

Production Process Digital Twins

Real Value Mandates Modelling Rigour

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Optimising Operations



Production facilities should produce more!

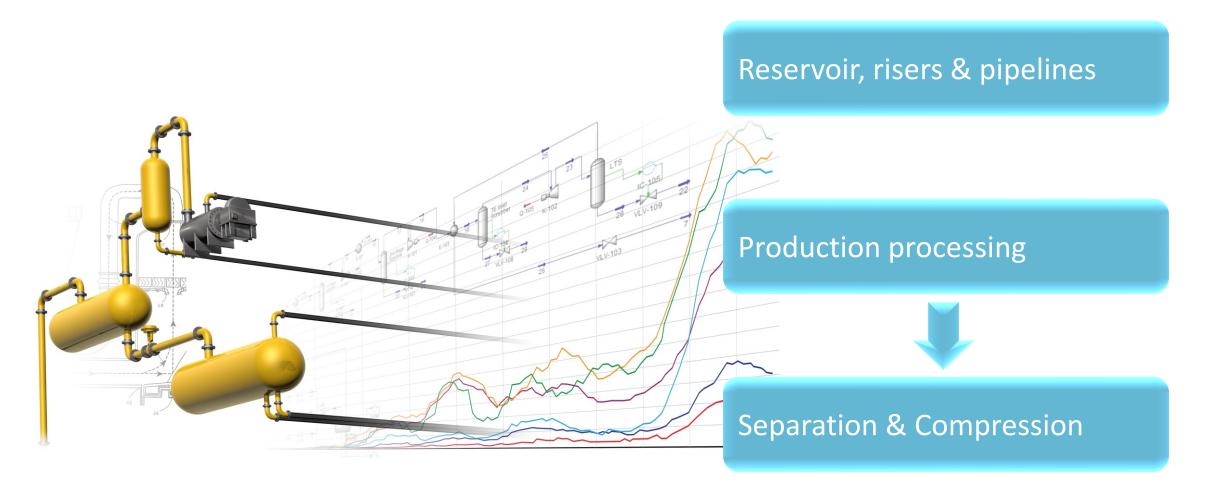
Onshore – Offshore platform - FPSO

So why don't they?



Constraints

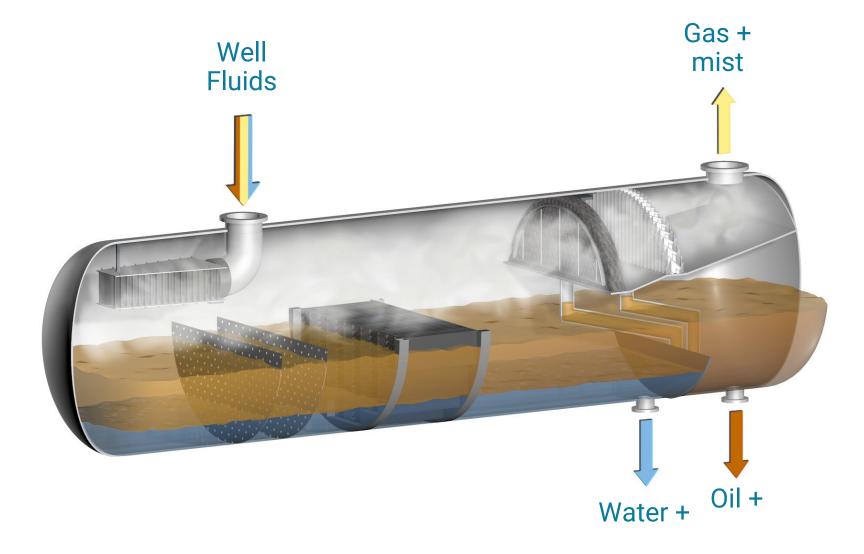




Optimise Separation to Optimise Operations => Maximise Revenue and Margin

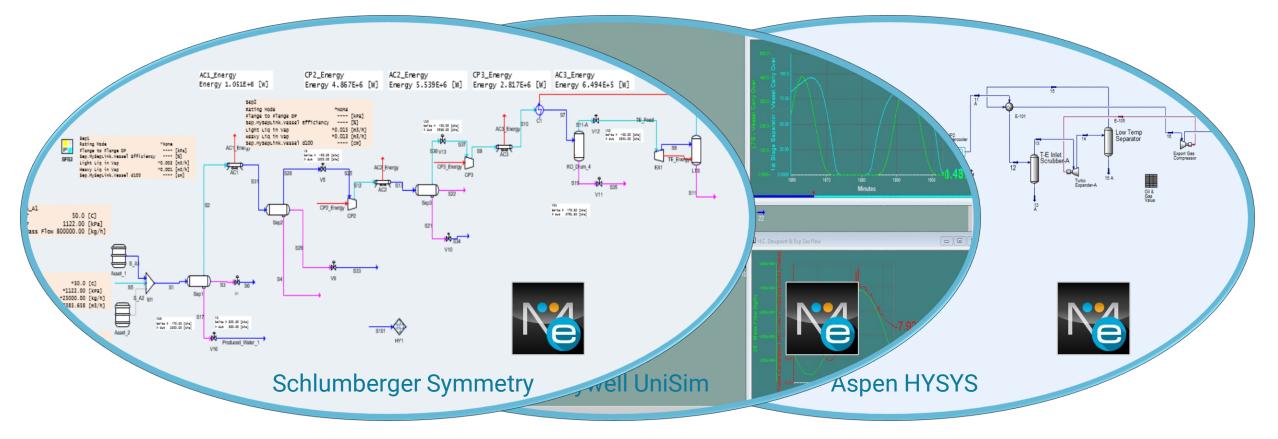
Separation & Production





Simulation Platform - Digital Twin





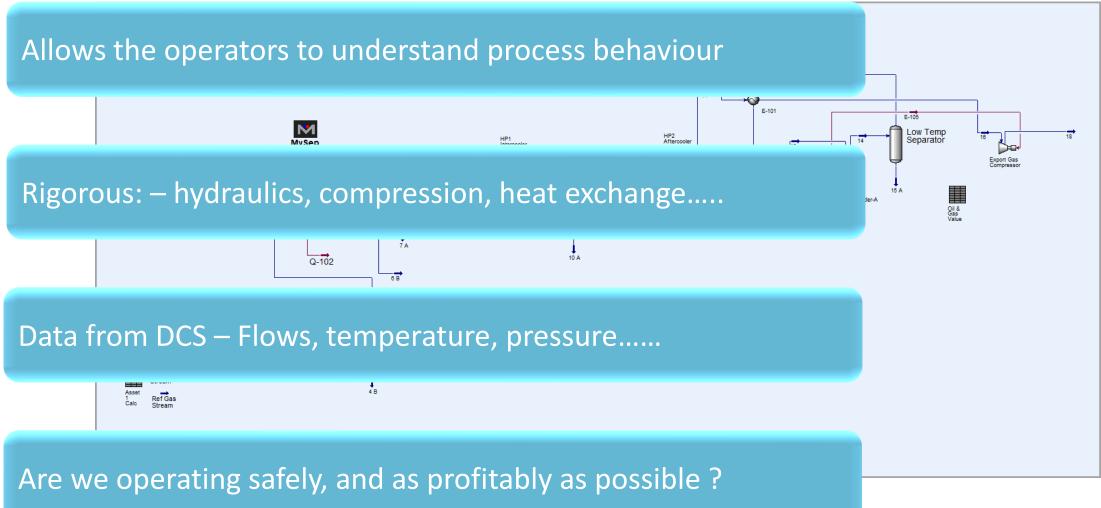
AVEVA PRO/II
& Dynsim

Kongsberg K-Spice



The Process Digital Twin





Let's Consider A Facility





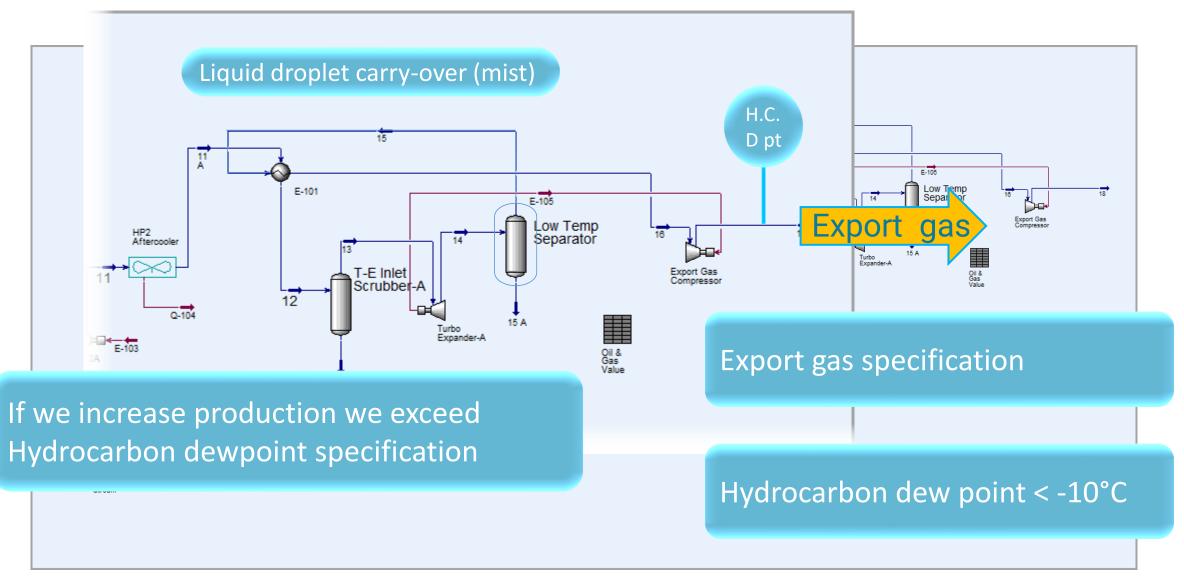
Facility Process Digital Twin



Digital Twin process flow diagram 74,000 bbl/day Oil & 79 MMSCF/day Gas Separator Revenue ≈ \$6.5 MM/day Key Carry-over Results Implemented on commercial MIX-100 simulator platform Constraint – Hydrocarbon dew point

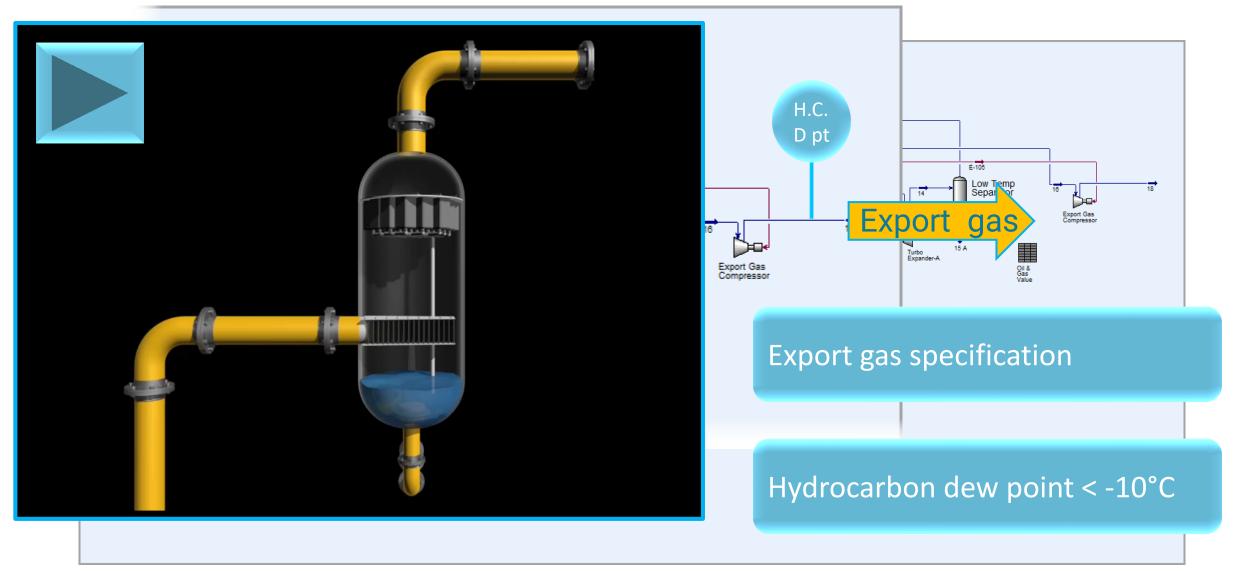
Understand Production Constraint





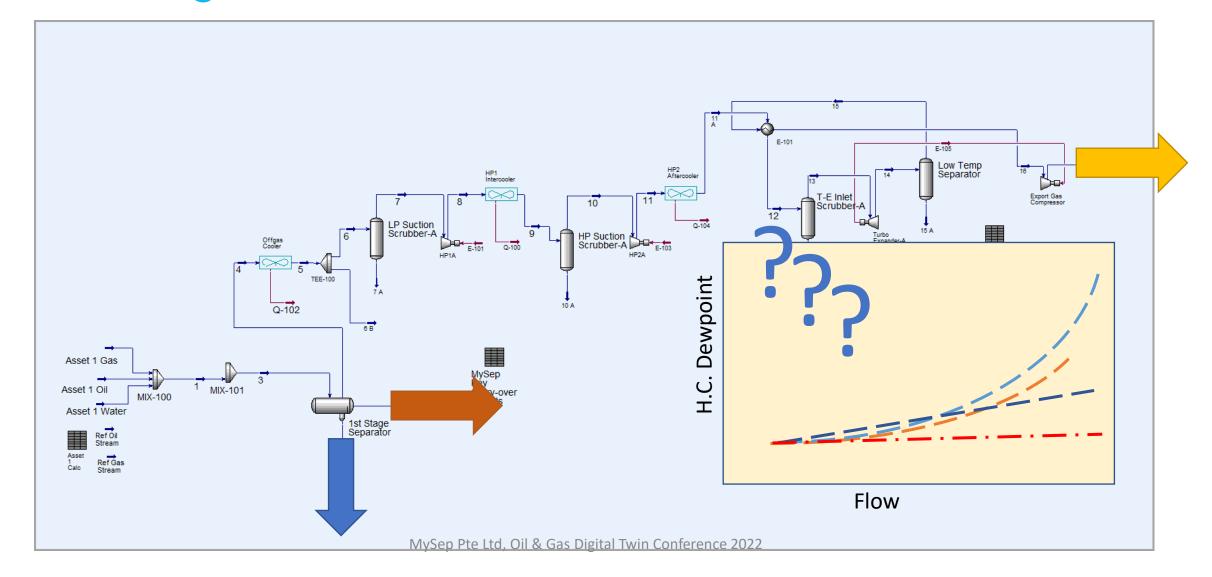
Understand Liquid Carry-over





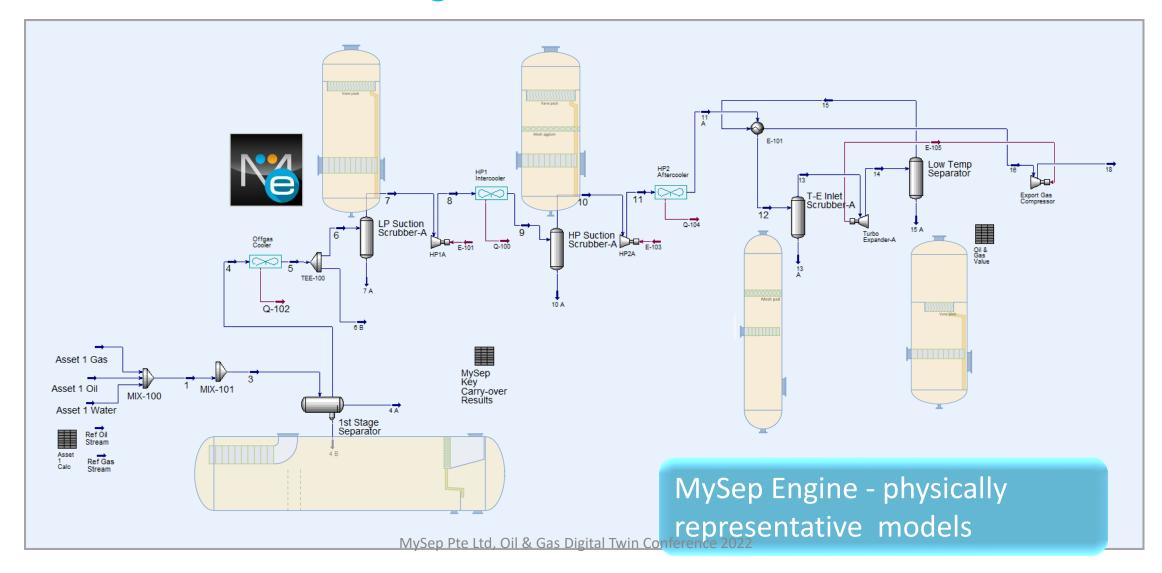
No Rigorous Separator Models in Our Digital Twin

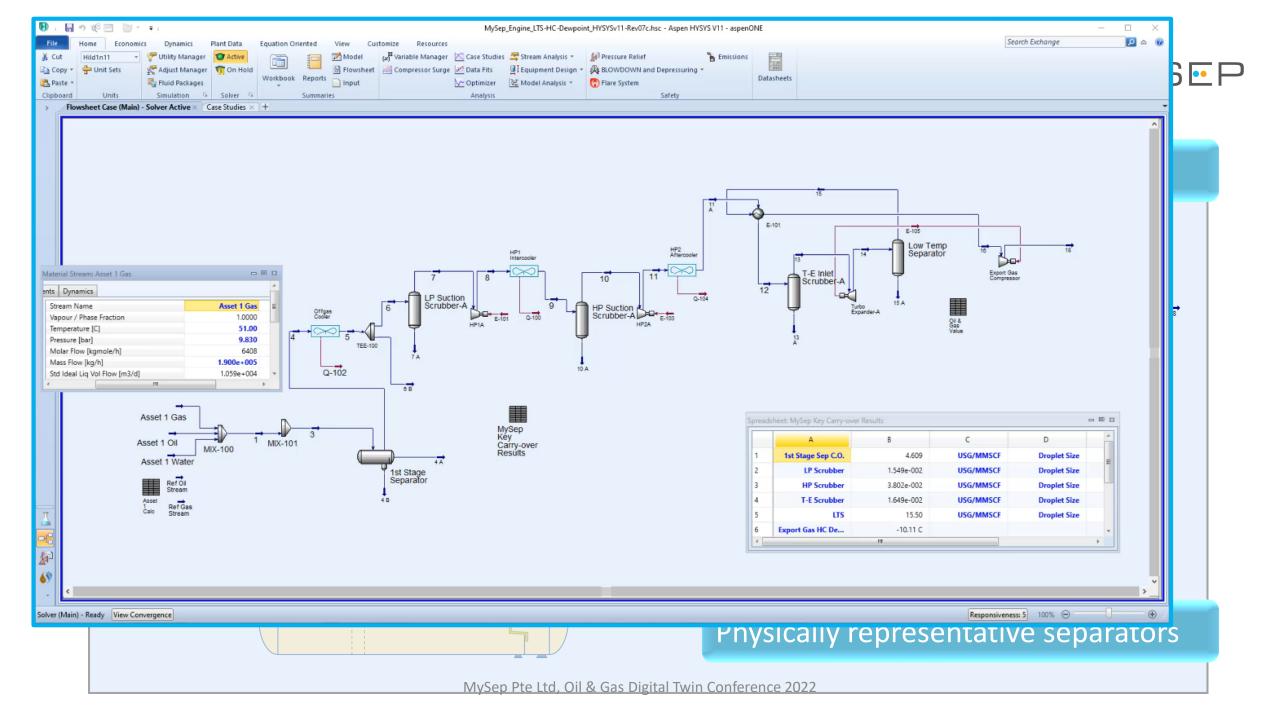




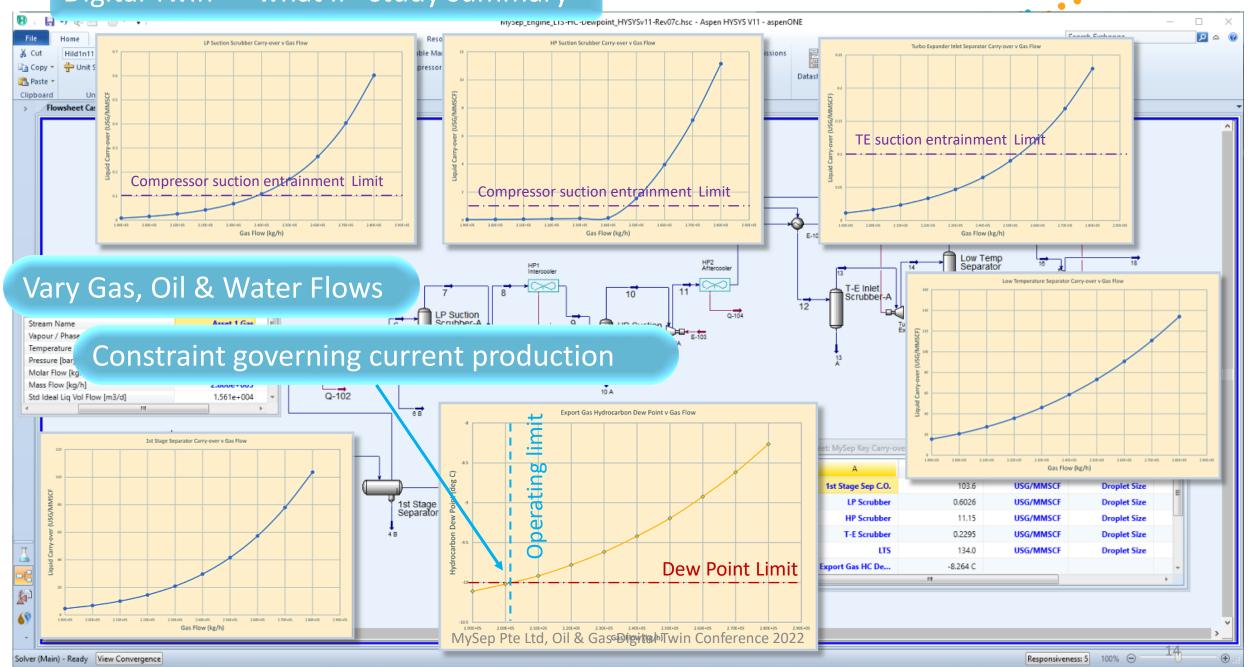
Let's Put Rigorous Separator Models in Our Digital Twin





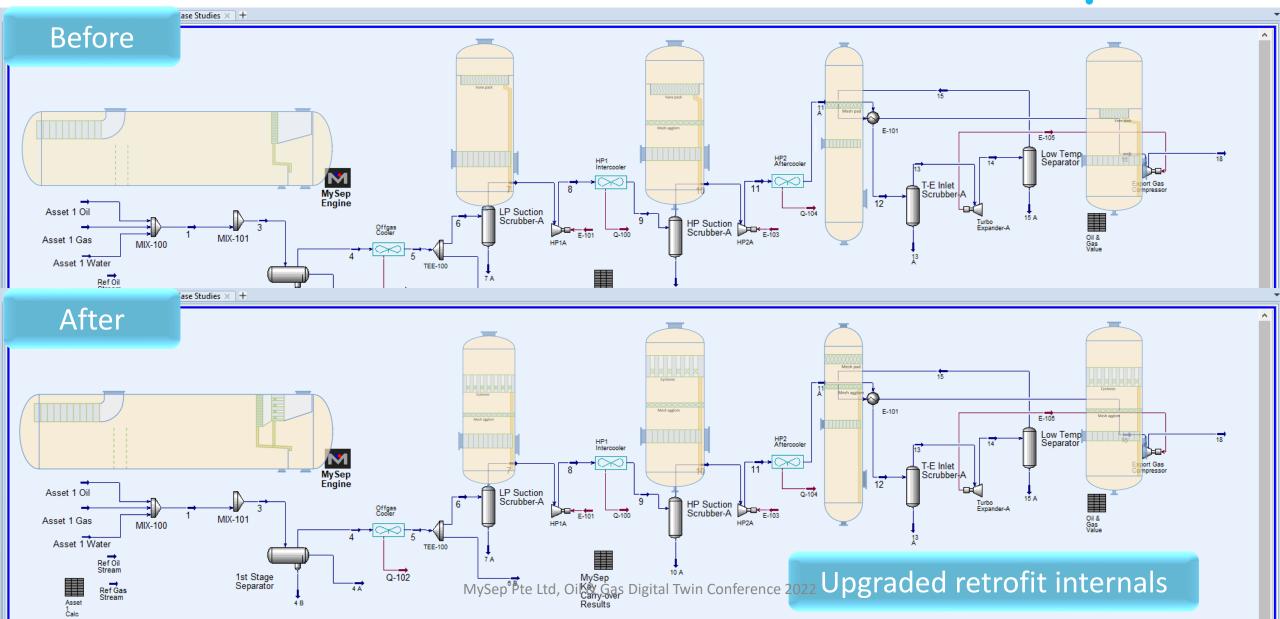


Digital Twin – "what if" study summary



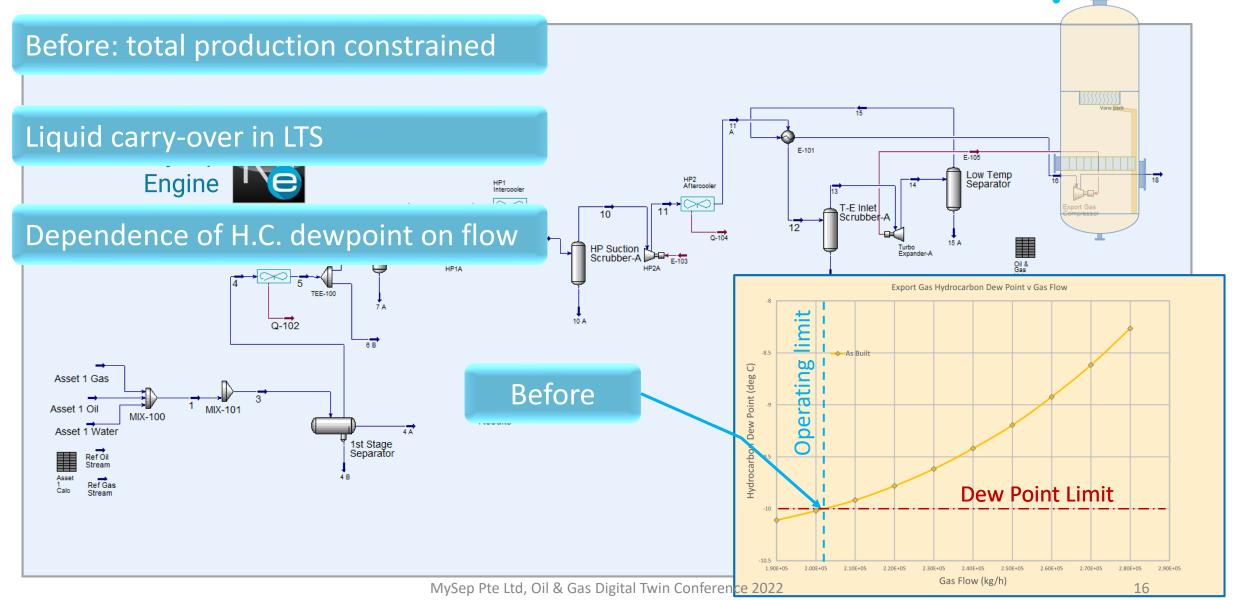
Can we de-bottleneck – Digital Twin?





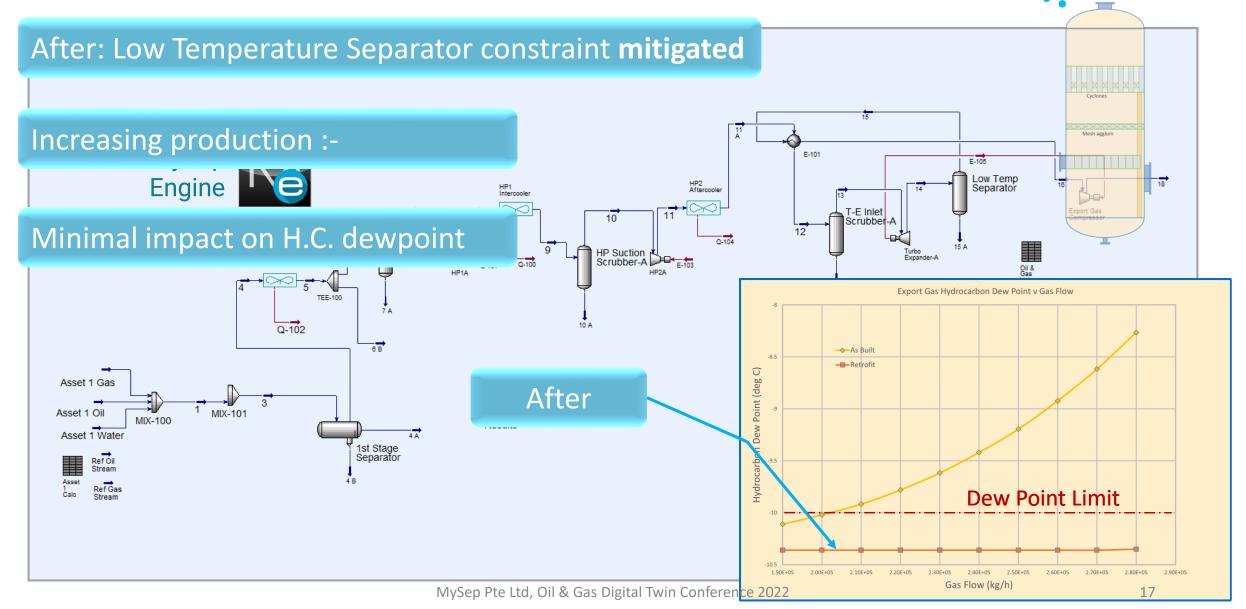
Digital Twin Study with Revamps





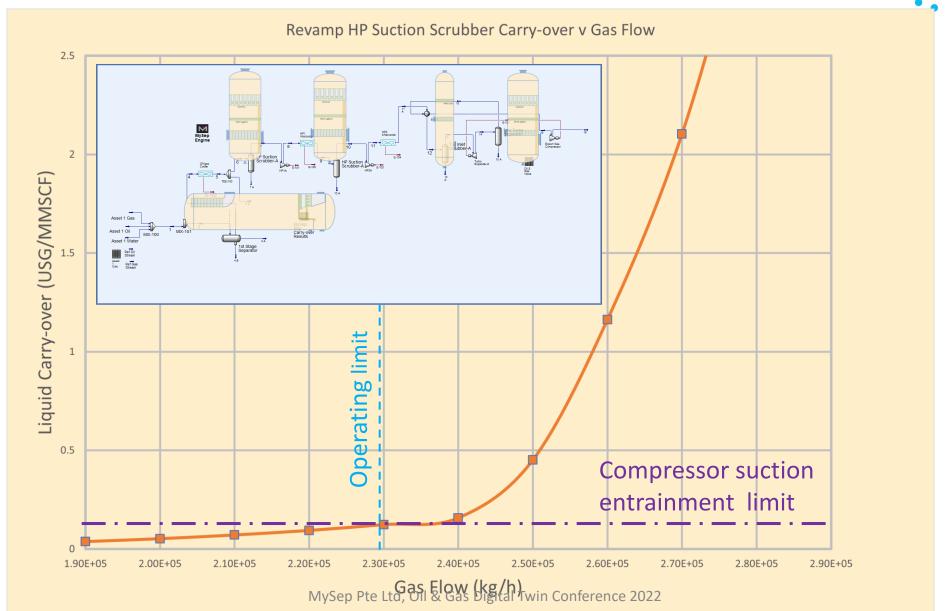
Evaluating our Optimised Process





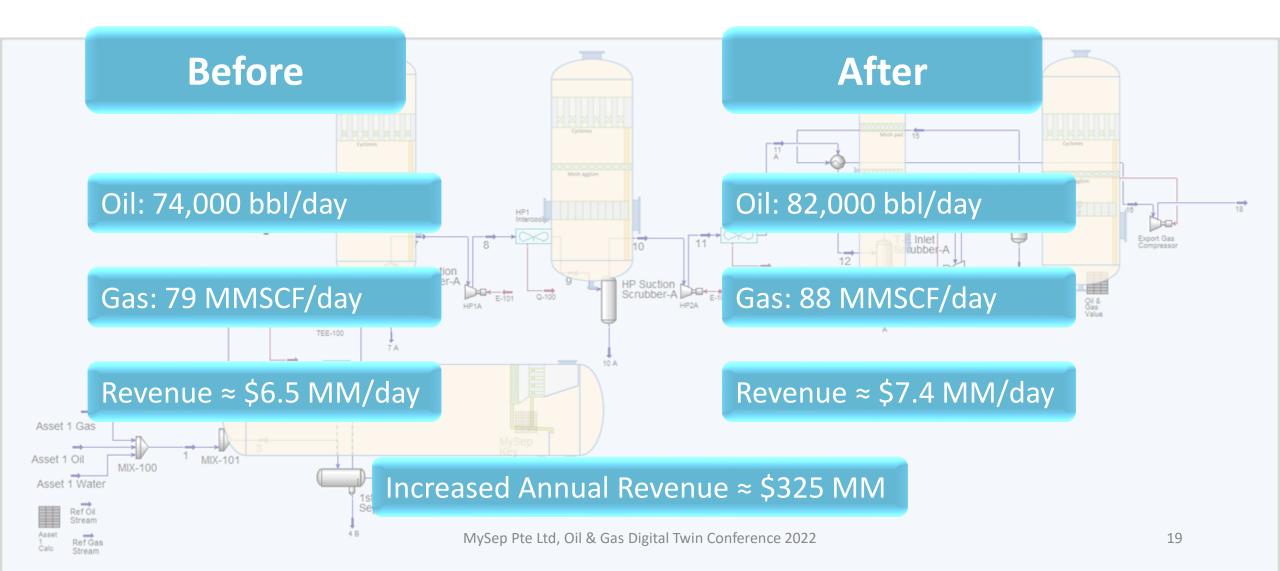
The New Process Constraint





Summary of Digital Twin Result





Developments



- MySep customers working on Online models
 - Live facility DCS data into Digital Twin
 - Live business performance for operations team
- Model predictions augment data historian records
 - Carry-over, droplet size distributions "virtual tags"
- Potential for AI to have model "inferred" data to enhance machine failure prediction

Conclusions



- MySep Engine and MySep Studio The Industry Standard Software
- Digital twins are essential to:-
 - Optimise operation to meet business targets
 - Maintain asset integrity and
 - Avoid un-planned shut-down
- Rigorous separation modelling is a key component





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Real value mandates modelling rigour!