

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

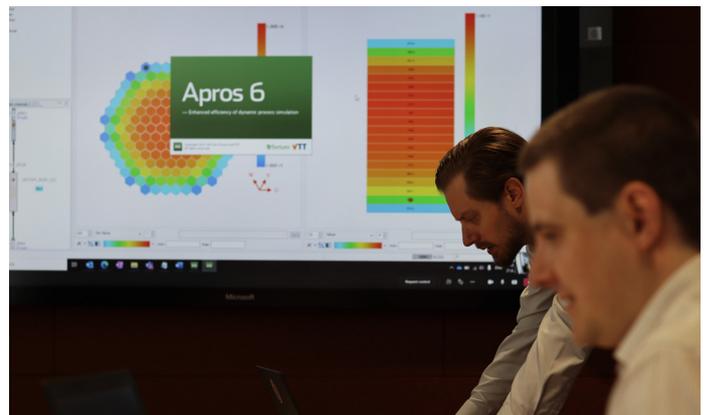
- Comprehensive plant model covering reactor island, turbine island, balance of plant, electrical and automation systems
- Light water reactor types: BWR, PWR, VVER
- 1D and 3D neutronics solvers, incl. two-group nodal kinetic model
- Thermal hydraulic solvers including three- and six-equation flow models
- 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 power grid model
- Fully graphical user interface for model configuration and simulation
- Connectivity to third party software

BENEFITS

- Vendor independent code owned by NPP owner&operator and a 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

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
- Testing I&C (both emulated and real cabinets)



Nuclear References

TEOLLISUUDEN VOIMA OY, FINLAND

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

FORTUM POWER AND HEAT OY, FINLAND

Engineering and full scope simulators for Loviisa NPP units 1 and 2. Apros in use since 1990.

OSKARSHAMNS KRAFTGRUPP (OKG) AB, SWEDEN

Engineering and analysis simulator for BWR units. Apros in use since 2010.

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.

ČEZ, CZECH REPUBLIC

Engineering and analysis simulator for Dukovany and Temelín NPPs. Apros in use since 2018.

SLOVENSKÉ ELEKTRÁRNE A.S, SLOVAKIA

Engineering and analysis simulator for Bohunice and Mochovce NPPs. Apros in use since 2009.

GEN-ENERGIJA D.O.O., SLOVENIA

Engineering and analysis simulator for Krsko NPP. Apros in use since 2012.

JAPAN NUCLEAR SAFETY AUTHORITY, JAPAN

Engineering simulator for safety assessment support and training. Apros in use since 2013.

KOREA HYDRO & NUCLEAR POWER CO., LTD., KOREA

Engineering and analysis simulator. Apros in use since 2020.

CHINA NUCLEAR POWER ENGINEERING CO., CHINA

Engineering simulator for several NPP units. Apros in use since 2004.

INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

Engineering simulators and plant analyzers for nuclear power and desalination plant use. Apros deliveries to several countries since 2002.

Ask for more references!

CONNECTIVITY:

- Integrate with your document management systems
- Connectivity to DCS and other tools and systems via OPC UA, OPC DA
- Connectivity to plant design systems
- Integration with CFD and FEM tools

Ask for more details!



▲ TVO Olkiluoto NPP, Finland. Source: TVO