OpenDNA

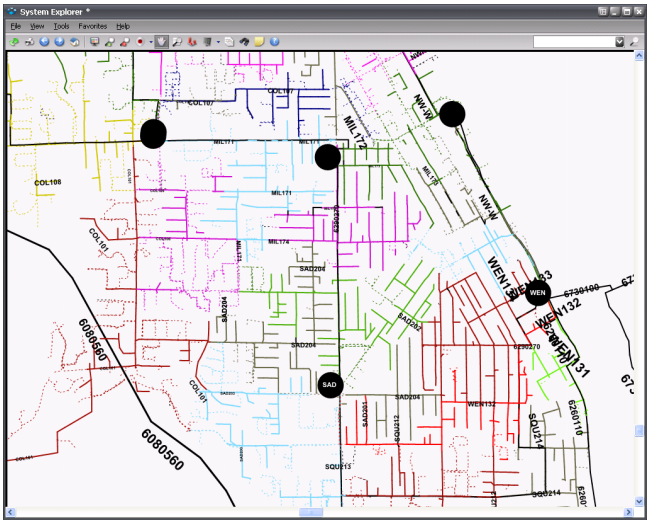
Distribution Network Analysis

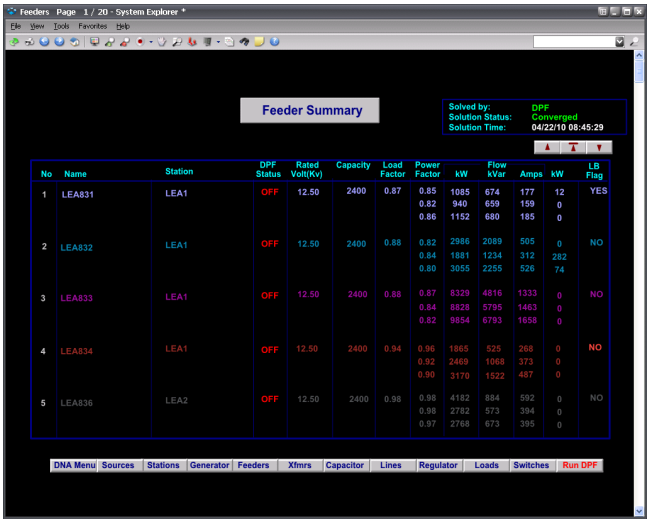
Knowing and understanding the power supply within electrical distribution networks is a constant goal for the operators of distribution systems. Customer complaints due to outages, low voltage conditions, and a variety of other issues necessitate that the operators have powerful tools retain a cutting edge and, in some areas, retain their customer base. Distribution engineers are looking for ways to minimize losses and equipment overloads and identify feeder load conditions and system weaknesses before they actually occur.

The OSI Distribution Network Analysis (**OpenDNA™**) product is an easy to use suite of applications that provides the necessary tools to effectively monitor the overall state and key parameters of the electrical distribution system. It provides the vital information operators need to make operational decisions relative to normal and emergency operations.

The heart of **OpenDNA** is its analysis tools for topology processing and three-phase unbalanced power flow. To the extent possible, Real-time measurements are used by the analyses to formulate the real-time base case system. These measurements are then augmented with schedule and operator-maintained information for non-telemetered delivery points and switching devices. Once the information is established, the fundamental components perform their evaluations.

- Distribution Topology Processing (DTP) – The DTP provides a dynamic analysis of the electrical topology of the system and reports overall conditions to the operator. Powerful displays provide a quick indication of outaged customers and other abnormal network conditions.
- Distribution Power Flow (DPF) – The DPF applies analog values to the topology results of the DTP by performing a three-phase unbalanced power flow analysis. Analog conditions (voltages, flows, violations, etc.) of the overall system are then available to the operator. Also, key performance indices are evaluated and displayed. The results of the power flow provide much improved visibility into sparsely telemetered systems, as are typical with distribution networks.





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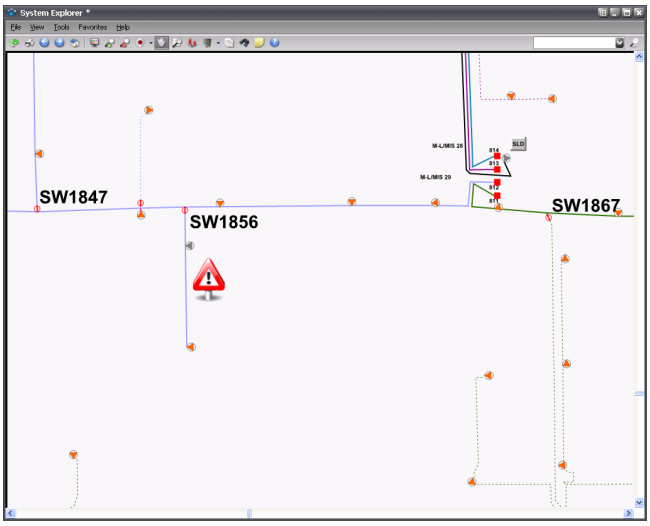
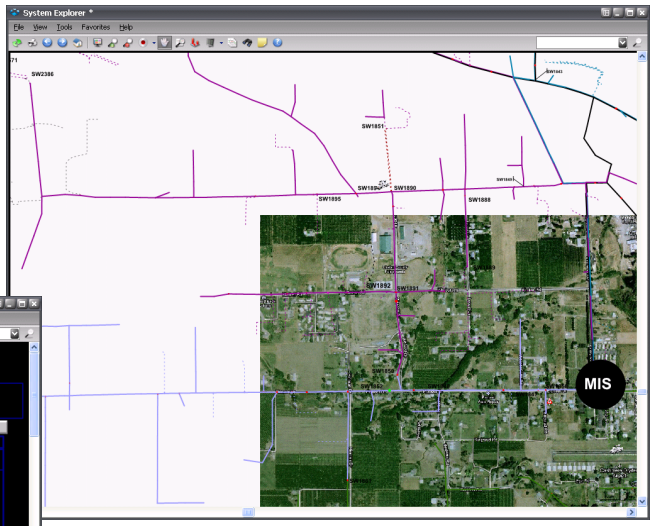
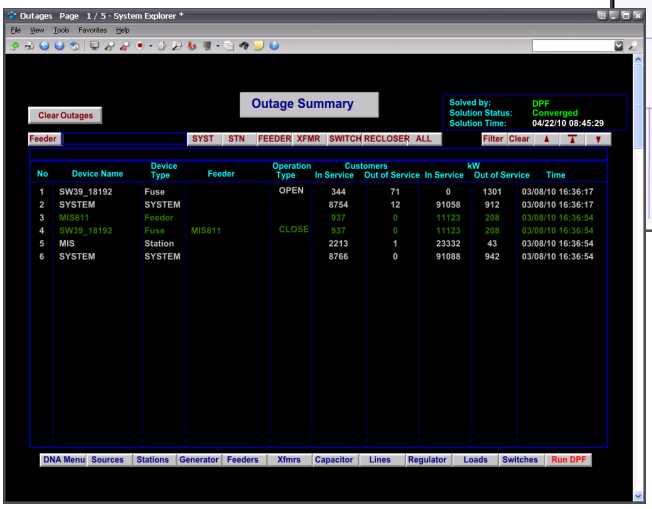
OpenDNA analyses can be executed in both real-time and study modes. In the real-time mode, the analysis may be initiated manually by operator request or automatically based on defined periodic executions and significant system events. The study execution mode is provided to allow operators and system planner the ability to study "what if" scenarios. For example, the study mode may be used to pre-evaluate planned switching orders. **OpenDNA** can be easily interfaced to OSI's Switching Order Management (**OpenSOM™**) software to automatically execute switching evaluations). Likewise, equipment may be added, modified, or deleted within a study environment to analyze the effects of a proposed change.



Users may view the results of **OpenDNA** in a variety of ways. The same Graphical User Interface (GUI) capabilities are available regardless of whether the analysis was made to the real-time system or in a study mode. The data may be easily displayed on operational one-line diagrams to supplement real-time telemetry, thus providing the Distribution Operators with a much more (and needed) visibility of the distribution network. In addition, a set of tabular displays with powerful navigation tools is provided and may be used on their own or in conjunction with one-line diagrams to provide significant operational and planning capabilities.





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