



XtremeElectric™ Electrical Network Modeling Software

XtremeElectric builds sophisticated electrical system models based upon Kirchoff's current law and the Norton equivalent circuit along with complex variable calculations to deliver higher fidelity than all comparable models. By using a network matrix solution in a complex equation form, XtremeElectric accurately calculates the interaction between electrical components and provides realistic values for:

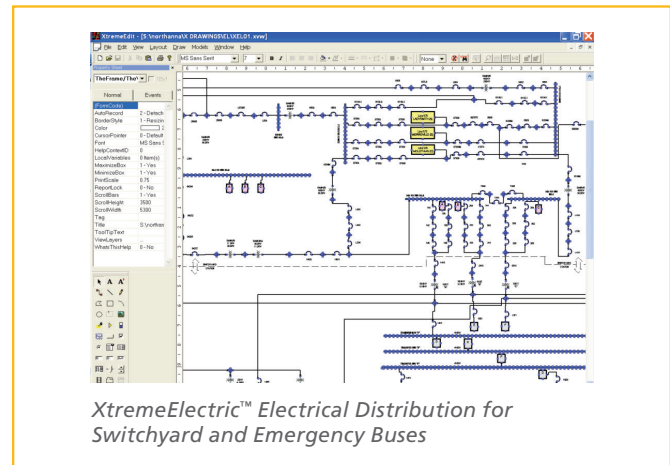
- Voltage
- Phase
- Frequency
- Real, imaginary and total current
- Real and reactive power

This enables XtremeElectric to successfully simulate phenomena such as:

- Multiple voltage levels per the plant single line diagram
- Dynamic fault propagation
- Paralleling of multiple source and load combinations
- Bi-directional computation of current and power (e.g., a source can be a sink under certain conditions)
- Transformer back feed from lower to higher potentials
- Accurate generator model responses for:
- Steady state transients and load changes
- Out of phase synchronization
- Pole slipping due to loss of excitation
- Effect of connecting multiple generators and the grid
- Load rejection and islanding
- Degraded DC voltage conditions
- Multiple networks interfacing

XtremeElectric has been used to develop new models for the electrical networks, from the external grid to the 480 VAC induction motors, for the following plants; Surry, North Anna, Kewaunee, Hatch, Dresden, LaSalle, Clinton, Quad Cities, Byron, Limerick, Vogtle and Braidwood. The XtremeElectric component library is comprehensive, and all components are included with the base product.

Below is a portion of the North Anna Electrical distribution, showing a portion of the switchyard and the emergency buses. With an electrical network generated from the XtremeElectric model builder, the user will be able to see current surges and bus voltage drops when starting large loads, as well as the effects of degraded grid conditions outlined in the SOER 99-01 and NRC Generic Letter 2006-02.



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