USE CASES Feeder Fault Isolation and Restoration

Reducing Customer Minutes Interrupted with Grid Monitoring.

Grid monitoring using Sentient’s MM3™ Intelligent sensor and Ample™ Analytics Suite offers an easily and quickly deployed solution that dramatically accelerates feeder fault isolation and restoration, helping utilities lower circuit patrol time and the total number of customer minutes interrupted, resulting in significant reductions in SAIDI.

Intelligent Sensors Adjacent to Overhead Sectionalizing Devices.

Strategically deploying Sentient MM3s adjacent to key manually operated overhead sectionalizing switches on a distribution circuit allows the main feeder circuit to be broken up into 3, 4 or more sections. Sentient MM3 sensors will immediately identify the faulted sections to operational users that can dispatch crews directly to the appropriate sectionalizing devices immediately that surround the faulted section instead of performing extensive crew patrol on the circuit to visually find the fault. Feeders enabled with Distribution Automation can be complemented with Sentient MM3s deployed at legacy sectionalizing devices to further highlight the faulted sections between the legacy sectionalizing devices and reduce the need for excessive crew patrols.

Intelligent Sensors at the feeder origination near non-SCADA Substations.

Many utilities lack Substation Automation at all (or portions of their substations); as a result, no remote fault detection capability of any nature is in place. As a first step to better visibility and reduced SAIDI, Sentient MM3s can be deployed at or near the origination point of the feeder so as to provide automated fault detection and communication to back-end operational systems (OMS/DMS). When other MM3s are added on the circuit as described in #1 above, reliability can be further improved with ease.
Intelligent Line Monitors at Overhead to Underground Transition Points.

By positioning Sentient MM3 Line Monitors adjacent to sectionalizing devices at overhead to underground transition points, Network Operators can immediately determine if the fault is located within the underground sections of the feeder and direct the crews in the isolation of the fault and the restoration of the remaining sections of the feeder. Fault magnitude, last known load and other data available can also be used for specific fault pinpointing purposes, such as distance to fault calculations for the underground portion of the feeder.

Intelligent Line Monitors Adjacent to Inaccessible Feeder Sections.

Feeder sections crossing waterways, and overhead feeders that navigate through forests or heavy vegetation areas provide additional opportunities to use Sentient MM3s, typically by deploying the units at both ends of the inaccessible section. This approach is especially effective in reducing patrol efforts where patrolling is near impossible. For underground cable crossing a waterway, intelligent sensors also provide a clear indication whether the fault current has traversed it — if the cable was not subjected to the fault current, no special testing is required before service through this section can be restored, saving valuable time and Customer Minutes Interrupted.

A Complete Grid Analytics System.

Sentient Energy’s Grid Analytics System consists of intelligent sensors, distributed apps and the Ample Analytics suite. Sentient’s flagship, the MM3™, is an intelligent oscilloscope with high-performance sensors featuring substation-class measurement, computing and processing capabilities. Much like modern smart phones, Sentient MM3s can accept new apps downloaded over-the-air and be configured to meet the utility’s evolving needs. MM3s locally capture and process detailed data at many points along the network and communicate specific alerts and analyses to SCADA or Ample™ Analytics modules for feeder or system wide studies. This decentralized approach maximizes the amount of information gathered in the field while minimizing the amount of data transmitted.