Advanced Process Simulation Software

APROS

Advanced simulation software for multiple purposes
- Process Engineering and Optimization
- Accident and Transient Analyses
- Training Simulators
- I&C Testing

Fortum  VTT
APROS Advanced Process Simulation Software

Engineering and Safety Analyses

Physical models for the full plant: 1-D and 3-D reactor core, full plant thermal hydraulics, containment, I&C systems, electrical systems APROS calculation models are extensively validated in many projects during the last decades. Finnish Safety Authority STUK has approved APROS for accident analyses for the licensing of Finnish NPPs.

Training and Testing Simulator

Plant simulation model can be used for versatile tasks, e.g. an engineering simulator model can be used as a basis for a training simulator in a cost-effective way.

Dynamic plant scale process simulation has been successfully applied in several industrial projects for functional testing of the automation system – virtual commissioning. The major benefits are the reduction of the commissioning time on the site, and the ability to test even the safety critical functions in a comprehensive manner.

Software Features

Interactive graphical interface for process modelling, simulation running and on-line modifications of the model.

APROS environment provides interfaces for connecting external software to the simulation engine. Alternatives are OPC interface and easily customizable TCP/IP based APROS Communications Library ACL. Possibility to create own calculation models with DLL libraries.

Case: VVER-440 Automation Renewal

APROS is utilized extensively at Fortum for Loviisa NPP to assure that the renewal of I&C systems can be realized safely and economically. The engineering simulator is used in the design and validation of the modifications of the renewed I&C systems. The development simulator is aimed for the design, testing and acceptance of the new control room interface. The testing simulator is used for testing the new I&C systems and retuning of the controllers mainly during the factory acceptance tests. The training simulator will be used in training the operators and the other technical personnel in the operation of the digital control room facilities.

For further information please contact APROS developers

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References

VVER-440, PWR
Loviisa NPP, Finland
Detailed plant model for accident analyses and engineering

Areva EPR 1600 MW, PWR
Olkiluoto 3, Finland
Accident analyses
2*100 % LOCA
Engineering applications

860 MW, BWR
Olkiluoto 1&2, Finland
Transient analyses
Turbine optimization

1060 MW, BWR
Forsmark 1&2, Sweden
Power upgrade studies

VVER-1000, PWR
Tianwan NPP, China
Safety analyses

Desalination model
Integrated NPP and desalination plant model

Other APROS applications:
Thermal power plant models
Pulp and paper models
District heating models

For more information see:
APROS.vtt.fi