



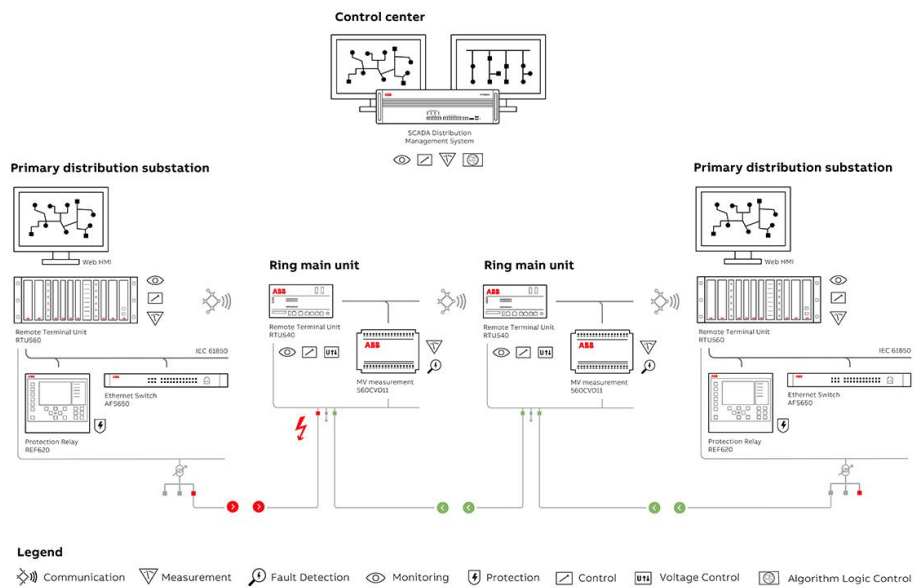
Maximizing the Effect of Outage Management Systems

A significant grouping of benefits involves improved capabilities for responding to electrical faults in the utility's electric delivery system. The automation schemes would provide improved capabilities for activating protective relays (e.g., tripping substation feeder breakers to protect fuses) and instantly switching circuits, as needed, to protect the system. It would provide improved controls for automated balancing, shedding, and transferring of loads; and it would provide advanced decision support systems for human operators.

Power grid faults are defined as physical conditions that cause a circuit element to fail to perform in the required manner. This includes physical short circuits, open circuits, failed devices and overloads. A short circuit is some form of abnormal connection that causes current to flow in some path other than the one intended for proper circuit operation. Short circuit faults may have very low impedance (also known as "bolted faults") or may have some significant amount of fault impedance. In most cases, bolted faults will result in the operation of a protective device, yielding an outage to some utility customers. Faults that have enough impedance to prevent a protective device from operating are known as high impedance faults. Such high impedance faults may not result in outages, but can cause significant power quality issues, and can result in serious utility equipment damage. In the case of downed but still energized lines, high impedance faults also pose a safety hazard.

AMI and OMS integration allows proactive response to outages rather than waiting for customers to call in, minimizing customer re-calls and eliminating the need to phone customers to verify restoration. Real-time communications links that deliver outage and restoration alarms will send high-priority message when service is out. Fault detection, isolation, and recovery (FDIR) is a subfield of control engineering which concerns itself with monitoring a system, identifying when a fault has occurred, and pinpointing the type of fault and its location.

The development of a robust outage management/fault detection program often depends upon the deployment of an advanced distribution management system (ADMS). An ADMS is the software platform that supports the full suite of distribution management and optimization. An ADMS includes functions that automate outage restoration and optimize the performance of the distribution grid. ADMS functions being developed for electric utilities include fault location, isolation and restoration; volt/volt-ampere reactive optimization; conservation through voltage reduction; peak demand management; and support for microgrids and electric vehicles.



Small Shovel can help utilities to maximize the effectiveness of outage management systems. By managing the entire OMS functionality end-to-end, Small Shovel works as an expert outsourced partner to:

- Manage the IT/OT requirements of the OMS
- Monitor events and support dispatching functions
- Perform regular system evaluations to identify potential system vulnerabilities

How can Small Shovel help your utility? Contact us at info@smallshovel.com to find out!

