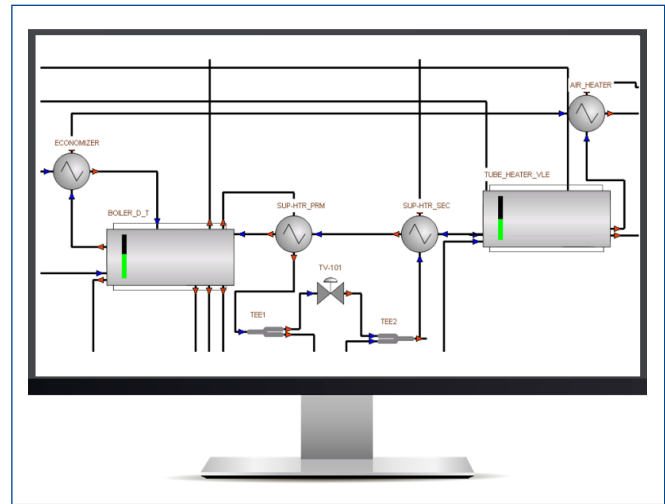# DeltaV™ Mimic Process – Power

- Intuitive unit operation modeling

- Supports complete boiler system simulation

- Provides realistic Drum modeling including dynamic shrink/swell with compensation

- Accurate thermodynamics and steam quality calculations based upon integrated steam tables (IAPWS-IF97 standard)

Introduction

DeltaV™ Mimic Process – Power includes high fidelity dynamic models for unit operations commonly found in power plants including coal boilers, gas/oil boilers, waste incinerators, and cogeneration units. These objects can be used for application software testing, operator training, and process or operation improvements.

Benefits

- **Intuitive unit operation modeling –** These process objects come with modeling infrastructure that makes the development of accurate models quick and easy.

- **Supports complete boiler system simulation –** While there are a variety of boiler processes, in general a complete solution for a boiler facility will include dynamic simulation for steam and mud drums, economizers, superheaters, attemperators, desuperheaters, steam headers, deaerators, natural gas/oil/solid fuel system, and air systems (ID fan, FD fan, and scrubber).

- **Provides realistic Drum modeling including dynamic shrink/swell with compensation –** This level of process modeling allows the user to accurately model the complex dynamics of a boiler and train plant personnel on safe operations.

- **Accurate thermodynamics and steam quality calculations based upon integrated steam tables (IAPWS-IF97 standard) –** The integration of the latest steam table standards provides accurate thermodynamics, vapor-liquid equilibrium, and steam quality calculations, with no additional work for the process modeler.

Product Description

DeltaV Mimic Process – Power provides high-fidelity dynamic models for unit operations commonly found in a wide range of power generation facilities configurations. The objects include:

- **Boiler with Furnace Object –** providing complete combustion model, water and steam balance model and all associated equipment.

- **Desuperheater Object –** for conditioning steam to its saturated state.

- **Steam Header Object –** for complete mass and energy balance of saturated or superheated steam flows across entire header.

- **Turbine Object –** for complete steam and power generation balance.

- **Multi-Stage Turbine Object –** for complete steam and power generation balance with a single injection source with up to 100 stages.

Each process object in Mimic Process – Power includes specific parameters designed for quick configuration.

Boiler with Furnace

The Boiler with Furnace object provides a complete integrated model of the combustion process and steam / water balance in the power plant boiler. The modeling basis is proven power generation stoichiometry and first principles mass and energy balances. Up to five fuel feeds can be configured for each furnace with any combustion source available from the Mimic Fuel object. The combustion model is complete and accurate including flue gas composition, energy generated, full combustion characteristics modeled. Water/steam balance model has all components of the boiler including the steam flow, feed water flow, and drum level. Boiler equipment is accurately modeled with user selections for each subsection of the boiler including primary superheater, desuperheater, secondary superheater, economizer, air heater, and precipitators.

The Boiler object comprises a furnace, air heaters, economizer, boiler drum and super heaters. Together all this equipment functions as three distinct sub-systems:

- Furnace

- Water Side

- Steam Side

Desuperheater

The Desuperheater object is built to condition superheated steam to saturated steam. The Desuperheater object supports either a nominal water input or a stream connection from another Mimic object.

Steam Header

The Steam Header object is built to handle saturated or superheated steam from up to 8 inlet streams, distributed to up to 8 outlet streams. Pressure, temperature, and total steam mass of the header are modeled. A complete, rigorous mass and energy balance is calculated across the entire header each second.

Turbine

The Turbine object provides a complete steam and power generation balance around this equipment including the steam inlet extraction and exhaustion balance. The Turbine object supports all commonly used operation modes and can be run in pressure control, power control, or extraction flow control modes.

Multi-Stage Turbine

The Multi-Stage object provides a complete stream and power generation balance with user-defined configuration of up to 100 stages and 5 user defined extraction points. This object supports all commonly used operation modes and can be run in pressure control, power control, or extraction flow control modes.

Product Support

Mimic Product Support is delivered through Guardian™. Guardian is Emerson's digital platform for addressing the end-to-end lifecycle needs of automation & control software and asset performance management solutions. The Guardian digital experience enables users to quickly connect to product support; securely manage subscriptions; get intuitive views into system health; and explore additional software and services that propel performance.

Ordering Information

DeltaV Mimic is licensed on a Flexible Subscription Unit (FSU) basis. An FSU is a currency that can be used to access any Mimic feature licensed on an FSU basis, with each feature requiring its own number of FSUs. The FSU subscription is offered in one-year, three-year, and five-year terms. To purchase, extend, or expand a license, please contact your Emerson Sales Representative.

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