Basic Engineering Problem for LPG Column:

1. The feed to LPG column is a saturated liquid mixture of hydrocarbons at a flow of 27,682 kg/hr at a pressure of 10.5 kg/cm^{2}g. The feed composition is given as per below table.
2. The column is operating at a pressure of 10 kg/cm2g with a pressure drop of 0.1 kg/cm^2 and the overhead composition is as per below table. The recovery of LPG in overhead is 73.33%. The column reflux drum is located at a height of 10 m.
3. Pump Discharge pressure is to be maintained at 25 kg/cm^{2}g to meet the storage pressure requirement, for preparation of datasheet it is required to calculate the pump NPSHA & Power requirement.
4. The pipe run length from pump discharge to tanks is 500 m, perform line sizing to limit the pressure drop to max. of 0.5 kg/cm^2
5. The liquid LPG obtained from column top at a temperature of 52.8 deg. C is to be stored in storage tank at a temperature of 35 deg. C, find out the utility requirement to cool the process side to 35 deg. C and prepare a basic TEMA sheet with available process parameters. Exchanger tube side inlet is cooling water at 2.5 kg/cm^{2}g pressure and 30 deg. C. and outlet temperature is restricted to 40 deg. C.

Composition on Molar basis:

	FEED	DISTILLATE
Composition		
Propane	0.3302	0.4173
i-Butane	0.2142	0.2707
n-Butane	0.2471	0.3105
i-Pentane	0.1005	0.0014
n-Pentane	0.1080	0.0001

PFD: