Advanced Energetics

Exercise 02: Computing the minimum energy requirement by applying the problem table method

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PROCESS DESCRIPTION

Figure 1 shows a process for which the minimum energy requirement has to be calculated.
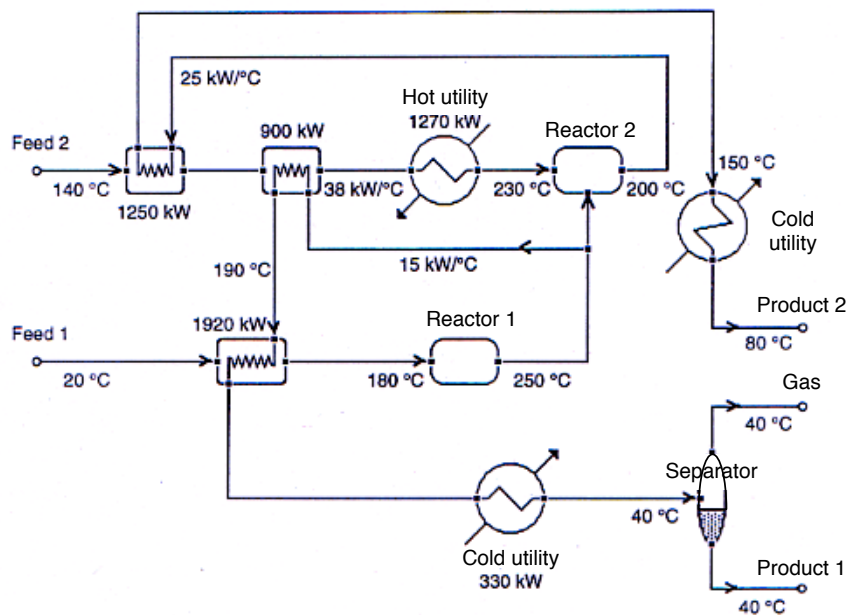

Figure 1: process flowsheet

OPERATING COSTS

- Natural gas: 0.09 CHF/kWh

- Water: 0.01 CHF/ m^3

USEFUL VALUES

- Operating time 8000 h/year

- Cooling water inlet: 25°C , outlet: 35 °C

QUESTIONS

1. Compute actual energy bill;

2. Calculate MER (minimum energy requirements) and draw the composite curves;

3. Calculate possible energy savings;

4. Compute new energy bill (considering operating costs only);

5. Identify penalizing heat exchangers;

NOTE: Use different values for the ΔT_{min}.