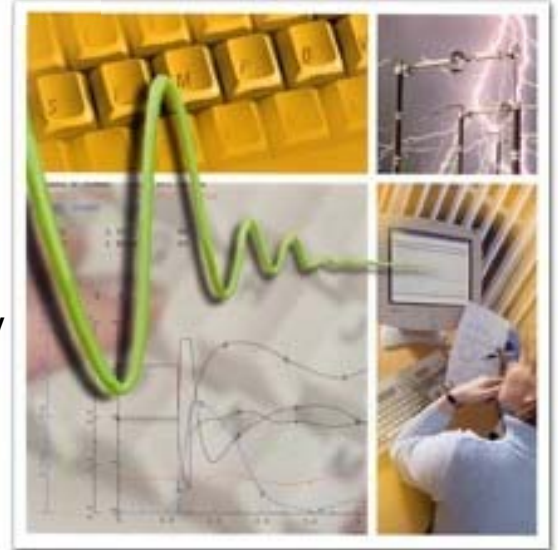


# SIMPOW®

## SIMulation of POWer systems

### Calculation Modules

- Power-flow analysis
- Fault analysis
- Dynamic analysis
  - Short, Mid and Long term stability
  - Linear analysis
  - Electromagnetic transients (EMT)



### Features

- Developed since 1977, and used by ABB for the design of HVDC, HVDC Light®, FACTS and traction systems
- Analysis in both time and frequency domain
- Switch between phasor and instantaneous value mode during simulation
- Instantaneous value representation in some parts of a system and fundamental frequency in other parts
- Interactive or in background mode (semi batch)
- Extensive linear analysis module
- Variable or fixed time step
- Robust numerical technique
- Import of PSS/E™ files
- Integration possibilities in the NEPLAN® software (see separate pamphlet)

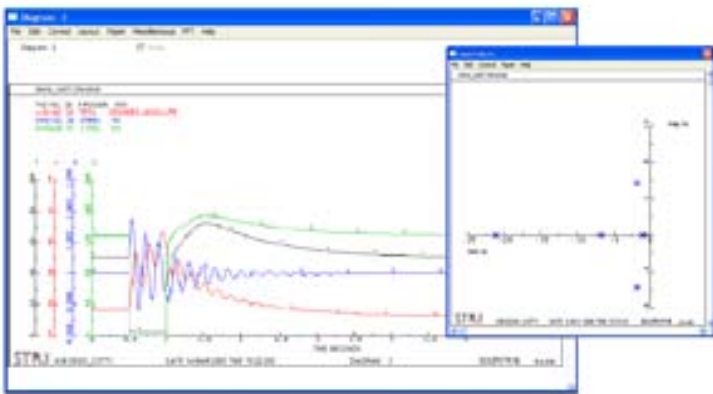
### Mode

- Basic models such as nodes, lines, transformers, series reactors and capacitors, varistors, shunt impedances, voltage and frequency dependent loads, synchronous and asynchronous machines, double-fed asynchronous machine, mechanical loads, turbines, turbine governors, exciters and voltage regulators, power system stabilisers etc.
- Advanced models such as rotary-, HVDC-, PWM- and cyclo converters, synchronous machine start-up model, ferroresonance transformer model, transformers with magnetising and saturation, high-frequency line model, inertia models etc.
- Build your own models with the high level programming language DSL (Dynamic Simulation Language) or the DSL Code Generator



**SIMPOW®** used in projects for the design of HVDC, HVDC Light®, FACTS and traction systems e.g.:

- Itaipu HVDC project, Brazil
- Gotland II HVDC project, Sweden
- Rihand-Delhi HVDC project, India
- Gotland HVDC Light, Sweden
- Québec-New England Phase II HVDC project, Canada/USA
- Three Gorges-Changzhou and Guangdong HVDC Transmission project, China
- Pulches-Henderson series compensation project, Argentina
- Kanpur 2x140 Mvar SVC project, India
- McCullough, SC, 500 kV-project, Nevada Power, USA
- Raipur, SSR-study, TCSC, 400 kV-project, India
- London Underground, SVC project, Great Britain



**SIMPOW®** used in studies, typically:

- Fault calculations and relay protection studies
- Power oscillation studies
- Tuning of Power System Stabiliser (PSS)
- Motor start simulations
- Inrush current calculations
- Harmonics analysis
- Reactive compensation studies
- Ferroresonance phenomena
- SVC design studies
- Voltage stability studies
- Filter design calculations
- Subsynchronous torsional interaction studies (SSR, SSTI)
- Auxiliary power supply studies, e.g. in power plants
- Fault and harmonics calculation in a large underground train power supply system
- Design and dynamic performance of wind generator parks in a power system taking advantage of HVDC Light® as system stabiliser



#### Validation of models

Validation of the existing models has been done in various ways. The simplest models such as transformers, lines, nodes, faults, etc. have been validated in accordance with text books, plausibility of results and comparison with theory. Advanced SVC and HVDC components and regulators as well as associated synchronous machines, have been verified against analogue simulator and also against test results from existing SVC plants and HVDC links, e.g. the Gotland Link.

The validation has also been done by comparison of results from other computer programs similar to SIMPOW.

