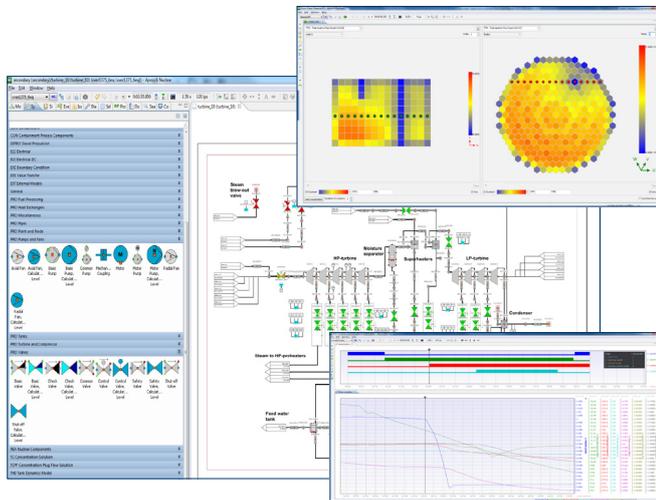


Apros[®] Nuclear Products

Dynamic Simulation and Safety Analysis

Ensuring safety and operational performance in nuclear power plant projects

Apros[®] Nuclear simulation and analysis software has shown its excellence as a key contributor in assuring nuclear power projects achieve the highest plant safety and operational performance levels. It has been successfully used in a series of major nuclear power plant projects, including power upgrade, modernization, safety improvement, and new plant projects.



FEATURES

- comprehensive plant model covering reactor island, turbine island, balance of plant, electrical and automation systems
- light water reactor types covered: BWR, PWR, VVER
- 1D- and 3D neutronics solvers, incl. two-group nodal kinetic model
- thermal hydraulic solvers incl. six-equation, and three-equation flow models
- complete process component libraries including containment, cooling towers, passive systems, and severe accident management systems
- complete automation model incl. PID controls, interlockings, sequence controls
- plant electrical systems and grid model
- fully graphical user interface for model configuration and simulation
- connectivity to third party software

Applications

- feasibility studies and verification of plant modifications
- safety transient and accident analysis e.g for licensing
- process, automation and HMI design and testing
- operating procedures development and testing
- operator training

BENEFITS

- vendor independent code owned by NPP owner-operator and research organization committed to further improvement and support
- the same tool for entire plant model and several purposes: development, maintenance, and resource savings
- more realistic transient behavior due to less boundary conditions assumptions; real physical feedback e.g. between turbine and reactor plant models
- quick and easy-to-use fully graphical model configuration, simulation and maintenance
- successful references worldwide in approx. 30 countries
- extensively verified code and validated models against real measurement data

In partnership with



Next generation
energy company



Apros[®] Nuclear Products

Dynamic Simulation and Safety Analysis

High-fidelity simulation of your entire nuclear power plant using a single tool

China Nuclear Power Engineering Co., China
Engineering simulator several NPP units. Apros in use since 2004.

Forsmarks Kraftgrupp Ab, Sweden
Engineering simulator for all three Forsmark units. In addition, transient and safety analysis for unit 2. Apros in use since 2007.

Fortum Power and Heat Oy, Finland
Engineering and plant analyzers for Loviisa NPP units 1 and 2. Apros in use since 1990.

Gen-Energija d.o.o., Slovenia
Engineering and analysis simulator for Krsko NPP. Apros in use since 2012.



Forsmark NPP experts in Apros[®] training

Connectivity

- integrate with your document management systems
- connectivity to DCS and other tools systems via OPC UA, OPC DA
- connectivity to plant design systems
- integration with CFD and FEM tools

Ask for more details!

International Atomic Energy Agency (IAEA)
Engineering simulators and plant analyzers for nuclear power and desalination plant use. Apros deliveries to several countries since 2002.

Japan Nuclear Safety Authority, Japan
Engineering simulator for safety assessment support and training. Apros in use since 2013.

Kola NPP, Russia
Engineering simulator for safety assessment support and training. Apros in use since 1995.

Teollisuuden Voima Oy, Finland
Engineering simulator for ASEA-Atom BWR type units 1/2, and Areva EPR unit 3. Apros in use since 1993.

Ask for more references!



TVO Oikiluoto NPP, Finland

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