Applying the Digital Twin to Grinding Circuits

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 a grinding circuit.

Grinding Circuits Modeling

Solutions for grinding circuits include dynamic models of the following process areas:

- Fine Ore Bins
- Belt Feeders
- Conveyors
- SAG, AG or Ball Mill
- Pumpboxes
- Cyclone Cluster

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**

Application Capabilities

Mill

- Dynamic, real-time material balance and particle size tracking of each component.
- Comminution determined via breakage matrices that vary with ore hardness, mill level, grinding material, and speed.
- Power requirement modeled using Bond, Kick or Rittinger energy calculations.
- Semi-Autogenous, Autogenous or Ball type Mill with grinding material tracking and wear.

Hydrocyclone Cluster

- Dynamic, real-time material balance and particle size tracking of each component.
- Realistic size classification and residence times using a modified Lapple model.
- Cyclone roping and plugging conditions.

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Instructor Station

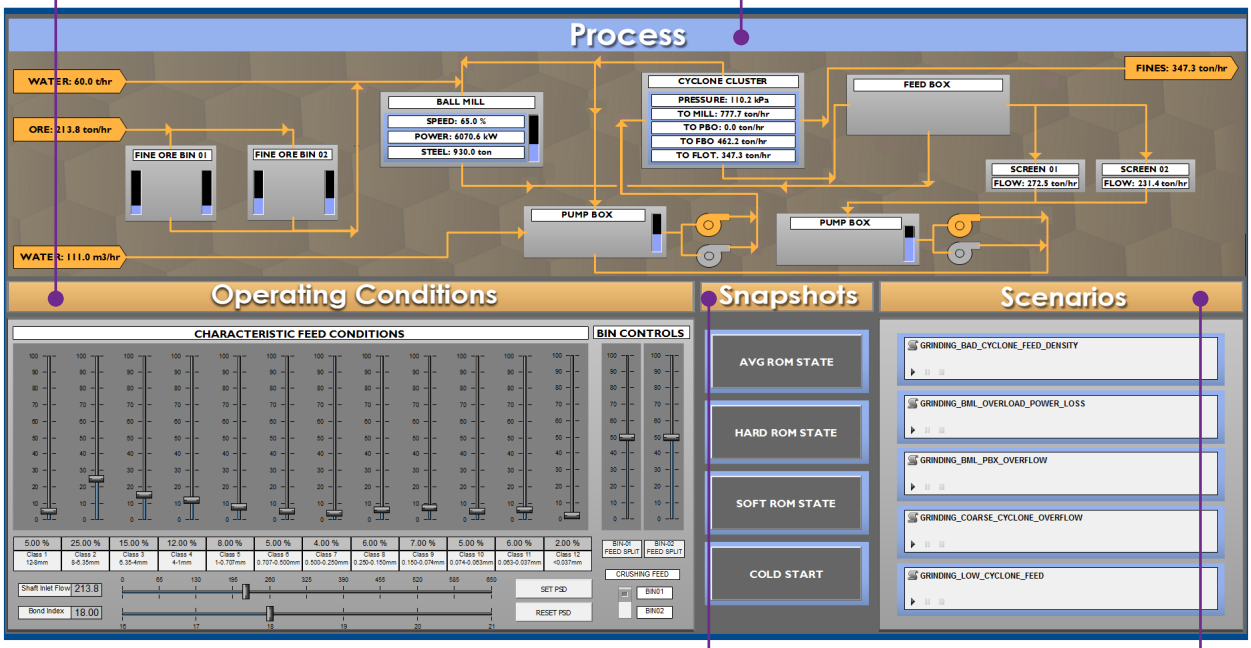
Instructor controls in Mimic and instructor screens in Mimic Component Studio allow your training team to prepare for working with the control system and process. Any element in Mimic can be manipulated or controlled, and instructor screens provide easy access in one location. Typical controls allow 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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