Use Case 8: Load Shedding (by Order)

Summary:

This procedure describes what activities are performed by an operator when he gets the order to release a determined value of load in a period, due to the possibility of partial or complete blackout. When the emergency situation is over, the operator has to restore the power. It is possible to create and execute certain jobs in order to restore power [UC24], [UC25] and [UC26].

Load shedding is a function to protect equipment against under-frequency. This kind of action is drastic and should only be used as a last resource. But there are situations where there is no other possibility. It can avoid danger to human life in sequence of a blackout, a voltage collapse, etc. Automatic load shedding is described in [UC28].

Actor(s):

Name	Role description
Operator in the transport/production control center	determines the value of load to release and sends this information
Operator in the distribution control room	opens the necessary breakers and restores the power

Participating Systems:

System	Services or information provided
Energy Management	• sends an order to release a determined value of load in a period
Network Operation	• Network operation monitoring (substation- and network state supervision, logging) • Network control (Remote control: Pre-scheduled sequence issuing of remote commands)

Pre-conditions:

The SCADA System is in operation. The operator is logged in to the system.

Assumptions / Design Considerations:

None.

Normal Sequence:

Use Case Step	Description
Receiving value	The operator in the distribution control room receives an order to release a determined value of load in a period.
List of priority for opening	The system must build a list of feeders (or sub-feeders) that should be open in order to get the

	total of load shedding necessary. This list should be build according to a set of rules, which would be established by the utility company policy. (e.g. feeder priority, number of clients, importance of clients, load on the feeder, time/date, breaker remote or local controlled, etc.)
Opening feeders	The operator (or automatic system) opens the breakers necessary according to the list, starting from the lowest priority to the highest.
List of priorities for closing	The system must build a list of priorities for the closing of the feeders. This list could be the same as the previous or could in some cases be built according to a different set of rules, but using the same procedure.
Restoration	The operator (or automatic system) restores the power to the feeder as soon as that action is possible according to the list of priorities (build in the previous step), from the highest to the lowest priority. [**Exception** - The operator executes a job to restore power.]

Exceptions / Alternate Sequences:

[**Exception** - The operator executes a job to restore power.]: The operator has the possibility to create a new job or to use a suitable existing job for restoration [UC24], [UC25] and [UC26].

Post-conditions:

The power is restored to every feeder.

References:

[1] Use Case – UC24 Job Management/Interactive Job Creation
[2] Use Case – UC25 Job Management/Job Execution
[3] Use Case – UC26 Job Management/Job Creation by Recording
[4] Use Case – UC28 Load Shedding (by Frequency Relay)