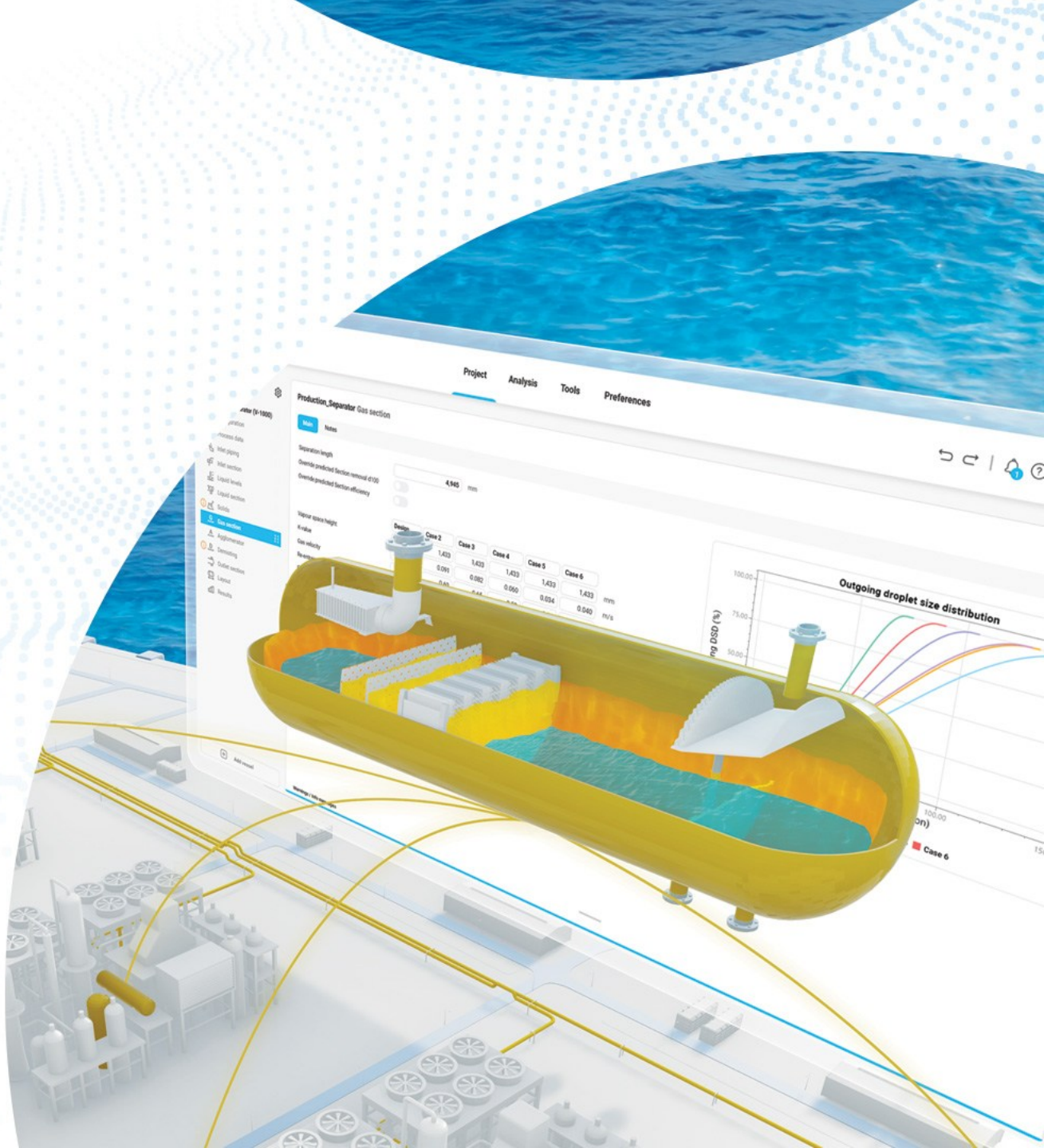
MYSEP

MySep Engine improves production efficiencies by identifying hidden phase separation constraints



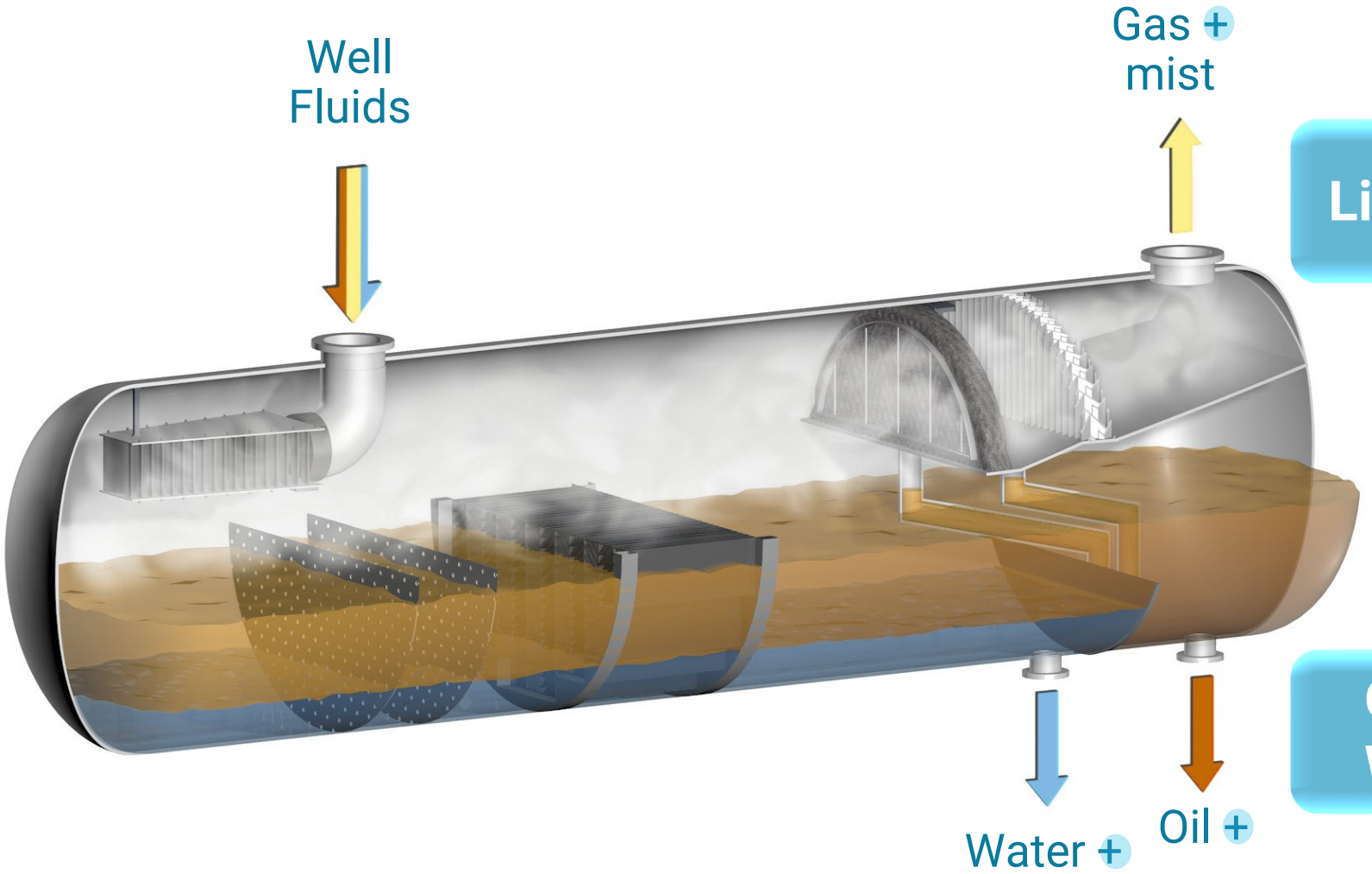
UK Technology Leadership Board

Pitching event – May 28th, 2026

MYSEP

Separation – *what's the problem ?*

Separation, what's the problem ?



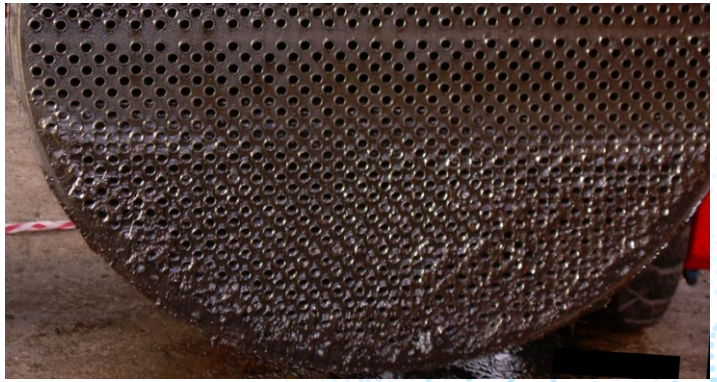
Liquid carry-over !

Oil-in-Water !
Water-in-Oil !

MYSEP

Effect of liquid carry-over on downstream equipment and on products

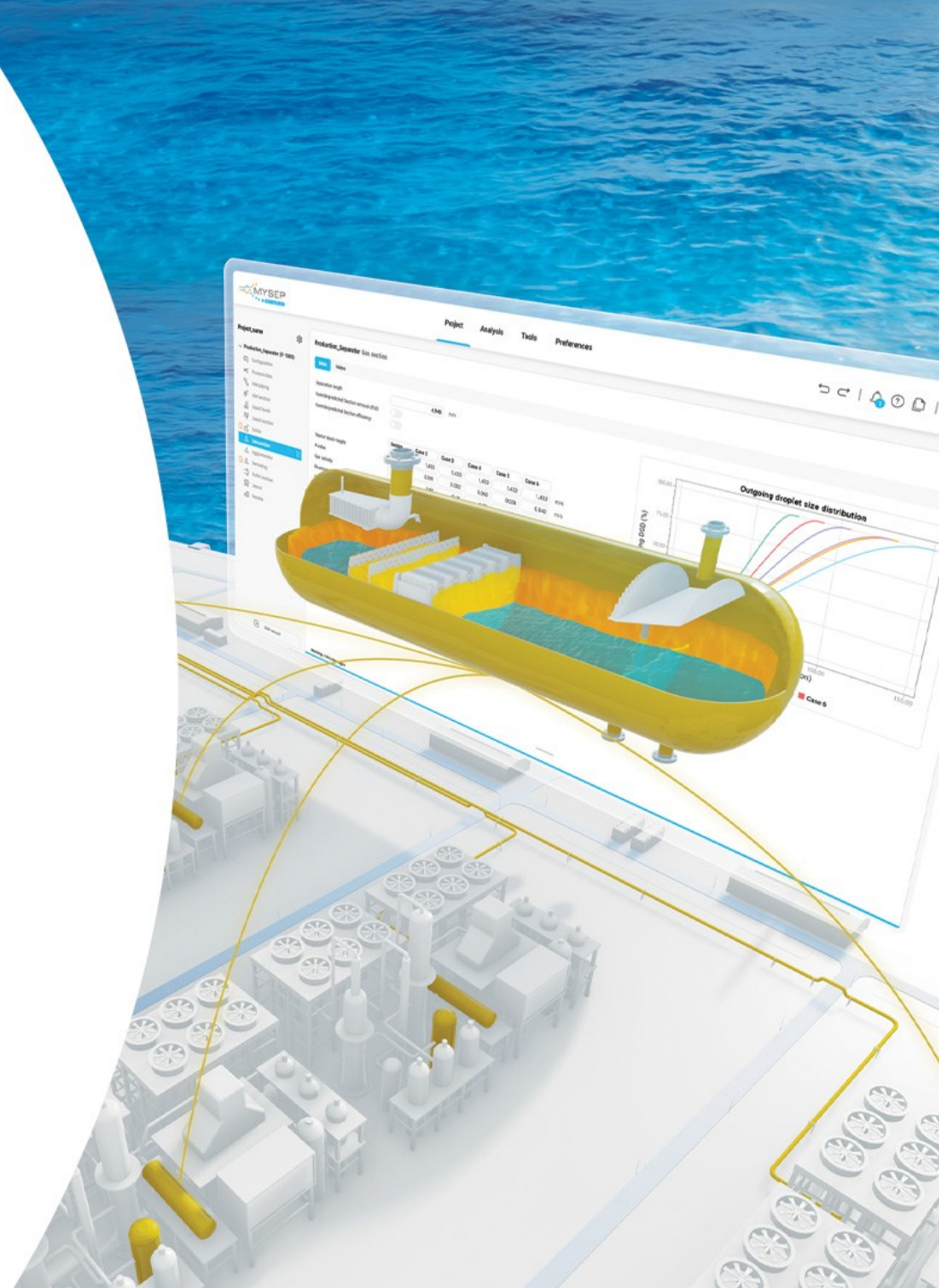
- Product quality (e.g. dew point)
- Compressors
  - increasing compression energy demand
  - fouling
  - damage
- Heat exchangers
  - increasing compression energy demand
  - fouling
- Foaming in amine contactors
- Mol-sieves degradation



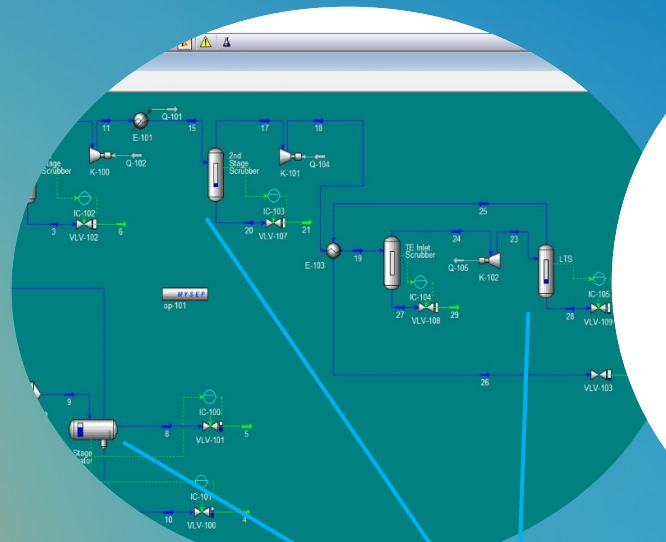
Picture at courtesy of Calgavin Ltd

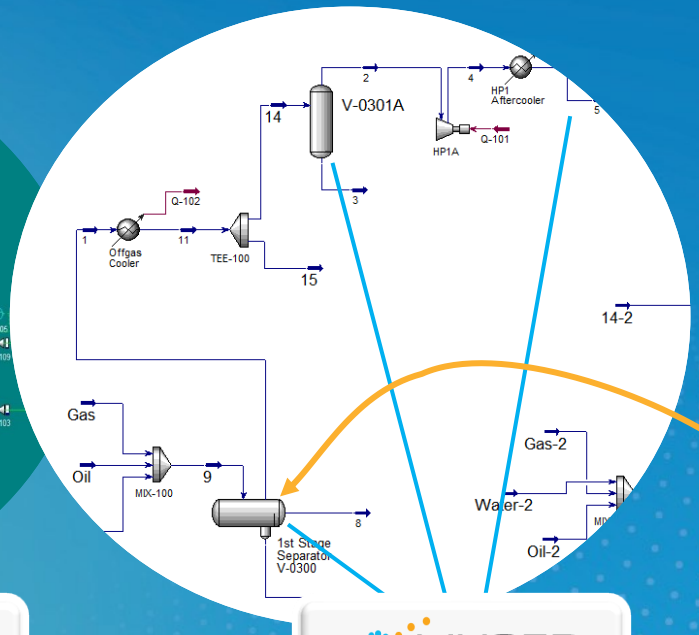
MYSEP

MySep Products



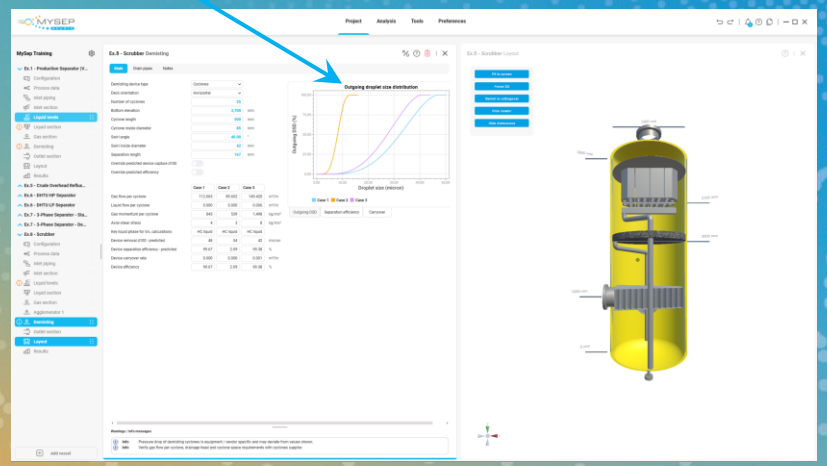
MySep Products – MySep Studio

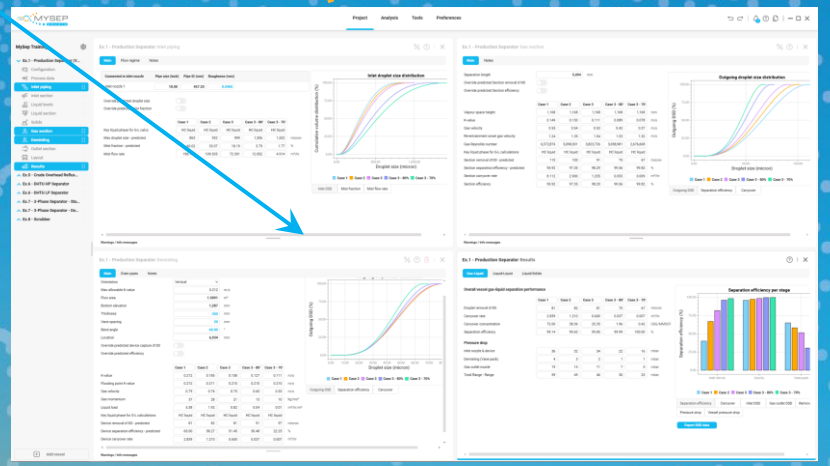




MySep Studio

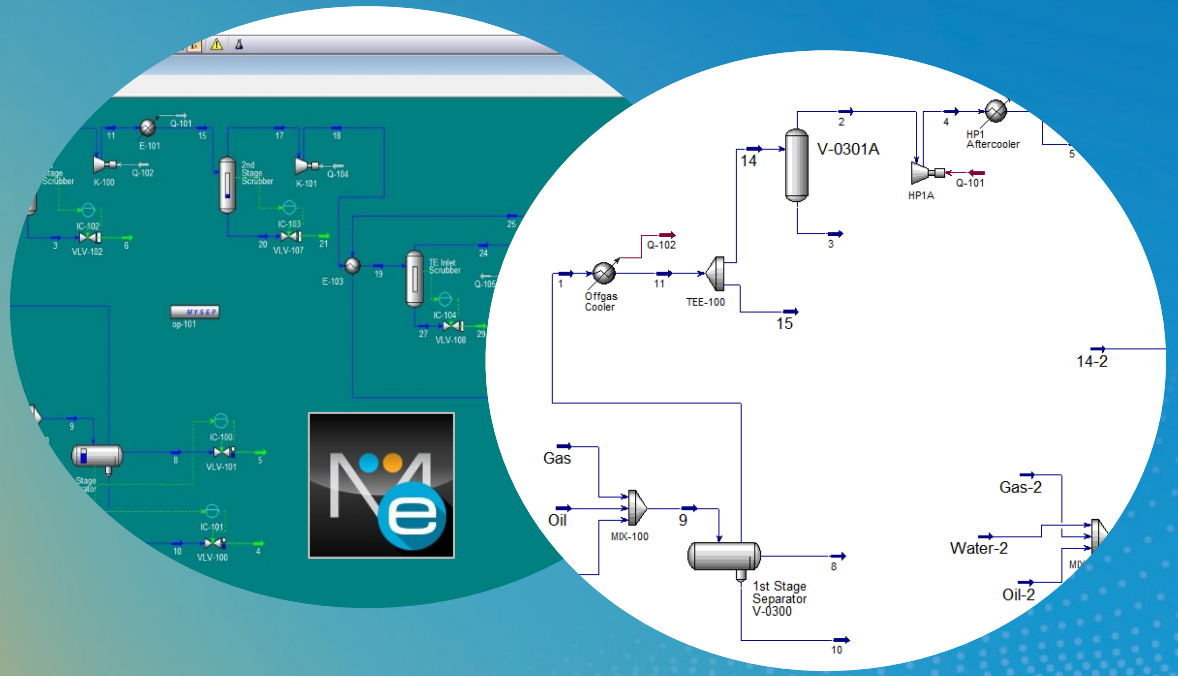
- Design & Rating
  - *Desktop software*
  - *Bi-directional linking to – HYSYS, Symmetry, UniSim, PRO/II, Petro-SIM,*
- Detailed Performance Analysis





www.mysep.com

MySep Products – MySep Engine



MySep Engine

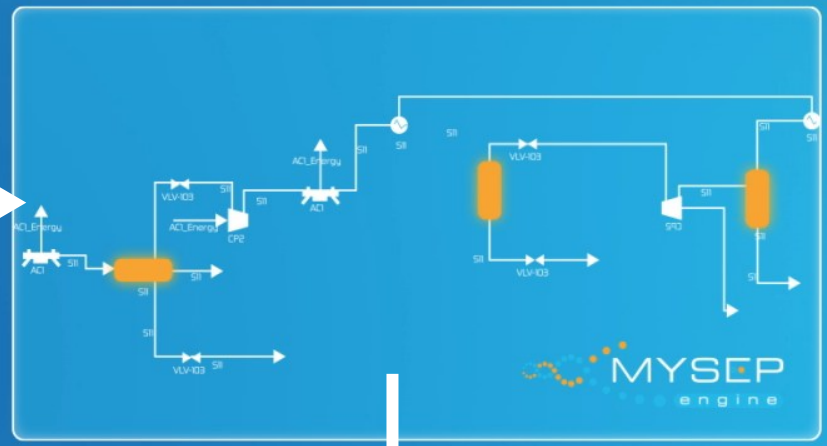
- Models separation performance inside simulator
  - *Liquid-liquid carry-over*
  - *Liquid carryover in gas*
  - *Pressure drop*
- Steady state and Dynamics

Supports

- Aspen HYSYS
- AVEVA PRO/II and DYNSIM
- Honeywell UniSim Design
- KBC Petro-SIM
- Kongsberg K-Spice
- SLB Symmetry

MySep Products Summarised

Perfect your
separation models
with **MySep Studio**



Optimize your process
with a **MySep Engine**
Activated Digital Twin

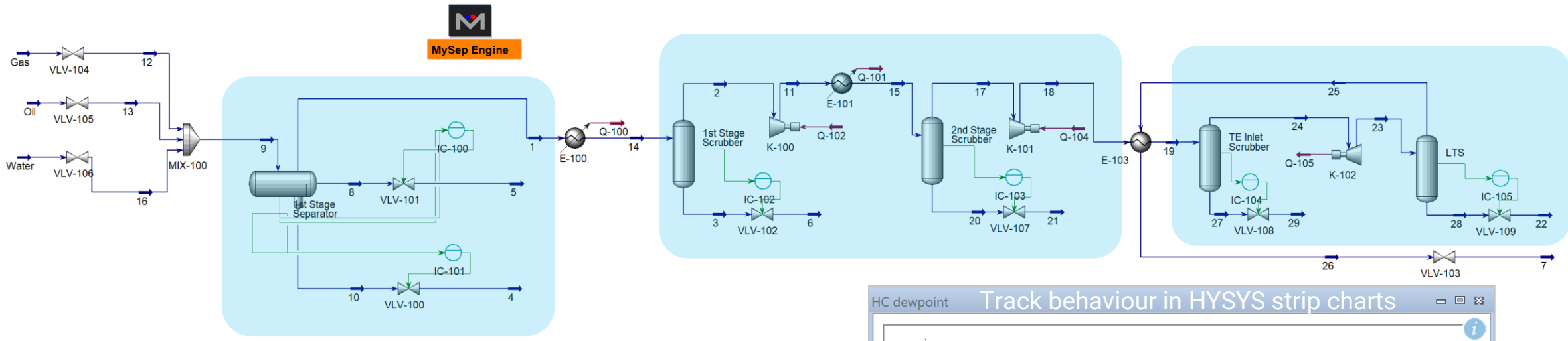
MYSEP

Let’s Consider A Facility

Dynamic simulation of Oil & Gas production process

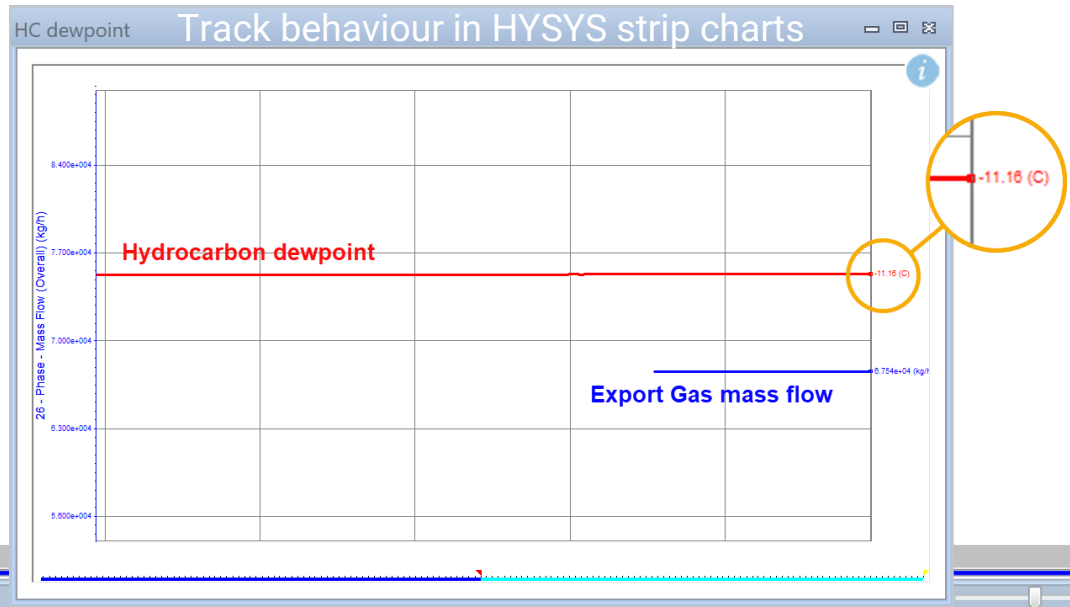
1st stage separation – 3-phase

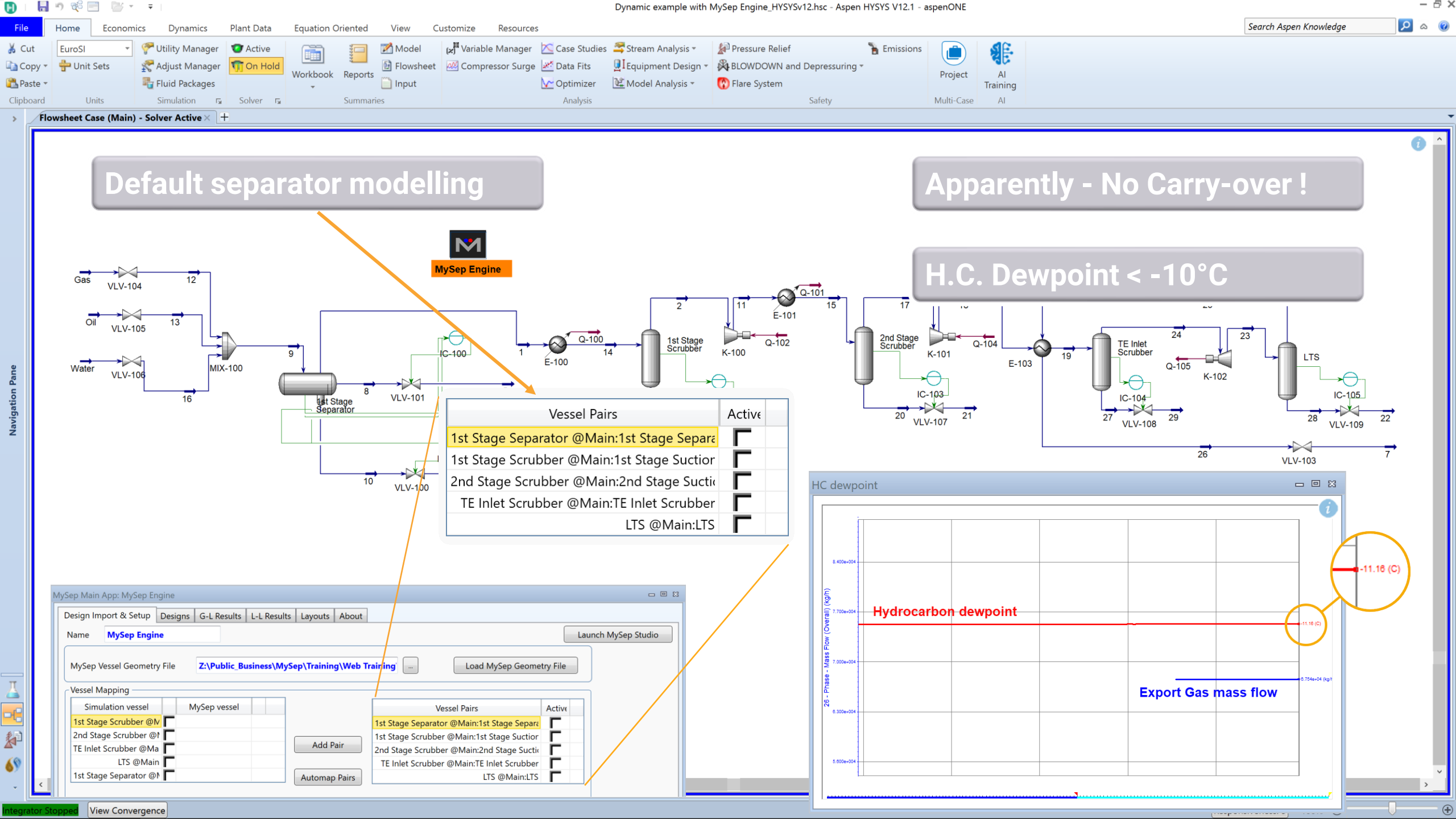
Control hydrocarbon dewpoint of export gas

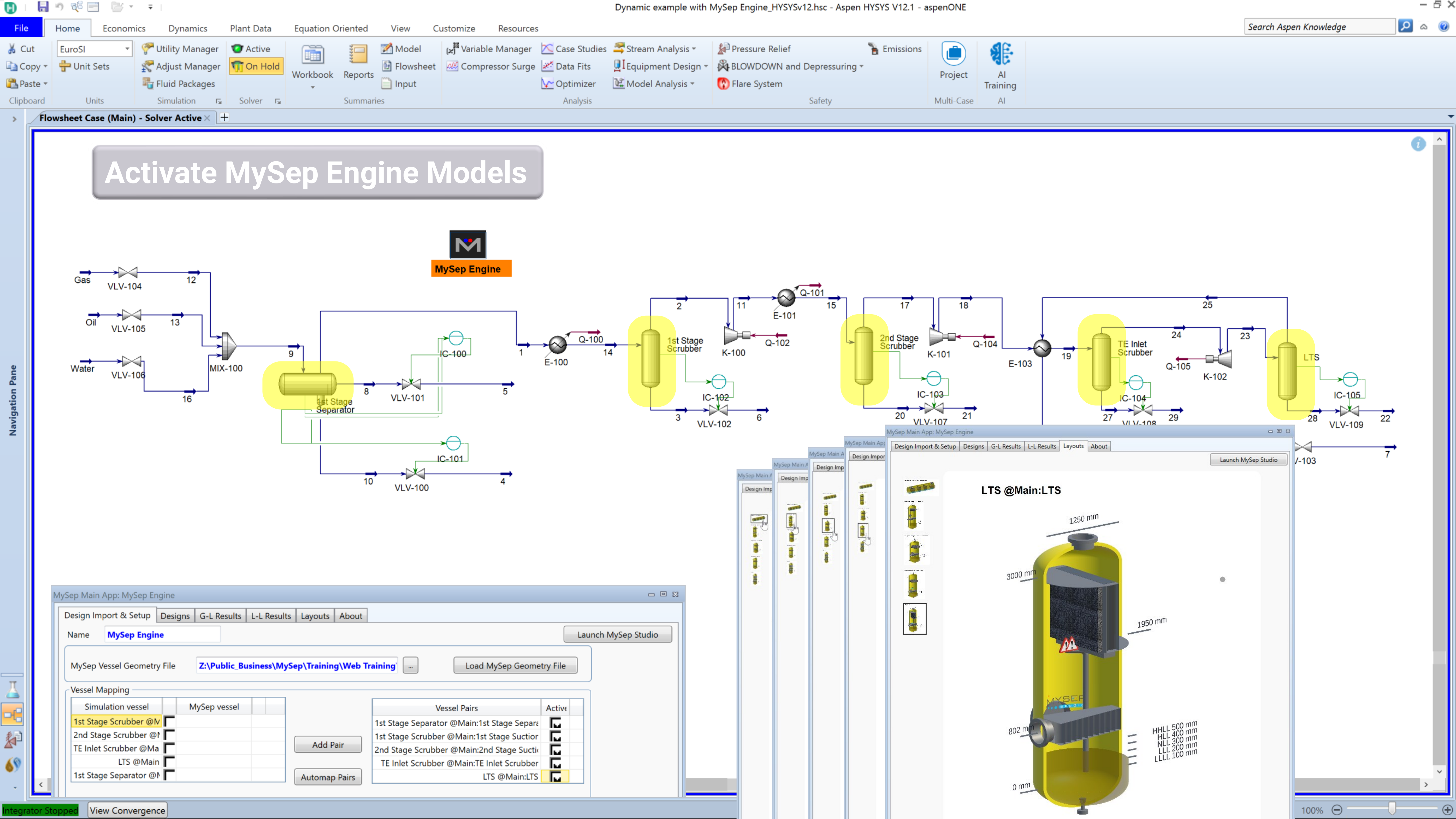


2-stage gas compression

Turbo-expansion & low temperature separation




Dynamic example with MySep Engine_HYSYSv12.hsc - Aspen HYSYS V12.1 - aspenONE
Default separator modelling
Apparently - No Carry-over !
H.C. Dewpoint < -10°C
MySep Engine
Gas
VLV-104
12
Oil
VLV-105
13
Water
VLV-106
16
MIX-100
9
1st Stage Separator
8
VLV-101
10
VLV-100
IC-100
1
E-100
Q-100
14
2
1st Stage Scrubber
K-100
Q-102
11
E-101
Q-101
15
17
2nd Stage Scrubber
K-101
Q-104
IC-103
20
VLV-107
21
E-103
19
TE Inlet Scrubber
24
Q-105
K-102
23
LTS
IC-104
27
VLV-108
29
IC-105
28
VLV-109
22
26
VLV-103
7
Vessel Pairs
Active
1st Stage Separator @Main:1st Stage Separa
1st Stage Scrubber @Main:1st Stage Suctior
2nd Stage Scrubber @Main:2nd Stage Sucti
TE Inlet Scrubber @Main:TE Inlet Scrubber
LTS @Main:LTS
MySep Main App: MySep Engine
Design Import & Setup
Designs
G-L Results
L-L Results
Layouts
About
Name
MySep Engine
Launch MySep Studio
MySep Vessel Geometry File
Z:\Public_Business\MySep\Training\Web Training
Load MySep Geometry File
Vessel Mapping
Simulation vessel
MySep vessel
1st Stage Scrubber @M
2nd Stage Scrubber @I
TE Inlet Scrubber @Ma
LTS @Main
1st Stage Separator @I
Add Pair
Automap Pairs
HC dewpoint
Hydrocarbon dewpoint
Export Gas mass flow
-11.16 (C)
26 - Phase - Mass Flow (Overall) (kg/h)
Navigation Pane
Integrator Stopped
View Convergence



Dynamic example with MySep Engine_HYSYSv12.hsc - Aspen HYSYS V12.1 - aspenONE
File
Home
Economics
Dynamics
Plant Data
Equation Oriented
View
Customize
Resources
Search Aspen Knowledge
Cut
Copy
Paste
Clipboard
EuroSI
Unit Sets
Units
Utility Manager
Adjust Manager
Fluid Packages
Simulation
Active
On Hold
Solver
Workbook
Reports
Model
Flowsheet
Input
Summaries
Variable Manager
Compressor Surge
Case Studies
Data Fits
Optimizer
Stream Analysis
Equipment Design
Model Analysis
Analysis
Pressure Relief
BLOWDOWN and Depressuring
Flare System
Emissions
Safety
Project
Multi-Case
AI Training
AI
Flowsheet Case (Main) - Solver Active
Navigation Pane
Activate MySep Engine Models
MySep Engine
Gas
Oil
Water
VLV-104
VLV-105
VLV-106
MIX-100
1st Stage Separator
VLV-101
VLV-100
IC-100
IC-101
E-100
Q-100
1st Stage Scrubber
K-100
Q-102
E-101
Q-101
IC-102
VLV-102
2nd Stage Scrubber
K-101
Q-104
IC-103
VLV-107
E-103
TE Inlet Scrubber
Q-105
K-102
IC-104
LTS
IC-105
VLV-109
MySep Main App: MySep Engine
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G-L Results
L-L Results
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MySep vessel
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2nd Stage Scrubber @M
TE Inlet Scrubber @Ma
LTS @Main
1st Stage Separator @M
Add Pair
Automap Pairs
Vessel Pairs
Active
1st Stage Separator @Main:1st Stage Separa
1st Stage Scrubber @Main:1st Stage Suction
2nd Stage Scrubber @Main:2nd Stage Suctio
TE Inlet Scrubber @Main:TE Inlet Scrubber
LTS @Main:LTS
LTS @Main:LTS
1250 mm
3000 mm
1950 mm
802 mm
0 mm
HHLL 500 mm
HLL 400 mm
NLL 300 mm
LLL 200 mm
LLLL 100 mm
Integrator Stopped
View Convergence
100%

Dynamic example with MySep Engine_HYSYSv12.hsc - Aspen HYSYS V12.1 - aspenONE

File | Home | Economics | Dynamics | Plant Data | Equation Oriented | View | Customize | Resources

Search Aspen Knowledge

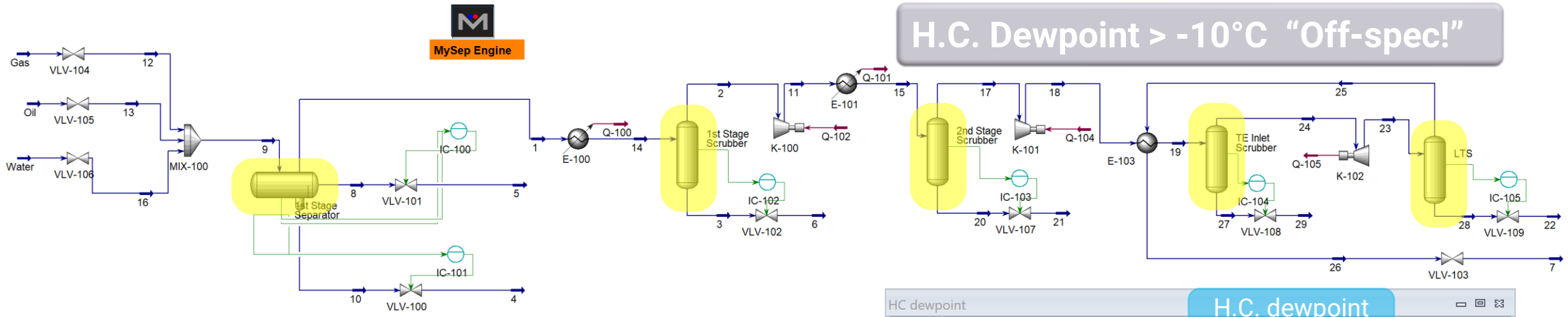
Cut | Copy | Paste | Clipboard
EuroSI | Unit Sets | Units
Utility Manager | Adjust Manager | Fluid Packages | Simulation
Active | On Hold | Solver
Workbook | Reports | Model | Flowsheet | Input | Summaries
Variable Manager | Compressor Surge | Case Studies | Data Fits | Optimizer | Stream Analysis | Equipment Design | Model Analysis | Analysis
Pressure Relief | BLOWDOWN and Depressuring | Flare System | Emissions | Safety
Project | Multi-Case
AI Training | AI

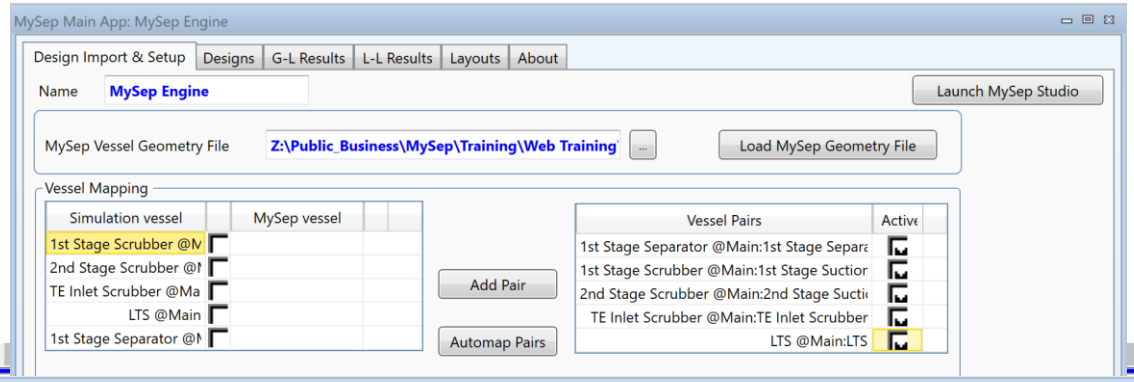
Flowsheet Case (Main) - Solver Active

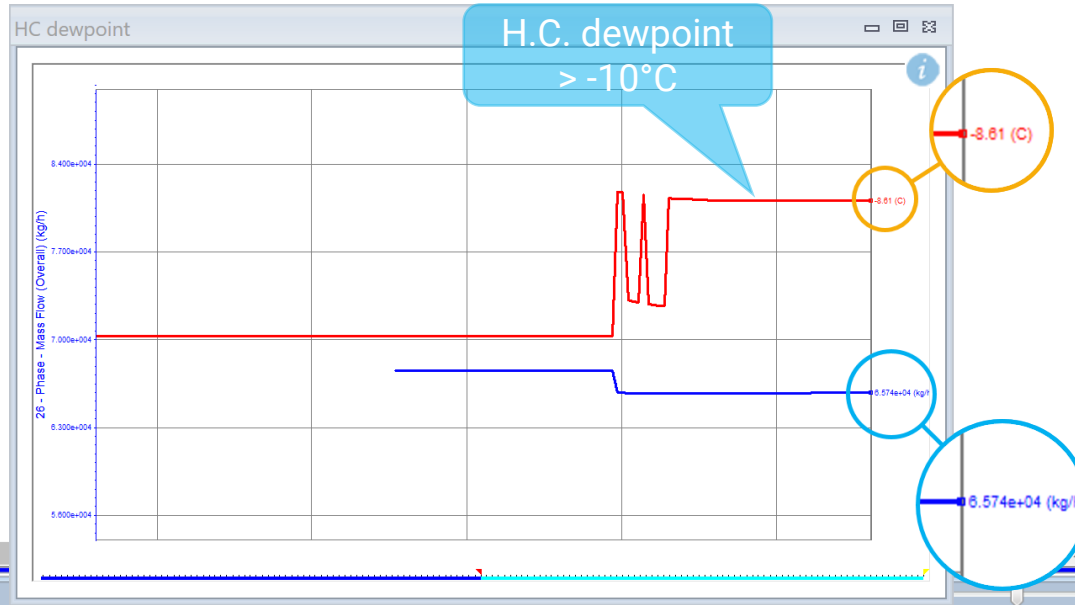
"Activated" MySep Engine Models

Rigorous carry-over modelling

H.C. Dewpoint > -10°C "Off-spec!"







Integrator Stopped | View Convergence

Dynamic example with MySep Engine_HYSYSv12.hsc - Aspen HYSYS V12.1 - aspenONE

File | Home | Economics | Dynamics | Plant Data | Equation Oriented | View | Customize | Resources

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Active | On Hold | Solver
Workbook | Reports | Model | Flowsheet | Input | Summaries
Variable Manager | Compressor Surge | Case Studies | Data Fits | Optimizer | Stream Anal | Equipment D | Model Analy | Analysis

Flowsheet Case (Main) - Solver Active

Can we get back On Spec ?

MySep Engine

Gas | VLV-104 | 12
Oil | VLV-105 | 13
Water | VLV-106 | 16
MIX-100 | 9
1st Stage Separator | 8 | VLV-101 | IC-100 | 5
1 | E-100 | Q-100 | 14
1st Stage Scrubber | K-100 | Q-102 | E-101
3 | VLV-102 | 6 | IC-102
IC-101 | 10 | VLV-100 | 4
2nd Stage Scrubber | K-101 | Q-104
20 | VLV-107 | 21 | IC-103
E-103 | 19
TE Inlet Scrubber | 24 | 23 | Q-105 | K-102
27 | VLV-108 | 29 | IC-104
LTS | IC-105 | 28 | VLV-109 | 22
26 | VLV-103 | 7

Valve: VLV-103

Design | Rating | Worksheet | Dynamics

Rating
- Sizing
- Nozzles
- Options
- Flow Limits

Valve Operating Characteristics
- Linear
- Quick Opening
- Equal Percentage
- User Table

Valve Vapor Flow Models

Valve Types

Sizing Conditions — Current | User Input

Inlet Pressure [bar]	11.76
Molecular Weight	26.84
Valve Opening [%]	19.10
Delta P [bar]	3.762
Flow Rate [kg/h]	6.574e+004

Sizing Methods — Cv | Cg
- ANSI/ISA method
- Manufacturer specific methods
- Simple resistance equation

MySep Main App: MySep Engine

Design Import & Setup | Designs | G-L Results | L-L Results | Layouts | About

Name: MySep Engine | Launch MySep Studio

MySep Vessel Geometry File: Z:\Public_Business\MySep\Training\Web Training | Load MySep Geometry File

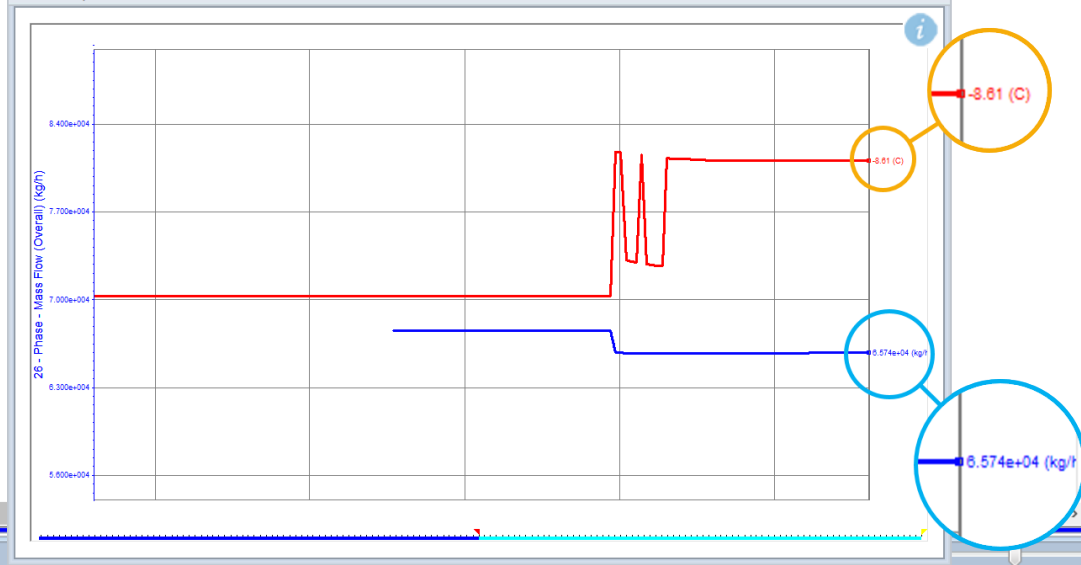
Vessel Mapping

Simulation vessel	MySep vessel
1st Stage Scrubber @M	
2nd Stage Scrubber @I	
TE Inlet Scrubber @Ma	
LTS @Main	
1st Stage Separator @I	

Add Pair | Automap Pairs

Vessel Pairs	Active
1st Stage Separator @Main:1st Stage Separ	
1st Stage Scrubber @Main:1st Stage Suctior	
2nd Stage Scrubber @Main:2nd Stage Suctic	
TE Inlet Scrubber @Main:TE Inlet Scrubber	
LTS @Main:LTS	

HC dewpoint



Integrator Stopped | View Convergence

Navigation Pane

Dynamic example with MySep Engine_HYSYSv12.hsc - Aspen HYSYS V12.1 - aspenONE

File | Home | Economics | Dynamics | Plant Data | Equation Oriented | View | Customize | Resources

Cut | Copy | Paste | Clipboard | EuroSI | Unit Sets | Units | Utility Manager | Adjust Manager | Fluid Packages | Simulation | Active | On Hold | Solver | Workbook | Reports | Model | Flowsheet | Input | Summaries | Variable Manager | Compressor Surge | Case Studies | Data Fits | Optimizer | Stream Anal | Equipment | Model Analy | Analysis

Flowsheet Case (Main) - Solver Active

Navigation Pane

Close VLV-103 more

Reduce production throughput

H.C. dewpoint On Spec (< -10°C)

BUT 13% less export gas

Valve: VLV-103

Design | Rating | Worksheet | Dynamics

Rating
- Sizing
- Nozzles
- Options
- Flow Limits

Valve Operating Characteristics
- Linear
- Quick Opening
- Equal Percentage
- User Table

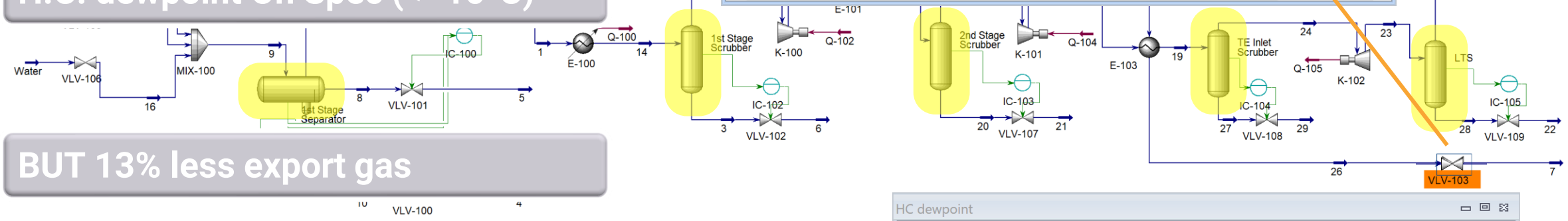
Valve Vapor Flow Models

Valve Types

Sizing Conditions — Current | User Input

Inlet Pressure [bar]	12.19
Molecular Weight	26.73
Valve Opening [%]	16.00
Delta P [bar]	4.186
Flow Rate [kg/h]	5.869e+004

Sizing Methods — Cv | Cg
- ANSI/ISA method
- Manufacturer specific methods
- Simple resistance equation



MySep Main App: MySep Engine

Design Import & Setup | Designs | G-L Results | L-L Results | Layouts | About

Name: MySep Engine — Launch MySep Studio

MySep Vessel Geometry File: Z:\Public_Business\MySep\Training\Web Training — Load MySep Geometry File

Vessel Mapping

Simulation vessel	MySep vessel
1st Stage Scrubber @M	
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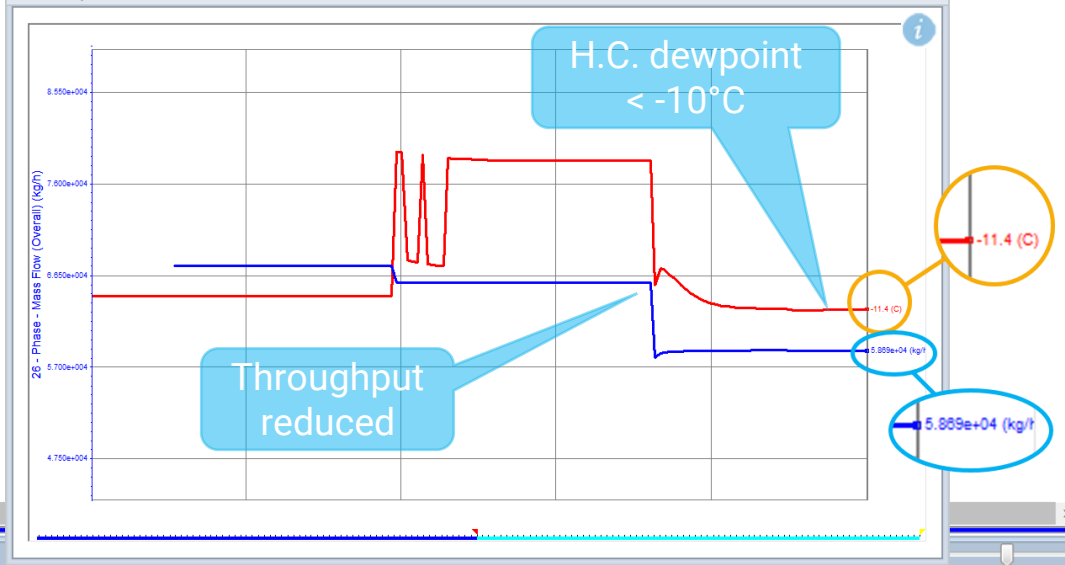
TE Inlet Scrubber @Ma	
LTS @Main	
1st Stage Separator @I	

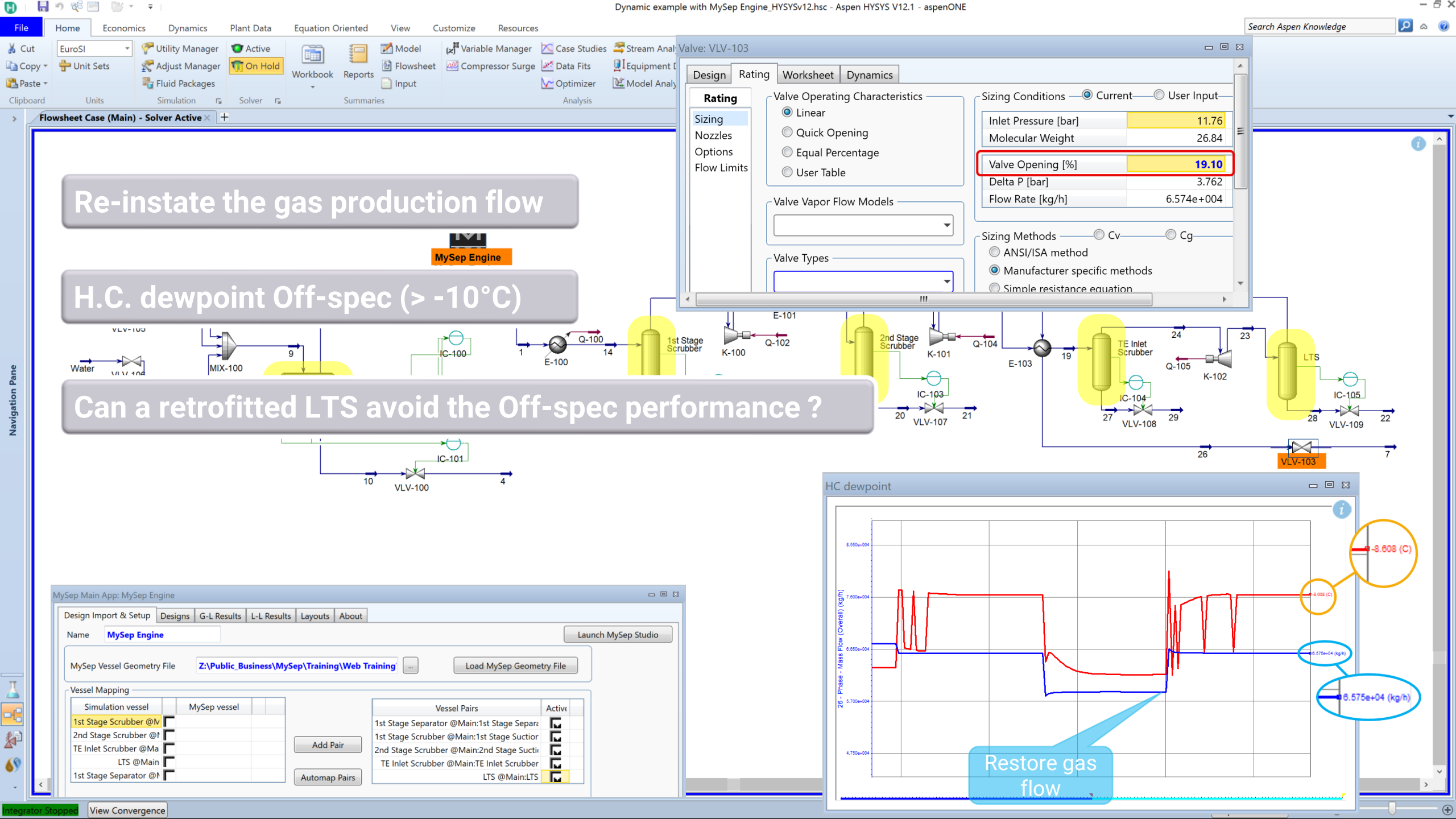
Add Pair | Automap Pairs

Vessel Pairs	Active
1st Stage Separator @Main:1st Stage Separ	
1st Stage Scrubber @Main:1st Stage Suction	
2nd Stage Scrubber @Main:2nd Stage Suctio	
TE Inlet Scrubber @Main:TE Inlet Scrubber	
LTS @Main:LTS	

HC dewpoint



Integrator Stopped | View Convergence


Dynamic example with MySep Engine_HYSYSv12.hsc - Aspen HYSYS V12.1 - aspenONE
Re-instate the gas production flow
MySep Engine
H.C. dewpoint Off-spec (> -10°C)
Can a retrofitted LTS avoid the Off-spec performance ?
Valve: VLV-103
Design
Rating
Worksheet
Dynamics
Sizing
Nozzles
Options
Flow Limits
Valve Operating Characteristics
Linear
Quick Opening
Equal Percentage
User Table
Valve Vapor Flow Models
Valve Types
Sizing Conditions
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User Input
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ANSI/ISA method
Manufacturer specific methods
Simple resistance equation
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MIX-100
IC-100
E-100
Q-100
1st Stage Scrubber
K-100
Q-102
E-101
2nd Stage Scrubber
K-101
Q-104
IC-103
VLV-107
E-103
TE Inlet Scrubber
IC-104
VLV-108
Q-105
K-102
LTS
IC-105
VLV-109
VLV-103
IC-101
VLV-100
HC dewpoint
-8.608 (C)
6.575e+04 (kg/h)
Restore gas flow
MySep Main App: MySep Engine
Design Import & Setup
Designs
G-L Results
L-L Results
Layouts
About
Name
MySep Engine
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Z:\Public_Business\MySep\Training\Web Training
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MySep vessel
1st Stage Scrubber @M
2nd Stage Scrubber @M
TE Inlet Scrubber @Ma
LTS @Main
1st Stage Separator @M
Add Pair
Automap Pairs
Vessel Pairs
Active
1st Stage Separator @Main:1st Stage Separ
1st Stage Scrubber @Main:1st Stage Suction
2nd Stage Scrubber @Main:2nd Stage Suctio
TE Inlet Scrubber @Main:TE Inlet Scrubber
LTS @Main:LTS
Navigation Pane
Integrator Stopped
View Convergence

Dynamic example with MySep Engine_HYSYSv12.hsc - Aspen HYSYS V12.1 - aspenONE

File Home Economics Dynamics Plant Data Equation Oriented View Customize Resources

Cut Copy Paste | EuroSI Unit Sets | Utility Manager Adjust Manager Fluid Packages | Active On Hand | Workbook Reports | Model Flowsheet Input | Variable Manager Compressor Surge | Case Studies Data Fits Optimizer | Stream Analysis Equipment Design Model Analysis | Pressure Relief BLOWDOWN and D Flare System

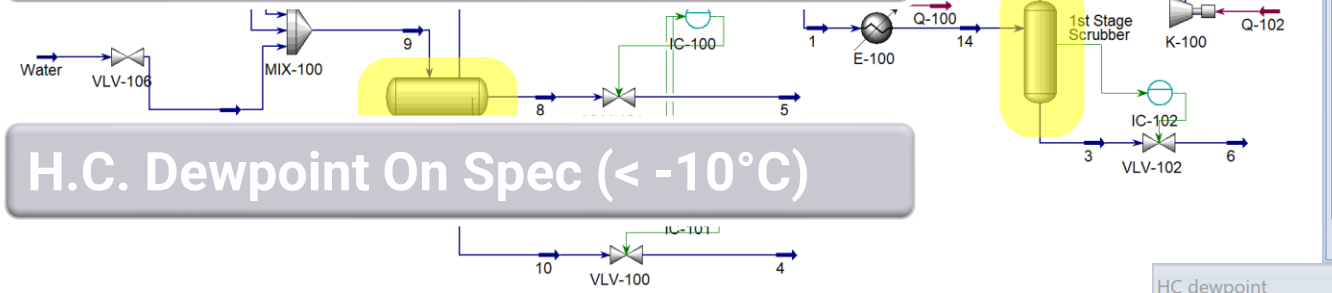
Clipboard Units Simulation Solver Summaries Analysis

Flowsheet Case (Main) - Solver Active

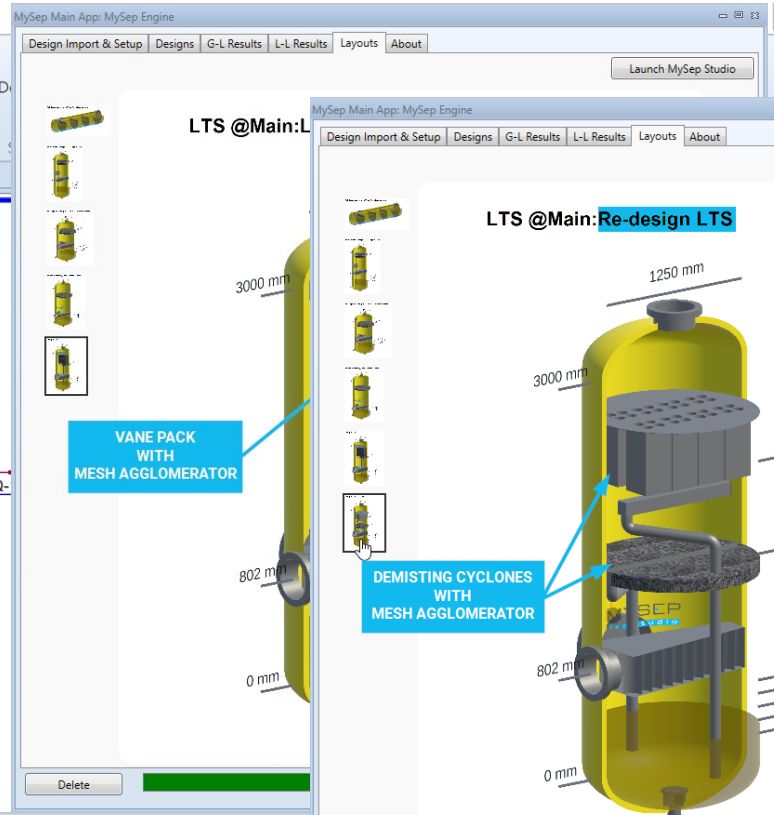
Import a retrofitted LTS design

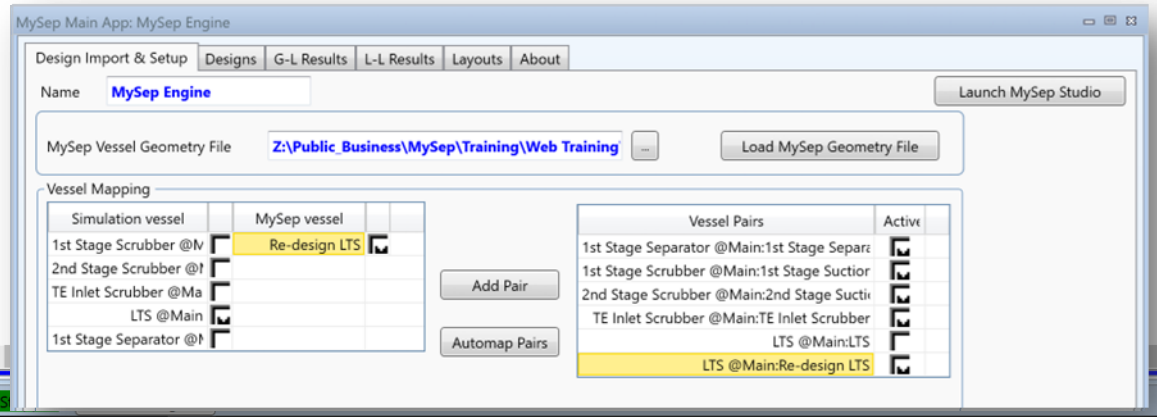
MySep Engine

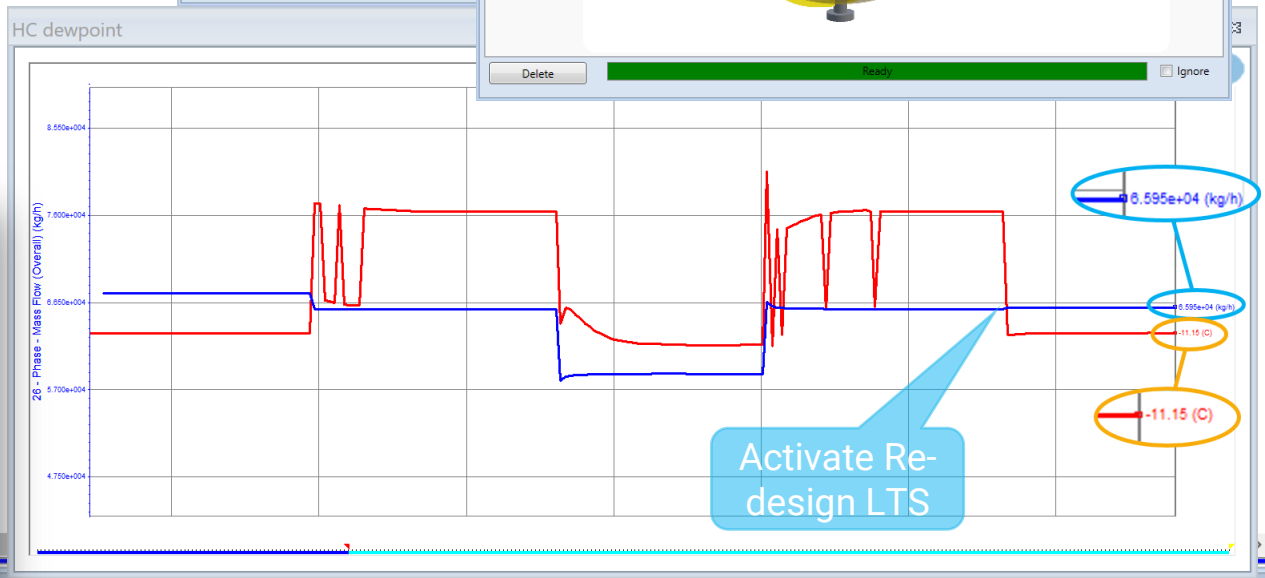
Pair and activate new geometry



H.C. Dewpoint On Spec (< -10°C)





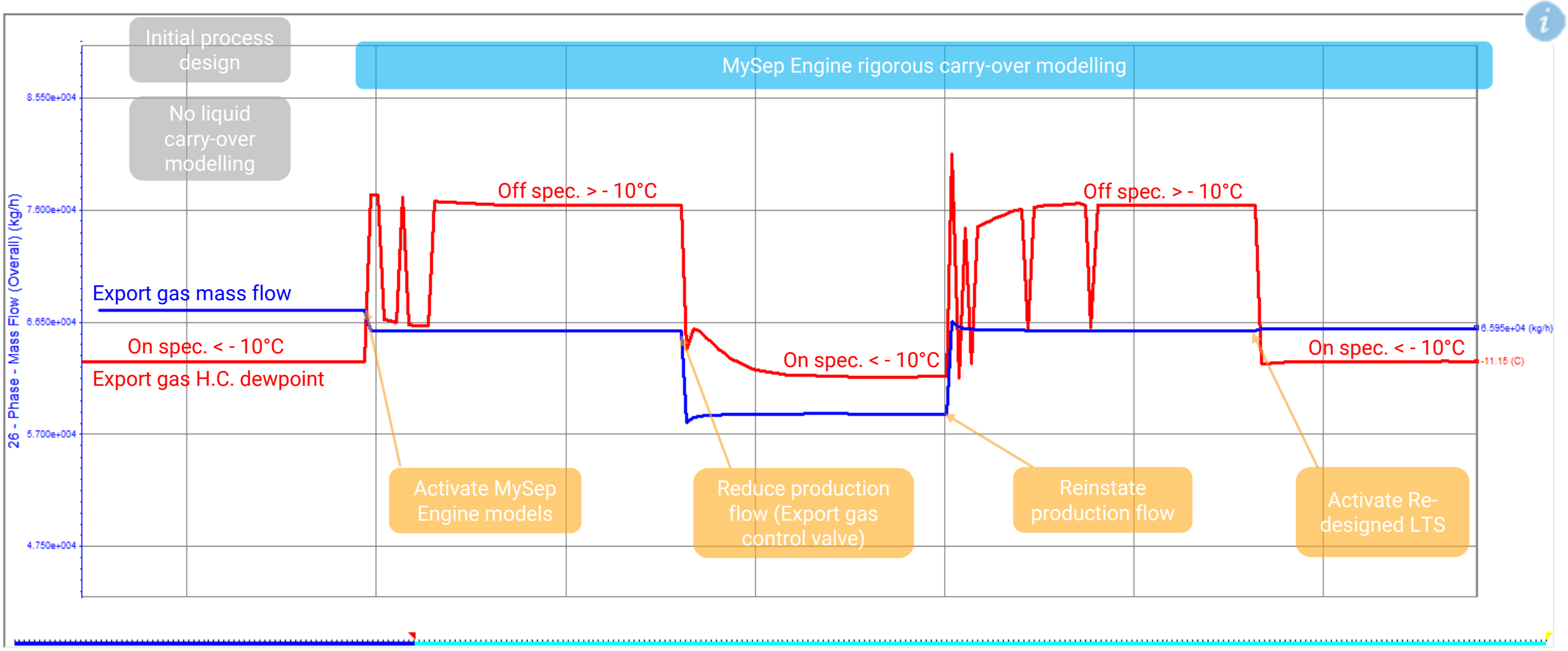


Navigation Pane

MYSEP

Summary

HC dewpoint


Initial process design
No liquid carry-over modelling
MySep Engine rigorous carry-over modelling
8.550e+004
7.600e+004
6.650e+004
5.700e+004
4.750e+004
26 - Phase - Mass Flow (Overall) (kg/h)
Export gas mass flow
On spec. < - 10°C
Export gas H.C. dewpoint
Off spec. > - 10°C
On spec. < - 10°C
Off spec. > - 10°C
On spec. < - 10°C
6.595e+04 (kg/h)
-11.15 (C)
Activate MySep Engine models
Reduce production flow (Export gas control valve)
Reinstate production flow
Activate Re-designed LTS

MYSEP

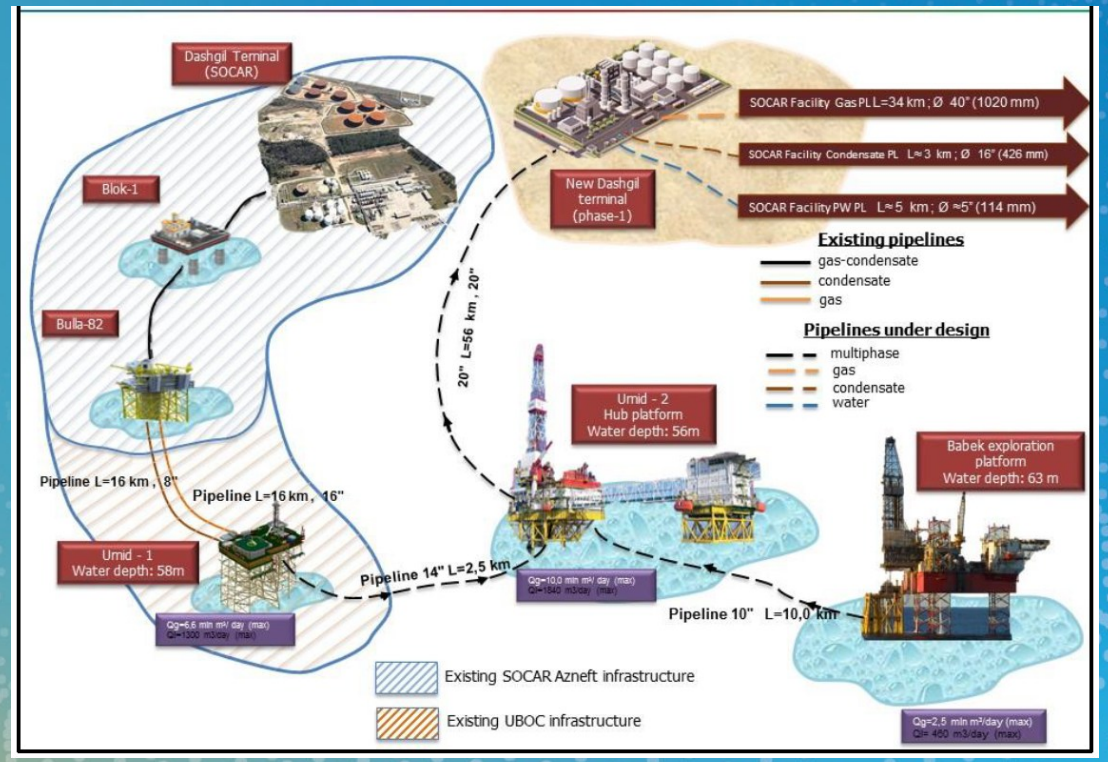
MySep Engine **rigorous** **separation modelling**

in process **simulations**

for proper **Design** and

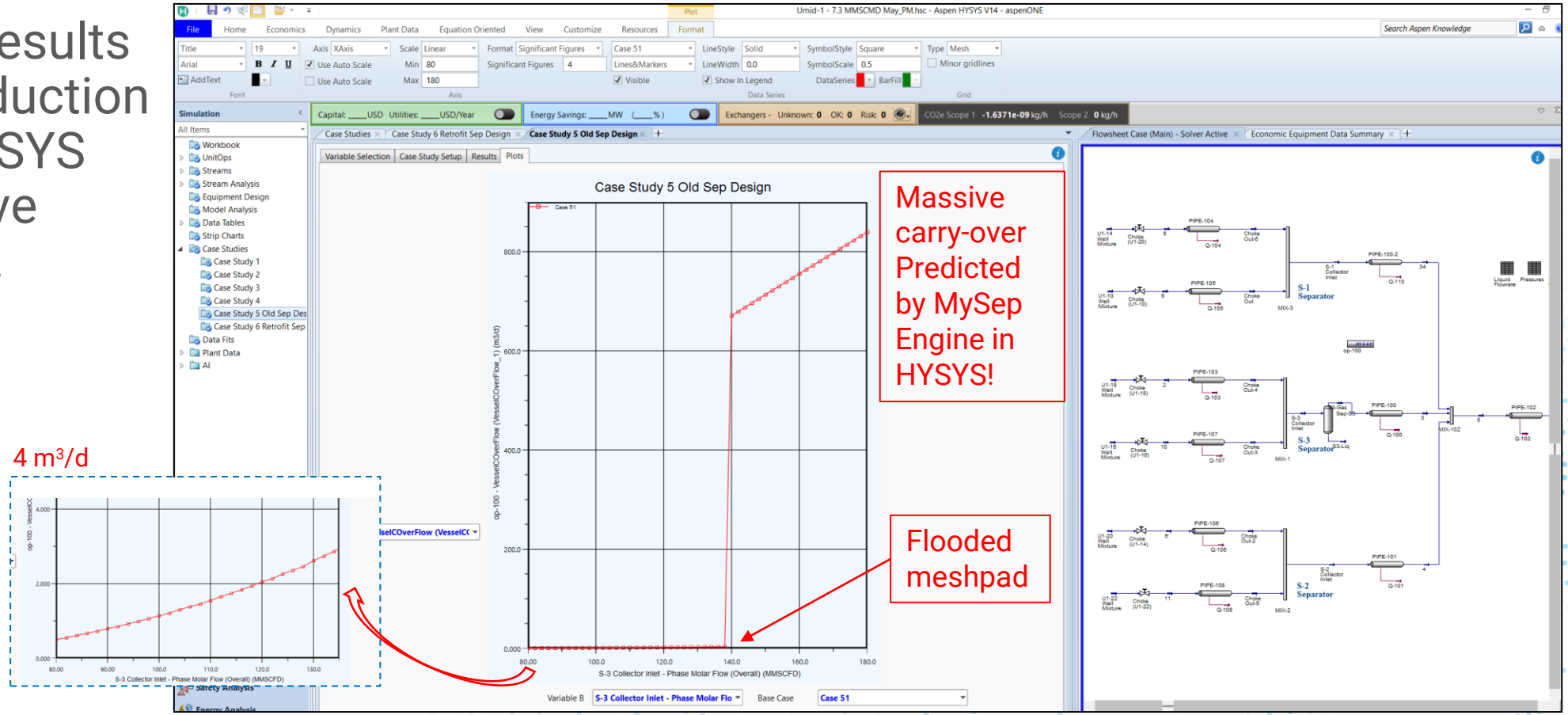
optimisation of **Operations**

Case Study – Caspian Sea production facility



Case Study: Production constraint due to liquid carryover into gas pipeline

MySep Engine results of existing production separator in HYSYS revealed massive liquid carryover.



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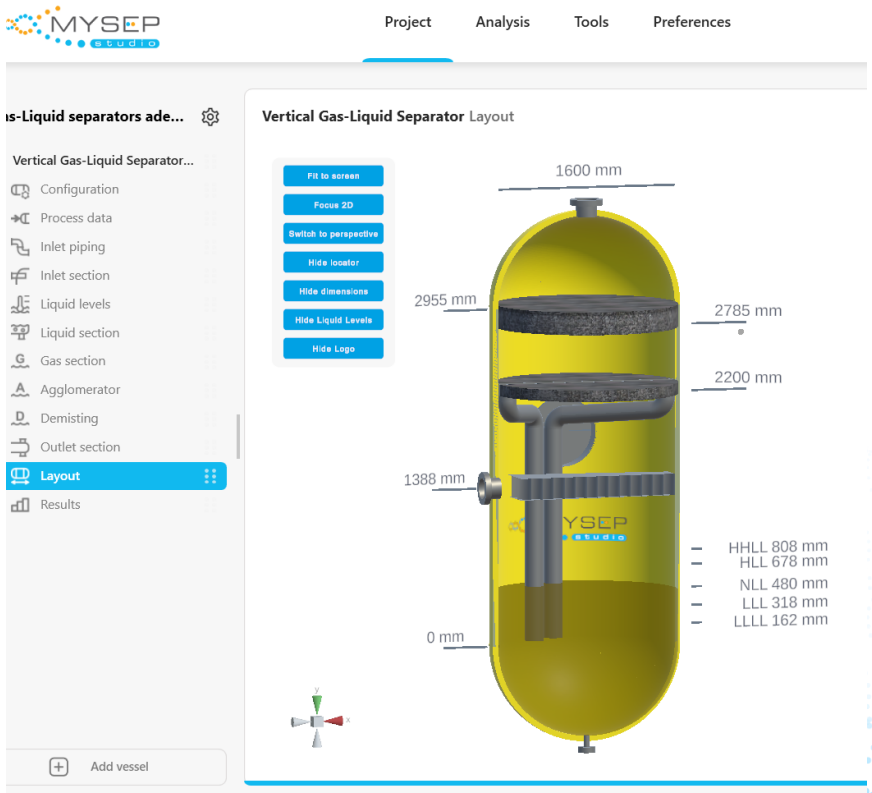
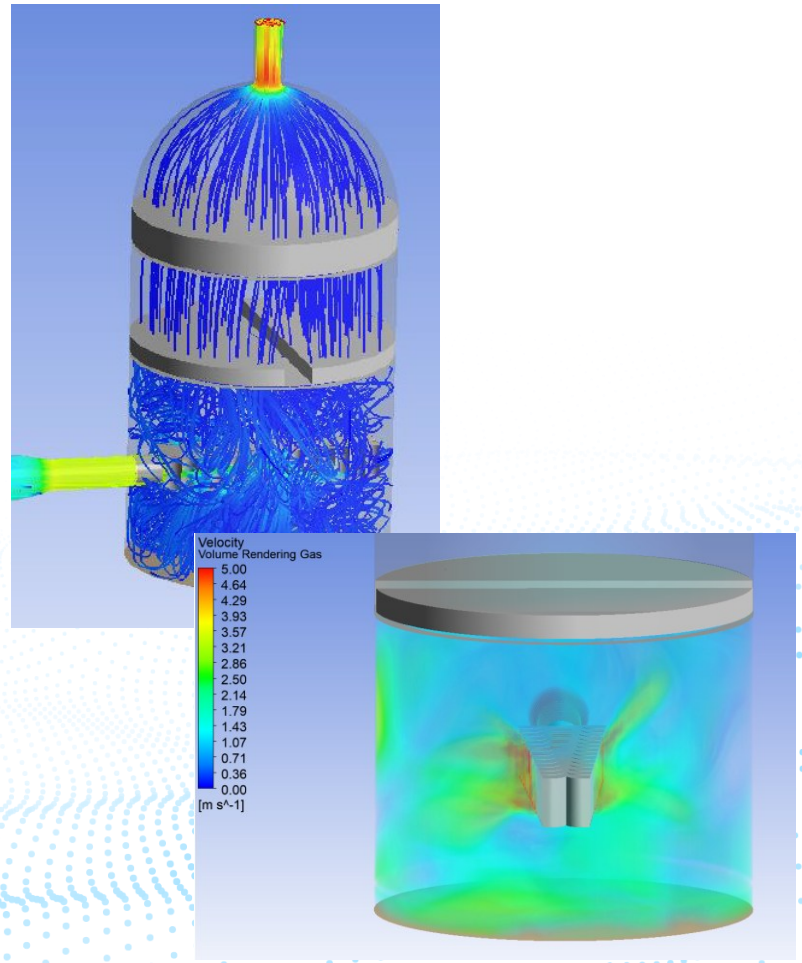
Case Study: Production constraint due to liquid carryover into gas pipeline

Improved retrofit design analyzed with MySep software and CFD.





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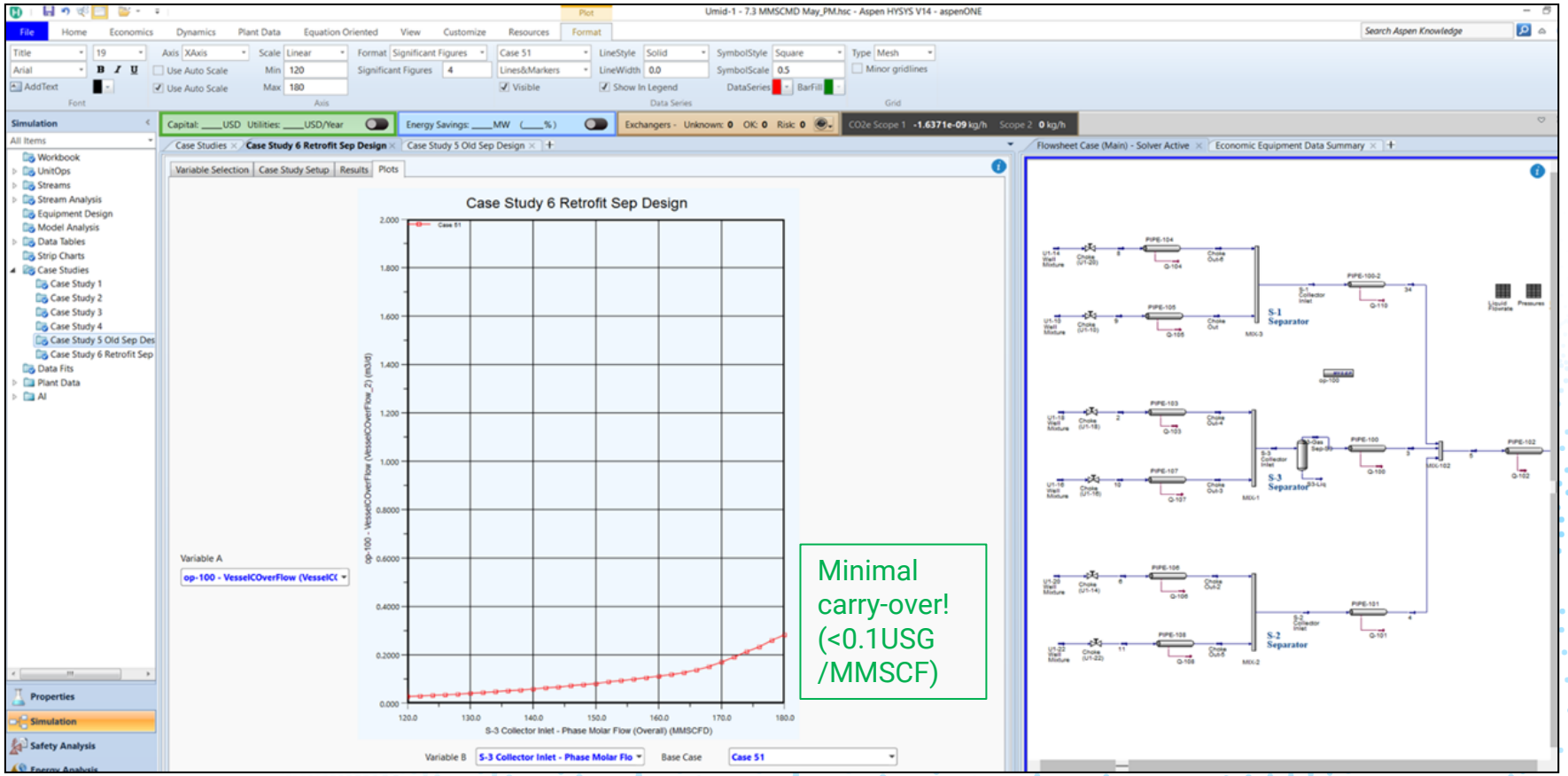
Case Study: Production constraint due to liquid carryover into gas pipeline

MySep Engine results of retrofit production separator in HYSYS demonstrated minimal carryover, even at increased production.



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Case Study: Production constraint due to liquid carryover into gas pipeline

Commercial impact of for the operator:

- Production increase: ± 2.0 MMNCMD of gas (42-50% increase).
- Increased revenue: ± 6 Million USD / Month (@ 3,000 USD/MMSCF)
- ROI: ± 12 days, including production losses during the production stop of 7 days!
- No more “liquid bottleneck” at operator’s terminal

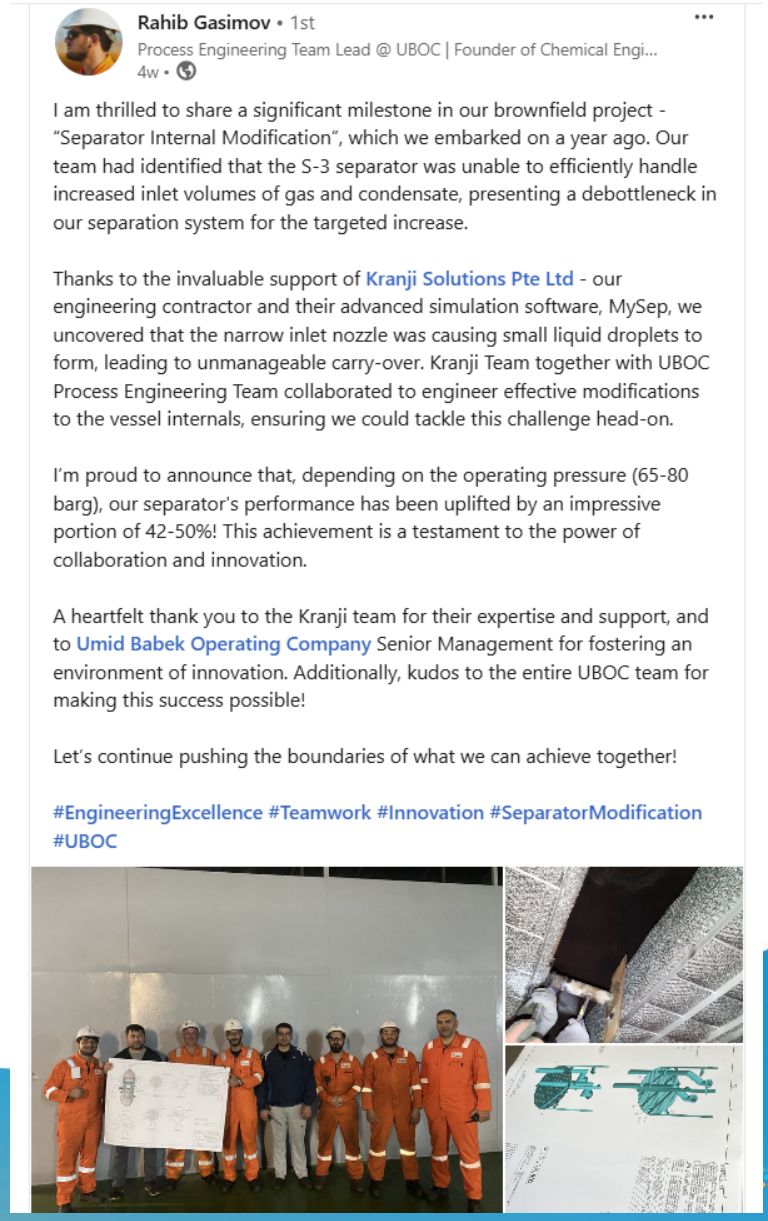
Case Study: Production constraint due to liquid carryover into gas pipeline

Testimonial

I am pleased to inform you that the review is now complete, and we are happy to report a significant performance improvement of 42–50%, depending on the vessel's operating pressure. This represents a major upgrade in efficiency and output.

I would like to extend my deepest gratitude to UBOC Senior Management for their openness and support in facilitating this type of modification project. Special thanks as well to the entire UBOC team for their dedication and effort in making this initiative a success!

Additionally, I would like to acknowledge Kranji team's exemplary work throughout the modification process. Your expertise, professionalism, and commitment to engineering and quality have contributed greatly to the success of this project. The seamless coordination and timely execution of the installation have been key factors in achieving these outstanding results.



Rahib Gasimov • 1st
Process Engineering Team Lead @ UBOC | Founder of Chemical Engi...
4w •

I am thrilled to share a significant milestone in our brownfield project - "Separator Internal Modification", which we embarked on a year ago. Our team had identified that the S-3 separator was unable to efficiently handle increased inlet volumes of gas and condensate, presenting a debottleneck in our separation system for the targeted increase.

Thanks to the invaluable support of Kranji Solutions Pte Ltd - our engineering contractor and their advanced simulation software, MySep, we uncovered that the narrow inlet nozzle was causing small liquid droplets to form, leading to unmanageable carry-over. Kranji Team together with UBOC Process Engineering Team collaborated to engineer effective modifications to the vessel internals, ensuring we could tackle this challenge head-on.

I'm proud to announce that, depending on the operating pressure (65-80 barg), our separator's performance has been uplifted by an impressive portion of 42-50%! This achievement is a testament to the power of collaboration and innovation.

A heartfelt thank you to the Kranji team for their expertise and support, and to Umid Babek Operating Company Senior Management for fostering an environment of innovation. Additionally, kudos to the entire UBOC team for making this success possible!

Let's continue pushing the boundaries of what we can achieve together!

#EngineeringExcellence #Teamwork #Innovation #SeparatorModification #UBOC

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