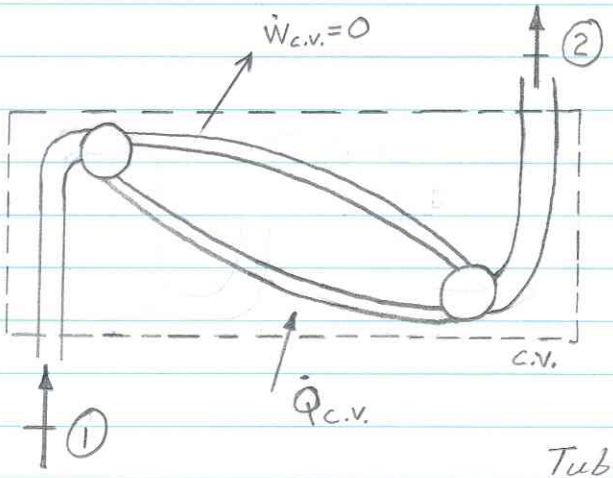
Example: Problem 6.65, Steam Generator – Boiler

- purpose: to boil (change the phase) a liquid and produce vapor



Assumptions:

1. Steady state, steady flow
2. $\dot{W}_{c.v.} = 0$
3. $\Delta PE = 0$
4. Tube diameter is constant.

Tube diameter $D = 30$ mm

State 1 compressed liquid water

$P_1 = 10$ MPa

$T_1 = 30°C$

$\dot{V}_1 = 3$ L/s

State 2

$P_2 = 9$ MPa

$T_2 = 400°C$

Determine the rate of heat transfer to the water.