

Exercice d'hydraulique n°9

$$1) P_{dc \text{ Aspi}} = 1,1 (L Q^4 \rho^3 P) \\ = 0,346 \text{ mCE}$$

$$P_{dc \text{ Ref}} = 4,349 \text{ mCE}$$

$$2) HMT = H_{geo} + P_{dc \text{ A}} + P_{dc \text{ R}} \\ = 60 + 0,346 + 4,349 \\ = 64,695 \text{ mCE}$$

$$3) P_R = Q \rho g h_{mt} \\ = \frac{72}{3600} \times 1000 \times 9,81 \times 64,695 \\ = 12693,2 \text{ W} = 12,69 \text{ kW}$$

$$P_{abs} = \frac{P_R}{\eta_{pompe}} = \frac{12,69}{0,78} = 16,27 \text{ kW}$$

$$P_{elec} = \frac{P_{abs}}{\eta_{elec \text{ moteur}}} = \frac{16,27}{0,92} = 17,68 \text{ kW}$$

$$4) 1 \text{ an} = 240 \text{ j} = 1920 \text{ h} \quad \text{et} \quad 1 \text{ kWh} = 0,07 \text{ € HT} \\ P_{elec} = 17,68 \text{ kW}$$

$$\text{Coût elec} = 2376,19 \text{ € HT}$$

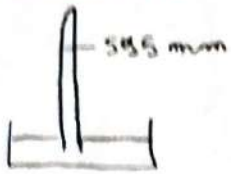
$$\left\{ \begin{array}{l} l = 360 \text{ m} \\ R_{eq} = 0,5 \text{ mm} \\ D = 0,25 \text{ m} \\ L = 1,40 \cdot 10^{-3} \\ H = 1,96 \\ N = 5,19 \end{array} \right.$$

$$Q = 72 \text{ m}^3 \text{ h}^{-1} \\ = \frac{72}{3600} \text{ m}^3 \text{ s}^{-1}$$

$$\left\{ \begin{array}{l} l = 1840 \text{ m} \\ R_{eq} = 0,1 \text{ mm} \\ D = 0,2 \\ L = 1,1 \cdot 10^{-3} \\ H = 1,89 \\ N = 5,01 \end{array} \right.$$

$$\left\{ \begin{array}{l} Q = \frac{72}{3600} \text{ m}^3 \text{ s}^{-1} \\ \rho = 1000 \text{ kg m}^{-3} \\ g = 9,81 \text{ m s}^{-2} \\ h_{mt} = 64,695 \text{ mCE} \end{array} \right.$$

Calcul du NPSH



$$P = \rho g h \text{ Pa}$$

$$= 13600 \times 9,81 \times 0,595$$

$$= 79382,5 \text{ Pa}$$

$$= 0,79 \text{ bar} = 8,06 \text{ mCE}$$

$$= 790 \text{ mbar}$$

Eau à 60°C

$$\hookrightarrow 983,2 \text{ kg m}^{-3}$$

$$\hookrightarrow P_{\text{sat}} = 200 \text{ mbar}$$

$$= 2,04 \text{ mCE}$$

$$\text{NPSH} = 8,06 - 2,04 - 3 - 0,6$$

$$= 6,02 - 3 - 0,6$$

$$= 3,02 - 0,6$$

$$= 2,42 \text{ mCE}$$