

EMPOWER - Substation Maintenance Module



The *EMPOWER Substation Maintenance Module* is the largest of the *EMPOWER* application modules, and provides a comprehensive tool to assist in scheduling, record-keeping and reporting of the numerous activities and data associated with substation maintenance. Substation configurations are defined by the user placing the desired equipment into a schematic diagram. The configuration may take any form the user desires, and for convenience, pre-defined schematics are supplied for single-ended, dual and ring substation configurations (these are easily edited for customization).

The Substation Maintenance Module provides for the following types of equipment (each of which is considered an independently maintainable entity):

- Switchgear (primary and low voltage)
 - Tie Switches and Breakers
 - Transformers (primary and station service)
 - Tapchangers
 - Battery Chargers
 - Batteries and Cells
 - Protective Devices
 - Feeder Breakers
 - Reclosers
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Substations are presented graphically to the user as station block diagrams. Created under the module's Substation Editor using drag and drop techniques with pre-defined symbols, these diagrams show all maintenance entities with their electrical connection inter-relationships. Naming conventions for devices are all under the user's control. Entities beyond or at their "next service date" are highlighted to so indicate, and service-due reports covering all substations are available on demand for various time-scales (i.e. next week, next month, etc.).

Prior to performing the required maintenance, device "field worksheets" may be generated by the *EMPOWER* user. These forms are completed in the field by filling in blanks or checking boxes of choice for the various steps of the particular devices' maintenance procedures. Upon return of this information, the *EMPOWER* user, with a click of the mouse on the station block diagram, calls up a template for each device serviced. Using standard Microsoft Windows techniques (eg. pulldown menus, radio buttons, checkboxes, etc.), the user then transfers the maintenance information to the data base for a permanent record. The entity will remain in the "service-required" state until all maintenance fields have been completed whereupon the record is effectively "signed-off".

Historical information may be interactively queried from the data base at any time, and management reports are available on demand. These reports allow the user to view and print summary data of maintenance due over all substations and over varying timescales, as well as work completion reports both in detail, and as percentage achieved over time.