Problem No. B1 (Enthalpy of Compressed Liquid)

Determine the specific enthalpy of liquid water at 100ºC and 15 MPa by:

a) using compressed liquid tables
b) approximating it as a saturated liquid
c) using the correction:

$$h_{@\ p,T} \approx h_{f@T} + v_{f@T}\,(p - p_{sat\ @\ T}).$$

Problem No. B2

Consider a steam power plant operating on the simple ideal Rankine cycle. The steam enters the turbine at 3 MPa and 350ºC and is condensed in the condenser at a pressure of 75kPa. Determine the thermal efficiency of this cycle.

Hint: In state 2 $w^{*}_{pump\ in} = v_1(p_2 - p_1)$.

Homework:

Problem No. B2b

Consider a steam power plant operating on the simple ideal Rankine cycle. The steam enters the turbine at 3 MPa and 350ºC and is condensed in the condenser at a pressure of 10kPa. Determine the thermal efficiency of this cycle.

Problem No. B2c

Consider a steam power plant operating on the simple ideal Rankine cycle. The steam enters the turbine at 3 MPa and 600ºC and is condensed in the condenser at a pressure of 75kPa. Determine the thermal efficiency of this cycle.

Problem No. B2d

Consider a steam power plant operating on the simple ideal Rankine cycle. The steam enters the turbine at 15 MPa and 600ºC and is condensed in the condenser at a pressure of 75kPa. Determine the thermal efficiency of this cycle.