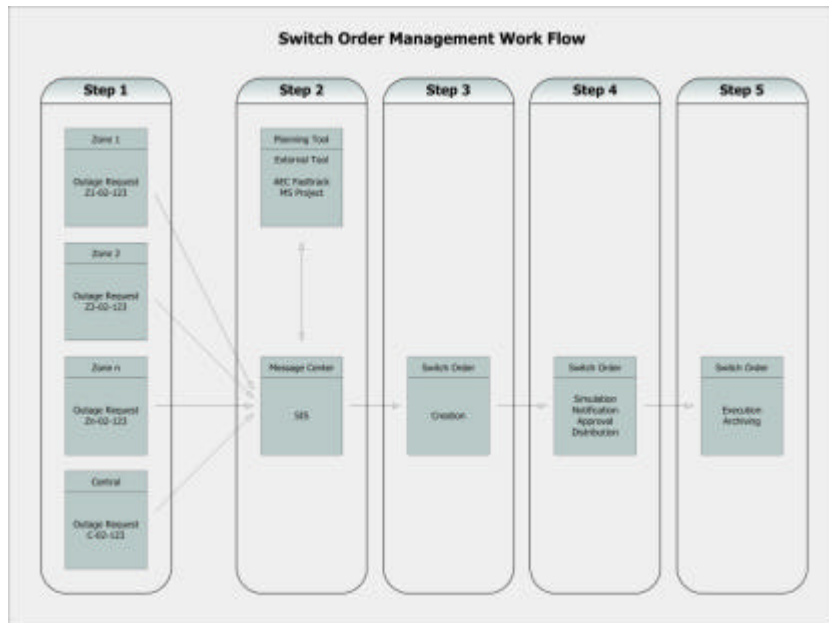# Work Order Clearance, WOC

SPIDERä

Application

SPIDER DMS offers the operational staff an efficient, intuitive and powerful tool for administration, creation, simulation, approval, and execution of work clearance activities for work on the electric network. It may also be used for interactive planning and execution of fault location and restoration switching.

Work Order Clearance, WOC, offers the following functions:

- Work Order Clearance Request
- Work Order Clearance Planning
- Work Order Clearance Creation
- Simulation of Switching Plan
- Work Order Clearance Approval
- Execution of Work Orders
- Archiving of Work Order Clearance
- Customer Notification
- Permits and Safety Documents

Function

The Work Order Clearance, called WOC, offers an efficient and intuitive tool for administration, creation, simulation, approval, and execution of work clearance activities for work. It may also be used for interactive planning and execution of fault location and restoration switching.

SPIDER can generate a list of customers that will be affected by outages, caused by planned switching. The listing can for instance be utilized for mailing to the customers and or as information for Customer Service Representatives.

Operators prepare and may simulate work orders using the dynamic topological network model in SPIDER. The interactive creation is efficient, intuitive and reduces risk for typing errors.

The simulation is visualized on network displays.

Every switching action is also checked for compliance with switching security check rules. This security checking eliminates the risk for performing major inadvertent switching, such as trying to energize a grounded line section.

Additionally, network analysis tools that may be provided in the delivery, such as Distribution Load Flow and Short Circuit Analysis, may also be used in the simulation, analysing the consequences of the switching sequence before approval and execution.

The simulation capability thus improves the security against inadvertent and dangerous switching that may cause disturbances or harm humans and equipment.

Below is a description of a typical use of the Work Order Clearance tool:

Step 1 - Outage and Work Requests

Outage and work requests may originate from different parts of a utility (different departments or zones), where the request can handle various types of work, ranging from maintenance of network parts to tree trimming and construction work. These outage and work requests can be issued using a separate system, or be a common Microsoft Word type of document, and attached to a message posted on the Service Diary using the Message Generator.

The SIS (Service Information System) of SPIDER is used for distribution of work clearance requests.

Step 2 - Planning and Coordination

The centralized or decentralized planning department(s) receives the work clearance requests. An external planning tool is usually used, where planning and coordination of work is done. By coordination work, less customer outages are required and resources are used in a more efficient way.

After planning and coordination of outages and works, a work order clearance request is issued using the SIS. This request contains necessary information, in the message itself or by attaching a document, to create a work order clearance etc..

Step 3 – Work Order Clearance Creation

A person with the appropriate authority receives the work order clearance request and creates the sequence of switchings and other activities required using the Work Order Clearance tool.

The operator creates switching steps in the work order by simple copy and paste. It is also possible to enter operation steps manually, as texts. Text required in a work order concerning measures around the switching work itself and information of administrative character are possible to pick from standard texts in work order clearance forms or copied from archived orders which have been opened.

The work order clearance has a separate text field used as input to the customer notification process.

Documents can be attached to a work order clearance, e.g. a schematic diagram showing the normal network states.

Step 4 - Work Order Simulation, Approval, and Distribution

A work order clearance can be simulated. Simulation can start from the normal switching situation, the current switching situation or the situation resulting from simulation of another switch order. As the operator simulates the switching, the actions taken can be viewed in network diagrams.

After successful simulation, the operator can approve the work order clearance, which must be done before it can be executed. After approval, the work order clearance is distributed to the persons concerned.

Step 5 - Work Order Clearance Execution and Archiving

To execute a work order clearance the operator selects one operation step at a time and explicitly requests its execution. Simultaneously he can see, in the schematic, which objects are affected. For non-SCADA objects the execution only means that the database is updated to the new state. This is valid for both a High Voltage and a Medium Voltage network.

The execution of switch instructions activates the outage management function to see if an outage is created. The outage management function will check if an outage is the cause of an active work order and assign it as being a planned outage.

Work order clearances are archived and old ones can easily be retrieved and used as a base for new work orders.