

科目：291001

知能類：K1.01 [3.4/3.5]

序號：B1

Which one of the following describes the operation of a safety valve installed on a high pressure steam system?

- A. A safety valve is initially lifted off its seat by system pressure, then is forced fully open by an air-operated piston.
- B. As system pressure increases to the safety setpoint, the pressure overcomes spring force on the valve operator, causing the valve to open.
- C. A safety valve will remain open until system pressure has been reduced to the pilot valve actuation setpoint.
- D. When the open safety valve has returned system pressure to the lifting set point, a combination of air and steam pressure above the valve disk closes the valve.

ANSWER: B.

下列何者是描述裝置在高壓蒸汽系統上安全閥的運作方式？

- A. 安全閥先被系統的壓力舉離其閥座，然後被空氣操作的活塞完全打開。
- B. 當系統壓力增加至安全設定值時，壓力會克服加於閥上的彈簧力量，使閥因而打開。
- C. 安全閥會維持打開的模式，直到系統壓力降低至驅動嚮導閥(Pilot Valve)的設定值。
- D. 當打開的安全閥將系統壓力降至舉離的設定值時，在氣閥盤上方的空氣和蒸汽組合壓力會將閥關上。

答案： B.

科目：291001

知能類：K1.01 [3.4/3.5]

序號：B901

Which one of the following valves provides overpressure protection to limit the internal pressure in vessels and thus protect personnel and equipment?

- A. Safety
- B. Control
- C. Sentinel
- D. Pressure regulating

ANSWER: A.

下列何種閥提供了過壓保護，藉由控制容器內部壓力以保護人員與設備的安全？

- A. 安全(Safety)閥
- B. 控制(Control)閥
- C. 警戒(Sentinel)閥
- D. 壓力調節(Pressure regulating)閥

答案： A.

科目：291001

知能類：K1.01 [3.4/3.5]

序號：B1101 (N/A)

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

- A. An open safety valve will close when reactor pressure decreases enough for gravity and spring tension to overcome the effect of reactor pressure on the main valve disk.
- B. An open safety valve will close when the pilot valve senses a reduced reactor pressure and isolates reactor pressure to the main valve disk.
- C. When reactor pressure reaches the lift set point, the safety valve begins to open and will modulate to a position that is directly proportional to reactor pressure.
- D. When reactor pressure reaches the lift set point, a pilot valve closes to create a ΔP across the main valve disk which overcomes gravity and spring tension to open the valve.

ANSWER: A.

下列何者描述反應爐壓力槽安全閥的運作方式？

- A. 當反應爐壓力降至夠低，使重力和彈簧張力大於施加在主閥盤上的爐壓時，打開的安全閥就會關上。
- B. 當嚮導閥(Pilot Valve)偵測到爐壓降低並將主閥盤上的反應爐壓力隔離時，打開的安全閥就會關上。
- C. 當爐壓達到舉離的設定值時，安全閥開始打開，並調整至與爐壓成正比的位置。
- D. 當爐壓達到舉離的設定值時，一嚮導閥會關上，在主閥盤上產生差壓(ΔP)，使之大於重力與彈簧張力，因而打開安全閥。

答案： A.

科目：291001

知能類：K1.01 [3.4/3.5]

序號：B1701 (P1802)

A vertical safety valve has a compressed spring assembly that is applying 1200 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.

一直立的安全閥上面裝有壓縮彈簧裝置，會在閥盤上方施力1200 lbf，以對抗系統壓力。系統壓力則施加於直徑3英吋的閥盤底面。

下列何者為讓安全閥打開的大約系統壓力？（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：291001

知能類：K1.01 [3.4/3.5]

序號：B2003 (P1903)

A vertical safety valve with a 3-inch diameter disk has a spring applying 1000 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 begin to open? (Neglect the effect of atmospheric pressure.)

- A. 35 psi
- B. 111 psi
- C. 142 psi
- D. 444 psi

ANSWER: C.

盤面直徑3英吋的直立安全閥上面裝有能施力1000 lbf的彈簧裝置，以對抗系統壓力。下列何者為讓安全閥開始打開的大約系統壓力？（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：291001

知能類：K1.01 [3.4/3.5]

序號：B2103 (P2101)

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

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

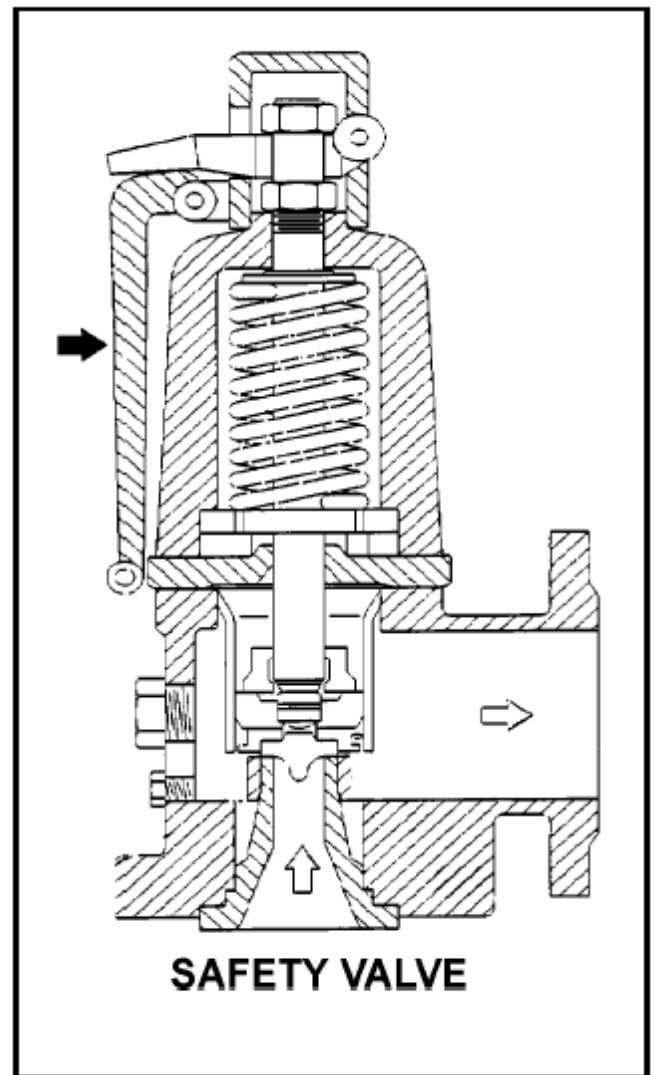
- A. ratchet open the safety valve.
- B. pop open the safety valve.
- C. gag shut the safety valve.
- D. determine the position of the safety valve.

ANSWER: B.

參考一典型安全閥的圖示。（見圖）
實心箭頭所指的組件是運轉員用來手
動 ...

- A. 用扳手打開(ratchet open)安全閥。
- B. 彈開(pop open)安全閥。
- C. 塞住(gag shut)安全閥。
- D. 確認(determine)安全閥的位置。

答案： B.



科目：291001

知能類：K1.01 [3.4/3.5]

序號：B2301 (P2301)

A vertical safety valve has a compressed spring assembly that is applying 2500 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.

一直立安全閥上面裝有壓縮彈簧裝置，會在閥盤上方施力2500 lbf，以對抗系統壓力。系統壓力則施加於直徑5英吋的氣閥盤底面。

下列何者為讓安全閥打開的大約系統壓力？（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：291001

知能類：K1.01 [3.4/3.5]

序號：B2803 (P2801)

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面裝有能施力2,400 lbf的彈簧裝置，以對抗系統壓力。下列何者為讓安全閥打開的大約系統壓力？

- A. 95 psig
- B. 191 psig
- C. 382 psig
- D. 764 psig

答案： D.

科目：291001

知能類：K1.01 [3.4/3.5]

序號：B3401 (P3401)

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

Setpoint pressure (MSSV starts to open): 1200 psia

Maximum pressure (MSSV will be fully open): 1230 psia

Reseat pressure (MSSV will be fully closed): 1140 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.

假設操作主蒸汽安全閥(MSSV)的壓力條件如下：

壓力設定值（MSSV開始打開）：1200 psia

最大壓力（MSSV全開）：1230 psia

歸位壓力（MSSV完全關閉）：1140 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： 291001
知能類： K1.02 [3.4/3.6]
序號： B2 (P3302)*

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, twophase 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 _____.

- B. A; A
- B. A; B
- C. B; A
- D. B; B

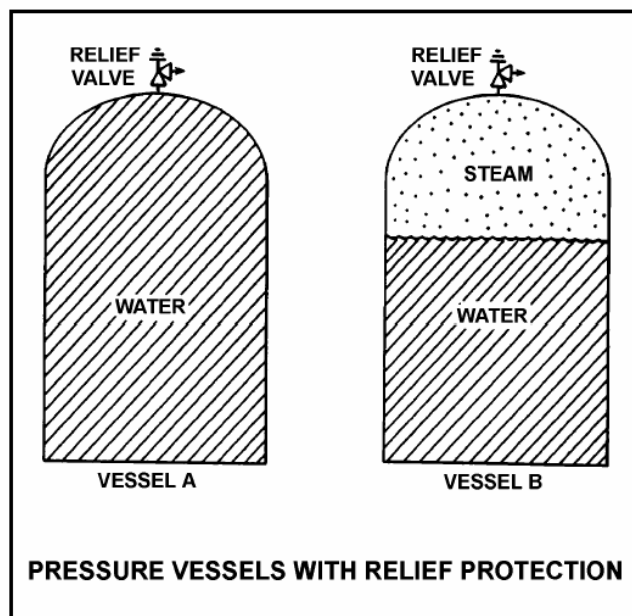
ANSWER: A.

參考兩個具有相同釋壓閥(Relief Valve)保護裝置的相同壓力容器（見下圖）。

容器(Vessel)A內裝滿80°F次冷(Subcooled)的水，容器B內則為飽和雙相狀態。兩個容器都在封閉狀態並施予50 psig的壓力。如果兩者的釋壓閥同時完全打開，容器_____在開始時降壓較快；容器_____在開始時會外釋較多的質量。

- A. A; A
- B. A; B
- C. B; A
- D. B; B

答案： A.



科目：291001

知能類：K1.02 [3.4/3.5]

序號：B201 (P501)

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. set point deviation.
- B. set point tolerance.
- C. accumulation.
- D. blowdown.

ANSWER: C.

釋壓閥(Relief Valve)開始打開的壓力設定值與完全打開時的壓力差稱為…

- A. 設定值偏差(Deviation)
- B. 設定值公差(Tolerance)
- C. 蓄壓(Accumulation)
- D. 沖放(Blowdown)

答案： C.

科目：291001

知能類：K1.02 [3.4/3.6]

序號：B301 (P202)

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

- A. blowdown.
- B. accumulation.
- C. setpoint tolerance.
- D. setpoint deviation.

ANSWER: A.

安全閥打開的壓力設定值與其關閉的壓力差稱為…

- A. 沖放(Blowdown)
- B. 蓄壓(Accumulation)
- C. 設定值公差(Tolerance)
- D. 設定值偏差(Deviation)

答案： A.

科目：291001

知能類：K1.02 [3.4/3.6]

序號：B1301 (P1801)

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 one-half 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.

參考兩個具有相同釋壓閥(Relief Valve)保護裝置的相同壓力容器(Vessel) (見下圖)。

兩個容器都在封閉狀態，並施予50 psig的壓力。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；如果兩者的釋壓閥都在40 psig時關閉，容器_____會減少較多的質量。

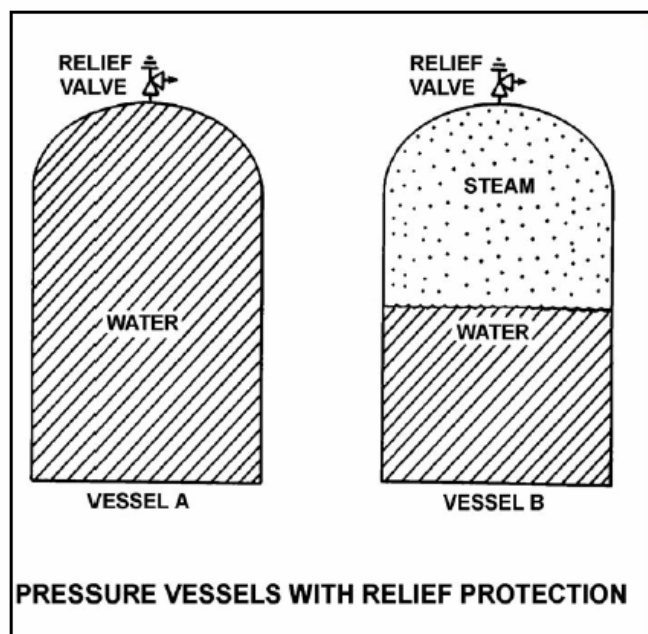
A. A; A

B. A; B

C. B; A

D. B; B

答案： B.



科目：291001

知能類：K1.02 [3.4/3.6]

序號：B1801 (P1504)

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(Relief Valve)和典型安全閥的差別？

- A. 釋壓閥的驅動器關閉彈簧處在壓縮的狀態，而安全閥的驅動器關閉彈簧則處於拉緊的狀態。
- B. 當壓力超過設定值時，釋壓閥會逐漸打開，而安全閥則在壓力達到設定值時就會完全打開。
- C. 釋壓閥容許被鉗塞(Gag)，而安全閥則不。
- D. 釋壓閥的沖放大於安全閥的沖放。

答案： B.

科目：291001

知能類：K1.02 [3.4/3.6]

序號：B2205 (P602)

When comparing the characteristics of gate valves and globe valves in an operating system, 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.

在比較運轉中系統的閘閥和球形閥間的特性時，球形閥通常在全開時會有較_____的壓降現象，而且比較_____用來調節系統流量。

- A. 小；少
- B. 大；常
- C. 小；常
- D. 大；少

答案： B.

科目：291001

知能類：K1.02 [3.4/3.6]

序號：B2501 (P2501)

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(Relief Valve)，而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。

在兩槽內以釋放/安全閥設計流量的50%等速加入水，在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；穩定在稍高於壓力設定值
- B. 穩定在稍高於壓力設定值；在壓力設定值上下幾個百分比內晃動
- C. 在壓力設定值上下幾個百分比內晃動；穩定在稍高於壓力設定值
- D. 在壓力設定值上下幾個百分比內晃動；在壓力設定值上下幾個百分比內晃動

答案： B.

科目： 291001

知能類： K1.02 [3.4/3.6]

序號： B2701 (P2701)

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(Vessel)A和容器B完全相同，但是容器A的過壓保護的裝置為安全閥，而容器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，在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；穩定在稍高於壓力設定值
- B. 穩定在稍高於壓力設定值；在壓力設定值上下幾個百分比內晃動
- C. 在壓力設定值上下幾個百分比內晃動；穩定在稍高於壓力設定值
- D. 在壓力設定值上下幾個百分比內晃動；在壓力設定值上下幾個百分比內晃動

答案： C.

科目：291001

知能類：K1.03 [2.7/2.8]

序號：B202

If a pressure control valve at the outlet of a heat exchanger opens farther, system flow rate will _____ and system head loss will _____.

- A. increase; decrease
- B. increase; increase
- C. decrease; decrease
- D. decrease; increase

ANSWER: A.

如果熱交換器出口的壓力控制閥多打開一些，系統流量會 _____，且系統水頭損失會 _____。

- A. 增加；減少
- B. 增加；增加
- C. 減少；減少
- D. 減少；增加

答案： A.

科目：291001

知能類：K1.03 [2.7/2.8]

序號：B2101 (P2102)

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.

下列何者為描述在運轉中的水系統的典型閘閥在開啟過程中流量變化的特性？

- A. 閘盤打開過程的前25%開度所導致的流量改變比後25%小。
- B. 閘盤打開過程的前25%開度所導致的流量改變比後25%大。
- C. 閘盤打開過程的前25%開度所導致的流量改變和後25%差不多。
- D. 打開了25%開度的閘閥盤會導致大約全流量的25%。

答案： B.

科目：291001

知能類：K1.03 [2.7/2.8]

序號：B2303 (P2303)

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(Valve Seat)兩側上有相當_____的壓降而產生孔蝕(Cavitation)現象。

- A. 打開；大
- B. 打開；小
- C. 關閉；大
- D. 關閉；小

答案： C.

科目：291001

知能類：K1.03 [2.7/2.8]

序號：B2601 (P2302)

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.

下列何者為描述在運轉中的水系統的典型球形閥在開啟過程中流量變化的特性？

- A. 閥盤打開過程的前25%開度所導致的流量改變比後25%小。
- B. 閥盤打開過程的前25%開度所導致的流量改變比後25%大。
- C. 閥盤打開過程的前25%開度所導致的流量改變和後25%差不多。
- D. 打開了25%開度的球形閥會導致大約25%的全流量。

答案： B.

科目：291001

知能類：K1.03 [2.7/2.8]

序號：B3002 (P3001)

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.

下列何者為描述典型的球形閥的節流特性？

- A. 閥盤打開過程的前三分之一會導致大約三分之一的全流量。
- B. 閥盤打開過程的前三分之一所增加的流量小於過程的後三分之一。
- C. 閥盤打開過程的前三分之一所增加的流量大於過程的後三分之一。
- D. 閥盤打開過程的前三分之二所增加的流量大約等於過程的後三分之一。

答案： C.

科目：291001

知能類：K1.03 [2.7/2.8]

序號：B3902 (P3901)

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; higher

B. higher; lower

C. lower; higher

D. lower; lower

ANSWER: B.

冷卻水系統圖中的兩個離心泵都在運轉中（見下圖）。

運轉員將泵B停止，但是泵B的止回閥卻沒有關上。與只有泵A在正常運轉時相比，泵B的止回閥沒有關閉會使泵A的流量____於正常值；而且熱交換器流量會____於正常值。

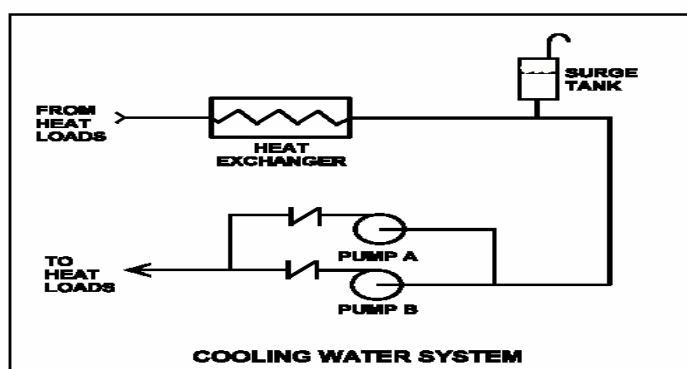
A. 高；高

B. 高；低

C. 低；高

D. 低；低

答案： B.



科目：291001

知能類：K1.04 [2.7/2.8]

序號：B502 (P203)

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

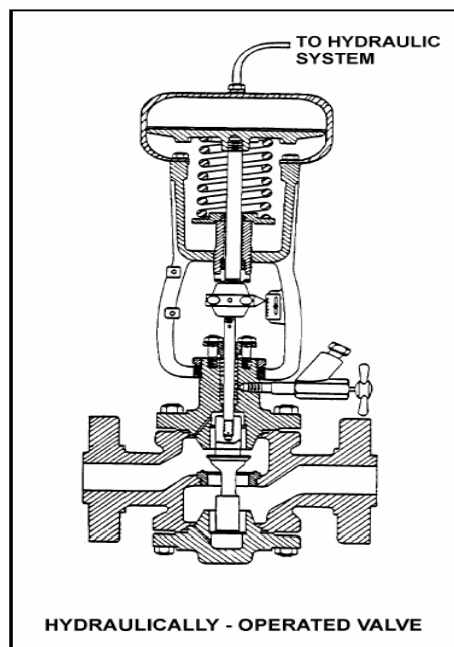
ANSWER: A.

參考處於節流狀態的液壓操作閥圖（見下圖）。

選出在失去液壓系統之壓力後，此閥的位置。

- A. 全開
- B. 不變
- C. 全關
- D. 在一半的位置

答案： A.



科目：291001

知能類：K1.04 [2.7/2.8]

序號：B602 (P1202)

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(Moter-operated Valve)會在閥的引動器(Actuator)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：291001

知能類：K1.04 [2.7/2.8]

序號：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?

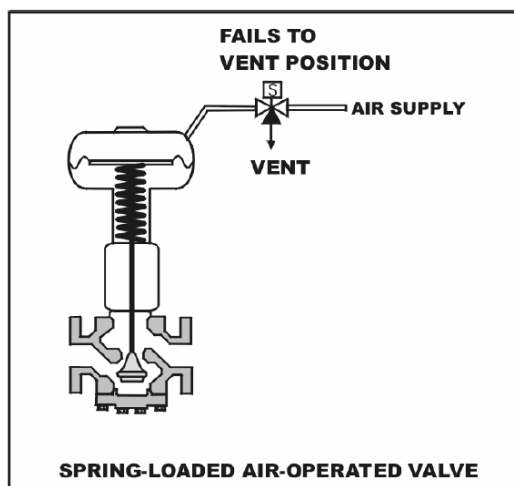
- A. Original position
- B. More closed
- C. More open
- D. Varies with system flow

ANSWER: B.

參考處於節流狀態且裝有彈簧的空氣操作閥(Air-operated Valve)圖（見下圖）。如果連接閥的空氣管漏氣而導致閥的引動器(Actuator)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：291001

知能類：K1.04 [2.7/2.8]

序號：B1109 (P1101)

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 loss of electrical power to the solenoid? (The figure currently depicts normal air supply pressure and an energized solenoid.)

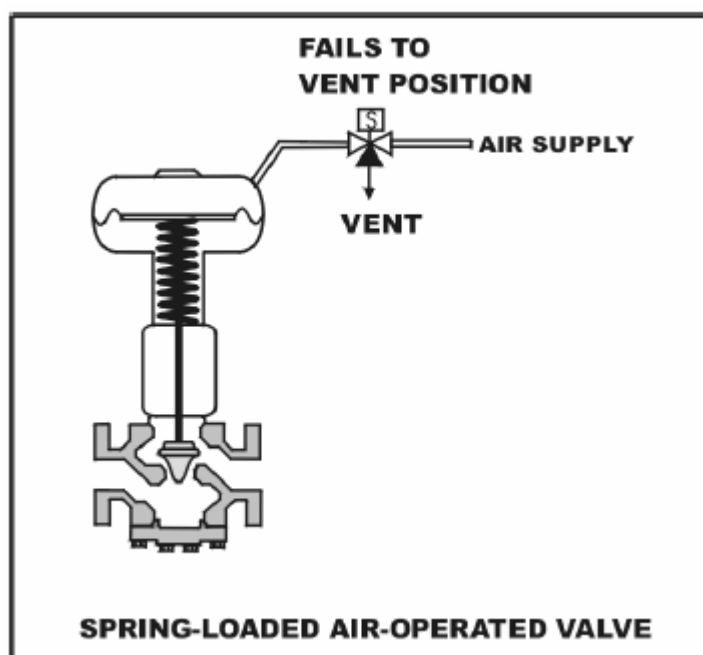
- A. As is
- B. More open
- C. More closed
- D. Varies with system flow

ANSWER: B.

參考處於節流狀態且裝有彈簧的空氣操作閥(Air-operated Valve)圖（見下圖）。圖中顯示在正常供氣壓力和賦能的電磁線圈(Solenoid)，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：291001

知能類：K1.04 [2.7/2.8]

序號：B1401 (P112)

Refer to the drawing of a spring-loaded air-operated valve (see figure below) in which the solenoid is shown energized.

Which one of the following will be the final valve position following a loss of electrical power to the solenoid?

- A. Midposition
- B. Closed
- C. As is
- D. Open

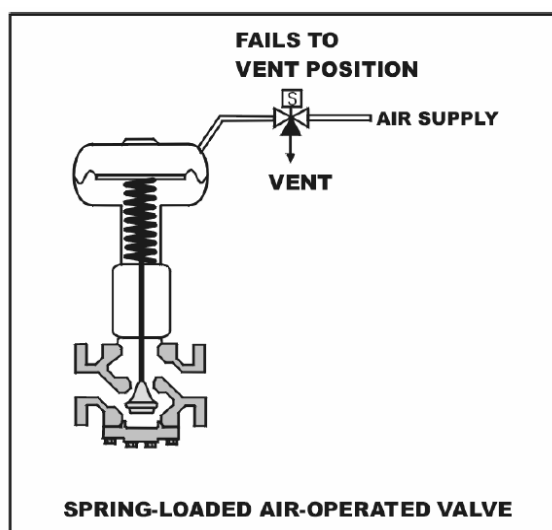
ANSWER: B.

參考電磁線圈(Solenoid)賦能且裝有彈簧的空氣操作閥(Air-operated Valve)圖（見下圖）。

如果電磁線圈失去電力，空氣操作閥最後會在什麼位置？

- A. 半開半關
- B. 關閉
- C. 維持原狀
- D. 打開

答案： B.



科目：291001

知能類：K1.04 [2.7/2.8]

序號：B1702 (P1701)

Which one of the following statements describes the flow rate characteristics of a typical gate or globe valve?

- A. The last 25% of valve stem movement in the open direction for a gate valve will produce a greater change in flow rate than the first 25% of valve stem movement.
- B. The last 25% of valve stem movement in the open direction for a globe valve will produce a greater change in flow rate than the first 25% of valve stem movement.
- C. A globe valve designed specifically for throttling flow must be operated in the first 25% of its range to control flow.
- D. The first 25% of valve stem movement in the open direction for a gate valve will produce a greater change in flow rate than the last 25% of valve stem movement.

ANSWER: D.

下列何者正確的描述典型的閘閥或球形閥的流量特性？

- A. 和剛開啟的25%開度相比，閘閥在最後開啟的25%開度會產生較大的流量改變。
- B. 和最後開啟的25%開度相比，球形閥在剛開啟的25%開度會產生較大的流量改變。
- C. 專為節流設計的球形閥必須在剛開啟的25%開度內操作才能控制流量。
- D. 和最後開啟的25%開度相比，閘閥在剛開啟的25%開度會產生較大的流量改變。

答案： D.

科目： 291001
知能類： K1.04 [2.7/2.8]
序號： B1903 (P101)

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.

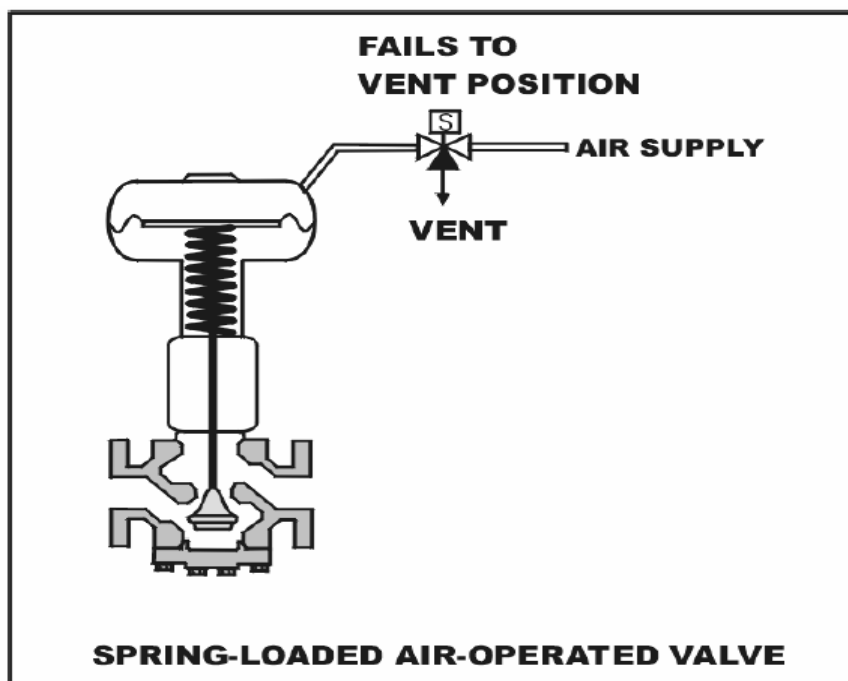
ANSWER: C.

參考裝有彈簧的空氣操作閥圖（見下圖）。

如果失去氣壓，此閥會...

- A. 全打。
- 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： 291001
知能類： K1.05 [2.9/2.8]
序號： B203 (P2103)

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.

若要在現場檢查一個閥是否是打開的，下列何者並非一般可接受的方法？

- A. 觀察現場的流量計。
- B. 檢查現場閥位標示是否在「開」的位置。
- C. 將閥的操作器向「關」的方向操作，確認有一些轉動。
- D. 試著將閥的操作器向「開」的方向操作，確認無法轉動。

答案： D.

科目： 291001

知能類： K1.05 [3.2/3.2]

序號： B402 (P5)

To verify that 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 until flow sounds are heard, then close the valve using normal force.
- B. close direction using normal force and verify there is no substantial handwheel movement.
- C. close direction until it stops, then close it an additional one-half turn using additional force if necessary.
- D. open direction until the valve stem moves in the open direction, then close the valve using normal force.

ANSWER: B.

為了確認一個正在運轉中的系統的手動閥是關閉的，運轉員應該觀察閥的位置標示，並將手輪(Handwheel)轉向...

- A. 開的方向，直到聽見流動的聲音，再用正常力量將閥關上。
- B. 關的方向（用正常力量），並確認手輪沒有明顯的轉動。
- C. 關的方向，直到停止，然後在必要時，用力再轉半圈。
- D. 開的方向，直到閥桿(Valve Stem)朝開的方向移動，然後再用正常力量將閥關閉。

答案： B.

科目：291001

知能類：K1.05 [2.9/2.8]

序號：B503 (P205)

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.

為了確認在一個運轉中的系統的手動閥是在全開的位置，運轉員應該將閥的手輪轉向...

- A. 開的方向，直到閥位後座(Backseat)的半圈。
- B. 全關的位置，然後再開到全開的位置。
- C. 關的方向，然後將閥開到原先的位置。
- D. 開的方向，直到閥碰到後座，然後再關到想要的位置。

答案： C.

科目：291001

知能類：K1.05 [2.9/2.8]

序號：B1404 (P1602)

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 threading to be fully exposed.
- C. Attempt to turn the valve handwheel in the close direction and verify no movement.
- D. Compare an upstream and downstream pressure gauge to ensure zero differential pressure.

ANSWER: C.

若要在現場檢查在一個已洩壓的靜態管路系統中的手動閥是否是全關的，下列何者為一般可接受的方法？

- A. 檢查下游流量計是否為零流量。
- B. 目視觀察氣閥的升桿(Rising-stem)完全顯露出來。
- C. 試著將閥的手輪轉向關的方向，並確認不能再轉動。
- D. 比較上游和下游的壓力計，確定兩者為零壓差。

答案： C.

科目：291001

知能類：K1.05 [3.2/3.2]

序號：B1802 (P1704)

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 onequarter turn in the close direction.

ANSWER: C.

為了確認一個運轉中的系統的手動閥是否為關閉的，運轉員應該觀察閥位標示，並將閥的手輪轉向...

- A. 開的方向至少一轉，然後再用正常力量將閥關閉。
- B. 開的方向，直到可以觀察到系統有流量，然後再用正常力量將閥關閉。
- C. 關的方向（用正常力量），並確認手輪沒有明顯的轉動。
- D. 關的方向（用正常力量），然後再朝關的方向多轉四分之一轉。

答案： C.

科目：291001

知能類：K1.05 [2.9/2.8]

序號：B2502 (P1602)

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. Compare an upstream and downstream pressure gauge to ensure zero differential pressure.
- 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 movement.

ANSWER: C.

若要在現場確認在一個已洩壓的靜態管路系統中的手動閥是否完全關閉，下列何者為一般可接受的方式？

- A. 檢查下游流量計是否指示零流量。
- B. 比較上游和下游的壓力計，確認兩者之間為零壓差。
- C. 試著將閥的手輪轉向關的方向，確認沒有轉動。
- D. 試著將閥的手輪轉向開的方向，確認可以轉動。

答案： C.

科目：291002

知能類：K1.05 [3.1/3.1]

序號：B3807 (P3807)

Refer to the drawing of a differential pressure manometer (see figure below).

The manometer is filled with water and installed across an orifice in a ventilation duct to determine the rate of air flow. The manometer is currently indicating a water level difference of 16 inches at an air flow rate of 300 ft³/min.

Which one of the following will be the approximate rate of air flow when the manometer indicates a water level difference of 4 inches?

- A. 75 ft³/min.
- B. 125 ft³/min.
- C. 150 ft³/min.
- D. 175 ft³/min.

ANSWER: C.

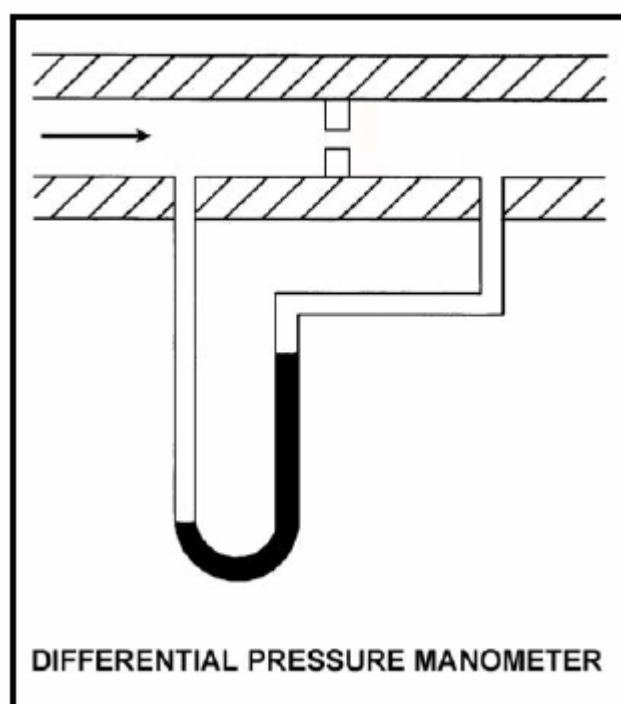
參考示差壓流量的圖（見下圖）。

裝了水的壓力計安裝在通風管的一個限流孔的兩側上，用來量測氣流量。壓力計目前顯示兩邊的水位差為16英吋，此時的氣流量為每分鐘300立方呎（300 ft³/min）。

當這個壓力計兩邊的水位差為4英吋時，下列何者為當時的大約氣流量？

- A. 每分鐘75 ft³/min。
- B. 每分鐘125 ft³/min。
- C. 每分鐘150 ft³/min。
- D. 每分鐘175 ft³/min。

答案： C.



科目：291001

知能類：K1.06 [2.7/2.7]

序號：B1003 (P1603)

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.

為了阻止閥桿的輕微洩漏對於一自動閥進行迫緊迫緊格蘭(Packing Gland)並已完成。則若運轉員將迫緊迫緊旋緊過度，會發生何事？

- A. 流入閥內部的冷卻流體減少
- B. 閥盤與閥桿會分離
- C. 閥位極限開關(Limit Switch)產生對準偏差(Misalignment)
- D. 從全開到全關的行程(Stroke)時間增加

答案：D.

科目：291001

知能類：K1.06 [2.7/2.7]

序號：B2802 (P1303)

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.

對於一有輕微迫緊格蘭洩漏的閥進行迫緊迫緊格蘭(Packing Gland)後，運轉員試圖操作該閥，但發覺閥被卡住。最可能的原因為何？

- A. 因為迫緊迫緊過緊而導致閥盤與閥桿分離
- B. 運轉員在調整迫緊迫緊時將閥設於錯誤位置
- C. 於迫緊迫緊格蘭時閥在關閉方向受到的扭力過大
- D. 維修運轉員將迫緊迫緊格蘭過緊，導致閥桿卡住

答案：D.

科目：291001

知能類：K1.06 [2.7/2.7]

序號：B3503 (P3503)

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 crossconnected?

- 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.

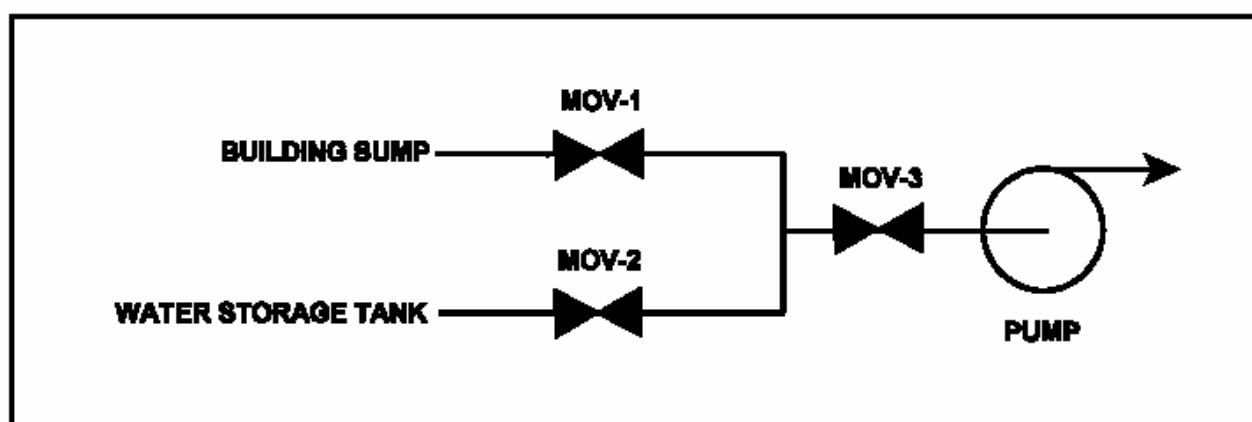
ANSWER: D.

參考有兩個進水管(Suction Source)的供水泵圖（見下圖），所有馬達操作閥（MOVs）目前都是關閉的。

下列哪一個MOV的連鎖會讓泵從廠房集水坑或蓄水槽之一抽水，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MOV中至少有一個是全關的，否則沒有任何一個MOV可以打開。
- C. 除非MOV中至少有兩個是全關的，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：291001

知能類：K1.07 [3.4/3.4]

序號：B315 (P19)

Why must an operator pay particular attention to an auto/manual valve controller when it is placed in the manual mode?

- A. Manual valve control is not as stable as automatic valve control.
- B. Valve position will no longer change in response to changes in system parameters.
- C. The position of the valve can only be determined locally during manual control.
- D. The valve can only be operated locally during manual control.

ANSWER: B.

當將一個自動/手動的閥的控制器置於手控模式時，為何運轉員要特別注意？

- A. 閥的手動控制不如自動控制來的穩定。
- B. 閥位不再隨著系統參數的變化而改變。
- C. 在手控時，閥位只能在現場決定。
- D. 在手控時，閥只能在現場操作。

答案： B.

科目：291001

知能類：K1.07 [3.4/3.4]

序號：B1203

When transferring a valve controller from the manual mode to the automatic mode, the automatic valve controller output signal should be _____ the manual valve controller output signal at the time of transfer.

- A. equal to
- B. greater than
- C. less than
- D. increasing with

ANSWER: A.

將一個閥的控制器由手動模式切換至自動控制模式時，閥控制器自動模式的輸出訊號應該____閥控制器手動模式的輸出訊號。

- A. 等於
- B. 大於
- C. 小於
- D. 跟著（手動控制器）增加

答案： A.

科目：291001

知能類：K1.07 [3.4/3.4]

序號：B1502 (P220)

When shifting from automatic to manual control of a typical valve controller, why should the controller manual and automatic output signals be matched?

- A. To prevent a sudden valve repositioning upon the transfer
- B. To satisfy the controller transfer interlocks
- C. To move the valve to the new position prior to the transfer
- D. To prevent the controller from locking up due to a large deviation

ANSWER: A.

當一個典型的閥的控制器由自動控制切換為手動時，為什麼控制器的自動和手動輸出訊號需要互相一致？

- A. 為了避免在切換時產生突發的閥位變動。
- B. 為了要滿足控制器的切換連鎖設定。
- C. 為了在切換前讓閥位移到新位置。
- D. 為了避免因訊號的偏差大而讓控制器被鎖定。

答案： A.

科目：291001

知能類：K1.07 [3.4/3.4]

序號：B2204 (P802)

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.

在核能電廠常用的兩種止回閥(Check Valve)的型式為：

- A. 球形(Globe)閥和閘(Gate)閥。
- B. 球(Ball)閥和閥塞(Plug)閥。
- C. 擺動(Swing)閥和提升(Lift)閥。
- D. 針(Needle)閥和角(Angle)閥。

答案： C.

科目：291001

知能類：K1.08 [3.4/3.5]

序號：B108 (P403)

When manually positioning a motor-operated valve, why must care be taken to avoid using excessive valve seating/backseating force?

- A. Limit switch settings may change.
- B. The valve may not operate on demand.
- C. The motor may not reengage.
- D. Torque switch settings may change.

ANSWER: B.

在手動調定馬達操作閥的閥位時，為何要特別注意操作閥的關緊與後座時不能用太大的力量？

- A. 極限開關(Limit Switch)設定可能會變動。
- B. 閥可能無法依指令運作。
- C. 馬達可能無法重新咬合(Reengage)。
- D. 扭力開關設定可能會變動。

答案：B.

科目：291001

知能類：K1.08 [3.4/3.5]

序號：B204 (P204)

When the manual declutch lever of a motor-operated valve is moved out of the normal position it _____ the motor and _____ the handwheel.

- A. engages; engages
- B. engages; disengages
- C. disengages; engages
- D. disengages; disengages

ANSWER: C.

當一馬達操作閥之手動離合桿被推離其正常位置時，會與馬達 _____ ，同時與手輪 _____ 。

- A. 咬合；咬合
- B. 咬合；脫離
- C. 脫離；咬合
- D. 脫離；脫離

答案： C.

科目：291001

知能類：K1.08 [3.4/3.5]

序號：B1605 (P1702)

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®馬達操作閥安裝在一緊急爐心冷卻系統(ECCS)中。ECCS的起動信號會使閥的馬達通電，並將該閥開啟。此閥通常是開啟的，但是會因應偵測試驗程序書之要求而由運轉員在現場以手動的方式關閉。若該閥的離合桿已被放開，同時該閥正經由操作閥的手輪而在關閉中。

如果此時接收到ECCS的起動信號，則此閥所受影響為何？

- A. 手輪會脫離，而閥會自動開啟。
- B. 手輪會脫離，而閥會維持在目前位置。
- C. 手輪會維持咬合，而閥會自動開啟。
- D. 手輪會維持咬合，而運轉員可以繼續關閉該閥。

答案： A.

科目： 291001

知能類： K1.08 [3.4/3.5]

序號： B2004 (P2003)

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.

在一緊急爐心冷卻(ECCS)系統中，對Limitorque®馬達操作閥(MOV) 正進行一項偵測試驗的程序。離合桿已被操作及釋放，而閥目前由某位運轉員以手動方式在現場開啟。此MOV之斷路器因偵測試驗程序之需要而閉合。在閥手輪操作過程中，若收到ECCS的起動信號時，通常會使閥的馬達通電，以關閉該閥。

起動信號會使此閥所受影響為何？

- A. 手輪會脫離，而閥會自動關閉。
- B. 手輪會脫離，而閥會維持目前位置。
- C. 手輪會維持咬合，而閥會自動關閉。
- D. 手輪會維持咬合，而運轉員可以繼續開啟該閥。

答案： A.

科目： 291001

知能類： K1.08 [3.4/3.5]

序號： B2603 (P2503)

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 motor to trip on overload during subsequent remote operation.
- B. The valve actuator clutch may be damaged and disable subsequent remote 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.

當手動關閉某馬達操作閥時，為何運轉員要避免過度鎖緊？

- A. 此閥可能會卡住，而導致馬達在後續的遙控操作中負荷過重而跳脫。
- B. 此閥之作動離合器可能會受損，而無法進行後續遙控操作。
- C. 此閥桿的極限開關(Limit Switch)可能會受損，而導致遠端閥位指示不正確。
- D. 此閥引動器的位置指示器可能會受損，而導致現場的閥位指示不正確。

答案： A.

科目： 291001

知能類： K1.08 [3.4/3.5]

序號： B2704 (P2703)

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.

一個典型的馬達作動閥(MOV)已經從主控制室被開啟，而此MOV的斷路器也被開啟。一個電廠運轉員收到指示，在現場關閉此MOV，以做偵測試驗。如果此運轉員在沒有先操作離合桿的情況下，試圖以順時鐘方向轉動此MOV的手輪，則會發生下列何事？

- A. 手輪不會轉動，而閥桿不會移動。
- B. 手輪會轉動，但閥桿不會移動。
- C. 手輪會轉動，同時閥桿會朝著關閉方向移動，因為當手輪轉動時，離合器會自動咬合。
- D. 手輪會轉動，而閥桿會朝著關閉方向移動，因為當斷路器開啟時，離合器會自動咬合。

答案： B.

科目： 291001

知能類： K1.08 [3.4/3.5]

序號： B4003 (P4002)

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 non-rising stem.)

- A. Ball
- B. Gate
- C. Plug
- D. Butterfly

ANSWER: B.

當馬達引動器處於無法運作狀態下，需要許多種形式的閥均具備現場手動關閉之能力。

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

- A. 球閥
- B. 閘閥
- C. 旋塞閥
- D. 蝶閥

答案： B.

科目： 291001

知能類： K1.09 [2.7/2.7]

序號： B3304 (P3304)

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.

一個普通的馬達操作閥在完整翻修過閥及引動器後恢復運轉。此閥以遙控方式開啟與關閉以驗證其可用性。量測閥每個方向的行程時間是十五秒，較正常時間長25%。

下列何者是導致此時間增加的原因？

- A. 其閥位極限開關(Limit Switch)被取下，而未被重新裝回。
- B. 閥之扭力極限開關(Torque Limit Switch)被錯誤調整，使得在正常設定點一半時便開啟。
- C. 此閥的迫緊被更換摩擦係數較低的材料。
- D. 閥桿的迫緊格蘭(Packing Gland)更換後，新的迫緊格蘭鎖得太緊。

答案： D.

科目： 291001

知能類： K1.10 [3.1/3.1]

序號： B205 (P1503)

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(Check Valve)通常用於

- A. 預防非操作系統管線與元件過壓。
- B. 預防非運轉中的元件或流徑(Flowpath)的逆流。
- C. 靠提供一固定背壓而預防產生泵的脫羈(runout)。
- D. 藉助維持非運轉系統滿水，預防泵的孔蝕作用。

答案： B.

科目： 291001

知能類： K1.10 [3.1/3.1]

序號： B302 (P303)

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. contains both a gate valve disk and a check valve disk.
- D. can be opened manually to allow flow in both directions.

ANSWER: B.

關斷止回閥(Stop Check Valve)為止回閥的一種型式而

- A. 無法由遠端關閉
- B. 能用以防止流體雙向流動
- C. 同時包含閘閥盤與止回閥(Check Valve)盤
- D. 能手動開啟而允許雙向流動

答案： B.

科目： 291001

知能類： K1.10 [3.1/3.1]

序號： B1102 (P2202)

Which one of the following is the type of valve used to control the direction of fluid flow through a system and prevent backflow?

- A. Butterfly valve
- B. Gate valve
- C. Globe valve
- D. Check valve

ANSWER: D.

下列何種閥是用來控制流體流經某系統之方向並防止回流？

- A. 蝶閥
- B. 閘閥
- C. 球形(globe)閥
- D. 止回閥(Check Valve)

答案： D.

科目： 291001

知能類： K1.10 [3.1/3.1]

序號： B2903 (P1003)

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.

一般的止回閥(Check Valve)設計用以

- A. 僅允許流體單向流動。
- B. 預防系統壓力過大。
- C. 隔離系統元件。
- D. 進行自動的泵溢氣(Vent)。

答案： A.

科目： 291001

知能類： K1.11 [3.2/3.2]

序號： B6 (P1902)

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的後座(backseat)的功能與用途？

- A. 移除來自於迫緊函(Stuffing Box)之壓力，通常用以隔離迫緊函以進行閥之重新迫緊
- B. 移除來自於迫緊函之壓力，通常用於當有隔離迫緊洩漏之需要時
- C. 作為主閥座(primary seat)洩漏時替代之用，通常用於為了保護人員所進行的系統隔離
- D. 作為主閥座(primary seat)洩漏時替代之用，通常用於當有防止主閥座嚴重洩漏之需要時。

答案： B.

科目： 291001

知能類： K1.11 [3.2/3.2]

序號： B206 (P201)

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.

一名運轉員試圖關閉一全開的直立手動閘閥，以便將冷卻水系統上的一已經冷卻的泵隔離，以便進行維修。然而，該運轉員無法朝關閉方向轉動手輪。

下列何者會導致此現象？

- A. 在閘盤下方產生液鎖(hydraulic lock)
- B. 在閘盤與迫緊迫緊格蘭(Packing Gland)間的閘蓋產生液鎖
- C. 閘盤的兩瓣膨脹而卡住閘座(Valve Seat)
- D. 閘桿與閘蓋(Bonnet)間的熱收縮不一致，導致閘盤卡住上密封

答案： D.

科目： 291001

知能類： K1.11 [3.2/3.2]

序號： B304 (P3)

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

- A. isolate system pressure from the stem packing to minimize leakage past the valve stem.
- B. fully remove the valve disk from the flow stream to minimize system headloss.
- C. ensure the valve is fully open by verifying that the valve disk is attached to the valve stem.
- D. reduce valve disk wear by completely removing it from the flow stream.

ANSWER: A.

將運轉中的系統的手動閥鎖緊後座(backseating)的目的是

- A. 將系統壓力隔離於閥桿迫緊之外，以將通過閥桿的洩漏減到最低。
- B. 將閥盤完全隔離於流動流體外，以將系統的水頭損失減到最低。
- C. 藉由驗證閥盤依附在閥桿上而確保閥處於全開。
- D. 藉由將閥盤隔離於流動流體外而降低閥盤磨損。

答案： A.

科目：291001

知能類：K1.11 [3.2/3.2]

序號：B1705 (P1405)

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

Which one of the following describes the type of valve shown?

- A. Rising-stem globe valve
- B. Nonrising-stem globe valve
- C. Rising-stem gate valve
- D. Nonrising-stem gate valve

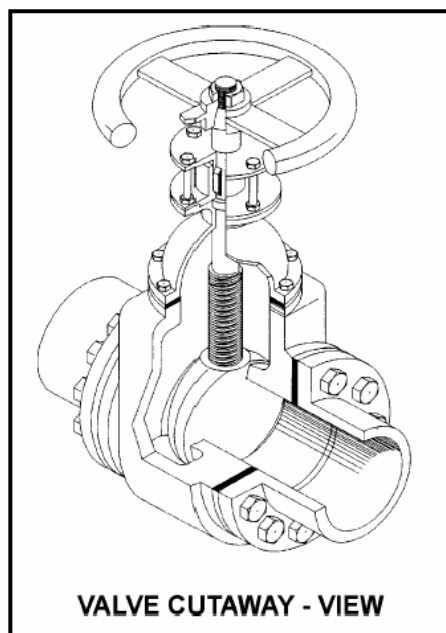
ANSWER: D.

參閱閥之圖示（見下圖）。

下列何者說明圖示中閥之種類？

- A. 升桿(Rising-stem)球形閥
- B. 非升(Nonrising-stem)桿球形閥
- C. 升桿閘閥
- D. 非升桿閘閥

答案：D.



科目： 291001

知能類： K1.11 [3.2/3.2]

序號： B2504 (P2504)

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，_____閥在高壓應用中一般較不易發生洩漏；而_____閥於全開時，一般呈現較低的系統壓降。

- A. 球；球
- B. 球；蝶
- C. 蝶；球
- D. 蝶；蝶

答案： A.

科目： 291001

知能類： K1.11 [3.2/3.2]

序號： B2904 (P2903)

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.

在相同的液體流程系統中，比較球閥與蝶閥，在全關以及高差壓情況下能夠允許較多洩漏的是_____閥，而當全開時會導致較高系統壓降的是_____閥。

- A. 球；蝶；
- B. 球；球
- C. 蝶；蝶
- D. 蝶；球

答案： C.

科目： 291001

知能類： K1.11 [3.2/3.2]

序號： B3804 (P3804)

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.

在相同的液體流程系統中，比較球閥與蝶閥，在全關以及高差壓情況下具有較高密封性的是_____閥，而當全開時會導致較高系統壓降的是_____閥。

- A. 球；蝶
- B. 球；球
- C. 蝶；蝶
- D. 蝶；球

答案： A.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B16

Which one of the following valves is most likely to be used with a throttling positioner?

- A. Stop valve
- B. Globe valve
- C. Gate valve
- D. Butterfly valve

ANSWER: B.

下列何種閥最可能與節流定位器(positioner)一起使用？

- A. 關斷閥
- B. 球形閥
- C. 閘閥
- D. 蝶閥

答案： B.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B110

Some valve positioning (drive) devices are capable of stopping the valve between a fully open and a fully closed (throttled) position. Which one of the following valves has the best throttling characteristics?

- A. Stop valve
- B. Globe valve
- C. Gate valve
- D. Butterfly valve

ANSWER: B.

某些閥定位設備具有停在全開與全關之間之節流功能。下列哪一種閥具有最佳的節流特性？

- A. 關斷閥
- B. 球閥
- C. 閘閥
- D. 蝶閥

答案： B.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B172

Globe valves are preferred over gate valves for throttling because...

- A. flow control is more linear for globe valves than for gate valves.
- B. head loss from a fully open globe valve is smaller than the head loss from a fully open gate valve.
- C. valve position indication for a midpositioned valve is more reliable for globe valves than for gate valves.
- D. valve motor operators are more adaptable to globe valves than to gate valves.

ANSWER: A.

球閥比閘閥適於節流，乃因為

- A. 球形閥的流量控制比閘閥較為線性
- B. 全開球形閥所生之水頭損失比全開閘閥之水頭損失為小
- C. 在中間位置的閥位指示上，球形閥較閘閥為可靠
- D. 球形閥之馬達操作器(operators)之適用力較閘閥為佳

答案： A.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B406

Gate valves are most often used to...

- A. protect system integrity by relieving excess pressure.
- B. redirect fluid flow in an operating system.
- C. isolate fluid flow in an operating system.
- D. control fluid flow rate in an operating system.

ANSWER: C.

閘閥最常用在

- A. 藉由釋放過量壓力而保護系統完整性。
- B. 在運轉中的系統中改變流體流動方向。
- C. 在運轉中的系統中隔離流體流動。
- D. 在運轉中的系統中控制流體流動速率。

答案： C.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B504 (P1104)

Gate valves should not be used to throttle fluid flow because...

- A. the tortuous flow path through a gate valve body makes flow control difficult.
- B. gate valves must be fully opened and backseated to prevent stem leakage.
- C. the turbulent flow created by a partially opened gate valve will cause erosion damage to the valve seat.
- D. the large size of the gate valve disk requires an oversized actuator to accurately position the disk.

ANSWER: C.

閘閥不應使用於流體的節流，因為

- A. 通過閘閥體的彎曲流動路徑，使得流量控制困難
- B. 閘閥必須要全關並加上上密封(backseated)方能防止閘桿洩漏
- C. 半開閘閥所產生的擾流流動會導致對於閘座(Valve Seat)的沖蝕(Erosion)損害
- D. 大尺寸閘閥盤需要大型的引動器方能正確定位閘盤

答案： C.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B805 (P2604)

A gate valve is generally a poor choice for throttling fluid 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 result unless the gate valve is fully open or fully closed.
- D. the head loss from a throttled gate valve will result in an unacceptable reduction in system flow rate.

ANSWER: A.

閘閥通常不適用於節流流體的流量，因為

- A. 半開閘閥所生之擾流會導致對閥的損害
- B. 通過閘閥體的彎曲流動路徑，使得流量控制困難
- C. 過量的閥桿洩漏會發生，除非閘閥處於全開或全關
- D. 因節流閘閥所生之水頭損失會導致系統流量不可接受的降低

答案： A.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B905 (P2404)

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.

閘閥與球形閥相比，閘閥

- A. 在節流上較為有效。
- B. 作為壓力調節閥較為有效。
- C. 當全開時產生較大的壓降。
- D. 在大的差壓下，需要較大的力量才能開啟。

答案： D.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B1205 (P2004)

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.

在對有輕微迫緊洩漏之閥，進行迫緊格蘭(Packing Gland)之後，運轉員試圖操作此閥，但發現閥被卡住。最可能的原因為何？

- A. 因為迫緊格蘭過緊而導致閥盤與閥桿分離
- B. 調整迫緊格蘭時運轉員將閥置於錯誤閥位
- C. 在迫緊格蘭時，閥在關閉方向的受到扭力過大
- D. 維修運轉員將迫緊格蘭調整過緊，導致閥桿卡住

答案： D.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B1305 (P1901)

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，相對於球形閥而言，下列何者是使用閘閥節流的不利之處？

- A. 通過節流的閘閥體的彎曲流動路徑，使得流量控制困難。
- B. 閘閥會發生閥桿洩漏，除非閘閥處於全開並施以後座(backseated)。
- C. 由節流閘閥所產生的擾流會導致對於閥座(Valve Seat)沖蝕(Erosion)損害。
- D. 全開之閘閥所生之系統水頭損失較全開之球形閥為大。

答案： C.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B1604 (P2804)

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.

在同樣的應用中，比較均為全開之一般的閘閥與球形閥，閘閥有_____壓力降，同時通常用於_____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： 291001

知能類： K1.12 [2.6/2.8]

序號： B1805 (P1501)

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.

比較應用於相同運轉中的冷卻水系統的三吋閘閥與三吋球閥，如果兩閥均處於全開，則球形閥產生_____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： 291001

知能類： K1.12 [2.6/2.8]

序號： B1904 (P1302)

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. larger; smaller
- C. smaller; smaller
- D. larger; larger

ANSWER: A.

比較應用於相同之運轉中的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，則閘閥產生_____水頭損失，以及_____的流量。

- A. 較小；較大
- B. 較大；較小
- C. 較小；較小
- D. 較大；較大

答案： A.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B2005 (P602)

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.

比較在同一應用中的球形閥與閘閥，當全開時閘閥具有_____壓降，同時對於節流是_____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： 291001

知能類： K1.12 [2.6/2.8]

序號： B2305 (P2304)

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，球閥

- A. 對於節流效果較差。
- B. 作為壓力調整閥效果較差。
- C. 當全開時產生較小的壓降。
- D. 在大的差壓下，只要較小的力量便能開啟。

答案： D.

科目： 291001

知能類： K1.12 [2.6/2.8]

序號： B2605 (P2204)

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.

閘閥通常不用在調節水流，因為

- A. 通過閘時流動方向快速變化會導致無法回復的高水頭損失
- B. 閘閥會發生閘桿洩漏，除非處於全開或全關
- C. 半開的閘閥所生的擾流會導致閘座(Valve Seat)以及閘盤的過度磨損
- D. 通過閘閥的流量與通過閘兩端的差壓不成正比

答案： C.

科目/題號：291001/1 (2016新增)

知能類：K1.01 [3.4/3.5] K1.02 [3.4/3.6]

序號：B4201 (P4201)

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 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; and 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.

一座滿水的儲水槽用一只正排量泵(PDP)以10 gpm穩定流量率注水進入該槽執行100 psig的靜水壓測試。該槽設置排放至大氣的一只安全閥及一只釋壓閥作為過壓保護，各閥的開啟壓力設定值為105 psig，最大額定排放流量率為6 gpm。測試中，當儲水槽壓力達到100 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，儲水槽壓力會_____105 psig；同時比較大的排放流量率是從_____閥排出。

- A.停留在；安全
- B.超過；安全
- C.停留在；釋壓
- D.超過；釋壓

答案： B

科目/題號：291001/2 (2016新增)

知能類：K1.01 [3.4/3.5]

序號：B4401 (P4401)

Given the following pressure specifications for a safety relief valve (SRV):

Setpoint pressure (SRV will start to open) = 1,200 psia

Maximum pressure (SRV will be fully open) = 1,242 psia

Reseat pressure (SRV will be fully closed) = 1,152 psia

Which one of the following is the percent accumulation for the SRV?

A. 2.5 percent

B. 3.0 percent

C. 3.5 percent

D. 4.0 percent

ANSWER: C.

假設某安全釋壓閥的壓力條件如下：

壓力設定值(SRV 開始開啟) = 1,200psia

最大壓力(SRV 全開) = 1,242psia

回座壓力(SRV 全關) = 1,152 psia

下列何者為該安全釋壓閥的蓄壓(accumulation)百分比：

A. 2.5%

B. 3.0%

C. 3.5%

D. 4.0%

答案： C

科目/題號：291001/3 (2016新增)

知能類：K1.01 [3.4/3.5] K1.02 [3.4/3.6]

序號：B4701 (P4701)

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_____的流量率排放至大氣。

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：291001/4 (2016新增)
知能類：K1.01 [3.4/3.5] K1.02 [3.4/3.6]
序號：B5201 (P5201)

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?

- | <u>Relief Valve Status</u> | <u>Safety Valve Status</u> |
|--|---|
| 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 |

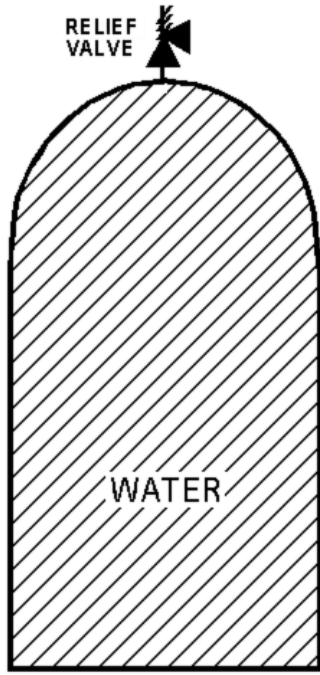
ANSWER: B.

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。

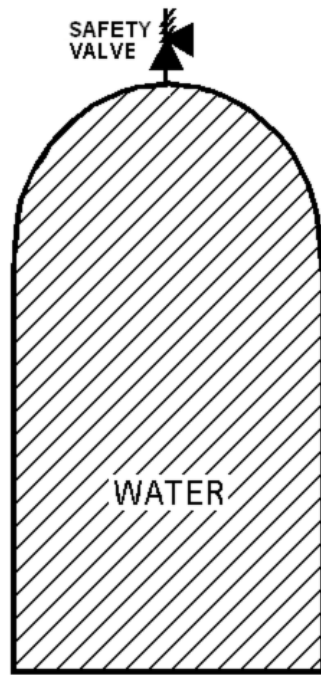
在這兩只正排量泵持續運轉的情況下，安裝於儲水槽上的釋壓閥與安全閥之狀態為何？

- | <u>釋壓閥之狀態</u> | <u>安全閥之狀態</u> |
|----------------|-----------------------|
| 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



TANK A



TANK B

科目/題號：291001/5 (2016新增)

知能類：K1.01 [3.4/3.5] K1.02 [3.4/3.6]

序號：B6101 (P6101)

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)百分比為5%
- 安全閥的開啟壓力設定值為240 psig，沖放(blowdown)百分比為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_____的流量率排放至大氣。

- 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：291001/6 (2016新增)

知能類：K1.01 [3.4/3.5] K1.02 [3.4/3.6]

序號：B6201 (P6201)

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. The relief valves are installed to prevent chattering of the safety valves during normal power operation.
- 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：291001/7 (2016新增)

知能類：K1.01 [3.4/3.5] K1.02 [3.4/3.6]

序號：B7671 (P7671)

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 220 psig with an accumulation of 5 percent.
- The safety valve opening setpoint is 260 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.

After a few minutes with the PDP still running, the relief valve will be discharging a flow rate of approximately _____; and the safety valve will be _____.

- A. 2 gpm; partially open
- B. 6 gpm; partially open
- C. 2 gpm; cycling between fully open and fully closed
- D. 6 gpm; cycling between fully open and fully closed

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220 psig，蓄壓(accumulation)百分比為5%
- 安全閥的開啟壓力設定值為260 psig，沖放(blowdown)百分比為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。

該PDP繼續運轉幾分鐘後，釋壓閥會排放約_____的流量率至大氣；同時安全閥會_____。

- A. 2 gpm；部份開啟
- B. 6 gpm；部份開啟
- C. 2 gpm；在全開與全關間反覆動作(Cycling)
- D. 6 gpm；在全開與全關間反覆動作(Cycling)

答案： D

科目/題號：291001/8 (2016新增)

知能類：K1.02 [3.4/3.6]

序號：B6402 (P6401)

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?

	<u>Relief Valve A</u>	<u>Relief Valve B</u>
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率為何？

	<u>A 釋壓閥</u>	<u>B 釋壓閥</u>
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：291001/9 (2016新增)

知能類：K1.02 [3.4/3.6]

序號：B6701 (P6701)

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%
- 各釋壓閥之流量具線性特質，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：291001/10 (2016新增)

知能類：K1.02 [3.4/3.6]

序號：B7611 (P7611)

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。當 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：291001/11 (2016新增)

知能類：K1.03 [3.4/3.6]

序號：B2205 (P405)

Consider a typical gate valve and a typical globe valve in the same water system application. The 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.

考量一只典型的閘閥與一只典型的球型閥同時安裝在同一個水系統內。由於球型閥全開時通常會產生_____的壓降，一般比較_____用在系統流量的節流。

- A.比較小；少
- B.比較大；常
- C.比較小；常
- D.比較大；少

答案： B

科目/題號：291001/12 (2016新增)

知能類：K1.03 [2.7/2.8]

序號：B4103 (P4101)

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.

下列何者尺寸相似的閥安裝在運轉中的水系統，當該閥全開時產生最小的摩擦水頭損失？

- A.球閥
- B.球型閥
- C.蝶閥
- D.擺動止回閥

答案： A

科目/題號：291001/13 (2016新增)

知能類：K1.03 [2.7/2.8]

序號：B4802 (P4801)

Refer to the centrifugal pump operating curve with two system head loss curves (see figure below). The curves apply to an open cooling water system using one single-speed centrifugal pump discharging through a typical flow control valve.

One of the system curves shows system head loss with the flow control valve 25 percent open. The other system curve shows system head loss with the flow control valve 100 percent open. The pump is initially operating with the valve 25 percent open, resulting in a pump flow rate of 800 gpm.

If the flow control valve is subsequently fully opened, pump flow rate through the valve will be approximately...

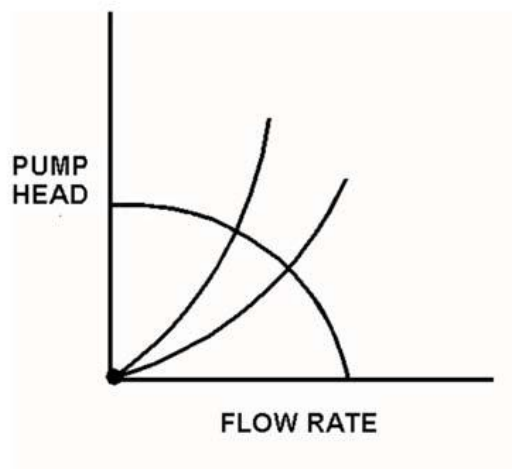
- A. 400 gpm.
- B. 1,200 gpm.
- C. 1,600 gpm.
- D. 3,200 gpm.

ANSWER: B.

參考某離心泵的運轉曲線與二條系統水頭損失曲線圖(見下圖)。此曲線適用於使用單一轉速離心泵出口流經一只流量控制閥的開放式冷卻水系統。其中一條曲線是流量控制閥開度為 25% 時的系統水頭損失曲線，另一條曲線則是流量控制閥開度為 100% 時的系統水頭損失曲線。此泵初始運轉其流量控制閥開度為 25%，泵出水流量率為 800 gpm。倘若流量控制閥最終全開，則泵出口流量率大約是多少？

- A. 400 gpm
- B. 1,200 gpm
- C. 1,600 gpm
- D. 3,200 gpm

答案： B



科目/題號：291001/14 (2016新增)

知能類：K1.03 [2.7/2.8]

序號：B4901 (P4901)

Consider a 6-inch globe valve and a 6-inch gate valve in the same water system application. Typically, the valve that requires the most linear disk travel from fully closed to fully open is the _____ valve; and the valve that produces the smallest pressure drop when fully open is the _____ valve.

- A. gate; gate
- B. gate; globe
- C. globe; gate
- D. globe; globe

ANSWER: A.

考量一只6-inch球型閥和一只6-inch閘閥安裝在一水系統內。一般而言，從全關到全開的過程中，閥盤移動之行程最大的是_____；當閥全開時造成最小壓降的閥是_____。

- A.閘閥；閘閥
- B.閘閥；球型閥
- C.球型閥；閘閥
- D.球型閥；球型閥

答案： A

科目/題號：291001/15 (2016新增)

知能類：K1.03 [2.7/2.8]

序號：B6001 (P6001)

Subcooled water was flowing through a throttled valve with the following initial parameters:

Inlet pressure = 60 psia

Outlet pressure = 50 psia

Flow rate = 800 gpm

The valve was opened fully and the following parameters currently exist:

Inlet pressure = 60 psia

Outlet pressure = 55 psia

What is the approximate flow rate through the fully open valve?

A. 400 gpm

B. 566 gpm

C. 635 gpm

D. Cannot be determined without additional information.

ANSWER: D.

次冷水流經一只節流閥，其初始參數如下：

進口壓力 = 60 psia

出口壓力 = 50 psia

流量率 = 800 gpm

若將該節流閥全開，則參數變成：

進口壓力 = 60 psia

出口壓力 = 55 psia

請問流經此全開節流閥的流量率大約為何？

A. 400 gpm

B. 566 gpm

C. 635 gpm

D. 數據不足無法估算

答案： D

科目/題號：291001/16 (2016新增)

知能類：K1.03 [2.7/2.8]

序號：B6601 (P6601)

Subcooled water is flowing through a throttle valve in an open system. The initial steady-state conditions for the throttle valve are as follows:

Inlet pressure = 60 psia

Outlet pressure = 44 psia

Flow rate = 800 gpm

Four hours later, the current steady-state conditions for the throttle valve are as follows:

Inlet pressure = 63 psia

Outlet pressure = 54 psia

Flow rate = 600 gpm

Which one of the following could be responsible for the difference between the initial and current conditions for the throttle valve?

A. The throttle valve was opened more.

B. The throttle valve was closed more.

C. Another valve, located upstream of the throttle valve, was partially closed.

D. Another valve, located downstream of the throttle valve, was partially closed.

ANSWER: D.

在一開放式系統中，次冷狀態的水流經一只節流閥，該節流閥的初始穩定狀態參數如下：

進口壓力 = 60 psia

出口壓力 = 44 psia

流量率 = 800 gpm

4 小時後，該節流閥當時的穩定狀態參數變成：

進口壓力 = 63 psia

出口壓力 = 54 psia

流量率 = 600 gpm

下列何者是造成節流閥的初始穩定狀態參數與 4 小時後的穩定狀態參數有所落差的原因？

A. 該節流閥的開度變大

B. 該節流閥的開度變小

C. 位於該節流閥上游的另一只閥門的開度變小

D. 位於該節流閥下游的另一只閥門的開度變小

答案： D

科目/題號：291001/17 (2016新增)

知能類：K1.03 [2.7/2.8]

序號：B7302 (P7302)

Subcooled water is flowing through a throttled valve in an open system. The initial steady-state conditions for the throttled valve are as follows:

Inlet pressure = 60 psia

Outlet pressure = 44 psia

Flow rate = 800 gpm

After four hours, the current steady-state conditions for the throttled valve are as follows:

Inlet pressure = 62 psia

Outlet pressure = 40 psia

Flow rate = 600 gpm

Which one of the following could be responsible for the difference between the initial and current steady-state conditions for the throttled valve?

- A. The throttled valve was opened more.
- B. The throttled valve was closed more.
- C. Another valve, located upstream of the throttled valve, was partially closed.
- D. Another valve, located downstream of the throttled valve, was partially closed.

ANSWER: B.

在一開放式系統中，次冷狀態的水流經一只節流閥，該節流閥的初始穩定狀態參數如下：

進口壓力 = 60 psia

出口壓力 = 44 psia

流量率 = 800 gpm

4 小時後，該節流閥當時的穩定狀態參數變成：

進口壓力 = 62 psia

出口壓力 = 40 psia

流量率 = 600 gpm

下列何者是造成節流閥的初始穩定狀態參數與 4 小時後的穩定狀態參數有所落差的原因？

- A. 該節流閥的開度變大
- B. 該節流閥的開度變小
- C. 位於該節流閥上游的另一只閥門的開度變小
- D. 位於該節流閥下游的另一只閥門的開度變小

答案： B

科目/題號：291001/18 (2016 新增)

知能類：K1.03 [2.7/2.8]

序號：B7601 (P7601)

Refer to the drawing of an operating cooling water system (see figure below) in which valves A and B are identical. Valve A is one-half open and valve B is fully open. If valve A is opened fully, the differential pressure (D/P) across valve B will...

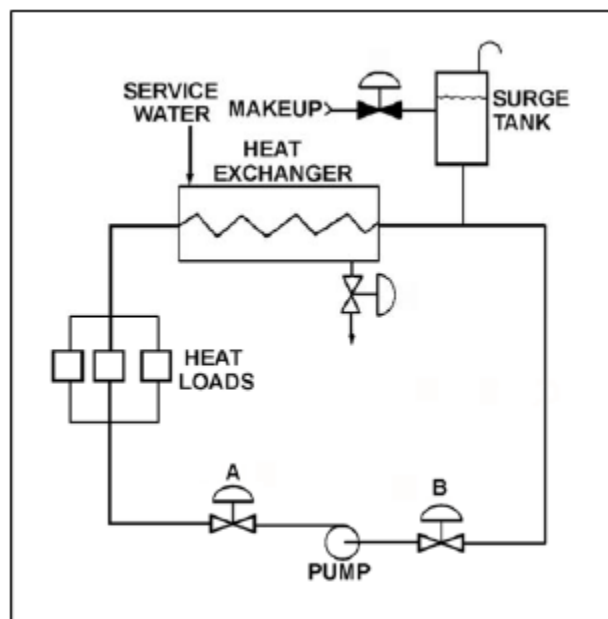
- A. increase by the same amount as the absolute change in D/P across valve A.
- B. increase by an amount less than the absolute change in D/P across valve A.
- C. decrease by the same amount as the absolute change in D/P across valve A.
- D. decrease by an amount less than the absolute change in D/P across valve A.

ANSWER: B.

參考下圖運轉中的冷卻水系統，其中 A 閥與 B 閥為完全相同的閥門。A 閥開度為半開，而 B 閥為全開。倘若將 A 閥全開，則 B 閥進出口間的壓差(D/P)會：

- A. 增加，增加的量與 A 閥進出口間壓差變化的絕對值相同。
- B. 增加，增加的量比 A 閥進出口間壓差變化的絕對值還小。
- C. 減少，減少的量與 A 閥進出口間壓差變化的絕對值相同。
- D. 減少，減少的量比 A 閥進出口間壓差變化的絕對值還小。

答案： B



科目/題號：291001/19 (2016 新增)

知能類：K1.03 [2.7/2.8]

序號：B7641 (P7641)

Consider a 6-inch globe valve and a 6-inch gate valve in the same water system application. The valve that typically requires the least linear travel of the disk from fully closed to fully open is the _____ valve; and the valve that produces the greatest pressure drop when fully open is the _____ valve.

- A. gate; gate
- B. gate; globe
- C. globe; gate
- D. globe; globe

ANSWER: D.

考量一只 6-inch 球型閥和一只 6-inch 閘閥安裝在一水系統內。一般而言，從全關到全開的過程中，閥盤移動行程最小的是_____；當閥全開時造成最大壓降的閥是_____。

- A. 閘閥；閘閥
- B. 閘閥；球型閥
- C. 球型閥；閘閥
- D. 球型閥；球型閥

答案： D

科目/題號：291001/20 (2016 新增)

知能類：K1.03 [2.7/2.8]

序號：B7661 (P7661)

Subcooled water is flowing through a throttle valve in an open system. The initial steady-state conditions for the throttle valve are as follows:

Inlet pressure = 60 psia

Outlet pressure = 44 psia

Flow rate = 800 gpm

Four hours later, the current steady-state conditions for the throttle valve are as follows:

Inlet pressure = 51 psia

Outlet pressure = 42 psia

Flow rate = 600 gpm

Which one of the following could be responsible for the difference between the initial and current conditions for the throttle valve?

A. The throttle valve was opened more.

B. The throttle valve was closed more.

C. Another valve, located upstream of the throttle valve, was partially closed.

D. Another valve, located downstream of the throttle valve, was partially closed.

ANSWER: C.

在一開放式系統中，次冷狀態的水流經一只節流閥，該節流閥的初始穩定狀態參數如下：

進口壓力 = 60 psia

出口壓力 = 44 psia

流量率 = 800 gpm

4 小時後，該節流閥當時的穩定狀態參數變成：

進口壓力 = 51 psia

出口壓力 = 42 psia

流量率 = 600 gpm

下列何者是造成節流閥的初始穩定狀態參數與 4 小時後的穩定狀態參數有所落差的原因？

A. 該節流閥的開度變大

B. 該節流閥的開度變小

C. 位於該節流閥上游的另一只閥門的開度變小

D. 位於該節流閥下游的另一只閥門的開度變小

答案： C

科目/題號：291001/21 (2016 新增)

知能類：K1.04 [2.7/2.8]

序號：B5002 (P5002)

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 |

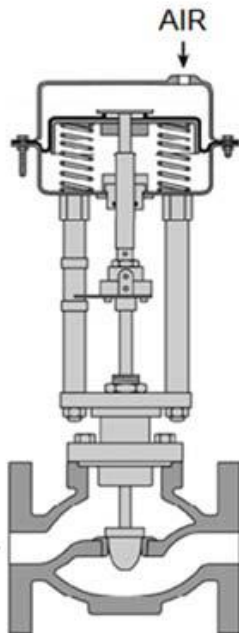
ANSWER: C.

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的類型，以及驅動器失去施壓空氣後該閥的失效位置：

- | | <u>閥的類型</u> | <u>閥的失效位置</u> |
|----|-------------|---------------|
| 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：291001/22 (2016 新增)

知能類：K1.04 [2.7/2.8]

序號：B5301 (P5302)

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.

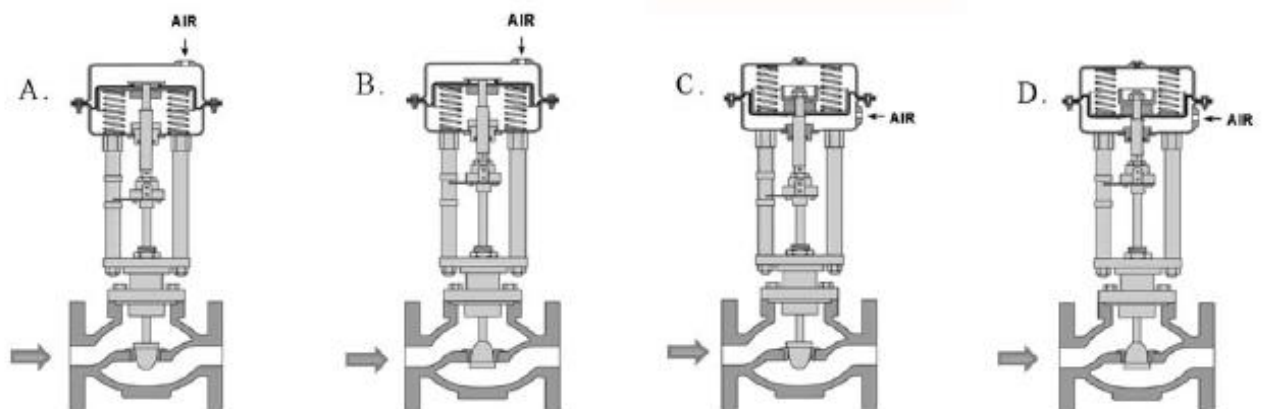
ANSWER: C.

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
- 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：291001/23 (2016 新增)

知能類：K1.04 [2.7/2.8]

序號：B5502 (P5502)

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？

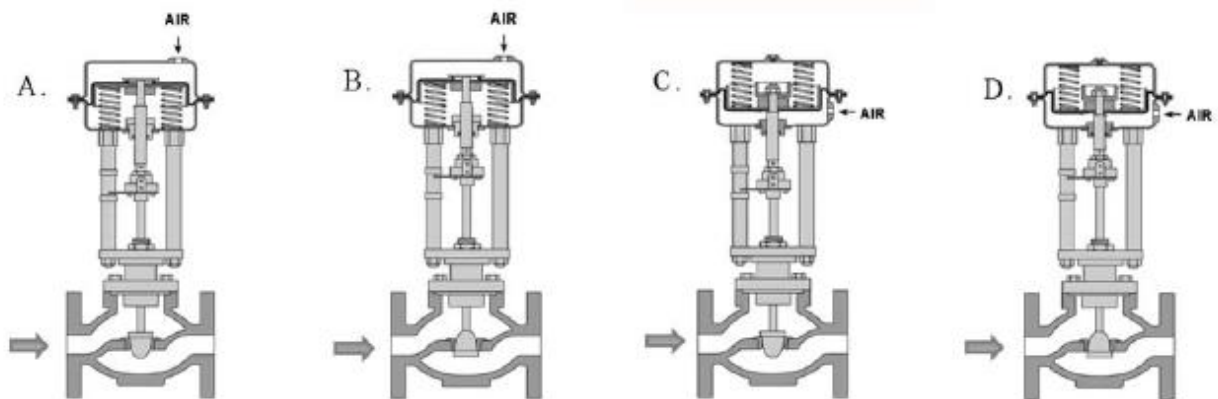
A. A 及 B

B. B 及 C

C. C 及 D

D. D 及 A

答案： B



科目/題號：291001/24 (2016 新增)

知能類：K1.04 [2.7/2.8]

序號：B5902 (P5901)

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?

- | | <u>Valve</u> | <u>Fail</u> |
|----|--------------|-----------------|
| | <u>Type</u> | <u>Position</u> |
| A. | Ball | Open |
| B. | Ball | Closed |
| C. | Globe | Open |
| D. | Globe | Closed |

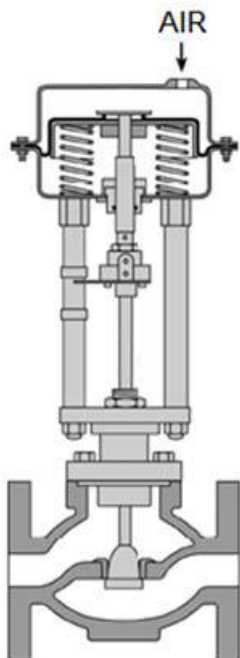
ANSWER: D.

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？

- | | <u>閥的類型</u> | <u>閥的失效位置</u> |
|----|-------------|---------------|
| 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：291001/25 (2016 新增)

知能類：K1.05 [2.9/2.8]

序號：B7621 (P7621)

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.

在現場檢視一只 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：291001/26 (2016新增)

知能類：K1.05 [2.9/2.8]

序號：B7651 (P7651)

During a local inspection of a manually operated three-inch gate valve, the valve stem is observed to be flush with the top of the handwheel. Two inches of unthreaded valve stem is visible between the handwheel and the packing gland. The handwheel is mounted to the valve body and valve stem such that the handwheel can be rotated in either direction, but cannot change its axial position.

Which one of the following describes the position of the 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 has a rising stem.
- D. The valve may be in any position because it has a non-rising stem.

ANSWER: D.

在現場檢視一只 3-inch 手動操作的閘閥時，發現閥桿與手輪的上部表面平齊。在手輪與迫緊格蘭之間可見 2-inch 長無螺紋的閥桿。手輪是安裝在閥體與閥桿上，所以手輪可以雙向轉動，但是不能改變其軸向位置。

下列何者描述為該閘閥的閥位？

- A. 該閥全開或幾乎全開
- B. 該閥全關或幾乎全關
- C. 由於該閥有上升閥桿，因此無法確認閥位
- D. 由於該閥無上升閥桿，因此無法確認閥位

答案： D

科目/題號：291001/27 (2016 新增)

知能類：K1.09 [2.7/2.7]

序號：B7631 (P7631)

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.

一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

科目/題號：291001/28 (2016 新增)

知能類：K1.11 [3.2/3.2]

序號：B7003 (P7002)

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：291001/29 (2016 新增)

知能類：K1.12 [2.6/2.8]

序號：B1505 (P1302)

Consider a 3-inch gate valve and a 3-inch globe valve in separate but identical operating water systems. If both valves are fully open, the gate valve will produce the _____ head loss and the _____ flow rate.

- A. smaller; larger
- B. larger; smaller
- C. smaller; smaller
- D. larger; larger

ANSWER: A.

考量一只 3-inch 閘閥與一只 3-inch 球型閥分別安裝在兩個相同且運轉中的水系統。倘若此二閥均全開，則閘閥會產生_____的水頭損失，以及_____的流量率。

- A. 較小；較大
- B. 較大；較小
- C. 較小；較小
- D. 較大；較大

答案： A