AVEVA Innovations Demo

Greenhouse gas minimization with AVEVA Process Simulation

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Greenhouse Gas Minimization (5:30)



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AVEVA™ Process Simulation

Built from the ground up, delivering the process digital twin,
to the next generation of engineers.

Europe Advisory Group Meeting
Cal Depew, AVEVA Process Simulation Product Director
James Kattapuram, AVEVA Process Simulation Development Director

16 June 2021

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slido

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AVEVA PRO/II Simulation & AVEVA Process Simulation: Did you make any entries in the Aha Ideas Board over the past few months?

ⓘ Start presenting to display the poll results on this slide.

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How are sustainability industry trends affecting you?

ⓘ Start presenting to display the poll results on this slide.

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01 **Vision and Trends**

02 New Features since last year

03 Roadmap

04 Feedback and Comments

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The Process Side of Digital Transformation

Designed from the ground up, delivering the process digital twin, to the next generation of engineers

Designed from the Ground Up

- Multi-core
- Continuously saved for cloud
- Role-based user interface
- Open model writing

Delivering the Process Digital Twin

- Design, Rating and Dynamic Mode
- Libraries for different Assets
- One single model for the entire asset lifecycle

To the Next Generation of Process Engineers

- Groundbreaking Ease of Use
- Instantaneous results
- Intuitive User Interface

50% reduction in simulation effort across the lifecycle Collaboration internally and externally

Adaptable for Sustainable Process Development

Improved engineering workflow

Enables True Digital Transformation

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Reduce Total Ownership Cost and Process Engineering Hours

A unified environment improves personnel utilization, IT accessibility, cross tool integration, and reduce s software training



The value of a smartphone is greater than the sum of the separate devices.



A Typical EPC Process Engineering Department has over 50 applications that they use on a regular basis.

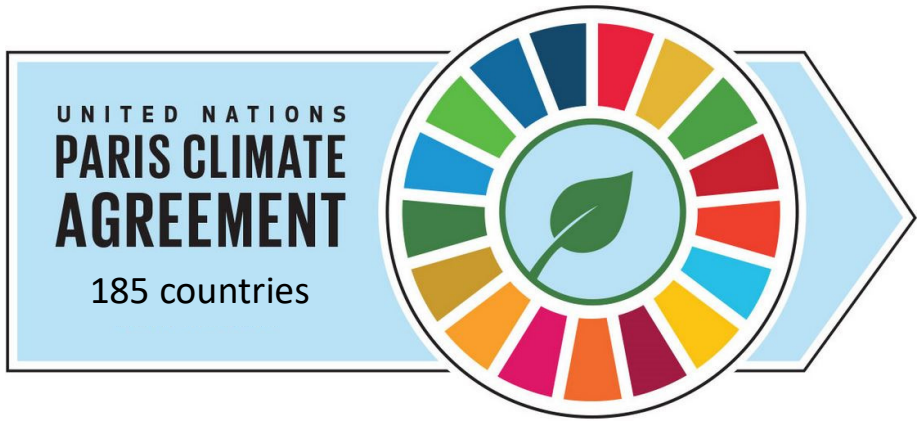
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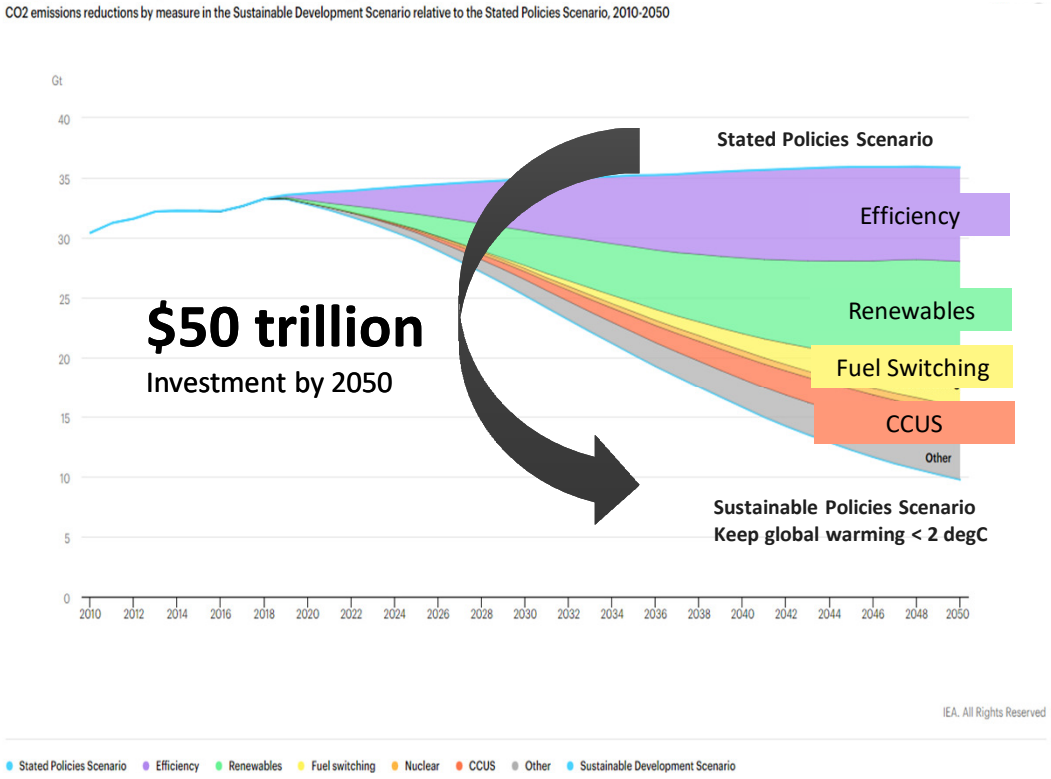
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Sustainable development has become top agenda for the world to address climate challenges

SOURCE: United Nations, International Energy Agency, Morgan Stanley



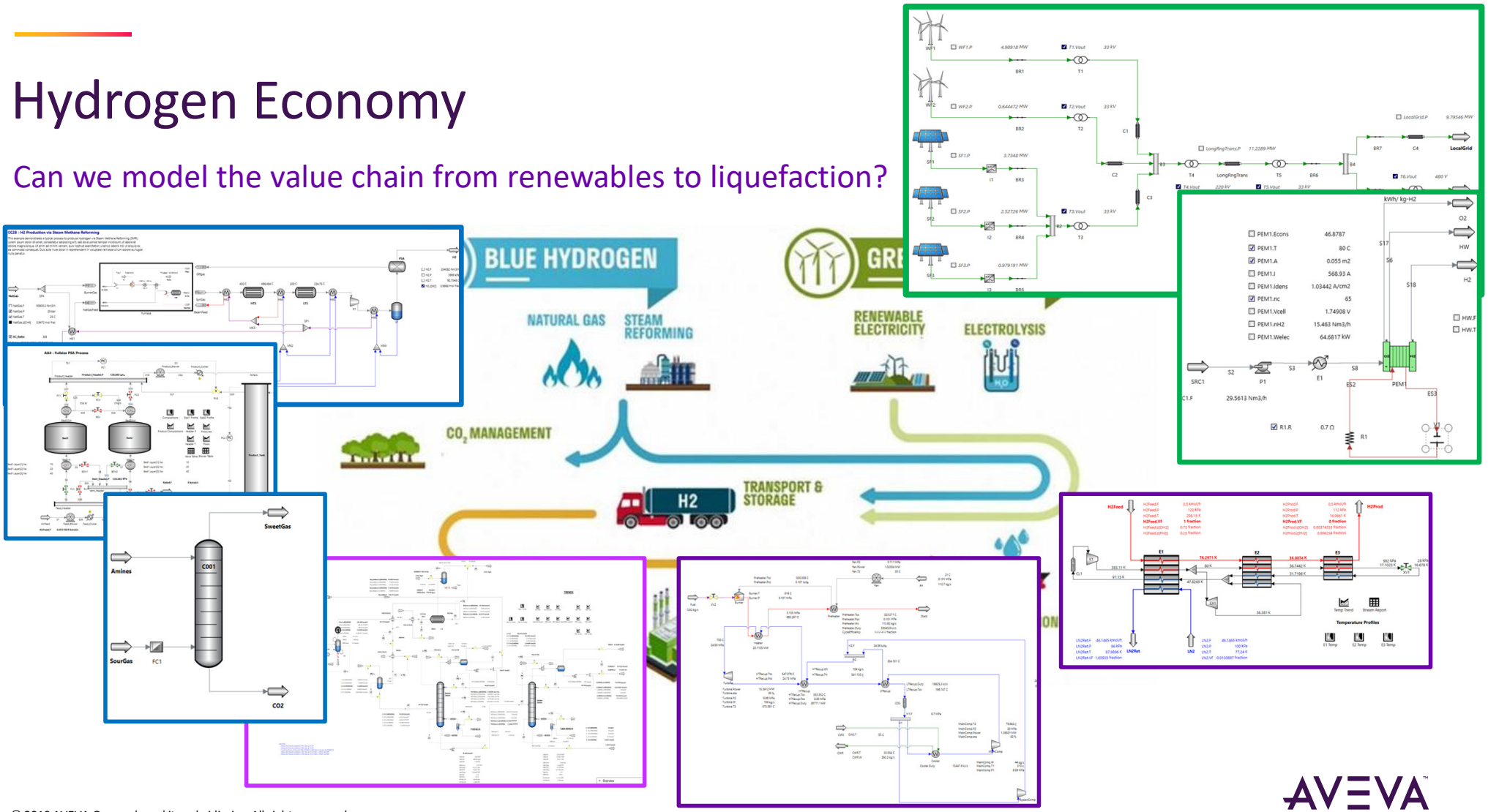


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Hydrogen Economy

Can we model the value chain from renewables to liquefaction?

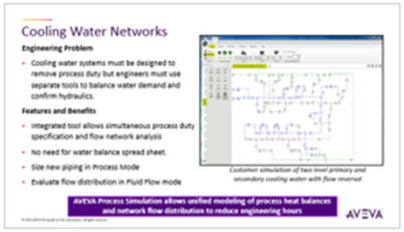


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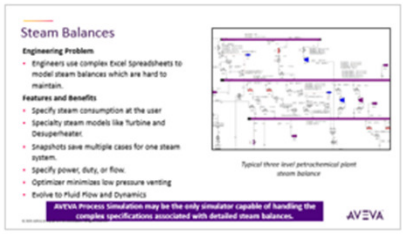
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AVEVA Process Simulation Capabilities Slide 1 of 2

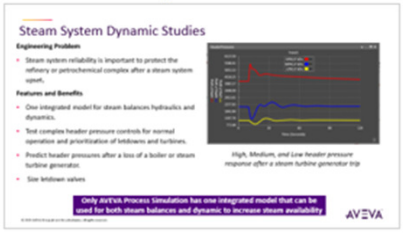
Cooling water networks



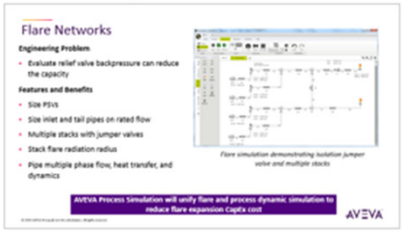
Steam balances



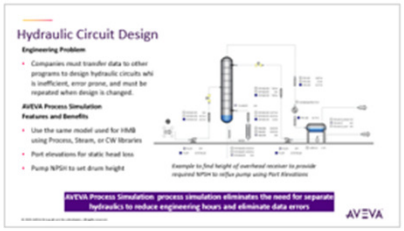
Steam dynamic studies



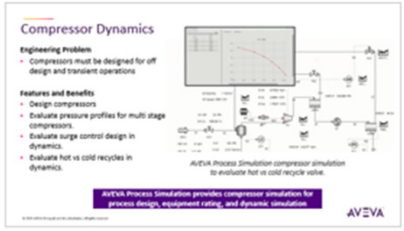
Flare systems



Hydraulic circuit design



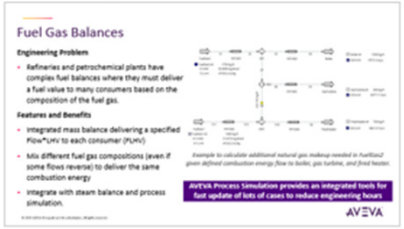
Compressor dynamics



Hot oil networks



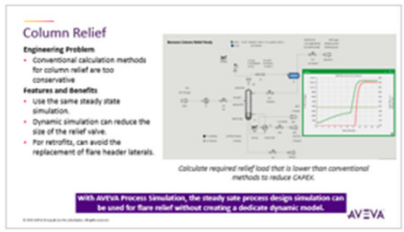
Fuel gas balances



Batch Distillation



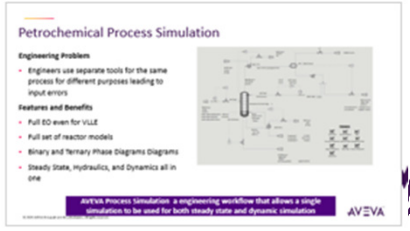
Column relief



Chemical processes



Petrochemical processes



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AVEVA Process Simulation Capabilities Slide 2 of 2

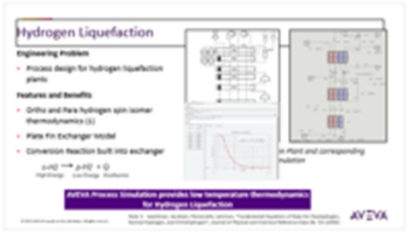
Air separation



LNG processes



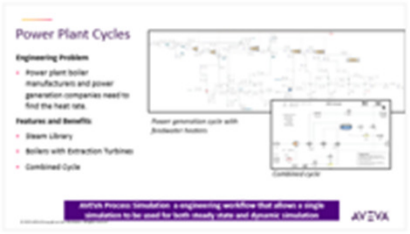
Hydrogen liquefaction



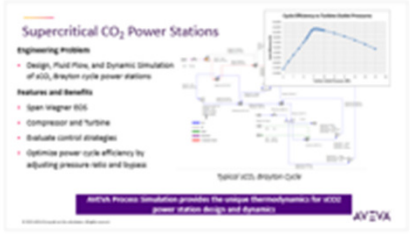
Pressure swing adsorption



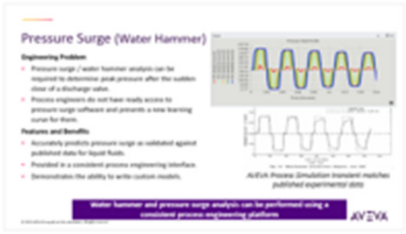
Power plant cycles



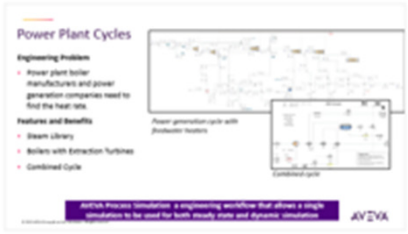
Supercritical CO_2 power



Pressure surge



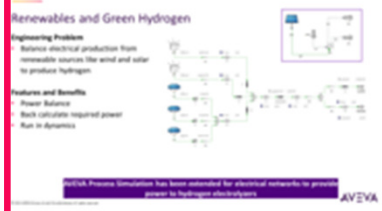
HX tube rupture



Vacuum transfer lines



Renewables/Green H2



Steam Methane reforming



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AVEVA™ Process Simulation Proposed Release Plan

Continue rapid development of Features for Chemical Process Simulation

AVEVA™ Process Simulation 5.1 Released (Jan 2021)

Thermo
- Hydrofluoric Acid (HF) Thermo Considering Reaction ($H_6F_6 = [HF]_6$)
- IF97 Transport Properties
- Thermo Access Interface (DPP, DDBSP)
- VLLE Improvements
- eNRTL Electrolyte Improvements

Models
- Batch Distillation Library (Beta)
- Reactor heat streams
- Gibbs Reactor Improvements
- Rate Based Library Improvements
- Excel Reactor Configuration Tool
- Sour Water and Examples

Platform
- Python Scripting Interface
- Thermo and Solver Diagnostics
- Reduced Memory Footprint
- Fluid changes in manual mode

Other
- Best Practices

AVEVA™ Process Simulation 5.2 Active (April 2021)

Thermo
- DECHEMA DPP Interface (DECHEMA)
- Extended Wilson Method
- Thermo Library Generation Tool
- Binary and Ternary diagram mass fraction basis
- Thermo Access Interface Enhancements

Models
- Batch Distillation Library
- Liquid-Liquid Decanter Model
- Drum/Separator Entrainment
- Measurement Reconciliation Model
- Pop Acting Relief valve model
- Flare Flag model
- Reaction Generator Excel Tool

Platform
- Specification Sets
- Model changes in manual mode
- PRO/II Stream and Fluid Migration

AVEVA™ Process Simulation 5.3 Beta Planned (July 2021)

Thermo
- Wilson Thermo Data Override
- UNIQUAC Thermo Data override
- Constant Component Thermo Data Override
- Binary Phase Diagram gamma-x plot

Models
- Renewable Energy library POC
- H2 Electrolyzer Model POC
- Greenhouse Gas Calculations
- Pump multiple curves
- Batch Library Improvements

Platform
- Specification Set Tooltips
- Diagram legend placement
- User Interface Style Improvements
- Table automatic updates
- Scripting Interface Improvements

Examples
- Steam Methane Reforming to produce blue Hydrogen

AVEVA™ Process Simulation 2022 Proposed (Oct 2021)

Thermo
- Predictive SRK with gE UNIFAC
- eNRTL Thermo Data Override
- SRK / PR Binary Data Override
- Phase Envelope Diagrams

Models
- Column hydraulics report
- Level transmitter in Preview Library
- Koch Glitsch Column Internals
- Sulzer Column Internals

Platform
- Simulation Search
- Trend Export to Excel

--- Still being planned ---

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01 Vision of AVEVA Process Simulation

02 New Features

03 Roadmap

04 Feedback and Comments

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AVEVA Process Simulation

New Features

AVEVA™ Process Simulation 5.1 New Features

Align objects on the Canvas

Objectives/Background

- It takes too long to manually align objects, especially variable references, on the canvas.

Solutions

- Group select objects and right select Alignment
  - Align Left
  - Align Top
  - Align Bottom
  - Same Width
  - Same Height
  - Space Down
  - Space Across
  - Align Variable References

Delivery Plan

- Version 5.1 (January 2021)



SRC1.W	659622 lb/h
SRC1.F	22863.6 lbmol/h
SRC1.P	14.6959 psia
SRC1.T	76.73 F
SRC1.Mt	2.20462 lbmol
SRC1.MW	28.8504 lb/lbmol

Video of Alignment feature

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AVEVA™ Process Simulation 5.1 New Features

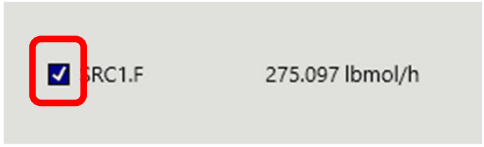
Variable references automatically show specification

Objectives/Background

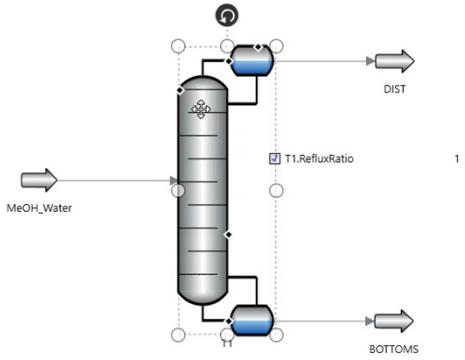
- When we introduced the option to show specifications with the variable reference.
- Users asked us to make this the default behavior as it provides a reminder of what has been changed.

Solutions

- Drag a variable reference from mini inspector, full inspector, or simulation manager, and the specification box is displayed by default.
- Can change specs directly on canvas.
- Document the specification changes that you make by making them visible on the canvas.



Specification is now enabled by default.



Video shows how to drag spec and change them

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AVEVA™ Process Simulation 5.2 New Features

Changed Specification Sets

Objectives/Background

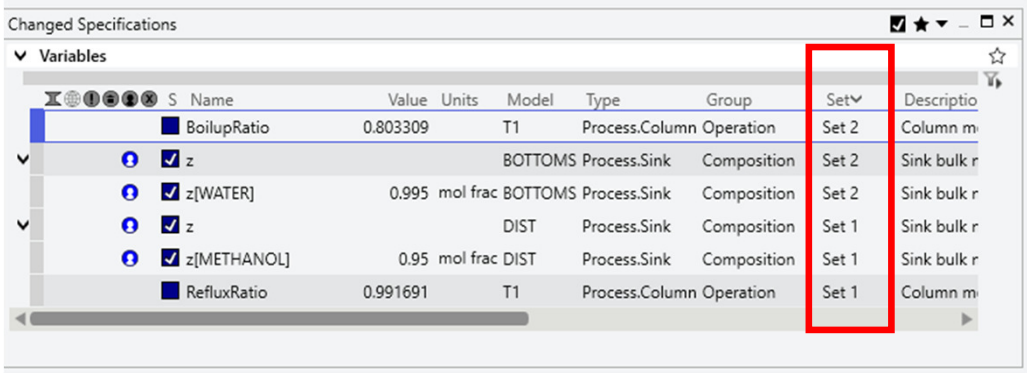
- Changed specifications are the specifications changed by the user shown with a blue square background.
- Users need a more targeted way of seeing changed specifications for large simulations.

Solution

- We create “Specification Sets” of variable specifications changed at the time to make the simulation properly specified (“square”) again.
- Viewed in Changed Specifications or Full Inspector

Delivery Plan

- Delivered for 5.2
- Customer-driven Improvements after 5.3



In Changed Specifications or Full Inspector, just click on Set to sort by the Specification Set to see the variables whose specifications were made at the same time.

From C1 Methanol Distillation

- *In Set 1, Reflux ratio is swapped with overhead methanol purity*
- *In Set 2, Boilup ratio is swapped with bottoms water purity*

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AVEVA™ Process Simulation 5.3 Beta Features

Changed Specification Sets Tooltips

Objectives/Background

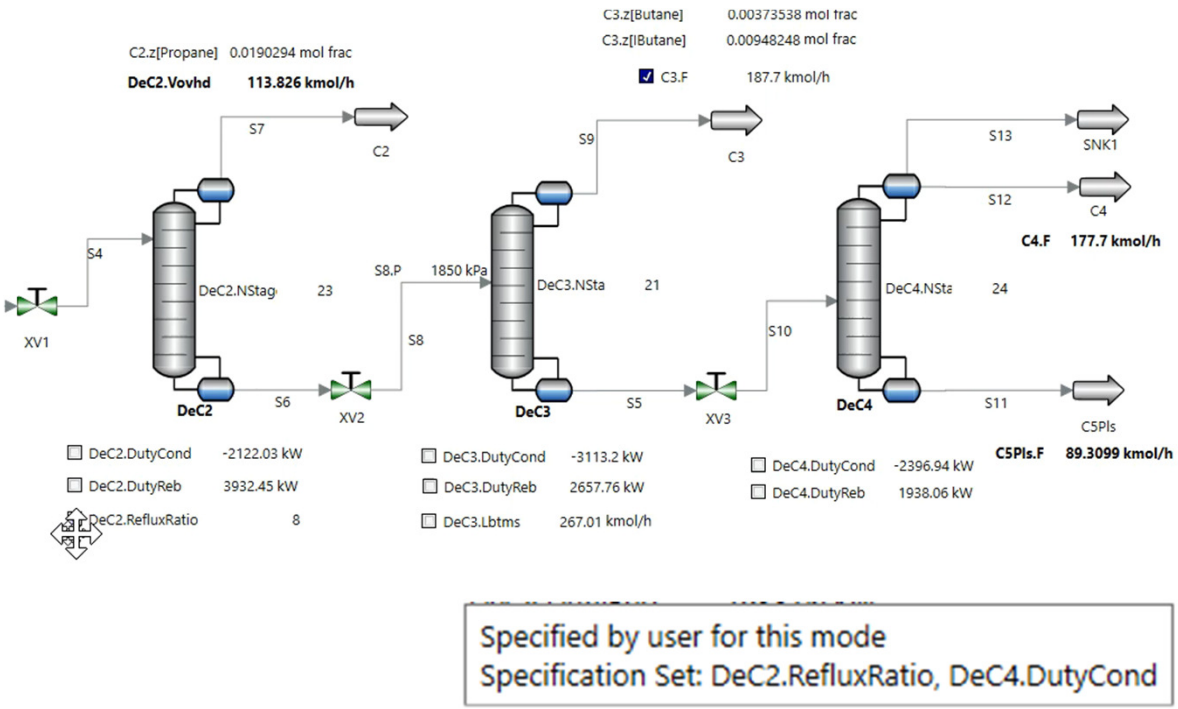
- How can you quickly find out what variables were specified at the same time without having to go to the "Changed Specifications" display.

Solution

- Hover over any blue specification box to see what other variables specifications were made at the same time.

Delivery Plan

- Changed Specifications released in 5.2



Case where reflux ration of column DeC2 and condenser duty of column DeC4 were swapped, which would have been very hard to know.

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AVEVA™ Process Simulation 5.2 New Features

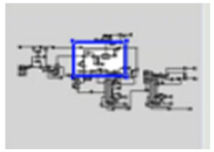
View entire flowsheet

Objectives/Background

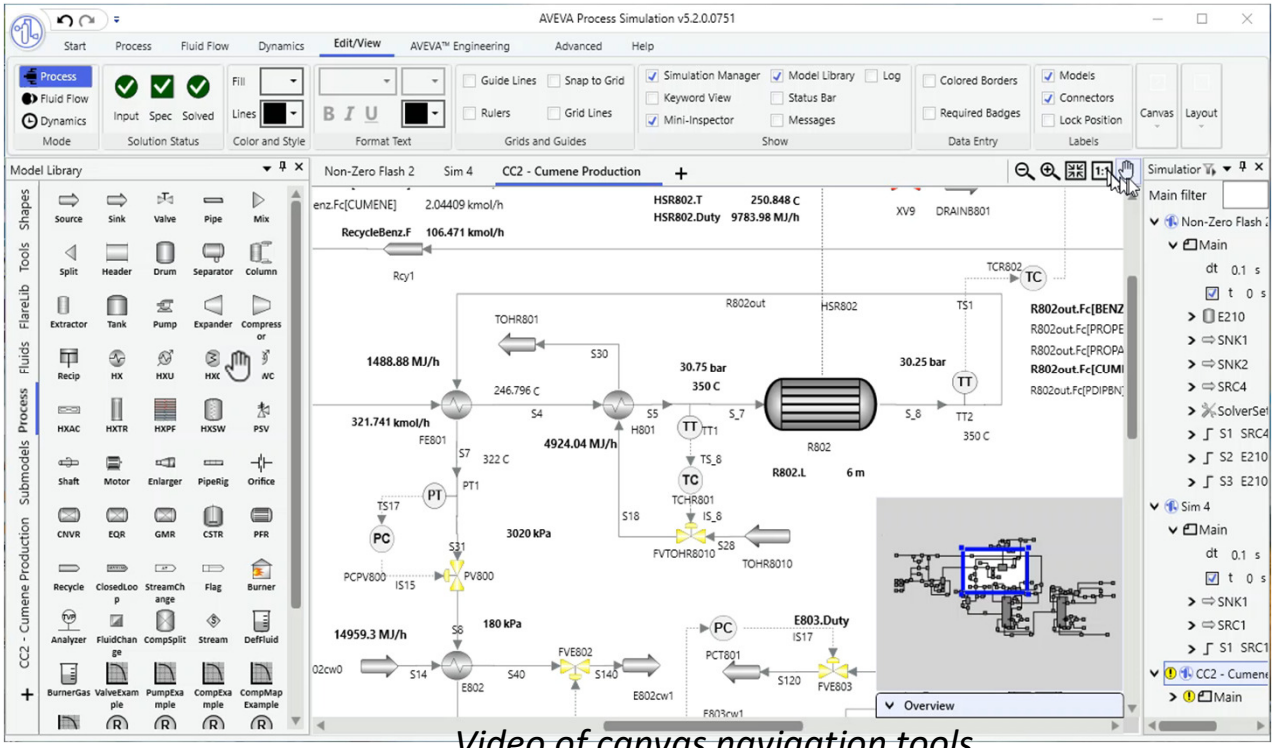
- Hard to see entire simulation when it is large so we added fit to page option and revised all of the control icons.

Solution

- Zoom out
- Zoom in
- Fit to page
- Reset zoom to one to one
- Put canvas in pan mode



Note: Overview is still the fastest way to pan the flowsheet canvas.



Video of canvas navigation tools

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AVEVA™ Process Simulation 5.1 New Features

Flowsheet Icon Images

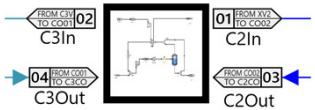
Objectives/Background

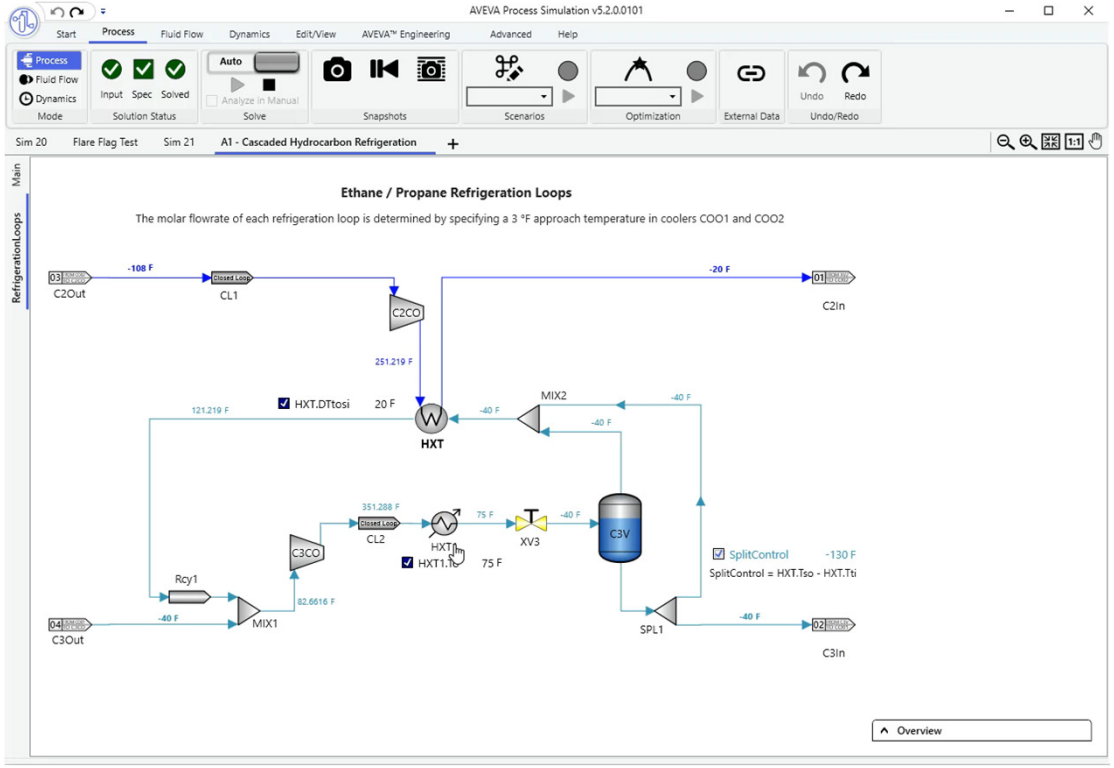
- Flowsheet icons do not visually indicate what they include.



Solution

- Replace flowsheet icon with any image on your file system.
- Replace flowsheet icon with a screenshot of the actual flowsheet from the clipboard.





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AVEVA™ Process Simulation 5.2 New Features

Binary and Ternary Phase Diagram Mass Fraction Basis

Objectives/Background

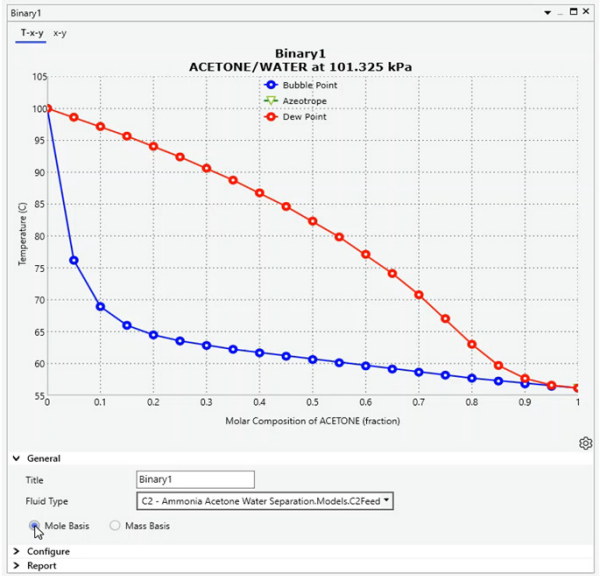
- Phase diagrams only displayed in a mole basis. Many customers work on a mass basis.

Solution

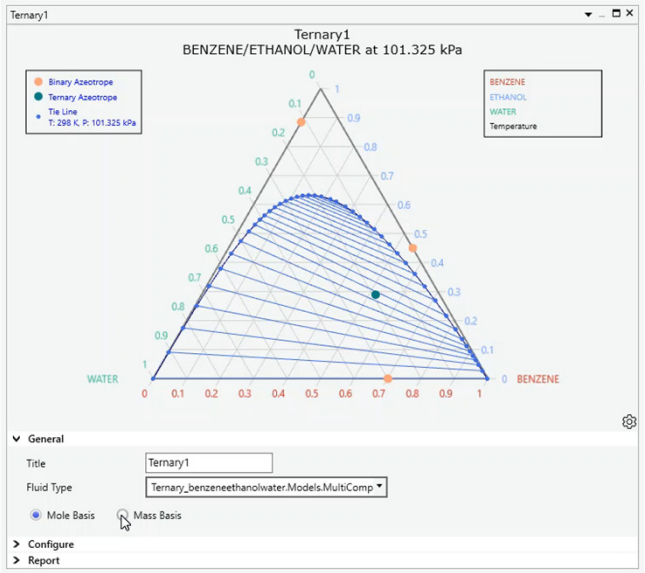
- Add Mass Basis
- Binary Phase Diagram
- Ternary Phase Diagram.

Delivery Plan

- Version 5.2 (April 2021)



Play video



Play video

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AVEVA™ Process Simulation 5.1 New Features

Binary Phase Diagram Zoom

Objectives/Background

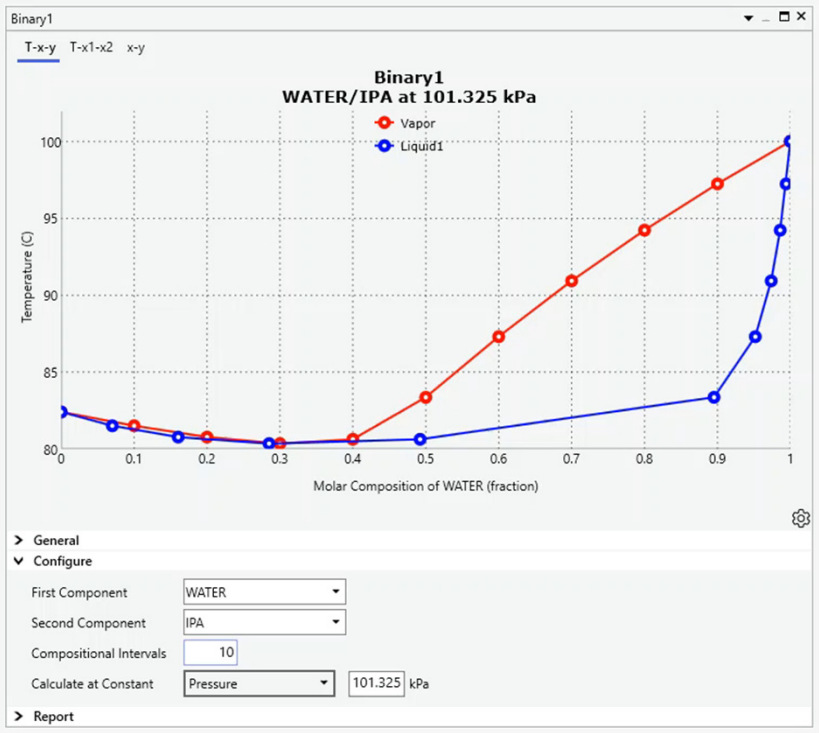
- Zoom in to a binary phase diagram so that you can see more detail

Solutions

- Place mouse at the location that you want to see more detail.
- Use the scroll wheel to zoom in.
- Can also select an area to zoom to.
- Use more points if you need more detail.

Delivery Plan

- Version 5.1 (January 2021)



Play video

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AVEVA™ Process Simulation 5.0 New Features

Heat Curve Export for Exchanger Design

Objectives/Background

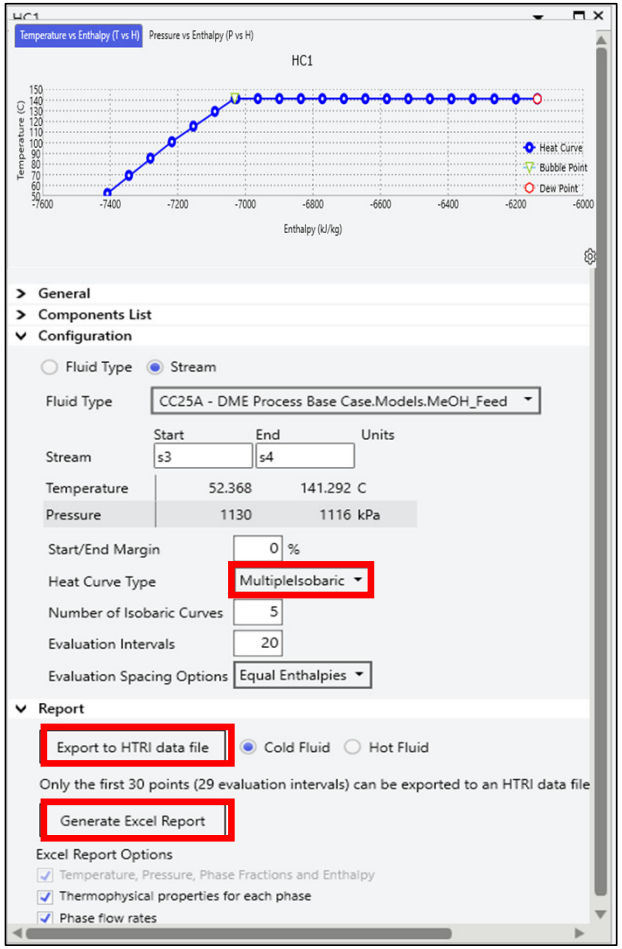
- Process simulators are needed to generate heating curves with property data to design heat exchangers

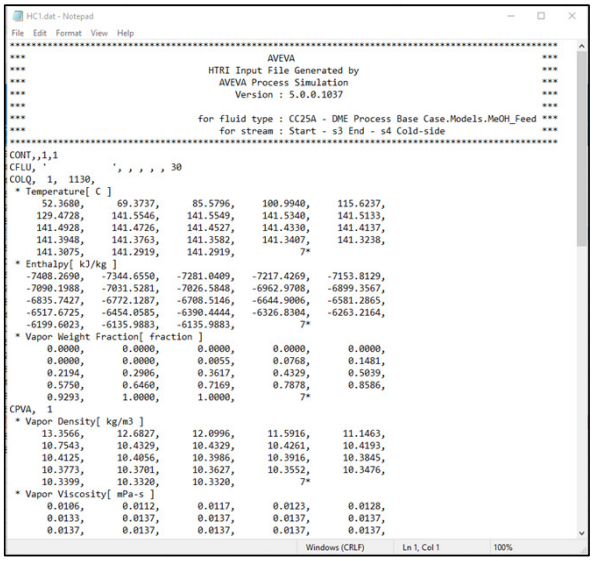
Solutions

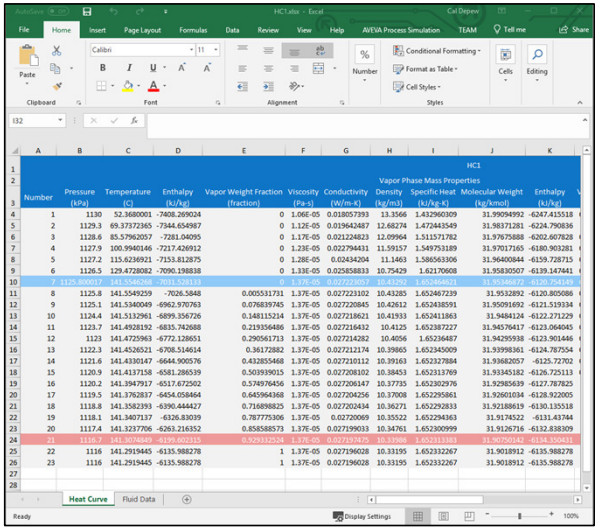
- Select start and end stream which may cover multiple exchangers
- Select multi-Isobaric to data can be interpolated at different exchanger pressure drops
- Export to Microsoft Excel
- Export to HTRI® Xchanger Suite dat file

Delivery Plan

- Version 5.0 (October 2020)
- VLLE Fluids (Future)
- Steam Fluids (Future)







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AVEVA™ Process Simulation 4.2–5.3

Thermo Data Override

Objectives/Background

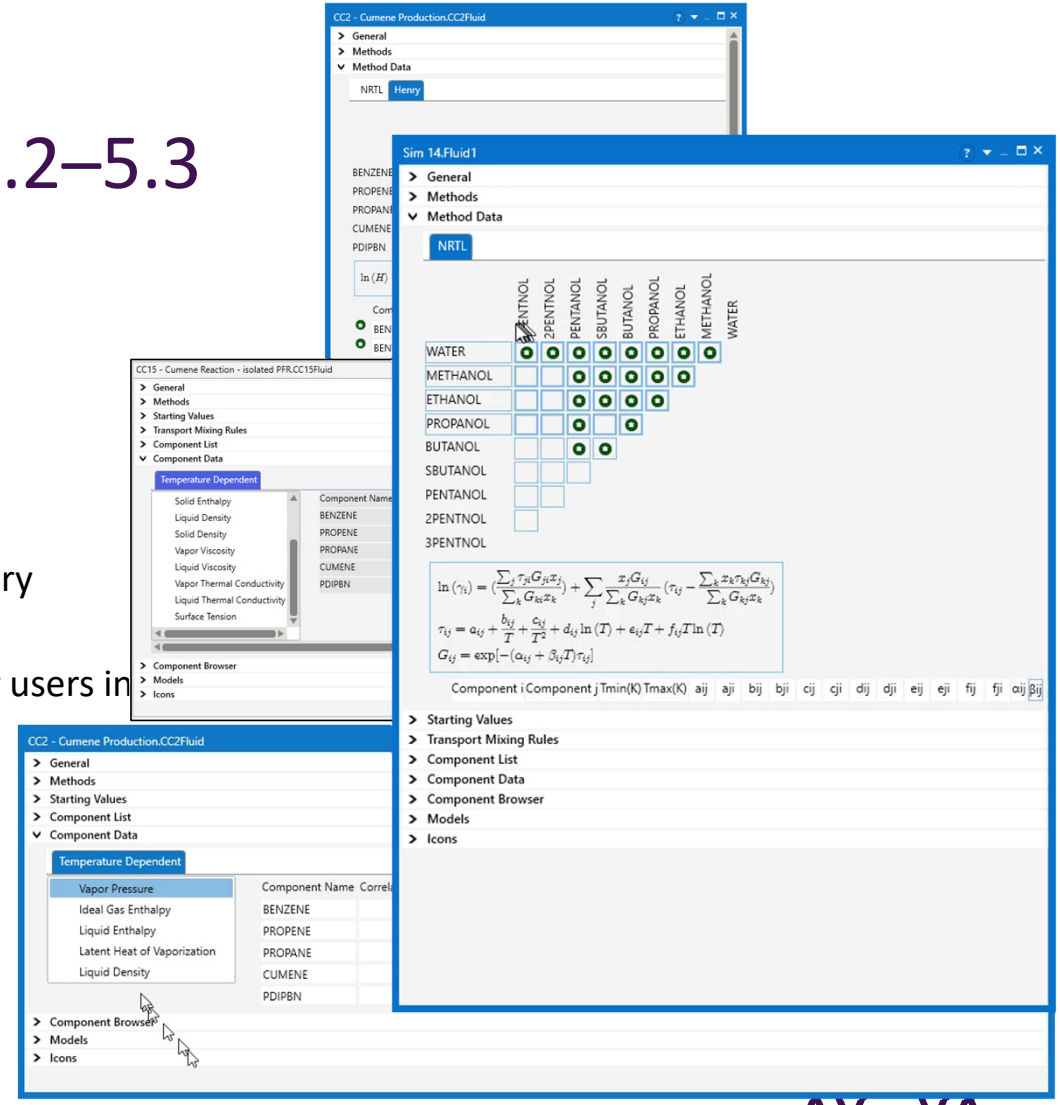
- Quickly see effect of thermo parameter changes on the simulation.
- Changing data in TDM is not simulation specific.

Solutions

- Fluid Editor contains thermo data to override TDM Library
- Updating lb1 and lb2 files no longer required.
- Thermodynamics specialists may share Fluid with other users in their company.

Delivery Plan

- NRTL binary data: Version 4.2 Beta (April 2020)
- Temp Dependent Pure : Version 4.3 (Jul 2020)
- Henry's parameters: Version 4.3 (Jul 2020)
- Transport properties: Version 5.0 (Oct 2020)
- Wilson and UNIQUAC binary: Version 5.3 Beta
- Constant Pure Component: Version 4.3 (Jul 2020)



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AVEVA™ Process Simulation 5.2 New Features

Thermo Library Generation Tool (using Excel and Python)

Objectives/Background

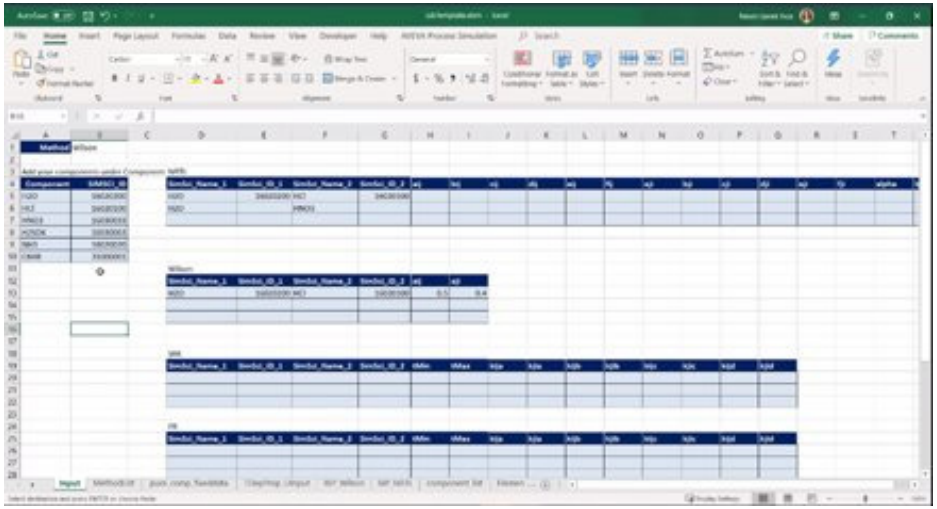
- Entering thermo component and binary data into TDM is very tedious. Plus we maintain our own data.

Solutions

- Excel spreadsheet with a Python script to create lb1.lb2 libraries.
- Can copy and paste from other Excel data sources.
- Use for binary data when using DIPPR pure component databank
- Use for electrolyte NRTL data.
- Creates lb1/lb2 files

Delivery Plan

- Not shipped with product
- Email to secondary support to demo and explain to customers



Create input in Excel



And create libraries using Python.

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AVEVA™ Process Simulation 5.2 New Features

DECHEMA DPP Regression

Objectives/Background

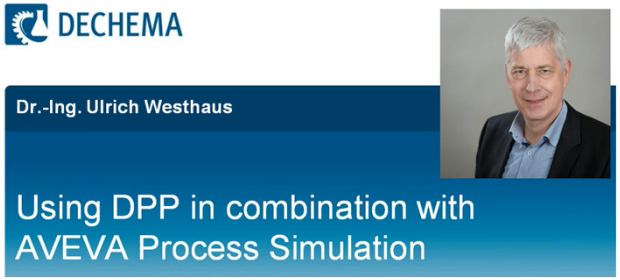
- Use the populate DECHEMA Data Preparation Package (DPP) to maintain company thermo data in a neutral format, and regress experimental data.

Solutions

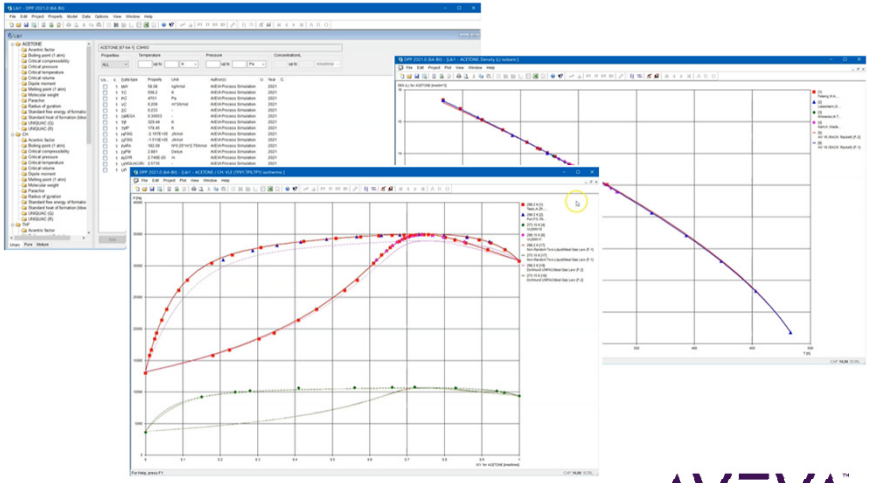
- DECHEMA has integrated DPP to AVEVA Process Simulation using the Thermo Access Interface.
- Pure Component Data, Ideal, NRTL, and Henry for VLE and VLLE

Delivery Plan

- AVEVA Process Simulation Version 5.2 April 2021
- DPP 2021 "Preview Release" available now
- More thermo methods as they are added to "Thermo Data override"



Link to DECHEMA DPP Video by Dr. Westhaus



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AVEVA™ Process Simulation 5.2 New Features

Three-Way Valve Model Preview

Objectives/Background

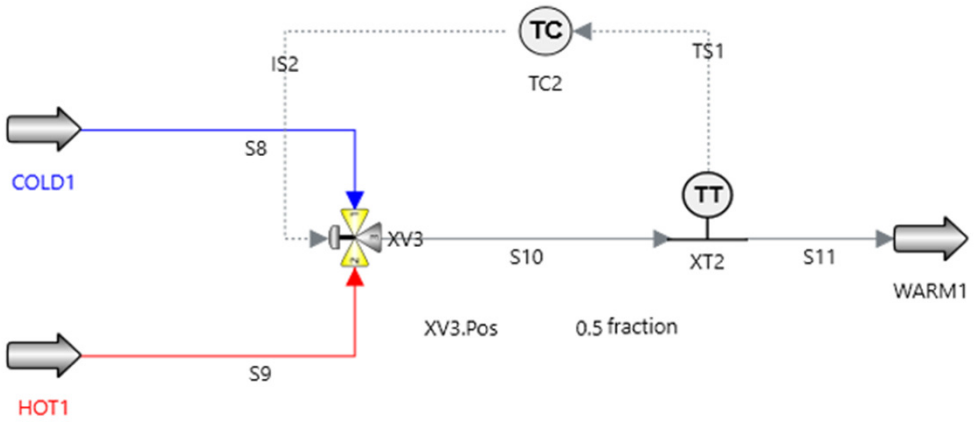
- Three-way valves are used to split or mix flows when there is not very much room for separate valves.
- Temperature control is a common use case

Solutions

- New three-way valve in Preview Library
- Mixing service
- Splitting service
- Use a separate temperature controller if needed

Delivery Plan

- Version 5.2 Preview Library (April 2021)



Three-way valve in mixing service for temperature control.

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AVEVA™ Process Simulation 5.2 New Features

Liquid-Liquid Decanter Model Preview

Objectives/Background

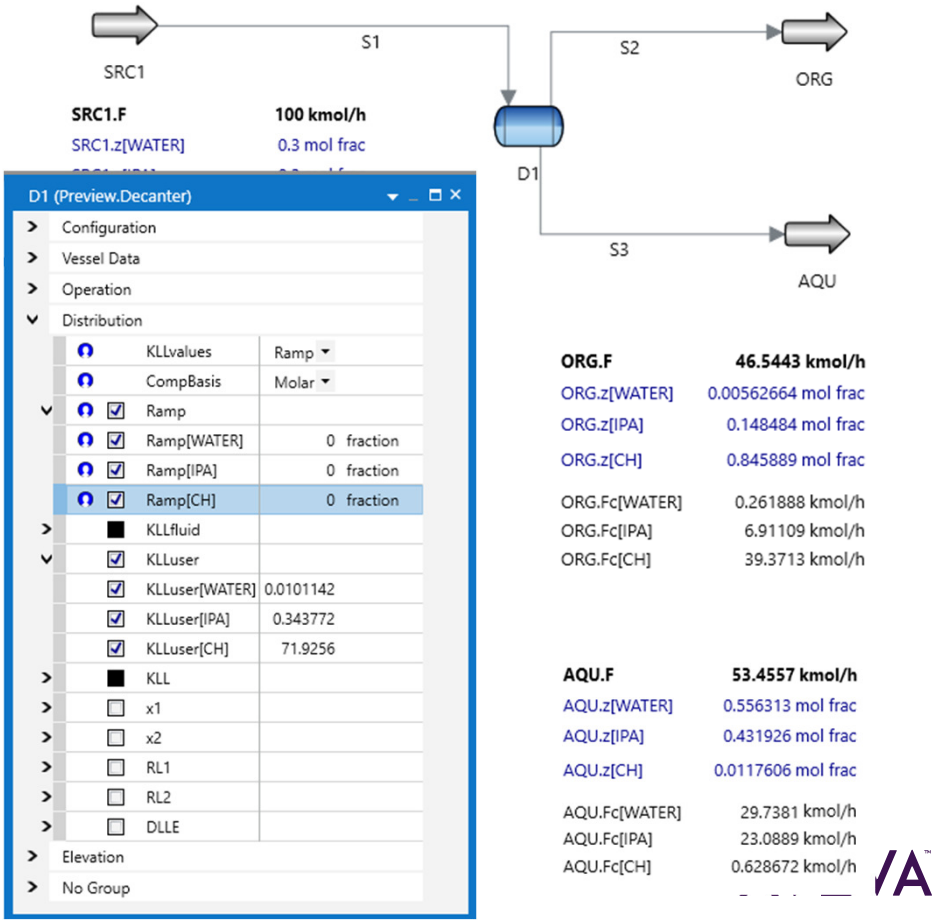
- Liquid-liquid decanters may be difficult to match actual plant data using rigorous K-values from thermo without tedious work updating thermo binaries interaction parameters.

Solutions

- Ramp KLL K values
  - Ramp = 0 User defined KLL values
  - Ramp = 1 Thermo defined KLL values from fluid state
- With User Defined KLL Values (Ramp = 0)
  - Unspecify K-values
  - Set outlet compositions to match plant data
  - Then specify the K-values for other cases
- Does not support dynamics

Delivery Plan

- Version 5.2 Preview Library (April 2021)



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AVEVA™ Process Simulation 5.0 New Features

Economics Model Library

Objectives/Background

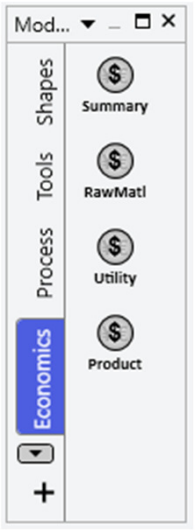
- Engineers want to create a design which reduces operating costs include feeds cost and utility costs such as water, steam, fuel, and electric power. But every facility may have unique facilities.

Solutions

- The Economics library provides templates for Extension Submodels that can extend the existing flowsheet models to calculate their operating cost.
- Copy models from Economics to Simulation to customize them for your plants utilities, feeds, and products.

Delivery Plan

- Economics Library in Example Libraries Folder
- Version 5.0 (October 2020)



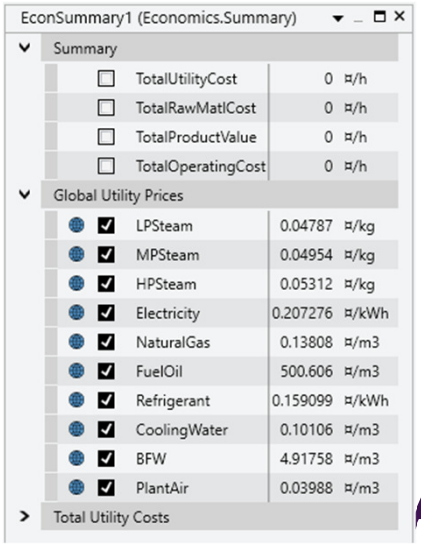
Example Models to copy to your simulation folder

Summary: Example Top level model to show summary of all costs and set utility prices.

Example Raw material cost extension model.

Example Utility cost extension model.

Example Product cost extension model.



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AVEVA™ Process Simulation 5.2 New Features

Measurement Model Preview

$$Total\ Error = Weight \sum (PV - Scan)^2$$

Objectives/Background

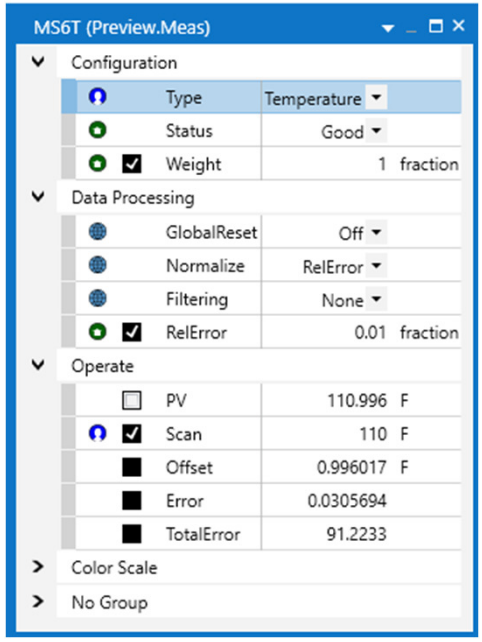
- Tuning simulations to match plant data is time consuming particularly when you have more measurement data than tuning handles.

Solutions

- The Measurement model from preview calculates the total error of all measurements in the plant.
- Can be fed from OSI PI
- Color or icon shows degree of error.
- Uses average error or square or error

Delivery Plan

- Version 5.2 Preview Library (April 2021)



See GG3 Example in following slides

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AVEVA™ Process Simulation 5.2 New Features

Example GG3 Chiller Plant Reconciliation

Objectives/Background

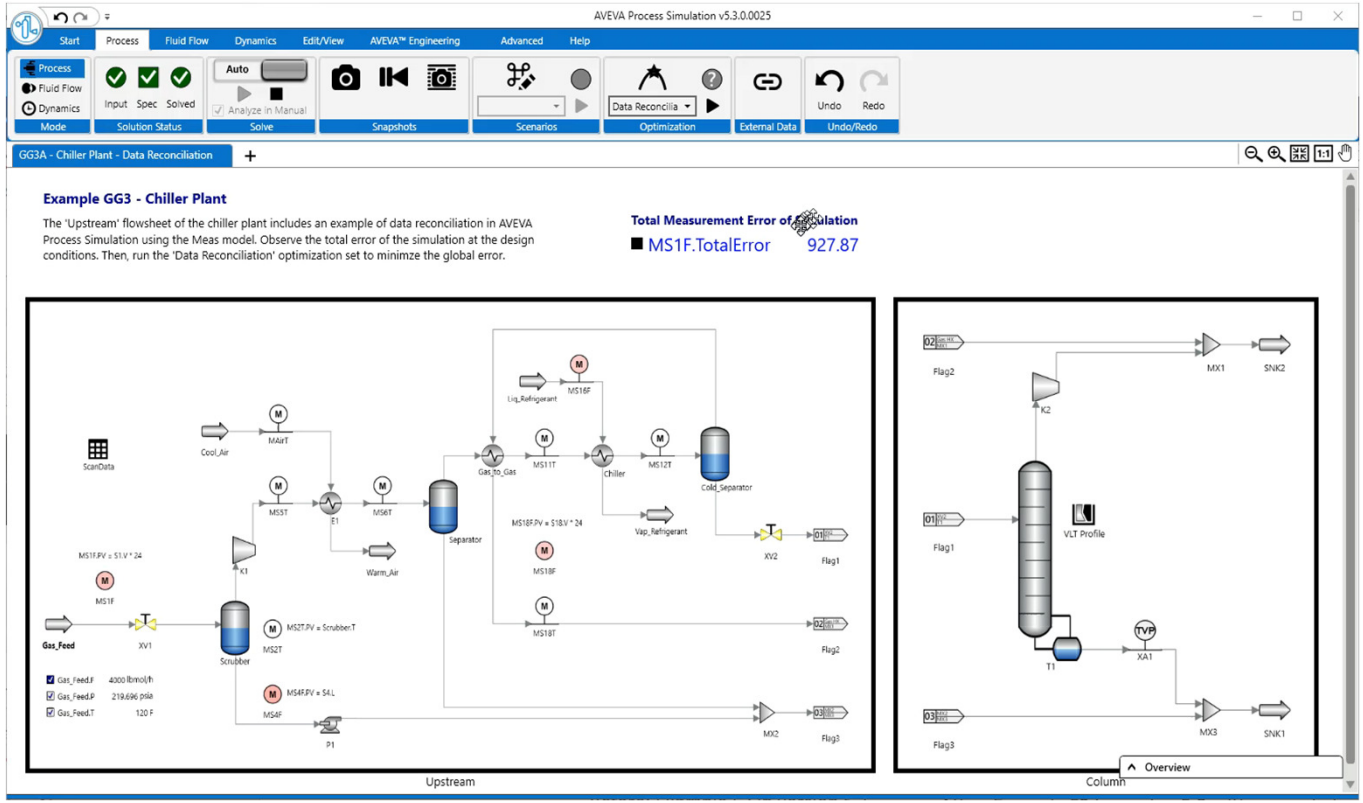
- Users may manually collect data from OSI PI interface may want to reconcile their simulation with plant data.

Solution

- Example Simulation that shows Preview Measurement model to reconcile data.
- Well known Chiller Plant from ROMeo

Delivery Plan

- Undocumented example in 5.2.



Play Video to see total error reduce

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AVEVA™ Process Simulation 5.2 New Features

Excel Reaction Generator Tool

Objectives/Background

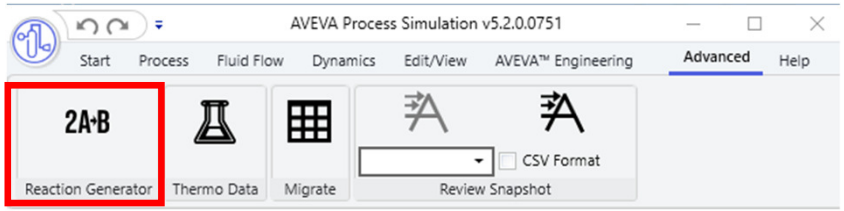
- Easily prepare reaction models for all reactors using this Microsoft Excel tool that creates the submodel for you.

Solutions

- Available from Advanced Ribbon
- Generate a library containing the submodel for parallel or sequential CNVRs
- EQR, CSTR and PFR support
- Up to 40 reactions

Delivery Plan

- Version 5.1 available as a preview in the simulation reports folder
- Version 5.2 supports EQR and PFR and called from Ribbon



Available from Advanced Ribbon

Default Library Name	GeneratedRxnLib
Reaction Model Name	RxnSubmodel
Number of Reactions	2
Reaction Type	Kinetic

Reset | Load Components from Fluid

Generate AVEVA Process Simulation LIBX File

REACTION 1: ETHANOL + ACETIC = EOAC + H2O

	Name	Stoich	Full Component Name	Order
1	ETHANOL	-1.000	Ethanol	1
2	ACETIC	-1.000	Acetic Acid	1
3	EOAC	1.000	Ethyl Acetate	
4	H2O	1.000	Water	

KINETIC DATA

Activity Phase	Liquid
Activity Basis	Molar Concentration

Rate Basis	Volume

$$Rate = A \cdot exp\left(\frac{-E_a}{RT}\right) \cdot T^n \cdot \prod [Component]^{Order}$$

Pre-exponential Factor (A)	483.33
Activation Energy (Ea)	59445.1
Temperature Exponent (n)	

Define the order of reaction with respect to each component on the left. Blank components will be treated as zero order.

Units	
Temperature	K
Pressure	kPa
Moles	kmol
Mass	kg
Volume	m3
Energy	kJ
Time	s

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AVEVA™ Process Simulation 5.0 New Features

Liquid Ring Vacuum Pump (Preview)

Objectives/Background

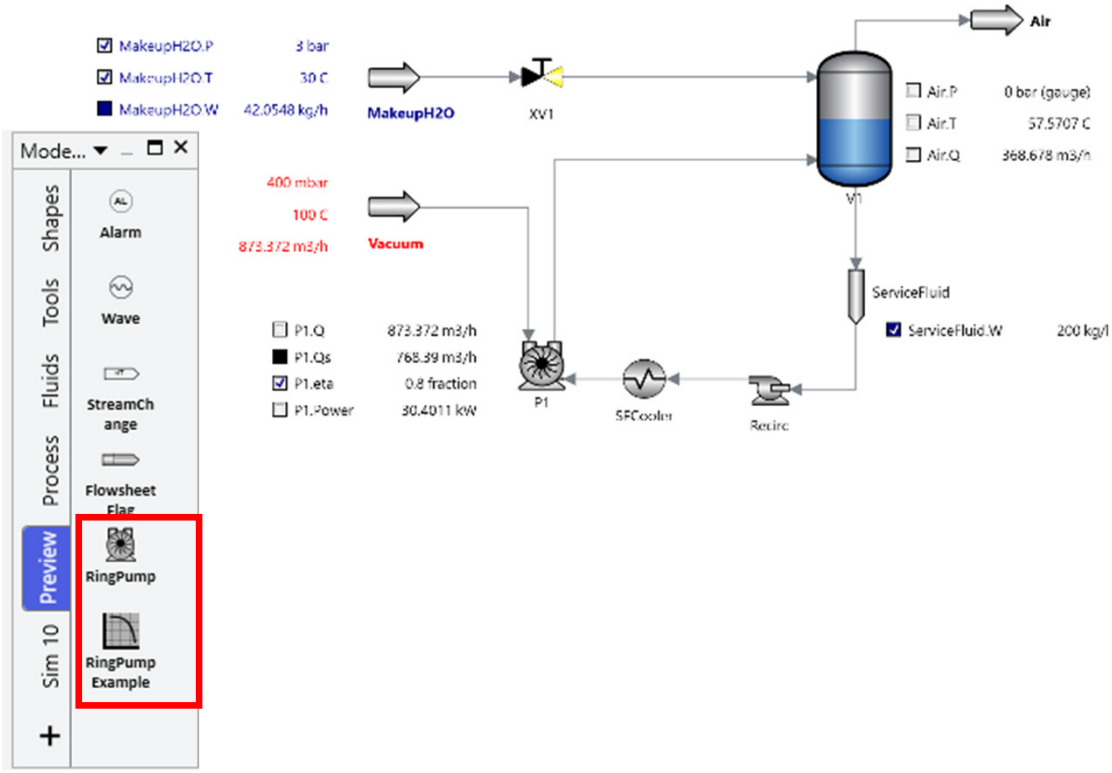
- Liquid Ring Vacuum Pumps (LRVP) are parts of chemical processes and have no suitable process model

Solutions

- The RingPump model provides a basic mass and energy balance for a liquid ring vacuum pump including the vapor and liquid seal .
- Example curve available.
- Only process mode

Delivery Plan

- Preview Library
- Version 5.0 (October 2020)

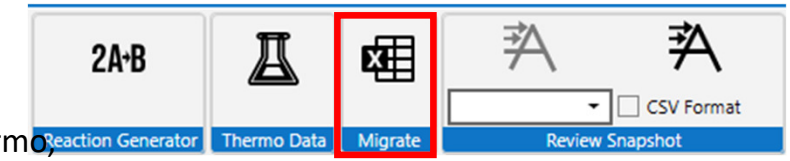


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AVEVA™ Process Simulation 5.2 New Features

PRO/II Component, Methods, and Stream Migration



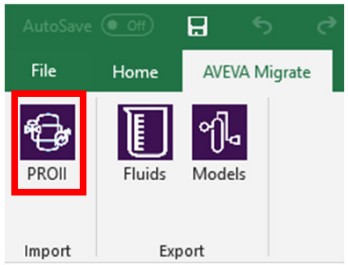
Available from Advanced Ribbon

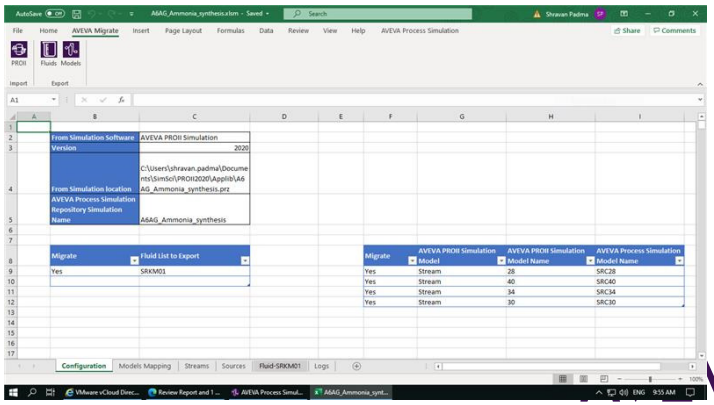
Objectives/Background

- Reduce time to transfer input data from other simulators, especially thermo, component, and feed stream data.
- Convert Petro components from PRO/II created with Assays.

Solution

- Press Migrate from Advanced Ribbon to launch Microsoft Excel
- Press PRO/II from AVEVA Migration to select PRO/II Simulation
- Imports Thermo Data, Component List, and Stream Compositions
- Review and modify in Microsoft Excel
- Exports Fluids and So to AVEVA Process Simulation





Limitations

- Must have 64 Bit Microsoft Excel and 64 Bit PRO/II
- Check for conversion messages in Excel Logs Tab
- Check source flash results (VF @ T and P) to check new results

Delivery Plan

- Henry Data – Future
- Future Thermo Data Override
- Models - Future

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AVEVA™ Process Simulation 5.1 New Features

Scripting Interface using Python or C#

Objectives/Background

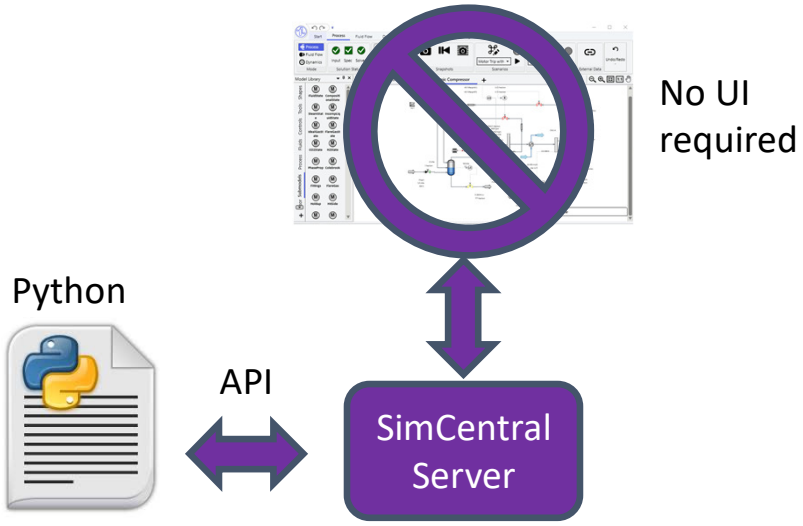
- This new application programming interface (API) allows third-party developers to author scripts that automate various operations against simulations

Solutions

- Provided Software Development Kit (SDK)
- Can be called from Python or C#
  - Read and write values for variables and parameters
  - Create and revert snapshots
  - Run scenarios
  - Create or edit simulations
- User Interface not used

Delivery Plan

- Already in use by several companies and universities.
- Request the SDK from Support / R&D

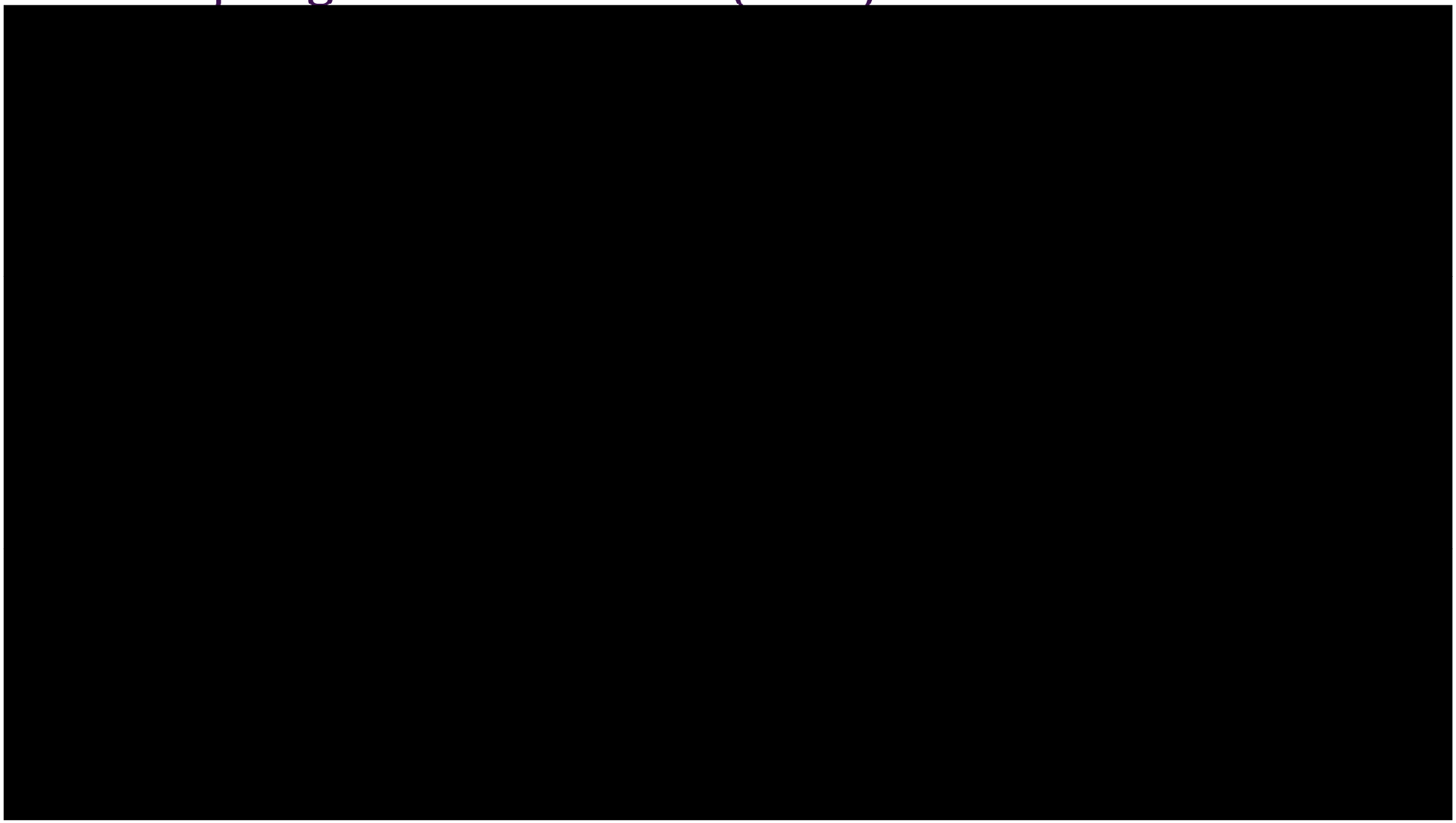


Python script can control SimCentral server without the user interface

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V5.2 Scripting Interface Video (4”37)



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V5.2: Measurement Model Video (2:51)



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AVEVA™ Process Simulation 5.2 New Features

Batch Distillation Library

Objectives/Background

- Simulate batch distillation columns using a separate Batch library for conceptual engineering of batch processes.

Beta Feedback

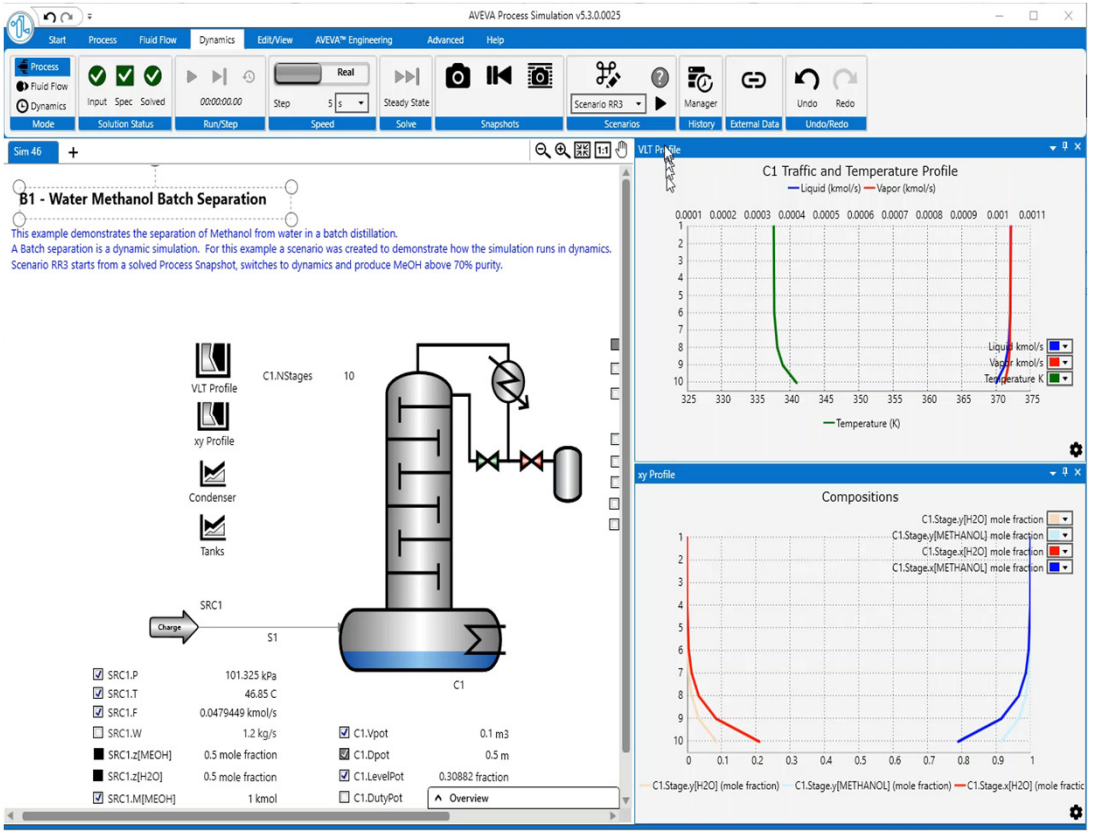
- Very positive feedback from six Customers in Japan and Germany
- Beta Complete and now part of AVEVA Process Simulation

Solutions

- One composed model with internal tanks.
- Flexible specification without having holdups in condenser/tray section.

Delivery Plan

- Version 5.2
- VLLE future version



Play Video

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Batch Distillation Video (2:47)



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Greenhouse Gas Minimization (5:30)



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AVEVA™ Process Simulation 5.2 New Features

Best Practices and FAQs

Objectives/Background

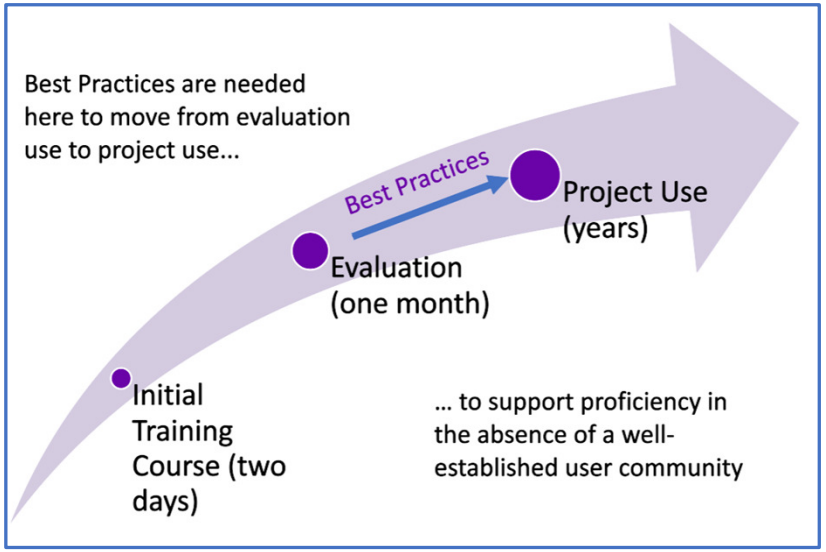
- Our beginner training may not be enough for intermediate users since there is not yet an established user community

Solution

- Share our best practices with intermediate users.
- Organized by subject matter.
- Provided in power point form.

Delivery Plan

- Available on our internal AVEVA Share Point for Pre-sales.
- Request R&D permission to send to customers
- Ask advanced users for contribution to AVEVA to share will all users.



Best Practices Subjects

- Thermodynamics
- Steady State
- Dynamics
- Flares
- Steam Balances
- Transient Flow
- Controls

Documents > Process & Simulation > AVEVA Process Simulation > Technical Support > **Best Practices and FAQs**

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AVEVA™ Process Simulation 4.3 New Features

Unified Engineering: Variable Mapping to AVEVA™ Engineering

Problem

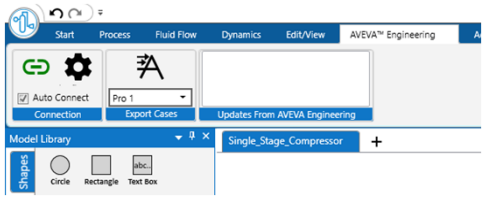
- Variable values must be transferred to and from AVEVA™ Engineering

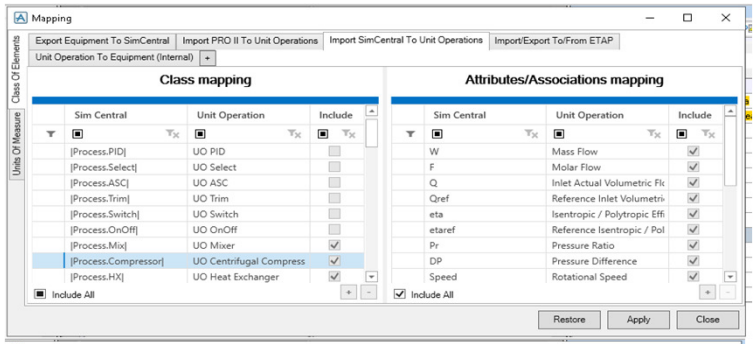
Solution - Two Way Transfer

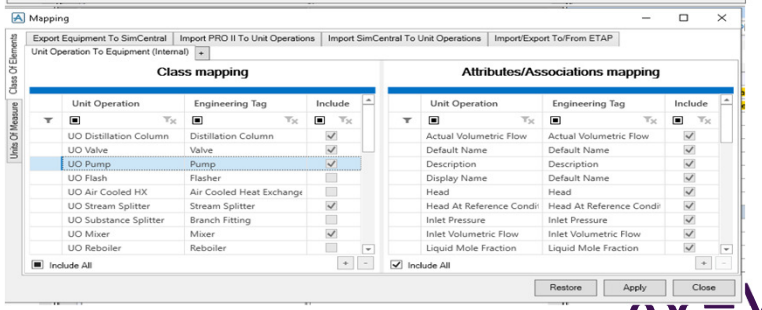
- **Send.** Process mode heat and material balance simulation to AVEVA Engineering to design equipment in Engineering
- **Receive.** AVEVA Engineering design information into Fluid Flow and Dynamics mode to rate and check the design

Models Mapped

- Valve, Pump, Pipe, Compressor, Drum, Column, Extractor, Relief valve, Heat Exchanger

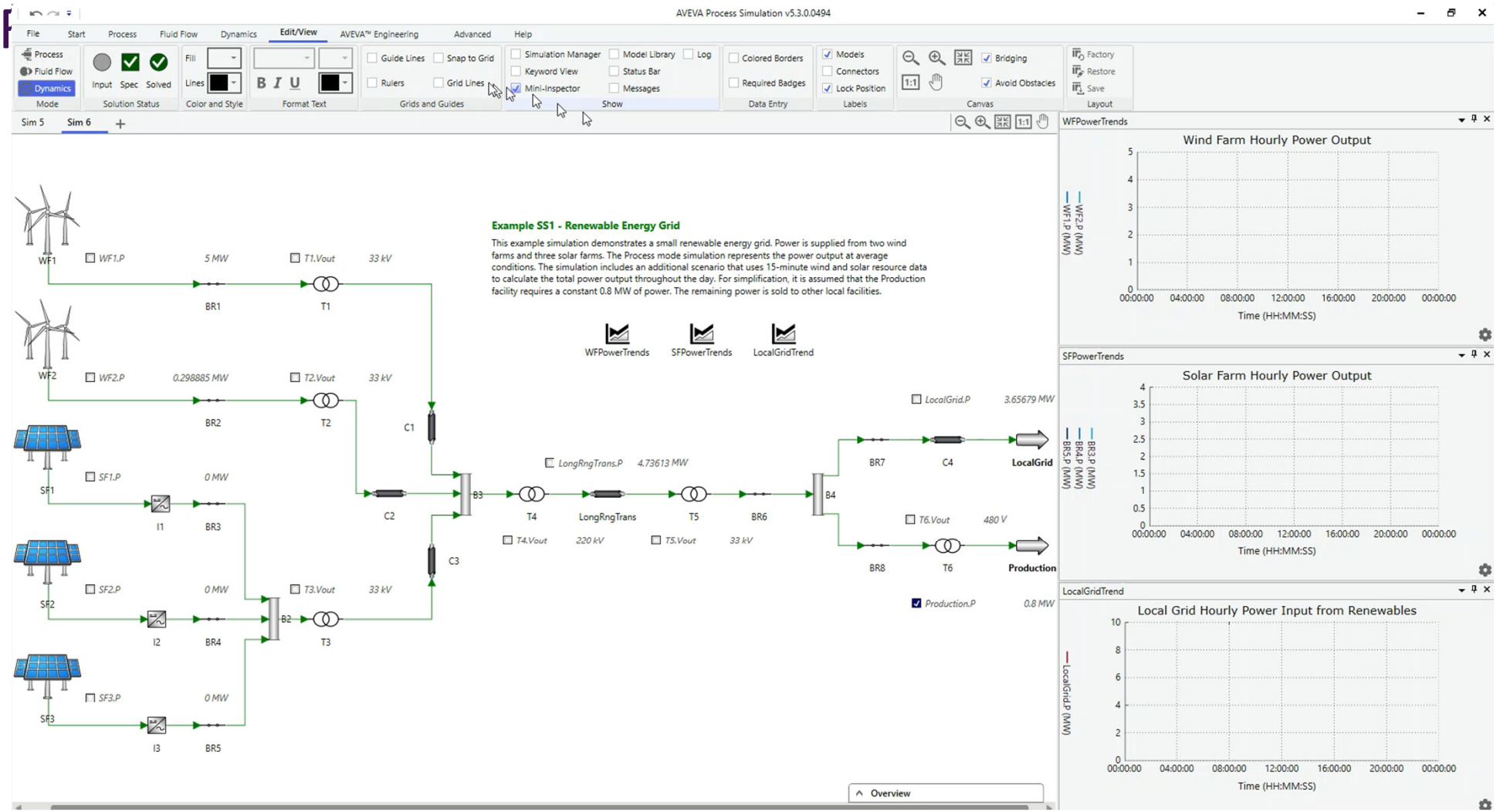






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01 Vision of AVEVA Process Simulation

02 New Features

03 **Roadmap**

04 Feedback and Comments

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Features

Release 5.3 July 2021

User Interface
- Modern ribbon design
- Undo / redo changes
- Open multiple simulations
- Changes continuously saved
- Subflowsheets
- Units of Measure
- User Roles

Simulation Modes
- Three simulation modes
- (1) Process simulation mode
- (2) Fluid flow / rating mode
- (3) Dynamics mode
- Return to any mode
- Design Optimization

Solver Management
- Continuously solved
- Free variable specification
- Specification analyzer feedback
- Fast equation-oriented solution
- Robust block decomposition
- Implicit Euler dynamic integrator
- Implicit Trapezoidal Integrator
- Return to any saved snapshot

Thermodynamic Methods
- Ideal
- Industrial Steam Tables IF97
- Soave-Redlich-Kwong (SRK)
- Peng Robinson (PR)
- SRKH (Huron-Vidal)
- SRKM / PRM
- Wilson (Extended)
- NRTL
- UNIFAC (Dortmund)
- UNIQUAC
- LACT with EOS for vapor
- Hayden-O'Connell for fugacity
- Lee-Kesler Enthalpies
- Grayson-Streed/Improved GS
- Isomeric Hydrogen
- Span-Wagner supercritical CO2
- Bosen and Engels Electrolytes
- Electrolyte NRTL (eNRTL)

Phase Equilibrium
- VLE
- VLWE (beta)
- VLLE
- Non-Equilibrium Solids

Thermo Data
- Petro components
- SimSci Databanks
- DIPPR Lite Databank
- DECHEMA Data Import
- Thermo Data Manager (TDM)
- NRTL Binary Override
- Henry Data Override
- Pure Component Override
- Transport property mixing rules

Model Libraries
- Adsorption
- Batch Distillation
- Cooling Water
- Flare
- Membrane
- Rate-Based Column
- Process
- Steam
- Transient Flow

Controls Library
- Alarm (preview)
- Anti-Surge
- Integral (preview)
- On/Off Control
- Measurement (preview)
- PID Control
- Select
- Split
- Switch
- Transmitter
- Wave (preview)

Model Writing
- Parameters
- Variables
- Conditions
- Equations
- Ports
- Submodels
- Connections
- Icons
- Type change propagation

Process Library
- Source / Sink
- Mix / Split / Header
- Drum (2 phase)
- Separator (3 phase)
- Column / Hydraulics
- Valve / Three-way Valve
- Relief Valve
- Orifice
- Pipe
- PipeRig (two phase)
- Pump (multi-speed)
- **Liquid Ring Vacuum Pump (Preview)**
- Compressor (multi-speed)
- Reciprocating Compressor
- Expander
- Motor
- Extractor
- Heat Exchanger
- Air Cooler
- Water/Utility Cooler
- Thermosyphon Reboiler
- Spiral Wound HX
- Plate Fin HX
- Recycle
- Fluid Change
- Burner
- Equilibrium Reactor
- Conversion Reactor
- Stirred Tank Reactor
- Plug Flow Reactor
- Gibbs Minimization Reactor
- **Flag / Flowsheet Isolator**

Tools and Utilities
- Snapshots
- Trends
- Profile Plots
- Heat Curve
- Binary Phase Diagrams
- Ternary Phase Diagrams
- Scenario
- Curve (with Image Import)
- Stream / Equipment Tables
- OSI PI External Data
- Global Variables
- **Reaction Generator Tool**

Excel Reports Add-in
- Excel Ribbon Control
- Compare Snapshots
- Compare Simulations
- Get Value Function
- Set Value Function
- Get Dynamics Value Function
- Get Model List Function
- More Functions

Programming Interfaces
- External Equation Interface
- User Added Thermo Interface
- Python Scripting Interface
- Thermo Access Interface

Deployment
- 64 Bit Computation
- Single user Desktop installer
- Token, ALS, CALM, LaaS Licensing

Unified Engineering
- To AVEVA™ Engineering
- From AVEVA™ Engineering

New in 5.0, 51, 5.2, or 5.3 Beta

Notes: (beta/preview) – Feature for feedback. (wip) – Work in progress for future release

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Multi-Generation Plan - AVEVA™ Process Simulation

	Today (delivered)	Tomorrow (FY 22)	Future (FY 23-25)
Goals	• **Chemical Process Simulation** • **Process Utility Design** • **Flare Network Analysis**	• **Chemical Process Simulation** • **Renewable Processes / Green Hydrogen** • **Batch Distillation**	• **Upstream / Gas Processing Process Simulation** • **Downstream / Refinery Process Simulation** • **Live Performance Monitoring** • **Petrochemical Polymer Reactors**
Initiatives	• **Platform** ▪ Model Equation ▪ Process, Fluid Flow, and Dynamics Mode ▪ Multiple flowsheets ▪ Operational Costs ▪ Undo • **Model Libraries** ▪ Process Simulation Equipment Library ▪ Steam Library for Steam Balances ▪ Cooling Water for utility networks ▪ Controls for dynamics ▪ Batch Distillation ▪ Flare Networks ▪ Rate Based Distillation ▪ Pressure Swing Adsorption ▪ Membranes • **Integration/Interface** ▪ Export to HTRI Exchanger Suite ▪ Scripting Interface	• **Platform** ▪ Variable Specification Sets ▪ Stream Conditional Formatting • **Process Library** ▪ Decanter Model ▪ Ejector Model ▪ Column Sulzer and KG Internals ▪ Ultimate Analysis ▪ Rigorous Heat Exchanger ▪ Reaction Data Entry Forms • **Model Libraries** ▪ Renewables Library for Green Hydrogen Production ▪ Solids Handling Library • **Flare Library** ▪ Dynamic Simulation ▪ Flare Excel Report • **Integration/Interface** ▪ Thermo Data Access Interface for Regression	• **Platform** ▪ Snapshot Comparison Tool ▪ Case Study Analysis Tools ▪ Real time monitoring system • **Model Libraries** ▪ Polymer Reactor Library ▪ Refinery Reactor Library ▪ Depressuring Library • **Process Library** ▪ Crude Assays and Characterization ▪ Fired Heater Model ▪ Refinery Analyzers • **Flare Library** ▪ PSPPM Interface ▪ DIERS validation • **Integration/Interface** ▪ Integrated HTRI Exchanger Model ▪ AVEVA Dynamic Simulation Link

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Updated: Feb 1, 2021

Covestro

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01 Vision of AVEVA Process Simulation

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04 **Feedback and Comments**

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slido

Is your company’s business strategy impacted either by changes to a hydrogen economy or a circular economy?
Check all that apply, or are areas that your company is moving into:

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ⓘ Start presenting to display the poll results on this slide.

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Are any of these areas being de-emphasized? Check what applies to you:

ⓘ Start presenting to display the poll results on this slide.

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With regard to sustainability, what key features are you most concerned about having in the software? (Please type your response).

ⓘ Start presenting to display the poll results on this slide.

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In your role, what are you doing differently due to changes in business strategy? (Please type your response).

ⓘ Start presenting to display the poll results on this slide.

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For your work with AVEVA Simulation models and software, what are your three top concerns or complaints? (Please type your response.)

ⓘ Start presenting to display the poll results on this slide.

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@avevagroup

ABOUT AVEVA

AVEVA is a global leader in engineering and industrial software driving digital transformation across the entire asset and operational life cycle of capital-intensive industries.

The company's engineering, planning and operations, asset performance, and monitoring and control solutions deliver proven results to over 16,000 customers across the globe. Its customers are supported by the largest industrial software ecosystem, including 4,200 partners and 5,700 certified developers. AVEVA is headquartered in Cambridge, UK, with over 4,400 employees at 80 locations in over 40 countries.

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