Integrates switching with other network management tasks

The e-terradistribution Switching Operations application is part of Alstom Grid’s e-terradistribution suite of applications for real-time distribution network management. It integrates fast and accurate switching procedures into the network management environment.

Switching Operations is the formal process of performing switching changes on the network for the purposes of maintenance, network reconfiguration, restoration of unplanned outages and augmentation of the distribution network. Safety Documents are issued to work crews to confirm that the specified portion of the network has been made safe and is no longer under normal operational jurisdiction. The core of Switching Operations is the Switching Order, a structured list of switching procedures that is used to record and coordinate switching between the control room dispatcher and the field crews.

Network Switching Operations is a key module that expands the operations of the e-terradistribution Network View to support the formal process of switching on the network. It interfaces directly to the Network Operations Model and the network display.

As switching is a very common event on the distribution network and almost all switching requires a prepared Switching Order, it is important that the Switching Operations function provides a tool that allows dispatchers to quickly and accurately build, check and execute Switching Orders.

Switching Orders are built by simply selecting the required switches on the network and adding them to the order. The application provides tools for the editing and reordering of Switching Orders. Once a Switching Order has been created it can be saved for later reuse.

Switching Orders can also be generated automatically by the optional Network Optimization functions Fault Location, Isolation and Service Restoration (FLISR), Automatic Feeder Reconfiguration (AFR) and Planned Outage Study (POS).

Customer benefits

- Reduced work-load for dispatchers
- Stream-lined Switching Order creation
- Procedural rules automatically enforced to reduce switching errors
- Automatic record keeping for Switching Operations
- Real-time updates of network topology changes
- Improved coordination between dispatchers

Switching Operations are integrated with DMS, OMS and SCADA to ensure crew safety
Increased switching accuracy and enhanced crew safety through model-based analysis

Switching Orders can also be created and executed in Study mode to allow the effects of the switching on the network to be analyzed. The execution of Switching Orders follows a process in which the Switching Order guides the dispatcher to the relevant device for each step, carries out the specific action defined for this device and acknowledges the successful completion of the action.

The Switching Operations functionality covers the complete scope of the switching process, including:

- Fast and accurate creation of Switching Orders directly from the network geographic view
- Simulation of the execution of the Switching Order against a study model of the network based upon projected conditions at the planned time of switching
- Managing the execution of the Switching Order by verifying that each step has been correctly completed
- Placement of tags on the geographic network view to match those placed in the field
- Save and retrieve Switching Orders for record keeping and later use. This includes “macros” and “templates”
- Automated creation of a draft “Back-out” Switching Order to reduce the workload required to create the switching necessary to return the network to its original state
- Allow the dispatcher to modify a partly executed Switching Order in the case of equipment failure or an unexpected problem. This allows the dispatcher to plan the necessary changes to the switching steps and maintain an accurate record of the actions taken

Switching operations can also be recorded in a daily Switching Log, where switching is entered and then executed on a step-by-step basis. The switching logs may be automatically generated for each operator on a per-shift basis so that all operations are easily and accurately logged. This may be used for restoration Switching Orders and also as a switching log of multiple single-step operations such as re-fusing line switches.

Safety documents may be issued/released as steps of the Switching Order. Switching Orders may contain a reference back to the initiating cause of trouble.

Safety Documents are issued to work crews to confirm that the specified portion of the network has been made safe and is now under their jurisdiction. The network cannot normally be switched back into service until the safety documents are released. Switching Operations manages the creation, issue and release of safety document to support the business rules and switching procedures of the utility.

Safety Documents may exist as both electronic and hard-copy. Safety documents may be created as stand-alone documents or as part of a Switching Order. Safety documents may be created ahead of time and stored until required.

Safety Document symbols can be placed on the geographic network view to clearly indicate the status of an outage.

The Switching Operations application is configurable to allow the easy implementation of rules such as the Switching Order approval process and the types of actions that are associated with each device type.

Alstom Grid’s integrated solution for real-time management of distribution networks

Advantage

- Alstom Grid Energy Management and SCADA Systems are used by electricity utilities throughout the world. Alstom Grid employs industry experts to meet customer requirements.
- e-terra distribution Switching Operations has been specifically designed to meet the needs of all sizes of distribution utilities.
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