

科目： 293003

知能類： K1.07 [2.7/2.8]

序號： B474

Water is initially saturated with a quality of 50%, when a small amount of heat is added.

Assuming the water pressure remains constant and the water remains saturated, water quality will \_\_\_\_\_ and water temperature will \_\_\_\_\_.

- A. increase; increase
- B. increase; remain the same
- C. remain the same; increase
- D. remain the same; remain the same

ANSWER: B

水的起始飽和蒸汽乾度為50%，當加入微量的熱時，假設水的壓力維持一定，水也維持飽和，水的蒸汽乾度將會\_\_\_\_，水溫會\_\_\_\_。

- A. 提高；增加
- B. 提升；維持不變
- C. 維持不變；升高
- D. 維持不變；維持不變

答案： B.

科目： 293003

知能類： K1.07 [2.7/2.8]

序號： B1074 (P674)

A liquid is saturated with 0% quality. Assuming pressure remains constant, the addition of a small amount of heat will...

- A. raise the liquid temperature above the boiling point.
- B. result in a subcooled liquid.
- C. result in vaporization of the liquid.
- D. result in a superheated vapor.

ANSWER: C

一飽和液體其蒸汽乾度為0%。假設壓力維持不變，加入少量的熱，將會\_\_\_\_\_。

- A. 提高液體溫度，超過沸點
- B. 產生過冷的液體
- C. 使液體蒸發
- D. 產生過熱的蒸汽

答案： C.

科目： 293003

知能類： K1.07 [2.7/2.8]

序號： B1874 (P1374)

Consider a water/steam mixture with a quality of 95%. If pressure remains constant and heat is added to the mixture, the temperature of the mixture will \_\_\_\_\_ and the quality of the mixture will \_\_\_\_\_. (Assume the mixture remains saturated.)

- A. increase; remain the same
- B. increase; increase
- C. remain the same; remain the same
- D. remain the same; increase

ANSWER: B

一水/蒸汽混合物其蒸汽乾度為95%，如果壓力維持不變，在混合物內加入熱，混合物的溫度將會\_\_\_\_，混合物的蒸汽乾度將會\_\_\_\_。（假設混合物維持飽和狀態。）

- A. 升高；維持不變
- B. 升高；增加
- C. 維持不變；維持不變
- D. 維持不變；增加

答案： D.

科目： 293003

知能類： K1.07 [2.7/2.8]

序號： B1974 (P1474)

If 1 lbm of liquid water is in a saturated condition at a constant pressure, the addition of 1 Btu will...

- A. raise the temperature of the water by 1°F.
- B. vaporize a portion of the water.
- C. increase the density of the water.
- D. result in 1°F of superheat.

ANSWER: B

在定壓、飽和狀態下，一磅質量(lbm)的液態水中，加入1 Btu將會\_\_\_\_\_。

- A. 提高水溫1°F
- B. 蒸發部分的水
- C. 增加水的密度
- D. 造成1°F的過熱

答案： B.

科目： 293003

知能類： K1.07 [2.7/2.8]

序號： B3374 (P2874)

An open container holds one pound-mass of liquid water at saturated conditions and atmospheric pressure. The addition of 4 Btus will...

- A. result in 4°F of superheat.
- B. vaporize a portion of the water.
- C. increase the density of the water.
- D. raise the temperature of the water by 4°F.

ANSWER: B

在飽和狀態和大氣壓力下，一開放容器裝有一磅質量的液態水。若加入4Btu將會\_\_\_\_\_。

- A. 造成4°F的過熱
- B. 蒸發部分的水
- C. 提高水的密度
- D. 提高水溫4°F

答案： B.

科目： 293003

知能類： K1.07 [2.7/2.8]

序號： B3474

The temperature of a quantity of water is 212°F.

Which one of the following additional water parameters, when paired with the temperature, provides insufficient data to determine whether the water is a saturated liquid rather than a saturated liquid-vapor mixture?

- A. Enthalpy
- B. Entropy
- C. Pressure
- D. Specific volume

ANSWER: C

假設水的溫度為212°F。下列哪一項水的參數，配上溫度以後，產生的資料不足以決定水是否為飽和液體還是飽和液體—蒸汽混合物？

- A. 焓(Enthalpy)
- B. 熵(Entropy)
- C. 壓力(Pressure)
- D. 比容(Specific volume)

答案： C.

科目： 293003

知能類： K1.07 [2.7/2.8]

序號： B3574 (P1974)

A steam-water mixture is initially saturated with a quality of 50%, when a small amount of heat is added. Assuming pressure remains constant and the mixture remains saturated, mixture steam quality will \_\_\_\_\_ and mixture temperature will \_\_\_\_\_.

- A. increase; increase
- B. increase; remain the same
- C. remain the same; increase
- D. remain the same; remain the same

ANSWER: B

當加入微量的熱時，蒸汽—水混合物的起始飽和蒸汽乾度為50%，假設水的壓力維持一定，混合物也維持飽和，混合物的蒸汽乾度將會\_\_\_\_，且其溫度會\_\_\_\_。

- A. 增加；升高
- B. 增加；維持不變
- C. 維持不變；升高
- D. 維持不變；維持不變

答案： B.

科目： 293003

知能類： K1.09 [2.5/2.6]

序號： B146

Given a constant pressure, any further addition of heat will result in an increase in the temperature of...

- A. saturated vapors and subcooled liquids.
- B. wet vapors and saturated vapors.
- C. saturated liquids and saturated vapors.
- D. subcooled liquids and wet vapors.

ANSWER: A

壓力固定時，加入額外的熱，將會使\_\_\_\_\_的溫度增加。

- A. 飽和蒸汽和過冷液體
- B. 濕蒸汽和飽和蒸汽
- C. 飽和液體和飽和蒸汽
- D. 過冷液體和濕蒸汽

答案： A.



科目： 293003

知能類： K1.09 [2.5/2.6]

序號： B875 (P874)

Consider a water/steam mixture with a current quality of 99%. If pressure remains constant and heat is removed from the mixture, the temperature of the mixture will \_\_\_\_\_ and the quality of the mixture will \_\_\_\_\_. (Assume the mixture remains saturated.)

- A. decrease; increase
- B. decrease; decrease
- C. remain the same; increase
- D. remain the same; decrease

ANSWER: D

水/蒸汽混合物的蒸汽乾度為99%，如果壓力維持不變，移除混合物內的熱量時，混合物的溫度將會\_\_\_\_，且其乾度將會\_\_\_\_。（假設混合物維持飽和狀態。）

- A. 降低；增加
- B. 降低；降低
- C. 維持不變；增加
- D. 維持不變；降低

答案： D.

科目： 293003

知能類： K1.09 [2.5/2.6]

序號： B1274

A saturated vapor exists at 800 psia. If 500 Btu/lbm is removed from this saturated vapor at a constant pressure the...

- A. temperature will decrease.
- B. density will decrease.
- C. specific volume will decrease.
- D. enthalpy will increase.

ANSWER: C

存在於800 psia的飽和蒸汽，如果在定壓下從飽和蒸汽中移除500 Btu/lbm，則\_\_\_\_\_。

- A. 溫度將會降低
- B. 密度將會降低
- C. 比容會降低
- D. 焓會增加

答案： C.

科目： 293003

知能類： K1.09 [2.5/2.6]

序號： B1474

Which one of the following will decrease if heat is added to a saturated vapor at a constant pressure?

- A. Density
- B. Temperature
- C. Entropy
- D. Enthalpy

ANSWER: A

如果壓力不變，在飽和蒸汽中加入熱，下列何者會降低？

- A. 密度
- B. 溫度
- C. 熵
- D. 焓

答案： A.

科目： 293003

知能類： K1.09 [2.5/2.6]

序號： B1574 (P1574)

Consider a steam-water mixture with a current quality of 79%. If pressure remains constant and heat is added to the mixture, the temperature of the mixture will \_\_\_\_\_ and the quality of the mixture will \_\_\_\_\_. (Assume the mixture remains saturated.)

- A. remain the same; increase
- B. remain the same; remain the same
- C. increase; increase
- D. increase; remain the same

ANSWER: A

現有蒸汽乾度79%的蒸汽—水混合物，如果壓力保持不變，在混合物中加熱，混合物的溫度將會\_\_\_\_，其乾度將會\_\_\_\_。（假設混合物維持飽和狀態。）

- A. 維持不變；增加
- B. 維持不變；維持不變
- C. 升高；增加
- D. 升高；維持不變

答案： A.

科目： 293003

知能類： K1.09 [2.5/2.6]

序號： B2074 (P2074)

Consider a saturated water/steam mixture at 500°F with a quality of 90%. If the pressure of the mixture is decreased with no heat gain or loss, the temperature of the mixture will \_\_\_\_\_ and the quality of the mixture will \_\_\_\_\_. (Assume the mixture remains saturated.)

- A. decrease; decrease
- B. decrease; increase
- C. remain the same; decrease
- D. remain the same; increase

ANSWER: B

蒸汽乾度90%、500°F的飽和水—蒸汽混合物，如果壓力降低，混合物並無增加或損失熱量，混合物的溫度將會\_\_\_\_，其乾度將會\_\_\_\_。（假設混合物維持飽和狀態。）

- A. 降低；降低
- B. 降低；增加
- C. 維持不變；降低
- D. 維持不變；增加

答案： B.

科目： 293003

知能類： K1.09 [2.5/2.6]

序號： B2174

Consider a saturated vapor at 470°F. If the pressure of the vapor remains constant and heat is added, vapor temperature will \_\_\_\_\_ and vapor quality will \_\_\_\_\_ .

- A. remain the same; remain the same
- B. remain the same; increase
- C. increase; remain the same
- D. increase; increase

ANSWER: C

現有470°F的飽和蒸汽，如果蒸汽壓力維持不變，在混合物中加熱，蒸汽溫度將會\_\_\_\_，其乾度將會\_\_\_\_。

- A. 維持不變；維持不變
- B. 維持不變；增加
- C. 升高；維持不變
- D. 升高；增加

答案： C.

科目： 293003

知能類： K1.09 [2.5/2.6]

序號： B2975 (P2974)

Consider a shutdown reactor vessel containing a saturated water/vapor mixture at 500°F. The mixture is currently stable with no net heat gain or loss occurring. Reactor vessel water level is 100 inches above the top of the fuel bundles.

If a leak near the bottom of the vessel results in a loss of 10% of the liquid volume from the vessel, the temperature of the mixture will \_\_\_\_\_, and the overall quality of the mixture will \_\_\_\_\_. (Assume the mixture remains saturated.)

- A. decrease; increase
- B. decrease; decrease
- C. remain the same; increase
- D. remain the same; decrease

ANSWER: A

停機的反應爐內含有500°F的飽和水/蒸汽混合物，混合物目前狀況穩定，沒有淨熱量獲得或損失發生。反應爐內的水位在燃料頂部上方100 英吋。

如果在靠近反應爐的底部有裂縫，導致10%容積的液體從反應爐流失，混合物的溫度將會\_\_\_\_，其整體蒸汽乾度將會\_\_\_\_。（假設混合物維持飽和狀態。）

- A. 降低；增加
- B. 降低；降低
- C. 維持不變；增加
- D. 維持不變；降低

答案： A.

科目： 293003

知能類： K1.12 [2.5/2.6]

序號： B141

What is the approximate quality of wet steam leaving the reactor at 530 psig with an enthalpy of 928.9 Btu/lbm?

A. 25%

B. 37%

C. 63%

D. 75%

ANSWER: C

一壓力為530 psig，焓為928.9 Btu/lbm的濕蒸汽正流出反應爐，請問該蒸汽之乾度大約為多少？

A. 25%

B. 37%

C. 63%

D. 75%

答案： C.



科目： 293003

知能類： K1.12 [2.5/2.6]

序號： B2375 (P2374)

Which one of the following describes the effect of removing heat from a steam-water mixture that is in a saturated condition? (Assume the mixture remains saturated.)

- A. Temperature will increase.
- B. Temperature will decrease.
- C. Quality will increase.
- D. Quality will decrease.

ANSWER: D

從飽和蒸汽—水混合物中移除熱量會產生哪種影響？（假設混合物維持飽和狀態。）

- A. 溫度會升高
- B. 溫度會降低
- C. 蒸汽乾度會增加
- D. 蒸汽乾度會降低

答案： D.

科目： 293003

知能類： K1.12 [2.5/2.6]

序號： B2874 (P1976)

Which one of the following is the approximate steam quality of a steam-water mixture at 467°F with an enthalpy of 1000 Btu/lbm?

A. 24%

B. 27%

C. 73%

D. 76%

ANSWER: C

下列何者為467°F、焓1000 Btu/lbm的蒸汽—水混合物之蒸汽乾度？

A. 24%

B. 27%

C. 73%

D. 76%

答案： C.

科目： 293003

知能類： K1.12 [2.5/2.6]

序號： B3075 (P3074)

The temperature of a saturated steam-water mixture is 467°F.

Which one of the following additional parameter values, when paired with the temperature, provides insufficient data to determine the approximate steam quality of the mixture?

- A. Pressure at 499.96 psia
- B. Enthalpy at 977.33 Btu/lbm
- C. Entropy at 1.17 Btu/lbm -°R
- D. Specific volume at 0.817 ft<sup>3</sup>/lbm

ANSWER: A

一飽和蒸汽—水混合物的溫度為467°F。下列哪一種額外的參數值，配上溫度以後，產生的資料不足以決定混合物的蒸汽乾度？

- A. 壓力499.96 psia
- B. 焓977.33 Btu/lbm
- C. 熵1.17 Btu/lbm -°R
- D. 比容0.817 ft<sup>3</sup>/lbm

答案： A.

科目： 293003

知能類： K1.16 [2.8/2.8]

序號： B74

Given an operating reactor at 985 psig and a feed-water inlet temperature of 400°F, what will be feed-water subcooling?

A. 136.6°F

B. 140.6°F

C. 144.6°F

D. 148.6°F

ANSWER: C

運轉中的反應爐壓力為985 psig，飼水的進口溫度為400°F，飼水的次冷度為\_\_\_\_\_？

A. 136.6°F

B. 140.6°F

C. 144.6°F

D. 148.6°F

答案： C.

科目： 293003

知能類： K1.16 [2.8/2.8]

序號： B775

What effect will occur if heat is removed from water that is in a subcooled condition?

- A. Temperature of the water will increase.
- B. Enthalpy of the water will decrease.
- C. Quality of the water will increase.
- D. Density of the water will decrease.

ANSWER: B

如果從次冷狀態的水中移除熱量，會產生何種影響？

- A. 水溫會升高
- B. 焓會減低
- C. 乾度會增加
- D. 密度會減小

答案： B.

科目： 293003

知能類： K1.16 [2.8/2.8]

序號： B2973 (P2975)

An open vessel contains one pound-mass of water at 206°F and atmospheric pressure. Which one of the following will be caused by the addition of 3 Btu to the water?

- A. The water temperature will rise by 3°F.
- B. 3% of the water mass will vaporize.
- C. The water density will decrease by 3%.
- D. The water will become superheated by 3°F.

ANSWER: A

一開放容器在206°F和大氣壓力下，裝有一磅質量的水。在水中加入3Btu將會\_\_\_\_\_。

- A. 提高水溫3°F
- B. 蒸發3%的水
- C. 減少水的密度3%
- D. 產生3°F的過熱

答案： A.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B3175 (P3175)

A steam line is carrying saturated steam vapor at 500 psia and 467°F. Approximately how much heat addition to the steam vapor is necessary to achieve 60°F of superheat?

A. 31 Btu/lbm

B. 45 Btu/lbm

C. 58 Btu/lbm

D. 71 Btu/lbm

ANSWER: B

蒸汽管線運送500 psia、467°F飽和蒸汽。若要達到60°F的過熱，大約要在蒸汽中加入多少熱量？

A. 31 Btu/lbm

B. 45 Btu/lbm

C. 58 Btu/lbm

D. 71 Btu/lbm

答案： B.

科目： 293003

知能類： K1.22 [2.9/3.2]

序號： B1377

Saturated steam undergoes an ideal expansion process in an ideal turbine from 1000 psia to 28 inches Hg vacuum. Approximately how much specific work is being performed by the turbine?

A. 1193 Btu/lbm

B. 775 Btu/lbm

C. 418 Btu/lbm

D. 388 Btu/lbm

ANSWER: C

飽和蒸汽在理想汽機中進行理想的膨脹過程，從1000 psia到28 inch Hg真空。汽機的功率比大約為多少？

A. 1193 Btu/lbm

B. 775 Btu/lbm

C. 418 Btu/lbm

D. 388 Btu/lbm

答案： C.



科目： 293003

知能類： K1.22 [2.9/3.2]

序號： B1175 (P1675)

What is the temperature of a water-steam mixture that has an enthalpy of 1150 Btu/lbm and a quality of 95%?

A. 210°F

B. 270°F

C. 360°F

D. 420°F

ANSWER: C

焓1150 Btu/lbm、蒸汽乾度95%的水—蒸汽混合物的溫度為多少？

A. 210°F

B. 270°F

C. 360°F

D. 420°F

答案： C.

科目： 293003

知能類： K1.22 [2.9/3.2]

序號： B1577

Saturated steam undergoes an ideal expansion process in an ideal turbine from 294 psig to 27 inches Hg vacuum. Approximately how much specific work is being performed by the turbine?

A. 1203 Btu/lbm

B. 418 Btu/lbm

C. 343 Btu/lbm

D. 308 Btu/lbm

ANSWER: C

飽和蒸汽在理想汽機中進行理想的膨脹過程，從294 psia到27 inch Hg真空。汽機的比功大約為多少？

A. 1203 Btu/lbm

B. 418 Btu/lbm

C. 343 Btu/lbm

D. 308 Btu/lbm

答案： C.

科目： 293003

知能類： K1.22 [2.9/3.2]

序號： B1675 (N/A)

Which one of the following is the reactor coolant heatup rate, assuming an initial reactor pressure of 470 psig and a reactor pressure of 980 psig 2 hours later?

A. 40°F/hr

B. 60°F/hr

C. 80°F/hr

D. 120°F/hr

ANSWER: A

假設反應爐的起始壓力為470 psig，2小時之後的壓力為980 psig。下列何者為反應爐冷卻水的溫度上升率？

A. 40°F/hr

B. 60°F/hr

C. 80°F/hr

D. 120°F/hr

答案： A.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B75

The saturation pressure corresponding to 400°F is...

- A. 232.6 psia
- B. 247.3 psia
- C. 262.0 psia
- D. 444.6 psia

ANSWER: B

400°F的飽和壓力為\_\_\_\_\_。

- A. 232.6 psia
- B. 247.3 psia
- C. 262.0 psia
- D. 444.6 psia

答案： B.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B103

An operator suspects that a steam line temperature instrument reading is not correct. A recently calibrated pressure gauge sensing steam pressure for the same steam line indicates 351 psig. Assuming the system is operating at saturation pressure, what should the temperature instrument indicate?

- A. 424°F
- B. 428°F
- C. 432°F
- D. 436°F

ANSWER: D

運轉員懷疑蒸汽管線的溫度儀器讀數不正確。最近校正過的壓力計偵測到同一管線的蒸汽壓力為351 psig。假設系統運轉於飽和壓力，溫度儀器的讀數應為多少？

- A. 424°F
- B. 428°F
- C. 432°F
- D. 436°F

答案： D.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B139

The saturation temperature for steam at a pressure of 785 psig is approximately...

A. 510°F

B. 513°F

C. 515°F

D. 518°F

ANSWER: D

壓力785 psig的蒸汽，飽和溫度大約為多少？

A. 510°F

B. 513°F

C. 515°F

D. 518°F

答案： D.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B190

Which one of the following is the approximate quality of steam leaving a cyclone separator at 985 psig and 1186 Btu/lbm?

A. 95%

B. 96%

C. 97%

D. 99%

ANSWER: D

以985 psig、1186 Btu/lbm離開汽水分離器的蒸汽，蒸汽乾度大約為下列何者？

A. 95%

B. 96%

C. 97%

D. 99%

答案： D.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B275 (P275)

The saturation pressure for water at 328°F is...

- A. 85 psig
- B. 100 psig
- C. 115 psig
- D. 130 psig

ANSWER: A

328°F的水，飽和壓力為\_\_\_\_\_。

- A. 85 psig
- B. 100 psig
- C. 115 psig
- D. 130 psig

答案： A.



科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B375

Saturated steam at 250 psia enters turbine X. Superheated steam at 250 psia and 500°F enters turbine Y. Both turbines are 100% efficient and exhaust to a condenser at 1 psia.

Which one of the following lists the percentage of moisture at the exhaust of turbines X and Y?

A. Turbine X = 24.5%; turbine Y = 20.8%

B. Turbine X = 26.3%; turbine Y = 13.0%

C. Turbine X = 24.5%; turbine Y = 13.0%

D. Turbine X = 26.3%; turbine Y = 20.8%

ANSWER: A

250 psia的飽和蒸汽進入汽機X。250 psia、500°F的過熱蒸汽進入汽機Y。兩部汽機都以100%的效率運作，並排氣到壓力為1 psia之冷凝器內。

下列何者為汽機X和Y排氣中的濕度百分比？

A. 汽機 X = 24.5%; 汽機 Y = 20.8%

B. 汽機 X = 26.3%; 汽機 Y = 13.0%

C. 汽機 X = 24.5%; 汽機 Y = 13.0%

D. 汽機 X = 26.3%; 汽機 Y = 20.8%

答案： A.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B382

Cooling water exits a fuel channel with an enthalpy of 1195 Btu/lbm at a reactor pressure of 1050 psig. What is the state of the fluid at the exit of the fuel channel?

- A. Saturated
- B. Superheated
- C. Compressed
- D. Subcooled

ANSWER: B

冷卻水離開燃料匣時的焓為1195 Btu/lbm，反應爐壓力為1050 psig。離開燃料匣的冷卻水為何種狀態？

- A. 飽和
- B. 過熱
- C. 壓縮
- D. 過冷

答案： B.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B974

Which one of the following sets of water parameters will result in the highest fluid quality?

A. 500°F; 1100 Btu/lbm

B. 320°F; 1070 Btu/lbm

C. 200°F; 1040 Btu/lbm

D. 160°F; 960 Btu/lbm

ANSWER: C

下列哪一組水的參數可以產生最高的蒸汽乾度？

A. 500°F; 1100 Btu/lbm

B. 320°F; 1070 Btu/lbm

C. 200°F; 1040 Btu/lbm

D. 160°F; 960 Btu/lbm

答案： C.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B975

Which one of the following represents the value of enthalpy (h) for steam at 235.3 psig and 500°F?

A.  $h = 1201.1$ , Btu/lbm

B.  $h = 1202.2$ , Btu/lbm

C.  $h = 1263.5$ , Btu/lbm

D.  $h = 1286.6$ , Btu/lbm

ANSWER: C

下列何者為235.3 psig、500°F蒸汽的焓？

A.  $h = 1201.1$ , Btu/lbm

B.  $h = 1202.2$ , Btu/lbm

C.  $h = 1263.5$ , Btu/lbm

D.  $h = 1286.6$ , Btu/lbm

答案： C.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B1375

A steam/water mixture leaving the reactor core has the following parameter values:

Temperature = 550.5°F

Pressure = 1035 psig

Quality = 14.5%

Which one of the following is the enthalpy of the steam-water mixture?

A. 610 Btu/lbm

B. 643 Btu/lbm

C. 720 Btu/lbm

D. 860 Btu/lbm

ANSWER: B

離開反應爐爐心的蒸汽/水混合物具有下列的參數值：

溫度 = 550°F

壓力 = 1035 psig

蒸汽乾度 = 14.5%

下列何者為該蒸汽—水混合物的焓？

A. 610 Btu/lbm

B. 643 Btu/lbm

C. 720 Btu/lbm

D. 860 Btu/lbm

答案： B.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B1575

A steam-water mixture leaving the reactor core has the following parameter values:

Temperature = 550.5°F

Pressure = 1035 psig

Quality = 20%

Which one of the following is the approximate enthalpy of the steam-water mixture?

A. 641 Btu/lbm

B. 678 Btu/lbm

C. 751 Btu/lbm

D. 1063 Btu/lbm

ANSWER: B

離開反應爐爐心的蒸汽/水混合物具有下列的參數值：

溫度 = 550.5°F

壓力 = 1035 psig

蒸汽乾度 = 20%

下列何者為該蒸汽—水混合物的焓？

A. 641 Btu/lbm

B. 678 Btu/lbm

C. 751 Btu/lbm

D. 1063 Btu/lbm

答案： B.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B1776 (P1775)

Which one of the following is the approximate amount of heat required to convert 3 lbm of water at 100°F and 100 psia to a saturated vapor at 100 psia?

- A. 888.6 Btu
- B. 1119.2 Btu
- C. 2665.8 Btu
- D. 3357.6 Btu

ANSWER: D

要將3 lbm的水由100°F、100 psia轉換成100 psia的飽和蒸汽，大約需要多少熱量？

- A. 888.6 Btu
- B. 1119.2 Btu
- C. 2665.8 Btu
- D. 3357.6 Btu

答案： D.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B2075 (P2077)

A plant is operating at 50% power. Main steam at a main turbine steam inlet valve has the following properties:

Pressure: 900 psia

Quality: 98%

The main turbine steam chest pressure is 400 psia. Which one of the following is the approximate quality of the steam in the steam chest?

A. 97%

B. 98%

C. 99%

D. 100%

ANSWER: A

核電廠以50%功率運轉。主汽機蒸汽進口閥的蒸汽具有下列性質：

壓力： 900 psia

蒸汽乾度：98%

主汽機汽櫃壓力為400 psia，下列何者為汽櫃內蒸汽乾度？

A. 97%

B. 98%

C. 99%

D. 100%

答案： A.



科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B2275 (P2275)

$1.0 \times 10^6$  lbm/hr saturated steam at 30% steam quality is leaving a main turbine and entering a condenser at 2.0 psia. Condensate is entering the hotwell at 118°F.

Which one of the following is the approximate condenser heat transfer rate?

A.  $3.1 \times 10^8$  Btu/hr

B.  $5.8 \times 10^8$  Btu/hr

C.  $7.2 \times 10^8$  Btu/hr

D.  $9.9 \times 10^8$  Btu/hr

ANSWER: A

蒸汽乾度30%、 $1.0 \times 10^6$  lbm/hr的飽和蒸汽離開主汽機，進入壓力2.0 psia的冷凝器。冷凝水以118°F進入熱井中。下列何者為冷凝器的近似熱傳導率？

A.  $3.1 \times 10^8$  Btu/hr

B.  $5.8 \times 10^8$  Btu/hr

C.  $7.2 \times 10^8$  Btu/hr

D.  $9.9 \times 10^8$  Btu/hr

答案： A.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B2374 (P2375)

Which one of the following is the approximate amount of heat required to convert 2.0 lbm of water at 100°F and 100 psia to a saturated vapor at 100 psia?

A. 1119 Btu

B. 1187 Btu

C. 2238 Btu

D. 2374 Btu

ANSWER: C

要將2.0 lbm、100°F、100 psia的水轉換成100 psia的飽和蒸汽，大約需要多少熱量？

A. 1119 Btu

B. 1187 Btu

C. 2238 Btu

D. 2374 Btu

答案： C.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B2474

Turbine X is an ideal steam turbine that exhausts to a condenser at 1.0 psia. Turbine X is driven by saturated steam (100% quality) at 500 psia. Which one of the following lists the approximate specific work output of turbine X and moisture content of the steam exiting turbine X?

<u>Specific Work</u>	<u>Moisture Content</u>
A. 388 Btu/lbm	72%
B. 388 Btu/lbm	28%
C. 817 Btu/lbm	72%
D. 817 Btu/lbm	28%

ANSWER: B

汽機X為理想汽機，將氣排入壓力1.0 psia之冷凝器內。汽機X是由500 psia飽和蒸汽（100%）驅動。下列何者為汽機X的輸出功率比？，和排出汽機X的蒸汽濕度含量？

	<u>功率比?</u>	<u>濕氣含量</u>
A.	388 Btu/lbm	72%
B.	388 Btu/lbm	28%
C.	817 Btu/lbm	72%
D.	817 Btu/lbm	28%

答案： B.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B2475 (P2475)

A steam line is carrying steam at 500 psia and 507°F. Approximately how much ambient heat loss is required before moisture formation occurs in the steam line?

A. 31 Btu/lbm

B. 45 Btu/lbm

C. 58 Btu/lbm

D. 71 Btu/lbm

ANSWER: A

蒸汽管線運送500 psia、507°F的蒸汽。大約要多少熱量流失至環境，才會在蒸汽管線中產生凝結？

A. 31 Btu/lbm

B. 45 Btu/lbm

C. 58 Btu/lbm

D. 71 Btu/lbm

答案： A

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B2575 (P2575)

Which one of the following is the approximate amount of heat required to convert 2.0 lbm of water at 100°F and 100 psia to a superheated vapor at 400°F and 100 psia?

A. 1119 Btu

B. 1159 Btu

C. 2238 Btu

D. 2318 Btu

ANSWER: D

大約需要多少熱量才能將2.0 lbm、100°F、100 psia的水轉換成400°F、100 psia的過熱蒸汽？

A. 1119 Btu

B. 1159 Btu

C. 2238 Btu

D. 2318 Btu

答案： D.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B2675 (P2675)

What is the specific heat (Btu/lbm-°F) of water at 300°F and 100 psia?

- A. 1.025 Btu/lbm-°F
- B. 1.125 Btu/lbm-°F
- C. 1.175 Btu/lbm-°F
- D. 1.250 Btu/lbm-°F

ANSWER: A

300°F、100 psia的水比熱(Btu/lbm-°F)為多少？

- A. 1.025 Btu/lbm-°F
- B. 1.125 Btu/lbm-°F
- C. 1.175 Btu/lbm-°F
- D. 1.250 Btu/lbm-°F

答案： A.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B2774 (P2778)

The theoretical maximum efficiency of a steam cycle is given by the equation:

$$\text{Eff}_{\text{thmax}} = (1 - T_{\text{out}}/T_{\text{in}}) \times 100\%$$

where  $T_{\text{out}}$  is the absolute temperature for heat rejection and  $T_{\text{in}}$  is the absolute temperature for heat addition. (Fahrenheit temperature is converted to absolute temperature by adding 460°.)

A plant is operating with a stable reactor vessel pressure of 900 psia. What is the approximate theoretical maximum steam cycle efficiency this plant can achieve by establishing its main condenser vacuum at 1.0 psia?

- A. 35%
- B. 43%
- C. 65%
- D. 81%

ANSWER: B

蒸汽循環的最大效率在理論上可用下列算式推算：

$$\text{Eff}_{\text{thmax}} = (1 - T_{\text{out}}/T_{\text{in}}) \times 100\%$$

$T_{\text{out}}$  是排出熱的絕對溫度， $T_{\text{in}}$  是加入熱的絕對溫度。（絕對溫度為華氏溫度加上460°。）核電廠反應器以900 psia穩定壓力運轉，如果該電廠的主冷凝器真空度為1.0 psia，理論上可以達到的最大蒸汽循環效率約為多少？

- A. 35%
- B. 43%
- C. 65%
- D. 81%

答案： B.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B2776 (P2775)

With the plant operating near rated power, air inleakage into the main condenser causes main condenser pressure to increase from 1.0 psia to 2.0 psia.

Given the following:

- Initial main condenser condensate depression was 4°F.
- After the plant stabilizes, with main condenser pressure at 2.0 psia, main condenser condensate depression is 2°F.

Which one of the following is the approximate increase in main condenser specific heat rejection needed to restore condensate depression to 4°F?

- A. 2 Btu/lbm
- B. 4 Btu/lbm
- C. 8 Btu/lbm
- D. 16 Btu/lbm

ANSWER: A

核電廠以接近額定功率運轉。由於主冷凝器有空氣滲入，導致主冷凝器的壓力由1.0 psia 增加到2.0 psia。

給予下列條件：

- 主冷凝器的冷凝水次冷度(condensate depression)為4°F
  - 等電廠穩定後，主冷凝器的壓力為2.0 psia，主冷凝器冷凝水次冷度為2°F
- 若要使冷凝水次冷度回到4°F，主冷凝器排氣比熱大約要增加多少？

- A. 2 Btu/lbm
- B. 4 Btu/lbm
- C. 8 Btu/lbm
- D. 16 Btu/lbm

答案： A.



科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B2875

A plant is operating at a low power level. Main steam at the main turbine steam inlet valve has the following properties:

Pressure: 900 psia

Quality: 99%

The main turbine steam chest pressure is 300 psia. Which one of the following is the approximate temperature of the steam in the steam chest?

A. 417°F

B. 439°F

C. 496°F

D. 532 °F

ANSWER: A

核電廠以低功率運轉。主汽機蒸汽進口閥的主蒸汽具有下列性質：

壓力： 900 psia

蒸汽乾度： 99%

主汽機汽櫃的壓力為300 psia, 下列何者為汽櫃中蒸汽的大約溫度？

A. 417°F

B. 439°F

C. 496°F

D. 532 °F

答案： A.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B3074 (P3077)

A reactor plant is operating at 100% rated power. Steam is escaping to atmosphere through a flange leak in a steam supply line to the low pressure section of the main turbine.

Given:

- Steam line pressure is 300 psia.
- Steam line temperature is 440°F.

What is the approximate temperature of the steam as it reaches atmospheric pressure?

- A. 212°F
- B. 268°F
- C. 322°F
- D. 358 °F

ANSWER: D

核能電廠以100%功率運轉。蒸汽由連接至主汽機低壓區的蒸汽管線凸緣裂縫洩漏到大氣中。

若給予下列數據：

- 蒸汽管線壓力為300 psia
- 蒸汽管線溫度為440°F

則蒸汽漏到大氣壓力時的溫度約為多少？

- A. 212°F
- B. 268°F
- C. 322°F
- D. 358°F

答案： D.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B3274 (P3275)

An ideal main turbine generator (MTG) is producing 1000 MW of electrical power while being supplied with 100% quality steam at 920 psig. Steam supply pressure is then gradually increased to 980 psig at the same quality. Assume turbine control valve position and condenser vacuum remain the same.

Which one of the following describes why the MTG output increases as steam pressure increases?

- A. Each lbm of steam entering the turbine has a higher specific heat.
- B. Each lbm of steam entering the turbine has a higher specific enthalpy.
- C. Each lbm of steam passing through the turbine expands to fill a greater volume.
- D. Each lbm of steam passing through the turbine performs increased work in the turbine.

ANSWER: D

理想的主汽輪發電機在輸入920 psig、100%蒸汽乾度的蒸汽時，會產生1000MW的電力。輸入的蒸汽壓力逐漸增加到980 psig，蒸汽乾度不變。假設汽輪機的控制閥位置和冷凝器的真空度保持不變。

下列何者可以解釋為何主汽輪發電機的輸出會隨著蒸汽壓力增加而增加？

- A. 進入汽輪機的每一磅蒸汽都有較高的比熱。
- B. 進入汽輪機的每一磅蒸汽都有較高的比焓。
- C. 經過汽輪機的每一磅蒸汽都要膨脹以充滿較大的容積。
- D. 經過汽輪機的每一磅蒸汽都在汽輪機內做較大的功。

答案： D.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B3275

A nuclear power plant is shutdown at normal operating temperatures and pressures. Reactor coolant temperature is being controlled by dumping main steam (100% quality) to the main condenser.

Given the following:

- Main steam pressure: 1000 psia
- Main condenser vacuum: 28"Hg

Which one of the following is the approximate temperature of the steam as it enters the main condenser?

- A. 102°F
- B. 212°F
- C. 295°F
- D. 358°F

ANSWER: C

核電廠在正常運轉的溫度和壓力下停機。反應爐冷卻水溫度由排放至主冷凝器的主蒸汽（蒸汽乾度100%）來控制。

若給予下列條件：

- 主蒸汽壓力：1000 psia
- 主冷凝器真空：28 inch Hg

則下列何者為蒸汽進入主冷凝器時的大約溫度？

- A. 102°F
- B. 212°F
- C. 295°F
- D. 358°F

答案： C.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B3475 (P3475)

Which one of the following is the approximate amount of heat required to convert 2 lbm of water at 100°F and 100 psia to a saturated vapor at 100 psia?

- A. 559.6 Btu
- B. 1119.2 Btu
- C. 2238.4 Btu
- D. 3357.6 Btu

ANSWER: C

要將100°F、100 psia、2 lbm的水轉換成100 psia飽和蒸汽，需要多少的熱量？

- A. 559.6 Btu
- B. 1119.2 Btu
- C. 2238.4 Btu
- D. 3357.6 Btu

答案： C.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B3575 (P3577)

Saturated steam (100% quality) at 1000 psia is being supplied to the inlet of a partially-open steam throttle valve on a main turbine. Pressure in the steam chest downstream of the throttle valve is 150 psia. Assume a typical throttling process with no heat gain or loss to/from the steam.

When compared to the conditions at the inlet to the throttle valve, which one of the following describes the conditions in the steam chest for specific enthalpy and entropy?

- | Steam Chest              | Steam Chest             |
|--------------------------|-------------------------|
| <u>Specific Enthalpy</u> | <u>Specific Entropy</u> |
| A. About the same        | About the same          |
| B. About the same        | Significantly higher    |
| C. Significantly lower   | About the same          |
| D. Significantly lower   | Significantly higher    |

ANSWER: B

1000 psia的飽和蒸汽（蒸汽乾度100%）被輸送到主汽機上部分開啟的蒸汽節流閥入口。節流閥下游汽櫃內的蒸汽壓力為150 psia。假設典型的節流過程不會增加或減少蒸汽的熱量。與節流閥入口的狀態相比，下列何者為汽櫃內比焓和比熵的狀態？

- | <u>比焓</u> | <u>比熵</u> |
|-----------|-----------|
| A. 大約一樣   | 大約一樣      |
| B. 大約一樣   | 明顯的較高     |
| C. 明顯的較低  | 大約一樣      |
| D. 明顯的較低  | 明顯的較高     |

答案： B.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B3675 (P3677)

A nuclear plant is shutdown and steam is escaping to atmosphere through a leak in a main steam line. If main steam line pressure is 300 psia, what is the approximate temperature of the steam as it reaches atmospheric pressure? (Assume the steam in the main steam line has a quality of 100%.)

A. 212°F

B. 268°F

C. 322°F

D. 358°F

ANSWER: C

核電廠停機時，蒸汽由主蒸汽管的裂縫洩漏到大氣中。如果主蒸汽管線壓力為300 psia，當蒸汽洩漏到大氣時的溫度大約為多少？（假設主蒸汽管線的蒸汽乾度為100%。）

A. 212°F

B. 268°F

C. 322°F

D. 358°F

答案： C.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B3774 (P3775)

A 100 ft<sup>3</sup> vessel contains a saturated water-steam mixture at 1,000 psia. The water portion occupies 30 ft<sup>3</sup> and the steam portion occupies the remaining 70 ft<sup>3</sup>. What is the approximate total mass of the mixture in the vessel?

A. 1,547 lbm

B. 2,612 lbm

C. 3,310 lbm

D. 4,245 lbm

ANSWER: A

一個100 ft<sup>3</sup> 的容器裝有1,000 psia的飽和水—蒸汽混合物。水佔了30 ft<sup>3</sup>，蒸汽佔了70 ft<sup>3</sup>。容器內的混合物總質量約為多少？

A. 1,547 lbm

B. 2,612 lbm

C. 3,310 lbm

D. 4,245 lbm

答案： A.



科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B3938 (P3939)

Main steam is being used to reheat high-pressure (HP) turbine exhaust in a moisture separator reheater (MSR).

Given:

- The HP turbine exhaust enters the MSR reheater section as saturated steam (100% quality).
- The exhaust enters and exits the reheater section at 280 psia and a flow rate of 1.0E6 lbm/hr.
- The main steam heat transfer rate in the reheater section is 42.1E6 Btu/hr.

Which one of the following is the approximate temperature of the HP turbine exhaust leaving the reheater section of the MSR?

- A. 450°F
- B. 475°F
- C. 500°F
- D. 525°F

ANSWER: B

在汽水分離再熱器中主蒸汽被用來加熱高壓汽機的排汽。

若給予下列條件：

- 進入汽水分離再熱器再熱區的高壓汽機排汽為飽和蒸汽（蒸汽乾度100%）。
- 進出再熱區的排汽壓力為280 psia，流量為1.0E6 lbm/hr。
- 再熱區內的主蒸汽熱傳導率為42.1E6 Btu/hr。

則下列何者為高壓汽機排汽離開汽水分離再熱器再熱區的大約溫度？

- A. 450°F
- B. 475°F
- C. 500°F
- D. 525°F

答案： B.

科目： 293003

知能類： K1.23 [2.8/3.1]

序號： B4038

A 100 ft<sup>3</sup> vessel contains a saturated water-steam mixture at 1,000 psia. The water portion occupies 70 ft<sup>3</sup> and the steam portion occupies the remaining 30 ft<sup>3</sup>. What is the approximate total mass of the mixture in the vessel?

A. 1,547 lbm

B. 2,612 lbm

C. 3,310 lbm

D. 4,245 lbm

ANSWER: C

一個100 ft<sup>3</sup> 的容器裝有1,000 psia的飽和水—蒸汽混合物。水佔了70 ft<sup>3</sup> ，蒸汽佔了剩餘的30 ft<sup>3</sup> 。容器內的混合物總質量約為多少？

A. 1,547 lbm

B. 2,612 lbm

C. 3,310 lbm

D. 4,245 lbm

答案： C.

科目/題號：293003/1 (2016 新增)

知能類：K1.22 [2.9/3.2]

序號：B6038 (P6039)

Given a set of steam tables that lists the following parameters for saturated steam and water:

- Pressure
- Enthalpy
- Specific volume
- Entropy
- Temperature

One can determine the \_\_\_\_\_ of a saturated steam-water mixture given only the \_\_\_\_\_.

- A. temperature; enthalpy
- B. temperature; pressure
- C. pressure; entropy
- D. pressure; specific volume

ANSWER: B.

已知一組蒸汽表，有如下飽和蒸汽和水的參數：

- 壓力
- 焓
- 比容
- 熵
- 溫度

只要已知\_\_\_\_\_就能確定飽和蒸汽-水混合物的\_\_\_\_\_。

- A. 焓；溫度
- B. 壓力；溫度
- C. 熵；壓力
- D. 比容；壓力

答案： B

科目/題號：293003/2 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B4138 (P4139)

A saturated steam-water mixture at 50 percent quality is leaving a main turbine at  $1.0 \times 10^6$  lbm/hr and entering a condenser at 1.6 psia. Condensate enters the hotwell at 112°F.

Which one of the following is the approximate condenser heat transfer rate?

A.  $3.1 \times 10^8$  Btu/hr

B.  $3.8 \times 10^8$  Btu/hr

C.  $4.5 \times 10^8$  Btu/hr

D.  $5.2 \times 10^8$  Btu/hr

ANSWER: D.

乾度 50% 的飽和蒸汽-水混合物以  $1.0 \times 10^6$  lbm/hr 離開主汽機並以 1.6 psia 進入冷凝器。冷凝後以 112°F 進入熱井。下列何者是冷凝器熱傳導率的近似值？

A.  $3.1 \times 10^8$  Btu/hr

B.  $3.8 \times 10^8$  Btu/hr

C.  $4.5 \times 10^8$  Btu/hr

D.  $5.2 \times 10^8$  Btu/hr

答案： D

科目/題號：293003/3 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B4338 (P4339)

A nuclear power plant is operating at 100 percent power. The main turbine has one high pressure (HP) unit and one low pressure (LP) unit.

Main steam enters the HP unit of the main turbine with the following parameters:

Pressure = 1,000 psia

Quality = 100 percent

The exhaust steam exits the HP unit at 200 psia, then goes through a moisture separator-reheater, and

enters the LP units with the following parameters:

Pressure = 200 psia

Temperature = 500°F

The main condenser pressure is 1.0 psia. Assume that each unit of the main turbine is 100 percent efficient.

The higher enthalpy steam is being supplied to the \_\_\_\_\_ unit of the main turbine; and the greater moisture content is found in the exhaust of the \_\_\_\_\_ unit.

A. LP; LP

B. LP; HP

C. HP; LP

D. HP; HP

ANSWER: A.

一座核電廠在 100% 功率運轉。主汽機由一組高壓(HP)汽機和一組低壓(LP)汽機組成。

主蒸汽以下列參數進入高壓汽機：

壓力=1,000 psia

乾度=100%

高壓汽機排汽壓力 200 psia，然後經過一個汽水分離再熱器，進入低壓汽機，有如下參數：

壓力=200 psia

溫度=500°F

主冷凝器壓力是 1.0 psia。假設每部高壓和低壓汽機效率皆為 100%。

較高焓蒸汽被供給到\_\_\_\_\_汽機；在\_\_\_\_\_排汽中比較大的水分含量。

A. LP ; LP

B. LP ; HP

C. HP ; LP

D. HP ; HP

答案： A

科目/題號：293003/4 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B4738 (P4739)

Consider a 100 lbm quantity of a saturated steam-water mixture at standard atmospheric pressure. The mixture has a quality of 70 percent. Assume that pressure remains constant and there is no heat loss from the mixture.

Which one of the following is the approximate heat addition needed to increase the quality of the mixture to 100 percent?

- A. 5,400 Btu
- B. 12,600 Btu
- C. 29,100 Btu
- D. 67,900 Btu

ANSWER: C.

在標準大氣壓下 100 lbm 的飽和蒸汽-水混合物，該混合物具有 70% 的乾度。假定壓力保持恆定，並且混合物沒有熱損失。

下列何者是提升混合物乾度至 100% 所需增加熱量的近似值？

- A. 5,400 Btu
- B. 12,600 Btu
- C. 29,100 Btu
- D. 67,900 Btu

答案： C

科目/題號：293003/5 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B4838 (P4839)

An open vessel contains 1.0 lbm-mass of water at 204°F and standard atmospheric pressure. If 16.0 Btu of heat is added to the water, the water temperature will rise by about \_\_\_\_\_; and approximately \_\_\_\_\_ of the water mass will become steam.

- A. 8°F; 1 percent
- B. 8°F; 10 percent
- C. 16°F; 1 percent
- D. 16°F; 10 percent

ANSWER: A.

一個開放的容器中含有溫度 204°F 和標準大氣壓力，質量 1.0 lbm 的水。如果將熱量 16.0 Btu 加入水中，水的溫度將上升約\_\_\_\_\_；大約\_\_\_\_\_的水量將成為蒸汽。

- A. 8°F；1%
- B. 8°F；10%
- C. 16°F；1%
- D. 16°F；10%

答案： A

科目/題號：293003/6 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B4938 (P4939)

Water enters an ideal convergent-divergent nozzle with the following parameters:

Pressure = 300 psia

Temperature = 102°F

Velocity = 50 ft/sec

The velocity of the water at the throat of the nozzle is 200 ft/sec.

Given that nozzles convert enthalpy to kinetic energy, and assuming no heat transfer to or from the nozzle, what is the approximate pressure of the water at the throat of the nozzle?

A. 296 psia

B. 150 psia

C. 75 psia

D. 50 psia

ANSWER: D.

水以下列參數流進一理想的漸縮-漸擴噴嘴：

壓力= 300 psia

溫度= 102°F

流速= 50 ft/sec

水流在噴嘴喉部的流速為 200 ft/sec

已知噴嘴轉換焓值為動能，並且假設噴嘴沒有熱傳進出，請問水在噴嘴的喉部的壓力大約為多少？

A. 296 psia

B. 150 psia

C. 75 psia

D. 50 psia

答案： D



科目/題號：293003/7 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B5038 (P5039)

An open vessel contains 1.0 lbm of water at 206°F and standard atmospheric pressure. Which one of the following will be caused by the addition of 12.0 Btu to the water?

- A. The water temperature will rise by about 6°F and none of the water will vaporize.
- B. The water temperature will rise by about 6°F and some of the water will vaporize.
- C. The water temperature will rise by about 12°F and none of the water will vaporize.
- D. The water temperature will rise by about 12°F and some of the water will vaporize.

ANSWER: B.

一個開放的容器中含有 206°F 和標準大氣壓力，質量 1.0 lbm 的水。

以下何者是因為加入熱量 12.0 Btu 至水所造成的？

- A. 水溫將上升約 6°F 和沒有水會蒸發
- B. 水溫將上升約 6°F 和部分水會蒸發
- C. 水溫將上升約 12°F 和沒有水會蒸發
- D. 水溫將上升約 12°F 和部分水會蒸發

答案： B

科目/題號：293003/8 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B5138 (P5139)

A feedwater pump discharges into a 16-inch diameter discharge line. Given the following:

Pump discharge pressure = 950 psia

Feedwater temperature = 300°F

Feedwater velocity = 15.2 ft/sec

What is the feedwater pump discharge mass flow rate?

A.  $1.1 \times 10^6$  lbm/hr

B.  $4.4 \times 10^6$  lbm/hr

C.  $1.8 \times 10^7$  lbm/hr

D.  $5.3 \times 10^7$  lbm/hr

ANSWER: B.

飼水泵出口管路直徑 16-inch。下列為已知：

泵出口壓力= 950 psia

飼水溫度= 300°F

飼水流速= 15.2 ft/sec

請問飼水泵出口的質量流量率為多少？

A.  $1.1 \times 10^6$  lbm/hr

B.  $4.4 \times 10^6$  lbm/hr

C.  $1.8 \times 10^7$  lbm/hr

D.  $5.3 \times 10^7$  lbm/hr

答案： B

科目/題號：293003/9 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B5238 (P5239)

Dry saturated steam enters a frictionless convergent-divergent nozzle with the following parameters:

Pressure = 850 psia

Velocity = 10 ft/sec

The steam at the throat of the nozzle has a subsonic velocity of 950 ft/sec.

Given that nozzles convert enthalpy to kinetic energy, and assuming no heat transfer to or from the nozzle, what is the enthalpy of the steam at the throat of the nozzle?

A. 1,162 Btu/lbm

B. 1,171 Btu/lbm

C. 1,180 Btu/lbm

D. 1,189 Btu/lbm

ANSWER: C.

乾飽和蒸汽以下列參數進入無摩擦漸縮-漸擴噴嘴：

壓力= 850 psia

速度= 10 ft/sec

蒸汽在噴嘴的喉部具有 950 ft/sec 的次音速

已知噴嘴轉換焓為動能，並且假設噴嘴沒有熱傳進出，請問蒸汽在噴嘴喉部的焓值為多少？

A. 1,162 Btu/lbm

B. 1,171 Btu/lbm

C. 1,180 Btu/lbm

D. 1,189 Btu/lbm

答案： C

科目/題號：293003/10 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B5338 (P5340)

A nuclear power plant is operating with the following main steam parameters at the main turbine steam inlet valves:

Pressure = 900 psia

Quality = 99 percent

The main turbine steam chest pressure is 300 psia. Assuming an ideal throttling process, what is the quality of the steam in the steam chest?

A. 100 percent

B. 98 percent

C. 88 percent

D. 87 percent

ANSWER: B.

一座核電廠運轉中，主汽機進汽閥處的主蒸汽參數如下：

壓力= 900 psia

乾度= 99%

主汽機汽櫃壓力為 300 psia。假設其為一個理想的節流流程，則汽櫃的蒸汽乾度為多少？

A. 100%

B. 98%

C. 88%

D. 87%

答案： B

科目/題號：293003/11 (2016 新增)

知能類：K1.23

序號：B5438 (P5439)

An ideal auxiliary steam turbine exhausts to the atmosphere. The steam turbine is supplied with dry saturated steam at 900 psia. Which one of the following is the maximum specific work (Btu/lbm) that can be extracted from the steam by the steam turbine?

- A. 283 Btu/lbm
- B. 670 Btu/lbm
- C. 913 Btu/lbm
- D. 1,196 Btu/lbm

ANSWER: A.

一部理想的輔助汽機排汽到大氣中。汽機蒸汽是由 900 psia 乾飽和蒸汽供給。下列何者是汽機可從蒸汽抽取之最大比功(Btu/lbm)？

- A. 283 Btu/lbm
- B. 670 Btu/lbm
- C. 913 Btu/lbm
- D. 1,196 Btu/lbm

答案： A

科目/題號：293003/12 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B5638

A main steam line safety valve is leaking by, allowing 100 percent quality steam from the reactor vessel to enter the discharge pipe, which remains at a constant pressure of 10 psig. Initial safety valve discharge pipe temperature is elevated but stable. Assume no heat loss from the safety valve discharge pipe.

When the leak is noted, the reactor is shut down and a plant cooldown and depressurization are commenced. As the main steam pressure slowly decreases from 1,000 psig to 800 psig, the safety valve discharge pipe temperature will...

- A. decrease, because the entropy of the safety valve discharge will be decreasing.
- B. decrease, because the enthalpy of the safety valve discharge will be decreasing.
- C. increase, because the safety valve discharge will become more superheated as reactor vessel pressure decreases.
- D. remain the same, because the safety valve discharge will remain a saturated steam-water mixture at 10 psig.

ANSWER: C.

一條主蒸汽管路安全閥正在洩漏，使 100% 乾度蒸汽從反應器進入其排放管，並維持在 10psig 的恆定壓力。初始安全閥排放管溫度升高但穩定。假設安全閥排放管沒有熱損失。

當洩漏被發現，反應器停機且核電廠開始冷卻和降壓。在主蒸汽壓力緩慢地從 1000 psig 減低到 800 psig 時，安全閥排放管溫度將.....

- A. 減低，因為安全閥排放的熵值將會減低
- B. 減低，因為安全閥排放的焓值將會降低
- C. 增加，因為安全閥的排放將隨著反應器壓力降低而變得更加過熱
- D. 保持不變，因為安全閥的排放將維持在 10psig 下之飽和蒸汽-水混合物

答案： C

科目/題號：293003/13 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B5738 (P5739)

A steam turbine exhausts to a steam condenser at 1.0 psia. The steam turbine is supplied with dry saturated steam at 900 psia at a flow rate of 200,000 lbm/hr. What is the approximate rate of condensate addition to the condenser hotwell in gallons per minute?

- A. 400 gpm
- B. 2,400 gpm
- C. 4,000 gpm
- D. 24,000 gpm

ANSWER: A.

一氣機排汽至壓力 1.0 psia 的冷凝器。汽機之蒸汽是由流量 200,000 lbm/hr，壓力 900 psia 之乾飽和蒸汽供給。加在冷凝器熱井的冷凝率大約是多少 gpm？

- A. 400 gpm
- B. 2,400 gpm
- C. 4,000 gpm
- D. 24,000 gpm

答案： A

科目/題號：293003/14 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B5938

What happens to the enthalpy of the saturated steam in a reactor vessel (RV) during a reactor heatup as RV pressure increases from 100 psia to 1,000 psia?

- A. The enthalpy increases during the entire pressure increase.
- B. The enthalpy initially increases and then decreases.
- C. The enthalpy decreases during the entire pressure increase.
- D. The enthalpy initially decreases and then increases.

ANSWER: B.

在反應器加熱期間壓力槽壓力由 100 psia 升高至 1,000 psia，反應器壓力槽內的飽和蒸汽焓值會如何變化？

- A. 整個壓力過程焓值都增加
- B. 焓值起始先增加然後降低
- C. 整個壓力過程焓值都降低
- D. 焓值起始先降低然後增加

答案： B



科目/題號：293003/15 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B6338 (P6339)

Dry saturated steam is flowing to a reheater. The reheater inlet and outlet pressures are both 260 psia. If the reheater adds 60.5 Btu/lbm to the steam, what is the temperature of the steam exiting the reheater?

- A. 405°F
- B. 450°F
- C. 465°F
- D. 500°F

ANSWER: D.

乾飽和蒸汽流進一個再熱器。再熱器進口和出口壓力都是 260 psia。如果再熱器增加了 60.5 Btu/lbm 至蒸汽，則離開再熱器的蒸汽溫度是多少？

- A. 405°F
- B. 450°F
- C. 465°F
- D. 500°F

答案： D

科目/題號：293003/16 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B6438 (P6439)

An open vessel contains 5.0 lbm of water at constant standard atmospheric pressure. The water has been heated to the saturation temperature. If an additional 1,600 Btu is added to the water, the water temperature will \_\_\_\_\_, and \_\_\_\_\_ than 50 percent of the water will vaporize.

- A. increase significantly; less
- B. increase significantly; more
- C. remain about the same; less
- D. remain about the same; more

ANSWER: C.

一個開放的容器中含有標準大氣壓下 5.0 lbm 的水。水已被加熱到飽和溫度。若再加入 1,600 Btu 熱量到水中，水溫將\_\_\_\_\_和 \_\_\_\_\_於 50%的水會蒸發。

- A.顯著增加；少
- B.顯著增加；多
- C.幾乎保持不變；少
- D.幾乎保持不變；多

答案： C

科目/題號：293003/17 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B6538 (P6540)

A nuclear power plant is operating at power. Steam is escaping to atmosphere through a flange leak in a steam line supplying the low pressure section of the main turbine.

Given:

- Steam line pressure is 200 psia.
- Steam line temperature is 400°F.

Assuming no heat transfer to/from the steam, what is the approximate temperature of the steam as it reaches atmospheric pressure?

- A. 212°F
- B. 284°F
- C. 339°F
- D. 375°F

ANSWER: C.

一座核電廠正在功率運轉。由主蒸汽管路供給至主汽機的低壓段的蒸汽，經由法蘭洩漏逃逸到大氣中。

已知：

- 蒸汽管路壓力為 200 psia
- 蒸汽管路溫度為 400°F

假設蒸汽沒有熱傳進出，當蒸汽達到大氣壓時，其溫度大約為多少？

- A. 212°F
- B. 284°F
- C. 339°F
- D. 375°F

答案： C

科目/題號：293003/18 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B6638 (P6639)

Dry saturated steam at 240 psia enters an ideal low pressure (LP) turbine and exhausts to a steam condenser at 1.0 psia. Compared to the LP turbine entry conditions, the volumetric flow rate of the steam leaving the LP turbine will be about \_\_\_\_\_ times larger.

A. 103

B. 132

C. 174

D. 240

ANSWER: B.

壓力 240 psia 乾飽和蒸汽進入理想的低壓(LP)汽機，並排放 1.0 psia 蒸汽至冷凝器。與低壓汽機進口的條件相較，離開低壓汽機的蒸汽體積流量率約為 \_\_\_\_\_ 倍大。

A. 103

B. 132

C. 174

D. 240

答案： B

科目/題號：293003/19 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B6938 (P6939)

A nuclear power plant experienced a loss of all AC electrical power due to a natural disaster. A few days later, there is turbulent boiling in the spent fuel pool. Average spent fuel temperature is elevated but stable. Assume that boiling is the only means of heat removal from the spent fuel pool.

Given the following stable current conditions:

Spent fuel decay heat rate = 4.8 MW

Spent fuel building pressure = 14.7 psia

Spent fuel pool temperature = 212°F

At what approximate rate is the mass of water in the spent fuel pool decreasing?

A. 4,170 lbm/hr

B. 4,950 lbm/hr

C. 14,230 lbm/hr

D. 16,870 lbm/hr

ANSWER: D.

由於自然災害，一座核電廠經歷了喪失全部交流電力。幾天後，在用過燃料池發生擾流沸騰。用過燃料平均溫度是升高後穩定。假定沸騰是唯一自用過燃料池移除熱量的方法。

下列為目前穩定的條件：

用過燃料熱衰變率= 4.8 MW

用過燃料廠房壓力= 14.7 psia

用過燃料池水溫= 212°F

用過燃料池的水會以大約多少質量流量率減少？

A. 4,170 lbm/hr

B. 4,950 lbm/hr

C. 14,230 lbm/hr

D. 16,870 lbm/hr

答案： D

科目/題號：293003/20 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7038 (P7039)

Given the following initial conditions for a spent fuel pool:

Spent fuel decay heat rate = 5.0 MW

Spent fuel pool water temperature = 90°F

Spent fuel pool water mass =  $2.5 \times 10^6$  lbm

Spent fuel pool water specific heat = 1.0 Btu/lbm-°F

If a complete loss of spent fuel pool cooling occurs, how long will it take for spent fuel pool water temperature to reach 212°F? (Assume that the spent fuel pool remains in thermal equilibrium, and that there is no heat removal from the spent fuel pool.)

A. 18 hours

B. 31 hours

C. 48 hours

D. 61 hours

ANSWER: A.

已知用過燃料池下列的初始條件：

用過燃料熱衰變率= 5.0 MW

用過燃料池水溫度= 90°F

用過燃料池水質量=  $2.5 \times 10^6$  lbm

用過燃料池水比熱= 1.0 Btu/lbm-°F

如果用過燃料池完全喪失冷卻時，需要多長時間池水溫度會達到 212°F？(假設用過燃料池仍然處於熱平衡，且沒有熱移除)

A. 18 小時

B. 31 小時

C. 48 小時

D. 61 小時

答案： A

科目/題號：293003/21 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7138 (P7140)

A nuclear power plant is operating with the following main steam parameters at the main turbine steam inlet valves:

Pressure = 1,050 psia

Quality = 100 percent

The main turbine steam chest pressure is 400 psia. Assuming an ideal throttling process, which one of the following describes the steam in the steam chest?

- A. Saturated, 96 percent quality
- B. Saturated, 98 percent quality
- C. Saturated, 100 percent quality
- D. Superheated

ANSWER: B.

一座核電廠運轉中，在主汽機進汽閥處之主蒸汽參數如下：

壓力= 1050 psia

乾度= 100%

主汽機汽櫃壓力為 400 psia。假設是理想的節流流程，則下列何者描述汽櫃內的蒸汽狀態？

- A.飽和，96%乾度
- B.飽和，98%乾度
- C.飽和，100%乾度
- D.過熱蒸汽

答案： B

科目/題號：293003/22 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7238 (P7239)

An open vessel contains 1.0 lbm of water at 120°F and standard atmospheric pressure. Which one of the following will be caused by the addition of 540 Btu to the water?

- A. The water temperature will increase to approximately 212°F; and less than 50 percent of the water will vaporize.
- B. The water temperature will increase to approximately 212°F; and more than 50 percent of the water will vaporize.
- C. The water temperature will increase to significantly higher than 212°F; and less than 50 percent of the water will vaporize.
- D. The water temperature will increase to significantly higher than 212°F; and more than 50 percent of the water will vaporize.

ANSWER: A.

一個開放的容器中含有標準大氣壓下 120°F 的水 1.0 lbm。下列何者會是添加 540 Btu 熱至水所造成的？

- A. 水的溫度將上升至約 212°F；少於 50% 的水會蒸發
- B. 水的溫度將上升至約 212°F；多於 50% 的水會蒸發
- C. 水的溫度將上升至顯著高於 212°F；少於 50% 的水會蒸發
- D. 水的溫度將上升至顯著高於 212°F；高於 50% 的水會蒸發

答案： A



科目/題號：293003/23 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7338 (P7339)

Dry saturated steam at 1,000 psia enters an ideal high pressure (HP) turbine and exhausts at 100 psia. The HP turbine exhaust then enters an ideal low pressure (LP) turbine and exhausts to a steam condenser at 1.5 psia. Which one of the following will cause the HP and LP turbines to produce more equal power? (Assume all pressures remain the same unless stated otherwise.)

- A. Reheat the HP turbine exhaust.
- B. Lower the steam condenser pressure.
- C. Remove the moisture from the HP turbine exhaust.
- D. Decrease the pressure of the dry saturated steam entering the HP turbine.

ANSWER: C.

壓力 1,000 psia 乾飽和蒸汽進入理想的高壓(HP)汽機，並以壓力 100 psia 排汽。高壓(HP)汽機排汽然後進入理想的低壓(LP)汽機，排放壓力 1.5 psia 的蒸汽至冷凝器內。下列何者會導致 HP 和 LP 汽機產生相近的功率？(除非有其他敘述，否則假設所有壓力仍相同)

- A. HP 汽機排汽再熱
- B. 降低冷凝器壓力
- C. 移除 HP 汽機排汽中的水分
- D. 減低進入 HP 汽機的乾飽和蒸汽壓力

答案： C

科目/題號：293003/24 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7438

A nuclear power plant experienced a reactor scram. One hour after the scram, core cooling is being accomplished by relieving dry saturated steam from the reactor vessel (RV). Water level in the RV is being maintained by an operating feedwater pump. Average fuel temperature is stable.

Given the following current conditions:

Core decay heat rate = 33 MW

RV pressure = 1,000 psia

Feedwater temperature = 90°F

For the above conditions, approximately what feedwater flow rate is needed to maintain a constant mass of water in the RV?

A. 100,000 lbm/hr

B. 125,000 lbm/hr

C. 170,000 lbm/hr

D. 215,000 lbm/hr

ANSWER: A.

一座核電廠歷經一次反應器急停。反應器急停一小時後，爐心冷卻係由釋放反應爐(RV)乾飽和蒸汽來達成。RV 水位由運轉一台飼水泵來維持。平均核燃料溫度穩定。

已知目前下列條件：

爐心熱衰變率= 33 MW

RV 壓力= 1,000 psia

飼水溫度= 90°F

依據上述條件，大約需要多少飼水流量率，以保持 RV 的恆定水量？

A. 100,000 lbm/hr

B. 125,000 lbm/hr

C. 170,000 lbm/hr

D. 215,000 lbm/hr

答案： A

科目/題號：293003/25 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7538 (P7539)

Subcooled water is flowing through a heat exchanger with the following parameters:

Inlet temperature = 75°F

Outlet temperature = 120°F

Mass flow rate =  $6.0 \times 10^4$  lbm/hr

What is the approximate heat transfer rate in the heat exchanger?

A.  $1.1 \times 10^6$  Btu/hr

B.  $2.1 \times 10^6$  Btu/hr

C.  $2.7 \times 10^6$  Btu/hr

D.  $3.3 \times 10^6$  Btu/hr

ANSWER: C.

次冷度水以下列參數流經熱交換器：

進口溫度= 75°F

出口溫度= 120°F

質量流量率=  $6.0 \times 10^4$  lbm/hr

熱交換器的熱傳率大約為多少？

A.  $1.1 \times 10^6$  Btu/hr

B.  $2.1 \times 10^6$  Btu/hr

C.  $2.7 \times 10^6$  Btu/hr

D.  $3.3 \times 10^6$  Btu/hr

答案： C

科目/題號：293003/26 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7619 (P7619)

A nuclear power plant is operating with the following main steam parameters at a partially open main turbine steam inlet valve:

Pressure = 1,000 psia

Quality = 100 percent

The main turbine steam chest pressure is 50 psia. Which one of the following describes the steam in the steam chest?

- A. Saturated, 98 percent quality
- B. Saturated, 99 percent quality
- C. Saturated, 100 percent quality
- D. Superheated

ANSWER: D.

一座運轉核電廠在部分打開主汽機進汽閥處主蒸汽參數如下：

壓力=1,000psia

乾度=100%

主汽機汽櫃壓力 50 psia。下列何者描述汽櫃蒸汽狀態？

- A.飽和，98%乾度
- B.飽和，99%乾度
- C.飽和，100%乾度
- D.過熱蒸汽

答案： D

科目/題號：293003/27 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7629 (P7629)

An open vessel contains 2.0 lbm of water at 200°F and standard atmospheric pressure. Which one of the following will be caused by the addition of 16.0 Btu to the water?

- A. The water temperature will increase, and all of the water will boil off.
- B. The water temperature will increase, and none of the water will boil off.
- C. The water temperature will rise to 212°F, and some of the water will boil off.
- D. The water temperature will rise to 216°F and some of the water will boil off.

ANSWER: B.

一個開放的容器中含有標準大氣壓下 200°F 的水 2.0 lbm。下列何者會是添加 16.0 Btu 熱至水所造成的？

- A. 水溫會增加，全部水會蒸發掉
- B. 水溫會增加，沒有水會蒸發掉
- C. 水溫將上升到 212°F，且部分水將蒸發掉
- D. 水溫將上升到 216°F，且部分水將蒸發掉

答案： B

科目/題號：293003/28 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7659 (P7659)

Dry saturated steam at 900 psia enters an ideal high pressure (HP) turbine and exhausts at 240 psia. How much heat, if any, must be added to the HP turbine exhaust to produce dry saturated steam at 240 psia?

- A. 0 Btu/lbm
- B. 11 Btu/lbm
- C. 111 Btu/lbm
- D. 155 Btu/lbm

ANSWER: C.

900 psia 的乾飽和蒸汽進入理想的高壓(HP)汽機，排汽壓力 240 psia。如果可能，必須添加多少熱量(Btu/lbm)到 HP 汽機排汽，以產生 240 psia 乾飽和蒸汽？

- A. 0 Btu/lbm
- B. 11 Btu/lbm
- C. 111 Btu/lbm
- D. 155 Btu/lbm

答案： C

科目/題號：293003/29 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7679 (P7679)

Dry saturated steam enters a turbine at 1000 psia with the turbine exhaust pressure at 2 psia. The efficiency of the turbine is 85 percent. What is the approximate specific work output of the turbine?

- A. 329 Btu/lbm
- B. 355 Btu/lbm
- C. 387 Btu/lbm
- D. 455 Btu/lbm

ANSWER: A.

壓力 1000 psia 乾飽和蒸汽進入汽機，且汽機以 2 psia 排汽。汽機效率為 85%。汽機的輸出比功大約為多少？

- A. 329 Btu/lbm
- B. 355 Btu/lbm
- C. 387 Btu/lbm
- D. 455 Btu/lbm

答案： A

科目/題號：293003/30 (2016 新增)

知能類：K1.23 [2.8/3.1]

序號：B7689 (P3277)

A nuclear power plant is operating at 100 percent power. Steam is escaping to atmosphere through a flange leak in a steam line that supplies the low pressure unit of the main turbine.

Given:

- Steam line pressure is 280 psia.
- Steam line steam temperature is 450°F.

What is the approximate temperature of the steam as it reaches standard atmospheric pressure?

- A. 212°F
- B. 268°F
- C. 322°F
- D. 378°F

ANSWER: D.

一座核電廠在 100% 的功率運轉。由主蒸汽管路供給至汽機的低壓段蒸汽，經由法蘭洩漏逃逸到大氣中。

已知：

- 蒸汽管路壓力 280 psia.
- 蒸汽管路之蒸汽溫度 450°F.

當蒸汽達到標準大氣壓時的溫度大約是多少？

- A. 212°F
- B. 268°F
- C. 322°F
- D. 378°F

答案：D