Flow Exergy HW#2

Given:
Reconsider the superheat power cycle with states as indicated in Flow Exergy HW#1. Again the environment is at T_0 = 300 K and P_0 = 100 kPa. In addition the mass flow rate of the steam is 2.6 x 10^5 kg/h.

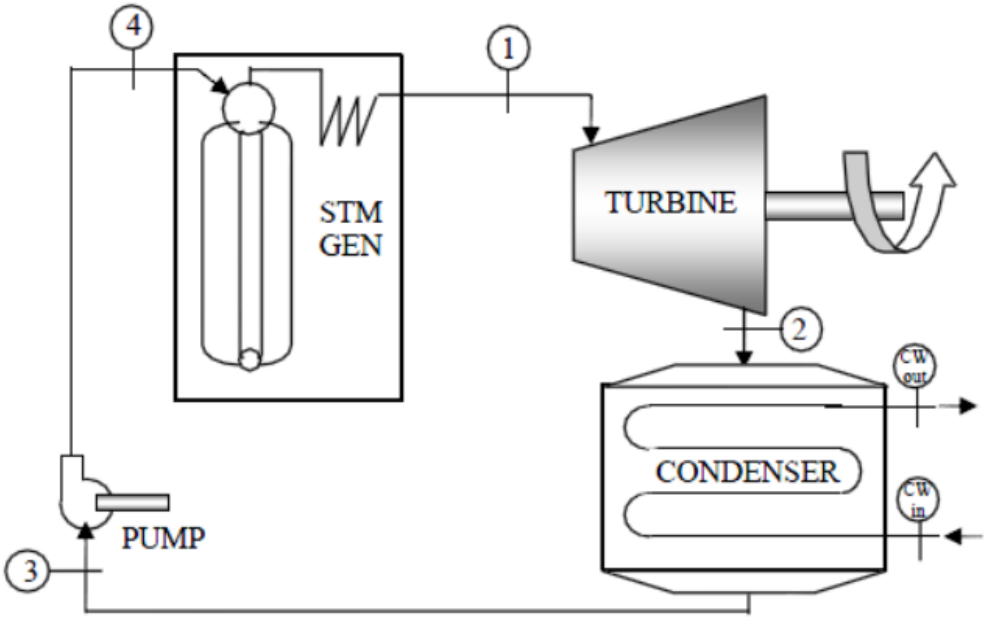

Figure 1: Cycle components

Determine:
(a) the *net* rate of *energy* increase of the steam passing through the steam generator.
(b) the *net* rate *exergy* increase of the steam passing through the steam generator.
(c) the rate exergy destruction in the turbine.
(d) the required mass flow rate of the cooling water.
(e) the *net* rate *energy* exits the plant with the cooling water.
(f) the *net* rate *exergy* exits the plant with the cooling water.

Solutions: Standard assumptions can be applied. Each component is steady-state and changes in kinetic and potential energies can be neglected. Turbomachinery can be assumed adiabatic; and pressure drops in the heat exchangers can be neglected.