



# Advanced Fault Protection Improves Reliability

**S&C Featured Solution:** Vista® Underground Distribution Switchgear

**Location:** United States, West Coast

## Background

A major West Coast utility wanted to improve the reliability of their underground distribution system by installing fault interrupting devices at the midpoints of a number of underground feeders. These fault interrupters would operate in response to a fault on the feeder, sectionalizing the feeder and thus keeping half of the loads in service. This single device would significantly improve service reliability.

Before implementing this improvement, the utility had to find a switchgear product that would meet a number of criteria:

**Three-phase fault interruption**—Since the switchgear would be installed on a main feeder serving a variety of loads, three-phase fault interruption was required.

**Coordination with existing devices**—The protection curve had to “fit” perfectly between the curves for the upstream relay and the downstream current-limiting fuses.

**Ground fault protection**—Ground fault settings were a must in order to fully coordinate with the upstream breakers.

**Low profile**—Because many of the desired installation sites were located in the heart of residential and commercial areas, the gear had to be as inconspicuous as possible.

Although the utility had been considering this application for eight years, they had yet to find the “ideal” device that would fully satisfy all of these

criteria. Finally, after reviewing S&C’s new Vista Underground Distribution Switchgear, they knew they had found a solution.

## How did they do it?

The utility applied a Vista switchgear Model 211 (one load switch, one fault interrupter) to sectionalize the mid point of a 13.8-kV express feeder, as shown in the one-line diagram below.

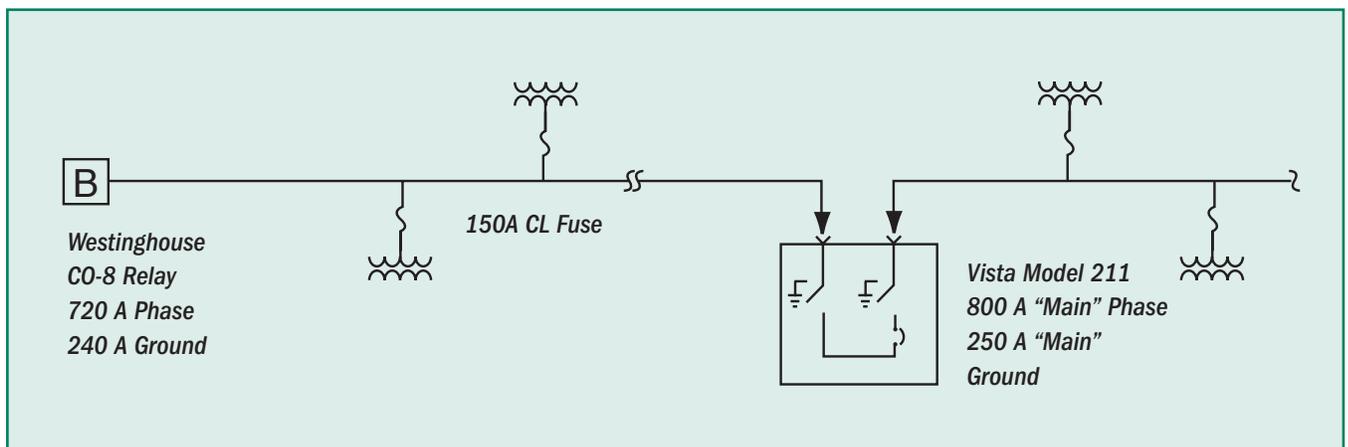
The 600-A, three-phase fault interrupter is controlled by a self-powered, microprocessor-based overcurrent control. The control incorporates a number of time-current characteristics and programmable curve attributes which were specifically designed for application on underground distribution systems.

The compact SF6-insulated unit was provided in a low-profile pad-mounted configuration. Plans for similar applications in the future are to go one step further and “bury” the gear in a submersible pit. This is made possible by the innovative new UnderCover™ Style installation concept shown on the following page.

## The results...

So how well did Vista switchgear meet the requirements for this application?

**Three-phase fault interruption**—The resettable fault interrupters were provided with three-phase operation.



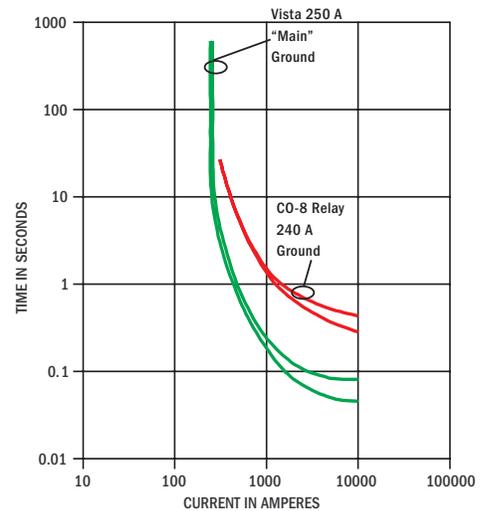
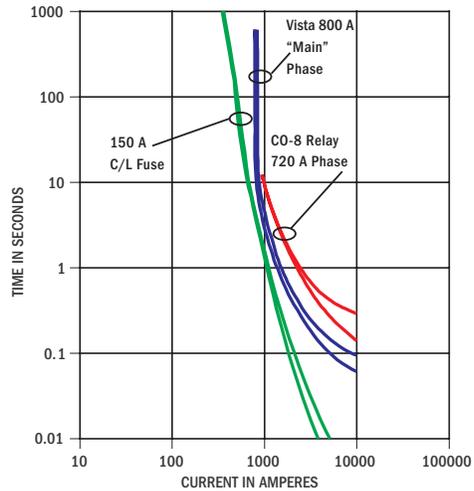


**Coordination with existing devices**—The main interrupter was easily programmed with an 800-A “coordinating speed” curve. This curve was specifically designed to “fit” between upstream circuit-breaker relays and downstream fuses. The plot to the right shows the perfect coordination achieved for this application.

**Ground fault protection**—A 250-A “coordinating speed” ground curve was also easily selected. As shown above, the ground curve easily coordinated with the upstream relay’s ground setting.

**Low profile**—The compact pad-mounted installation was less objectionable than traditional pad-mounted switchgear, and the UnderCover installation puts the gear completely out of sight to satisfy even the most discriminating communities.

In summary: service reliability was improved, perfect coordination was achieved, and the installation was inconspicuous to the surrounding community. This is just one example of the many outstanding solutions possible with the innovative Vista Underground



*Vista UDS is available for pad-mounted installations, vault installations, and the innovative new UnderCover™ Style installation. A wide variety of configurations is available from 15- through 38-kV and with any combination of up to six load switches and fault interrupters.*

