

SynerGEE® Electric

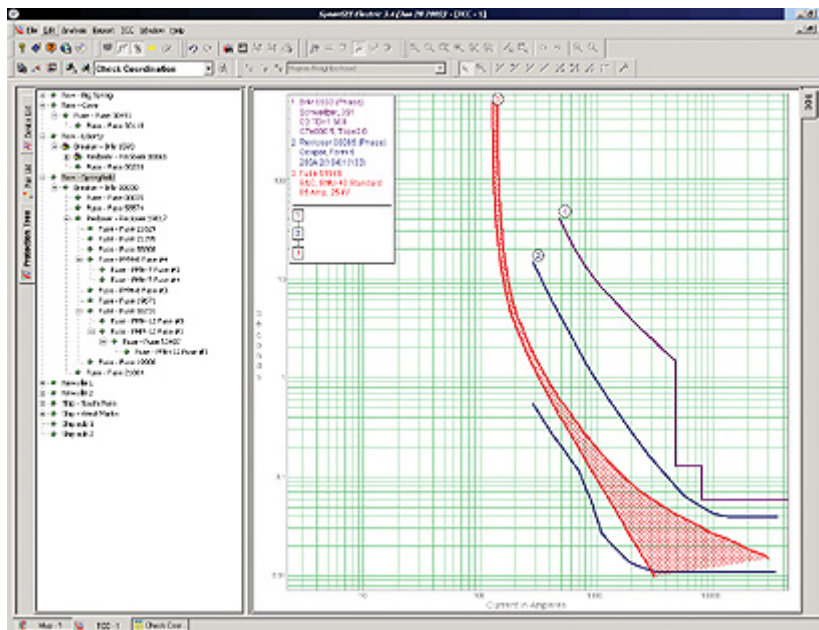
SynerGEE® Protection

SynerGEE® Protection offers the industry's most advanced environment for modeling over-current protection schemes of radial distribution feeders. Its automation of the labor-intensive task of coordinating protective devices is a powerful aid to distribution engineers. The application can be run as a module of SynerGEE or as a standalone protection coordination tool.

Interface

SynerGEE Protection uses a friendly and intuitive user interface. It includes the on-screen Time vs. Current Coordination (TCC) graph, which represents a significant advancement from traditional "light table" software.

The graph, which simulates standard Kearny log-log paper, allows you to plot as many curves on the graph as necessary to examine device coordination, all with just a few clicks. Devices plotted on the graph come directly from your model, not some external library. Plus, you can have multiple graphs open at once, print out your graphs or save them to disk for future use.



And, the ease of creating a TCC graph is only the beginning. The graph is a dynamic user interface that provides direct access to a host of powerful features, including:

- Complete control over all colors, styles, text annotations and zooming
- Single-click access to device properties, which you can edit and then observe the curves update automatically. You can even make changes to a device on a SynerGEE map and watch the TCC update
- Precise and simple tools for measuring time and current distances between curves.
- A clear view of protective device topology, including the layout of device pairs

Comprehensive device models

SynerGEE supports detailed models for fuses, reclosers, breakers and sectionalizers.

In addition, it can handle:

- Mechanical response times
- Load-flow and fault calculations for cutoff values and protection intervals
- Curve shifting through transformers
- Conductor damage curves

And, since you can use the same SynerGEE model for both planning and protection, you can save time, avoid redundancy and keep everyone on the same page. You can also use SynerGEE’s friendly modeling features to quickly create basic schematics for TCC and analysis work.

In addition to providing convenience, SynerGEE Protection demonstrates a commitment to reliable simulations based on real-world conditions. It includes over 10,000 curves in its library, including phase, ground, response, control and damage curves.

SynerGEE Protection represents a complete analysis package for evaluating protection coordination.

Check co-ordination analysis

A comprehensive analysis tool, Check Coordination, is available to evaluate device coordination on a large scale. With this tool, SynerGEE can check an entire feeder or system for device coordination, based on an internal rule base and a detailed set of acceptable margins that you specify.

Coordination Test Details for Feeder: New - Liberty						
Pair #	Check Status	Device Name(s)	Prot. Rule	Prot. Margin	Protecting Range	Coordination Check Discussion
Fuse Checks						
1	Pass	Fuse 51940	10-01	--	--	Fuse load current of 32A should not exceed its 65 amp rating.
2	Pass	Fuse 51940	10-02	200%	1600 A-	Minimum phase fault at 1600A should exceed 200% of fuse 65 amp rating.
3	Pass	Fuse 51940	10-03	200%	1600 A-	Minimum ground fault at 1600A should exceed 200% of fuse 65 amp rating.
4	Pass	Fuse 51940	10-04	90%	--	Fuse 32A load current should be less than 90% of minimum melt curve (128A).
5	Pass	Fuse 51940	10-05	--	--	Fuse has valid min-melt(12291) and max-clear(12292) curves.
Fuse Protecting Recloser Checks						
6	Pass	Fuse 51940 / Recloser 00065	12-01	95%	1000 - 8772 A	Recloser fast phase curve (K Factor = 1.0) should lie below fuse min. melt curve.
7	Pass	Fuse 51940 / Recloser 00065	12-02	95%	1000 - 5460 A	Recloser fast ground curve (K Factor = 1.0) should lie below fuse min. melt curve.
8	Pass	Fuse 51940 / Recloser 00065	12-03	95%	1000 - 8772 A	Recloser slow phase curve should lie above the fuse max. clear curve.
9	Fail	Fuse 51940 / Recloser 00065	12-04	95%	1000 - 5460 A	Recloser slow ground curve should lie above the fuse max. clear curve.

Check Coordination automatically divides a feeder into protective device pairs and verifies overcurrent protection for each. Each pair is created from a combination of any of the following devices, based on model and switch configurations:

- Expulsion fuse
- Current limiting fuse
- Hydraulic recloser
- Electronic recloser
- Electromechanical relay
- Electronic relay

The application also considers:

- Transformer inrush curves
- Transformer damage curves
- Conductor damage curves

With each pair, the analysis indicates whether the check passed or failed, and details the rule used to conduct the check.