Hydrogen Recycle in a Refinery.

Hydrogen is a critical commodity in a petroleum refinery. Alves and Towler (2002) describe a case study involving the optimization of a hydrogen distribution system within a refinery, and it is comprised of four sinks and six sources. The pertinent information regarding these sinks and sources is given in Table (1) and (2).

In this case study fresh hydrogen is available with a 5% mol/mol impurity content, Identify the target for minimum usage of fresh hydrogen and minimum discharge of gaseous waste.

Table 1. Sink data for hydrogen problem (Alves & Towler 2002)

Sinks	Flow (mol/s)	Maximum Inlet Impurity concentration mol%	Load (mol/s)
1	2495	19.39	483.8
2	180.2	21.15	38.1
3	554.4	22.43	124.4
4	720.7	24.86	179.2

Table 2: Source data for the hydrogen problem

Sources	Flow mol/s	Impurity conc mol%	Load (mol/s)
1	623.8	7	43.7
2	415.8	20	83.2
3	1801.9	25	450.5
4	138.6	25	34.7
5	346.5	27	93.6
6	457.4	30	137.2

Sink data

Flow
mol/s
2495

2495 + 180.2 = 2675.2

2675.2 + 554.4 = 3229.6

3229.6 + 720.7 = 3950.3

Load
mol/s
483.8

483.8 + 38.1 = 521.9

521.9 + 124.4 = 646.3

646.3 + 179.2 = 825.5

Source data.

Flow (mol/s)
623.8

623.8 + 415.8 = 1039.6

1039.6 + 1801.9 = 2841.5

2841.5 + 138.6 = 2980.1

2980.1 + 346.5 = 3326.6

3326.6 + 457.4 = 3784

Load (mol/s)
43.7

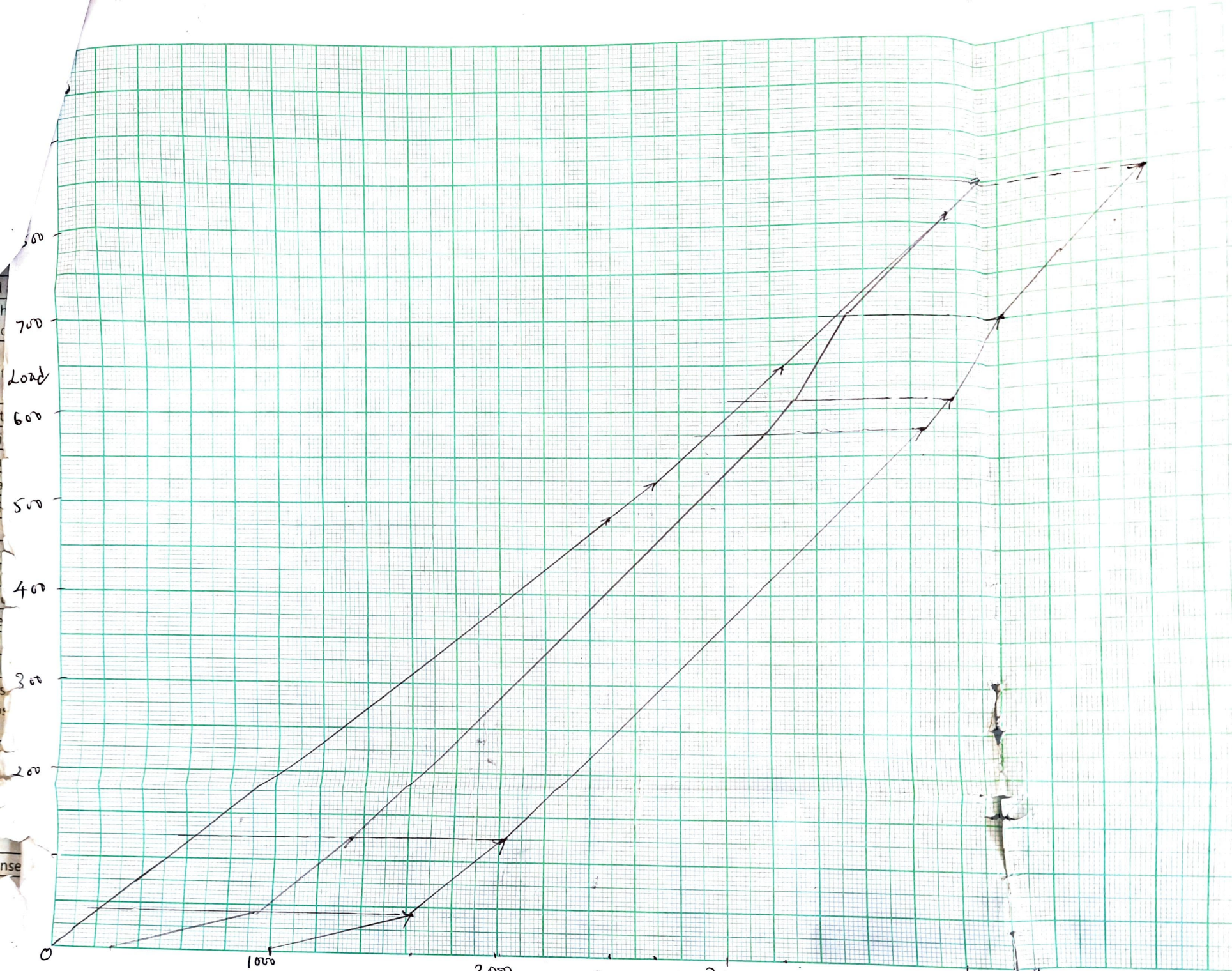
43.7 + 83.2 = 126.9

126.9 + 450.5 = 577.4

577.4 + 34.7 = 612.1

612.1 + 93.6 = 705.7

705.7 + 137.2 = 842.9



, Programmes Organized, Forum Activities (sports, lecture
s, competitions, paper presentations, cultural activities)

Sri DGP