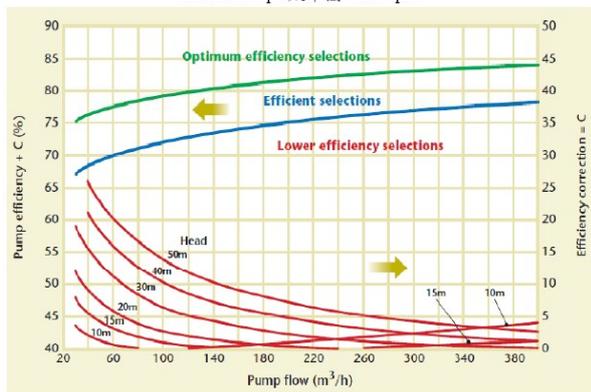


圖 9

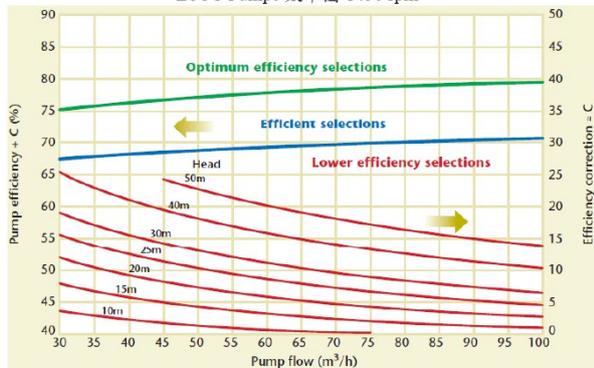
ESOB Pumps 效率圖 1450 rpm



ESOB Pumps : End suction pumps having their own bearings(聯軸式)

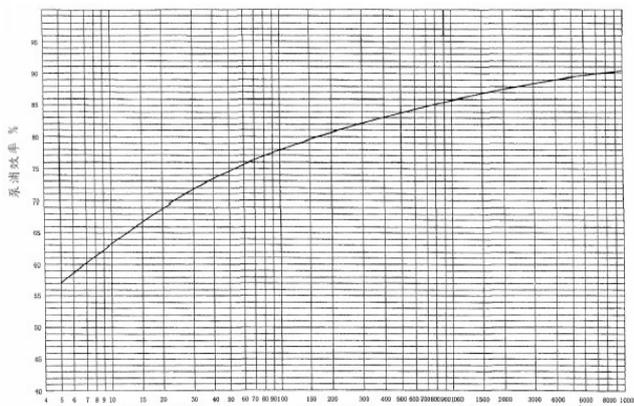
圖 11a[6]

ESCC Pumps 效率圖 1450 rpm



ESCC Pumps : End suction close coupled pumps(直結式)

圖 11c[6]



比速率 $N_s=120-210$ 之範圍不需修正 $N_s=3.65 \cdot ((Q)^{0.5}) \cdot RPM / ((H)^{0.75})$ 流量 M^3/h
單級端吸泵與雙吸泵的流量係指出口流量 $Q: M^3/sec$ $H:m$
單級清水離心泵效率曲線

圖 12a[5]

The efficiency of the pump shall be tested as described in this Annex and in accordance with EN ISO 9906-1999 class 2.

The mathematical description of the efficiency levels is based on the following equation¹:

$$\eta_{BOT} = -11.48 x^2 - 0.85 y^2 - 0.38 xy + 88.59 x + 13.46 y - C$$

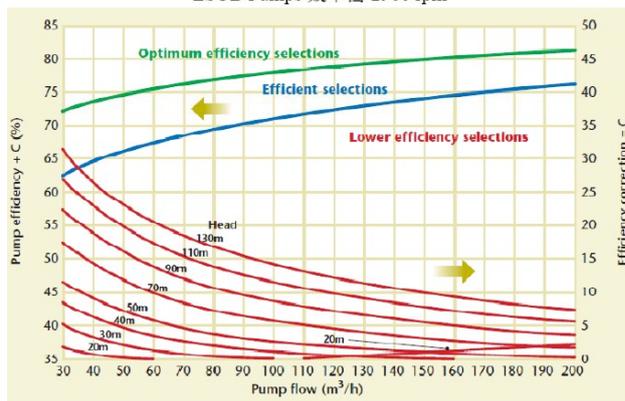
with
 $x = \ln(n_s)$ with n_s in $[min^{-1}]$
 $y = \ln(Q)$ with Q in $[m^3/h]$

$$N_s = rpm \cdot (m^3/sec)^{0.5} / (m)^{0.75}$$

上式中的比速率之流量計算單位= m^3/sec
 但在計算效率時的流量計算單位= m^3/hr

圖 10[11]

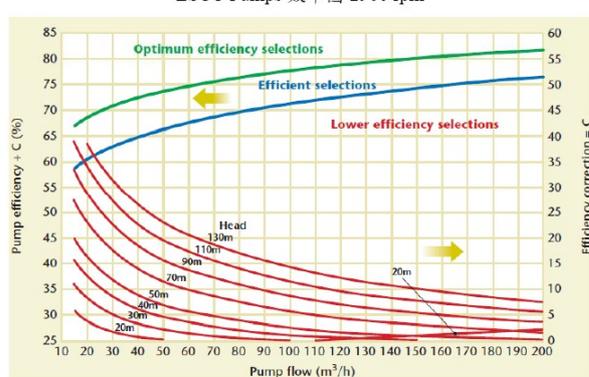
ESOB Pumps 效率圖 2900 rpm



ESOB Pumps : End suction pumps having their own bearings(聯軸式)

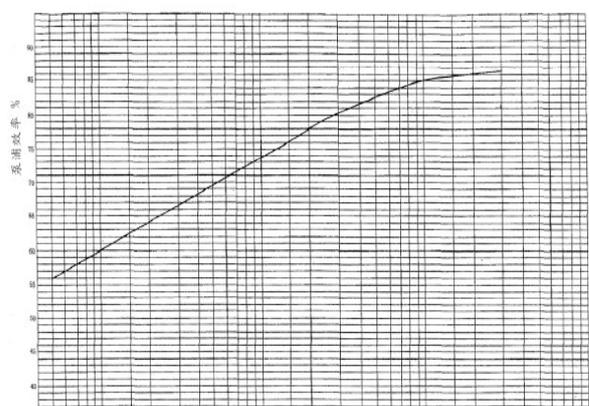
圖 11b[6]

ESCC Pumps 效率圖 2900 rpm



ESCC Pumps : End suction close coupled pumps(直結式)

圖 11d[6]



比速率 $N_s=3.65 \cdot ((Q)^{0.5}) / ((H)^{0.75})$ $Q:m^3/sec$ $H:m$
比速率 $N_s=120-210$ 範圍內不須修正 清水多級離心泵效率曲線

圖 12b[5]

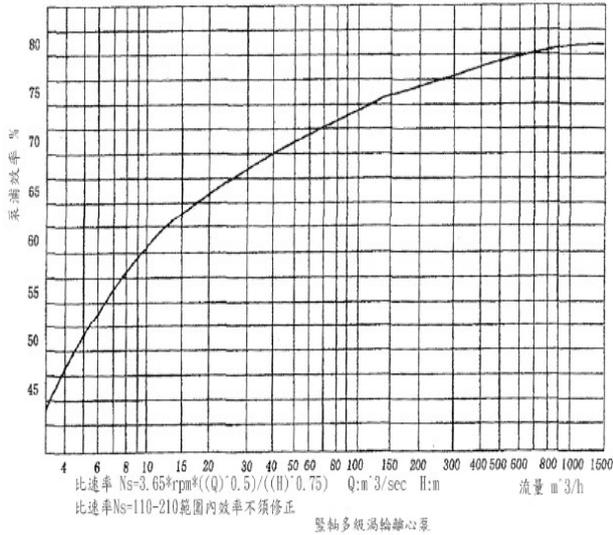


圖 12c[5]

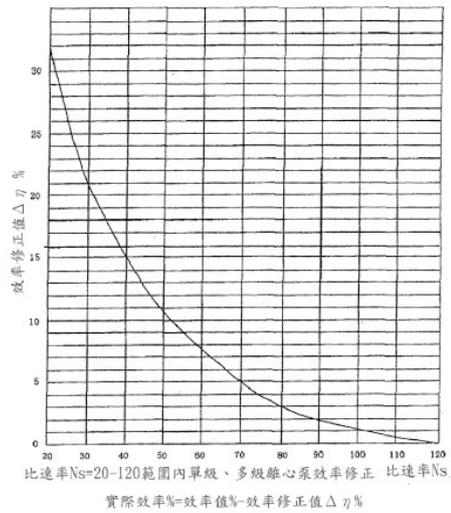


圖 12d[5]

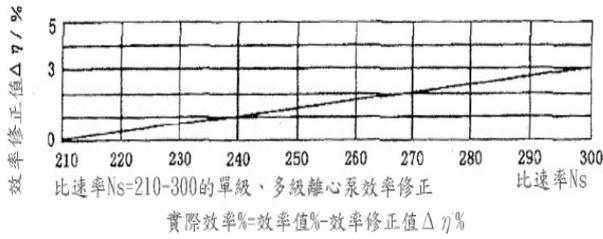


圖 12e[5]

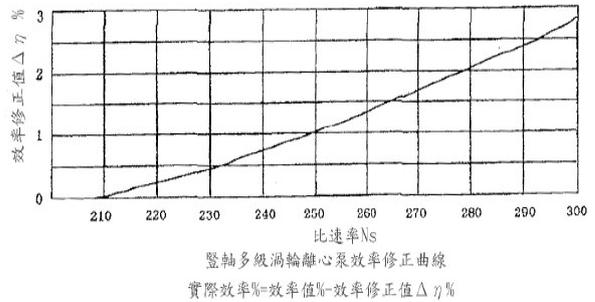


圖 12f[5]

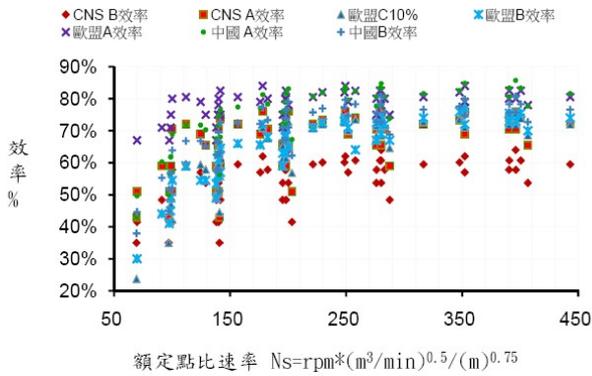


圖 13

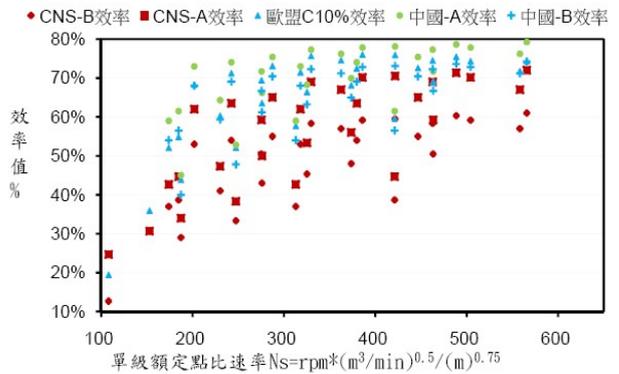


圖 14

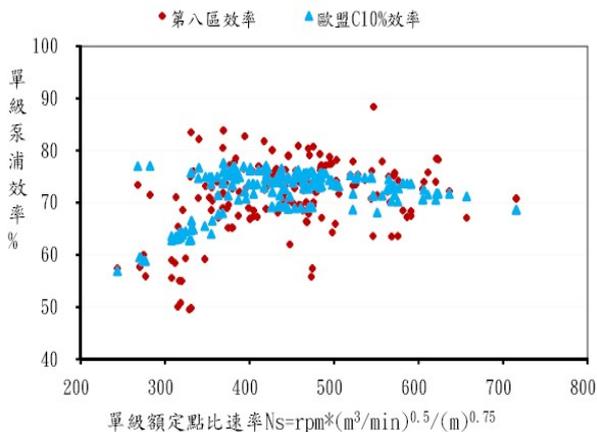


圖 15

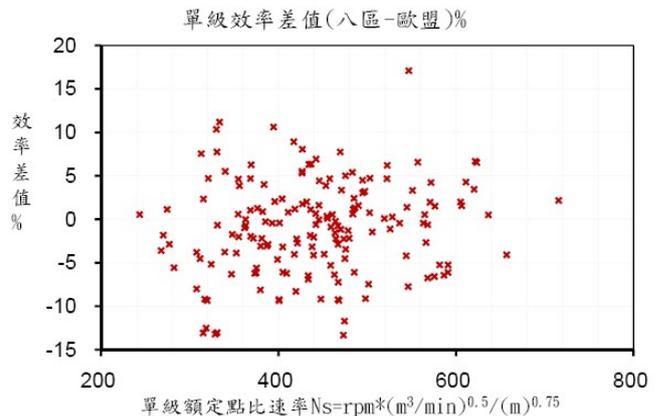


圖 16

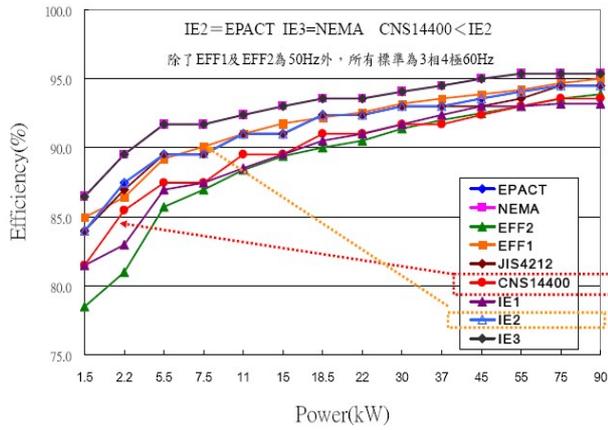


圖 17

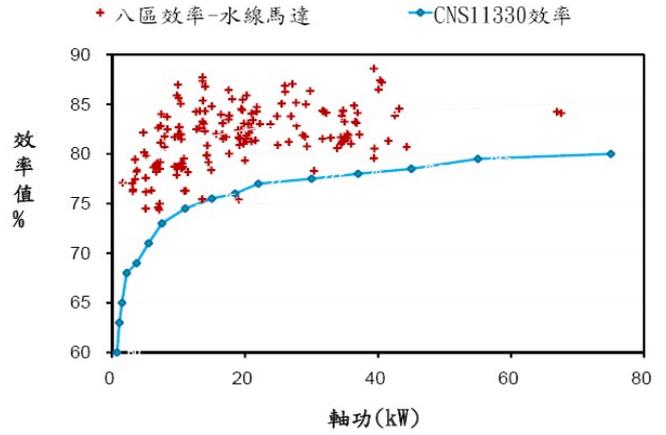


圖 18

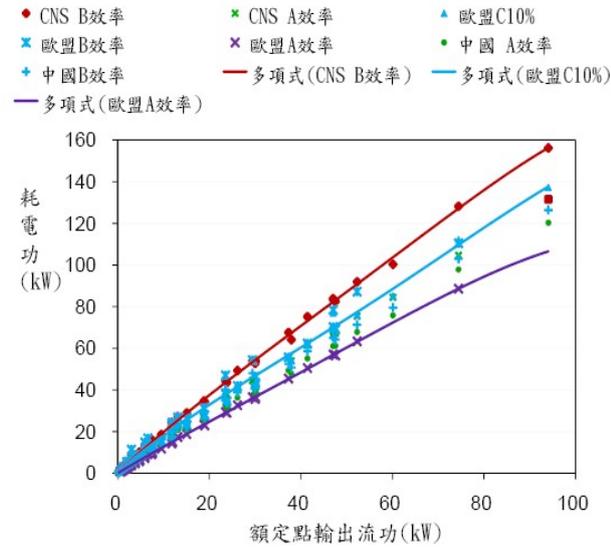


圖 19

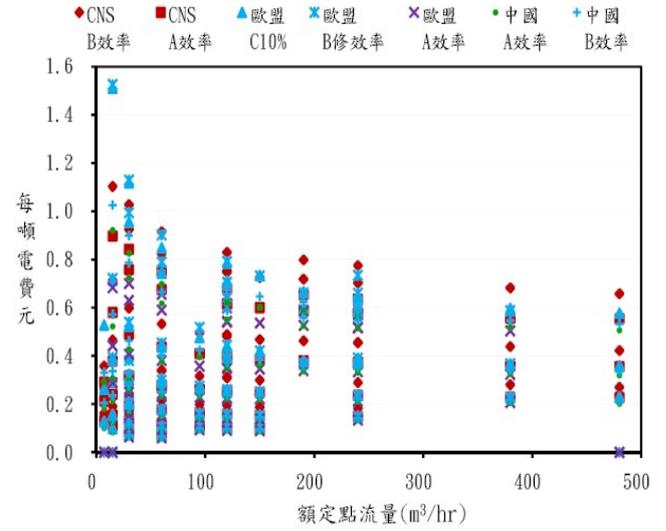


圖 20

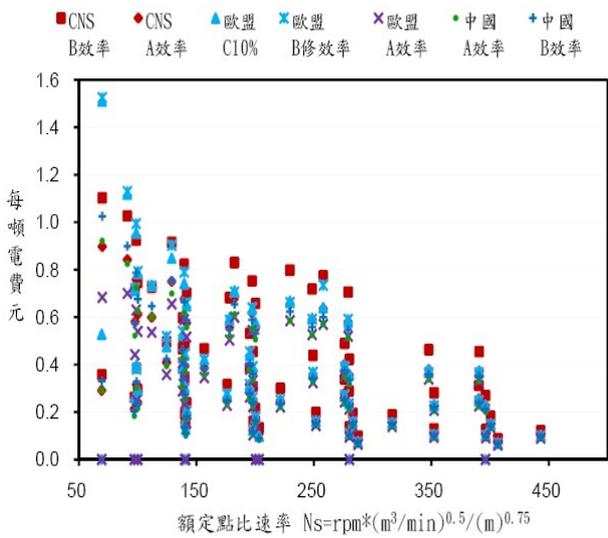


圖 21

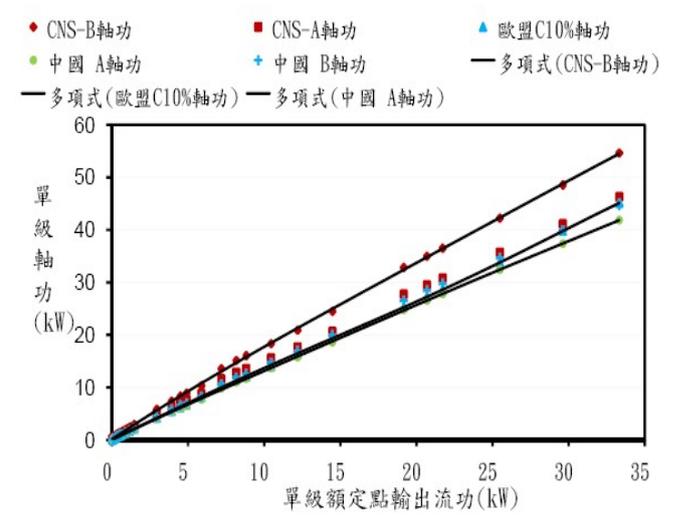


圖 22

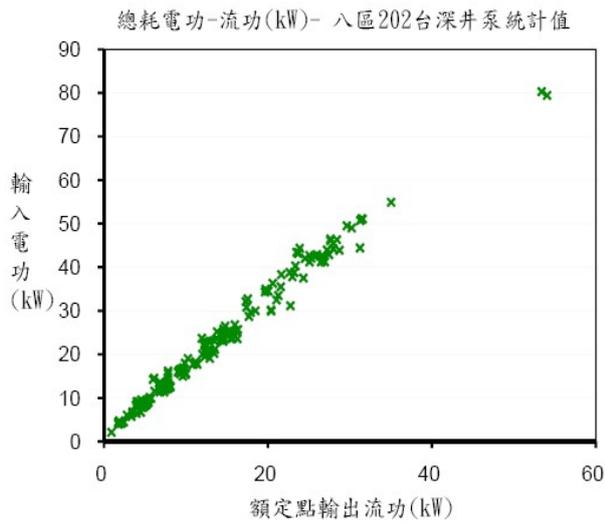


圖 23

八區原始數據並沒有提供深井系級數，其中級數係經驗判斷，藉以計算單級的流功與耗電功

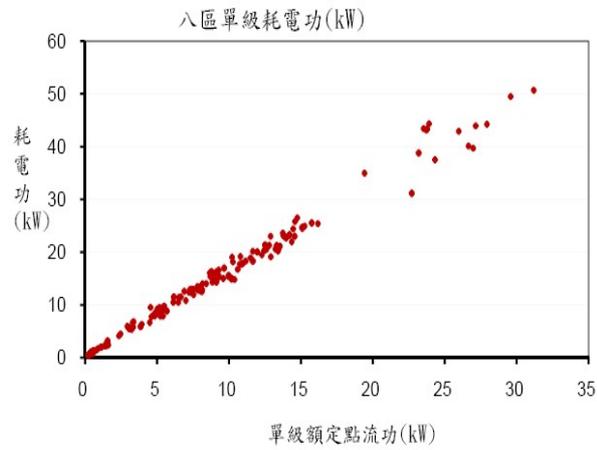


圖 25

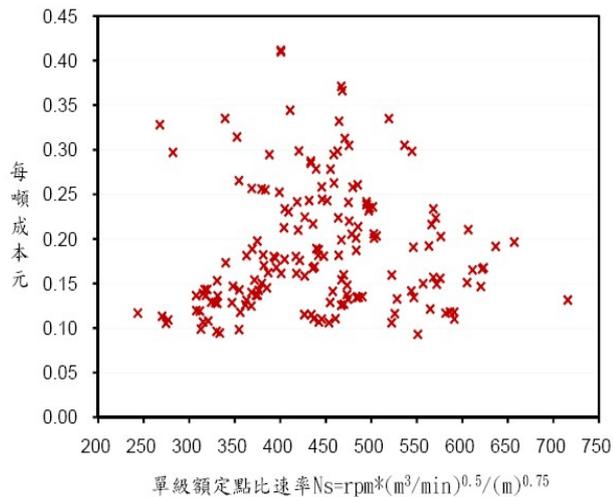


圖 27

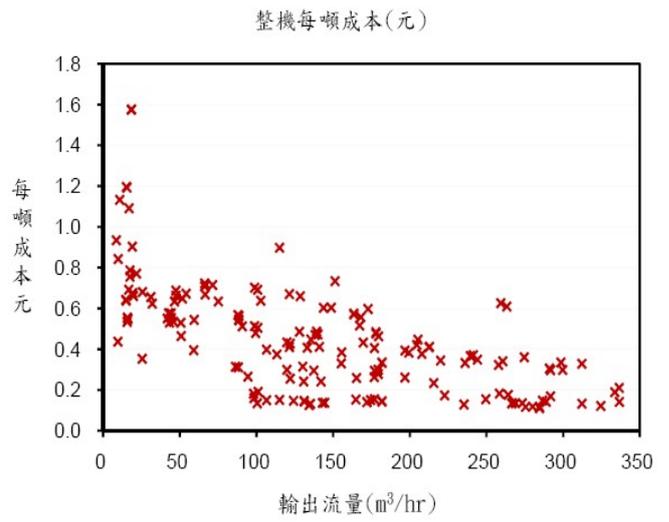


圖 24

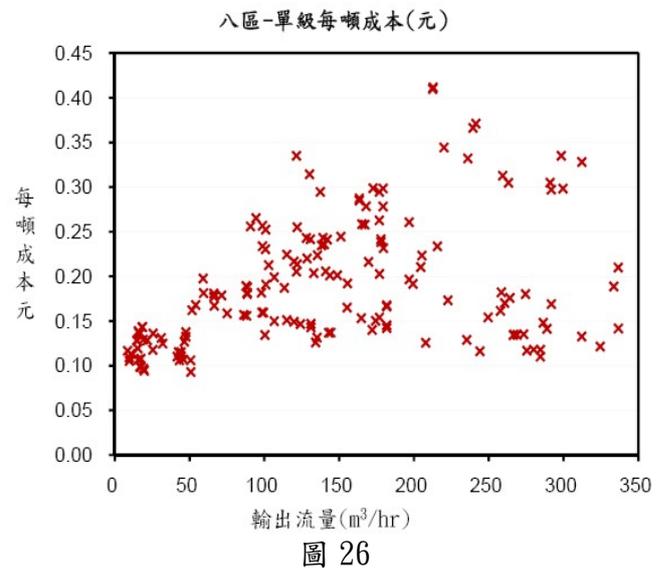


圖 26

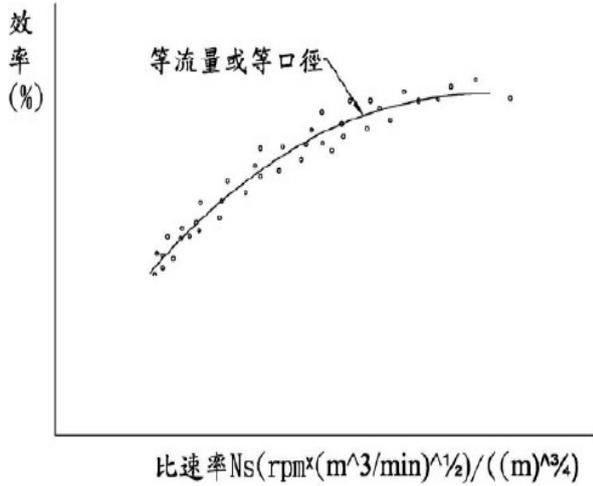


圖 28

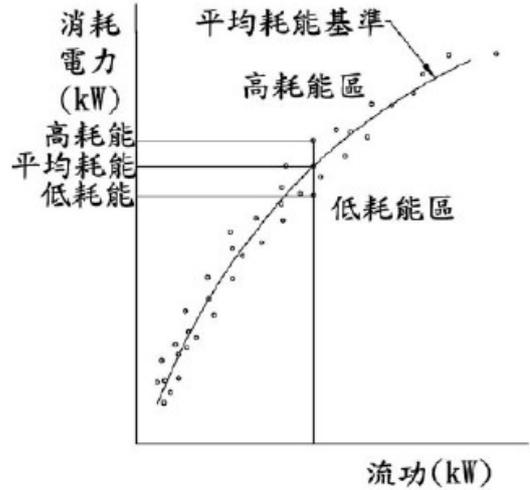


圖 29

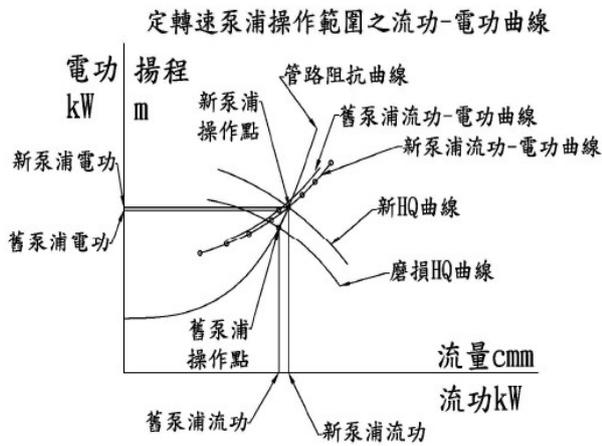
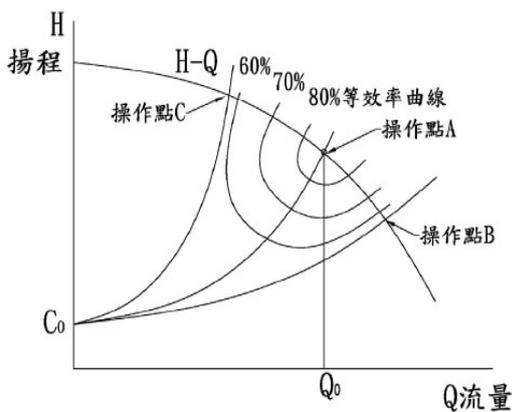


圖 30

高效率泵浦 VS. 低能源效率泵浦



低能源效率的風險——管路阻抗曲線計算的不確定

圖 32

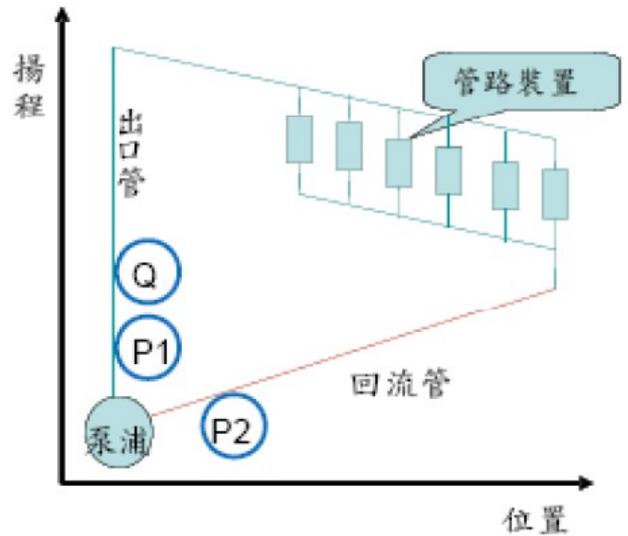


圖 31

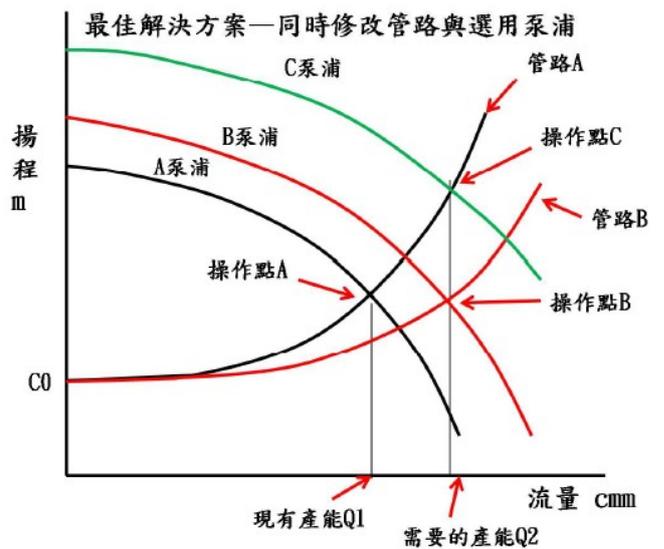


圖 33

不同轉速下的流量揚程曲線

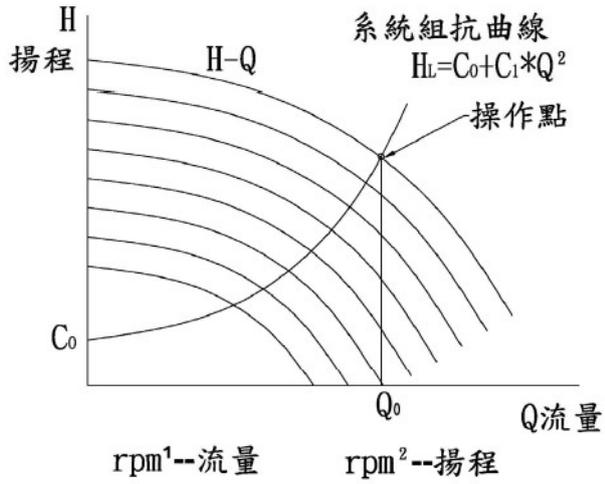


圖 34

定頻與變頻泵浦節能比較

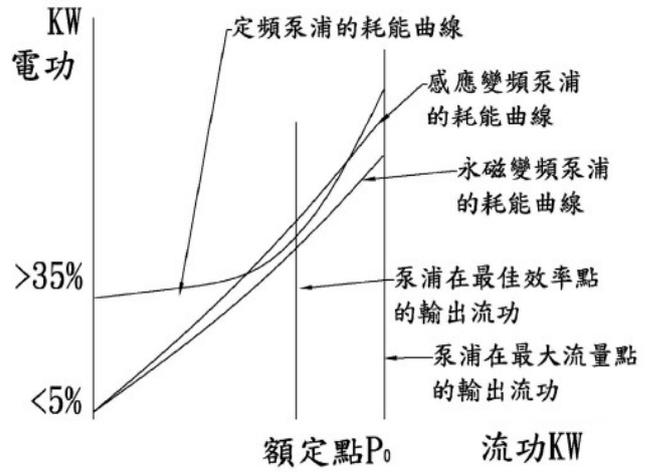


圖 35[17]

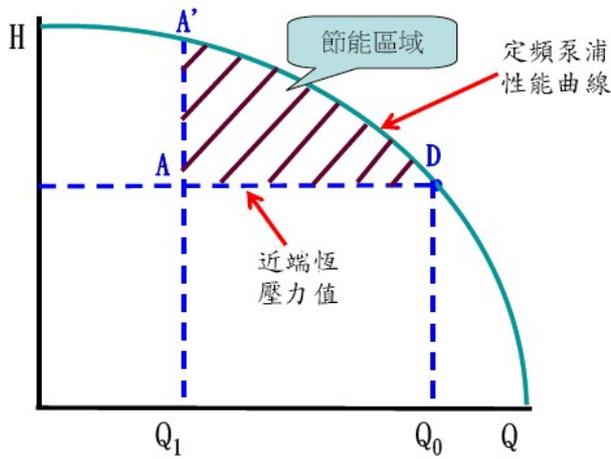


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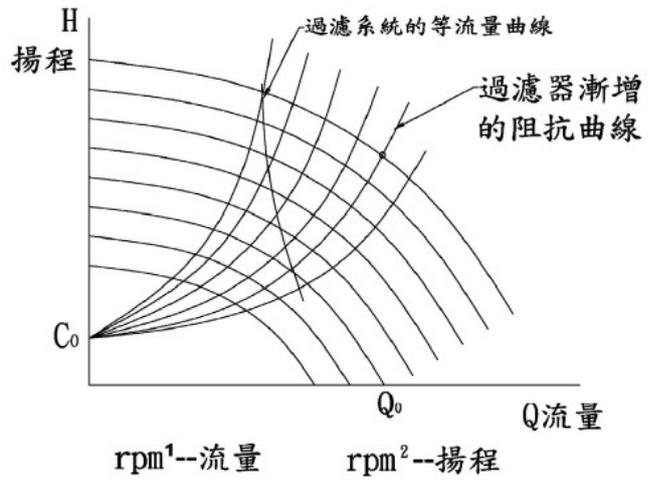


圖 37

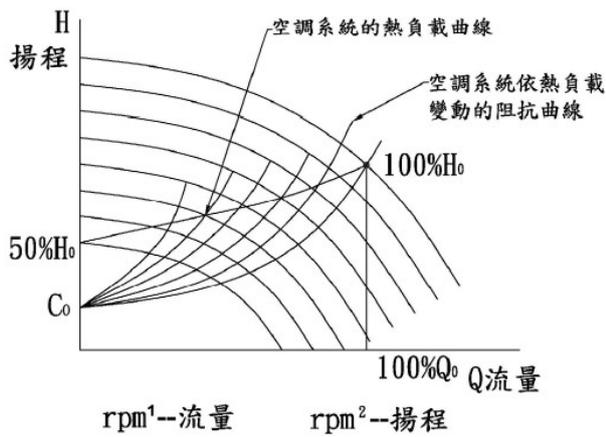


圖 38

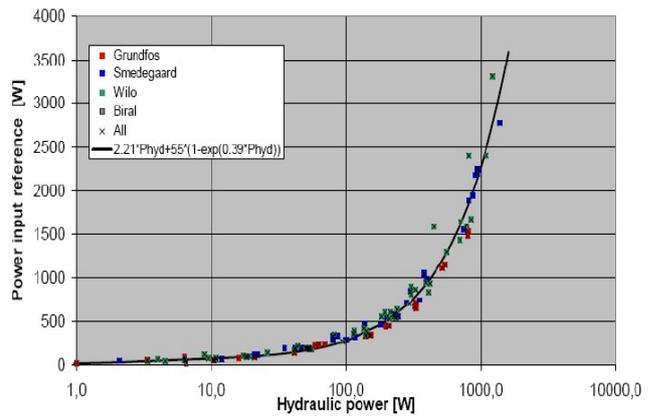


圖 39

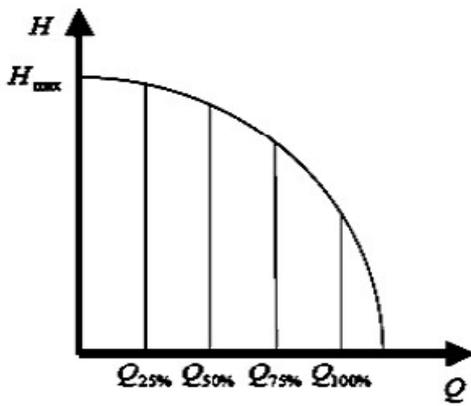


圖 40a

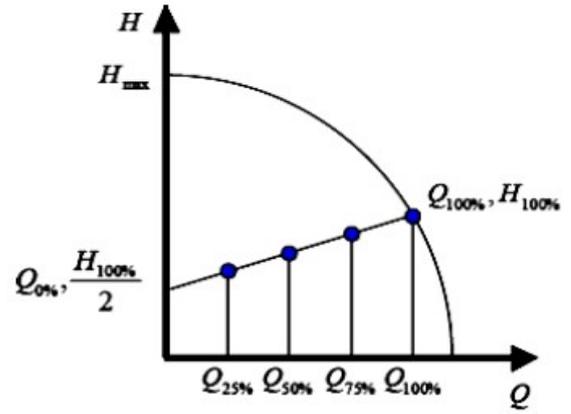


圖 40b

$$P_{ave} = P_{100\%} t_{100\%} + P_{75\%} t_{75\%} + P_{50\%} t_{50\%} + P_{25\%} t_{25\%}$$

P_{ref} = 以 $(H_{100\%} \cdot Q_{100\%})$ 以流功為基準取得耗能曲線之消耗電力功。

$$\text{耗能指標} = P_{ave} / P_{ref}$$

註：測試點的揚程必須大於負載曲線的揚程（使用相似定律換算法）

圖 40