ENGINEERING SIMULATORS

VISION

Obtain knowledge of dynamic power production behaviour in different operating modes based on modelling and simulation. Use the knowledge for the control system development, testing and implementation phases.

Principal functions:

- Model and simulate process and power production control system dynamics in stationary as well as non-stationary operating modes during start-up, power operation and shutdown of a power generating plant
- Validate proper functionality of the control system in real-time use before going live
- Optimum set-up of control and protection system parameters for different operating modes, incl. failure mode (increase the power plant operator's confidence in the ability of the control and protection system to manage emergency and failure modes)
- Analyse process non-standard and failure modes
- What-if analyses – knowledge of transition processes in different operating modes
- Maintain and develop knowledge of the operating personnel

BENEFITS

Obtain knowledge of power production behaviour in the event of unavailability / loss of processes, operator's manual intervention, or failure of control and protection systems, etc.

- Verification of control system algorithms in the process of design, implementation, modification and operation
- High speed of simulation (power production simulation model installed in PC)
- Possible connection to a real control system
- Real-time validation of real behaviour of a control system in a closed control loop
- Control of actuators and set-up of the required controlled parameter values directly from process diagram screens
- Easy modification of parameters and entry of failure modes of processes, control and protection systems
- Simultaneous visual monitoring of dynamic behaviour of control system processes and algorithms using graphic and numerical outputs
- Quick analysis of discrepancies between design and actual data measurement during start-up of a power generating plant
- Visualisation of calculated transient processes together with measured data
- Obtain knowledge of non-measured parameters
- Consider complex operational effects for system design and adjustment
- Propose and test measures for system troubleshooting before implementation
- Verify the efficiency of measures to increase operational reliability and safety
- Support for manual control under challenging operating conditions

DESCRIPTION

Software tool and related services for monitoring, evaluation and optimization of transition processes in power generating plants for nominal and failure modes or process, control and protection system changes.

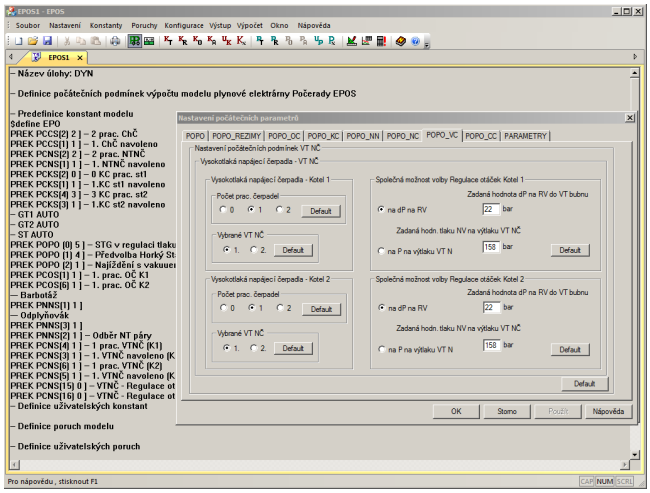
The basic platform of the simulator consists of three parts:

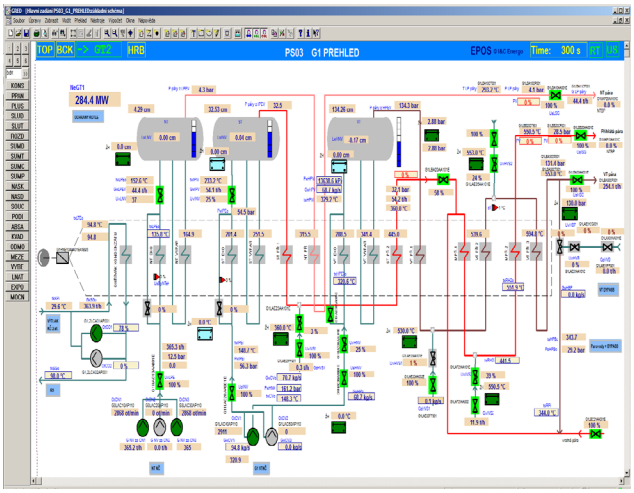
- MODYS – Structural block library to set up a simulation model of processes, control and protection systems
- GRED – Graphics editor to create a simulation model using MODYS blocks
- MODEX – Calculation and organization module of the simulator

Operating modes:

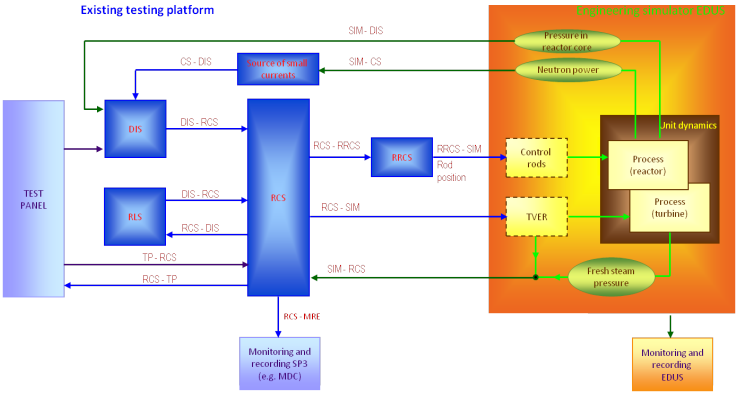
- Off-line what-if analyses, simulation and optimization
- Real-time validation of control system algorithm functionality via a logger in a closed regulation loop – HIL method (Hardware In the Loop) – compare simulated and real processes

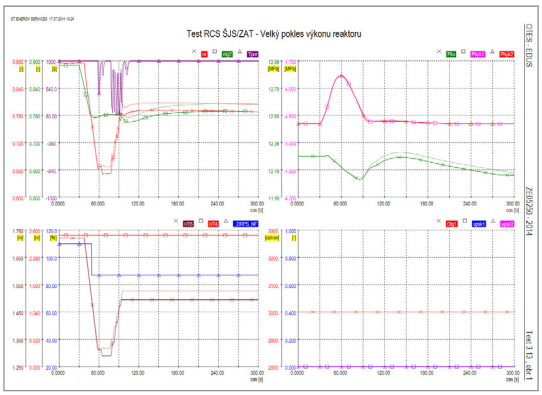
Simulator root screens





Real-time control system functionality validation





Using simulators in operation of power generating units

SIMED / EDUS – Dukovany NPP unit simulator	since 1988
DYTE – Temelin NPP unit simulator	since 2000
EPOS – Počerady gas-steam power plant unit simulator	since 2012

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