

Enhanced Substation Modeling

Model substations for a thorough analysis of your power system

Increased complexity in voltage and power controls, higher DER penetration with possible back feeding, evolving protection schemes; it is important to model, analyze and simulate the substation details.

The CYME Enhanced Substation Modeling module allows for the creation of the comprehensive model of the substation components required to perform thorough analyses such as power transients, effect on voltage regulation and other phenomena inside the substation.

Substation Modeling

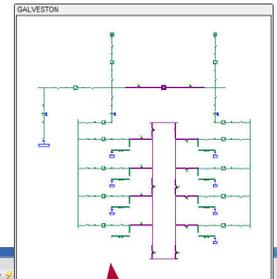
With the Enhanced Substation Modeling module of the CYME software, the user can model all the major components of distribution substations. The calculations done with the CYME analysis modules can then take into account the effects of these installations on the overall distribution system to produce results that closely reflect reality.

The Enhanced Substation Modeling module supports the three-phase modeling of substations, in a schematic representation connected to the overall grid.

It is used to model the interface between the distribution system and the transmission or sub-transmission system.

The software also provides the capability to connect the distribution feeders to the appropriate bus bar into their substation. Thus, the dependencies between the feeders can be taken into account by the CYME software.

Substation detailed view



Network ID	Serial ID	Equipment ID	Status	Phase	From Node	To Node	Manufacturer	Model	Voltage	Unfed Class
GA07	10700	SBC-10K	Connected	B	10706	10708			12.47	Unfed
GA07	11400	SBC-10K	Connected	ABC	11400	11410			12.47	Unfed
GA07	11800	SBC-10K	Connected	ABC	11710	11800			12.47	Unfed



Powering Business Worldwide

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Features

The substations modeled appear as icons on the overall representation of the circuit to avoid cluttering the view. A click on any one of those nested views reveals the content in a separate editable schematic view.

The substations can be modeled in details using the extensive CYME equipment library (buses, cables, transformers, switches, circuit breakers, protection devices, etc.). The user can also create new components based on the very detailed templates of the library to allow the right match with the nameplate data of your particular equipment. Once installed on the system model, the settings of the components can be adjusted as required.

The CYME software utilizes the data of the complete connected model in its calculations.



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Printed in Canada
Publication No. BR 917 060 EN
March 2017

Enhanced analysis results

The ability to add modeling detail upstream of distribution feeders provides the capability to indicate the dependency between the feeders connected to the same substation bus bar. This valuable data translates into the more precise simulation of the distribution system.

- **Fault Analysis** - Ability to simulate the effects of a fault on one circuit on the other circuits connected to the same bus bar. This includes:

- Voltage drop
- Fault contribution (if DG or DER is present on the network)

- **Load Allocation** - Ability to compute the substation transformer and/or voltage regulator diversity factor.

- **DER Impact Evaluation** - Ability, through a load flow simulation, to identify reverse power flow from one feeder to another, or even to the transmission/sub-transmission system.

- **Contingency Analysis** - Simplifies contingency analysis by allowing to easily simulate an out-of-service substation transformer (and thus all feeders connected to this transformer).

Sub-networks modeling

More accurate simulation results lead to the more precise planning and management of the expansion and maintenance of the distribution system, and a greater facility to manage the integration of the Distributed Generation (DG) and Distributed Energy Resources (DER) in the power grid; saving time and money.

The Sub-Networks Modeling module is included with any of the other CYME circuit/system modeling modules, and shares similar features. It supports the creation of any sub-network, including utility vaults, switching cabinets and modular substations; DG and DER components, in a nested representation connected to the overall grid.

The user can create a sub-network in a schematic or georeferenced view style as needed. Each can be shown as clickable nested view icons on the overall main representation of the system, revealing the editable view of the sub-network.

