NTNU – Trondheim
Norwegian University of
Science and Technology

TPG 4135 Production Technology

Field Processing and Systems

Postdoc Mariana Díaz
01 /21/2019

Plan

Week Nr.	Week starts	Topic	Lecturer
2	07.jan.19	Course introduction. Overview of field processing. Product specs.	MS
3	14.jan.19	Oil-Gas sep (VLE), Rachford Rice, EOS calculations.	MS
4	21.jan.19	Oil-Gas Separation . Introduction to process simulation (Hysys).	MD
5	28.jan.19	Oil-Gas Separation. Bubble and droplet dynamics. Separation capacity.	MD
6	04.feb.19	Oil-water separation	MD
7	11.feb.19	Water content in Natural gas. Gas dehydration (TEG)	MS
8	18.feb.19	Gas dehydration (TEG)	MS
9	25.feb.19	Pressure calculations in pipe (single and two-phase)	HA
10	04.mar.19	Pressure calculations in pipe (single and two-phase)	HA
11	11.mar.19	Heat transfer, pipe calculations, heat exchangers	HA
12	18.mar.19	Heat transfer, pipe calculations, heat exchangers	HA
13	25.mar.19	Pumping	MD
14	01.apr.19	Pumping/Compression	MD/HA
15	08.apr.19	Compression	HA
16	15.apr.19	Påskeferie	-
17	22.apr.19	Compression (probably one lecture only)	HA
18	29.apr.19	Spørretime	All

Monday: 12:15-14:00 (P12 PTS)
Tuesday: 14:15-16:00 (VG13 NHL)
Exercise: 16:15-18:00

Exam: 29.05, 15:00-19:00

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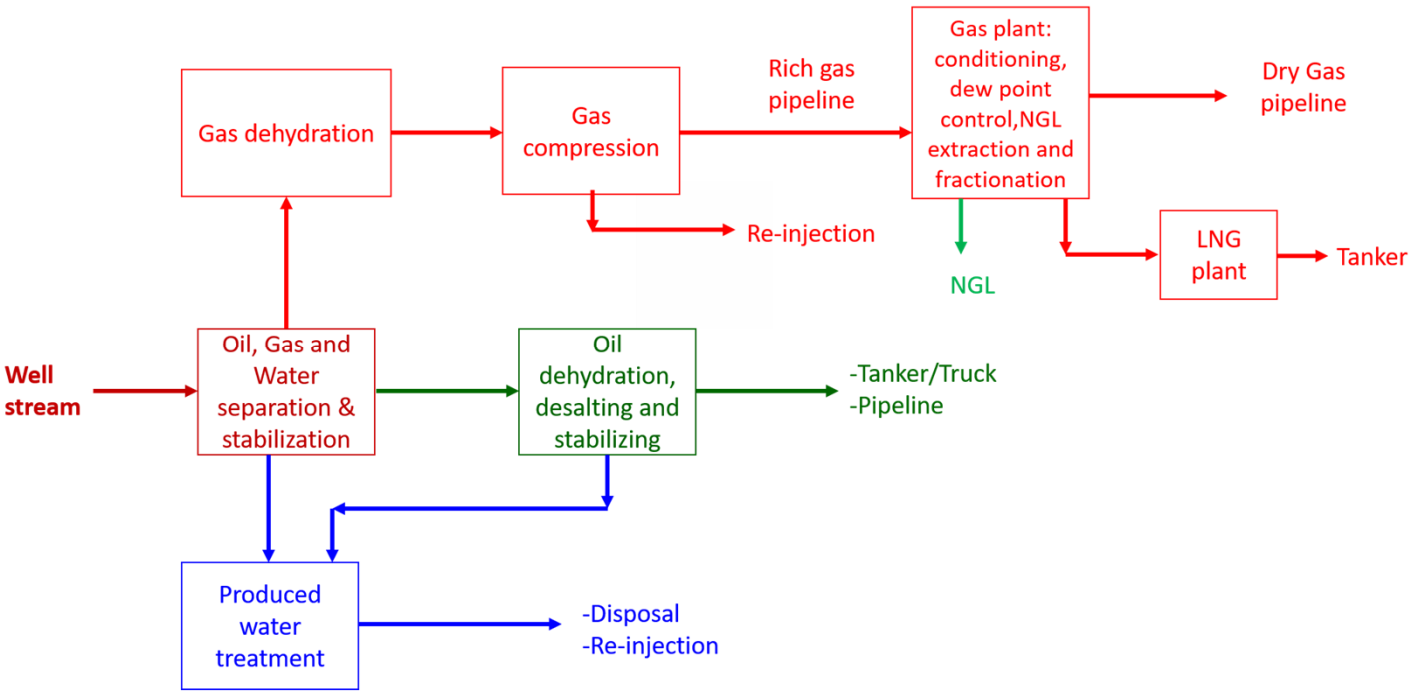
Processing Block Diagram



Stanko Milan (2018)

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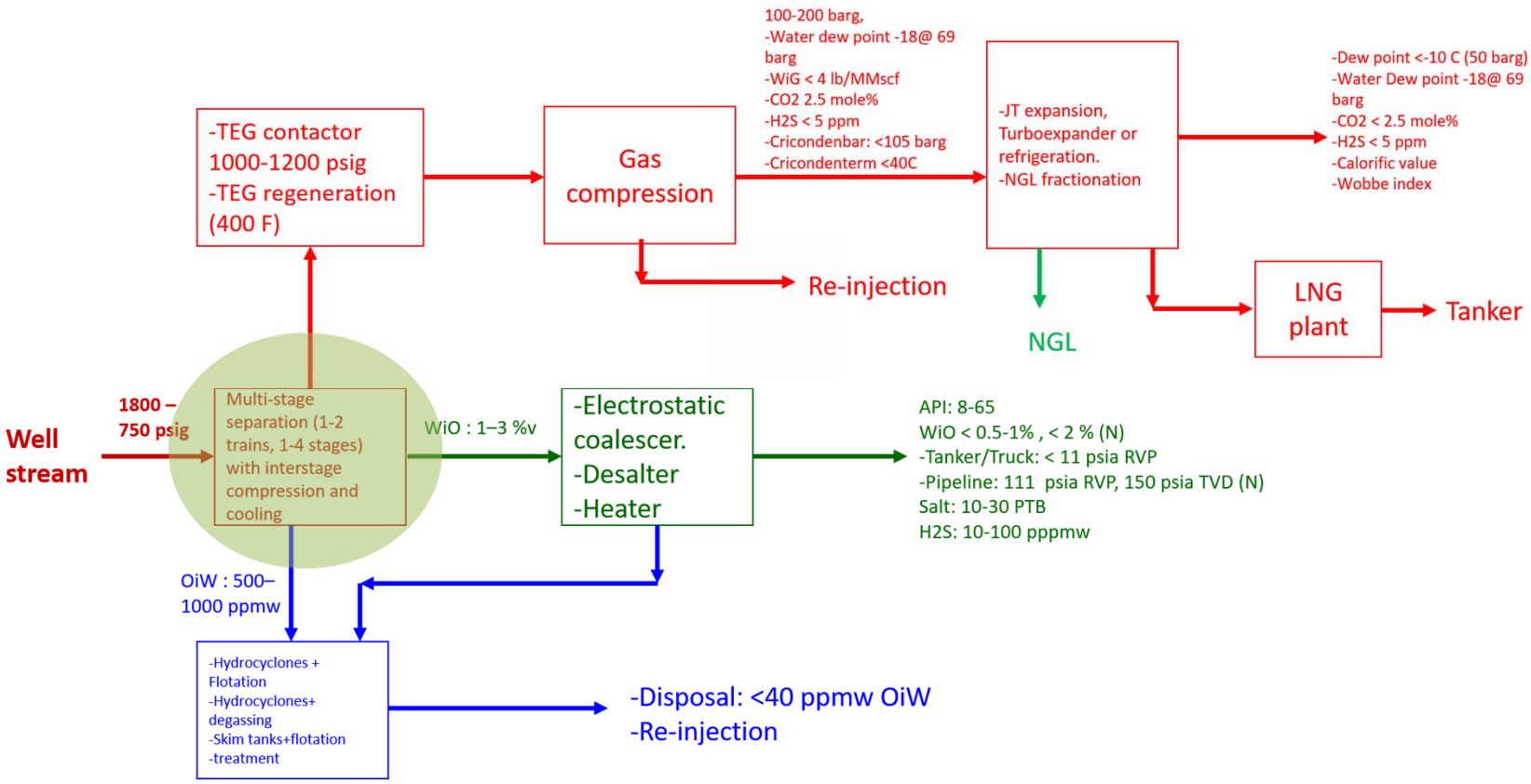
Processing Block Diagram



Stanko Milan (2018)

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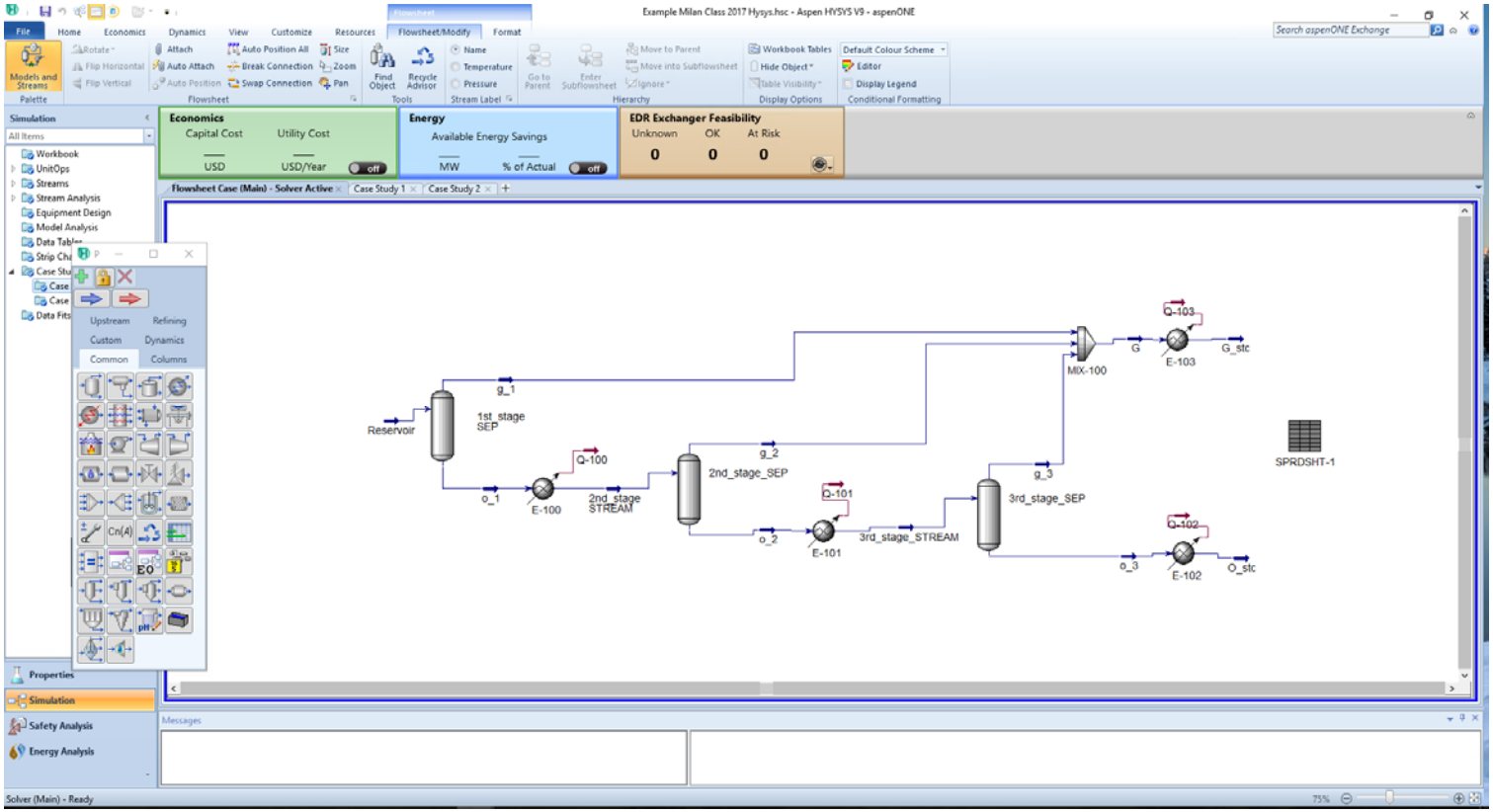
PROCESS SIMULATION HYSYS



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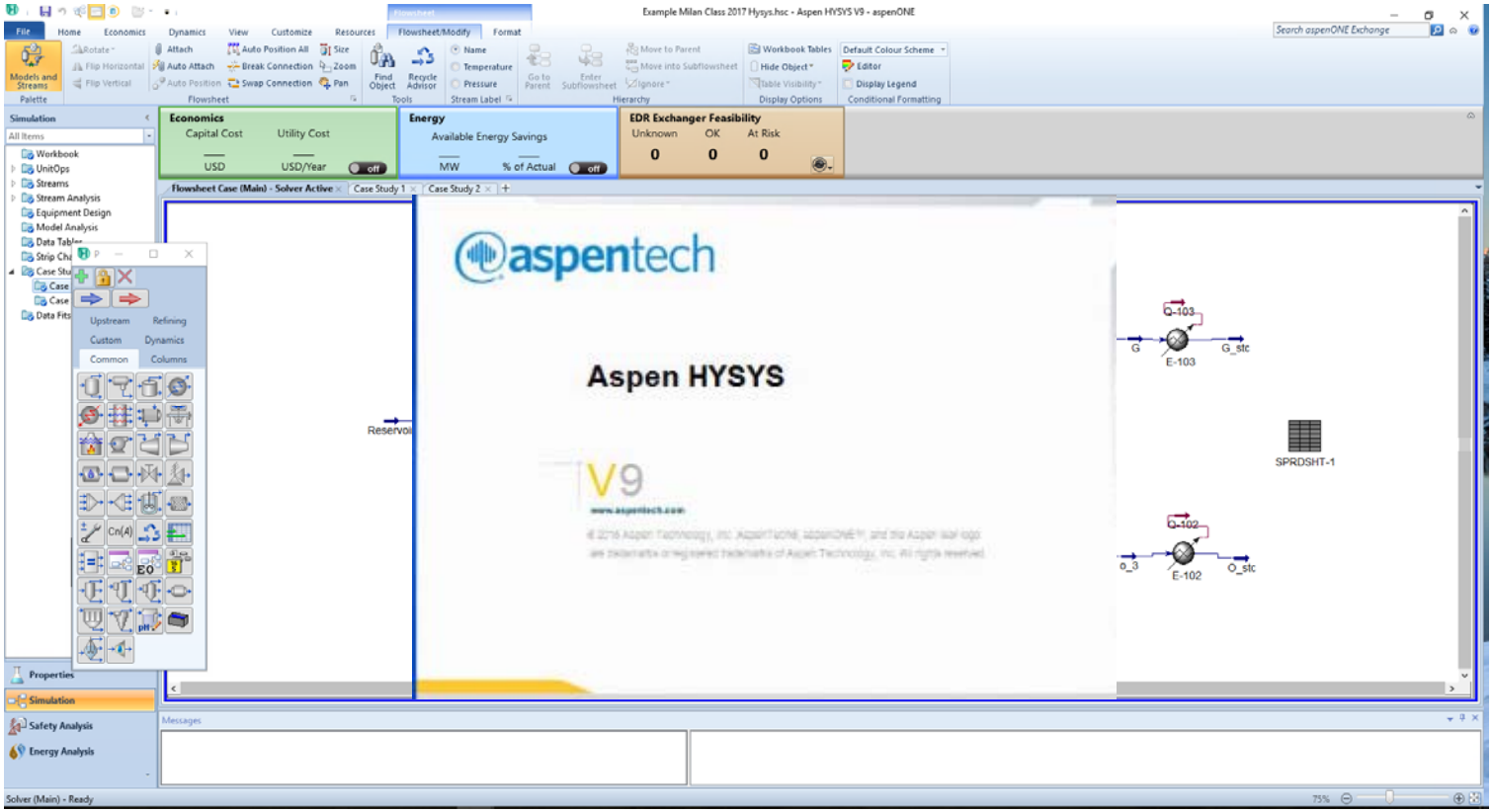
PROCESS SIMULATION HYSYS



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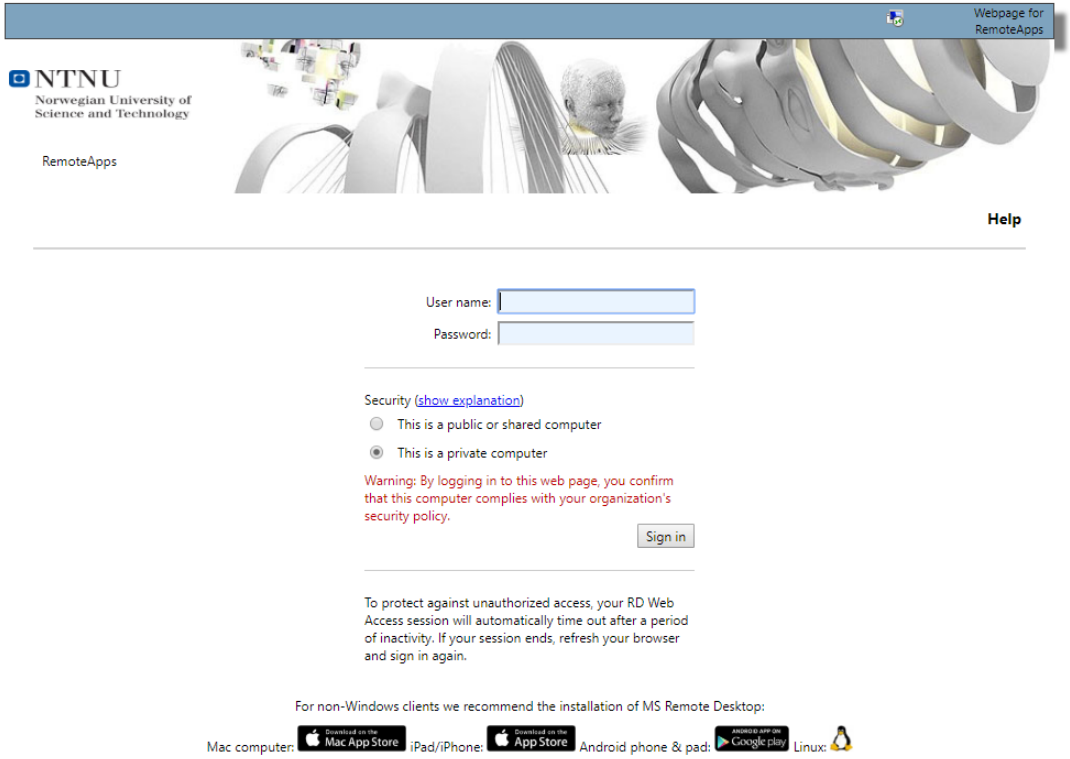
PROCESS SIMULATION HYSIS



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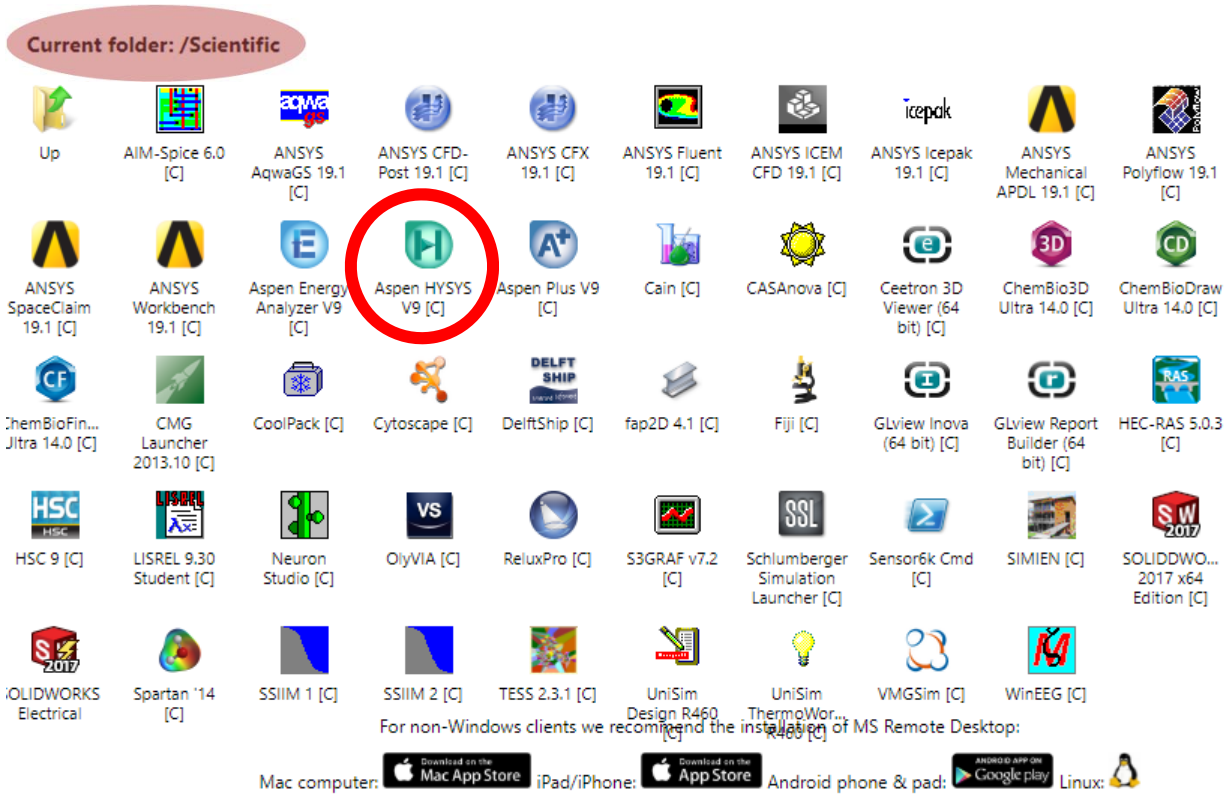

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Fluid Composition 1

	T (C)	P (bar)
Stage 1	75	65
Stage 2	65	20
Stage 3	60	2
Standard Conditions	15.66	1.01325

Component	Mole Fraction
Nitrogen	0.003672
CO2	0.001092
Methane	0.429256
Ethane	0.046897
Propane	0.029618
i-butane	0.014919
n-butane	0.009325
i-pentane	0.008446
n-pentane	0.005030
Hexanes	0.018433
Heptanes	0.041418
Octanes	0.049891
Nonanes	0.038403
Decanes	0.303600

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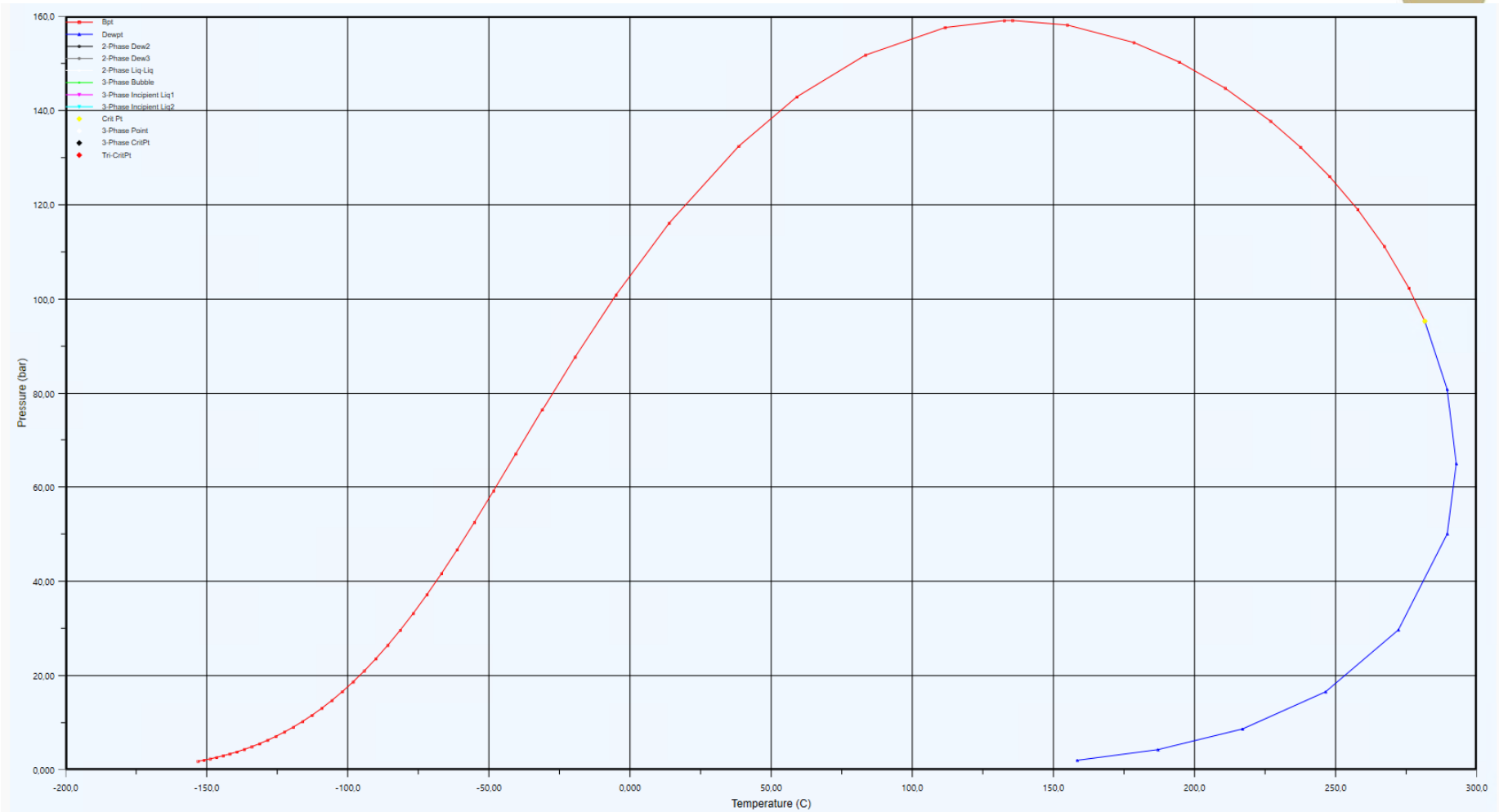
Fluid Composition



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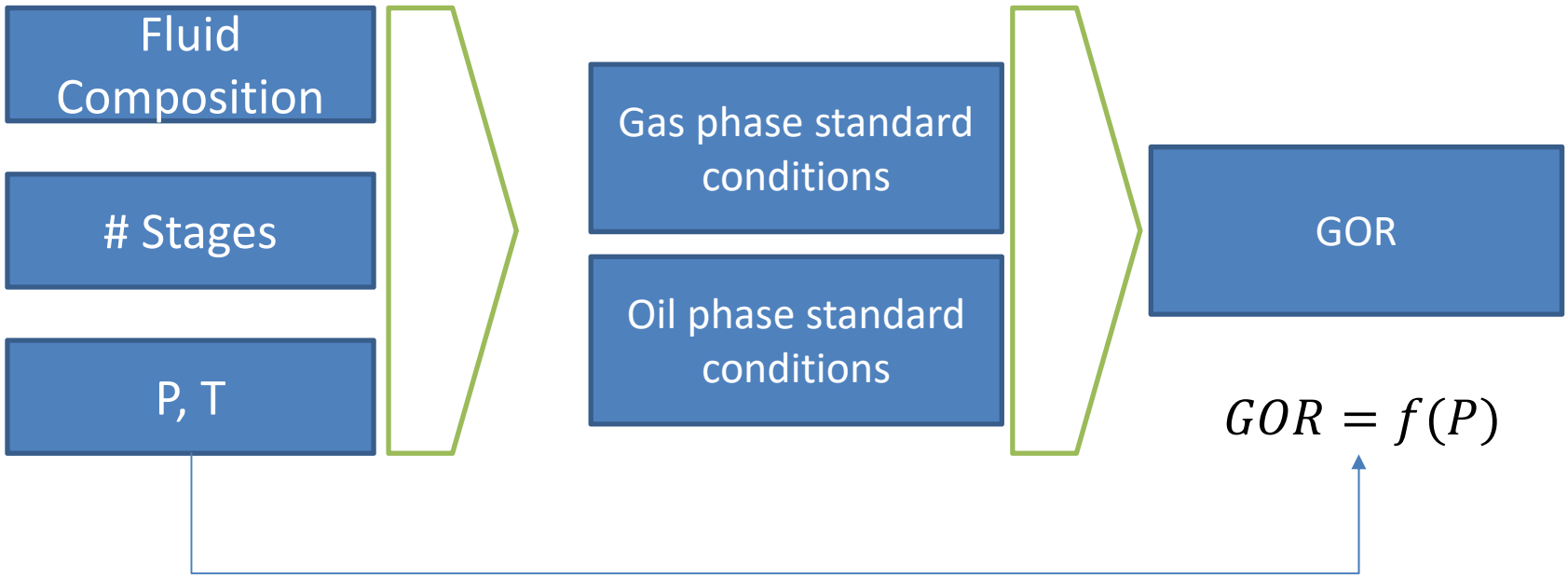
Summary


Fluid Composition
Stages
P, T
Gas phase standard conditions
Oil phase standard conditions
GOR
$GOR = f(P)$

GOR calculation

Imported Variables

Cell	Object	Variable Description
B1	G_SC	Phase Actual Volume Flow (Vapour Phase)
B2	L_SC	Phase Actual Volume Flow (Liquid Phase)
C1	G_SC_i	Phase Actual Volume Flow (Vapour Phase)
C2	L_SC_i	Phase Actual Volume Flow (Liquid Phase)

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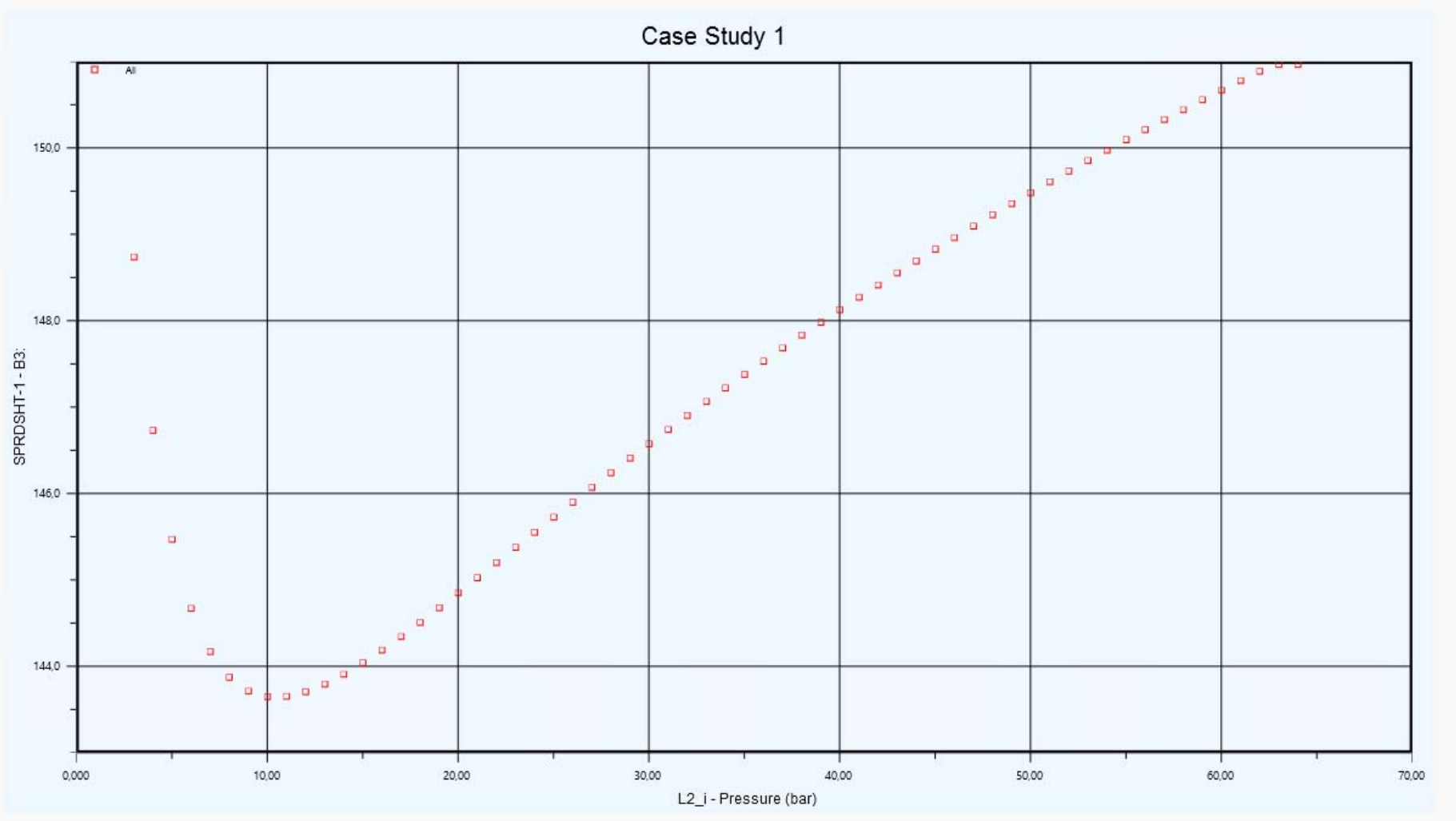
Summary



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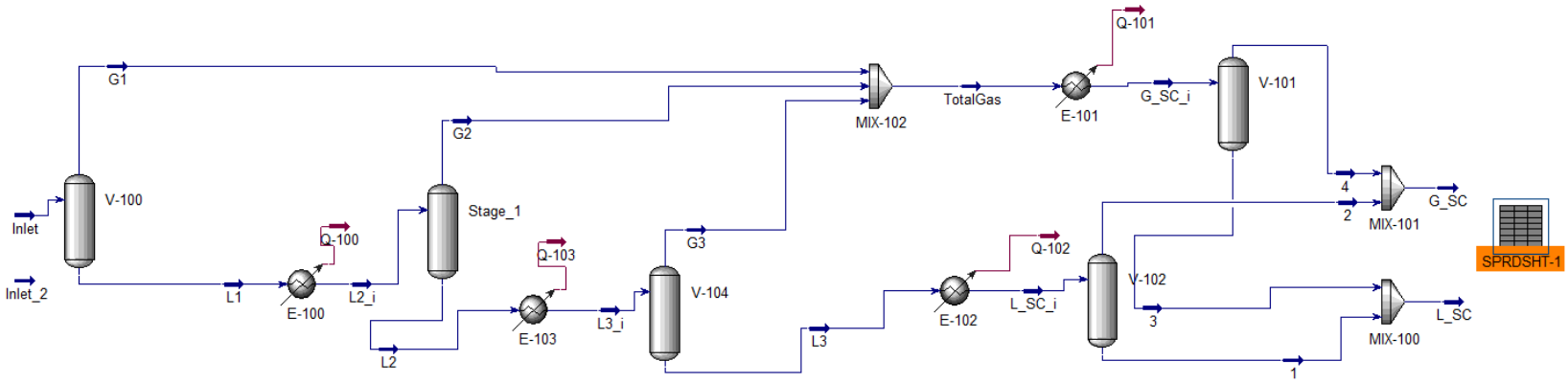
Summary



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Exercises

1. Change the number of stages: 1, 2 and 4 stages
2. Propose the temperature and pressure of the 3rd stage such the GOR is minimum when using 3 stages
3. Compare the liquid recovery at the end of the separation train for 1, 2 and 3 stages. Create a plot like Figure 1 for each case
4. Change the composition (Table 1)
5. Sensibility analysis of the first stage, P (80 to 30)

Table 1

Nitrogen	0.0024005
CO2	0.0157031
Methane	0.8687738
Ethane	0.0560112
Propane	0.0212042
i-Butane	0.0029006
n-Butane	0.0065013
i-Pentane	0.0020004
n-Pentane	0.0026005
n-Hexane	0.0032006
n-Heptane	0.0023005
n-Octane	0.0024005
n-Nonane	0.0018004
n-Decane	0.0122024

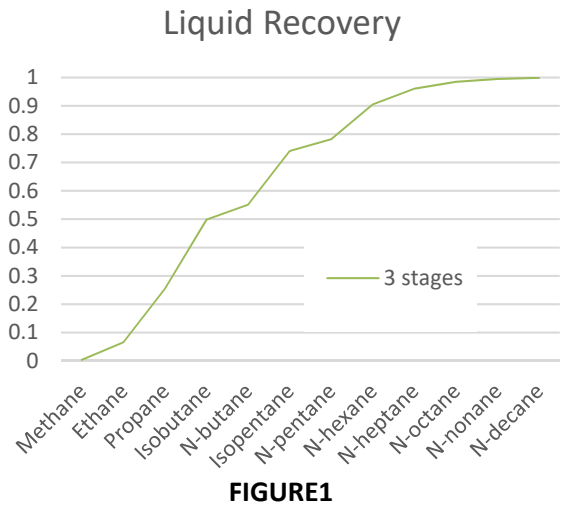

FIGURE1

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