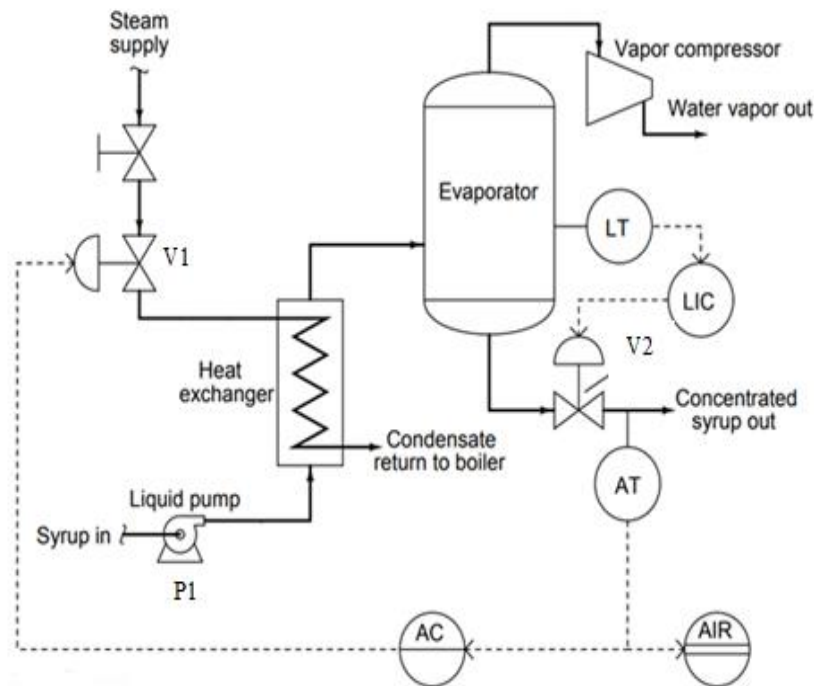


In the following process, maple syrup is heated as it passes through a steam heat exchanger, then enters an evaporator where the water boils off. The purpose of this is to raise the sugar concentration of the syrup, making it suitable for use as a food topping. A level control system (LT, LIC) maintains constant syrup level inside the evaporator, while an analytical control system (AT, AIR, and AC) monitors the sugar concentration of the syrup and adjusts steam flow to the heat exchanger accordingly.

Use HAZOP methodology and identify potential causes, potential consequences and potential action for the following:

- i. No flow (e.g., no flow into the heat exchanger)
- ii. More flow
- iii. Low temperature
- iv. High pressure



LT: level transmitter  
 LIC: level indicator controller  
 AC: analytical controller  
 AT: the syrup analyzer