科目： 191005
知能類：K1.01 [2.8/3.1]
序號： P26

Reactor coolant pump motor amps will _____ if the rotor is locked and the motor speed will _____ if the rotor shears.

A. increase, increase

B. increase, decrease

C. decrease, increase

D. decrease, decrease

ANSWER: A.

反應爐冷卻水泵，於轉子鎖死時馬達電流將_____，若轉子斷裂(shear)時馬達轉速將_____。

A. 增加，增加

B. 增加，減少

C. 減少，增加

D. 減少，減少

答案：A.

科目： 191005
知能類：K1.01 [2.8/3.1]
序號： P227

A nuclear power plant is operating normally at 80% power when a reactor coolant pump (RCP) shaft seizes. Which one of the following indications would not accompany the seized shaft?

A. Reactor coolant system pressure transient.

B. Decreased flow rate in the associated reactor coolant loop.

C. Decreased flow rate in the remaining reactor coolant loop(s).

D. Increased current to the affected RCP with possible breaker trip.

ANSWER: C.

核能電廠於 80%功率正常運轉，此時，反應爐冷卻水泵(RCP)轉軸卡住。下列何者不會隨著轉軸卡住而出現？

A. 反應爐冷卻水系統的壓力暫態。

B. 相關反應爐冷卻迴路的流量減少。

C. 剩餘反應爐冷卻迴路的流量減少。

D. 受影響反應爐冷卻水泵的電流增加，且斷路器可能跳脫。

答案：C.

科目： 191005
知能類：K1.01 [2.8/3.1]
序號： P327

A nuclear power plant is operating at 100% power when a reactor coolant pump (RCP) malfunction occurs. Thirty seconds after the malfunction, which one of the following can be used by an operator to determine whether the malfunction is a locked RCP rotor or a sheared RCP rotor? (Assume no operator action is taken.)

A. Reactor trip status

B. Loop flow indications

C. RCP ammeter indications

D. Loop differential temperature indications

ANSWER: C.

核能電廠於 100%功率運轉時，反應爐冷卻水泵(RCP)發生故障。故障三十秒後，運轉員可能採用下列何者，來判斷故障處是 RCP 轉子鎖死還是斷裂(假設運轉員沒有採取任何行動)？

A. 反應爐跳脫狀態。

B. 迴路流量指示值。

C. RCP 安培計指示值。

D. 迴路差溫指示值。

答案：C.

科目： 191005
知能類：K1.01 [2.8/3.1]
序號： P1127

During a locked reactor coolant pump (RCP) rotor event, RCP current will...

A. increase due to the increased rotor torque.

B. increase due to the increased stator counter electromotive force (CEMF).

C. decrease due to the decreased pump flow.

D. decrease due to the increased rotor CEMF.

ANSWER: A.

反應爐冷卻水泵(RCP)發生轉子鎖死事件時，RCP 的電流將……

A. 上升，因為轉子扭矩增加。

B. 上升，因為定子的逆向電動勢(CEMF)增加。

C. 下降，因為泵流量減少。

D. 下降，因為轉子的逆向電動勢(CEMF)增加。

答案：A.

科目： 191005
知能類：K1.01 [2.8/3.1]
序號： P1427 (B2626)

A nuclear power plant is operating at full power when a reactor coolant pump experiences a locked rotor. How will pump ammeter indication respond?

A. Decreases immediately to zero due to breaker trip

B. Decreases immediately to no-load motor amps

C. Increases immediately to many times running current, then decreases to no-load motor amps

D. Increases immediately to many times running current, then decreases to zero upon breaker trip

ANSWER: D.

核能電廠於全功率運轉時，反應爐冷卻水泵發生轉子鎖死事件。泵安培計的指示值將如何反應？

A. 由於斷路器跳脫，立即降至零。

B. 立即降至無載馬達安培數。

C. 立即增至運轉電流的數倍，然後降至無載馬達安培數。

D. 立即增至運轉電流的數倍，然後於斷路器跳脫時降至零。

答案：D.

科目： 191005
知能類：K1.01 [2.8/3.1]
序號： P2127 (B1326)

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

A. Decreases due to decreased pump flow

B. Decreases due to increased counter electromotive force

C. Increases due to decreased pump flow

D. Increases due to decreased counter electromotive force

ANSWER: D.

一冷卻水泵由一交流感應馬達驅動，若泵轉軸卡住，則泵馬達電流改變的方式及其原因，下列何者敘述正確？

A. 下降，因為泵流體減少。

B. 下降，因為逆向電動勢增加。

C. 上升，因為泵流體減少。

D. 上升，因為逆向電動勢減少。

答案：D.

科目： 191005
知能類：K1.01 [2.8/3.1]
序號： P2827 (B1726)

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

A. Decreases due to decreased pump work

B. Decreases due to decreased counter electromotive force

C. Increases due to increased pump work

D. Increases due to increased counter electromotive force

ANSWER: A.

一冷卻水泵由一交流感應馬達驅動，若泵轉軸斷裂(shears)，則泵馬達電流改變的方式及其原因，下列何者敘述正確？

A. 下降，因為泵作功減小。

B. 下降，因為逆向電動勢減小。

C. 上升，因為泵作功增加。

D. 上升，因為逆向電動勢減小

答案：A.

科目： 191005
知能類：K1.01 [2.8/3.1]
序號： P3127 (B2826)

A motor-driven centrifugal pump exhibits indications of pump failure while being started in an idle cooling water system. Assuming the pump motor breaker does not trip, which one of the following pairs of indications would be observed if the pump failure is a locked impeller shaft?

A. Lower than normal running current with zero system flow rate

B. Lower than normal running current with a fraction of normal system flow rate

C. Excessive duration of starting current peak with zero system flow rate

D. Excessive duration of starting current peak with a fraction of normal system flow rate

ANSWER: C.

靜止之冷卻水系統，其馬達驅動離心泵在啟動時發生故障。假設泵馬達斷路器(breaker)並沒有跳脫，若故障是因葉輪轉軸鎖死，則將會觀察到下列何項現象？

A. 低於正常運轉電流，系統流量為零。

B. 低於正常運轉電流，流量為正常系統流量的一部份。

C. 啟動電流峰值時間過長，系統流量為零。

D. 啟動電流峰值時間過長，流量為正常系統流量的一部份。

答案：C.

科目： 191005
知能類：K1.02 [2.8/2.9]
序號： P27

If the generator bearings on a motor-generator begin to overheat from excessive friction, which one of the following will occur next?

A. Generator current will begin to increase.

B. Generator windings will begin to heat up.

C. Motor current will begin to decrease.

D. Motor windings will begin to heat up.

ANSWER: D.

如果馬達-發電機的發電機軸承(bearing)，由於摩擦過度而開始過熱，接著將發生下列何種情況？

A. 發電機電流開始上升。

B. 發電機線圈開始變熱。

C. 馬達電流開始下降。

D. 馬達線圈開始變熱。

答案：D.

科目： 191005
知能類：K1.02 [2.8/2.9]
序號： P528

Which one of the following will provide motor protection against electrical damage caused by gradual bearing degradation?

A. Thermal overload device

B. Overcurrent trip relay

C. Underfrequency relay

D. Undervoltage device

ANSWER: A.

下列何者能保護馬達，不受軸承逐漸劣化而造成的電氣損害？

A. 熱過載裝置。

B. 過電流跳脫電驛。

C. 低頻電驛。

D. 低電壓裝置。

答案：A.

科目： 191005
知能類：K1.02 [2.8/2.9]
序號： P1028 (B1526)

Which one of the following will result from prolonged operation of an ac motor with excessively high stator temperatures?

A. Decreased electrical current demand due to reduced counter electromotive force

B. Increased electrical current demand due to reduced counter electromotive force

C. Decreased electrical resistance to ground due to breakdown of winding insulation

D. Increased electrical resistance to ground due to breakdown of winding insulation

ANSWER: C.

一交流馬達在過高定子溫度下長時間運轉，會導致下列何現象產生？

A. 因為逆向電動勢減小，使電流需求減小。

B. 因為逆向電動勢減小，使電流需求增加。

C. 因為線圈絕緣故障，使接地電阻減小。

D. 因為線圈絕緣故障，使接地電阻增加。

答案：C.

科目： 191005
知能類：K1.02 [2.8/2.9]
序號： P1528 (B1126)

Continuous operation of a motor at rated load with a loss of required cooling to the motor windings will eventually result in...

A. cavitation of the pumped fluid.

B. failure of the motor overcurrent protection devices.

C. breakdown of the motor insulation.

D. phase current imbalance in the motor and overspeed trip actuation.

ANSWER: C.

連續運轉於額定負載之馬達，於喪失馬達線圈所需要之冷卻時，將會導致……

A. 泵流體產生孔蝕現象。

B. 馬達過電流保護設備故障。

C. 馬達絕緣故障。

D. 馬達之相間電流不平衡與超速跳脫動作。

答案：C.

科目： 191005
知能類：K1.02 [2.8/2.9]
序號： P2927

Which one of the following breaker trip signals will trip the associated motor breaker if a motor bearing seizes while the motor is running?

A. Undervoltage

B. Underfrequency

C. Time-delayed overcurrent

D. Instantaneous overcurrent

ANSWER: C.

馬達軸承若於馬達運轉時卡住，下列何種斷路器跳脫訊號，將導致相關的馬達斷路器跳脫？

A. 低電壓訊號。

B. 低頻訊號。

C. 延時過電流訊號。

D. 瞬間過電流訊號。

答案：C.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P115 (B120)

A main generator that is connected to an infinite power grid has the following initial indications:

100 MWe
0 MVAR
2,900 安培
20,000 Vac

If main generator excitation is reduced slightly, amps will _____ and MWe will _____.

A. increase; decrease

B. decrease; decrease

C. increase; remain the same

D. decrease; remain the same

ANSWER: C.

一主發電機連接於一無限電力網上，指示初值如下：

100 MWe
0 MVAR
2,900安培
20,000 Vac

若主發電機激磁微幅下降，則安培數將會_____，而MWe將會_____。

A. 增加；減小

B. 減小；減小

C. 增加；維持不變

D. 減小；維持不變

答案：C.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P229

Excessive current will be drawn by an ac induction motor that is operating...

A. completely unloaded.

B. at full load.

C. with open-circuited stator windings.

D. with short-circuited stator windings.

ANSWER: D.

交流感應馬達於下列何種情況運轉時，將形成超額電流？

A. 完全卸載。

B. 全負載。

C. 具開放電路定子線圈。

D. 具短路定子線圈。

答案：D.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P529

A main generator that is connected to an infinite power grid has the following indications:

500 Mw
300 MVAR (VARs out)
2,800 amps

If main generator excitation is reduced slightly, current will _____ and Mw will _____.

A. increase; decrease

B. increase; remain the same

C. decrease; decrease

D. decrease; remain the same

ANSWER: D.

一部主發電機連接至無限電力網，其指示數值如下：

500 MW
300 MVAR (Var輸出)
2,800安培

如果主發電機激磁(excitation)微幅下降，電流將_____，而MW將_____。

A. 增加；減小

B. 增加；維持不變

C. 減小；減小

D. 減小；維持不變

答案：D.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P928

A main generator is operating in parallel with an infinite power grid. If the voltage supplied to the generator field is slowly and continuously decreased, the generator will experience high current due to... (Assume no generator protective actuations occur.)

A. excessive generator MWe.

B. excessive generator KVAR (lagging).

C. excessive generator KVAR (leading).

D. generator reverse power.

ANSWER: C.

一部主發電機與無限電力網並聯運轉。如果供應發電機的磁場電壓持續緩慢地降低，發電機將基於下列哪項因素而發生高電流(假設未啟動發電機防護措施)？

A. 發電機 MWe 過高。

B. 發電機 KVAR 過高(落後/lagging)。

C. 發電機 KVAR 過高(領先/leading)。

D. 發電機逆電力(reverse power)。

答案：C.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P1128 (B2228)

An ac generator is supplying an isolated electrical system with a power factor of 1.0. If generator voltage is held constant while real load (kW) increases, the current supplied by the generator will increase in direct proportion to the _____ of the change in real load. (Assume power factor remains constant at 1.0.)

A. cube

B. square

C. amount

D. square root

ANSWER: C.

一部交流發電機負責供電給獨立電力系統，其功率因數為1.0。若發電機電壓於實際負載(kW)增加時維持固定，發電機提供的電流，將與實際負載變化的_____成正比增加。(假設功率因數仍是1.0)。

A. 立方

B. 平方

C. 量

D. 平方根

答案：C.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P1428 (B1830)

A main generator that is connected to an infinite power grid has the following indications:

600 MWe
100 MVAR (VARs in)
13,800 amps
25,000 volts

If main generator excitation is increased slightly, amps will _____ and MWe will _____.

A. decrease; increase

B. increase; increase

C. decrease; remain the same

D. increase; remain the same

ANSWER: C.

一主發電機連接於無限電力網上，指示讀數如下：

600 MWe
100 MVAR (VAR輸入)
13,800安培
25,000伏特

若主發電機激磁(excitation)稍微增加，安培數將_____，MWe將會_____。

A. 減小；增加

B. 增加；增加

C. 減小；維持不變

D. 增加；維持不變

答案：C.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P1728 (B1729)

A main generator that is connected to an infinite power grid has the following indications:

600 MWe
100 MVAR (VARs in)
13,800 amps
25,000 volts

If main generator excitation is decreased slightly, amps will _____ and MVAR will _____.

A. decrease; increase

B. increase; increase

C. decrease; decrease

D. increase; decrease

ANSWER: B.

一主發電機連接於無限電力網上，指示讀數如下：

600 MWe
100 MVAR (VAR輸入)
13,800安培
25,000伏特

若主發電機激磁(excitation)稍微減小，安培數將_____，MVAR將會_____。

A. 減小；增加

B. 增加；增加

C. 減小；減小

D. 增加；減小

答案：B.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P1928 (B226)

A main generator is connected to an infinite power grid. Which one of the following conditions will exist on the generator if it is operating underexcited?

A. Negative MVARs (VARs in) and a leading power factor

B. Positive MVARs (VARs out) and a leading power factor

C. Positive MVARs (VARs out) and a lagging power factor

D. Negative MVARs (VARs in) and a lagging power factor

ANSWER: A.

一主發電機連接於無限電力網上，若此發電機在欠激磁(underexcited)下運轉，下列何種狀況會存在？

A. 負的MVAR(VAR輸入)與領先的功率因子。

B. 正的MVAR(VAR輸出)與領先的功率因子。

C. 正的MVAR(VAR輸出)與落後的功率因子。

D. 負的MVAR(VAR輸入)與落後的功率因子。

答案：A.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P2027 (B2028)

A diesel generator (D/G) is supplying both kW and kVAR to an electrical bus that is connected to an infinite power grid. Assuming D/G and bus voltage do not change, if the D/G voltage regulator set point is increased slightly, then D/G kW will _____ and D/G amps will _____.

A. remain the same; increase

B. remain the same; remain the same

C. increase; increase

D. increase; remain the same

ANSWER: A.

一部柴油發電機(D/G)正供應有效功率與無效功率，給一連接無限電力網的電力匯流排，假設此柴油發電機與匯流排電壓不變，若此柴油發電機的電壓調節器設定點稍微增加，則柴油發電機之有效功率將會_____，柴油發電機之安培數將會_____。

A. 維持不變；增加

B. 維持不變；維持不變

C. 增加；增加

D. 增加；維持不變

答案：A.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P2228

A diesel generator (D/G) is supplying an electrical bus that is connected to an infinite power grid. Assuming D/G terminal voltage and bus frequency do not change, if the D/G governor set point is increased from 60.0 Hz to 60.1 Hz, D/G kVAR load will _____ and D/G amps will _____.

A. increase; increase

B. increase; remain the same

C. remain the same; increase

D. remain the same; remain the same

ANSWER: C.

一部柴油發電機(D/G)正供電給連接無限電力網的電力匯流排，假設柴油發電機終端電壓與匯流排頻率不變，如果該柴油發電機的調節器設定點，從60.0 Hz增至60.1 Hz，柴油發電機的無效功率(kVAR)負載將_____，柴油發電機的安培數將_____。

A. 增加；增加

B. 增加；維持不變

C. 維持不變；增加

D. 維持不變；維持不變

答案：C.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P2328 (B2330)

A main generator that is connected to an infinite power grid has the following indications:

600 MWe
100 MVAR (VARs out)
13,800 amps
25,000 volts

If main generator excitation is decreased, amps will initially _____ and MVAR will initially _____.

A. decrease; increase

B. increase; increase

C. decrease; decrease

D. increase; decrease

ANSWER: C.

一部主發電機連接於無限電力網上，指示讀數如下：

600 MWe
100 MVAR (VAR輸出)
13,800安培
25,000伏特

若主發電機激磁(excitation)減小，安培數最初將會_____，而MVAR最初將會_____。

A. 減小；增加

B. 增加；增加

C. 減小；減小

D. 增加；減小

答案：C.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P2528 (B2530)

A diesel generator (D/G) is supplying both KW and KVAR to an electrical bus that is connected to an infinite power grid. Assuming bus voltage does not change, if the D/G voltage regulator set point is decreased slightly, then D/G KW will _____ and D/G amps will _____.

A. remain the same; decrease

B. remain the same; remain the same

C. decrease; decrease

D. decrease; remain the same

ANSWER: A.

一柴油發電機正供應有效功率與無效功率，給一連接於無限電力網的電力匯流排。假設匯流排電壓不變，若此柴油發電機的電壓調節器(voltage regulator)設定點稍微下降，則柴油發電機之有效功率將會_____，而柴油發電機之安培數將會_____。

A. 維持不變；減小

B. 維持不變；維持不變

C. 減小；減小

D. 減小；維持不變

答案：A.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P2628 (B1532)

A main generator that is connected to an infinite power grid has the following indications:

100 MWe
0 MVAR
2,900 amps
20,000 volts

If main generator excitation is increased, amps will _____ and MWe will _____.

A. remain the same; increase

B. increase; increase

C. remain the same; remain the same

D. increase; remain the same

ANSWER: D.

一部主發電機連接於無限電力網上，指示讀數如下：

100 MWe
0 MVAR
2,900安培
20,000伏特

若主發電機激磁(excitation)增加，安培數將會_____，而MWe將會_____。

A. 維持不變；增加

B. 增加；增加

C. 維持不變；維持不變

D. 增加；維持不變

答案：D.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P2728 (B2729)

A main generator is operating in parallel with an infinite power grid. If the voltage supplied to the generator field is slowly and continuously increased, the generator will experience high current due to: (Assume no generator protective actuations occur.)

A. generator reverse power.

B. excessive generator MWe.

C. excessive generator KVAR (VARs in).

D. excessive generator KVAR (VARs out).

ANSWER: D.

一主發電機與無限電力網併聯運轉，若供應給此發電機的磁場電壓緩慢且持續增加，此發電機將會發生高電流，因為：(假設沒有發電機保護動作發生)

A. 發電機逆電力。

B. 發電機MWe過高。

C. 發電機KVAR(VAR輸入)過高。

D. 發電機KVAR(VAR輸出)過高。

答案：D.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P2838 (B3543)

Two identical 1,000 MW electrical generators are operating in parallel supplying the same isolated electrical bus. The generator output breakers provide identical protection for the generators. Generator A and B output indications are as follows:

Generator A	Generator B
22 KV	22 KV
60.2 Hertz	60.2 Hertz
800 MW	800 MW
50 MVAR (out)	25 MVAR (in)

A malfunction causes the voltage regulator for generator B to slowly and continuously increase the terminal voltage for generator B. If no operator action is taken, generator B output current will...

A. increase continuously until the output breaker for generator A trips on overcurrent.

B. increase continuously until the output breaker for generator B trips on overcurrent.

C. initially decrease, and then increase until the output breaker for generator A trips on overcurrent.

D. initially decrease, and then increase until the output breaker for generator B trips on overcurrent.

ANSWER: D.

兩部相同之1,000 MW 交流電力發電機以並聯方式運轉，提供相同獨立之電力匯流排，發電機輸出斷路器(breaker)對此二發電機提供相同之保護，發電機A與B輸出數值如下：

發電機A	發電機B
22 KV	22 KV
60.2 Hertz	60.2 Hertz
800 MW	800 MW
50 MVAR (輸出)	25 MVAR (輸入)

故障導致發電機B之電壓調節器(voltage regulator)，緩慢持續增加發電機B之終端電壓。若運轉員沒有採取行動，則發電機B的輸出電流將會……

A. 持續增加，直到發電機A的輸出斷路器因過電流而跳脫。

B. 持續增加，直到發電機B的輸出斷路器因過電流而跳脫。

C. 電流最初下降，其後增加直到發電機A的輸出斷路器因為過電流而跳脫。

D. 電流最初下降，其後增加直到發電機B的輸出斷路器因為過電流而跳脫。

答案：D.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P3229 (B3227)

A cooling water system is being returned to service following maintenance on the two identical centrifugal cooling water pumps. The two pumps take suction from a common suction header and discharge to a common discharge header. Each pump is driven by a three phase ac induction motor.

Cooling water pump A was started five minutes ago to initiate flow in the cooling water system. Cooling water pump B is about to be started in parallel alignment with pump A.

When pump B is started, which one of the following would cause the ammeter for pump B to remain off-scale high for several seconds longer than usual before returning to normal running current indication?

A. The pump packing was removed and not reinstalled.

B. The pump was initially rotating in the reverse direction.

C. Two phases of the motor windings were electrically switched.

D. The coupling between the motor and the pump was removed and not reinstalled.

ANSWER: B.

一冷卻水系統在維修兩相同之離心冷卻水泵之後恢復使用，此兩泵從一共同的給水集管取水，同時排放至一共同的排水集管。每一泵由一三相交流感應馬達帶動。

冷卻水泵A五分鐘前啟動，開動冷卻水系統水流。冷卻水泵B與泵A並聯，且即將要啟動。

下列何者將導致泵B啟動時，其安培計維持在超出範圍高值的時間，較平常多出幾秒後，才回復至正常運轉電流指示？

A. 泵迫緊(packing)被移除，但並未重新安裝。

B. 泵在反向旋轉時啟動。

C. 馬達線圈的兩相位被電力調換。

D. 馬達與泵間的聯結器(coupling)被移除，且並未重新安裝。

答案：B.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P3629 (B3629)

A main turbine-generator is operating in parallel with an infinite power grid. If the turbine control valves (or throttle valves) slowly fail open, the generator will experience high current primarily due to... (Assume no generator protective actuations occur.)

A. excessive generator MWe.

B. excessive generator KVAR (VARs out).

C. excessive generator KVAR (VARs in).

D. generator reverse power.

ANSWER: A.

一主汽輪發電機與無限電力網併聯運轉，若此汽機控制閥(或節流閥)故障致緩慢地開啟，則發電機會發生高電流，主要因為.....(假設沒有發電機保護動作發生)

A. 發電機MWe過高。

B. 發電機KVAR(VAR輸出)過高。

C. 發電機KVAR(VAR輸入)過高。

D. 發電機逆電力(reverse power)。

答案：A.

科目： 191005
知能類：K1.03 [2.7/2.8]
知能類：K1.09 [2.3/2.6]
序號： P4115 (B4115)

A main generator is operating and connected to an infinite power grid. Elevated main generator winding temperature requires a reduction in reactive load from 200 MVAR (out) to 150 MVAR (out). To accomplish the reactive load reduction, the operator must _____ the generator field current; when generator reactive load equals 150 MVAR (out) the generator power factor will be _____than the initial power factor.

A. increase; larger

B. increase; smaller

C. decrease; larger

D. decrease; smaller

ANSWER: C.

一部主發電機與無限電力網併聯運轉。主發電機的線圈溫度偏高，必須將電抗性負載(reactive load)，從 200 MVAR(輸出)降至 150 MVAR(輸出)。為了降低電抗性負載，運轉員必須_____發電機磁場電流；發電機的電抗性負載等於 150 MVAR(輸出)時，發電機的功率因數(power factor)將_____於起初的功率因數。

A. 增加；大

B. 增加；小

C. 降低；大

D. 降低；小

答案：C.

科目： 191005
知能類：K1.03 [2.7/2.8]
序號： P4315

A main generator is operating and connected to an infinite power grid with the following initial generator parameters:

Terminal Voltage:	22 KV
Frequency:	60 Hertz
Load--Real:	575 MW
Load--Reactive:	100 MVAR (in)
Power Factor:	0.985

Which one of the following contains a combination of manual adjustments to the main generator voltage regulator and speed control setpoints such that each adjustment will result in an increase in main generator amps? (Assume that generator power factor remains less than 1.0.)

	VOLTAGE SETPOINT	SPEED SETPOINT
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

ANSWER: C.

一部主發電機連接至無限電力網運轉，發電機的初期參數如下：

終端電壓：	22 KV
頻率：	60 Hertz
實際負載：	575 MW
電抗性負載(Load-Reactive)：	100 MVAR (輸入)
功率因數(Power Factor)：	0.985

手動操作主發電機的電壓調節器及速控設定點時，下列哪組調整方式，將導致主發電機的安培數增加(假設發電機的功率因數仍然小於 1.0)？

	電壓設定點	速度設定點
A.	增加	增加
B.	增加	減少

C. 减少 增加

D. 减少 减少

答案：C.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P28

If the speed of a variable speed centrifugal pump is increased to cause pump flow rate to double, pump motor current will...

A. remain constant.

B. increase two-fold (double).

C. increase four-fold.

D. increas e eight-fold.

ANSWER: D.

如果變速離心泵的轉速增加，導致泵的流量增為兩倍，泵馬達電流將.....

A. 維持不變。

B. 增至兩倍(加倍)。

C. 增至四倍。

D. 增至八倍。

答案：D.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P120

A centrifugal pump is operating with the following parameters:

Pump speed = 1800 rpm
Pump head = 100 psid
Motor current = 10 amps

What will be the new value of pump head if the speed is increased such that the current requirements are now 640 amps?

A. 400 psid

B. 800 psid

C. 1200 psid

D. 1600 psid

ANSWER: D.

一部運轉中的離心泵，其參數如下所示：

泵轉速 = 1800 rpm
泵水頭 = 100 psid
馬達電流 = 10 安培

如果泵轉速加倍，導致目前所需的電流變成 640 安培，下列何者為新的泵水頭值？

A. 400 psid

B. 800 psid

C. 1200 psid

D. 1600 psid

答案：D.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P228 (B227)

A centrifugal pump has a flow rate of 3,000 gpm and a current requirement of 200 amps. If the pump speed is reduced such that the flow rate is 2,000 gpm, what is the final current requirement at the new lower speed? (Assume a constant motor voltage.)

A. 59 amps

B. 89 amps

C. 133 amps

D. 150 amps

ANSWER: A.

一離心泵在流量 3,000 gpm以及電流需求 200安培下運轉。若泵轉速減小，使得流量成為 2,000 gpm，新的較低流量的穩定電流需求為多少(假設馬達電壓固定不變)？

A. 59安培

B. 89安培

C. 133安培

D. 150安培

答案：A.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P328 (B326)

A centrifugal pump is operating with the following parameters:

Speed = 1,800 rpm
Current = 40 amperes
Pump head = 20 psi
Pump flow rate = 400 gpm

What will be the new value of pump head and current if the speed is increased to 2,000 rpm?

A. 22 psi, 49 amps

B. 22 psi, 55 amps

C. 25 psi, 49 amps

D. 25 psi, 55 amps

ANSWER: D.

一離心泵以下列參數運轉：

轉速 = 1,800 rpm
電流 = 40安培
泵水頭 = 20 psi
泵流量 = 400 gpm

若轉速增加到2,000 rpm，則下列何者將是新的泵水頭值及電流值？

A. 22 psi，49安培

B. 22 psi，55安培

C. 25 psi，49安培

D. 25 psi，55安培

答案：D.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P428

A centrifugal pump is operating at 600 rpm with the following parameters:

Current = 10 amperes
Pump head = 50 psi
Pump flow rate = 200 gpm

What will be the new value of pump head if the flow is increased such that the current requirements are now 640 amperes?

A. 400 psi

B. 600 psi

C. 800 psi

D. 1,200 psi

ANSWER: C.

一部離心泵以 600 rpm 的轉速轉動，其參數如下：

電流 = 10 安培
泵水頭 = 50 psi
泵流量 = 200 gpm

如果流量增加，導致目前所需的電流變成 640 安培時，下列何者為新的泵水頭值？

A. 400 psi

B. 600 psi

C. 800 psi

D. 1,200 psi

答案：C.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P630

A motor-driven centrifugal pump is operating at a low flow condition in an open system. The throttled discharge valve is then fully opened to increase system flow rate.

Which one of the following will increase?

A. Pump discharge pressure

B. Available net positive suction head

C. Motor amps

D. Pump speed

ANSWER: C.

一部馬達驅動的離心泵，以低流量於開放系統下運轉。接著將節流出口閥全開，藉此增加系統流量。

下列何者將增加？

A. 泵的出口壓力。

B. 可用淨正吸水頭。

C. 馬達電流(motor amps)。

D. 泵轉速。

答案：C.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P1329

A centrifugal pump is operating with the following parameters:

Speed	= 3,600 rpm
Current	= 100 amps
Pump head	= 50 psi
Pump flow rate	= 400 gpm

What will be the new value of pump head and current if the speed is decreased to 2,000 rpm?

A. 8.6 psi, 30.1 amps

B. 8.6 psi, 17.1 amps

C. 15.4 psi, 30.1 amps

D. 15.4 psi, 17.1 amps

ANSWER: D.

一部離心泵以下列參數運轉：

轉速	= 3,600 rpm
電流	= 100安培
泵水頭	= 50 psi
泵流量	= 400 gpm

若轉速降至2,000 rpm，下列何者將是新的泵水頭值及電流值？

A. 8.6 psi，30.1安培

B. 8.6 psi，17.1安培

C. 15.4 psi，30.1安培

D. 15.4 psi，17.1安培

答案：D.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P1429

A two-speed centrifugal pump is driven by an ac motor with the following initial conditions:

Pump speed = 400 rpm
Motor current = 40 amps
Pump head = 60 psid

If pump speed is increased to 1600 rpm what will be the new pump head?

A. 240 psid

B. 480 psid

C. 960 psid

D 3,840 psid

ANSWER: C.

一部兩段速離心泵以交流馬達驅動，其初期參數如下：

泵轉速 = 400 rpm
馬達電流 = 40 安培
泵水頭 = 60 psid

如果泵轉速增至 1600 rpm，下列何者為新的泵水頭值？

A. 240 psid

B. 480 psid

C. 960 psid

D. 3840 psid

答案：C.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P1530 (B2126)

A centrifugal pump is operating with the following parameters:

Speed	= 1,200 rpm
Current	= 40 amperes
Pump head	= 20 psi
Pump flow rate	= 400 gpm

What will be the approximate value of pump head and current if pump speed is increased to 1,600 rpm?

A. 25 psi, 55 amps

B. 25 psi, 95 amps

C. 36 psi, 55 amps

D. 36 psi, 95 amps

ANSWER: D.

一離心泵以下列參數運轉：

轉速	= 1,200 rpm
電流	= 40安培
泵水頭	= 20 psi
泵流量	= 400 gpm

若轉速增加到1,600 rpm，下列何者將會是泵水頭及電流的近似值？

A. 25 psi，55安培

B. 25 psi，95安培

C. 36 psi，55安培

D. 36 psi，95安培

答案：D.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P1629

A centrifugal pump is operating with the following parameters:

Speed = 1,200 rpm
Current = 40 amperes
Pump head = 20 psi
Pump flow rate = 400 gpm

What will be the approximate value of pump head and current if pump speed is increased to 1,800 rpm?

A. 36 psi, 95 amps

B. 36 psi, 135 amps

C. 45 psi, 95 amps

D. 45 psi, 135 amps

ANSWER: D.

一部離心泵以下列參數運轉：

轉速 = 1,200 rpm
電流 = 40安培
泵水頭 = 20 psi
泵流量 = 400 gpm

若轉速增加到1,800 rpm，下列何者將會是泵水頭及電流的近似值？

A. 36 psi，95安培

B. 36 psi，135安培

C. 45 psi，95安培

D. 45 psi，135安培

答案：D.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P1729 (B1719)

A centrifugal pump is operating with the following parameters:

Speed = 1,800 rpm
Current = 40 amperes
Pump head = 20 psi
Pump flow rate = 400 gpm

What will be the approximate value of pump head and current if pump speed is decreased to 1,200 rpm?

A. 13 psi, 18 amps

B. 13 psi, 12 amps

C. 9 psi, 18 amps

D. 9 psi, 12 amps

ANSWER: D.

一部離心泵以下列參數運轉：

轉速 = 1,800 rpm
電流 = 40安培
泵水頭 = 20 psi
泵流量 = 400 gpm

若轉速降至1,200 rpm，下列何者將是泵水頭及電流的近似值？

A. 13 psi，18安培

B. 13 psi，12安培

C. 9 psi，18安培

D. 9 psi，12安培

答案：D.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P1828 (B2627)

An ac motor-driven centrifugal pump is operating with a flow rate of 3,000 gpm and a motor current of 150 amps. If the pump speed is reduced such that the flow rate is 2,000 gpm, what is the approximate final motor current at the new lower speed? (Assume a constant motor voltage.)

A. 44 amperes

B. 59 amperes

C. 67 amperes

D. 100 amperes

ANSWER: A.

一部交流馬達驅動之離心泵，於流量3,000 gpm與馬達電流150安培下運轉。若馬達轉速下降，使得流量為2,000 gpm，則在此較低的新轉速下，最終之馬達電流約為多少？(假設馬達電壓固定)

A. 44安培

B. 59安培

C. 67安培

D. 100安培

答案：A.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P2130 (B2229)

A centrifugal pump is operating at 600 rpm with the following parameters:

Motor current = 100 amperes
Pump head = 50 psid
Pump flow rate = 880 gpm

Which one of the following will be the approximate value of pump head if pump speed is increased to 1200 rpm?

A. 71 psid

B. 126 psid

C. 172 psid

D. 200 psid

ANSWER: D.

一部離心泵在轉速600 rpm下，以下列參數運轉：

馬達電流 = 100安培
泵水頭 = 50 psid
泵流量 = 880 gpm

若轉速增加到1,200 rpm，則下列何者將會是泵水頭的近似值？

A. 71 psid

B. 126 psid

C. 172 psid

D. 200 psid

答案：D.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P2329 (B2321)

A multi-speed centrifugal pump is operating at 3,600 rpm with a flow rate of 3,000 gpm. Which one of the following approximates the new flow rate if the speed is decreased to 3,000 rpm?

A. 1,000 gpm

B. 1,500 gpm

C. 2,000 gpm

D. 2,500 gpm

ANSWER: D.

一部多速離心泵以 3,600 rpm 的轉速運轉，此時的流量為 3,000 gpm。轉速若降至 3,000 rpm，新的流量約為多少？

A. 1,000 gpm

B. 1,500 gpm

C. 2,000 gpm

D. 2,500 gpm

答案：D.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P2529 (B2527)

A multispeed centrifugal pump is operating with a flow rate of 1800 gpm at a speed of 3600 rpm. Which one of the following approximates the new flow rate if the pump speed is decreased to 2400 rpm?

A. 900 gpm

B. 1050 gpm

C. 1200 gpm

D. 1350 gpm

ANSWER: C.

一部多速離心泵在流量 1800 gpm及轉速 3600 rpm下運轉。若泵轉速減小至2400 rpm，則新的流量約為？

A. 900 gpm

B. 1050 gpm

C. 1200 gpm

D. 1350 gpm

答案：C.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P3129 (B1626)

A multi-speed motor-driven centrifugal pump is operating with the following parameters:

Motor current = 27 amps
Pump head = 50 psi
Pump flow rate = 880 gpm

Which one of the following will be the approximate new value of pump head if pump speed is increased such that the motor current is now 64 amperes?

A. 89 psi

B. 119 psi

C. 211 psi

D. 281 psi

ANSWER: A.

一部多速馬達驅動離心泵，以下列參數運轉：

馬達電流 = 27安培
泵水頭 = 50 psi
泵流量 = 880 gpm

如果泵轉速增加，使得馬達電流成為64安培，則泵水頭約為多少？

A. 89 psi

B. 119 psi

C. 211 psi

D. 281 psi

答案：A.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P3130 (B3127)

Which one of the following describes the relationship between the current supplied to an ac induction motor and the amount of heat generated (kW) in the motor windings?

A. Heat generation is directly proportional to the current.

B. Heat generation is proportional to the cube of the current.

C. Heat generation is proportional to the square of the current.

D. Heat generation is proportional to the square root of the current.

ANSWER: C.

下列何者為對一交流感應馬達的供應電流與馬達線圈所產生之熱量(kW)關係之描述？

A. 所生熱量正比於電流。

B. 所生熱量正比於電流立方。

C. 所生熱量正比於電流平方。

D. 所生熱量正比於電流平方根。

答案：C.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P3430 (B1228)

A centrifugal pump is operating at 600 rpm with the following parameters:

Current = 100 amperes
Pump head = 50 psid
Pump flow rate = 880 gpm

What will be the approximate value of pump head if pump speed is increased such that the pump now draws 640 amperes?

A. 93 psid

B. 126 psid

C. 173 psid

D. 320 psid

ANSWER: C.

一部離心泵以轉速600 rpm及下列參數運轉：

電流 = 100安培
泵水頭 = 50 psid
泵流量 = 880 gpm

如果泵轉速增加，使得馬達電流成為640安培，則泵水頭約為多少？

A. 93 psid

B. 126 psid

C. 173 psid

D. 320 psid

答案：C.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P3730 (B3722)

A rotary positive displacement pump (PDP) is being used to supply water to a piping system. The PDP is driven by an ac induction motor. The initial parameters are:

System pressure: 500 psig
PDP flow rate: 50 gpm
PDP motor current: 40 amps

After several hours, the PDP motor speed is increased such that the new PDP flow rate is 100 gpm. If system pressure does not change, what is the approximate value of the PDP motor current at the 100 gpm flow rate?

A. 80 amps

B. 160 amps

C. 320 amps

D. 640 amps

ANSWER: A.

一旋轉正排量泵(PDP)供水給管路系統。該正排量泵由交流感應馬達驅動，其初期參數如下：

系統壓力： 500 psig
PDP流量： 50 gpm
PDP馬達電流：40安培

幾小時後，正排量泵的馬達轉速增加，新流量成為100 gpm。如果系統壓力不變，正排量泵的流量為100 gpm時，其馬達電流的近似值為多少？

A. 80 安培

B. 160 安培

C. 320 安培

D. 640 安培

答案：A.

科目： 191005
知能類：K1.04 [2.7/2.8]
序號： P4515 (B4515)

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

The following initial pump conditions exist:

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

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

A. Less than 100 amps

B. 200 amps

C. 400 amps

D. More than 500 amps

ANSWER: A.

請參照下圖的離心冷卻水泵效能曲線。此泵利用單轉速交流感應馬達驅動，並以節流出口流量控制閥來控制泵流量。

泵的初始參數如下：

泵馬達電流：50 安培
泵流量： 400 gpm
泵進口溫度：70°F

如果重新調整流量控制閥，導致泵流量變成 800 gpm，下列何者為新泵馬達電流的近似值？

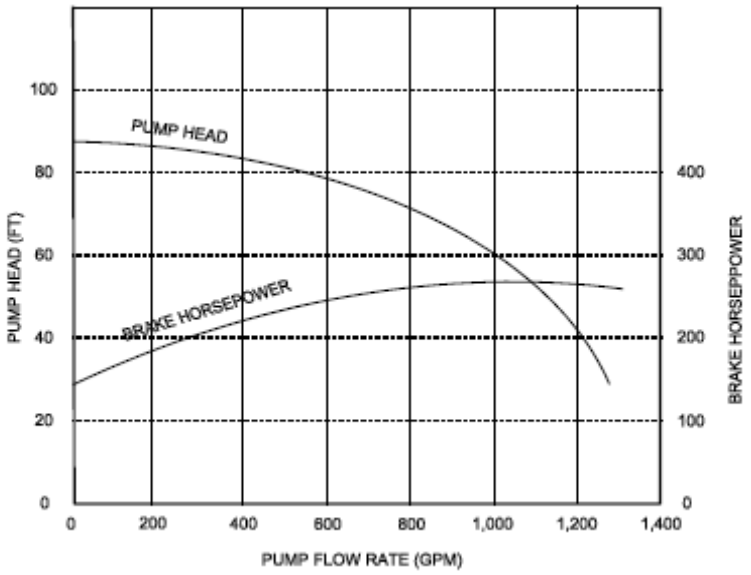
A. 低於 100 安培。

B. 200 安培。

C. 400 安培。

D. 高於 500 安培。

答案：A.


PUMP HEAD
BRAKE HORSEPOWER
PUMP HEAD (FT)
BRAKE HORSEPPOWER
PUMP FLOW RATE (GPM)
0
20
40
60
80
100
100
200
300
400
0
200
400
600
800
1,000
1,200
1,400

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P29 (B2127)

The starting current in a typical ac induction motor is significantly higher than the full-load running current because...

A. starting torque is lower than running torque.

B. starting torque is higher than running torque.

C. rotor speed during start is too low to generate sufficient counter electromotive force (CEMF) in the stator.

D. rotor current during start is too low to generate sufficient CEMF in the stator.

ANSWER: C.

一普通直流感應馬達起動電流，比全載運轉電流高許多，乃是因為.....

A. 起動轉矩較運轉轉矩低。

B. 起動轉矩較運轉轉矩高。

C. 起動時之轉子轉速太低，以致於無法在定子產生顯著的逆向電動勢(counter electromotive force)。

D. 起動時之轉子電流太低，以致於無法在定子產生顯著的逆向電動勢。

答案：C.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P108 (B105)

The average starting current for an ac motor is approximately...

A. the same as its normal running current.

B. two to three times its normal running current.

C. five to seven times its normal running current.

D. ten to fifteen times its normal running current.

ANSWER: C.

一普通交流馬達之平均啟動電流約為.....

A. 與其正常運轉電流相同。

B. 其正常運轉電流的二到三倍。

C. 其正常運轉電流的五到七倍。

D. 其正常運轉電流的十到十五倍。

答案：C.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P230

Which one of the following describes the motor current indications that would be observed during the start of a large ac motor connected to a load?

A. Amps slowly increase to the normal operating value over a period of five time constants.

B. Amps immediately increase to the normal operating value and stabilize.

C. Amps immediately increase to many times the normal operating value and then decrease to the normal operating value.

D. Amps immediately increase to the full-scale value and then decrease rapidly to zero due to overload protection.

ANSWER: C.

啟動銜接負載的大型交流馬達時，下列何者描述了此時觀察到的馬達電流指示值？

A. 安培數於五個時間常數期間，慢慢增至正常運轉值。

B. 安培數立即增至正常運轉值，並趨於穩定。

C. 安培數立即增至正常運轉值的數倍，然後降至正常運轉值。

D. 安培數立即增至最大值(full-scale value)，因為過載防護機制動作，再迅速降至零。

答案：C.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P429

If the discharge valve of a large motor-driven centrifugal pump is kept closed during a normal pump start, the amps indication for the ac induction motor will rise to...

A. several times the full-load current value and then decrease to the no-load current value.

B. approximately the full-load current value and then decrease to the no-load current value.

C. several times the full-load current value and then decrease to the full-load value.

D. approximately the full-load current value and then stabilize at the full-load current value.

ANSWER: A.

一部大型馬達驅動離心泵的出口閥，若於正常啟動過程中維持關閉狀態，該交流感應馬達的指示安培數，將升至……

A. 全載電流值的數倍，然後降至無載電流值。

B. 全載電流值的近似值，然後降至無載電流值。

C. 全載電流值的數倍，然後降至全載電流值。

D. 全載電流值的近似值，然後於全載電流值趨於穩定。

答案：A.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P930 (B2928)

Which one of the following causes starting current to be greater than running current for a typical ac induction motor?

A. The rotor does not develop maximum induced current flow until it has achieved synchronous speed.

B. After the motor starts, resistors are added to the electrical circuit to limit the running current.

C. A large amount of starting current is required to initially establish the rotating magnetic field.

D. The rotor field induces an opposing voltage in the stator that is proportional to rotor speed.

ANSWER: D.

對於一普通交流感應馬達，下列何者會導致起動電流較運轉電流為大？

A. 轉子未產生出最大感應電流，直到達成同步速度為止。

B. 在馬達起動後，電阻被加入電路中以限制運轉電流。

C. 起動電流大乃為初期建立一旋轉磁場所需。

D. 轉子磁場在定子中感應出與轉子轉速成正比之反相電壓。

答案：D.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P1230

The starting current in an ac motor is significantly higher than the full-load running current because...

A. little counter electromotive force is induced onto the rotor during motor start.

B. motor torque production is highest during motor start.

C. little counter electromotive force is induced onto the stator during motor start.

D. work performed by the motor is highest during motor start.

ANSWER: C.

交流馬達的啟動電流遠高於全載運轉電流，理由為何？

A. 馬達啟動時，轉子感應到少量逆向電動勢。

B. 產生的馬達轉矩，於啟動馬達時最高。

C. 馬達啟動時，定子感應到少量逆向電動勢。

D. 馬達所進行的功(work)，於啟動馬達時最高。

答案：C.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P1330

Starting current in an ac induction motor is typically _____ times full-load rated current.

A. 1/4 to 1/2

B. 2 to 3

C. 5 to 6

D. 10 to 12

ANSWER: C.

交流感應馬達的啟動電流，一般為全載額定電流的_____倍。

A. 1/4 至 1/2

B. 2 至 3

C. 5 至 6

D. 10 至 12

答案：C.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P1827 (B1327)

Which one of the following describes the motor current during the start of a typical ac motordriven centrifugal pump with a closed discharge valve? (Assume the pump does not trip.)

A. Current immediately increases to the full-load value and then gradually decreases to the no load value.

B. Current immediately increases to the full-load value and then stabilizes at the full-load value.

C. Current immediately increases to many times the full-load value and then rapidly decreases to the no-load value after several seconds and then stabilizes.

D. Current immediately increases to many times the full-load value and then rapidly decreases to the full-load value after several seconds and then stabilizes.

ANSWER: C.

在出口閥關閉之交流馬達驅動離心泵啟動時，下列何者為所觀察到馬達電流指示之描述？(假設泵沒有跳脫)

A. 電流立即增加至全載值，然後漸漸減少至無載值。

B. 電流立即增加至全載值，並達到穩定。

C. 電流立即增加至全載值的數倍，然後在數秒內快速減少至無載值，並達到穩定。

D. 電流立即增加至全載值的數倍，然後在數秒內快速減少至全載值，並達到穩定。

答案：C.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P1929 (B1428)

Which one of the following describes the typical ammeter response during a normal start of a large ac motor-driven centrifugal pump with a closed discharge valve?

A. Indication will approach full scale and then return to the full-load value.

B. Indication will go off scale high and then return to the no-load value.

C. Indication will approach full scale and then return to the no-load value.

D. Indication will go off scale high and then return to the full-load value.

ANSWER: B.

在出口閥關閉之大型交流馬達驅動離心泵正常起動時，下列何者為一般安培計反應之描述？

A. 指示數值將會接近最大值(full scale)，然後回到全載值。

B. 指示數值將會顯示超出範圍之高值，然後回到無載值。

C. 指示數值將會接近最大值(full scale)，然後回到無載值。

D. 指示數值將會顯示超出範圍之高值，然後回到全載值。

答案：B.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P2229

Which one of the following describes the motor current indications that would be observed during the start of a large ac motor-driven centrifugal pump with a closed discharge valve?

A. Current immediately increases to the full-load value and then decreases to the no-load value over several seconds.

B. Current immediately increases to the no-load value and then stabilizes.

C. Current immediately increases to greater than the full-load value and then decreases to the no-load value after several seconds.

D. Current immediately increases to greater than the full-load value and then decreases to the no-load value after several minutes.

ANSWER: C.

啟動出口閥關閉的大型交流馬達驅動離心泵時，下列何者描述了觀察得出的馬達電流指示值？

A. 電流立即增至全載值，然後在數秒內降至無載值。

B. 電流立即增至無載值，並達到穩定。

C. 電流立即增至大於全載值的數值，然後在數秒內降至無載值。

D. 電流立即增至大於全載值的數值，然後在數分鐘內降至無載值。

答案：C.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P2230 (B2227)

Two identical 4160 Vac induction motors are connected to identical centrifugal pumps being used to provide cooling water flow in separate systems in a nuclear power plant. Each motor is rated at 1000 hp. The discharge valve for pump A is fully open and the discharge valve for pump B is fully shut.

If each motor is then started, the longest time period required to stabilize motor current will be experienced by motor _____ and the higher stable motor current will be experienced by motor _____.

A. A; A

B. A; B

C. B; A

D. B; B

ANSWER: A.

提供核能電廠不同系統冷卻水之兩個相同4160V交流感應馬達離心泵，每具馬達額定馬力為 1000 hp，泵A之出口閥為全開，而泵B之出口閥為全關。

若將兩馬達起動，則須經歷較長時間方能使馬達電流穩定的是馬達_____，而具有較高穩定馬達電流的是馬達_____。

A. A；A

B. A；B

C. B；A

D. B；B

答案：A.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P2430 (B2428)

Which one of the following describes when the highest stator current will be experienced by an ac induction motor?

A. During motor operation at full load

B. During motor operation at zero load

C. Immediately after energizing the motor

D. Immediately after deenergizing the motor

ANSWER: C.

對於一交流感應馬達，其最高定子電流將會發生在何時？

A. 在馬達全負載運轉時。

B. 在馬達零負載(zero load)運轉時。

C. 在馬達通電之後立即發生。

D. 在馬達斷電之後立即發生。

答案：C.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P2730 (B2727)

Two identical 4160 Vac induction motors are connected to identical centrifugal pumps in identical but separate cooling water systems. Each motor is rated at 200 hp. The discharge valve for pump A is fully shut and the discharge valve for pump B is fully open.

If each motor is then started, the longest time period required to stabilize motor current will be experienced by motor _____ and the higher stable motor current will be experienced by motor _____.

A. A; A

B. A; B

C. B; A

D. B; B

ANSWER: D.

於相同但分離之冷卻水系統中之兩相同4160V交流感應馬達離心泵，每具馬達之馬力為200 hp，泵A之出口閥為全關，而泵B之出口閥為全開。

若將兩馬達起動，則需要較長時間方能使馬達電流穩定的是馬達_____，而馬達_____具有較高的穩定馬達電流。

A. A；A

B. A；B

C. B；A

D. B；B

答案：D.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P2830 (B2828)

Two identical 4160 Vac induction motors are connected to identical centrifugal pumps being used to provide cooling water flow in separate identical systems in a nuclear power plant. Each motor is rated at 1000 hp. The discharge valve for pump A is fully shut and the discharge valve for pump B is fully open.

If each motor is then started, the longer time period required to stabilize motor current will be experienced by motor _____ and the higher stable motor current will be experienced by motor _____.

A. A; A

B. A; B

C. B; A

D. B; B

ANSWER: D.

提供核能電廠相同但分離之冷卻水系統中之兩相同4160V交流感應馬達離心泵，每具馬達之馬力為 1000 hp，泵A之出口閥為全關，而泵B之出口閥為全開。

若將兩具馬達起動，則需要較長時間方能使馬達電流穩定的是馬達_____，而馬達_____具有較高的穩定馬達電流。

A. A；A

B. A；B

C. B；A

D. B；B

答案：D.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P2931 (B3529)

Two identical 4160 Vac induction motors are connected to identical centrifugal pumps in identical but separate cooling water systems. Each motor is rated at 200 hp. The discharge valve for pump A is fully shut and the discharge valve for pump B is fully open.

When the motors are started under these conditions, the shorter time period required to reach a stable running current will be experienced by motor _____, and the higher stable running current will be experienced by motor _____.

A. A; A

B. A; B

C. B; A

D. B; B

ANSWER: B.

於相同但分離之冷卻水系統中之兩相同4160V交流感應馬達離心泵，每具馬達之馬力為200 hp，泵A之出口閥為全關，而泵B之出口閥為全開。

若該兩具馬達在上述條件下起動時，則達到穩定運轉電流需時較短的是馬達_____，而馬達_____將具有較高的穩定運轉電流。

A. A；A

B. A；B

C. B；A

D. B；B

答案：B.

科目： 191005
知能類：K1.05 [2.8/2.7]
序號： P4615 (B4614)

Select the option that correctly fills in the blanks.

To minimize the adverse effects of starting current, an ac induction motor should be started _____ to _____ the stator counter electromotive force (CEMF).

A. unloaded; quickly establish

B. unloaded; delay

C. partially loaded; quickly establish

D. partially loaded; delay

ANSWER: A.

請選出空白處的正確選項。

為了降低啟動電流的不良影響，應於_____時啟動交流感應馬達，以利_____定子逆向電動勢(CEMF)。

A. 卸載；迅速建立

B. 卸載；延後

C. 部分負載；迅速建立

D. 部分負載；延後

答案：A.

科目： 191005
知能類：K1.06 [3.0/3.1]
序號： P30 (B1826)

What is the primary reason for limiting the number of starts for an electric motor in a given period of time?

A. Prevent overheating of the windings due to high starting currents.

B. Prevent overheating of the windings due to shorting within the stator.

C. Prevent rotor damage due to excessive cyclic stresses on the shaft.

D. Prevent rotor damage due to excessive axial displacement of the shaft.

ANSWER: A.

在某段時間內，限制一電動馬達起動次數之主要原因為何？

A. 預防因為高起動電流而導致線圈過熱。

B. 預防因為定子內的短路而導致線圈過熱。

C. 預防因為轉軸承受過度循環應力而導致轉子損害。

D. 預防因為轉軸過度軸向位移而導致轉子損害。

答案：A.

科目： 191005
知能類：K1.06 [3.0/3.1]
序號： P231 (B328)

Which one of the following is the basis for restricting the number of starts that a large ac motor may be subjected to within a one-hour period?

A. Prevent excessive torsional stresses on the motor shaft

B. Prevent excessive arcing and degradation of motor breaker contacts

C. Prevent excessive heat buildup within the motor windings

D. Prevent excessive wear of motor thrust bearings

ANSWER: C.

限制大型交流馬達在一小時內的啟動次數，其理由為何？

A. 預防馬達轉軸承受過度扭力。

B. 預防馬達斷路器接點產生過多電弧及劣化。

C. 預防馬達線圈累積過多熱量

D. 預防馬達止推軸承磨蝕過度。

答案：C.

科目： 191005
知能類：K1.06 [3.0/3.1]
序號： P1031

The number of starts for an electric motor in a given period of time should be limited because overheating of the _____ can occur due to the _____ counter electromotive force produced at low rotor speeds.

A. windings; low

B. windings; high

C. commutator and/or slip rings; low

D. commutator and/or slip rings; high

ANSWER: A.

限制電動馬達在某段時間內的啟動次數，其原因在於轉子低速轉動而產生的_____逆向電動勢，將導致_____過熱。

A. 低；線圈

B. 高；線圈

C. 低；換向器(commutator)及/或滑環(slip ring)

D. 高；換向器及/或滑環

答案：A.

科目： 191005
知能類：K1.06 [3.0/3.1]
序號： P1131

The frequency of start/stop cycles for an electrical motor is limited to prevent...

A. overheating the motor windings.

B. overheating the motor supply bus.

C. excessive shaft torsional stresses.

D. excessive cycling of the motor breaker.

ANSWER: A.

限制電動馬達的啟動/停止頻率，其用意在於防止.....

A. 馬達線圈過熱。

B. 馬達供電匯流排過熱。

C. 轉軸扭轉應力過大。

D. 馬達斷路器過度開關。

答案：A.

科目： 191005
知能類：K1.06 [3.0/3.1]
序號： P1331 (B1128)

Frequent start/stop cycling of large ac motors is prohibited to prevent...

A. excessive bearing wear.

B. motor shaft imbalance.

C. overloading electrical buswork.

D. overheating motor windings.

ANSWER: D.

限制大型交流馬達的啟動/停止頻率，其用意在於防止.....

A. 軸承過度磨損。

B. 馬達轉軸失衡。

C. 電動匯流排作功(buswork)過載。

D. 馬達線圈過熱。

答案：D.

科目： 191005
知能類：K1.06 [3.0/3.1]
序號： P2531 (B2528)

Frequent starts of large motors will result in overheating of the motor windings due to high current flow caused by...

A. low electrical resistance of the motor windings.

B. an electrical short circuit between the rotor and stator.

C. high counter electromotive force at low rotor speeds.

D. windage losses between the rotor and stator.

ANSWER: A.

大型馬達頻繁起動通常會導致馬達線圈過熱，係因何者所產生的高電流所致？

A. 馬達線圈的低電阻。

B. 轉子與定子間的電流短路。

C. 低轉子轉速的高逆向電動勢(counter electromotive force)。

D. 在轉子與定子間的風損(windage loss)。

答案：A.

科目： 191005
知能類：K1.06 [3.0/3.1]
序號： P2631 (B228)

Which one of the following is the reason for limiting the number of motor starts in a given time period?

A. Minimizes pitting of contacts in the motor breaker

B. Prevents excessive torsional stresses on motor shaft

C. Prevents overheating of motor windings

D. Minimizes axial stresses on motor bearings

ANSWER: C.

下列何者是限制某段時間內馬達起動次數的原因？

A. 使馬達斷路器之接點孔蝕 (pitting)降至最低。

B. 預防在馬達轉軸承受過高的扭力。

C. 預防馬達線圈過熱。

D. 使馬達軸承上的軸向應力降至最低。

答案：C.

科目： 191005
知能類：K1.06 [3.0/3.1]
序號： P3331 (B3327)

A large centrifugal pump is driven by a 200 horsepower 4.16 kV ac motor. The motor breaker control circuit contains the following protection devices: instantaneous overcurrent relay, motor thermal overload relay, control power fuses, and an anti-pumping device.

The pump had been manually started and stopped several times during a 5-minute period when the motor breaker unexpectedly tripped. In this situation, which one of the following is the most likely cause of the breaker trip?

A. Instantaneous overcurrent

B. Motor thermal overload

C. Blown control power fuse

D. Anti-pumping device actuation

ANSWER: B.

一大型離心泵由一200 hp馬力之4.16kV交流馬達驅動，此馬達斷路器(breaker)控制電路包含如下的保護設備：瞬間過電流電驛(instantaneous overcurrent relay)、馬達熱過載電驛(motor thermal overload relay)、控制電力保險絲(control power fuses)、以及防止反覆投切設備(anti-pumping devices)。

在五分鐘內此泵以手動起動及停止數次，之後馬達斷路器意外跳脫。於此情況下，下列何者是斷路器跳脫的最可能原因？

A. 瞬間電流過量。

B. 馬達熱超載。

C. 控制電力保險絲燒斷。

D. 防止反覆投切設備動作。

答案：B.

科目/題號：191005/1 (2016新增)
知能類：K1.02 [2.8/2.9]
序號：P344 (B340)

A thermal overload device for a large motor protects the motor from...
A. sustained overcurrent by opening the motor breaker or motor line contacts.
B. sustained overcurrent by opening contacts in the motor windings.
C. instantaneous overcurrent by opening the motor breaker or motor line contacts.
D. instantaneous overcurrent by opening contacts in the motor windings.
ANSWER: A.

大型馬達的熱過載裝置乃保護此馬達…
A.藉著將馬達斷路器或馬達電源線路接點打開，以免承受持續之過電流
B.藉著將馬達線圈接點打開，以免承受持續之過電流
C.藉著將馬達斷路器或馬達電源線路接點打開，以免遭致瞬間過電流
D.藉著將馬達線圈接點打開，以免遭致瞬間過電流

答案： A

科目/題號：191005/2 (2016新增)
知能類：K1.02 [2.8/2.9]
序號：P2644 (B2242)

Thermal overload devices will provide the first electrical protection for a pump motor in the event of...
A. a locked rotor upon starting.
B. an electrical short circuit.
C. gradual motor bearing damage.
D. a sheared shaft during operation.
ANSWER: C.

熱過載裝置會在何種情況下，提供泵馬達第一道電氣保護？
A.啟動時馬達轉子鎖死
B.電流短路
C.馬達軸承漸進式損壞
D.運轉時泵軸斷裂

答案： C

科目/題號：191005/3 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P4714 (B4714)

A nuclear power plant startup is in progress. The main generator has just been connected to the power grid with the following generator indications:

20 KV
288 amps
10 MW
0 MVAR

The operator suspects the main generator is operating under reverse power conditions and attempts to increase generator load (MW) normally. If the main generator is operating under reverse power conditions when the operator attempts to increase generator load, generator MW will initially _____; and generator amps will initially _____.
A. decrease; decrease
B. decrease; increase
C. increase; decrease
D. increase; increase
ANSWER: A.

序號:B 4714 (P4714)
核能電廠啟動階段，主發電機剛併聯。相關主發電機數據如下：

電壓 20 kV
電流 288 amps
功率 10 MW
無效功率 0 MVAR

運轉員懷疑主發電機是處於逆向功率條件下運轉，通常會試圖增加發電機的負載(MW)。當運轉員試圖增加發電機的負載時，假設主發電機是處於逆向功率條件下運轉，此時發電機MW會___；而且發電機電流(amps)會___.
A.降低；降低
B.降低；增加
C.增加；降低
D.增加；增加

答案： A

科目/題號：191005/4 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P4814 (B4815)

A main generator is connected to an infinite power grid with the following generator output parameters:

22 KV
60 Hertz
575 MW
100 MVAR (in)

Which one of the following contains a combination of manual adjustments to the main generator voltage regulator and speed control setpoints such that each adjustment will initially result in a decrease in main generator amps?

	Voltage Setpoint	Speed Setpoint
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

ANSWER: B.

一台主發電機併聯到一個無限電網，下列為主發電機輸出參數：

電壓 22kV
頻率 60 Hz
功率 575 MW
無效功率 100 MVAR(輸入)

下列何者為手動調整主發電機電壓調整器和轉速控制設定值的組合，可使主發電機的電流減少？

	電壓設定值	轉速設定值
A.	增加	增加
B.	增加	減低
C.	減低	增加
D.	減低	減低

答案： B

科目/題號：191005/5 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P5014

A main generator is connected to an infinite power grid with the following initial generator parameters:

22 KV
60 Hertz
600 MW
100 MVAR (out)

Which one of the following contains a combination of manual adjustments to the main generator voltage regulator and speed control setpoints such that each adjustment will initially result in an increase in main generator amps?

	Voltage Setpoint	Speed Setpoint
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

ANSWER: A.

一部主發電機併聯至無限電網，發電機的初始參數如下：

電壓 22 kV
頻率 60 Hertz
功率 600 MW
無效功率 100 MVAR (輸出)

下列何者為手動調整主發電機的電壓調節器和轉速控制設定值的組合，可使主發電機電流增加？

	電壓設定值	轉速設定值
A.	增加	增加
B.	增加	減少
C.	減少	增加
D.	減少	減少

答案： A

科目/題號：191005/6 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P5414 (B5415)

A main generator is connected to an infinite power grid. Which one of the following pairs of main generator output parameters places the generator in the closest proximity to slipping a pole.
A. 800 MW; 200 MVAR (in)
B. 800 MW; 600 MVAR (in)
C. 400 MW; 200 MVAR (out)
D. 400 MW; 600 MVAR (out)
ANSWER: B.

一台主發電機併聯到一無限電網。下列何者為主發電機輸出參數最接近發電機欠激磁點。
A. 800MW；200MVAR(輸入)
B. 800MW；600MVAR(輸入)
C. 400MW；200MVAR(輸出)
D. 400MW；600MVAR(輸出)

答案： B

科目/題號：191005/7 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P5514

A main generator is connected to an infinite power grid with the following initial generator parameters:

22 KV
60 Hertz
600 MW
100 MVAR (out)

Which one of the following contains a combination of manual adjustments to the main generator voltage regulator and speed control setpoints such that each adjustment will initially result in a decrease in main generator amps?

	Voltage Setpoint	Speed Setpoint
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

ANSWER: D.

一部主發電機併聯至無限電網，發電機的初始參數如下：

電壓 22 kV
頻率 60 Hertz
功率 600 MW
無效功率 100 MVAR (輸出)

下列何者為手動調整主發電機電壓調節器和轉速控制設定值的組合，可使主發電機電流降低？

	電壓設定值	轉速設定值
A.	增加	增加
B.	增加	減少
C.	減少	增加
D.	減少	減少

答案： D

科目/題號：191005/8 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P6014 (B6014)

During a surveillance test, a 4,000 KW diesel generator (DG) and a 1,000 MW main generator (MG) at a nuclear power plant are connected to the same power grid. The following stable generator output conditions exist:

Diesel Generator	Main Generator
700 KW	800 MW
200 KVAR (out)	100 MVAR (out)

A malfunction then occurs, causing the voltage regulator for the MG to slowly and continuously increase the MG field current. If no operator action is taken, the DG output current will _____
until a breaker trip separates the generators.
A. remain about the same
B. increase continuously
C. initially increase, and then decrease
D. initially decrease, and then increase
ANSWER: D.

核能發電廠在偵測試驗期間，一台 4,000kW 的柴油發電機（DG）和一台 1,000MW 主發電機（MG）被併聯到同一電網。下列是穩定的發電機輸出狀況：

柴油發電機	主發電機
700kW	800 MW
200kVAR(輸出)	100 MVAR (輸出)

故障發生，導致 MG 電壓調整器慢慢地，不斷增加 MG 激磁電流。如果運轉員不採取行動，DG 輸出電流將_____直到其斷路器跳脫。
A.保持不變
B.持續增加
C.初始增加，然後減低
D.初始減低，然後增加

答案： D

科目/題號：191005/9 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P6114 (B6115)

A main generator is connected to an infinite power grid with the following generator output parameters:

22 KV
60 Hertz
575 MW
100 MVAR (in)

Which one of the following contains a combination of minor adjustments to the main generator voltage regulator and speed control setpoints such that each adjustment will cause the main generator to operate at a power factor closer to 1.0? (Assume the generator power factor remains less than 1.0.)

	Voltage Setpoint	Speed Setpoint
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

ANSWER: A.

一台主發電機併聯到一個無限電網，下列為主發電機輸出參數：

電壓 22 kV
頻率 60 Hz
功率 575 MW
無效功率 100MVAR(輸入)

下列何者為微調主發電機電壓調整器和轉速控制的設定值組合，可降低主發電機功率因數接近 1.0？
(假設發電機功率因數保持小於 1.0)

	電壓設定值	轉速設定值
A.	增加	增加
B.	增加	減低
C.	減低	增加
D.	減低	減低

答案： A

科目/題號：191005/10 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P6315 (B6314)

A main turbine-generator is connected to an infinite power grid with the following generator output parameters:

25 KV
20,000 amps
830 MW
248 MVAR (out)

Which one of the following will significantly increase main generator output current without a significant change in main generator real load? (Assume the generator power factor remains less than 1.0.)
A. Increasing the main turbine speed control setpoint.
B. Increasing the main generator voltage regulator setpoint.
C. A 10 percent decrease in power grid electrical loads.
D. A 10 percent increase in power grid electrical loads.
ANSWER: B

一台主汽機發電機併聯到一個無限電網，下列為主發電機輸出參數：

電壓 25kV
電流 20,000 amps
功率 830 MW
無效功率 248 MVAR(輸出)

在主發電機實際負載沒有顯著變化下，下列何者會顯著增加主發電機的輸出電流？(假設發電機功率因數保持小於 1.0)
A.增加主汽機轉速控制設定值
B.增加主發電機電壓調整器設定值
C.降低 10％電網的電力負載
D.增加 10％電網的電力負載

答案： B

科目/題號：191005/11 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P6515 (B4315)

A main generator is connected to an infinite power grid with the following generator output parameters:

22 KV
60 Hertz
575 MW
100 MVAR (out)

Which one of the following contains a combination of manual adjustments to the main generator voltage regulator and speed control setpoints such that each adjustment will result in main generator operation at a power factor closer to 1.0? (Assume the generator power factor remains less than 1.0.)

	Voltage Setpoint	Speed Setpoint
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

ANSWER: C.

一台主發電機併聯到無限電網，下列為發電機輸出參數：

電壓 22kV
頻率 60 Hz
功率 575 MW
無效功率 100 MVAR(輸出)

下列何者為手動調整主發電機電壓調整器和轉速控制之設定值組合，可使主發電機運轉功率因數接近1.0？(假設發電機功率因數保持小於1.0)

	電壓設定值	轉速設定值
A.	增加	增加
B.	增加	減低
C.	減低	增加
D.	減低	減低

答案： C

科目/題號：191005/12 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P6614 (B6615)

During a surveillance test, a 4,000 KW diesel generator (DG) and a 1,000 MW main generator (MG) at a nuclear power plant are connected to a power grid.
The following stable generator output conditions initially exist:

Diesel Generator	Main Generator
700 KW	800 MW
200 KVAR (out)	100 MVAR (out)

A malfunction then occurs, causing the voltage regulator for the MG to slowly and continuously decrease the MG field current. If no operator action is taken, the DG output current will _____ until a breaker trip separates the generators.
A. increase continuously
B. decrease continuously
C. initially increase, and then decrease
D. initially decrease, and then increase
ANSWER: A.

核能發電廠在偵測試驗期間，一台 4,000kW 的柴油發電機（DG）和一台 1,000MW 主發電機（MG）併聯到同一電網。下列是穩定的發電機輸出狀況：

柴油發電機	主發電機
700 kW	800MW
200 kVAR (輸出)	100 MVAR (輸出)

故障發生，導致 MG 電壓調整器慢慢地，不斷減低 MG 激磁電流。如果運轉員不採取行動，DG 輸出電流將_____直到其斷路器跳脫。
A.持續增加
B.持續減低
C.初始增加，然後減低
D.初始減低，然後增加

答案： A

科目/題號：191005/13 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P6914 (B6915)

A main generator is connected to an infinite power grid with the following generator output parameters:

100 MW
0 MVAR
2,625 amps
22 KV

If the main generator field current is decreased, main generator amps will initially _____; and MW will initially _____.
A. decrease; decrease
B. increase; decrease
C. decrease; remain the same
D. increase; remain the same
ANSWER: D.

一台主發電機併聯到一個無限電網，下列為主發電機輸出參數：

功率 100 MW
無效功率 0 MVAR
電流 2,625 amps
電壓 22 kV

如果主發電機磁場電流減低，主發電機電流將_____；且 MW 將_____。
A.減低；減低
B.增加；減低
C.減低；保持一樣
D.增加；保持一樣

答案： D

科目/題號：191005/14 (2016新增)
知能類：K1.03 [2.7/2.8]
序號：P7615 (B7615)

A 4,000 KW diesel generator (DG) is supplying 2,000 KW to a 4.16 KV emergency bus. The DG governor is in the isochronous mode (no speed droop). The emergency bus is about to be synchronized with, and then connected to, an infinite offsite power grid by closing the emergency bus normal power feeder breaker.
The following stable emergency bus and normal power conditions currently exist:

Emergency Bus (from DG)	Normal Power (from Offsite)
4.16 KV	4.16 KV
60.0 Hz	60.1 Hz

When the emergency bus normal power feeder breaker is closed, the DG will…
(Assume no additional operator action.)
A. transfer KW load to the offsite power grid but remain partially loaded.
B. transfer KW load to the offsite power grid until the DG is completely unloaded.
C. acquire KW load from the offsite power grid but remain within its KW load rating.
D. acquire KW load from the offsite power grid and ultimately exceed its KW load rating.
ANSWER: B.

一個4,000kW柴油發電機(DG)，供應2,000kW給一個4.16kV緊急匯流排。柴油發電機調速器置於定速(Isochronous)模式(非轉速垂降)。緊急匯流排即將經由正常電源斷路器閉合，與外部電網同步併聯。下列是目前穩定中緊急匯流排和正常電源的情況：

緊急匯流排 (DG端)	正常電源 (外部電源)
4.16kV	4.16kV
60.0 Hz	60.1 Hz

當緊急匯流排正常電源斷路器閉合，柴油發電機將….
A.轉移KW負載到外部電力網，但仍然部分加載
B.轉移KW負載到外部電力網直到DG完全卸載
C.獲得來自外部電力網 kW負載，但仍然維持其kW負載內
D.獲得來自外部電力網 kW負載，且最終超過其kW負載

答案： B

科目/題號：191005/15 (2016新增)
知能類：K1.03 [2.7/2,8]
序號：P7644 (B7644)

A main generator is connected to an infinite power grid with the following generator output parameters:

22 KV
60 Hertz
575 MW
100 MVAR (out)

Which one of the following contains a combination of minor adjustments to the main generator voltage regulator and speed control setpoints such that each adjustment will cause the main generator to operate at a power factor farther from 1.0? (Assume the generator power factor remains less than 1.0.)

	Voltage Setpoint	Speed Setpoint
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

ANSWER: B.

一台主發電機併聯至無限電網，主發電機輸出參數如下：

電壓 22 kV
頻率 60 Hz
功率 575 MW
無效功率 100 MVAR(輸出)

下列何者為微調主發電機電壓調節器和轉速控制的設定值組合，可降低主發電機功率因數遠離 1.0？(假設發電機功率因素保持小於 1.0)

	電壓設定值	轉速設定值
A.	增加	增加
B.	增加	減低
C.	減低	增加
D.	減低	減低

答案： B

科目/題號：191005/16 (2016新增)
知能類：K1.03 [2.7/2.8]
K1.04 [2.7/2.8]
序號：P7635 (B7635)

A radial flow centrifugal cooling water pump is being powered by a 480 VAC induction motor. If the motor input voltage slowly decreases from 480 VAC to 450 VAC, the pump flow rate will _____; and the motor current will _____. (Assume the motor does not stall.)
A. decrease; increase
B. decrease; decrease
C. remain the same; increase
D. remain the same; decrease
ANSWER: A.

徑流式離心泵是由一個 480V 交流感應馬達供電驅動。假設馬達輸入電壓慢慢由 480VAC 遞減至 450VAC，則泵的流量將_____；且馬達電流將_____.(假設馬達不失速)。
A.減低；增加
B.減低；減低
C.維持一樣；增加
D.維持一樣；減低

答案： A

科目/題號：191005/17 (2016新增)
知能類:: K1.04 [2.7/2.8]
序號：P4915 (B4914)

Consider two identical single-speed AC induction motors, one of which is connected to a radial-flow centrifugal pump and the other to a reciprocating-type positive displacement pump (PDP). Both pumps are taking suction at the same elevation from a vented water storage tank.
Each pump has a maximum design backpressure of 800 psig, and each is operating with the following initial conditions:

Flow rate = 200 gpm
Backpressure = 400 psig
Motor current = 100 amps

If the backpressure for each pump increases to 600 psig, the centrifugal pump will have a _____ flow rate than the PDP; and the centrifugal pump will have a _____ motor current than the PDP.
A. lower; higher
B. lower; lower
C. higher; higher
D. higher; lower
ANSWER: B.

兩台相同的定速交流感應馬達，其中一台連接到一個徑流式離心泵，另一台為往復式正排量泵（PDP）。兩台泵進口均自同一設有排氣裝置之儲水槽取水，且高度相同。每台泵最高設計背壓為 800 psig，且每台泵運轉初始狀態如下：

流量率=200 gpm
背壓=400 psig
馬達電流= 100 amps

假設每個泵背壓增加至 600 psig 的壓力，離心泵將具有比該 PDP _____流量率；離心泵將具有比該 PDP _____馬達電流。
A.較低的；較高的
B.較低的；較低的
C.較高的；較高的
D.較高的；較低的

答案： B

科目/題號：191005/18 (2016新增)
知能類：K1.04 [2.7/2.8]
序號：P5814 (B5814)

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

Motor current = 100 amps
Pump flow rate = 800 gpm

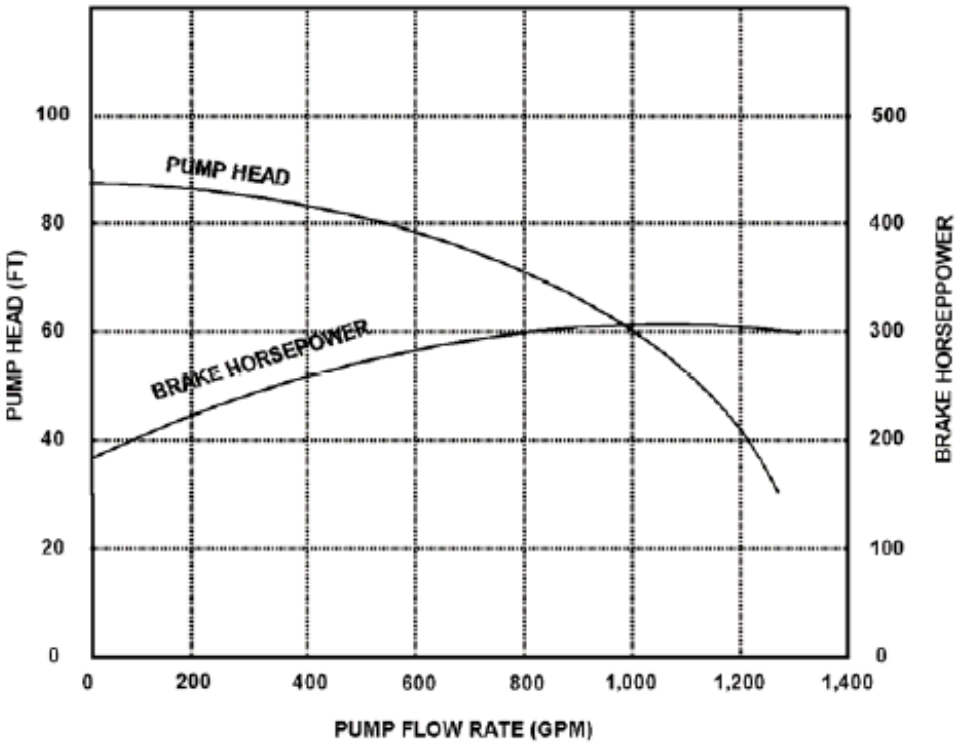
What will be the approximate value of pump motor current if the flow control valve is repositioned such that pump flow rate decreases to 400 gpm?
A. Less than 15 amps
B. 25 amps
C. 50 amps
D. Greater than 75 amps
ANSWER: D.

參考離心式泵性能曲線（見下圖）。泵是由一個定速交流感應馬達驅動。泵流量率是由流量控制閥控制。泵的初始運轉狀態如下：

馬達電流=100 amps
泵流量率=800 gpm

假設調整流量控制閥使得泵流量率降低到 400 gpm，則泵馬達電流的近似值大約為何？
A.小於 15 amps
B. 25 amps
C. 50 amps
D.大於 75 amps

答案： D


PUMP HEAD
BRAKE HORSEPOWER
PUMP HEAD (FT)
BRAKE HORSEPPOWER
PUMP FLOW RATE (GPM)
0
20
40
60
80
100
0
100
200
300
400
500
0
200
400
600
800
1,000
1,200
1,400

科目/題號：191005/19 (2016新增)
知能類：K1.04 [2.7/2.8]
序號：P6215 (B6215)

An AC induction motor is connected to a radial-flow centrifugal pump in a cooling water system. When the pump is started, the time period required to reach a stable running current will be shorter if the pump discharge valve is fully _____; and the stable running current will be lower if the pump discharge valve is fully _____.
A. open; open
B. open; closed
C. closed; open
D. closed; closed
ANSWER: D.

在冷卻水系統中，一交流感應馬達連接徑流式離心泵。當泵啟動時，如果泵出口閥是_____時，達到穩定運轉電流所需的期間將會縮短；如果泵的出口閥是_____，則穩定的運轉電流會低一些。
A.全開；全開
B.全開；全關
C.全關；全開
D.全關；全關

答案： D

科目/題號：191005/20 (2016 新增)
知能類：K1.04 [2.7/2.8]
序號：P6814 (B6814)

A centrifugal pump is driven by a single-speed AC induction motor. Pump flow rate is controlled by a throttled discharge flow control valve.
The following initial pump conditions exist:
Pump motor current = 50 amps
Pump flow rate = 400 gpm
What will the resulting pump motor current be if the flow control valve is repositioned such that pump flow rate increases to 800 gpm?
A. 100 amps
B. 200 amps
C. 400 amps
D. Cannot be determined without additional information.
ANSWER: D.

離心泵是由一個定速交流感應馬達驅動。泵流量率是由一個節流排放流量控制閥控制。下列是泵的初始狀況：
泵馬達電流=50 amps
泵流量率=400 gpm
如果調整流量控制閥使得泵流量率增加至 800 gpm，結果泵馬達電流為何？
A. 100amps
B. 200amps
C. 400amps
D.資料不足，不能確定

答案： D

科目/題號：191005/21 (2016新增)
知能類：K1.04 [2.7/2.8]
序號：P7214 (B7214)

An axial flow ventilation fan is being driven by an AC motor. The fan is operating at its maximum rated flow rate. How will the fan motor current initially change if the flow rate through the fan is decreased by partially closing a discharge damper?
A. The motor current will increase in accordance with the centrifugal pump laws.
B. The motor current will increase, but not in accordance with the centrifugal pump laws.
C. The motor current will decrease in accordance with the centrifugal pump laws.
D. The motor current will decrease, but not in accordance with the centrifugal pump laws.
ANSWER: B

軸流式風扇是由一個交流馬達驅動。風扇在其最大額定流量運轉。如果減少風門開度以降低風扇流量，則初始風扇的馬達電流如何改變？
A.馬達電流將按照離心泵定律增加
B.馬達電流會增加，但不按照離心泵的定律
C.馬達電流將按照離心泵定律減小
D.馬達電流會減小，但不按照離心泵的定律

答案： B

科目/題號：191005/22 (2016新增)
知能類：K1.04 [2.7/2.8]
序號：P7414 (B7414)

Consider two identical single-speed AC induction motors, one of which is connected to a radial-flow centrifugal pump and the other to a rotary-type positive displacement pump (PDP). Both pumps are taking suction from the bottom of a vented water storage tank.
Each pump is operating with the following initial conditions:
Flow rate = 200 gpm
Backpressure = 600 psig
Motor current = 100 amps
If the backpressure for each pump decreases to 400 psig, the centrifugal pump will have a _____ flow rate than the PDP; and the centrifugal pump will have a _____ motor current than the PDP.
A. lower; lower
B. lower; higher
C. higher; lower
D. higher; higher
ANSWER: D.

兩台相同的定速交流感應馬達，其中一台連接到徑流式離心泵，另一台連接到旋轉式正排量泵（PDP）。兩台泵進口均從排氣儲水槽的底部取水。每台泵的初始運轉狀態如下：
流量率=200gpm
背壓=600 psig
馬達電流= 100 amps
假設每台泵背壓減低至 400 psig，離心泵將具有比該 PDP _____流量率；離心泵將具有比該 PDP _____馬達電流。
A.較低的；較低的
B.較低的；較高的
C.較高的；較低的
D.較高的；較高的

答案： D

科目/題號：191005/23 (2016新增)
知能類：K1.04 [2.7/2.8]
序號：P7605 (B7605)

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

Motor current = 10 amps

Pump flow rate = 200 gpm

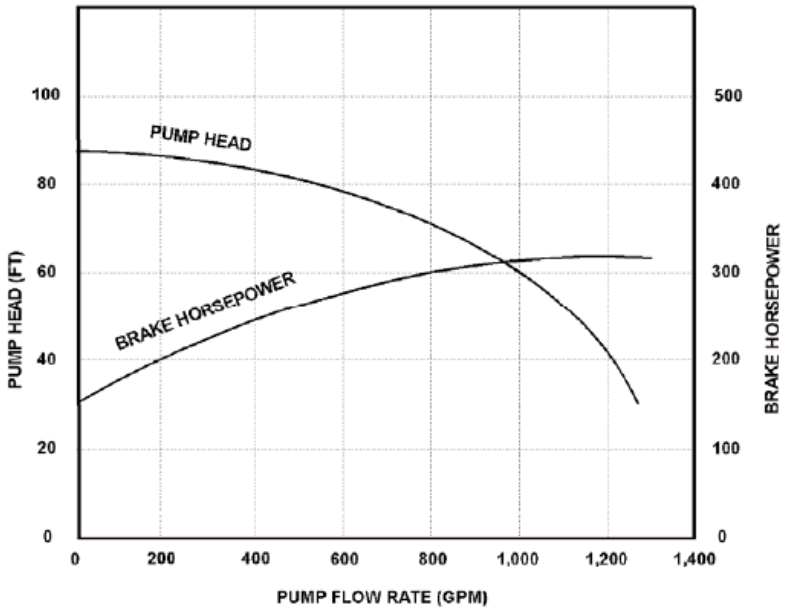
What will be the approximate value of pump motor current if the flow control valve is repositioned such that pump flow rate increases to 800 gpm?
A. 15 amps
B. 40 amps
C. 160 amps
D. Greater than 200 amps
ANSWER: A.

參考離心泵性能曲線圖（見下圖）。泵是由一個定速交流感應馬達驅動。泵流量率是由出口流量控制閥控制。泵的初始運轉狀態如下：

馬達電流=10amps

泵流量率=200gpm

假設調整流量控制閥使得泵流量率增加到 800gpm，則泵馬達電流的近似值大約為何？
A. 15amps
B. 40amps
C. 160amps
D.大於 200amps
答案： A



科目/題號：191005/24 (2016新增)
知能類：K1.05 [2.8/2.7]
序號：P5715 (B5714)

Two identical AC induction motors are connected to identical radial-flow centrifugal pumps in identical but separate cooling water systems. Each motor is rated at 200 hp. The discharge valve for pump A is fully open and the discharge valve for pump B is fully closed. Each pump is currently off.
If the pumps are started under these conditions, the shorter time period required to reach a stable running current will be experienced by the motor for pump _____; and the higher stable running current will be experienced by the motor for pump _____.
A. A; A
B. A; B
C. B; A
D. B; B
ANSWER: C.

兩個相同的交流感應馬達連接到兩個相同的徑流式離心泵，其冷卻水系統雖然相同但是各自分離而獨立。每個馬達有 200 匹額定馬力。目前每台泵都未運轉，A 泵的出口閥完全打開而 B 泵出口閥完全關閉。假設泵在這些條件下開始啟動，所需較短的時間以達到穩定運行的電流將是_____泵馬達；所需較高穩定運轉電流將是_____泵馬達。
A. A；A
B. A；B
C. B；A
D. B；B

答案： C