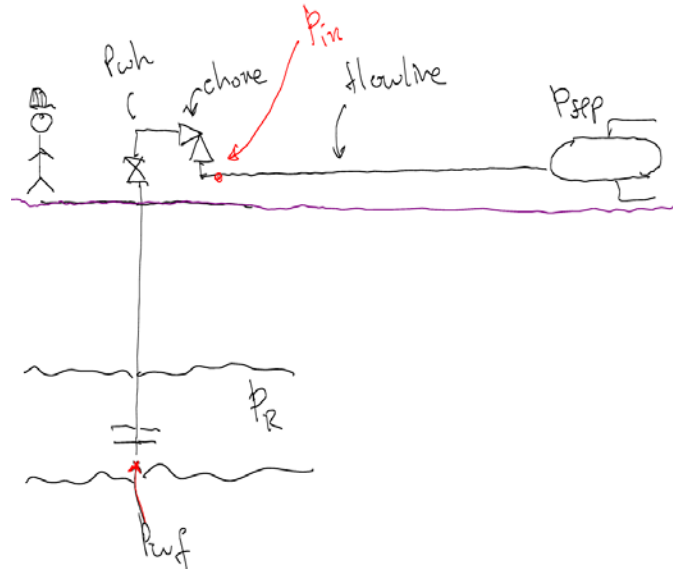**SOLVE THIS PROBLEM USING THE EXCEL FILE PROVIDED**

PROBLEM 3 (15 POINTS).

Consider the dry gas production system shown in the figure below:

Assume that the wellhead choke is 20% closed and that the system is producing a dry gas rate of 2.0 E6 Sm³/d.

Task (15 POINTS): The engineering team wants to increase the well rate by opening the wellhead choke, but this might take time since the well is located in a remote location with difficult access and the choke is manually actuated. Instead of opening the choke, a member of the team has suggested to route the production of the well to another separator that has lower pressure (20 bara). **Assess this idea and provide your recommendation**.

Additional information:

- The choke critical pressure ratio is 0.5
- Neglect the pressure drop in the flowline, i.e. assume $p_{in} = p_{sep} = 40$ bara
- Use the following equations:

Inflow equation:

$$q_{\bar{g}} = C_R \cdot \left(p_R^2 - p_{wf}^2 \right)^n$$

With

$C_R = 104$ Sm³/d/bar^2n

n= 0.9

$p_R = 304$ bara

Tubing equation:

$$q_{\bar{g}} = C_T \cdot \left(\frac{p_{wf}^2}{e^S} - p_{wh}^2 \right)^{0.5}$$

$C_T = 4.41$ E4   Sm³/d/bar

S = 0.31