

OCTOBER 26, 2023

Transforming Operation: Elevating Compressor Control Systems & Operator Training with AVEVA™ Dynamic Simulation

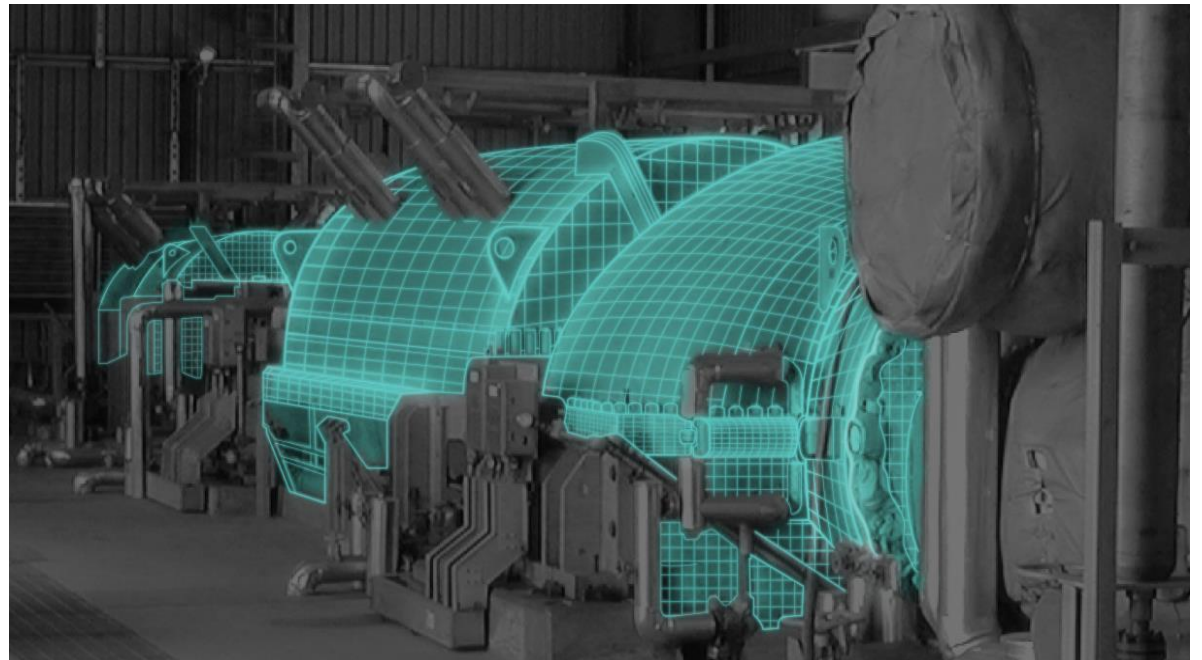
Jim Jacoby

AVEVA

Tri-Sen's Story

Innovator in turbomachinery controls

- Established in 1976
- Partnered with Triconex in 1987
- Developed compressor controls in 1993
- Purchased by Triconex in 1993
- Triconex purchased by Invensys in 1995
- Tri-Sen taken private in 2008
- Added dynamic simulation services in 2010
- Entered into alliance with Elliott in 2012
- Became a certified Triconex integrator in 2018



Business Challenge

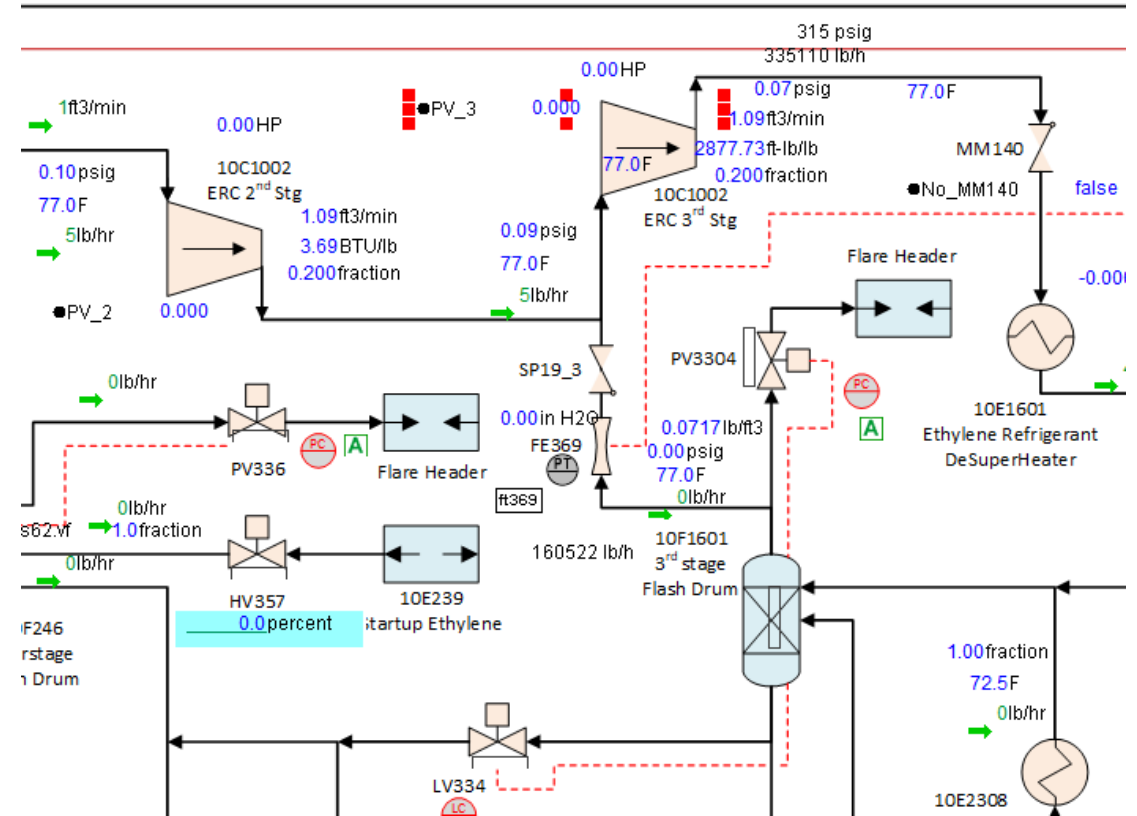
Upgrade of compressor and turbine controls for an ethylene plant

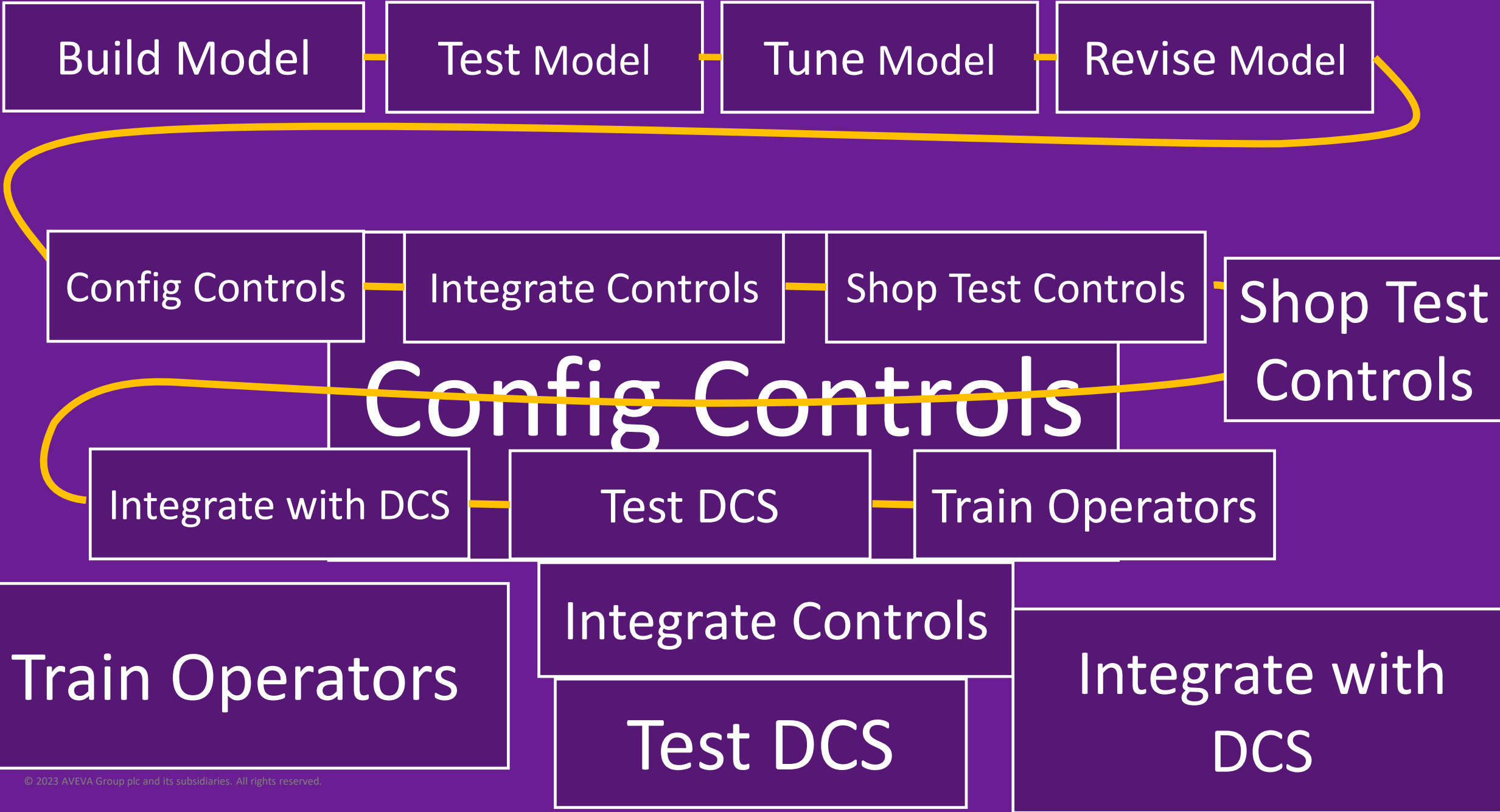
- Provide new compressor and turbine controls
- Find obstacles in the current plant design that could prevent success
- Design and test improvements
- Deliver on time
- Train operators

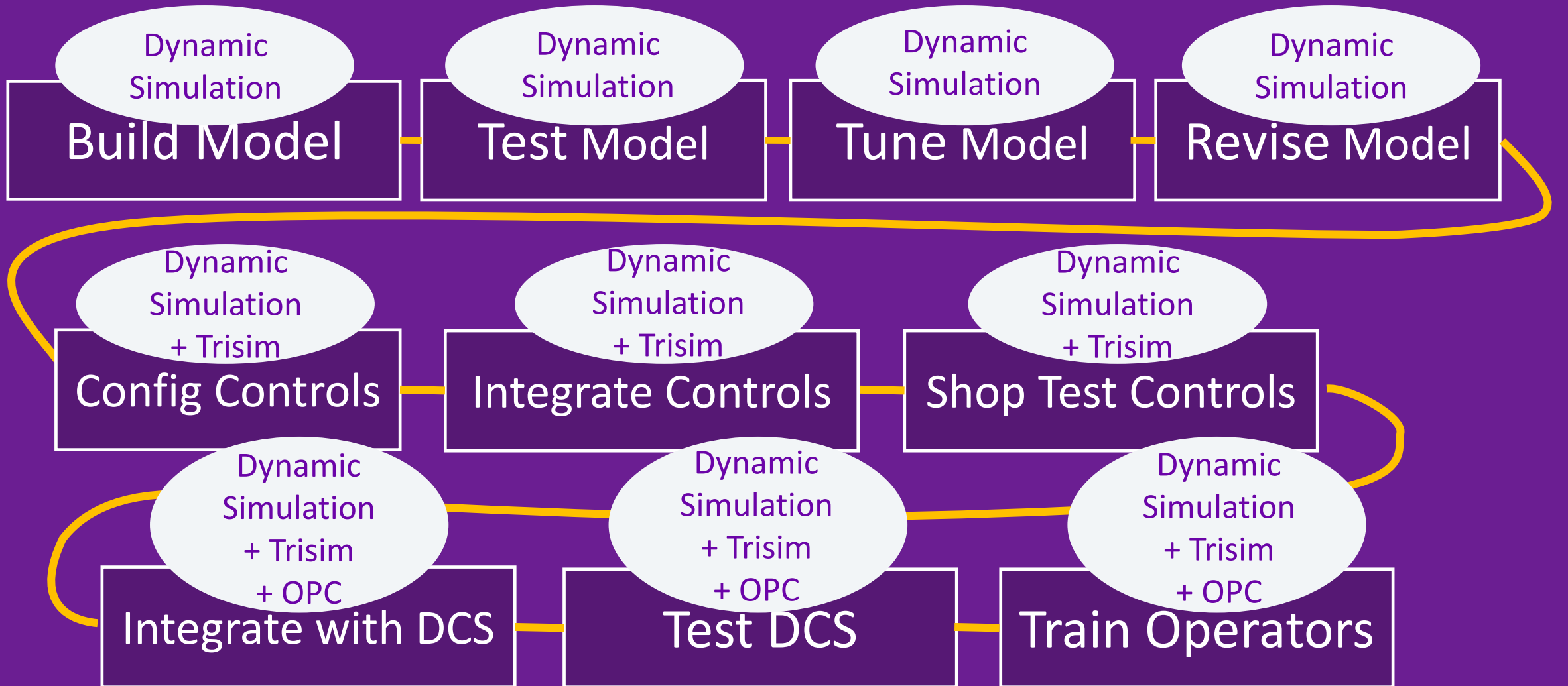


AVEVA Product Portfolio use case / application

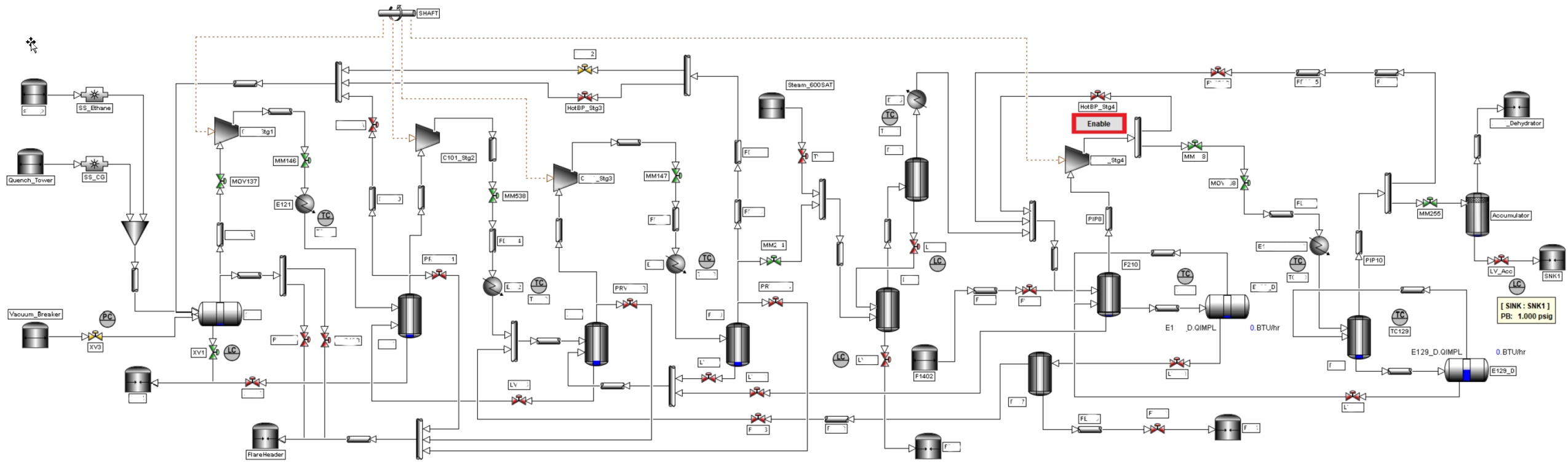
- Modelled with **AVEVA Dynamic Simulation**
 - Model tested against historian data
 - Failure testing
 - Tested modifications on model
- **Triconex** controls added for machinery
- **AVEVA for Triconex** integrates Triconex controls
- Virtual FAT using Dynamic Simulation and Trisim
- Simulation integrated with DCS
 - Tested DCS changes and screen designs
 - Trained operator
 - Performed additions control testing

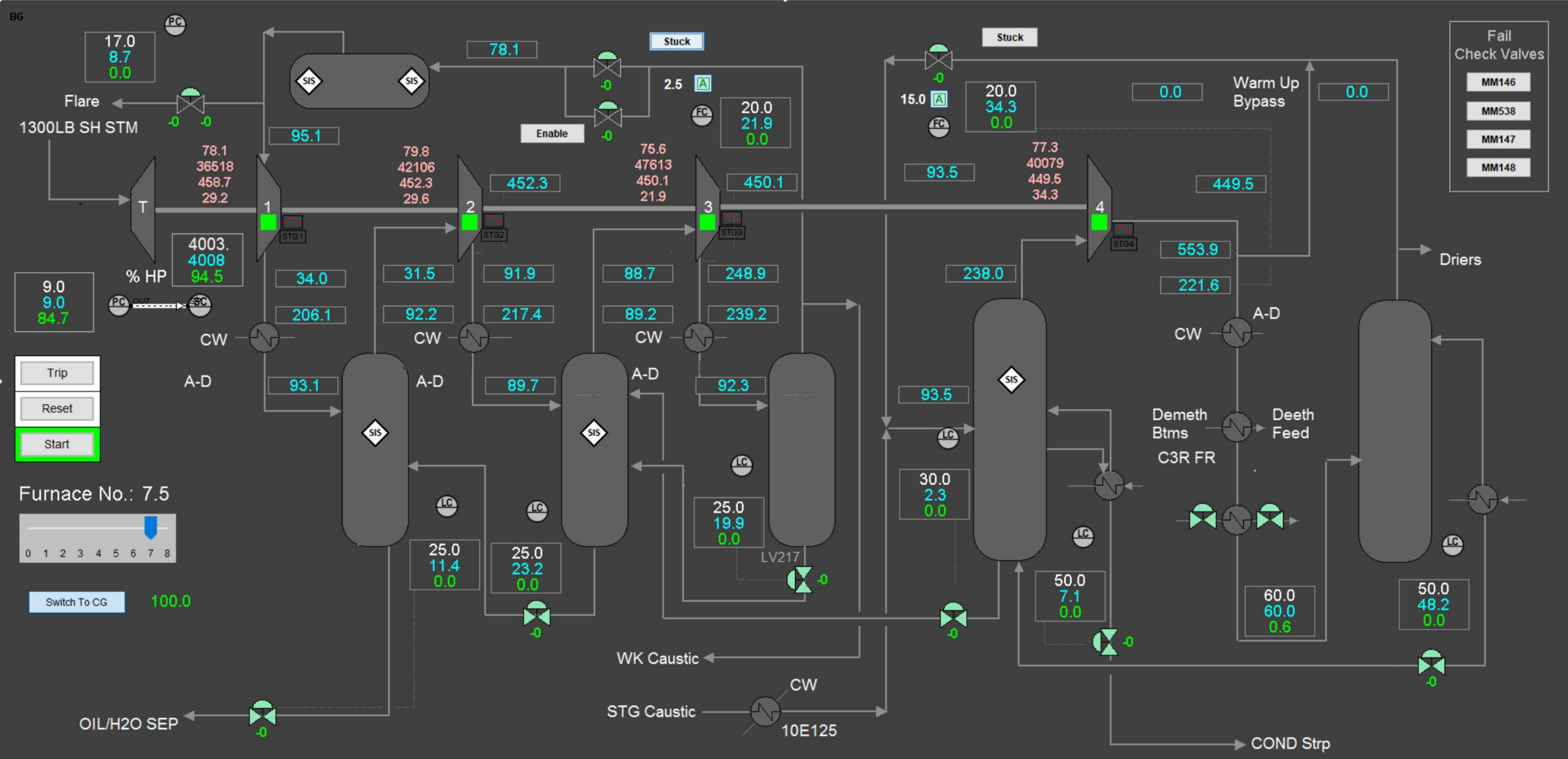






Model Flow Sheet





AVEVA product capabilities

Solutions for our business challenges

- Rigorous, first principles simulation
- Integrated model with the Triconex controls emulator
- Closed-loop software FAT
- Dynsim historian and trending tools used for engineering
- Integration with DCS (via OPC)



Conclusions

- Engineering of the system was more thorough – the simulation eliminates a lot of the guessing
- Project schedule benefitted from out-of-sequence tasks
- Trained operators were more confident during the first startup
- Startups of all compressor are quicker and more reliable and require less operator involvement
- Quicker starts reduce the amount of flaring
- During plant upsets, the operators no longer need to “baby sit” the compressors

How virtual testing environments can promote safe and successful controls upgrades

Goal & Challenges

- Goal: Ensure smooth controls upgrade for compressors and turbines
- Challenges: Identify obstacles in current plant design; Prevent delays that could extend downtime; Safely train operators to startup and operate the new control system.

Solution

- Create a high-fidelity virtual testing environment capable of rigorously reproducing the plant process behavior (AVEVA Dynamic Simulator) and the new control logics (Triconex emulator) to perform a virtual FAT, test failures, control changes and train operators

Results

- Systematic engineering of the system – guesses eliminated by the simulation
- Project schedule benefitted from out-of-sequence tasks
- Trained operators were more confident during the first startup
- Startups of all compressors are quicker and more reliable
- Quicker starts reduce the amount of flaring
- During plant disruptions, the operators no longer need to “babysit” the compressors

“You guys are wizards”

Customer Lead Process Engineer

Questions?

Please wait for the microphone.
State your name and company.



Please remember to...

Navigate to this session in the mobile app to complete the survey.



Thank you!

This presentation may include predictions, estimates, intentions, beliefs and other statements that are or may be construed as being forward-looking. While these forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could result in actual outcomes differing materially from those projected in these statements. No statement contained herein constitutes a commitment by AVEVA to perform any particular action or to deliver any particular product or product features. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this presentation.

The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.

 [linkedin.com/company/aveva](https://www.linkedin.com/company/aveva)

 [@avevagroup](https://twitter.com/avevagroup)

ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

Learn more at www.aveva.com



Jim Jacoby

Senior Vice President

- Tri-Sen System Corporation
- jjacoby@tri-sen.com

Customer can start their ethylene plant 30% faster.
During upsets, compressors take care of themselves

Challenge

- Eliminate check valve failures
- Eliminate surging during startups and trips
- Reduce startup time for compressors
- Reduce flaring

Solution

- Aveva Dynamic Simulation and Aveva for Triconex were used to model and test the process improvements and controls

Results

- **Faster, more reliable starts – reduced flaring**
- **No more compressor surging**
- **Operators no longer need to attend to compressors during upsets**
- **Operators were fully trained on simulator before startup**
- **Operators were sold on the improvements**