

OpenFISR

Fault Isolation and Service Restoration

It is an unavoidable fact that distribution systems are subject to various types of substation and feeder faults. Temporary faults, such as insulator flashover during lightning periods are cleared by the operation of re-closers and service is restored back to all customers. Permanent faults cause relay actions that open breakers and de-energize the area surrounding the faulted section of the substation or the feeder. Faults can occur inside a substation or on feeders. **OpenFISR™** uses telemetered status information in SCADA as well as status information deduced from Trouble Call and Outage Management systems to detect and isolate station and feeder faults.

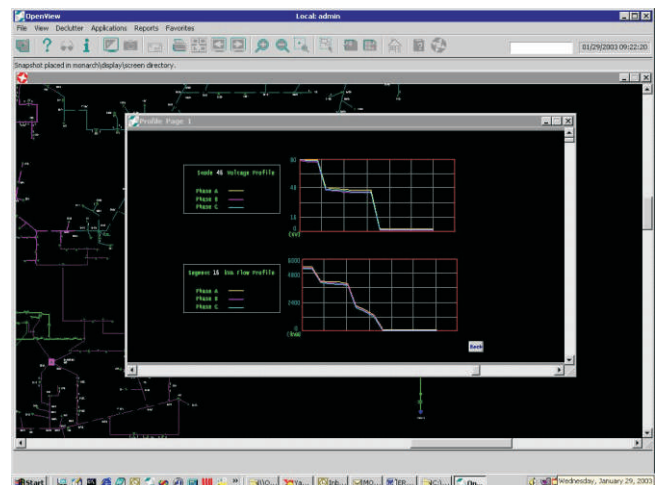
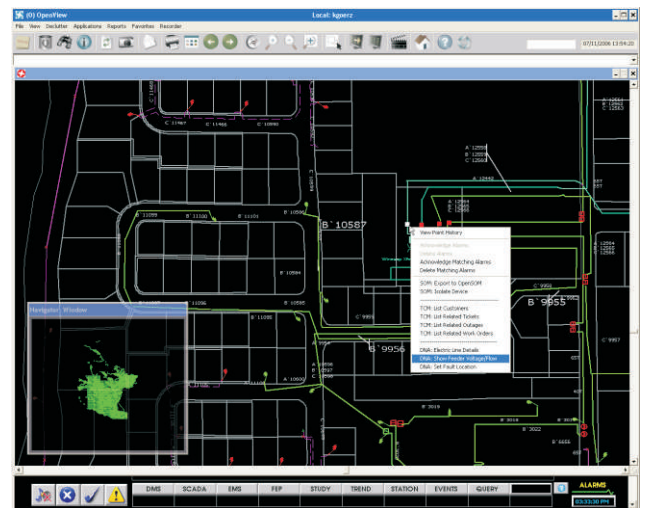
OSI's Fault Isolation and System Restoration (**OpenFISR**) product provides an efficient facility for distribution system fault isolation and service restoration. OpenFISR is an integral part of the OSI **monarch™** Distribution Management System (DMS) suite of products. And the **OpenFISR** adheres to OSI standards for powerful, yet simple and manageable, applications.

Primary features of **OpenFISR** include:

- Multi-Substation, multi-feeder and multi-fault processing and restoration
- An integrated environment encompassing SCADA, Distribution Network Analysis (**OpenDNA™**), Trouble Call Management (**OpenTCM™**) and Switching Order Management (**OpenSOM™**).
- Several modes of operations including MONITOR, CONTROL and SUSPEND/STORM
- Multiple restoration strategies are supported.

As its name implies, **OpenFISR** includes the two necessary components for effective fault management. A fault isolation component identifies fault location and pinpoints the system failure point. A restoration component restores power to un-faulted upstream and downstream network sections based on a number of specified and desired criteria.

OpenFISR is fully automated and incorporates advanced graphical interface techniques. Within the **monarch™** environment, **OpenFISR** runs in conjunction



with the **OpenView™** graphical user interface and utilizes advanced topology processing functions. It can readily handle fault conditions involving multiple stations and simultaneous fault locations. There are several modes of operation, including an advisory **MONITOR** mode, a fully automated **CONTROL** mode and a **SUSPEND/STORM** mode.

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OpenFISR – Fault Isolation and Service Restoration

In the case of a permanent substation fault, protection equipment automatically isolates faulty substation devices. Depending on the type of the fault and the dead feeders, **OpenFISR** analyzes conditions and recommends a set of switching actions for maximizing the restoration of affected feeders through connections to alternate healthy feeders.

Operators may also use alarm displays and/or trouble calls from customers to determine the extent of outage areas and to isolate faulty sections. Regardless of manual or automated isolations, **OpenFISR** respects limitations of control devices. For example, no controls are issued to devices with control inhibit tag and special care is practiced to not produce a loop (backwash) in the feeders' configuration. Likewise, the proposed switching list will not cause any transformer bank overloading and, if requested, the switching list will be delivered to the Switching Order Management (**OpenSOM**) for further analysis and implementation. A return to normal pre-fault configuration mode is also available.

The execution of **OpenFISR** may be suspended during storms or any emergency upon operator request.

