

Generator

Start-Up

Starting Recovery Utilization

Using full frequency-dependent machine and network models, the Generator Start-Up module analyzes cold-state starting of generators under normal and emergency conditions. The entire generator start-up process is modeled, including automatic control relay simulation and the dynamic behavior of exciters/AVRs, governors/turbines, and Power System Stabilizers (PSS). You can simulate the starting of generators, connection of generators to the network before reaching synchronizing speed, acceleration of motors, action of MOVs, and operation circuit breakers.

Quick Recovery of Power to Critical Loads

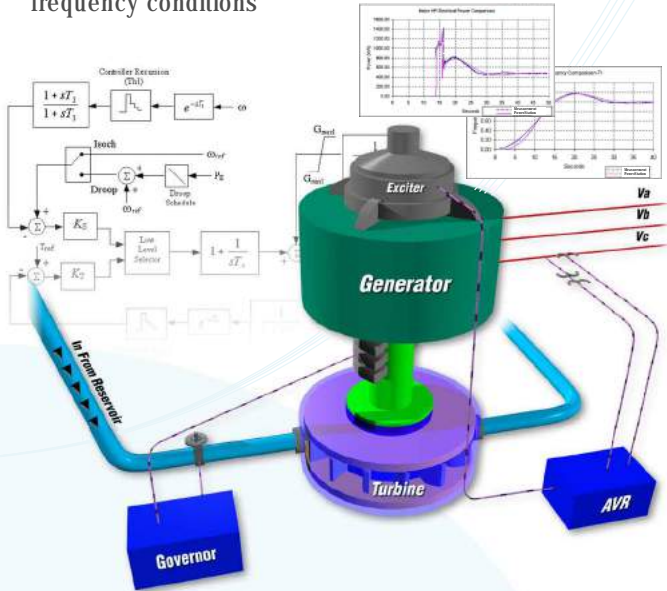
Generator start-up

Key Features

- Cold-State Generator Starting
- Load Generators Prior to Synchronous Speed
- Frequency-Dependent Machine Models
- Frequency-Dependent Network Models
- An Expansion to the Transient Stability Module
- Utilizes User-Defined Dynamic Models

Flexible Operation

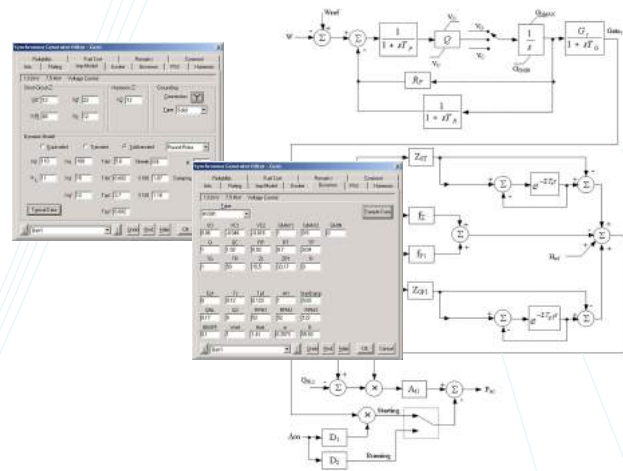
- Parameter correction due to saturation effects
- Initial field flashing circuit & switching time
- Special dynamic turbine actions during start-up
- Detailed & user-programmable speed-governor system control
- System switching actions controlled by relay settings
- Variety of relay controls (Volt, Hz, V/Hz, dHz/dt)
- Motor acceleration at under-voltage & under-frequency conditions



Comparison of Results to Field Data

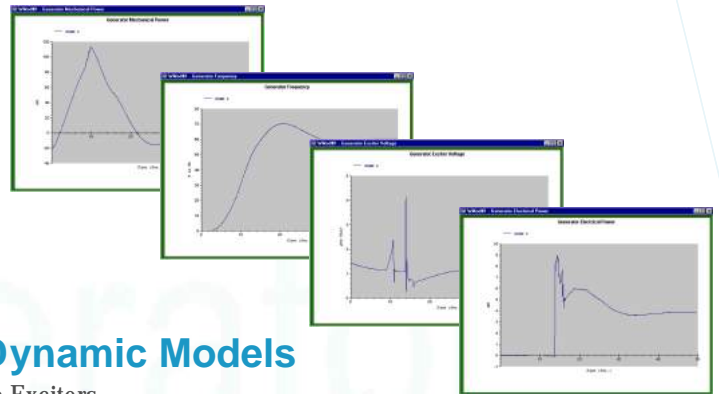
- Unlimited Buses* & Elements
- No Voltage Limitations
- Looped & Radial Systems
- Integrated 1-Phase, 3-Phase, & DC Systems
- Multiple Generators & Grid Connections
- Multiple Isolated Sub-Systems
- Customizable Libraries
- Graphical Display of Results on One-Line Diagrams
- Customizable Font Types, Sizes, Styles, & Colors
- Customizable Display of Ratings & Results
- Graphical Display of Equipment Impedance & Grounding
- Automatic Error Checking
- Graphical Display of Overstressed Devices
- Graphical Display of Over/Under Voltage Buses
- Dynamically Adjust Display of Results

*Maximum number of energized buses during calculations is license dependent.



Capabilities

- Quick recovery of power to critical loads
- Determine optimum loading time
- Schedule of loading sequence
- Analysis of generator & motor starting behavior
- Analysis of governor & AVR starting behavior
- Diesel generator starting for critical applications such as nuclear generation plants
- Analysis of power recovery to critical loads when power grid connection is lost
- Cold-state starting of stand-by generator under normal & emergency conditions
- Motor acceleration & rejection
- Simulate relay actions automatically during analysis



Dynamic Models

- Exciters
- Automatic Voltage Regulators (AVR)
- Governors
- Turbines
- Power System Stabilizers (PSS)



10 CFR 50 Appendix B • 10 CFR 21 • ANSI/ASME N45.2-1977 • ASME NQA-1
ISO 9001 • ANSI/IEEE Std 730.1-1989 • CAN/CSA-Q396.1.2-89

