Applying the Digital Twin to Leaching

Dynamic simulation with Mimic Simulation Software provides a high-performance solution for operator training and control system optimization. This Digital Twin technology delivers the complete environment for control system optimization and is an effective tool for teaching process and control engineers the control and operation of leach tanks and elution columns.

Leaching Modeling

Solutions for heap leaching include dynamic models of the following process areas:

- Leach Tanks
- Feed Tanks
- Elution Columns
- Regeneration Tanks
- Discharge Tanks

Application Capabilities

Leach Tank

- Dynamic, real-time mass and energy balances with individual component tracking.
- Reaction modeling using the Arrhenius equation for reaction rate constants.
- Tunable reaction rate constants (activation energies, pre-exponential factors, and reaction orders) for both, forward and reverse reactions.

Elution Column

- Dynamic, real-time mass and energy balances.
- Ion-exchange or affinity reaction models using the power law dependencies with the Arrhenius type equation for reaction rate constants.
- Dynamic, real-time individual component tracking with realistic composition profiles.
- Tunable reaction rate constants (activation energies, pre-exponential factors, and reaction orders) for both, forward and reverse reactions.

Mimic Simulation Software

- Train operators on infrequent and dangerous process occurrences
- Test control system enhancements
- Transfer knowledge from seasoned to inexperienced operators
- Increase overall plant safety

EMERSON™

Instructor Station

Instructor controls in Mimic and instructor screens in Mimic Component Studio allow your training team to prepare for working with the control system and process. Any element in Mimic can be manipulated or controlled, and instructor screens provide easy access in one location. Typical controls allow instructors to manipulate operating conditions, such as boundary conditions and compositions, introduce ad-hoc device failures, control scripted training scenarios, and restore snapshots to steady-state operations.
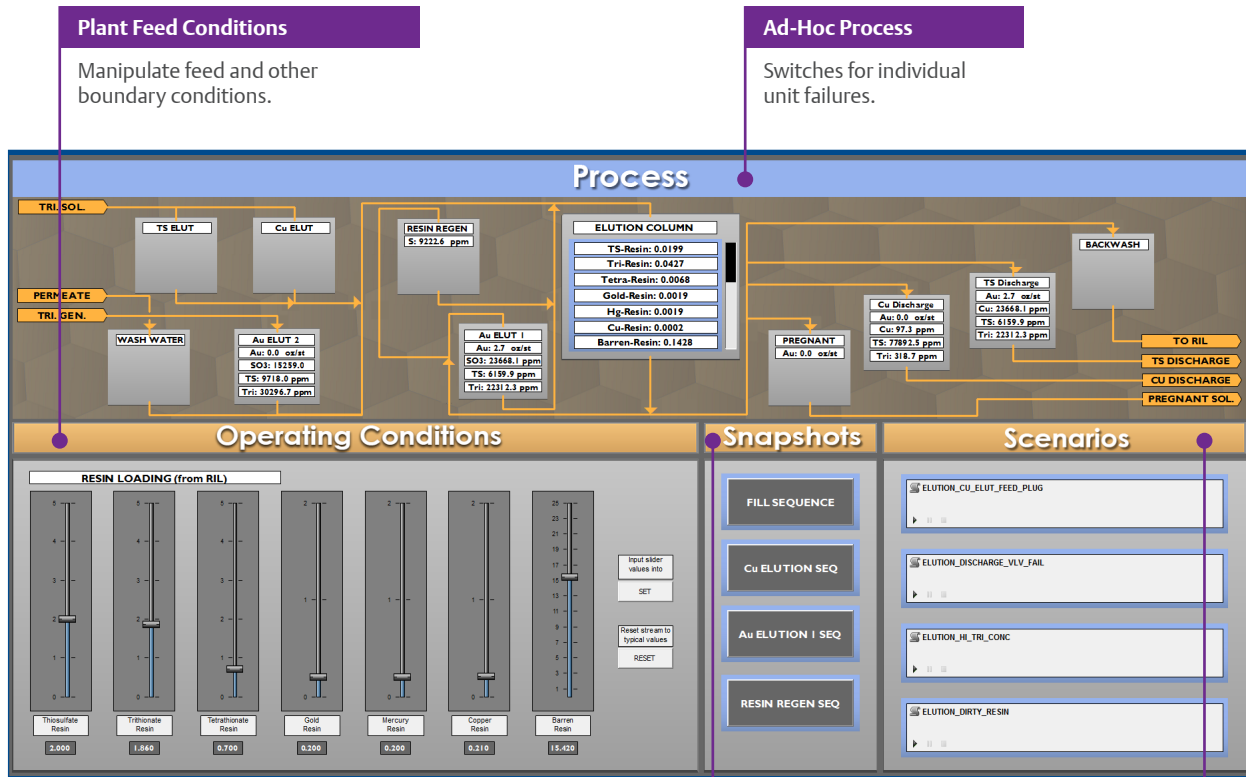
Plant Feed Conditions
Manipulate feed and other boundary conditions.

Ad-Hoc Process
Switches for individual unit failures.

Process Snapshots
Control and restore full steady-state, cold, or other plant conditions.

Scripted Scenarios
Pre-engineered scenarios with dynamic representation of student scores.

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