科目： 191001
知能類 ：K1.01 [3.3/3.4]
序號： P901

Which one of the following describes the function of a safety valve?

A. Provide overpressure protection to limit the internal pressure in vessels

B. Control pressure in a system to maintain optimum operational conditions

C. Sound a warning by lifting at a predetermined value slightly higher than operating pressure

D. Modulate open as necessary to maintain system pressure and/or temperature within normal limits

ANSWER: A.

下列何者說明為安全閥的功能？

A. 提供過壓防護機制以限制槽內壓力。

B. 控制系統壓力以維持最佳運轉狀態。

C. 在達略高於運轉壓力之設定值時開啟以發出警訊。

D. 依需要調節閥開度，維持系統壓力和/或溫度在正常限值內。

答案：A.

科目： 191001
知能類：K1.01 [3.3/3.4]
序號： P1802 (B1701)

A vertical safety valve has a compressed spring assembly that is applying 1,200 lbf to the top of the valve disk in opposition to system pressure. System pressure is being exerted on the underside of the valve disk that is 3 inches in diameter.

Which one of the following is the approximate system pressure at which the safety valve will open? (Neglect the effect of atmospheric pressure.)

A. 44 psi

B. 64 psi

C. 128 psi

D. 170 psi

ANSWER: D.

一直立安全閥上裝有壓縮彈簧裝置，施力 1,200 lbf 於閥盤上方以對抗系統壓力。系統壓力則施力於直徑 3 英吋的閥盤底面。

下列何者為讓安全閥打開的約略系統壓力(忽略大氣壓力的影響)？

A. 44 psi

B. 64 psi

C. 128 psi

D. 170 psi

答案：D.

科目： 191001
知能類：K1.01 [3.3/3.4]
序號： P1903 (B2003)

A vertical safety valve with a 3-inch diameter disk has a compressed spring applying 1,000 lbf to the top of the valve disk in opposition to system pressure. Which one of the following is the approximate system pressure at which the safety valve will open? (Neglect the effect of atmospheric pressure.)

A. 35 psi

B. 111 psi

C. 142 psi

D. 444 psi

ANSWER: C.

閥盤直徑 3 英吋的直立安全閥上，裝有施力 1,000 lbf 的彈簧裝置以對抗系統壓力。下列何者為讓安全閥開啟的約略系統壓力(忽略大氣壓力的影響)？

A. 35 psi

B. 111 psi

C. 142 psi

D. 444 psi

答案：C.

科目： 191001
知能類：K1.01 [3.3/3.4]
序號： P2101 (B2103)

Refer to the drawing of a typical safety valve (see figure below).

The component indicated by the solid arrow is used when necessary to manually...

A. rachet open the safety valve.

B. pop open the safety valve.

C. gag shut the safety valve.

D. determine the position of the safety valve.

ANSWER: B.

請參照下圖的典型安全閥。

實心箭頭所指的組件是運轉員在必要時以手動方式……

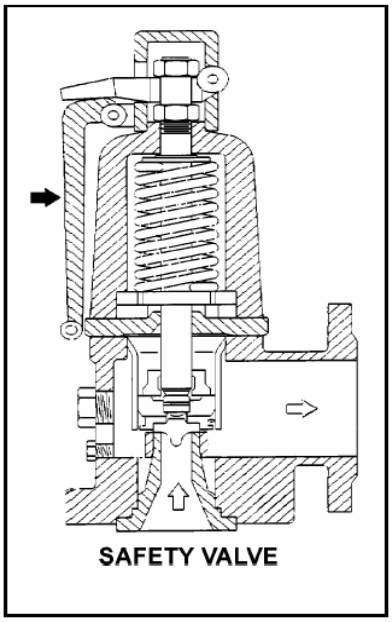
A. 用扳手打開安全閥。

B. 彈開(pop open)安全閥。

C. 塞住(gag shut)安全閥。

D. 確認安全閥的位置。

答案：B.



科目： 191001
知能類：K1.01 [3.3/3.4]
序號： P2301 (B2301)

A vertical safety valve has a compressed spring assembly that is applying 2,500 lbf to the top of the valve disk in opposition to system pressure. System pressure is being exerted on the underside of the valve disk that is 5 inches in diameter.

Which one of the following is the approximate system pressure at which the safety valve will open? (Neglect the effect of atmospheric pressure.)

A. 32 psi

B. 127 psi

C. 159 psi

D. 500 psi

ANSWER: B.

直立安全閥上裝有壓縮彈簧裝置，在閥盤上方施力 2,500 lbf 以對抗系統壓力。系統壓力則施加於直徑 5 英吋的閥盤底面。

下列何者為讓安全閥開啟的約略系統壓力(忽略大氣壓力的影響)？

A. 32 psi

B. 127 psi

C. 159 psi

D. 500 psi

答案：B.

科目： 191001
知能類：K1.01 [3.3/3.4]
序號： P2801 (B2803)

A vertical safety valve with a 2-inch diameter disk has a compressed spring applying 2,400 lbf to the top of the valve disk in opposition to system pressure. Which one of the following is the approximate system pressure at which the safety valve will open?

A. 95 psig

B. 191 psig

C. 382 psig

D. 764 psig

ANSWER: D.

盤面直徑 2 英吋的直立安全閥上，裝有在閥盤上方施力 2,400 lbf 的彈簧裝置以對抗系統壓力。下列何者為讓安全閥開啟的約略系統壓力？

A. 95 psig

B. 191 psig

C. 382 psig

D. 764 psig

答案：D.

科目： 191001
知能類：K1.01 [3.3/3.4]
序號： P3401 (B3401)

Given the following pressure specifications for operation of a main steam safety valve (MSSV):

| | |
|---|---|
| Setpoint pressure (MSSV starts to open): | 1,200 psia |
| Maximum pressure (MSSV will be fully open): | 1,230 psia |
| Reseat pressure (MSSV will be fully closed): | 1,140 psia |

Which one of the following is the percent blowdown for the MSSV?

A. 2.5%

B. 5.0%

C. 7.5%

D. 10.0%

ANSWER: B.

假設主蒸汽安全閥(MSSV)的壓力規範如下：

| | |
|---|---|
| 壓力設定值(MSSV 開始開啟)： | 1,200 psia |
| 最大壓力(MSSV 全開)： | 1,230 psia |
| 歸位壓力(MSSV 完全關閉)： | 1,140 psia |

下列何者為主蒸汽安全閥的沖放(blowdown)百分比：

A. 2.5%

B. 5.0%

C. 7.5%

D. 10.0%

答案：B.

科目： 191001
知能類：K1.01 [3.3/3.4]
K1.02 [3.0/3.3]
序號： P4201 (B4201)

A completely full water storage tank is being hydrostatically tested to 100 psig using a positive displacement pump (PDP) with a smooth and constant discharge flow rate of 10 gpm. The tank is protected by a safety valve and a relief valve; both valves will discharge to the atmosphere. Each valve has an opening setpoint of 105 psig and a maximum rated discharge flow rate of 6 gpm. The PDP is inadvertently left running when tank pressure reaches 100 psig.

With the PDP still running, tank pressure will stabilize _____ 105 psig; the greater mass flow rate will be coming from the _____ valve.

A. at; safety

B. above; safety

C. at; relief

D. above; relief

ANSWER: B.

假設一座全滿的儲水槽利用正排量泵(PDP)以穩定 10 gpm 的流量加壓至 100 psig 靜水壓測試。儲水槽以一只安全閥及一只釋壓閥做為保護；兩種閥將排放至大氣。各閥的開啟設定點均為 105 psig，最大排放流量均為 6 gpm。當槽壓抵達 100 psig 時，正排量泵(PDP)因疏忽而持續運轉。

正排量泵持續運轉時，槽壓將固定在_____；_____將有較高的質量流量。

A. 105 psig；安全閥

B. 105 psig 以上；安全閥

C. 105 psig；釋壓閥

D. 105 psig 以上；釋壓閥

答案：B.

科目： 191001
知能類：K1.01 [3.3/3.4]
序號： P4401 (B4401)

Given the following pressure specifications for a main steam safety valve (MSSV):

Setpoint pressure (MSSV will start to open): 1,200 psia
Maximum pressure (MSSV will be fully open): 1,242 psia
Reseat pressure (MSSV will be fully closed): 1,152 psia

Which one of the following is the percent accumulation for this MSSV?

A. 2.5%

B. 3.0%

C. 3.5%

D. 4.0%

ANSWER: C.

假設主蒸汽安全閥(MSSV)的壓力規範如下：

壓力設定值(MSSV 開始打開)： 1,200 psia
最大壓力(MSSV 全開)： 1,242 psia
歸位壓力(MSSV 完全關閉)： 1,152 psia

下列何者為主蒸汽安全閥的蓄壓百分比：

A. 2.5%

B. 3.0%

C. 3.5%

D. 4.0%

答案：C.

科目： 191001
知能類：K1.02 [3.3/3.4]
序號： P1

The primary purpose of a pressure relief valve is to...

A. reduce system energy.

B. reduce system pressure.

C. maintain system integrity.

D. maintain system mass.

ANSWER: C.

釋壓閥的主要用途為……

A. 降低系統能量。

B. 降低系統壓力。

C. 維持系統完整。

D. 維持系統質量。

答案：C.

科目： 191001
知能類：K1.02 [3.0/3.3]
序號： P202 (B301)

The difference between the set point pressure at which a safety valve opens and the pressure at which it closes is called...

A. blowdown.

B. accumulation.

C. set point tolerance.

D. set point deviation.

ANSWER: A.

安全閥開啟的壓力設定值與關閉時的壓力差距，稱為.....

A. 沖放

B. 蓄壓

C. 設定值公差

D. 設定值偏差

答案：A.

科目： 191001
知能類：K1.02 [3.0/3.3]
序號： P501(B201)

The difference between the setpoint pressure at which a relief valve begins to open and the pressure at which it is fully open is called...

A. setpoint deviation.

B. setpoint tolerance.

C. accumulation.

D. blowdown.

ANSWER: C.

釋壓閥開始打開的壓力設定值，與完全打開時的壓力差距，稱為.....

A. 設定值偏差

B. 設定值公差

C. 蓄壓(accumulation)

D. 沖放(blowdown)

答案：C.

科目： 191001
知能類：K1.02 [3.0/3.3]
序號： P1504 (B1801)

Which one of the following is a difference between a typical relief valve and a typical safety valve?

A. The actuator closing spring on a relief valve is in a compressed state whereas the actuator closing spring on a safety valve acts in tension.

B. A relief valve gradually opens as pressure increases above the setpoint pressure whereas a safety valve fully opens at the setpoint pressure.

C. Relief valves are capable of being gagged whereas safety valves are not.

D. The blowdown of a relief valve is greater than the blowdown of a safety valve.

ANSWER: B.

下列何者是典型釋壓閥和安全閥的差別？

A. 釋壓閥的操作器關閉彈簧處於壓縮狀態，安全閥的操作器關閉彈簧則處於拉緊狀態。

B. 釋壓閥於壓力超過設定值時逐漸開啟，安全閥則在壓力達到設定值時，就會完全開啟。

C. 釋壓閥可以鉗塞(gag)，安全閥則不能。

D. 釋壓閥的沖放大於安全閥的沖放。

答案：B.

科目： 191001
知能類：K1.02 [3.0/3.3]
序號： P1801 (B1301)

Refer to the drawing of two identical pressure vessels with identical relief valve protection (see figure below).

Both vessels have been pressurized to 50 psig and then isolated. Vessel A is completely filled with water at 150°F. Vessel B is in a saturated condition with one-half steam (100% quality) and onehalf water (0% quality) by volume.

If both relief valves fully open simultaneously, the faster pressure reduction will occur in vessel _____; and if both relief valves close at 40 psig, the greater mass loss will have occurred in vessel _____.

A. A; A

B. A; B

C. B; A

D. B; B

ANSWER: B.

請參照下圖之中，兩個具有相同釋壓閥保護裝置的相同壓力容器。

兩個容器都加壓至 50 psig 並維持隔離封閉狀態。容器 A 內裝滿 150°F 的水，容器 B 內則處於一半容積為蒸汽(100%乾度)，一半容積為水(0%乾度)的飽和狀態。

如果兩者的釋壓閥同時完全打開，容器_____降壓較快；兩者的釋壓閥都在 40 psig 關閉時，容器_____會減少較多質量。

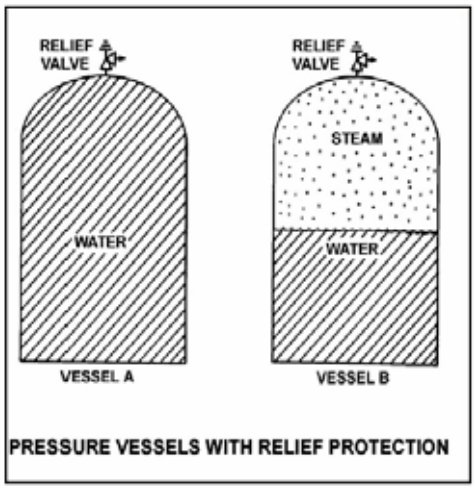
A. A; A

B. A; B

C. B; A

D. B; B

答案：B.



PRESSURE VESSELS WITH RELIEF PROTECTION

科目： 191001
知能類：K1.02 [3.0/3.3]
序號： P2501 (B2501)

Water storage tanks A and B are identical except that tank A receives overpressure protection from an installed relief valve. Tank B has an installed safety valve. The relief valve and safety valve have the same pressure set point and design flow rate.

Water is continuously added to each tank at the same rate (50% of the design flow rate of the relief/safety valve). After tank pressure reaches the set point for each valve, tank A pressure will _____ and tank B pressure will _____.

A. stabilize slightly above the pressure setpoint; stabilize slightly above the pressure setpoint

B. stabilize slightly above the pressure setpoint; fluctuate within a few percent of the pressure setpoint

C. fluctuate within a few percent of the pressure setpoint; stabilize slightly above the pressure setpoint

D. fluctuate within a few percent of the pressure setpoint; fluctuate within a few percent of the pressure setpoint

ANSWER: B.

儲水槽 A 和儲水槽 B 完全相同，但是 A 槽裝有過壓保護裝置的釋壓閥，B 槽則裝有安全閥。釋壓閥和安全閥均有相同的壓力設定值和設計流量。

在兩槽內，以釋壓/安全閥設計流量的 50％等速加入水，槽內壓力達到兩閥設定值時，A 槽的壓力會_____而 B 槽的壓力會_____。

A. 穩定在稍高於壓力設定值之處；穩定在稍高於壓力設定值之處。

B. 穩定在稍高於壓力設定值之處；於壓力設定值上下幾個百分比之間來回晃動。

C. 於壓力設定值上下幾個百分比之間來回晃動；穩定在稍高於壓力設定值之處。

D. 於壓力設定值上下幾個百分比之間來回晃動；於壓力設定值上下幾個百分比之間來回晃動。

答案：B.

科目： 191001
知能類：K1.02 [3.0/3.3]
序號： P2701 (B2701)

Vessels A and B are identical except that vessel A receives overpressure protection from an installed safety valve. Vessel B has an installed relief valve. The safety and relief valves have the same pressure setpoint and design flow rate.

Water is continuously added to each vessel at the same rate (50% of the design flow rate of the safety/relief valve). After vessel pressure reaches the setpoint for each valve, vessel A pressure will _____ and vessel B pressure will _____.

A. stabilize slightly above the pressure setpoint; stabilize slightly above the pressure setpoint

B. stabilize slightly above the pressure setpoint; fluctuate within a few percent of the pressure setpoint

C. fluctuate within a few percent of the pressure setpoint; stabilize slightly above the pressure setpoint

D. fluctuate within a few percent of the pressure setpoint; fluctuate within a few percent of the pressure setpoint

ANSWER: C.

容器 A 和容器 B 完全相同，但是容器 A 的過壓保護裝置為安全閥，容器 B 則為釋壓閥。安全閥和釋壓閥有相同的壓力設定值和設計流量。

在兩容器內，以安全/釋壓閥設計流量的 50%等速加入水，容器內壓力達到兩閥設定值時，容器 A 的壓力會_____而容器 B 的壓力會_____。

A. 穩定在稍高於壓力設定值之處；穩定在稍高於壓力設定值之處。

B. 穩定在稍高於壓力設定值之處；於壓力設定值上下幾個百分比之間來回晃動。

C. 於壓力設定值上下幾個百分比之間來回晃動；穩定在稍高於壓力設定值之處。

D. 於壓力設定值上下幾個百分比之間來回晃動；於壓力設定值上下幾個百分比之間來回晃動。

答案：C.

科目： 191001
知能類：K1.02 [3.4/3.6]
序號： P3302 (B2)

Refer to the drawing of two identical pressure vessels with identical relief valve protection (see figure below).

Vessel A is completely filled with subcooled water at 80°F and vessel B is in a saturated, two-phase condition. Both vessels are currently pressurized to 50 psig and isolated.

If both relief valves fully open simultaneously, the faster pressure reduction will initially occur in vessel _____ and the faster mass loss will initially occur in vessel _____.

A. A; A

B. A; B

C. B; A

D. B; B

ANSWER: A.

請參照下圖之中，兩個具有相同釋壓閥保護裝置的相同壓力容器。

容器 A 內裝滿 80°F 次冷水，容器 B 內則為飽和雙相狀態。兩個容器都加壓到 50 psig 後隔離。

如果兩者的釋壓閥同時完全打開，初期降壓較快的是容器_____；初期質量流失較快的是容器_____。

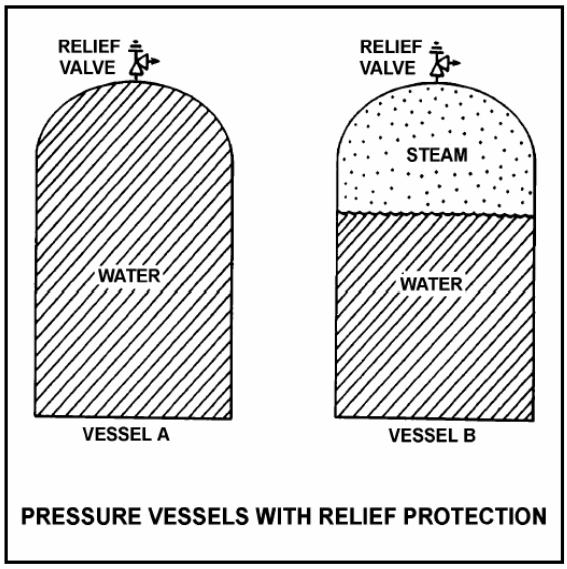
A. A; A

B. A; B

C. B; A

D. B; B

答案：A.



科目： 191001
知能類：K1.03 [2.7/2.9]
序號： P2

When a discharge valve is opened to atmosphere, the pressure on the upstream side of the valve will...

A. remain the same, and the pressure on the downstream side will increase.

B. increase, and the pressure on the downstream side will remain the same.

C. remain the same, and the pressure on the downstream side will decrease.

D. decrease, and the pressure on the downstream side will remain the same.

ANSWER: D.

釋放閥開啟排放至大氣時，閥內上游側的壓力將……

A. 維持相同，下游側壓力將升高。

B. 升高，下游側壓力將維持相同。

C. 維持相同，下游側壓力將降低。

D. 降低，下游側壓力將維持相同。

答案：D.

科目： 191001
知能類：K1.03 [2.7/2.9]
序號： P602 (B2005)

When comparing a globe valve and a gate valve in the same application, the gate valve has a _____ pressure drop when fully open and is the _____ choice for throttling.

A. higher; better

B. lower; better

C. higher; poorer

D. lower; poorer

ANSWER: D.

比較用途相同的球形閥及閘閥時，閘閥於全開時的壓降_____，所以是節流的_____選擇。

A. 較高；較佳

B. 較低；較佳

C. 較高；較差

D. 較低；較差

答案：D.

科目： 191001
知能類：K1.03 [2.7/2.9]
序號： P1201 (B2101)

Refer to the drawing of a lube oil heat exchanger (see figure below).

If a cooling water outlet valve is partially closed from the full open position, heat exchanger cooling water pressure upstream of the valve will _____ and the temperature of the lube oil exiting the heat exchanger will _____.

A. increase; decrease

B. increase; increase

C. decrease; decrease

D. decrease; increase

ANSWER: B.

請參照下圖的潤滑油熱交換器。

若將全開之冷卻水出口閥部份關閉，則該閥上游的熱交換器冷卻水壓力將_____，熱交換器排出的潤滑油溫度將_____。

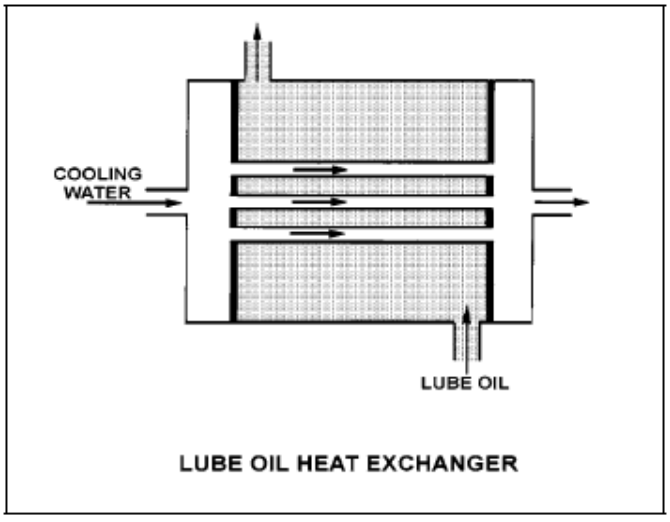
A. 升高；降低

B. 升高；增加

C. 降低；降低

D. 降低；增加

答案：B.



科目： 191001
知能類：K1.03 [2.7/2.9]
序號： P1302 (B1505)

When comparing a 3-inch gate valve to a 3-inch globe valve in the same application in an operating cooling water system, if both valves are fully open, the gate valve produces the _____ head loss and the _____ flow rate.

A. smaller; larger

B. smaller; smaller

C. larger; larger

D. larger; smaller

ANSWER: A.

比較使用於同一運轉中冷卻水系統用途相同的三吋閘閥與三吋球形閥，如果兩閥均處於全開狀態，閘閥產生_____的水頭損失，以及_____的流量。

A. 較小；較大

B. 較小；較小

C. 較大；較大

D. 較大；較小

答案：A.

科目： 191001
知能類：K1.03 [2.7/2.9]
序號： P2102 (B2101)

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

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

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

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

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

ANSWER: B.

下列何者描述了運轉中水系統的典型閘閥，在開啟過程中的流量變化特性？

A. 閥盤打開過程的前 25%開度所導致的流量變化，小於最後 25%開度。

B. 閥盤打開過程的前 25%開度所導致的流量變化，大於最後 25%開度。

C. 閥盤打開過程的前 25%開度所導致的流量變化，約等於最後 25%開度。

D. 閥盤開啟 25%開度的閘閥，大約提供全流量的 25%。

答案：B.

科目： 191001
知能類：K1.03 [2.7/2.9]
序號： P2302 (B2601)

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

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

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

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

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

ANSWER: B.

下列何者描述了運轉中水系統的典型球形閥，在開啟過程中的流量變化特性？

A. 閥盤打開過程的前 25%開度所導致的流量變化，小於最後 25%開度。

B. 閥盤打開過程的前 25%開度所導致的流量變化，大於最後 25%開度。

C. 閥盤打開過程的前 25%開度所導致的流量變化，約等於最後 25%開度。

D. 閥盤開啟 25%開度的球形閥，大約提供全流量的 25%。

答案：B.

科目： 191001
知能類：K1.03 [2.7/2.9]
序號： P2303 (B2303)

A control valve is most likely to experience cavitation when the valve is almost fully _____ because of a relatively _____ pressure drop across the valve seat.

A. open; large

B. open; small

C. closed; large

D. closed; small

ANSWER: C.

當控制閥幾乎完全_____時，最有可能因為閥座兩側有相當_____的壓降，進而產生孔蝕現象。

A. 打開；大

B. 打開；小

C. 關閉；大

D. 關閉；小

答案：C.

科目： 191001
知能類：K1.03 [2.7/2.9]
序號： P3001 (B3002)

Which one of the following statements describes the throttling characteristics of a typical globe valve?

A. The first third of valve disk travel in the open direction will result in approximately one-third of full flow rate.

B. The first third of valve disk travel in the open direction will produce a smaller increase in flow rate than the last third of valve disk travel.

C. The first third of valve disk travel in the open direction will produce a greater increase in flow rate than the last third of valve disk travel.

D. The first two-thirds of valve disk travel in the open direction will produce approximately the same increase in flow rate as the last third of valve disk travel.

ANSWER: C.

下列何者為典型球形閥的節流特性描述？

A. 閥盤打開過程的前三分之一開度，提供約三分之一的全流量。

B. 閥盤打開過程的前三分之一開度所增加的流量，小於該閥行程的最後三分之一。

C. 閥盤打開過程的前三分之一開度所增加的流量，大於該閥行程的最後三分之一。

D. 閥盤打開過程的前三分之二開度所增加的流量，大約等於該閥行程的最後三分之一。

答案：C.

科目： 191001
知能類：K1.03 [2.7/2.9]
序號： P3901 (B3902)

Refer to the drawing of a cooling water system in which both centrifugal pumps A and B are operating (see figure below).

An operator stops pump B, but the pump B check valve fails to close. In comparison to normal operation with only pump A running, operation with the failed pump B check valve will result in pump A flow rate being _____ than normal; and heat exchanger flow rate being _____ than normal.

A. higher; lower

B. higher; higher

C. lower; lower

D. lower; higher

ANSWER: A.

請參照下圖的冷卻水系統，離心泵 A 與 B 都在運轉中。

運轉員停止泵 B，泵 B 的止回閥卻無法關上。比較只有泵 A 運轉的正常情況，與泵 A 運轉而泵 B 的止回閥未關閉的運轉情況，將導致泵 A 的流量____於正常值；而且熱交換器的流量會____於正常值。

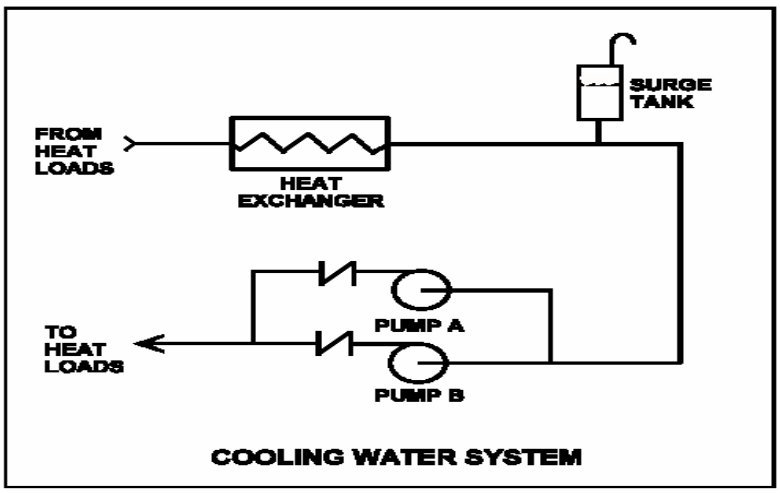
A. 高；低

B. 高；高

C. 低；低

D. 低；高

答案：A.



科目： 191001
知能類：K1.03 [2.7/2.9]
序號： P4101 (B4103)

Which one of the following types of similarly sized valves in an operating water system produces the least frictional head loss when fully open?

A. Ball

B. Globe

C. Butterfly

D. Swing check

ANSWER: A.

假設下列幾種閥的尺寸相同，下列何者於全開時，能在運轉中的水系統內，產生最小的摩擦水頭損失？

A. 球閥(Ball)

B. 球形閥

C. 蝶閥

D. 擺動式止回閥

答案：A.

科目： 191001
知能類：K1.04 [2.8/3.2]
序號： P101 (B1903)

Refer to the drawing of a spring-loaded air-operated valve (see figure below). Upon a loss of air pressure, this valve will...

A. go to the fully open position.

B. remain at the current position.

C. go to the fully closed position.

D. go to the midposition.

ANSWER: C.

請參照下圖之中，裝有彈簧的空氣操作閥。如果失去氣壓，此閥會……

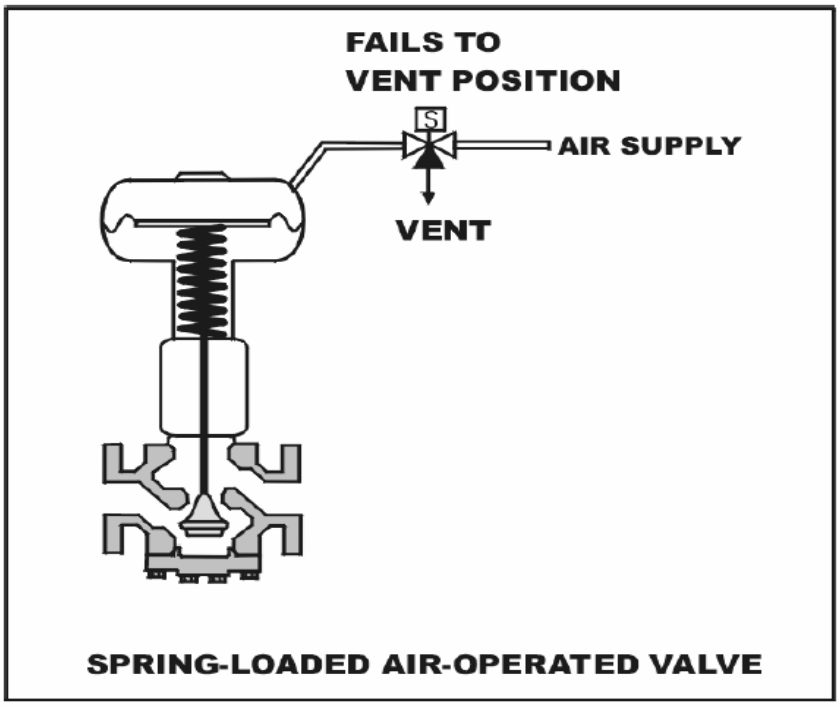
A. 全開

B. 停留在現在的位置上

C. 全關

D. 停在半開半關的位置

答案：C.



科目： 191001
知能類：K1.04 [2.8/3.2]
序號： P112 (B1401)

Using the drawing of an air-operated valve (see figure below), identify the valve position following a loss of electrical power.

A. Midposition

B. Closed

C. As is

D. Open

ANSWER: B.

請參照下圖的空氣操作閥，判斷該閥於失去電力後的位置？

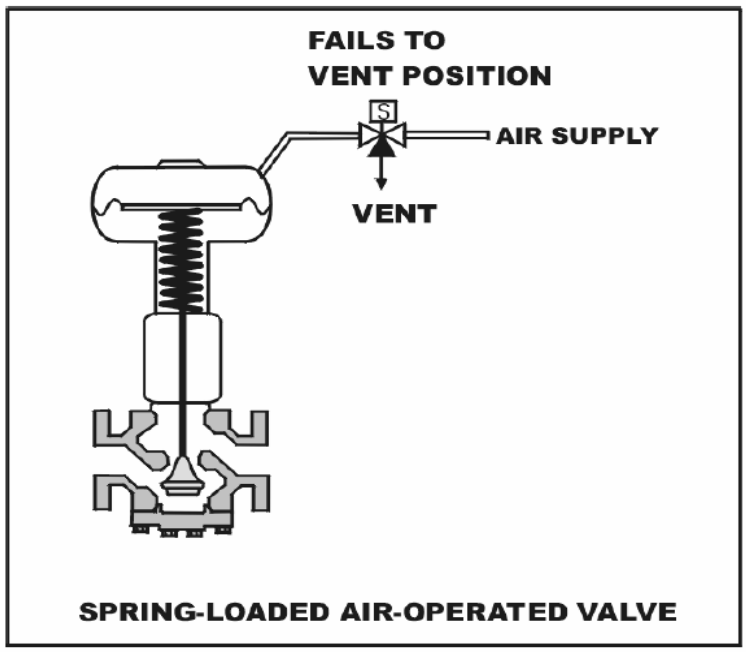
A. 半開半關

B. 關閉

C. 維持原狀

D. 打開

答案：B.



科目： 191001
知能類：K1.04 [2.8/3.2]
序號： P203 (B502)

Refer to the drawing of a hydraulically-operated valve that is shown in a throttled position (see figure below).

Select the position of this valve following a loss of hydraulic system pressure.

A. Fully open

B. As is

C. Fully closed

D. Midposition

ANSWER: A.

請參照下圖中，處於節流狀態的液壓操作閥。

請選出此閥在失去液壓系統壓力後的位置。

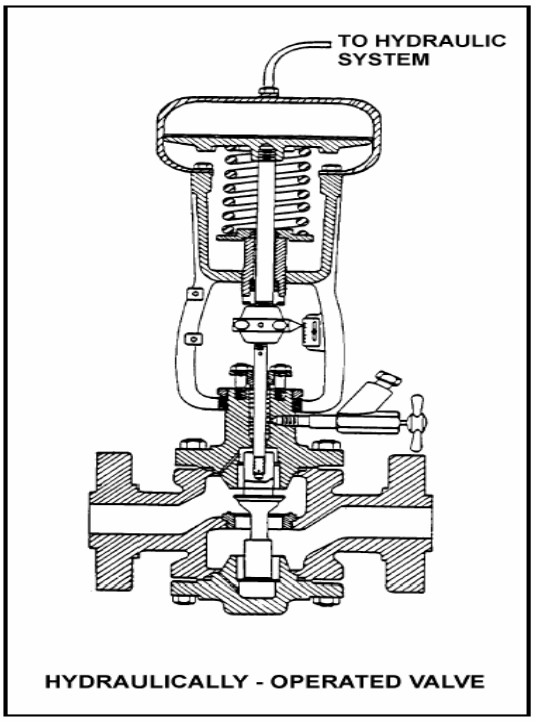
A. 全開

B. 不變

C. 全關

D. 在一半的位置

答案：A.



HYDRAULICALLY - OPERATED VALVE

科目： 191001
知能類：K1.04 [2.8/3.2]
序號： P1101 (B1109)

Refer to the drawing of a spring-loaded air-operated valve shown in a throttled position (see figure below).

The figure currently depicts normal air supply pressure and an energized solenoid. What will be the valve position following a loss of electrical power to the solenoid?

A. As is

B. More open

C. More closed

D. Varies with system flow

ANSWER: B.

請參照下圖之中，處於節流狀態且裝有彈簧的空氣操作閥。

圖中顯示在正常供氣壓力和受電(energized)狀態的電磁線圈，如果電磁線圈失去電力，閥的位置會如何？

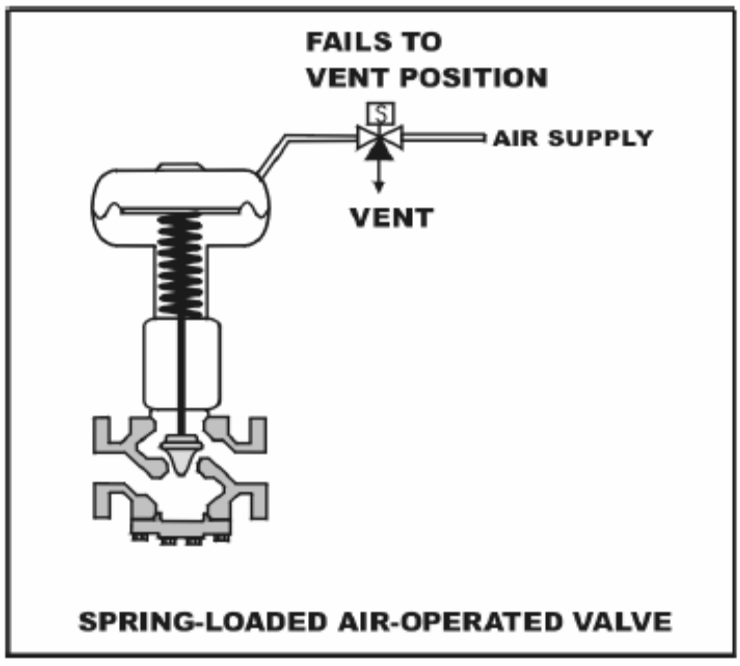
A. 保持現狀

B. 打開更多

C. 關小一些

D. 隨系統流量而改變

答案：B.



科目： 191001
知能類：K1.04 [2.8/3.2]
序號： P1202 (B602)

How will a typical motor-operated valve respond to a loss of electrical power to the valve actuator?

A. Open fully

B. Close fully

C. Remain as is

D. Move to 50% open

ANSWER: C.

典型的馬達操作閥，會在閥的操作器失去電力時，產生何種反應？

A. 完全打開

B. 完全關閉

C. 保持原狀

D. 成半開狀態

答案：C.

科目： 191001
知能類：K1.04 [2.8/3.2]
序號： P2104 (B1002)

Refer to the drawing of a spring-loaded air-operated valve shown in a throttled position (see figure below).

Which one of the following will be the valve position following a reduction in air pressure to the valve actuator caused by a leaking air connection at the valve?

A. Original position

B. More closed

C. More open

D. Varies with system flow

ANSWER: B.

請參照下圖之中，處於節流狀態且裝有彈簧的空氣操作閥。

如果連接閥的空氣管漏氣，導致閥的操作器壓力降低，閥的位置會是下列何者？

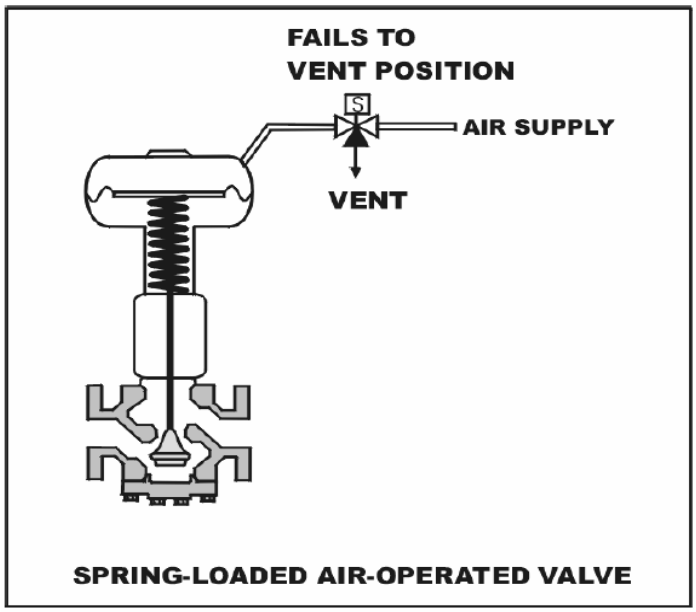
A. 原來位置

B. 關小一些

C. 打開更多

D. 隨系統流量而改變

答案：B.



科目： 191001
知能類：K1.05 [2.6/2.8]
序號： P3 (B304)

The purpose of backseating a manual valve in an operating system is to...

A. isolate system pressure from the packing and stuffing box to minimize packing leakage.

B. fully remove the valve disk from the flow stream to minimize system head loss.

C. provide a backup means of flow isolation in the event of primary seat leakage.

D. provide a backup means of flow isolation in the event of a pipe break.

ANSWER: A.

將運轉中系統的手動閥鎖緊背座，其用意在於……

A. 隔離迫緊(填料襯墊)與填函箱(stuffing box)的系統壓力，將迫緊的洩漏減到最低。

B. 將閥盤完全移至流動流體外，將系統的水頭損失減到最低。

C. 主閥座發生滲漏時，能做為隔離流體的後備措施。

D. 管路破裂時，能做為隔離流體的後備措施。

答案：A.

科目： 191001
知能類：K1.05 [2.6/2.8]
序號： P201 (B206)

An operator attempts to close a fully-open upright manual gate valve to isolate a pump in a cooling water system that has been cooled down for maintenance. However, the operator is unable to rotate the handwheel in the close direction.

Which one of the following could cause this condition?

A. A hydraulic lock has developed under the valve disk.

B. A hydraulic lock has developed in the valve bonnet between the valve disk and the packing gland.

C. The two halves of the valve disk have expanded and are jammed against the valve seats.

D. The valve disk has jammed against its backseat by the difference in the thermal contraction of the stem and the bonnet.

ANSWER: D.

運轉員試圖關閉在經降溫冷卻的冷卻水系統上一只全開的直立手動閘閥，以便進行泵維修。然而，該運轉員卻無法將手輪朝關閉方向轉動。

下列何者會導致此現象？

A. 閥盤下方產生液壓閉鎖(hydraulic lock)。

B. 閥盤與迫緊格蘭間的閥蓋產生液壓閉鎖。

C. 閥盤的兩瓣膨脹而卡住閥座。

D. 閥桿與閥蓋間的熱收縮不一致，導致閥盤卡住背座。

答案：D.

科目： 191001
知能類：K1.05 [2.6/2.8]
序號： P403 (B108)

When manually positioning a motor-operated valve, why must the operator avoid using excessive valve seating/backseating force?

A. The valve may bind during subsequent operation.

B. Valve stem limit switch settings may become inaccurate.

C. The clutch may not reengage the valve motor when required.

D. Stem position may no longer be an accurate indicator of valve position.

ANSWER: A.

手動調整馬達操作閥的閥位時，為何要特別注意在緊迫閥座/背座時，不能用太大的力量？

A. 閥可能在後續操作中卡住。

B. 閥桿的極限開關設定可能出錯。

C. 在有需求之時，離合器可能無法與閥用馬達重新咬合。

D. 閥桿位置可能不再是閥位的精確指標。

答案：A.

科目： 191001
知能類：K1.05 [2.6/2.8]
序號： P1303 (B2802)

After an adjustment of the packing gland on a valve that had a minor packing leak, the operator attempts to operate the valve but finds that the valve is stuck. What is the most probable cause?

A. The disk separated from the valve stem as a result of overtightening the packing.

B. The operator placed the valve in the wrong position while adjusting the packing.

C. Adjusting the packing overtorqued the valve in the closed direction.

D. The operator overtightened the packing, causing the stem to bind.

ANSWER: D.

運轉員調整迫緊略有洩漏的閥之迫緊格蘭後，試圖操作該閥，卻發現閥被卡住。最可能的原因為何？

A. 迫緊過緊而導致閥盤與閥桿分離。

B. 運轉員調整迫緊時，將閥設於錯誤位置。

C. 調整迫緊時，閥在關閉方向受到的扭力過大。

D. 運轉員將迫緊格蘭旋緊過度，導致閥桿卡住。

答案：D.

科目： 191001
知能類：K1.05 [2.6/2.8]
序號： P1603 (B1003)

An adjustment has just been completed on the packing gland of an automatic valve to stop a minor stem leak. Which one of the following can occur if the technician overtightened the packing gland?

A. Decreased cooling flow to the valve internals

B. Separation of the valve disk from the valve stem

C. Misalignment of the valve position limit switches

D. Increased stroke time from fully open to fully closed

ANSWER: D.

一自動閥剛完成調整迫緊格蘭以停止閥桿的輕微洩漏。若技術員將迫緊格蘭旋緊過度，會發生何事？

A. 流入閥內的冷卻流體減少。

B. 閥盤與閥桿分離。

C. 閥位極限開關無法對準。

D. 從全開到全關的行程(stroke)時間增加。

答案：D.

科目： 191001
知能類：K1.05 [2.6/2.8]
序號： P1902 (B6)

Which one of the following describes the function and use of the backseat on a manual valve?

A. Removes pressure from the packing/stuffing box and is typically used to isolate the stuffing box for valve repacking.

B. Removes pressure from the packing/stuffing box and is typically used when needed to isolate packing leakage.

C. Acts as a backup in case the primary seat leaks and is typically used during system isolation for personnel protection.

D. Acts as a backup in case the primary seat leaks and is typically used when needed to prevent the primary seat from leaking excessively.

ANSWER: B.

下列何者描述了手動閥後座的功能與用途？

A. 移除來自迫緊/填函箱的壓力，通常用於隔離填函箱，以更換閥迫緊。

B. 移除來自迫緊/填函箱的壓力，通常用於需要隔離迫緊洩漏之時。

C. 作為主閥座洩漏時的後備措施，通常用於系統隔離作業以保護人員。

D. 作為主閥座洩漏時的後備措施，通常用於防止主閥座嚴重洩漏時。

答案：B.

科目： 191001
知能類：K1.05 [2.6/2.8]
序號： P2503 (B2603)

When manually closing a motor-operated valve, why must the operator avoid using excessive valve seating force?

A. The valve may bind and cause the valve motor to trip on overload during subsequent remote operation.

B. The valve actuator clutch may be damaged and disable subsequent automatic operation.

C. The valve stem limit switches may be damaged and cause inaccurate remote valve position indication.

D. The valve actuator position indicator may be damaged and cause inaccurate local valve position indication.

ANSWER: A.

運轉員手動關閉馬達操作閥時，為何要注意在關緊閥座時，不能用太大的力量？

A. 閥可能卡住，造成閥之馬達在後續遙控操作中，因過載而跳脫。

B. 閥操作器的離合器可能受損而後續無法置自動運轉。

C. 閥桿極限開關可能受損，造成遠端閥位指示不正確。

D. 閥操作器的位置指示器可能受損，造成現場閥位指示出錯。

答案：A.

科目： 191001
知能類：K1.05 [2.6/2.8]
序號： P3503 (B3503)

Refer to the drawing of a water supply pump with two suction sources (see figure below). All motor-operated valves (MOVs) are currently closed.

Which one of the following MOV interlocks will permit the pump to take a suction on either the building sump or the water storage tank, while preventing the two sources from being cross connected?

A. Neither MOV-1 nor MOV-2 can be opened unless MOV-3 is fully closed.

B. None of the MOVs can be opened unless at least one MOV remains fully closed.

C. None of the MOVs can be opened unless at least two MOVs remain fully closed.

D. Neither MOV-1 nor MOV-2 can be opened unless the other source MOV is fully closed.

ANSWER: D.

請參照下圖之中，具備兩個進水管的供水泵，所有馬達操作閥(MOV)目前都是關閉的。

下列哪一項 MOV 的連鎖設計，允許泵從廠房集水坑或蓄水槽抽水，而不會讓兩者互通？

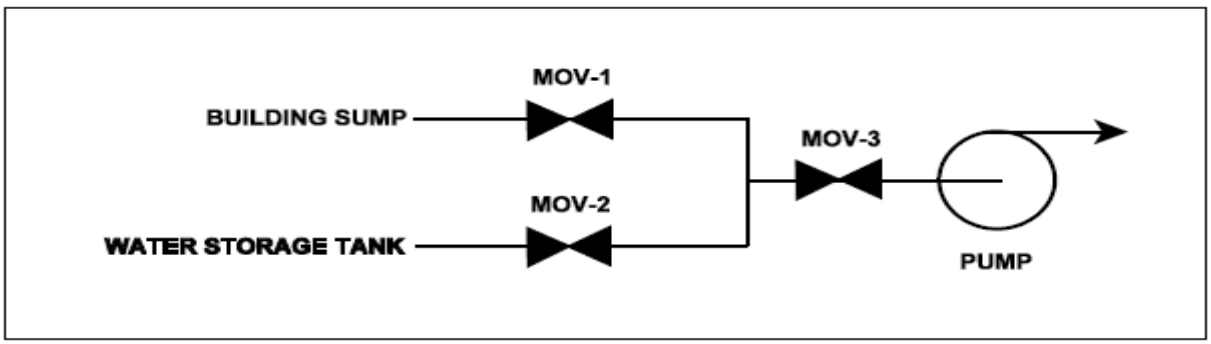
A. 除非 MOV-3 是全關的，否則 MOV-1 與 MOV-2 都不能打開。

B. 除非至少有一個 MOV 是全關的，否則沒有任何一個 MOV 可以打開。

C. 除非至少有兩個 MOV 是全關的，否則沒有任何一個 MOV 可以打開。

D. 除非 MOV-1(MOV-2)是全關的，否則 MOV-2(MOV-1)不能打開。

答案：D.



科目： 191001
知能類：K1.06 [3.3/3.7]
序號： P4

After manually positioning a motor-operated valve, the valve actuator is reengaged by actuation of the...

A. manual declutch lever to the disengage position.

B. manual declutch lever to the engage position.

C. racked in limit switch when the actuator motor breaker is racked in.

D. valve actuator motor in the open direction.

ANSWER: D.

手動定位馬達操作閥之後，啟動下列何者，即可使閥操作器重新嚙合？

A. 將手動離合桿移至脫離位置。

B. 將手動離合桿移至嚙合位置。

C. 搖入操作器馬達的斷路器之後，再將極限開關定位。

D. 以開啟的方向啟動閥操作器馬達。

答案：D.

科目： 191001
知能類：K1.06 [3.3/3.7]
序號： P204 (B204)

Operation of the manual declutch lever (initially in the normal position) of a motor-operated valve _____ the motor and _____ the handwheel.

A. disengages; engages

B. deenergizes; engages

C. engages; disengages

D. reenergizes; disengages

ANSWER: A.

操作馬達操作閥的手動離合桿(原於正常位置)時，會使馬達_____，使手輪_____。

A. 脫離；嚙合

B. 失電；嚙合

C. 嚙合；脫離

D. 再度受電；脫離

答案：A.

科目： 191001
知能類：K1.06 [3.3/3.7]
序號： P1702 (B1605)

A typical Limitorque® motor-operated valve is installed in an emergency core cooling system (ECCS) application. The ECCS actuation signal is designed to energize the valve motor and open the valve. The valve is currently open, but being manually/locally closed by a technician as required by a surveillance test procedure. The declutch lever has been operated and released, and the valve is being closed by operation of the valve handwheel.

If an ECCS actuation signal is received, how will the valve be affected?

A. The handwheel will disengage and the valve will automatically open.

B. The handwheel will disengage and the valve will remain in the current position.

C. The handwheel will remain engaged and the valve will automatically open.

D. The handwheel will remain engaged and the technician can continue to close the valve.

ANSWER: A.

一個典型的 Limitorque®馬達操作閥，安裝於緊急爐心冷卻系統(ECCS)中。ECCS 的起動信號會使閥用馬達受電，並將該閥開啟。此閥目前是開啟狀態，但是因應偵測試驗程序的要求，而由技術員在現場以手動方式關閉。現在該閥之離合桿已完成操作且釋放，正操作手輪以關閉該閥。

此時若收到 ECCS 的起動信號，則此閥所受影響為何？

A. 手輪將脫離，閥將自動開啟。

B. 手輪將脫離，閥將維持在目前位置。

C. 手輪將維持咬合，閥將自動開啟。

D. 手輪將維持咬合，技術員可以繼續關閉該閥。

答案：A.

科目： 191001
知能類：K1.06 [3.3/3.7]
序號： P2003 (B2004)

A surveillance test procedure is being performed on a typical Limitorque® motor-operated valve (MOV) used in an emergency core cooling system (ECCS) application. The declutch lever has been operated and released and the valve is being manually/locally opened by a technician. The MOV breaker is closed as required by the surveillance test procedure. During operation of the valve handwheel an ECCS actuation signal is received that normally energizes the valve motor and closes the valve.

How will the valve be affected by the actuation signal?

A. The handwheel will disengage and the valve will automatically close.

B. The handwheel will disengage and the valve will remain in the current position.

C. The handwheel will remain engaged and the valve will automatically close.

D. The handwheel will remain engaged and the technician can continue to open the valve.

ANSWER: A.

一只緊急爐心冷卻(ECCS)系統中之典型 Limitorque®馬達操作閥(MOV) 正進行偵測試驗。閥之離合桿已經操作完成且釋放，技術員目前以手動方式在現場開啟該閥。該馬達操作閥的斷路器，基於偵測試驗程序之需而閉合。在操作閥手輪的過程中，此閥收到 ECCS 的起動信號，此信號通常會使閥用馬達受電而關閉該閥。

起動信號如何影響此閥？

A. 手輪將脫離，閥將自動關閉。

B. 手輪將脫離，閥將維持目前位置。

C. 手輪將維持咬合，閥將自動關閉。

D. 手輪將維持咬合，技術員可以繼續開啟該閥。

答案：A.

科目： 191001
知能類：K1.06 [3.3/3.7]
序號： P2703 (B2704)

A typical motor-operated valve (MOV) has just been opened from the main control room, and the breaker for the MOV has been opened. A plant operator has been directed to close the MOV locally for a surveillance test.

If the operator attempts to turn the MOV handwheel in the clockwise direction without first operating the clutch lever, which one of the following will occur?

A. The handwheel will not turn, and the valve stem will not move.

B. The handwheel will turn, but the valve stem will not move.

C. The handwheel will turn, and the valve stem will move toward the closed position because the clutch is automatically engaged when the handwheel is turned.

D. The handwheel will turn, and the valve stem will move toward the closed position because the clutch is automatically engaged when the breaker is opened.

ANSWER: B.

主控制室剛開啟典型的馬達操作閥(MOV)，其斷路器先前已經開啟。電廠運轉員接獲指示，在現場關閉該馬達操作閥以進行偵測試驗。

如果該名運轉員在未先操作離合桿之下，試圖以順時鐘方向轉動馬達操作閥的手輪，則會發生下列何事？

A. 手輪不會轉動，閥桿不會移動。

B. 手輪將轉動，閥桿不會移動。

C. 手輪將轉動，閥桿將朝著關閉方向移動，因為當手輪轉動時，離合器會自動咬合。

D. 手輪將轉動，閥桿將朝著關閉方向移動，因為當斷路器開啟時，離合器會自動咬合。

答案：B.

科目： 191001
知能類：K1.06 [3.3/3.7]
序號： P4002 (B4003)

Various types of valves are being considered for use in an application that requires local manual closure capability in the event of an inoperable motor actuator.

Which one of the following types of similarly sized valves requires the most manual valve stem rotation to move the valve from fully open to fully closed? (Assume that each valve has a nonrising stem.)

A. Ball

B. Gate

C. Plug

D. Butterfly

ANSWER: B.

許多閥都能於馬達操作器無法運作時，在現場以手動方式關閥。

下列何種大小類似的閥，其閥桿需要手動轉動最多圈，才能將閥從全開轉到全關(假設每個閥都具備非上升閥桿)？

A. 球閥

B. 閘閥

C. 旋塞閥

D. 蝶閥

答案：B.

科目： 191001
知能類：K1.07 [2.5/2.8]
序號： P303 (B302)

A stop check valve is a type of check valve that...

A. cannot be shut remotely.

B. can be used to prevent flow in both directions.

C. can be opened manually to allow flow in both directions.

D. contains both a gate valve disk and a check valve disk.

ANSWER: B.

截斷止回閥(stop check valve)亦是一種止回閥，但是……

A. 無法由遠端關閉。

B. 能用以防止流體雙向流動。

C. 能手動開啟而允許雙向流動。

D. 同時包含閘閥盤與止回閥盤。

答案：B.

科目： 191001
知能類：K1.07 [2.5/2.8]
序號： P503

Which one of the following valves is used to control the direction of fluid flow and prevent backflow in a system?

A. Safety valve

B. Relief valve

C. Divert valve

D. Check valve

ANSWER: D.

下列哪種閥用來控制流體流動方向，並防止流體在系統內逆流？

A. 安全閥

B. 釋壓閥

C. 轉向閥(divert valve)

D. 止回閥

答案：D.

科目： 191001
知能類：K1.07 [2.5/2.8]
序號： P802 (B2204)

Two common types of check valves used in nuclear power plants are...

A. globe and gate.

B. ball and plug.

C. swing and lift.

D. needle and angle.

ANSWER: C.

常用於核能電廠的兩種止回閥為：

A. 球形止回閥和閘形止回閥。

B. 球形止回閥和旋塞式止回閥。

C. 擺動式止回閥和提昇式止回閥。

D. 針閥止回閥和角閥止回閥。

答案：C.

科目： 191001
知能類：K1.07 [2.5/2.8]
序號： P1003 (B2903)

A typical check valve is designed to...

A. permit flow in only one direction.

B. prevent system overpressure.

C. isolate system components.

D. perform automatic pump venting.

ANSWER: A.

典型止回閥的設計是……

A. 僅允許流體單向流動。

B. 預防系統過壓。

C. 隔離系統元件。

D. 進行泵自動逸氣。

答案：A.

科目： 191001
知能類：K1.07 [2.5/2.8]
序號： P1503 (B205)

Check valves are normally used to prevent...

A. overpressurization of nonoperating system piping and components.

B. backflow through nonoperating components or flowpaths.

C. pump runout by providing a constant backpressure.

D. pump cavitation by keeping nonoperating systems filled.

ANSWER: B.

止回閥通常用於……

A. 預防非運轉中系統管線與元件過壓。

B. 預防逆流至非運轉中的元件或流徑。

C. 提供固定背壓以預防泵失速(runout) 。

D. 維持非運轉系統滿水，預防泵的孔蝕作用。

答案：B.

科目： 191001
知能類：K1.07 [2.5/2.8]
序號： P2202 (B1102)

Which one of the following valves is used to control the direction of fluid flow and prevent backflow in a system?

A. Gate valve

B. Relief valve

C. Globe valve

D. Check valve

ANSWER: D.

下列何種閥用來控制系統中流體的流動方向，並防止其逆流？

A. 閘閥

B. 釋壓閥

C. 球形閥

D. 止回閥

答案：D.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P5 (B402)

To verify a manual valve in an operating system is closed, the operator should operate the valve handwheel in the...

A. open direction until the valve is fully open, then close it using normal force.

B. open direction until flow sounds are heard, then close the valve using normal force.

C. close direction using normal force and verify there is no substantial handwheel movement.

D. close direction until it stops, then close it an additional one-half turn using additional force if necessary.

ANSWER: C.

為了確認運轉中系統的手動閥處於關閉狀態，運轉員應將手輪轉向.....

A. 開啟方向，直到全開為止，再以正常施力關閥。

B. 開啟方向，直到聽見水流聲為止，再以正常施力關閥。

C. 關閉方向(正常施力)，並確認手輪沒有明顯轉動。

D. 關閉方向，直到停止，必要時再額外用力再轉半圈以關閉。

答案：C.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P205 (B503)

To verify the position of a fully open manual valve in an operating system, the operator should operate the valve handwheel...

A. in the open direction until the valve is backseated one-half turn.

B. to fully close the valve, then open the valve to the fully open position.

C. in the closed direction, then open the valve to its previously open position.

D. to open the valve until it touches the backseat, then close the valve to the desired position.

ANSWER: C.

為了確認運轉中系統的手動閥處於全開位置，運轉員應該將閥的手輪轉向……

A. 開啟方向，鎖緊至閥背座半圈處。

B. 全關位置，再開到全開位置。

C. 關閉方向，然後將閥開到原先的開啟位置。

D. 開啟方向，直到閥碰到背座，再關到所欲位置。

答案：C.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P405 (B2205)

A comparison of the characteristics of gate valves and globe valves in an operating system indicates a globe valve generally has a _____ pressure drop when fully open, and is _____ commonly used for throttling system flow.

A. smaller; less

B. larger; more

C. smaller; more

D. larger; less

ANSWER: B.

比較同一運轉系統的閘閥與球形閥，球形閥一般於全開時壓降_____，所以較_____用於系統節流。

A. 較小；少

B. 較大；多

C. 較小；多

D. 較大；少

答案：B.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P1104 (B504)

Gate valves generally are not used to throttle fluid flow because...

A. gate valves introduce a large system head loss when fully open.

B. all gate valves will experience stem leakage when partially open.

C. the turbulent flow created by a partially opened gate valve would cause damage to the valve.

D. the large size of the valve disk would require an oversized actuator to position the valve accurately.

ANSWER: C.

閘閥通常不應用於流體節流，因為.....

A. 閘閥於全開時，產生嚴重的系統水頭損失。

B. 所有閘閥將於部份開啟時，會產生閥桿滲漏的情形。

C. 部份開啟的閘閥所產生的擾流，會導致閥受損。

D. 大型閥盤需要大型操作器，方能正確定位閥。

答案：C.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P1405 (B1705)

Refer to the cutaway-view drawing of a valve (see figure below). Which one of the following describes the type of valve shown?

A. Rising-stem gate valve

B. Nonrising-stem gate valve

C. Rising-stem globe valve

D. Nonrising-stem globe valve

ANSWER: B.

請參照下面的閥剖面圖。下列何者說明了圖中閥的種類？

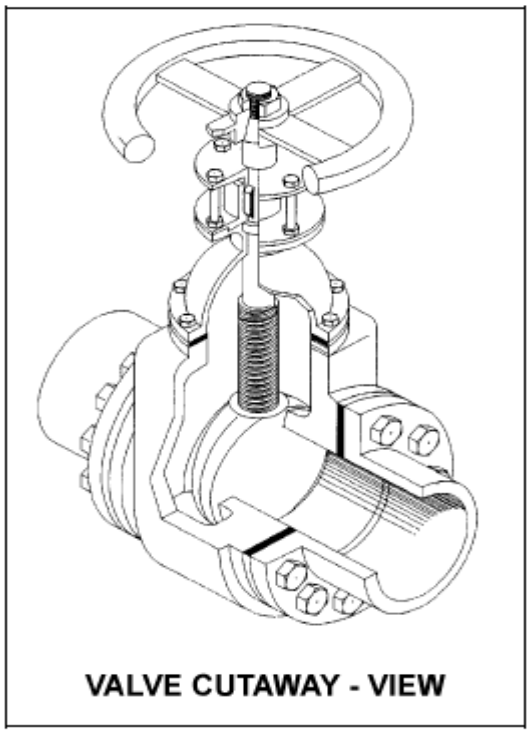
A. 升桿(Rising-stem)式閘閥

B. 非升桿(Nonrising-stem)式閘閥

C. 升桿式球形閥

D. 非升桿式球形閥

答案：B.



科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P1501 (B1805)

When comparing a 3-inch gate valve to a 3-inch globe valve in the same application in an operating cooling water system, if both valves are fully open, the globe valve produces the _____ head loss and the _____ flow rate.

A. larger; larger

B. larger; smaller

C. smaller; larger

D. smaller; smaller

ANSWER: B.

比較使用於同一運轉中冷卻水系統的三吋閘閥與三吋球形閥，如果兩閥均處於全開，則球形閥產生_____的水頭損失，以及_____的流量。

A. 較大；較大

B. 較大；較小

C. 較小；較大

D. 較小；較小

答案：B.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P1602 (B1404)

Which one of the following is a generally accepted method for locally verifying that a manual valve is fully closed in a depressurized static piping system?

A. Check a downstream flow gauge to be indicating zero flow

B. Visually observe the valve rising-stem threads to be fully exposed

C. Attempt to turn the valve handwheel in the close direction and verify no movement

D. Attempt to turn the valve handwheel in the open direction and verify valve opens

ANSWER: C.

欲在現場檢查已洩壓靜態管路系統中，判別其手動閥是否全關時，下列何者為一般接受的方法？

A. 檢查下游流量計是否指示為零流量。

B. 目視觀察手動閥升桿螺紋，是否完全顯露出來。

C. 試著將閥的手輪轉向關閉方向，並確認不能再轉動。

D. 試著將閥的手輪轉向開啟方向，並確認閥已開啟。

答案：C.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P1604 (B1604)

Compare a typical gate valve to a typical globe valve in the same application in an operating highpressure cooling water system. If both valves are fully open, the gate valve will have a _____ pressure drop and is the better choice for _____ flow.

A. higher; throttling

B. higher; isolating

C. lower; throttling

D. lower; isolating

ANSWER: D.

請比較在運轉中高壓冷卻水系統內，具有相同用途的典型閘閥和球形閥。倘若兩閥均為全開狀態，閘閥壓降_____，所以是_____的較佳選擇。

A. 較大；節流

B. 較大；隔離流量

C. 較小；節流

D. 較小；隔離流量

答案：D.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P1704 (B1802)

To verify a manual valve in an operating system is closed, the operator should observe valve position indication and operate the valve handwheel in the...

A. open direction at least one full rotation, then close the valve using normal force.

B. open direction until system flow is observed, then close the valve using normal force.

C. close direction using normal force and verify there is no substantial handwheel movement.

D. close direction using normal force, then operate the valve handwheel an additional one-quarter turn in the close direction.

ANSWER: C.

為了確認運轉中系統的手動閥，是否處於關閉狀態，運轉員應該觀察閥位標示，並將閥的手輪轉向……

A. 開啟方向至少一轉，再用正常施力關閥。

B. 開啟方向，直到可觀察到系統流量為止，再用正常施力關閥。

C. 關閉方向(用正常施力)，並確認手輪沒有明顯轉動。

D. 關閉方向(用正常施力)，再朝關閉方向多轉四分之一轉。

答案：C.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P1901 (B1305)

Which one of the following is a disadvantage associated with using a gate valve, versus a globe valve, to throttle flow in a cooling water system?

A. The tortuous flow path through a throttled gate valve body makes flow control difficult.

B. A gate valve will experience stem leakage unless it is fully opened and backseated.

C. The turbulent flow created by a throttled gate valve will cause erosion damage to the valve seat.

D. A fully open gate valve will produce a greater system head loss than a fully open globe valve.

ANSWER: C.

在冷卻水系統中，相對於球形閥，下列何者是使用閘閥節流的不利點？

A. 通過節流閘閥體的擾流，導致難以控制流量。

B. 除非閘閥全開並緊迫背座，否則閘閥將發生閥桿洩漏。

C. 節流閘閥產生的擾流，將對閥座造成沖蝕損害。

D. 全開閘閥產生的系統水頭損失，大於全開球形閥。

答案：C.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P2004 (B1205)

After an adjustment of the packing gland on a valve that had a minor packing leak, the operator attempts to operate the valve but finds that the valve is stuck. What is the most probable cause?

A. The disk separated from the valve stem as a result of overtightening the packing gland.

B. The operator placed the valve in the wrong position for adjusting the packing gland.

C. The valve was overtorqued in the closed direction during the packing gland adjustment.

D. The maintenance technician overtightened the packing gland, causing the stem to bind.

ANSWER: D.

運轉員調整迫緊略有洩漏的閥之迫緊格蘭後，試圖操作該閥，卻發現閥被卡住。最可能的原因為何？

A. 迫緊格蘭過緊，導致閥盤與閥桿分離。

B. 運轉員調整迫緊格蘭時，將閥設於錯誤位置。

C. 調整迫緊格蘭時，閥在關閉方向受到的扭力過大。

D. 維修技術員將迫緊格蘭旋緊過度，導致閥桿卡住。

答案：D.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P2103 (B203)

Which one of the following is not a generally accepted method for locally verifying that a valve is open?

A. Observe local flow rate instrumentation.

B. Check the local valve position indicator indicates "open."

C. Turn the valve operator in the "close" direction and verify that some movement occurs.

D. Attempt to turn the valve operator in the "open" direction and verify that no movement occurs.

ANSWER: D.

欲在現場檢查閥是否開啟，下列何者並非一般接受的方法？

A. 觀察現場的流量計。

B. 檢查現場閥位標示是否在「開啟」位置。

C. 將閥的操作器轉向「關閉」方向，確認有一些轉動。

D. 試著將閥的操作器轉向「開啟」的方向，確認無法轉動。

答案：D.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P2204 (B2605)

Gate valves generally are not used to throttle water flow because...

A. rapid changes in flow direction through the valve cause a large unrecoverable system head loss.

B. gate valves experience stem leakage unless they are fully open or fully closed.

C. the turbulent flow created by a partially opened gate valve causes excessive seat and disk wear.

D. Flow rate through a gate valve is not proportional to the differential pressure across the valve.

ANSWER: C.

閘閥通常不用來調節水流，因為.....

A. 通過閥時，流動方向快速變化，將造成無法彌補的系統水頭損失。

B. 除非閘閥處於全開或全關，否則會發生閥桿洩漏。

C. 部份開啟的閘閥所產生的擾流，會導致閥座及閥盤過度磨損。

D. 通過閘閥的流量，與閥兩端的差壓不成正比。

答案：C.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P2304 (B2305)

When comparing globe valves to gate valves, globe valves...

A. are less effective at throttling flow.

B. are less effective as pressure regulating valves.

C. produce a smaller pressure decrease when fully open.

D. require less force to open against large differential pressures.

ANSWER: D.

比較球形閥與閘閥，球形閥……

A. 節流效果較差。

B. 做為壓力調節閥的效果較差。

C. 全開時產生壓降降小。

D. 差壓大時，只要較小施力便能開啟。

答案：D.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P2404 (B905)

When comparing gate valves to globe valves, gate valves...

A. are more effective at throttling flow.

B. are more effective as pressure regulating valves.

C. produce a larger pressure decrease when fully open.

D. require more force to open against large differential pressures.

ANSWER: D.

比較閘閥與球形閥，閘閥……

A. 節流效果較好。

B. 做為壓力調節閥效果較好。

C. 全開時產生壓降較大。

D. 差壓大時，需要較大施力才能開啟。

答案：D.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P2504(B2504)

In a comparison of butterfly valves with ball valves, _____ valves are generally more leak tight in high pressure applications; and _____ valves generally exhibit the lower system pressure drop when fully open.

A. ball; ball

B. ball; butterfly

C. butterfly; ball

D. butterfly; butterfly

ANSWER: A.

比較蝶閥與球閥，_____閥在高壓用途上，一般較不易發生洩漏；而_____閥於全開時，呈現的系統壓降通常較低。

A. 球；球

B. 球；蝶

C. 蝶；球

D. 蝶；蝶

答案：A.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P2604 (B805)

A gate valve is generally a poor choice for throttling liquid flow because...

A. the turbulent flow created by a partially opened gate valve can cause extensive damage to the valve.

B. the tortuous path through a gate valve body can make flow control difficult.

C. excessive stem leakage will occur unless the gate valve is kept fully open or fully closed.

D. the head loss from a throttled gate valve causes an unacceptable reduction in system flow rate.

ANSWER: A.

閘閥通常不適用於節流流體流量，因為.....

A. 部份開啟的閘閥所產生的擾流，將導致閥受損甚巨。

B. 通過閘閥閥體的擾流，造成難以控制流量。

C. 除非閘閥全開或全關，否則將發生過量的閥桿洩漏。

D. 節流閘閥產生的水頭損失，導致系統流量出現無法接受的大幅縮減。

答案：A.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P2804 (B1604)

In a comparison between a typical gate valve and a typical globe valve in the same application with both valves fully open, the gate valve has a _____ pressure drop and is normally used in _____ flow applications.

A. larger; throttling

B. larger; on/off

C. smaller; throttling

D. smaller; on/off

ANSWER: D.

比較用途相同的一般全開閘閥與球形閥，閘閥有_____壓降，通常用於_____流量應用上。

A. 較大；節流

B. 較大；開/關

C. 較小；節流

D. 較小；開/關

答案：D.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P2903 (B2904)

In a comparison between ball valves and butterfly valves in the same liquid process system application, the valves that typically would allow more leakage when fully closed and under high differential pressure are _____ valves, and the valves that typically would cause the higher system pressure drop when fully open are _____ valves.

A. ball; butterfly

B. ball; ball

C. butterfly; butterfly

D. butterfly; ball

ANSWER: C.

比較置於相同液體流程系統的球閥與蝶閥，在全關及高差壓情況下，_____閥能允許較高洩漏；全開時，_____閥將導致系統出現較高壓降。

A. 球；蝶

B. 球；球

C. 蝶；蝶

D. 蝶；球

答案：C.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P3304 (B3304)

A typical motor-operated valve has been returned to service following a complete maintenance overhaul of the valve and actuator. The valve was remotely opened and closed to verify operability. The measured valve stroke time in each direction was 15 seconds, which is 25% longer than normal.

Which one of the following could have caused the increased stroke time?

A. The valve position limit switches were removed and were not reinstalled.

B. The valve torque limit switches were misadjusted to open at half their normal setpoints.

C. The valve was packed with improved packing material having a lower friction coefficient.

D. The valve stem packing gland was overtightened after the packing material was replaced.

ANSWER: D.

一個典型的馬達操作閥，在閥及操作器完整檢修之後恢復運轉。此閥藉遙控開啟與關閉，以驗證其可用性。量測閥每個方向的行程時間均是十五秒，較正常時間長25%。

下列何者是導致此時間增加的原因？

A. 閥位極限開關已經拆下，卻未重新裝回。

B. 調整閥的扭力極限開關時出錯，導致在正常設定點一半時便開啟。

C. 該閥的迫緊更換成摩擦係數較低的材料。

D. 更換閥桿的迫緊材料後，新的迫緊格蘭鎖得過緊。

答案：D.

科目： 191001
知能類：K1.08 [3.4/3.4]
序號： P3804 (B3804)

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

A. ball; butterfly

B. ball; ball

C. butterfly; butterfly

D. butterfly; ball

ANSWER: A.

比較置於相同液體流程系統的球閥與蝶閥，在全關及高差壓情況下，_____閥具有較高防漏性；全開時，_____閥一般產生較高的系統壓降。

A. 球；蝶

B. 球；球

C. 蝶；蝶

D. 蝶；球

答案：A.

科目： 191001
知能類：K1.11 [3.2/3.2]
序號： P3804 (B3804)

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

A. ball; butterfly

B. ball; ball

C. butterfly; butterfly

D. butterfly; ball

ANSWER: A.

比較置於相同液體流程系統的球閥與蝶閥，在全關及高差壓情況下，_____閥具有較高防漏性；全開時，_____閥一般產生較高的系統壓降。

A. 球；蝶

B. 球；球

C. 蝶；蝶

D. 蝶；球

答案：A.

科目/題號：191001/1 (2016新增)
知能類：K1.01 [3.3/3.4]
K1.02 [3.0/3.3]
序號：P4701 (B4701)

A completely full water storage tank is being hydrostatically tested to 200 psig using a positive displacement pump (PDP) with a smooth and constant discharge flow rate of 8 gpm. The tank is protected by a relief valve and a safety valve; both valves discharge to the atmosphere. Each valve has an opening setpoint of 205 psig and a maximum rated discharge flow rate of 6 gpm. The PDP is inadvertently left running when tank pressure reaches 200 psig.
When conditions stabilize with the PDP still running, the relief valve will be _____ open; and the safety valve will be discharging a flow rate of approximately _____ to the atmosphere.
A. partially; 6 gpm
B. partially; 2 gpm
C. fully; 6 gpm
D. fully; 2 gpm
ANSWER: A.

一座滿水的儲水槽用一只正排量泵(PDP)以8 gpm穩定流量率注水進入該槽，執行200 psig的靜水壓測試。該槽設置排放至大氣的一只釋壓閥及一只安全閥作為過壓保護，各閥的開啟壓力設定值均為205 psig，最大額定排放流量率為6 gpm。測試中，當儲水槽壓力達到200 psig 時，該正排量泵不經意任其持續運轉。
當該泵運轉至穩定狀態時，釋壓閥會_____；同時安全閥會以約_____的流量排水至大氣。
A.部份開啟；6 gpm
B.部份開啟；2 gpm
C.全開；6 gpm
D.全開；2 gpm

答案： A

科目/題號：191001/2 (2016新增)
知能類：K1.01 [3.3/3.4]
K1.02 [3.0/3.3]
序號：P5201 (B5201)

Refer to the drawing of two identical water storage tanks (see figure below). Tank A is protected by a relief valve and Tank B is protected by a safety valve. Each valve has an opening setpoint of 205 psig and a maximum rated discharge flow rate of 8 gpm.
The tanks are being hydrostatically tested to 200 psig. Each tank is being supplied with a smooth and constant flow rate of 2 gpm from separate positive displacement pumps (PDPs). Both PDPs are inadvertently left running when tank pressures reach 200 psig.
With the PDPs running continuously, what will be the resulting status of the relief and safety valves?

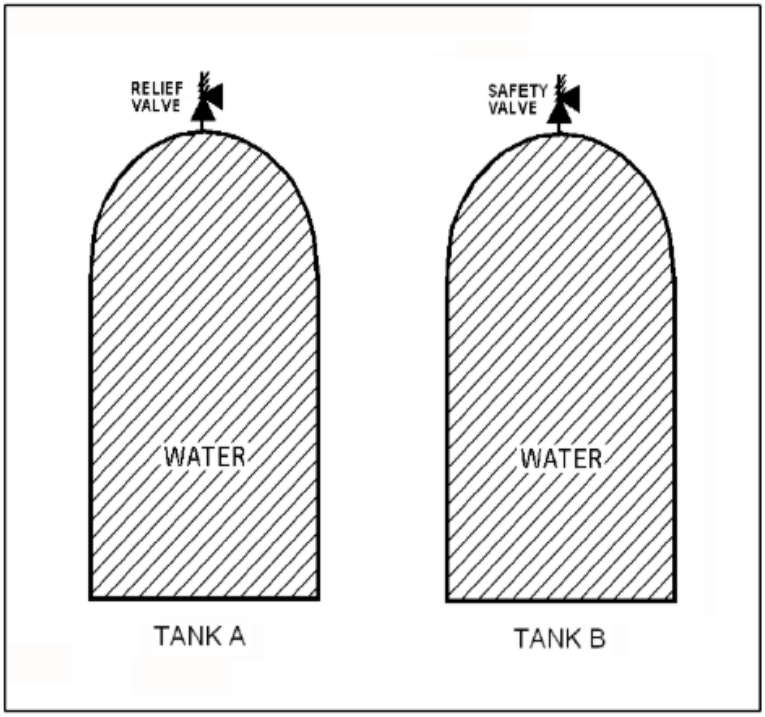
| | Relief Valve Status | Safety Valve Status |
|---|---|---|
| A. | Partially open | Partially open |
| B. | Partially open | Cycling between fully open and fully closed |
| C. | Cycling between fully open and fully closed | Partially open |
| D. | Cycling between fully open and fully closed | Cycling between fully open and fully closed |

ANSWER: B.

參考兩座相同的儲水槽(見下圖)，A 槽以一只釋壓閥作過壓保護，而 B 槽以一只安全閥作過壓保護，各閥的開啟設定值均為 205 psig，最大額定排放流量率為 8 gpm。此二儲水槽各用一只正排量泵(PDP)，都以 2 gpm 穩定流量率注水進入對應的儲水槽執行 200 psig 的靜水壓測試。測試中，當儲水槽壓力達到 200 psig 時，這兩只正排量泵均不經意任其持續運轉。
在這兩只正排量泵持續運轉的情況下，安裝於儲水槽上的釋壓閥與安全閥之狀態為何？

| | 釋壓閥之狀態 | 安全閥之狀態 |
|---|---|---|
| A. | 部份開啟 | 部份開啟 |
| B. | 部份開啟 | 在全開與全關間反覆動作(Cycling) |
| C. | 在全開與全關間反覆動作 | 部份開啟 |
| D. | 在全開與全關間反覆動作 | 在全開與全關間反覆動作 |

答案： B


RELIEF VALVE
SAFETY VALVE
WATER
WATER
TANK A
TANK B

科目/題號：191001/3 (2016新增)
知能類：K1.01 [3.3/3.4]
K1.02 [3.0/3.3]
序號：P6101 (B6101)

A completely full water storage tank is being hydrostatically tested to 200 psig using a positive displacement pump (PDP) with a smooth and constant discharge flow rate of 8 gpm. The tank is protected by a relief valve and a safety valve that both discharge to the atmosphere. The valves have the following characteristics:

- The relief valve opening setpoint is 200 psig with an accumulation of 5 percent.
- The safety valve opening setpoint is 240 psig with a blowdown of 5 percent.
- Both valves have a maximum discharge flow rate of 6 gpm.

The PDP is inadvertently left running when tank pressure reaches 200 psig.
When conditions stabilize with the PDP still running, the relief valve will be _____ open; and the safety valve will be discharging a flow rate of approximately _____ to the atmosphere.
A. partially; 6 gpm
B. partially; 2 gpm
C. fully; 6 gpm
D. fully; 2 gpm
ANSWER: D.

一座滿水的儲水槽用一只正排量泵(PDP)以8 gpm穩定流量率注水進入該槽，執行200 psig的靜水壓測試。該槽設置排放至大氣的一只釋壓閥及一只安全閥作為過壓保護。各閥的特性如下：

- 釋壓閥的開啟壓力設定值為200 psig，蓄壓(accumulation) 5%
- 安全閥的開啟壓力設定值為240 psig，沖放(blowdown) 5%
- 兩只閥的最大排放流量率均為6 gpm

當儲水槽壓力達到200 psig 時，該PDP不經意任其持續運轉。當該泵運轉至穩定狀態時，釋壓閥會_____；同時安全閥會以約_____的流量排水至大氣。
A.部份開啟；6 gpm
B.部份開啟；2 gpm
C.全開；6 gpm
D.全開；2 gpm

答案： D

科目/題號：191001/4 (2016新增)
知能類：K1.01 [3.3/3.4]
K1.02 [3.0/3.3]
序號：P6201 (B6201)

A main steam system uses a combination of safety and relief valves for overpressure protection. Which one of the following describes a major design consideration for installing both types of valves in the same system?
A. The safety valves are installed to prevent chattering of the relief valves during normal power operation.
B. The safety valves are installed to prevent unnecessary opening of the relief valves during a steam pressure transient.
C. C. The relief valves are installed to prevent chattering of the safety valves during normal power operation.
D. D. The relief valves are installed to prevent unnecessary opening of the safety valves during a steam pressure transient.
ANSWER: D.

某主蒸汽系統採用安全閥與釋壓閥的組合作為過壓保護
下列何者敘述為在此系統中同時安裝安全閥及釋壓閥的主要設計考量？
A.安裝安全閥的目的，主要是防止正常運轉期間釋壓閥產生反覆開關的現象
B.安裝安全閥的目的，主要是當蒸汽壓力出現暫態變化時防止釋壓閥非必要的開啟
C.安裝釋壓閥的目的，主要是防止正常運轉期間安全閥產生反覆開關的現象
D.安裝釋壓閥的目的，主要是當蒸汽壓力出現暫態變化時防止安全閥非必要的開啟

答案： D

科目/題號：191001/5 (2016新增)
知能類：K1.02 [3.0/3.3]
序號：P6401 (B6402)

A completely full water storage tank is being hydrostatically tested to 200 psig using a positive displacement pump (PDP) with a smooth and constant discharge flow rate of 6 gpm. The tank is protected by two relief valves that discharge to the atmosphere. The relief valves have the following characteristics:

- Relief valve A opening setpoint is 200 psig with an accumulation of 1.5 percent.
- Relief valve B opening setpoint is 200 psig with an accumulation of 3.0 percent.
- Each valve has linear flow rate characteristics and a maximum discharge flow rate of 6 gpm.

The PDP is inadvertently left running when tank pressure reaches 200 psig.
With the PDP running continuously, what will be the discharge flow rates of the relief valves when tank pressure stabilizes?

| | Relief Valve A | Relief Valve B |
|---|---|---|
| A. | 1 gpm | 5 gpm |
| B. | 2 gpm | 4 gpm |
| C. | 3 gpm | 3 gpm |
| D. | 4 gpm | 2 gpm |

ANSWER: D.

一座滿水的儲水槽用一只正排量泵(PDP)以6 gpm穩定流量率注水進入該槽，執行200 psig的靜水壓測試。該槽設置排放至大氣的二只釋壓閥作為過壓保護。此二釋壓閥的特性如下：

- A釋壓閥的開啟壓力設定值為200 psig，蓄壓(accumulation)百分比為1.5%
- B釋壓閥的開啟壓力設定值為200 psig，蓄壓(accumulation)百分比為3.0%
- 各閥之開度與流量率具線性關係，最大排放流量率均為6 gpm

當儲水槽壓力達到200 psig 時，該PDP不經意任其持續運轉。當儲水槽壓力穩定且PDP繼續運轉時，這兩只釋壓閥的排放流量為何？

| | A 釋壓閥 | B 釋壓閥 |
|---|---|---|
| A. | 1 gpm | 5 gpm |
| B. | 2 gpm | 4 gpm |
| C. | 3 gpm | 3 gpm |
| D. | 4 gpm | 2 gpm |

答案：D

科目/題號：191001/6 (2016新增)
知能類：K1.02 [3.0/3.3]
序號：P6701 (B6701)

A completely full water tank is being hydrostatically tested to 180 psig using a positive displacement pump (PDP) with a smooth and constant discharge flow rate of 6 gpm. The tank is protected by two relief valves that discharge to the atmosphere. The relief valves have the following characteristics:

- Relief valve A opening setpoint is 180 psig with an accumulation of 5 percent.
- Relief valve B opening setpoint is 200 psig with an accumulation of 5 percent.
- Each relief valve has linear flow rate characteristics and a maximum flow rate of 4 gpm.

The PDP is inadvertently left running when tank pressure reaches 180 psig.
With the PDP still running, at what pressure will the tank stabilize?
A. 190 psig
B. 195 psig
C. 205 psig
D. 210 psig
ANSWER: C.

一座滿水的儲水槽用一只正排量泵(PDP)以6 gpm穩定流量率注水進入該槽，執行180 psig的靜水壓測試。該槽設置排放至大氣的二只釋壓閥作為過壓保護。此二只釋壓閥的特性如下：

- A釋壓閥的開啟壓力設定值為180 psig，蓄壓(accumulation)百分比為5%
- B釋壓閥的開啟壓力設定值為200 psig，蓄壓(accumulation)百分比為5%
- 各釋壓閥之開度與流量率具線性關係，最大排放流量率均為4 gpm

當儲水槽壓力達到180 psig 時，該PDP不經意任其持續運轉。PDP繼續運轉時，該儲水槽壓力將穩定於何值？
A.190 psig
B.195 psig
C.205 psig
D.210 psig

答案：C

科目/題號：191001/7 (2016新增)
知能類：K1.02 [3.0/3.3]
序號：P7611 (B7611)

A completely full water storage tank is being hydrostatically tested to 200 psig using a positive displacement pump (PDP) with a smooth and constant discharge flow rate of 4 gpm. The tank is protected by a relief valve that discharges to the atmosphere. The relief valve has the following characteristics:

- The opening setpoint is 200 psig with an accumulation of 5 percent.
- The valve has linear flow characteristics and a maximum rated flow rate of 8 gpm.

The PDP is inadvertently left running when tank pressure reaches 200 psig.
With the PDP still running, at what pressure will the tank stabilize?
A. 190 psig
B. 195 psig
C. 205 psig
D. 210 psig
ANSWER: C.

一座滿水的儲水槽用一只正排量泵(PDP)以4 gpm穩定流量率注水進入該槽，執行200 psig的靜水壓測試。該槽設置一只排放至大氣的釋壓閥作為過壓保護。此釋壓閥的特性如下：

- 開啟壓力設定值為200 psig，蓄壓百分比為5%
- 閥之開度與流量率具線性關係，最大額定排放流量率為8 gpm

當儲水槽壓力達到 200 psig 時，該 PDP 不經意任其持續運轉。PDP 繼續運轉時，該儲水槽壓力將穩定於何值？
A.190 psig
B.195 psig
C.205 psig
D.210 psig

答案：C

科目/題號：191001/8 (2016新增)
知能類：K1.04 [2.8/3.2]
K1.08 [3.4/3.4]
序號：P5002 (B5002)

Refer to the drawing of a pneumatically-operated valve (see figure below). The valve actuator may be shown with or without air pressure applied to it.
Which one of the following describes the type of valve shown, and the fail position on loss of air to the actuator?

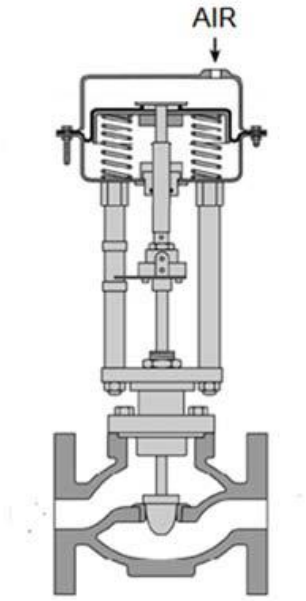
| | Valve Type | Fail Position |
|---|---|---|
| A. | Gate | Open |
| B. | Gate | Closed |
| C. | Globe | Open |
| D. | Globe | Closed |

ANSWER: C.

參考氣動閥圖(見下圖)。圖中所顯示的驅動器可能有或沒有引進施壓空氣。
下列何者為說明所示閥的類型，以及驅動器失去施壓空氣後該閥的失效位置：

| | 閥的類型 | 閥的失效位置 |
|---|---|---|
| A. | 閘閥 | 開啟 |
| B. | 閘閥 | 關閉 |
| C. | 球型閥 | 開啟 |
| D. | 球型閥 | 關閉 |

答案：C



科目/題號：191001/9 (2016 新增)
知能類：K1.04 [2.8/3.2]
K1.08 [3.4/3.4]
序號：P5302 (B5301)

Refer to the drawing of four air-operated valves (see figure below). **Note:** The valve actuators may be shown with or without air pressure applied.
Given:

- The direction of system flow is from left to right when the valves are open.
- The internal components for each valve are identical except for the orientation of the valve disk and seat.
- The valve actuators exert the same force on the attached valve stem for a given applied air pressure.

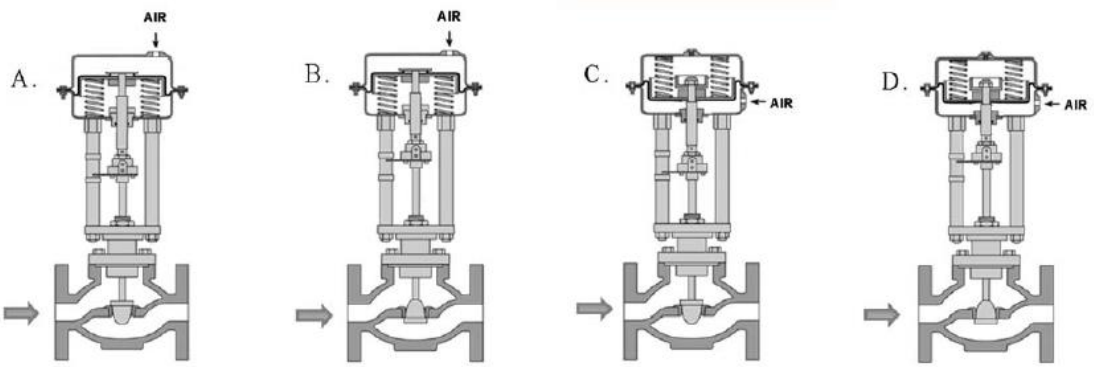
If each actuator is vented, which valve disk will remain closed with the most force?
A. A.
B. B.
C. C.
D. D.
ANSWER: C.

參考下圖中的 4 只氣動閥，圖上所顯示的驅動器可能有或沒有引進施壓空氣。已知：

- 當這些閥打開時，系統流體是從閥的左邊流向右邊
- 除了閥盤與閥座的定位不同外，各閥的內部組件完全相同
- 當施壓空氣進入這些閥的驅動器時，對驅動器所連結閥桿施加相同的力量

若將每個驅動器的施壓空氣排掉，何者的閥盤是以最大的力量來維持在關閉的位置？
A. A
B. B
C. C
D. D

答案：C

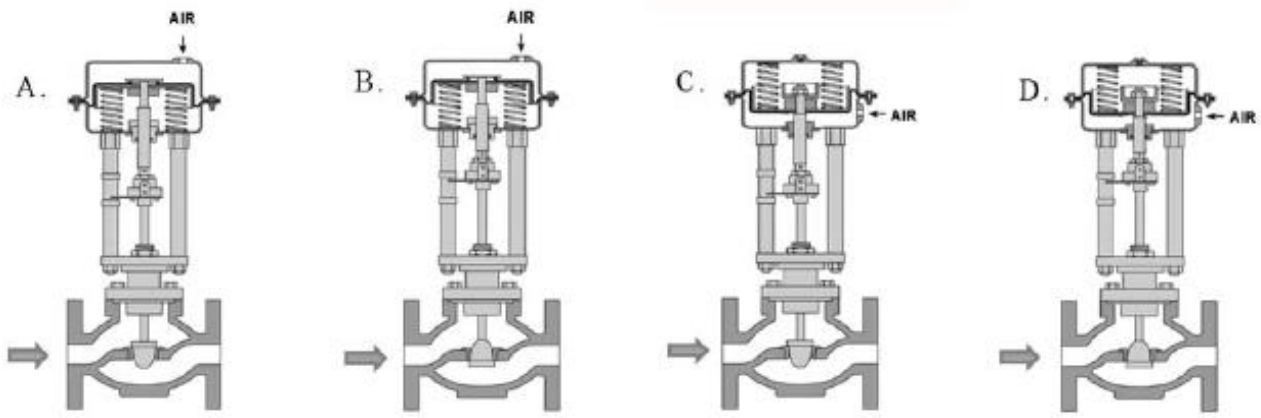


科目/題號：191001/10 (2016新增)
知能類：K1.04 [2.8/3.2]
序號：P5502 (B5502)

Refer to the drawing of four air-operated valves (see figure below). **Note:** The valve actuators may be shown with or without air pressure applied.
Which valves are currently shown in their failed (i.e., no air pressure applied to the actuator) positions?
A. A and B
B. B and C
C. C and D
D. D and A
ANSWER: B.

參考下圖中的 4 只氣動閥，圖上所顯示的驅動器可能有或沒有引進施壓空氣。
下列那些閥門顯示目前在失效(即無空氣壓力施加於驅動器)位置？
A. A 及 B
B. B 及 C
C. C 及 D
D. D 及 A

答案：B



科目/題號：191001/11 (2016新增)
知能類：K1.04 [2.8/3.2]
K1.08 [3.4/3.4]
序號：P5901 (B5902)

Refer to the drawing of a pneumatically-operated valve (see figure below). The valve actuator may be shown with or without applied air pressure.
Which one of the following describes the type of valve shown, and the valve's fail position on loss of air to the actuator?

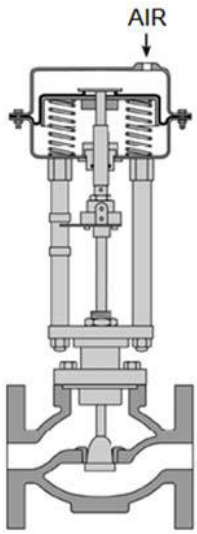
| | Valve Type | Fail Position |
|---|---|---|
| A. | Ball | Open |
| B. | Ball | Closed |
| C. | Globe | Open |
| D. | Globe | Closed |

ANSWER: D.

參考氣動閥圖(見下圖)。圖上所顯示的驅動器可能有或沒有引進施壓空氣。
下列何者為說明所示閥型，以及驅動器失去施壓空氣後該閥的失效位置：

| | 閥的類型 | 閥的失效位置 |
|---|---|---|
| A. | 球閥 | 開啟 |
| B. | 球閥 | 關閉 |
| C. | 球型閥 | 開啟 |
| D. | 球型閥 | 關閉 |

答案：D



科目/題號：191001/12 (2016 新增)
知能類：K1.08 [3.4/3.4]
序號：P7002 (B7003)

In a comparison between ball valves and butterfly valves in the same cooling water system application, the valve that would typically experience the greater seat leakage when fully closed with a large differential pressure is the _____ valve; and the valve that would typically cause the smaller head loss when fully open is the _____ valve.
A. ball; butterfly
B. ball; ball
C. butterfly; butterfly
D. butterfly; ball
ANSWER: D.

比較安裝於同一個冷卻水系統內的球閥與蝶閥，在高壓差情況下將閥全關會有較大閥座洩漏量的是_____閥，而當閥全開時會有較低水頭損失的是_____閥。
A.球；蝶
B.球；球
C.蝶；蝶
D.蝶；球

答案：D

科目/題號：191001/13 (2016新增)
知能類：K1.08 [3.4/3.4]
序號：P7621 (B7621)

During a local inspection of a manually operated 12-inch gate valve, the valve stem is observed to extend outward from the valve handwheel by 1 inch. The entire external valve stem is threaded, except for a 1-inch section that becomes smooth just before the valve stem enters the packing gland.
Which one of the following describes the position of the gate valve?
A. The valve is fully open or nearly fully open.
B. The valve is fully closed or nearly fully closed.
C. The valve may be in any position because it is a rising stem gate valve.
D. The valve may be in any position because it is a non-rising stem gate valve.
ANSWER: B.

在現場檢視 1 只 12-inch 手動操作的閘閥時，發現閥桿從該閥的手輪伸出 1-inch。整支閥桿的外露部分都有螺紋，只有在閥桿要進入閥的迫緊格蘭前 1-inch 長的那一段是光滑的。
下列何者為描述該閘閥的閥位？
A.該閥全開或幾乎全開
B.該閥全關或幾乎全關
C.由於該閥屬上升閥桿之閘閥，因此無法確認閥位
D.由於該閥屬非上升閥桿之閘閥，因此無法確認閥位

答案：B

科目/題號：191001/14 (2016新增)
知能類：K1.08 [3.4/3.4]
序號：P7631 (B7631)

A typical motor-operated valve has been returned to service following a complete maintenance overhaul of the valve and actuator. When the valve was remotely opened and closed to verify operability, the measured valve stroke time in each direction was 15 seconds, which is shorter than normal for this valve.
Which one of the following could have caused the shorter stroke time?
A. The valve position limit switches were removed and were not reinstalled.
B. The valve torque limit switches were misadjusted to open at twice their normal setpoints.
C. The valve was packed with improved packing material having a lower friction coefficient.
D. The valve stem packing gland was overtightened after the packing material was replaced.
ANSWER: C.

1只典型的馬達操作閥在完整維修閥及驅動器後回裝使用。當此閥以遙控方式開啟與關閉以驗證其可用性時，兩個方向的行程時間都是15秒，比該閥正常行程時間還短。
下列何者是導致此較短行程時間的原因？
A.其閥位極限開關被拆下，但未裝回
B.閥之扭力極限開關調整不良，需正常設定值二倍的扭力才會開啟
C.此閥的迫緊改用摩擦係數較低的材質
D.閥桿的迫緊格蘭更換後，新的迫緊格蘭鎖得太緊

答案：C