Survalent Technology

SMART DMS
DISTRIBUTION MANAGEMENT SYSTEM

Standard Features

SmartDMS is fully integrated on the Survalent SmartSCADA platform, enabling a wide-range of standard SCADA features such as multiple redundancy and a single user interface for both DMS and SCADA.

The following features are standard on every SmartDMS system:

Network Model

The network model is defined using a graphical line section editor that is built into the WorldView map editor. This editor allows the user to edit both the topology of the network and the parameters of the network elements.

Both the topology processor and the load flow calculations that use the network model support paralleled and looped networks as well as radial networks. There is no limit on the size of the network.

To make the load flow calculations as accurate as possible, the load modeling can be made to be sensitive to voltage, time of day, day of week and ambient temperature. These sensitivities are defined via load composition and load profile tables. To get a quick start, the user can begin with flat compositions and profiles and just use connected KVA or monthly billed KWH. Later, you can develop more complex load compositions and profiles to improve the accuracy of the model.

Topology Processing

The topology processor calculates the connectivity of line sections based on the topology of the network and the current status of the breakers and switches. For areas that are energized, the topology processor also indicates where the network is paralleled and/or looped. Since the system supports multi-phase non-ganged switches, each phase may have different connectivity (phases within a line section may be fed from different feeders).

The status of the line sections are displayed on the map by user-defined color-coding. A feeder trace function allows the dispatcher to ask the system to highlight the extent of any feeder. Multiple simultaneous traces with different colors can be requested. Traces are local to a workstation (a trace on one workstation does not appear on other workstations).

Load Flow

Periodically, the system performs a three-phase unbalanced load flow calculation and database update that:

- Redistributes the feeder load data so that the total matches the substation data in the SCADA system
- Updates the feeder voltage/loss profiles
- Updates the feeder min/max margin and min/max volts data

The load flow calculations are performed automatically:

- at a periodic interval, where the interval is user-defined

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- whenever there is a significant change in the substation data (voltage, load) in the SCADA system database, where the definition of "significant" is user-defined
- after a feeder reconfiguration has occurred (by switching action) or after the dispatcher has made some changes in the line sections database via the Line Section Editor

The results of the calculations may be viewed in reports. However, for many of the calculated data items, the Line Section Editor allows the user to specify SCADA database points to receive them, for easy viewing directly on the map. Among these calculated data items that can be mapped to SCADA database points are:

- three-phase voltages and currents at a line section
- the magnitude of the minimum current margin between the line section and the substation
- the magnitudes of the minimum and maximum voltages between the line section and the end of the feeder

Security Analysis

A security analysis is automatically performed after every load flow calculation. The security analysis compares the currents and voltages on all the line sections against user-specified warning limits. This check applies to both conductors and devices (switches, transformers, etc.) A momentary alarm is raised for each newly detected security threat. A Security Analysis display window shows the list of all presently outstanding security threats.

This creates a warning system that notifies the dispatcher of impending overloads or poor voltage conditions. On receipt of a security alarm, the dispatcher can use the Voltage/Loss Study or the Load Transfer Alternatives Study to assess possible reconfiguration or volt/var control actions.

Studies:

SmartDMS Studies and Reports are accessible via menus in the WorldView map window. Each study and report window contains a pushbutton that allows the dispatcher to obtain a hardcopy of the results.

- Switching Study
- Load Transfer Alternatives Study
- Short-Circuit Study
- Post-Fault Load Transfer Recommendations
- Capacitor Dispatch Study

Reports:

- Line Section Data
- Load Flow Data
- Load/Customer Report
- Voltage, Loss and Load Balance Report
- Line Section Report
- Capacitor and Regulator Report
- Switching Devices Report
- Load Margins Report
- Min/Max Voltage Report

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