B.

科目： 292006
知能類： K1.05 [2.9/2.9]
序號： B1160 (P1158)

A reactor has been operating at 25% power for 24 hours following a 2-hour power reduction from steady-state full power. Which one of the following describes the current status of core xenon-135 concentration?
A. At equilibrium
B. Decreasing toward an upturn
C. Decreasing toward an equilibrium value
D. Increasing toward a peak value
ANSWER: C.

反應器從穩態全功率經過兩小時的降載後，並在25%功率下運轉24小時。下列何者正確地描述了目前爐心的Xe-135濃度？
A. 處於平衡
B. 朝向回升減小
C. 朝向一平衡值減小
D. 朝向一峰值增加
答案： C.

科目： 292006
知能類： K1.05 [2.9/2.9]
序號： B1363

Which one of the following indicates that core Xe-135 is in equilibrium?
A. Xe-135 is being removed equally by neutron capture and decay.
B. The reactor has been operated at a steady-state power level for five days.
C. Xe-135 is being produced equally by fission and I-135 decay.
D. The reactor is currently operating at 100% power.
ANSWER: B.

下列何者說明爐心的Xe-135為平衡狀態？
A. Xe-135被中子捕獲移除的量等於其衰變的量
B. 反應器在穩態功率下運轉五天
C. Xe-135由分裂產生的量等於I-135衰變的量
D. 反應器目前在100%功率下運轉
答案： B.

科目： 292006
知能類： K1.05 [2.9/2.9]
序號： B1859

A reactor was operating for 42 weeks at a stable reduced power level when a reactor scram occurred. The reactor was returned to critical after 12 hours and then ramped to 60% power in 6 hours.
How much time at steady state 60% power will be required to reach equilibrium core xenon-135?
A. 20 to 30 hours
B. 40 to 50 hours
C. 70 to 80 hours
D. 90 to 100 hours
ANSWER: B.

反應器在穩定低功率運轉42週，此時發生反應器急停。在12小時後反應器回復臨界，並且在六小時內迅速提升至60%功率。在60%穩態功率下，要達到爐心氙毒的平衡狀態，需要多少時間？
A. 20 到 30 小時
B. 40 到 50 小時
C. 70 到 80 小時
D. 90 到 100 小時
答案： B.

科目： 292006
知能類： K1.05 [2.9/2.9]
序號： B1960 (P1360)

A reactor has been operating at a steady-state power level for 15 hours following a rapid power reduction from 100% to 80%. Which one of the following describes the current core xenon concentration?
A. Increasing toward equilibrium
B. Decreasing toward equilibrium
C. Increasing toward a peak
D. Decreasing toward a valley
ANSWER: B.

從100％功率快速降低至80％後，反應器在穩態功率下運轉15小時。下列何者正確地描述了爐心目前的氙毒濃度？
A. 朝平衡方向增加
B. 朝平衡方向減小
C. 朝向峰值增加
D. 朝向谷值減小
答案： B.

科目： 292006
知能類： K1.05 [2.9/2.9]
序號： B2659 (P2159)

Which one of the following indicates that core Xe-135 is in equilibrium?
A. Xe-135 production and removal rates are momentarily equal five hours after a power increase.
B. A reactor has been operated at 80% power for five days.
C. Xe-135 is being produced equally by fission and I-135 decay.
D. A reactor is currently operating at 100% power.
ANSWER: B.

下列那一個爐心的Xe-135處於平衡狀態？
A. 在功率增加之後五小時，Xe-135的產生與移除率暫時相等
B. 反應器在80％功率下運轉五天
C. 由分裂產生的Xe-135與I-135衰變之數量相等
D. 反應器目前在100％功率下運轉
答案： B.

科目： 292006
知能類： K1.05 [2.9/2.9]
序號： B2760 (P2859)

Reactors A and B are operating at steady-state 100% power with equilibrium core Xe-135. The reactors are identical except that reactor A is operating near the end of core life and reactor B is operating near the beginning of core life.
Which reactor is experiencing the most negative reactivity from equilibrium core Xe-135?
A. Reactor A due to a greater concentration of equilibrium core Xe-135
B. Reactor A due to lower competition from the fuel for thermal neutrons
C. Reactor B due to a greater thermal neutron flux in the core
D. Reactor B due to a smaller accumulation of stable fission product poisons
ANSWER: B.

反應器A與B在100%穩態功率下運轉，爐心內的Xe-135皆已達到平衡。兩反應器完全相同，唯反應器A接近爐心壽命末期，而反應器B接近爐心壽命初期。下列那一個反應器會有因Xe-135平衡濃度造成最大的負反應度？
A. 反應器A，因為其爐心Xe-135的平衡濃度較大
B. 反應器A，因為燃料對熱中子的利用較低
C. 反應器B，因為爐心的熱中子通量較大
D. 反應器B，因為穩定分裂產物毒素的累積量較小
答案： B.

科目： 292006
知能類： K1.06 [2.7/2.7]
序號： B59

A reactor has been operating at 50% power for one week when power is ramped over 4 hours to 100% power. How will the core xenon-135 concentration respond?
A. Decrease, and then build up to a higher equilibrium concentration
B. Increase, and then build up to a higher equilibrium concentration
C. Decrease, and then return to the same equilibrium concentration
D. Increase, and then return to the same equilibrium concentration
ANSWER: A.

反應器在50％功率下運轉一週，在四小時後迅速增加至100％功率。爐心Xe-135濃度將會如何反應？
A. 減小，然後增加至一較高的平衡濃度
B. 增加，然後增加至一較高的平衡濃度
C. 減小，然後回復至原本的平衡濃度
D. 增加，然後回復至原本的平衡濃度
答案： A.

科目： 292006
知能類： K1.06 [2.7/2.7]
序號： B660

A reactor has been operating at 75% power for one week when power is decreased to 50% over a 1 hour period. Which one of the following statements explains how xenon concentration will initially change?
A. Decreases, because the xenon production rate from fission has decreased
B. Increases, because of the reduced rate of xenon burnout
C. Decreases, because the rate of xenon decay exceeds the rate of production from fission
D. Increases, because the concentration of iodine-135 increases
ANSWER: B.

反應器在75%功率下運轉一週，在一小時期間內降低至50%功率。下列何者敘述解釋了氙毒濃度的初始變化？
A. 減小，因為從分裂而來的氙毒產生率減小
B. 增加，因為氙毒的燃耗率下降
C. 減小，因為氙毒的衰變率超過分裂的產生率
D. 增加，因為碘-135的濃度增加
答案： B.

科目： 292006
知能類： K1.06 [2.7/2.7]
序號： B961

A reactor has been operating at 100% power for two weeks when power is reduced to 50% in 1 hour. How will the amount of core xenon change over the next 24 hours?
A. Increase and stabilize at a new higher value
B. Increase initially, then decrease and stabilize at a lower value
C. Decrease and stabilize at a new lower value
D. Decrease initially, then increase and stabilize at a higher value
ANSWER: B.

反應器在100%功率下運轉兩週，在一小時期間內降低至50%功率。在未來24小時內，爐心氙毒的含量將如何變化？
A. 增加，並且在一新的較高數值達到穩定
B. 起初增加，然後在一較低數值達到穩定
C. 降低，然後在一新的較低數值達到穩定
D. 起初降低，然後在一較高數值達到穩定
答案： B.

科目： 292006
知能類： K1.06 [2.7/2.7]
序號： B1262 (P1960)

A 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
ANSWER: D.

反應器在100%功率下運轉兩週，在一小時期間內降低至10%功率。緊接著功率下降之後，爐心Xe-135的濃度將會_____並持續_____。
A. 降低；4至6小時
B. 增加；4至6小時
C. 降低；8至11小時
D. 增加；8至11小時
答案： D.

科目： 292006
知能類： K1.06 [2.7/2.7]
序號： B1860

A reactor has been operating at a steady-state power level for 15 hours following a rapid power reduction from 100% to 50%. Which one of the following describes the current core xenon-135 concentration?
A. Increasing toward a peak
B. Decreasing toward an upturn
C. Increasing toward equilibrium
D. Decreasing toward equilibrium
ANSWER: D.

從100%功率快速降低至50%後，反應器在穩態功率運轉15小時。下列何者正確地描述了目前爐心Xe-135的濃度？
A. 朝向峰值增加
B. 朝向回升減少
C. 朝向平衡增加
D. 朝向平衡減小
答案： D.

科目： 292006
知能類： K1.06 [2.7/2.7]
序號： B2559 (P3362)

A reactor has been operating at 70% power for 26 hours following a one-hour power reduction from steady-state 100% power. Which one of the following describes the current core xenon-135 concentration?
A. Increasing toward a peak
B. Decreasing toward an upturn
C. Decreasing toward equilibrium
D. At equilibrium
ANSWER: C.

反應器從100％穩態功率下降一小時後，在70％功率下運轉26小時。下列何者正確地描述了目前爐心Xe-135的濃度？
A. 朝向峰值增加
B. 朝向回升減少
C. 朝向平衡減小
D. 處於平衡
答案： C.

科目： 292006
知能類： K1.06 [2.7/2.7]
序號： B2761 (P2261)

A reactor has been operating at steady-state 50% power for 12 hours following a one-hour power reduction from steady-state 100% power. Which one of the following describes the current core xenon-135 concentration?
A. Increasing toward a peak
B. Decreasing toward an upturn
C. Increasing toward equilibrium
D. Decreasing toward equilibrium
ANSWER: D.

反應器從100％穩態功率下降一小時後，在50％功率下運轉12小時。下列何者正確地描述了目前爐心Xe-135的濃度？
A. 朝向峰值增加
B. 朝向回升減少
C. 朝向平衡增加
D. 朝向平衡減小
答案： D.

科目： 292006
知能類： K1.06 [2.7/2.7]
序號： B2960 (P2961)

A reactor has been operating at steady-state 30% power for 3 hours following a one-hour power reduction from steady-state 100% power. Which one of the following describes the current core xenon-135 concentration?
A. Increasing toward a peak
B. Increasing toward equilibrium
C. Decreasing toward an upturn
D. Decreasing toward equilibrium
ANSWER: A.

反應器從100％穩態功率下降一小時後，在30％功率下運轉3小時。下列何者正確地描述了目前爐心Xe-135的濃度？
A. 朝向峰值增加
B. 朝向平衡增加
C. 朝向回升減少
D. 朝向平衡減小
答案： A.

科目： 292006
知能類： K1.07 [3.2/3.2]
序號： B132

What is the difference in peak xenon concentration following a reactor scram after one week at 100% power as compared to a scram after one week at 50% power?

A. The time to reach the peak is shorter after 100% power than after 50% power, due to the higher iodine decay rate.
B. The peak from 50% is of a smaller magnitude due to the lower xenon burnout rate.
C. The peaks are equal because the decay rate of iodine remains constant.
D. The peak from 100% power is of a larger magnitude, due to the larger initial iodine concentration.

ANSWER: D.

反應器以100%功率運轉一週後急停，相較於以50%功率運轉一週後急停，兩者氙毒濃度峰值的差異為何？

A. 達到峰值的時間前者較後者為短，因為碘衰變率較高
B. 後者的峰值較小，因為氙毒燃耗率較低
C. 峰值相等，因為碘衰變率維持固定
D. 前者的峰值較大，因為碘的初始濃度較高

答案： D.

科目： 292006
知能類： K1.07 [3.2/3.2]
序號： B260

A reactor has been operating at 25% power for five days when a scram occurs. Xe-135 will peak in approximately...
A. 2 hours.
B. 5 hours.
C. 10 hours.
D. 20 hours.
ANSWER: B.

反應器在25%功率下運轉五天，此時發生急停。Xe-135達到峰值約需要
A. 2小時
B. 5小時
C. 10小時
D. 20小時
答案： B.

科目： 292006
知能類： K1.07 [3.2/3.2]
序號： B861

Which one of the following equilibrium reactor prescram conditions requires the greater amount of control rod withdrawal to perform a reactor startup during peak xenon conditions after a reactor scram? (BOL = beginning of core life. EOL = end of core life.)
A. BOL and 100% power
B. EOL and 100% power
C. BOL and 20% power
D. EOL and 20% power
ANSWER: B.

下列何種反應器急停前的平衡狀況，需要抽出較多的控制棒，使得反應器在急停後能於氙毒峰值期間進行啟動？（BOL＝爐心壽命初期。EOL＝爐心壽命末期）
A. BOL及100%功率
B. EOL及100%功率
C. BOL及20%功率
D. EOL及20%功率
答案： B.

科目： 292006
知能類： K1.07 [3.2/3.2]
序號： B1561 (P1561)

Select the combination below that completes the following statement.
The amount of control rod withdrawal needed to compensate for peak core xenon-135 negative reactivity will be smallest after a reactor scram from equilibrium _____ reactor power at the _____ of core life.
A. 20%; beginning
B. 20%; end
C. 100%; beginning
D. 100%; end
ANSWER: A.

選出適當的組合完成下列陳述。
在爐心壽命____，反應器從____平衡功率發生急停後，為補償爐心Xe-135峰值的負反應度所需要抽出的控制棒最少。
A. 初期，20%
B. 末期，20%
C. 初期，100%
D. 末期，100%
答案： A.

科目： 292006
知能類： K1.08 [2.8/3.2]
序號： B135

When comparing control rod worth (CRW) during a reactor startup from 100% peak xenon-135 and a reactor startup from xenon-free conditions...
A. center CRW will be higher during the peak xenon startup than during the xenon-free startup.
B. peripheral CRW will be higher during the peak xenon startup than during the xenon-free startup.
C. center and peripheral CRWs will be the same regardless of core xenon conditions.
D. it is impossible to determine how xenon will affect the worth of center and peripheral control rods.
ANSWER: B.

從100%峰值的Xe-135下啟動反應器，與無氙毒狀況下的反應器啟動，比較此兩者的控制棒本領（CRW）
A. 在峰值氙毒啟動時的中央CRW較無氙毒啟動時為高
B. 在峰值氙毒啟動時的邊緣CRW較無氙毒啟動時為高
C. 不論爐心的氙毒情況為何，中央與邊緣CRW相同
D. 無法判斷氙毒如何影響中央與邊緣的控制棒本領
答案： B.

科目： 292006
知能類： K1.08 [2.8/3.2]
序號： B261

A reactor has been operating at full power for several weeks when a scram occurs. When the reactor is brought critical 5 hours later, Xe-135 concentration will be highest in the _____ of the core, which causes thermal neutron flux to shift toward the _____ of the core.
A. center; periphery
B. periphery; periphery
C. center; center
D. periphery; center
ANSWER: A.

反應器在全功率下運轉數週時發生急停。當反應器在五小時後回到臨界，在爐心____的Xe-135濃度將會最高，如此將導致熱中子通量朝著爐心的____轉移
A. 中央；邊緣
B. 邊緣；邊緣
C. 中央；中央
D. 邊緣；中央
答案： A.

科目： 292006
知能類： K1.08 [2.8/3.2]
序號： B1062

A reactor is operating at the beginning of core life, 100% power, and equilibrium xenon concentration when a scram occurs. When the reactor is taken critical 5 hours later, xenon distribution will be maximum at the _____ of the core.
A. bottom and center
B. bottom and outer circumference
C. top and center
D. top and outer circumference
ANSWER: A.

反應器在爐心壽命初期，100%功率下運轉，在氙毒平衡濃度下發生急停。當反應器在五個小時後達到臨界時，在爐心____處氙毒的濃度最大。
A. 底部與中央
B. 底部與外圍邊緣
C. 頂部與中央
D. 頂部與外圍邊緣
答案： A.

科目： 292006
知能類： K1.08 [2.8/3.2]
序號： B2454

Sustained operation at 100% power requires periodic withdrawal of control rods to compensate for...
A. buildup of fission product poisons and decreasing control rod worth.
B. fuel depletion and buildup of fission product poisons.
C. decreasing control rod worth and burnable poison burnout.
D. burnable poison burnout and fuel depletion.
ANSWER: B.

在100%功率下持續運轉，需要週期性地抽出控制棒，以補償
A. 分裂產物毒素的累積，以及控制棒本領的降低
B. 燃料的燃耗，以及分裂產物毒素的累積
C. 控制棒本領的降低，以及可燃毒素的燃耗
D. 可燃毒素的燃耗，以及燃料的燃耗
答案： B.

科目： 292006
知能類： K1.08 [2.8/3.2]
序號： B2660 (P2359)

Which one of the following explains why core Xe-135 oscillations are a concern in a reactor?
A. They can adversely affect core power distribution and can require operation below full rated power.
B. They can adversely affect core power distribution and can prevent a reactor startup following a reactor scram.
C. They can cause excessively short reactor periods during power operation and can require operation below full rated power.
D. They can cause excessively short reactor periods during power operation and can prevent a reactor startup following a reactor scram.
ANSWER: A.

下列何者能解釋為何在反應器中，爐心的Xe-135振盪是重要的事？
A. 它們對爐心功率分佈有不利影響，並且會迫使運轉在低於全功率下進行
B. 它們對爐心功率分佈有不利影響，並且在反應器急停後，使反應器啟動不易進行
C. 它們會導致在功率運轉中過短的反應器週期，並且會迫使運轉在低於全功率下進行
D. 它們會導致在功率運轉中過短的反應器週期，並且在反應器急停後，使反應器啟動不易進行
答案： A.

科目： 292006
知能類： K1.08 [2.8/3.2]
序號： B2860

A reactor has been operating at 50% power for several weeks near the middle of core life with core axial power distribution evenly divided above and below the core midplane. Reactor power is to be increased to 65% over a two-hour period using shallow control rods only.
During the power increase, core axial power distribution will...
A. shift toward the top of the core.
B. shift toward the bottom of the core.
C. remain evenly divided above and below the core midplane.
D. have peaks near the top and the bottom of the core.
ANSWER: B.

反應器於接近爐心壽命中期，在50%功率下運轉數週，其爐心軸向功率分佈均勻分配於爐心上半部與下半部。反應器功率將在兩小時內，僅利用淺控制棒而增加到65%。在功率增加期間，爐心軸向功率分佈將
A. 朝向爐心頂部轉移
B. 朝向爐心底部轉移
C. 在爐心中央面上下維持均勻分佈
D. 在靠近爐心的頂部與底部處產生峰值
答案： B.

科目： 292006
知能類： K1.08 [2.8/3.2]
序號： B3061 (P3060)

A reactor has been operating at full power for one month following a refueling outage with core axial neutron flux distribution peaked in the bottom half of the core. An inadvertent reactor scram occurs. The reactor is restarted, with criticality occurring 6 hours after the scram. Reactor power is increased to 60% over the next 4 hours and stabilized.
How will core axial neutron flux distribution be affected during the 1-hour period immediately following the return to 60% power?
The core axial neutron flux peak will be located _____ in the core than the pre-scram peak location, and the flux peak will be moving _____.
A. higher; upward
B. higher; downward
C. lower; upward
D. lower; downward
ANSWER: B.

在大修後反應器在全功率下運轉一個月，其爐心軸向中子通量分佈在爐心的下半部達於峰值。此時反應器發生意外的急停，然後重新啟動並在急停後六小時達到臨界。反應器功率在接下來的四小時增加到60%並且穩定運轉。在反應器功率達60%後緊接著的一小時內，爐心軸向中子通量的分佈如何受到影響？爐心軸向中子通量峰值將會____急停前的峰值位置，而中子通量峰值將會____移動。
A. 高於；往上
B. 高於；往下
C. 低於；往上
D. 低於；往下
答案： B.

科目： 292006
知能類： K1.09 [2.5/2.5]
序號： B262

A reactor is being started up and taken to rated power using a constant ramp rate following an extended outage. To compensate for the effect of core xenon-135 while increasing reactor power, it will be necessary to _____ rods and _____ recirculation flow.
A. insert; decrease
B. insert; increase
C. withdraw; increase
D. withdraw; decrease
ANSWER: C.

反應器在長期大修後進行啟動，以穩定速率提昇到額定功率。在增加反應器功率時為補償爐心Xe-135的影響，所以需要____控制棒，同時____再循環流量。
A. 插入；減小
B. 插入；增加
C. 抽出；增加
D. 抽出；減小
答案： C.

科目： 292006
知能類： K1.09 [2.5/2.5]
序號： B355 (P353)

A plant is being returned to operation following a refueling outage. Fuel preconditioning requires reactor power to be increased from 10% to full power gradually over a one week period. During this slow power increase, most of the positive reactivity added by the operator is required to overcome the negative reactivity from...
A. fuel burnup.
B. xenon buildup.
C. fuel temperature increase.
D. moderator temperature increase.
ANSWER: B.

在大修後電廠重新回復運轉。因燃料預調節要求反應器功率在一週內從10%逐漸增加到全功率。在功率緩慢增加期間，運轉員所加入之大部分的正反應度，乃是為了克服來自於何處的負反應度？
A. 燃料燃耗
B. 氙毒累積
C. 燃料溫度增加
D. 緩和劑溫度增加
答案： B.

科目： 292006
知能類： K1.09 [2.5/2.5]
序號： B562 (P561)
Following a seven day shutdown, a reactor startup is performed and a plant is taken to 100% power over a 16-hour period. After reaching 100% power, what type of reactivity will the operator need to add to compensate for core xenon-135 changes over the next 24 hours?
A. Negative only
B. Negative, then positive
C. Positive only
D. Positive, then negative
ANSWER: C.

在停機七天後，啟動反應器並且要在16小時期間達到100%功率。在達到100%功率後，為補償之後24小時爐心Xe-135的變化，運轉員將需要加入何種反應度？
A. 只有負反應度
B. 負反應度，然後正反應度
C. 只有正反應度
D. 正反應度，然後負反應度
答案： C.

科目： 292006
知能類： K1.09 [2.5/2.5]
序號： B2861 (P2260)

A reactor is initially shut down with no xenon in the core. Over the next four hours, the reactor is made critical and power level is increased to the point of adding heat. The shift supervisor has directed that power be maintained constant at this level for 12 hours for testing.
To accomplish this, control rods will have to be...
A. withdrawn periodically for the duration of the 12 hours.
B. inserted periodically for the duration of the 12 hours.
C. withdrawn periodically for 4 to 6 hours, then inserted periodically.
D. inserted periodically for 4 to 6 hours, then withdrawn periodically.
ANSWER: A.

反應器於停機初期爐心無氙毒。在其後四小時內，反應器達於臨界且功率增加到加熱階段起始點。值工師指示將功率穩定維持於該功率12小時以執行測試，為了達到此目的，控制棒必須
A. 在此12小時內週期性地抽出
B. 在此12小時內週期性地插入
C. 在4至6小時內週期性地抽出，然後週期性地插入
D. 在4至6小時內週期性地插入，然後週期性地抽出
答案： A

科目： 292006
知能類： K1.10 [2.9/2.9]
序號： B57

Following a reactor scram from a long-term, steady-state, 100% power run, a reactor is to be taken critical. The calculated estimated critical conditions (position) are based on a xenon-free core. Which one of the following is the shortest time after the initial scram that a xenon-free core will exist?
A. 8 to 10 hours
B. 15 to 25 hours
C. 40 to 50 hours
D. 70 to 80 hours
ANSWER: D.

反應器從長期穩態100%功率運轉下發生急停後，準備再重新達到臨界。根據無氙毒爐心計算得到臨界預估狀況（棒位）。在最初急停後，爐心無氙毒存在的最短時間是下列何者？
A. 8至10小時
B. 15至25小時
C. 40至50小時
D. 70至80小時
答案： D.

科目： 292006
知能類： K1.10 [2.9/2.9]
序號： B1162

A reactor scram occurred from steady state 100% power and a startup is currently in progress. Which one of the following sets of initial startup conditions will require the most control rod withdrawal to achieve criticality? (BOC = beginning of fuel cycle; EOC = end of fuel cycle.)

	CORE AGE	TIME SINCE REACTOR SCRAM
A.	BOC	12 hours
B.	BOC	40 hours
C.	EOC	12 hours
D.	EOC	40 hours

ANSWER: C.

反應器從100%穩態功率運轉狀態下發生急停，然後進行啟動。下列何種啟動時的初始狀況，需要抽出最多的控制棒才能達到臨界？（BOC＝燃料週期初期；EOC＝燃料週期末期）

	爐心壽命	自反應器急停後時間
A.	BOC	12小時
B.	BOC	40小時
C.	EOC	12小時
D.	EOC	40小時

答案： C.

科目： 292006
知能類： K1.10 [2.9/2.9]
序號： B1361 (P1358)

A reactor has been operating at 75% power for two months. A manual reactor scram is required for a test. The scram will be followed immediately by a reactor startup with criticality scheduled to occur 12 hours after the scram.
The greatest assurance that xenon reactivity will permit criticality during the startup will be attained if the reactor is operated at _____ power for 48 hours prior to the scram and if criticality is rescheduled for _____ hours after the scram.
A. 100%; 8
B. 100%; 16
C. 50%; 8
D. 50%; 16
ANSWER: D.

反應器在75%功率下運轉兩個月，為了測試要求以手動方式急停。急停後需要立即進行反應器啟動，並且預計在急停後12小時達到臨界。若此反應器在急停前於____功率下運轉48小時，同時若預計於急停後____小時臨界，則最能確保氙毒的反應度不會影響反應器在啟動期間可以達到臨界。
A. 100%; 8
B. 100%; 16
C. 50%; 8
D. 50%; 16
答案： D.

科目： 292006
知能類： K1.10 [2.9/2.9]
序號： B1461 (P1462)

A reactor has been operating at 100% power for two months when a reactor scram occurs. Four hours later, the reactor is critical and stable at 10% power.
Which one of the following operator actions is required to maintain reactor power at 10% over the next 24 hours?
A. Add positive reactivity during the entire period
B. Add negative reactivity during the entire period
C. Add positive reactivity, then negative reactivity
D. Add negative reactivity, then positive reactivity
ANSWER: C.

反應器在100％功率下運轉兩個月，此時發生急停。四小時後，反應器達到臨界，並穩定在10％功率。為了在之後24小時內，維持反應器功率在10％，則運轉員需要採取下列何種動作？
A. 在整個期間中加入正反應度
B. 在整個期間中加入負反應度
C. 先加入正反應度，然後加入負反應度
D. 先加入負反應度，然後加入正反應度
答案： C.

科目： 292006
知能類： K1.10 [2.9/2.9]
序號： B1763 (P1762)

A reactor startup is being conducted and criticality has been achieved 15 hours after a reactor scram from two months of operation at full power. After 1 additional hour, reactor power is stabilized at 10^{-4}% power and all control rod motion is stopped.
Which one of the following describes the response of reactor power over the next 2 hours without any further operator actions?
A. Power increases toward the point of adding heat due to the decay of Xe-135.
B. Power increases toward the point of adding heat due to the decay of Sm-149.
C. Power decreases toward the shutdown neutron level due to the buildup of Xe-135.
D. Power decreases toward the shutdown neutron level due to the buildup of Sm-149.
ANSWER: A.

反應器全功率運轉兩個月後發生急停，在急停後15小時達到臨界，然後準備進行啟動。在臨界後的一小時後，反應器功率穩定於10^{-4}%功率，同時所有控制棒均停止動作。下列何者正確地描述了運轉員沒有採取任何動作下，在其後2小時反應器功率的反應？
A. 功率朝著加熱階段起始點增加，因為Xe-135的衰變
B. 功率朝著加熱階段起始點增加，因為Sm-149的衰變
C. 功率朝著停機中子位階減小，因為Xe-135的累積
D. 功率朝著停機中子位階減小，因為Sm-149的累積
答案： A.

科目： 292006
知能類： K1.10 [2.9/2.9]
序號： B3861 (P3860)

A reactor has been operating at 80% power for two months. A manual reactor scram is required for a test. The scram will be followed by a reactor startup with criticality scheduled to occur 24 hours after the scram.
The greatest assurance that xenon reactivity will permit criticality during the reactor startup will be attained if the reactor is operated at _____ power for 48 hours prior to the scram and if criticality is rescheduled for _____ hours after the scram.
A. 60%; 18
B. 60%; 30
C. 100%; 18
D. 100%; 30
ANSWER: B.

反應器在80%功率下運轉兩個月，為了測試需要以手動方式急停。急停後進行反應器啟動，並且預計在急停24小時後達到臨界。若此反應器在急停前於____功率下運轉48小時，同時若預計於急停後____小時臨界，則最能確保氙毒的反應度不會影響反應器在啟動期間可以達到臨界。
A. 60%; 18
B. 60%; 30
C. 100%; 18
D. 100%; 30
答案： B.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B173

A reactor has been operating at 50% power for four days. Power is then increased to 100% over a 1 hour period. How much time will be required for core xenon-135 concentration to reach its minimum value after the power increase?
A. 4 to 8 hours
B. 10 to 15 hours
C. 40 to 50 hours
D. 70 to 80 hours
ANSWER: A.

反應器在50%功率下運轉四天，其後在一小時內增加到100%功率。在功率增加後約需多少時間，爐心Xe-135濃度會降低到其最小值？
A. 4至8小時
B. 10至15小時
C. 40至50小時
D. 70至80小時
答案： A.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B459 (P260)

Two identical reactors have been operating at a constant power level for one week. Reactor A is at 50% power and reactor B is at 100% power. If both reactors scram at the same time, xenon- 135 will peak first in reactor _____ and the highest xenon-135 reactivity peak will occur in reactor _____.
A. B; B
B. B; A
C. A; B
D. A; A
ANSWER: C.

兩相同之反應器在固定功率下運轉一週。反應器A在50％功率，而反應器B在100％功率下運轉。若兩反應器同時發生急停，在反應器____的Xe-135會先達到峰值，而Xe-135反應度峰值最高會發生在反應器____。
A. B；B
B. B；A
C. A；B
D. A；A
答案： C.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B1362

A reactor has been operating at 100% power for two weeks when power is reduced to 50%. During the next 2 hours, what must the operator do to compensate for a change in core Xe-135?
A. The operator must add positive reactivity because Xe-135 is decaying.
B. The operator must add negative reactivity because Xe-135 is decaying.
C. The operator must add positive reactivity because Xe-135 is building in.
D. The operator must add negative reactivity because Xe-135 is building in.
ANSWER: C.

反應器在100%功率下運轉兩週，然後降至50%功率。在其後2小時內，運轉員需要怎麼做以補償爐心Xe-135的改變？
A. 運轉員必須要加入正反應度，因為Xe-135在衰變中
B. 運轉員必須要加入負反應度，因為Xe-135在衰變中
C. 運轉員必須要加入正反應度，因為Xe-135在累積中
D. 運轉員必須要加入負反應度，因為Xe-135在累積中
答案： C.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B1759

Which one of the following describes the change in core xenon-135 concentration immediately following a 10% power increase from equilibrium 70% power over a two-hour period?

A. Xe-135 concentration will initially decrease due to the increased rate of decay of Xe-135 to Cs-135.
B. Xe-135 concentration will initially decrease due to the increased absorption of thermal neutrons by xenon-135.
C. Xe-135 concentration will initially increase due to the increased I-135 production rate directly from fission.
D. Xe-135 concentration will initially increase due to the increased production rate directly from fission.

ANSWER: B.

從70%平衡功率在兩小時內增加10%後，下列何者正確地描述了爐心內Xe-135的濃度變化？

A. Xe-135濃度起初減小，因為Xe-135衰變至銫-135的速率增加
B. Xe-135濃度起初減小，因為被Xe-135吸收的熱中子增加
C. Xe-135濃度起初增加，因為直接從分裂而生的碘-135增加
D. Xe-135濃度起初增加，因為直接從分裂而生的Xe-135增加

答案： B.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B1761 (P1159)

Two identical reactors have been operating at a constant power level for one week. Reactor A is at 100% power and reactor B is at 50% power. If both reactors scram at the same time, xenon- 135 concentration will peak first in reactor _____ and the highest peak xenon-135 concentration will occur in reactor _____.
A. B; B
B. B; A
C. A; B
D. A; A
ANSWER: B.

兩相同反應器在固定功率下運轉一週。反應器A在100%功率，反應器B在50%功率下運轉。若兩反應器同時發生急停，則反應器____將先出現Xe-135濃度的峰值，而最高的Xe-135濃度將會出現在反應器____中。
A. B；B
B. B；A
C. A；B
D. A；A
答案： B.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B2063

A reactor had been operating at 50% power for two weeks when power was increased to 100% over a 3-hour period. To maintain reactor power stable during the next 24 hours, which one of the following incremental control rod manipulations will be required?
A. Withdraw rods slowly during the entire period
B. Withdraw rods slowly at first, then insert rods slowly
C. Insert rods slowly during the entire period
D. Insert rods slowly at first, then withdraw rods slowly
ANSWER: D.

反應器於50％功率下運轉兩週，在3小時內將功率增加至100％。為了在之後24小時內維持反應器功率穩定，則控制棒需要以下列何種方式操作？
A. 在整個階段當中緩慢抽出控制棒
B. 最初緩慢抽出控制棒，然後緩慢插入控制棒
C. 在整個階段當中緩慢插入控制棒
D. 最初緩慢插入控制棒，然後緩慢抽出控制棒
答案： D.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B2158 (P2061)

A reactor had been operating at 100% power for two weeks when power was reduced to 50% over a 1-hour period. In order to maintain reactor power stable during the next 24 hours, which one of the following incremental control rod manipulations will be required?
A. Withdraw rods slowly during the entire period.
B. Withdraw rods slowly at first, then insert rods slowly.
C. Insert rods slowly during the entire period.
D. Insert rods slowly at first, then withdraw rods slowly.
ANSWER: B.

反應器在100％功率下運轉兩週，在一小時內降低為50％功率。為了在之後24小時內維持反應器功率穩定，則控制棒需要以下列何種方式操作？
A. 在整個階段當中緩慢抽出控制棒
B. 最初緩慢抽出控制棒，然後緩慢插入控制棒
C. 在整個階段當中緩慢插入控制棒
D. 最初緩慢插入控制棒，然後緩慢抽出控制棒
答案： B.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B2259

Which one of the following describes the change in core xenon-135 concentration immediately following a power increase from 50% power equilibrium conditions?
A. Initially decreases due to the increased rate of xenon-135 radioactive decay.
B. Initially decreases due to the increased absorption of thermal neutrons by xenon-135.
C. Initially increases due to the increased xenon-135 production from fission.
D. Initially increases due to the increased iodine-135 production from fission.
ANSWER: B.

下列何者正確地描述了從50%功率平衡狀態下，增加功率後爐心內Xe-135的濃度變化？
A. 起初減少，因為Xe-135放射衰變率增加
B. 起初減少，因為Xe-135的熱中子吸收增加
C. 起初增加，因為由分裂而生的Xe-135增加
D. 起初增加，因為由分裂而生的碘-135增加
答案： B.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B2361 (P2360)

A reactor had been operating at 70% power for two weeks when power was increased to 100% over a 2-hour period. To offset core Xe-135 reactivity changes during the next 12 hours, which one of the following incremental control rod manipulations will be required?
A. Withdraw rods slowly during the entire period.
B. Withdraw rods slowly at first, then insert rods slowly.
C. Insert rods slowly during the entire period.
D. Insert rods slowly at first, then withdraw rods slowly.
ANSWER: D.

反應器於70%功率運轉兩週，在兩小時內增加至100%功率。為了補償在之後12小時內爐心Xe-135的反應度變化，則控制棒需要以下列何種方式操作？
A. 在整個階段當中緩慢抽出控制棒
B. 最初緩慢抽出控制棒，然後緩慢插入控制棒
C. 在整個階段當中緩慢插入控制棒
D. 最初緩慢插入控制棒，然後緩慢抽出控制棒
答案： D.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B2561 (P2559)

A reactor is initially operating at 100% power with equilibrium core xenon-135. Power is decreased to 50% over a 2 hour period. No subsequent operator actions are taken. Considering only the reactivity effects of core xenon-135 changes, which one of the following describes reactor power 10 hours after the power change is completed?
A. Less than 50% and decreasing slowly
B. Less than 50% and increasing slowly
C. Greater than 50% and decreasing slowly
D. Greater than 50% and increasing slowly
ANSWER: B.

反應器爐心起初在平衡Xe-135條件下，於100％功率運轉。功率在兩小時內減少至50％。沒有採取任何運轉員動作，只考慮爐心內Xe-135改變所產生的反應度效應，下列何者正確地描述了在功率改變完成經10小時後之反應器功率？
A. 小於50％，並且緩慢減小
B. 小於50％，並且緩慢增加
C. 大於50％，並且緩慢減小
D. 大於50％，並且緩慢增加
答案： B.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B2762

A reactor is initially operating at 60% power with equilibrium core xenon-135. Power is increased to 80% over a 2-hour period. No subsequent operator actions are taken.
Considering only the reactivity effects of core xenon-135 changes, which one of the following describes reactor power 24 hours after the power change is completed?
A. Greater than 80% and decreasing slowly
B. Greater than 80% and increasing slowly
C. Less than 80% and decreasing slowly
D. Less than 80% and increasing slowly
ANSWER: C.

反應器爐心起初在平衡Xe-135條件下，於60％功率運轉。功率在兩小時內增加至80％。沒有採取任何運轉員動作。只考慮爐心內Xe-135改變所產生的反應度效應，下列何者正確地描述了在功率改變完成經24小時後之反應器功率？
A. 大於80％，並且緩慢減小
B. 大於80％，並且緩慢增加
C. 小於80％，並且緩慢減小
D. 小於80％，並且緩慢增加
答案： C.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B2862

A reactor has been operating at 50% power for 3 hours following a one-hour power reduction from steady-state 100% power. Which one of the following describes the current core xenon-135 concentration?
A. Increasing toward a peak
B. Decreasing toward an upturn
C. Increasing toward equilibrium
D. Decreasing toward equilibrium
ANSWER: A.

反應器功率於一小時內從100％穩態功率降至50％功率，並運轉三小時。下列何者正確地描述了目前爐心內Xe-135之濃度？
A. 朝向峰值增加
B. 朝向回升減小
C. 朝向平衡增加
D. 朝向平衡減小
答案： A.

科目： 292006
知能類： K1.11 [2.6/2.7]
序號： B3259

A reactor is initially operating at equilibrium 100% power. An operator inserts control rods intermittently over a period of 30 minutes. At the end of this time period, reactor power is 70%. Assuming no additional operator actions are taken, what will reactor power be after an additional 60 minutes?
A. 70% and stable
B. Less than 70% and slowly increasing
C. Less than 70% and slowly decreasing
D. Less than 70% and stable
ANSWER: C.

反應器起初於100％平衡功率運轉。運轉員在30分鐘的期間內間歇地插入控制棒。在此期間結束時，反應器功率為70％。假設運轉員未再採取任何動作，則之後的60分鐘後，反應器的功率將會如何？
A. 70%，且維持穩定
B. 小於70％，且緩慢增加
C. 小於70％，且緩慢減小
D. 小於70%，且維持穩定
答案： C.

科目： 292006
知能類： K1.12 [2.8/2.3]
序號： B463

A reactor has been operating at 100% power for several weeks. Following a reactor scram/trip the reactor first will be considered xenon-free after...
A. 40 to 50 hours.
B. 70 to 80 hours.
C. 100 to 110 hours.
D. 130 to 140 hours.
ANSWER: B.

反應器在100％功率下運轉數週。在反應器急停之後需經過多少時間，反應器才被認為已處於無氙毒狀況？
A. 40至50小時
B. 70至80小時
C. 100至110小時
D. 130至140小時
答案： B.

科目： 292006
知能類： K1.12 [2.8/2.3]
序號： B1462

A reactor scram has occurred following two months operation at steady-state 100% power. How soon after the scram will the reactor first be considered xenon-free?
A. 8 to 10 hours
B. 24 to 30 hours
C. 40 to 50 hours
D. 70 to 80 hours
ANSWER: D.

反應器在100%穩態功率下運轉兩個月後發生急停，在急停後需經多少時間反應器才被認為處於無氙毒狀況？
A. 8至10小時
B. 24至30小時
C. 40至50小時
D. 70至80小時
答案： D.

科目： 292006
知能類： K1.12 [2.8/2.3]
序號： B2159 (P1063)

A reactor has been operating at 100% power for three weeks when a reactor scram occurs. Which one of the following describes the concentration of Xe-135 in the core 24 hours after the scram?
A. At least 2 times the concentration at the time of the scram and decreasing
B. Less than 1/2 the concentration at the time of the scram and decreasing
C. At or approaching a peak value
D. Approximately the same as at the time of the scram
ANSWER: D.

反應器在100%功率下運轉三週，發生反應器急停。下列何者正確地描述了在急停24小時後，爐心內的Xe-135濃度？
A. 至少是急停時的兩倍，並且逐漸減小
B. 不到急停時的二分之一，並且逐漸減小
C. 位於或接近峰值
D. 大約與急停時相等
答案： D.

科目： 292006
知能類： K1.12 [2.8/2.3]
序號： B2262 (P2462)

Twenty-four hours after a reactor scram from a long-term, steady-state, 100% power run, the core xenon-135 concentration will be approximately...
A. the same as at the time of the scram and decreasing.
B. the same as at the time of the scram and increasing.
C. 50% lower than at the time of the scram and decreasing.
D. 50% higher than at the time of the scram and increasing.
ANSWER: A.

反應器在長期穩態100％功率下運轉後發生急停，之後24小時爐心的Xe-135濃度大約
A. 與急停時相等，並且逐漸減小
B. 與急停時相等，並且逐漸增加
C. 較急停時小50％，並且逐漸減小
D. 較急停時大50％，並且逐漸增加
答案： A.

科目： 292006
知能類： K1.12 [2.8/2.3]
序號： B2461 (P2262)

Fourteen hours after a reactor scram from 100% power equilibrium xenon conditions, the amount of core xenon-135 will be...

A. lower than 100% equilibrium xenon, and will have added a net positive reactivity since the scram.
B. lower than 100% equilibrium xenon, and will have added a net negative reactivity since the scram.
C. higher than 100% equilibrium xenon, and will have added a net positive reactivity since the scram.
D. higher than 100% equilibrium xenon, and will have added a net negative reactivity since the scram.

ANSWER: D.

反應器在100％功率平衡氙毒狀況下發生急停，之後14小時爐心內Xe-135的含量將會

A. 小於100％平衡氙毒，並且自急停之後加入淨正反應度
B. 小於100％平衡氙毒，並且自急停之後加入淨負反應度
C. 大於100％平衡氙毒，並且自急停之後加入淨正反應度
D. 大於100％平衡氙毒，並且自急停之後加入淨負反應度

答案： D.

科目： 292006
知能類： K1.12 [2.8/2.3]
序號： B2662 (P2662)

Given:
A reactor had been operating at 100% power for six weeks when a scram occurred.
A reactor startup was performed and criticality was reached 16 hours after the scram.
Two hours later, the reactor is stable at 30% power.
If no operator actions occur during the next hour, reactor power will _____ because core Xe-135 concentration is _____.
A. increase; decreasing
B. increase; increasing
C. decrease; decreasing
D. decrease; increasing
ANSWER: A.

反應器於100%功率運轉六週，此時發生急停。其後進行反應器啟動，並於急停16小時後達到臨界。兩小時後，反應器於30%功率達到穩定。若在之後一小時內運轉員未採取任何動作，則反應器功率將會____，因為爐心Xe-135濃度正在____。
A. 增加；減小
B. 增加；增加
C. 減小；減小
D. 減小；增加
答案： A.

科目： 292006
知能類： K1.12 [2.8/2.3]
序號： B2763 (P2762)

A 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-stateconcentration in _____ hours.
A. 8 to 10
B. 20 to 25
C. 40 to 50
D. 70 to 80
ANSWER: D.

反應器於100%功率下運轉兩個月，然後在兩小時內進行停機。在停機之後，爐心內Xe-135將會在____小時後達到長期穩態濃度。
A. 8至10
B. 20至25
C. 40至50
D. 70至80
答案： D.

科目： 292006
知能類： K1.13 [2.6/2.6]
序號： B63

If a reactor that has operated at 100% power for 10 days is shut down rapidly, xenon concentration will...
A. slowly decay away to almost zero in 3 days.
B. increase to a new equilibrium in 3 days.
C. peak in about a half day, then decay to almost zero in 3 days.
D. ramp down with reactor power.
ANSWER: C.

若反應器於100%功率運轉10天，然後快速停機，氙毒濃度將會
A. 在3天內緩慢衰退至接近零
B. 在3天內增加到新平衡值
C. 在半天內達到峰值，然後在3天內衰退至接近零
D. 隨反應器功率平滑降低
答案： C.

科目： 292006
知能類： K1.13 [2.6/2.6]
序號： B1463

Which one of the following describes a reason for the direction of change in core xenon-135 reactivity immediately after a reactor shutdown from long-term power operation?
A. The production rate of Xe-135 from I-135 decay significantly decreases.
B. The production rate of Xe-135 from fission significantly decreases.
C. The removal rate of Xe-135 by decay to I-135 significantly decreases.
D. The removal rate of Xe-135 by neutron absorption significantly decreases.
ANSWER: D.

反應器在長期功率運轉後停機，下列何者正確地描述了停機後爐心內Xe-135反應度立即變化的原因？
A. 由碘-135衰變而生之Xe-135的產生率顯著減小
B. 由分裂而生之Xe-135的產生率顯著減小
C. Xe-135衰變至碘-135之Xe-135移除率顯著減小
D. 被中子吸收之Xe-135移除率顯著減小
答案： D.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B56

A reactor has been shut down for two weeks after six months of full power operation. A reactor startup is performed and reactor power is stabilized at 10%. What control rod movement is required to maintain 10% stable power over the next 2 hours?
A. Small amounts of rod insertion to compensate for samarium depletion.
B. Small amounts of rod withdrawal to compensate for samarium buildup.
C. Small amounts of rod insertion to compensate for xenon burnout.
D. Small amounts of rod withdrawal to compensate for xenon buildup.
ANSWER: D.

反應器在六個月全功率運轉後，停機兩週。而後反應器啟動，同時反應器穩定在10%功率。欲在之後2小時內維持10%的穩定功率，則需要如何移動控制棒？
A. 小量的控制棒插入，以補償Sm的燃耗
B. 小量的控制棒抽出，以補償Sm的累積
C. 小量的控制棒插入，以補償Xe的燃耗
D. 小量的控制棒抽出，以補償Xe的累積
答案： D.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B62

A reactor that has been operating at 100% power for about two weeks has power reduced to 50% in 1 hour. To compensate for the change in xenon-135 during the next 4 hours, the operator must add...
A. negative reactivity to compensate for xenon building in.
B. negative reactivity because xenon is rapidly decaying away.
C. positive reactivity to compensate for xenon building in.
D. positive reactivity because xenon is rapidly decaying away.
ANSWER: C.

反應器在100%功率下運轉兩週，然後在1小時內下降至50%功率。為了補償Xe-135在之後4小時內的改變，運轉員應該加入
A. 負反應度，以補償氙毒的累積
B. 負反應度，因為氙的迅速衰變
C. 正反應度，以補償氙的累積
D. 正反應度，因為氙的快速衰變
答案： C.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B263

A reactor has been operating at full power for 10 weeks when a scram occurs. The reactor is made critical 24 hours later, and power level is maintained low in the intermediate range. To maintain a constant power level for the next several hours, control rods must be...
A. inserted, because xenon burnout will cause increased neutron flux peaking near the periphery of the core.
B. maintained at the present height as xenon establishes its equilibrium value for this power level.
C. inserted, because xenon will approximately follow its normal decay curve.
D. withdrawn, because xenon concentration is increasing toward equilibrium.
ANSWER: C.

反應器在全功率下運轉10週後發生急停。此反應器在24小時後達到臨界，而功率維持在中程階低值附近。為了在之後數小時內維持穩定功率，控制棒應該
A. 插入，因為氙毒燃耗將會導致在爐心邊緣附近的中子通量峰值增加
B. 維持在目前的高度，因為氙毒在此功率下建立其平衡值
C. 插入，因為氙毒將會約略遵循其正常衰變曲線減少
D. 抽出，因為氙毒濃度正朝著平衡增加
答案： C.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B363 (P2260)

A reactor is initially shut down with no xenon in the core. The reactor is taken critical and 4 hours later power is in the middle of the intermediate range monitors, range 8. The maintenance department has asked that power be maintained constant at this level for approximately 12 hours. To accomplish this, control rods will have to be...
A. withdrawn slowly for the duration of the 12 hours.
B. inserted slowly for the duration of the 12 hours.
C. withdrawn slowly for 4 to 6 hours, then inserted slowly.
D. inserted slowly for 4 to 6 hours, then withdrawn slowly.
ANSWER: A.

反應器一開始處於停機狀態，且爐心無氙毒。然後將反應器啟動達到臨界，4小時後功率在中程階中子偵檢器的中央第8階。維修部門要求穩定維持在此功率約12小時。為了達成此目標，控制棒必須
A. 於此12小時中緩慢抽出
B. 於此12小時中緩慢插入
C. 於4至6小時中緩慢抽出，然後緩慢插入
D. 於4至6小時中緩慢插入，然後緩慢抽出
答案： A.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B461

Four hours after a reactor scram from a long-term, steady-state, 100% power run, the reactor has been taken critical and is to be maintained at 1% to 2% power. Which one of the following operator actions is required?
A. Add positive reactivity because xenon is building in
B. Add negative reactivity because xenon is building in
C. Add negative reactivity because xenon is decaying away
D. Add positive reactivity because xenon is decaying away
ANSWER: A.

反應器於100%長期穩態功率運轉後發生急停，其後四小時此反應器達到臨界，並維持在1%至2%功率。運轉員必須採取下列何種動作？
A. 加入正反應度，因為氙毒正在累積
B. 加入負反應度，因為氙毒正在累積
C. 加入負反應度，因為氙毒正在衰變
D. 加入正反應度，因為氙毒正在衰變
答案： A.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B964 (P2262)

Sixteen hours after a reactor scram from 100% power, equilibrium xenon condition, the amount of core xenon will be...

A. lower than 100% equilibrium xenon, and will have added a net positive reactivity since the scram.
B. higher than 100% equilibrium xenon, and will have added a net positive reactivity since the scram.
C. lower than 100% equilibrium xenon, and will have added a net negative reactivity since the scram.
D. higher than 100% equilibrium xenon, and will have added a net negative reactivity since the scram.

ANSWER: D.

反應器在100％功率、平衡氙毒狀況下發生急停，之後16小時，爐心氙毒含量將會

A. 小於100％平衡氙毒，並且自急停之後，加入淨正反應度
B. 大於100％平衡氙毒，並且自急停之後，加入淨正反應度
C. 小於100％平衡氙毒，並且自急停之後，加入淨負反應度
D. 大於100％平衡氙毒，並且自急停之後，加入淨負反應度

答案： D.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B1164

A reactor is operating at 100% power with equilibrium xenon conditions at the beginning of a fuel cycle when a reactor scram occurs. The reactor is taken critical 4 hours later. Which one of the following describes the effect of xenon on control rod worth when the reactor becomes critical?

A. Increasing xenon concentration at the periphery of the core will cause periphery rods to exhibit high-worth characteristics.
B. Peak thermal flux at the periphery of the core will cause periphery rods to exhibit high-worth characteristics.
C. Peak thermal flux at the center of the core will cause center rods to exhibit high-worth characteristics.
D. Decreasing xenon concentration at the center of the core will cause center control rods to exhibit high-worth characteristics.

ANSWER: B.

反應器在燃料週期初期、平衡氙毒狀況下於100％功率運轉，此時發生反應器急停。此反應器4小時後達到臨界。下列何者正確地描述了在反應器臨界時，氙毒對控制棒本領的影響？

A. 增加爐心邊緣氙毒濃度將會導致邊緣控制棒呈現高本領特徵
B. 在爐心邊緣的峰值熱通量將會導致邊緣控制棒呈現高本領特徵
C. 在爐心中央的峰值熱通量將會導致中央控制棒呈現高本領特徵
D. 降低爐心中央氙毒濃度將會導致中央控制棒呈現高本領特徵

答案： B.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B1663

A reactor is initially operating at 50% power with equilibrium core xenon-135. Power is increased to 75% over a 1 hour period with no subsequent operator actions. Considering only the reactivity effects of core xenon-135 changes, which one of the following describes reactor power 8 hours after the power change?
A. Greater than 75% and decreasing slowly
B. Greater than 75% and increasing slowly
C. Lower than 75% and decreasing slowly
D. Lower than 75% and increasing slowly
ANSWER: A.

反應器起初在50%功率之爐心Xe-135平衡狀況下運轉。在一小時期間內增加至75%功率，運轉員未採取任何動作。只考慮爐心內Xe-135改變所產生的反應度效應，下列何者正確地描述了在功率改變完成經8小時後之反應器功率？
A. 大於75%，並且緩慢減小
B. 大於75%，並且緩慢增加
C. 小於75%，並且緩慢減小
D. 小於75%，並且緩慢增加
答案： A.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B1762

A reactor is operating at 100% power with equilibrium xenon conditions at the beginning of a fuel cycle when a reactor scram occurs. The reactor is taken critical 4 hours later. Which one of the following describes the effect of core xenon-135 on control rod worth when the reactor becomes critical?

A. High xenon-135 concentration at the periphery of the core will cause periphery rods to exhibit relatively high-worth characteristics.
B. High xenon-135 concentration at the periphery of the core will cause central rods to exhibit relatively high-worth characteristics.
C. High xenon-135 concentration at the center of the core will cause peripheral rods to exhibit relatively high-worth characteristics.
D. High xenon-135 concentration at the center of the core will cause central rods to exhibit relatively high-worth characteristics.

ANSWER: C.

反應器在燃料週期初期、平衡氙毒狀況下於100％功率運轉，此時發生反應器急停。此反應器4小時後達到臨界。下列何者正確地描述了反應器臨界時，爐心Xe-135對控制棒本領的影響？

A. 爐心邊緣Xe-135的高濃度將會導致邊緣控制棒呈現相對的高本領特徵
B. 爐心邊緣Xe-135的高濃度將會導致中央控制棒呈現相對的高本領特徵
C. 爐心中央Xe-135的高濃度將會導致邊緣控制棒呈現相對的高本領特徵
D. 爐心中央Xe-135的高濃度將會導致中央控制棒呈現相對的高本領特徵

答案： C.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B1862 (P361)

A plant has been operating at 100% power for two months when a reactor scram occurs. Shortly after the reactor scram a reactor startup is commenced. Six hours after the scram, reactor power is at 2%. To maintain power stable at 2% over the next hour, the operator must add...
A. positive reactivity because core xenon-135 is building up.
B. negative reactivity because core xenon-135 is building up.
C. positive reactivity because core xenon-135 is decaying away.
D. negative reactivity because core xenon-135 is decaying away.
ANSWER: A.

反應器於100%功率下運轉兩個月，此時發生急停。急停發生不久此反應器準備進行啟動，急停後六小時，反應器功率為2%。為了在之後一小時內維持功率穩定於2%，則運轉員應該加入
A. 正反應度，因為爐心Xe-135正在累積
B. 負反應度，因為爐心Xe-135正在累積
C. 正反應度，因為爐心Xe-135正在衰變
D. 負反應度，因為爐心Xe-135正在衰變
答案： A.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B2062

A reactor is initially operating at 100% power with equilibrium core xenon-135. Power is decreased to 75% over a 1-hour period and stabilized. No subsequent operator actions are taken. Considering only the reactivity effects of core xenon-135 changes, which one of the following describes reactor power 10 hours after the power change?
A. Greater than 75% and decreasing slowly
B. Greater than 75% and increasing slowly
C. Less than 75% and decreasing slowly
D. Less than 75% and increasing slowly
ANSWER: D.

反應器起初在100%功率之爐心Xe-135平衡狀況下運轉，功率在一小時內降低至75%並達到穩定，且運轉員未採取任何動作。只考慮爐心內Xe-135改變所產生的反應度效應，下列何者正確地描述了在功率改變完成經10小時後之反應器功率？
A. 大於75%，並且緩慢減小
B. 大於75%，並且緩慢增加
C. 小於75%，並且緩慢減小
D. 小於75%，並且緩慢增加
答案： D.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B2263 (N/A)

A reactor is operating at 80% power following a power reduction from 100% over a one-hour period. To keep reactor power at 80% over the next three hours, the operator must _____ control rods or _____ reactor recirculation flow rate.
A. insert; increase
B. insert; decrease
C. withdraw; increase
D. withdraw; decrease
ANSWER: C.

反應器在一小時內從100%功率降載至80%功率運轉。為了之後三小時維持反應器功率在80%，運轉員應該_____控制棒或者_____反應器再循環流量。
A. 插入；增加
B. 插入；減小
C. 抽出；增加
D. 抽出；減小
答案： C.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B2964 (P2963)

A reactor is operating at 60% power immediately after a one-hour power increase from equilibrium 40% power. To keep reactor power at 60% over the next two hours, the operator must _____ control rods or _____ reactor recirculation flow rate.
A. insert; increase
B. insert; decrease
C. withdraw; increase
D. withdraw; decrease
ANSWER: B.

反應器在一小時內，從40%平衡功率瞬速增加至60%功率運轉。為了之後兩小時內維持反應器功率在60%，運轉員應該_____控制棒或者_____反應器再循環流量。
A. 插入；增加
B. 插入；減小
C. 抽出；增加
D. 抽出；減小
答案： B.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B3063

A reactor is initially operating at 100% power with equilibrium core xenon-135. Power is decreased to 75% over a 1-hour period and stabilized. No subsequent operator actions are taken. Considering only the reactivity effects of core xenon-135 changes, which one of the following describes reactor power 30 hours after the power change?
A. Less than 75% and increasing slowly
B. Less than 75% and decreasing slowly
C. Greater than 75% and increasing slowly
D. Greater than 75% and decreasing slowly
ANSWER: C.

反應器起初在100%功率之爐心Xe-135平衡狀況下運轉，功率在一小時內降低至75%並達到穩定，且運轉員未採取任何動作。只考慮爐心內Xe-135改變所產生的反應度效應，下列何者正確地描述了在功率改變完成經30小時後之反應器功率？
A. 小於75%，並且緩慢增加
B. 小於75%，並且緩慢減小
C. 大於75%，並且緩慢增加
D. 大於75%，並且緩慢減小
答案： C.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B3563 (P3563)

A plant had been operating at 100% power for two months when a reactor scram occurred. Soon afterward, a reactor startup was performed. Twelve hours after the scram, the startup has been paused with reactor power at 2%.
To maintain reactor power stable at 2% over the next hour, the operator must add _____ reactivity because core xenon-135 concentration will be _____.
A. positive; increasing.
B. negative; increasing.
C. positive; decreasing.
D. negative; decreasing.
ANSWER: D.

電廠在100%功率下運轉兩個月，此時發生反應器急停。不久之後，反應器進行啟動，急停後12小時反應器功率為2%。為了維持之後一小時內反應器功率仍穩定於2%，運轉員應該加入_____反應度，因為爐心Xe-135濃度將會_____。
A. 正；增加
B. 負；增加
C. 正；減少
D. 負；減少
答案： D.

科目： 292006
知能類： K1.14 [3.1/3.2]
序號： B3863

A nuclear power plant has been operating at steady-state 100% reactor power for three weeks when the operator slowly adds negative reactivity to the core over a period of 15 minutes to lower power level to 90%. Which one of the following describes reactor power 60 minutes later
if no additional operator action is taken?
A. Higher than 90% and increasing slowly.
B. Higher than 90% and decreasing slowly.
C. Lower than 90% and increasing slowly.
D. Lower than 90% and decreasing slowly.
ANSWER: D.

核能電廠在100％穩態功率下運轉三週，此時運轉員在15分鐘內對爐心緩慢加入負反應度，將功率降低至90％。若運轉員未採取任何動作，則下列何者正確地描述了60分鐘後的反應器功率？
A. 高於90％，並緩慢增加
B. 高於90％，並緩慢減少
C. 低於90％，並緩慢增加
D. 低於90％，並緩慢減少
答案： D.

科目/題號：292006/1 (2016 新增)
知能類：k1.07〔3.2/3.2〕
序號：B1361(P1358)

A reactor has been operating at 75 percent power for two months. A manual reactor scram is required for a test. The scram will be followed immediately by a reactor startup with criticality scheduled to occur 12 hours after the scram.
The greatest assurance that fission product poison reactivity will permit criticality during the startup will exist if the reactor is operated at _____ power for 48 hours prior to the scram; and if criticality is rescheduled for _____ hours after the scram.
A. 100 percent; 8
B. 100 percent; 16
C. 50 percent; 8
D. 50 percent; 16
ANSWER: D.

核子反應器在75%功率下運轉兩個月，基於測試之需而以手動急停。急停後需要立即啟動反應器，並預計在急停後12小時達到臨界。
若此反應器在急停前於_____功率下運轉48小時，同時再度預定於急停後_____小時臨界，最能確保分裂產物毒物反應度不影響反應器在啟動期間達到臨界。
A. 100%；8
B. 100%；16
C. 50%；8
D. 50%；16

答案： D

科目/題號：292006/2 (2016 新增)
知能類：k1.07〔3.2/3.2〕
序號：B3861(P3860)

A reactor has been operating at 80 percent power for two months. A manual reactor scram is required for a test. The scram will be followed by a reactor startup with criticality scheduled to occur 24 hours after the scram.
The greatest assurance that xenon-135 reactivity will permit criticality during the reactor startup will exist if the reactor is operated at _____ power for 48 hours prior to the scram; and if criticality is rescheduled for _____ hours after the scram.
A. 60 percent; 18
B. 60 percent; 30
C. 100 percent; 18
D. 100 percent; 30
ANSWER: B.

核子反應器在80%功率下運轉兩個月，基於測試之需而以手動急停。急停後需要立即啟動反應器，並預計在急停後24小時達到臨界。
若此反應器在急停前於_____功率下運轉 48 小時，同時再度預定於急停後_____小時臨界，最能確保氙-135 反應度不影響反應器在啟動期間達到臨界。
A.60%；18
B.60%；30
C.100%；18
D.100%；30

答案： B

科目/題號：292006/3 (2016 新增)
知能類：k1.07〔3.2/3.2〕
序號：B6031

A reactor scram occurred one hour ago following several months of operation at 100 percent power. Reactor vessel pressure is being maintained at 800 psia and the source range count rate is currently 400 cps. If no operator action is taken, how will the source range count rate respond during the next 24 hours? (Assume a constant source neutron flux.)
A. The count rate will remain about the same.
B. The count rate will decrease for the entire period.
C. The count rate will initially decrease and then increase.
D. The count rate will initially increase and then decrease.
ANSWER: C.

反應器在100%運轉數個月後於1小時前發生急停。反應器壓力保持在800 psia，而源階計數率目前是400 cps。假如運轉員未採取任何行動，則在未來24小時源階計數率的反應為何？(假設中子源通量為不變)
A.計數率將大約保持不變
B.計數率在整個期間將減少
C.計數率起初減少然後增加
D.計數率起初增加然後減少

答案： C

科目/題號：292006/4 (2016 新增)
知能類：k1.09〔2.5/2.5〕
序號：B6930

A nuclear power plant was operating at 100 percent power for 3 months near the end of a fuel cycle when a reactor scram occurred. Eighteen hours later, the reactor is critical at the point of adding heat with normal operating reactor vessel temperature and pressure. Power level will be raised to 100 percent over the next 3 hours. During this power level increase, most of the positive reactivity added by the operator will be required to overcome the negative reactivity from...
A. fuel burnup.
B. xenon-135 buildup.
C. fuel temperature increase.
D. moderator temperature increase.
ANSWER: C.

當反應器發生急停時，此核能電廠已在接近燃料循環末期以100%功率運轉三個月。於18小時後，反應器以正常運轉溫度和壓力在加熱點達臨界。在其後3小時反應器功率提升至100%。在此功率提升時，運轉員所必須加入之正反應度主要係用來克服由____所造成之負反應度。
A.燃料燃耗
B.氙-135逐漸累積
C.燃料溫度上升
D.緩和劑溫度上升

答案： C

科目/題號：292006/5 (2016新增)
知能類：K1.09 [2.5/2.5]
序號：B5631 (P5631)

A reactor has been shut down for 7 days to perform maintenance. A reactor startup is performed, and power level is increased to 50 percent over a two-hour period. Ten hours after reactor power reaches 50 percent, the magnitude of xenon-135 negative reactivity will be...
A. increasing toward a downturn.
B. increasing toward an equilibrium value.
C. decreasing toward an equilibrium value.
D. decreasing toward an upturn.
ANSWER: B.

一反應器已停機 7天以進行維修後，反應器執行啟動，並在 2小時內提升至50%功率。當反應器功率達50%後 10小時，氙-135的負反應度將會_____。
A.由增加變反轉向降低
B.增加到一個平衡值
C.降低到一個平衡值
D.由降低變反轉向增加

答案： B

科目/題號：292006/6 (2016 新增)
知能類： K1.10 [2.9/2.9]
序號： B4430

A reactor scram occurred from steady-state 100 percent power and a reactor startup is currently in progress. Which one of the following sets of initial startup conditions will require the smallest amount of control rod withdrawal to achieve criticality? (BOC--beginning of fuel cycle; EOC – end of fuel cycle.)

	Core Age	Time Since Reactor Scram
A.	BOC	12 hours
B.	BOC	40 hours
C.	EOC	12 hours
D.	EOC	40 hours

ANSWER: B.

一反應器從100%功率穩定狀態發生急停，目前正進行反應器啟動。下列何者初始啟動條件組合，係達到臨界所需抽出的控制棒最少？(BOC—燃料週期初期；EOC--燃料週期末期)

	爐心壽命	反應器急停後時間
A.	燃料週期初期	12小時
B.	燃料週期初期	40小時
C.	燃料週期末期	12小時
D.	燃料週期末期	40小時

答案： B

科目/題號：292006/7 (2016 新增)
知能類：K1.14 [3.1/3.2]
序號：B4631

Six hours after a reactor scram from steady-state 100 percent power operation, a reactor is taken critical and power is immediately stabilized low in the intermediate range. To maintain the reactor critical at a constant power level for the next hour, the operator must add _____ reactivity because the xenon-135 concentration is _____.
A. negative; increasing
B. negative; decreasing
C. positive; increasing
D. positive; decreasing
ANSWER: C.

反應器從100%運轉穩定狀態急停後6小時，此反應器即啟動至臨界且穩定在中程階的低功率。為維持反應器在未來數小時保持臨界功率，運轉員必須加入____反應度，因為氙-135濃度____。
A.負值；增加
B.負值；減少
C.正值；增加
D.正值；減少

答案： C

科目/題號：292006/8 (2016 新增)
知能類：k1.14〔3.1/3.2〕
序號：B6831(P6831)

A reactor has been shut down for 7 days following 2 months of steady-state 100 percent power operation. A reactor startup is then performed and the reactor is taken to 100 percent power over a 12-hour period. After 100 percent power is reached, what incremental control rod positioning will be needed to compensate for xenon-135 changes over the next 24 hours?
A. Withdraw rods slowly during the entire period.
B. Withdraw rods slowly at first, and then insert rods slowly.
C. Insert rods slowly during the entire period.
D. Insert rods slowly at first, and then withdraw rods slowly.
ANSWER: A.

一反應器於100%穩定狀態運轉兩個月後，已停機 7天。然後此反應器執行啟動，並在12小時期間將反應器功率提升到100%。在達到100%功率後，於未來24小時必須抽出多少控制棒以補償氙-135的改變量？
A.在整個期間緩慢抽棒
B.首先緩慢抽棒，然後緩慢插棒
C.在整個期間緩慢插棒
D.首先緩慢插棒，然後緩慢抽棒

答案： A

科目/題號：292006/9 (2016 新增)
知能類：k1.14〔3.1/3.2〕
序號：B7431(P7431)

A nuclear power plant was initially operating at steady-state 100 percent power at the end of a fuel cycle (EOC) when the plant was shut down for refueling. After refueling, the reactor was restarted and the plant is currently operating at steady-state 100 percent power at the beginning of a fuel cycle (BOC). Assume the average energy released by each fission did not change.
Compared to the equilibrium xenon-135 concentration at 100 percent power just prior to the refueling, the current equilibrium xenon-135 concentration is…
A. greater, because the higher fission rate at BOC produces xenon-135 at a faster rate.
B. greater, because the lower thermal neutron flux at BOC removes xenon-135 at a slower rate.
C. smaller, because the lower fission rate at BOC produces xenon-135 at a slower rate.
D. smaller, because the higher thermal neutron flux at BOC removes xenon-135 at a faster rate.
ANSWER: B.

一座核能電廠起初在燃料週期末期(EOC)100%功率穩定運轉，電廠為更換燃料而停機。更換燃料後，反應器再啟動，目前在燃料週期初期(BOC)以100%功率穩定運轉。假設每一分裂所釋出能量不變。與更換燃料前100%功率氙-135平衡濃度相比目前氙-135平衡濃度____。
A.較大，因為在燃料週期初期較高的分裂率，以較快速率產生氙-135
B.較大，因為在燃料週期初期較低的熱中子通量以較低速率移除氙-135
C.較小，因為在燃料週期初期較低的分裂率，以較慢速率產生氙-135
D.較小，因為在燃料週期初期較高的熱中子通量以較快速率移除氙-135

答案： B

科目/題號：292006/10 (2016 新增)
知能類：k1.14〔3.1/3.2〕
序號：B7531

A nuclear power plant had been shut down for two weeks near the middle of a fuel cycle when a reactor startup was commenced. Twelve hours later, reactor power is 100 percent, where it is being maintained. Which one of the following is the primary reason for periodically withdrawing control rods during the next 36 hours?
A. To offset the buildup of xenon-135.
B. To offset the depletion of the reactor fuel.
C. To maintain an adequate shutdown margin.
D. To maintain reactor heat flux below the critical heat flux.
ANSWER: A.

一座核能電廠接近燃料週期中期當開始啟動反應器時已停機兩週。在 12 小時後反應器功率為 100%，並維持在 100%運轉。下列何者為其在未來 36 小時週期性抽出控制棒的主要理由？
A.為了補償氙-135 逐漸累積
B.為了補償反應器燃料的燃耗
C.為了維持足夠的停機餘裕
D.為了維持反應器熱通量低於臨界熱通量

答案： A

科目/題號：292006/11 (2016 新增)
知能類：k1.14〔3.1/3.2〕
序號：B7657(P7657)

With Xe-135 initially at equilibrium, which one of the following power changes produces the greatest change in equilibrium Xe-135 negative reactivity?
A. 0 percent to 10 percent
B. 30 percent to 40 percent
C. 60 percent to 70 percent
D. 90 percent to 100 percent
ANSWER: A.

氙-135起始是平衡，下列何者功率的改變所產生的氙-135平衡負反應度變化最大？
A.0%到10%
B.30%到40%
C.60%到70%
D.90%到100%

答案： A