RIL GLYCOL PLANT

Group Number: 3

Nency Badiyani	23PGAI0018
Kashyap Shekhada	23PGAI0102
Vishnuvardhan Chandrappagari	23PGAI0100
Ahmedraza Sharif	23PGAI0120
Shubham Gupta	23PGAI0123

Questions:

1. Assume that the EO% is 9%. Based on this assumption, formulate the problem as a linear programming problem to maximize the profit.

   Rs3455.091K is our maximized profit, when formulated as linear programming problem.

   Where K = 1000.

   We are assuming that our factory is running 350 days and 15 days are for maintenance purpose according to our stated assumptions.

2. Solve the problem using excel or LINDO and answer the following questions:

   a. What is the amount of AEO to be used in Glycol Section

      522.9109K is the amount of AEO being used in Glycol Section.

   b. What is the amount of AEO to be used in EO Purification

      77.089 tons of AEO in EO Purification is used.

c. What is the quantity of water to be added to Glycol Section

2149.73 tons of water added to Glycol Section

d. How much of is MEG Produced in Glycol Section

In Glycol Section, 187.04 tons of MEG is produced

e. How much of TEG is Produced in Glycol Section

1.98 tons of TEG produced in Glycol Section

f. How much of DEG is Produced in Glycol Section

35.106 tons of DEG produced

g. How much of DEG is used for conversion to TEG in DTT Unit

35.106 tons of DEG used for conversion process in DTT Unit

h. What is the amount of DEG sold at Rs. 27,000 per ton

15 Tons per day of DEG sold at Rs 27,000 per ton up to the current demand

i. What is the amount of DEG Sold at Rs. 15,000 per ton

20.106 Tons per day of DEG Sold at Rs 15,000 per ton

⇒ DTT section not run at full capacity.

Plant load for EOE has to be maintained to 283.08 TPD

Max (Profit)

EO % = 9% (Ethylene oxide/Glycol)

(Ethylene oxide Equivalents) Max (EOE) ≤ 80000 TPA (Tonnes per Annum) ≈ 219.18

(Pure ethyle oxi) Max (PEO) ≤ 10000 TPA 27.39

(Mono ethyle glycol) Max (MEG) ≤ 100000 TPA 273.97

(Di ethyle glycol) Max (DEG) ≤ 9900 TPA 27.123

(Tri Ethyle glycol) Max (TEG) ≤ 560 TPA 1.534

~~PEO ⇒ 72 TPD~~

AEO = 600 TPD

Glycol Bleed Recovery

MEG = 19.68 TPD → Sold

DEG = 1.92

EOE = 15.5664 TPD ≈ 18.185

Max (PEO) ≤ 72 TPD, TEG ≤ 30 TPD

DEG ≤ 15 TPD

EO/water = 9% / 100

360 MEG = 600 AEO

0.6

AEO + Water vapour ≤ 3168 TPD

<

24 × 365 DEG + PEO = TEG

$$EO\% = \frac{0.46\ \cancel{PEO}\ AEO}{\text{Total quantity mix (AEO \& W)}}$$

$$(0.46\,PEO + 0.54\,other + W)$$

$\frac{MEG}{DEG} = 9.45554$; $\frac{DEG}{TEG} = 12.97892$

%	MEG/DEG	DEG/TEG	MEG/TEG
	9.45554	12.97892	122.722697

1 Ton MEG = 0.71
1 DEG = 0.83
1 TEG = 0.88

Glycol
- MEG – 360 TPD
- TEG
- DEG

DEG + PEO

PEO DEG ⇒ ~~DEG~~ + Heavy

0.466T + 0.774 ⇒ 1 + 0.24

260.96 433.44 560

Full Capacity

100 EO → 46 AEO → 21.16 PEO

1304.348 TPD

600 TPD → 276 TPD

EO → EOE 283.08 TPD

Bleed
- MEG – 19.68 TPD
- DEG – 1.92 TPD
- EOE – 15.5664 TPD

37.1664 TPD

PEO	DEG	TEG
Max 72		154.5