Distribution Network Data Intelligence

Project Spotlight: Operation FUSION
Sierra Pacific Power Company

Technology that Improves Distribution Operations

More and more utilities are investing in major applications (Mobile Computing, Outage Management and Automated Mapping & Facilities Management) in order to improve operational efficiencies. However, in many cases, the utility selects complex systems that offer plenty of functionality yet they overlook one major factor—Data. Often utilities are not aware of the importance of Data integrity and mapping accuracy, until their project is well underway. Without proper connectivity, Data and maps, any investment in these systems cannot realize its full potential.

Sierra Pacific Power Company understands this concept well. Sierra has lived through a failed mapping project (which attempted to implement highly complex and functional systems).

After that attempt, Sierra revisited their strategy. "This started with a mapping project", explained Joe Pellissier, Sierra Pacific's GIS and Distribution Technology Manager. "We realized we had a tool to centralize all this Data so we could share more information with each other. FUSION is a company-wide application used to the day-to-day operations necessary for keeping the lights on and the gas flowing".

A Brief History

Sierra looked for a simple mapping system whose single focus was mapping a distribution network including a complete connectivity model and device attributes. Sierra selected Adele, from JCMB Technology. With Adele, Sierra was able to produce a solid, connected Distribution Network Model. Sierra Pacific mapped the entire electric, gas and water service territories. They now have a centralized Distribution Network Model for all facility Data that has become the foundation for more complex system applications and functionality.

Sierra realizes that Data is the core on which all else is built...and that's exactly what they did, in an efficient, cost-effective manner.

The Next Step: Project *Operation FUSION*

In 2004, Sierra deployed *Operation FUSION*, a project that leveraged their major asset—centralized Distribution Network Model Data.

Operation FUSION is more than a suite of applications; it is an integrated approach to planning, operating and maintaining the Utility's infrastructure. Operation FUSION has been integrated into several areas within Distribution Operations.

At Sierra, some applications are very graphical while others manage tabular Data. The common thread is that employees use the same Data with different applications to perform or enhance their specific job functions.

For example, by accessing the Data that's available in the FUSION system, including circuit maps and maintenance histories of specific circuits, service center dispatchers, troublemen, line crews, system engineers and system control operators can coordinate their efforts more efficiently in order to respond to electric outages. The net results are enhanced operations, lower cost per hookup, and reduced outage times. For example, Troublemen and dispatchers now have the same information with different views at their fingertips, which enhance service restoration. Field employees spend less time on the radio or searching through binders filled with circuit maps.

According to Carol Roth, Supervisor of Distribution Planning for Sierra Pacific, "Distribution Planning is able to assess their long-term needs by using the Data to analyze their facilities and determine locations for future substations and electric feeder lines"

FUSION applications are also utilized to provide estimates and create work orders to hook up new customers. The maps in service actually illustrate future-use work orders so even proposed construction is detailed at the right location.

Operation FUSION allows Sierra to keep up with their record-setting customer growth, make the best-informed decisions for the customer, while holding down their cost per hook-up.

Implementing Operation FUSION

This company-wide system was implemented in a component approach, over a 12-month period. Some of these components were implemented in parallel depending upon user needs. During this time, Sierra worked closely with JCMB Technology, as well as several managers within Sierra; this ensured that the requirements of each department were taken into consideration.

Outage Radar

Sierra had implemented an IVR system to manage outage calls. This

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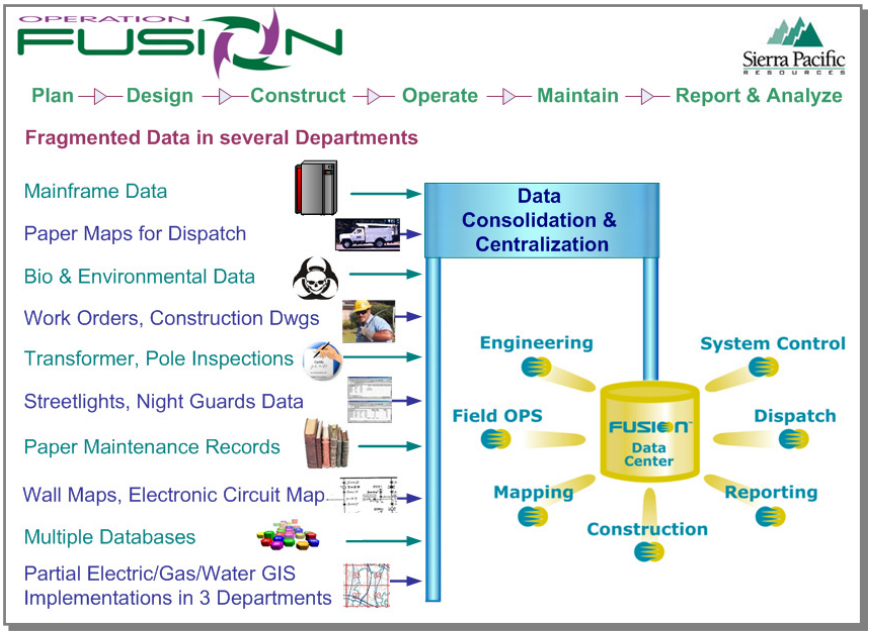
system used a tabular Data to display call information. This component of Operation FUSION *graphically* displays outage calls on top of the Distribution Network Model. The IVR takes the call Data, sends it to the Outage Radar and locates the calls using the GIS portion of the parcel maps. When the operator is ready to "work the outage", he calls up the electric system maps and displays them behind the calls. This allows the dispatch operator to see what devices may be causing the outage pattern as displayed on the screen and sends the troubleman there first for verification.

This component delivers approximately 50 percent of what an OMS system delivers for about 10% of the cost.

LineView

This component analyses the connectivity database and components of a circuit, then produces an electrical diagram specified by the user. Sierra deployed LineView to generate specialized mapping needs from the Data found in the Distribution Network Model. Prior to this, Sierra provided users in the field as well as in System Control, with specialized "stripped-down" maps. These maps were maintained in parallel with the network model and errors were created due to duplicate mapping and Data. LineView allows a special map to be created automatically, thereby eliminating devices that users do not want to display. LineView also creates special themed maps for System Engineering, schematic views, overhead versus underground layouts and many other user-configurable themes.



Equipment Life Cycle (ELC)

ELC provides users with a single Data Center for all facility information. Most utilities store records for pole testing and treatment, transformer testing, outside of the Distribution Network Model. Typically this is reoccurring information on components within the electrical system. By storing these records in separate systems, errors are induced for Data that is common to both systems. As well, time-consuming maintenance is required to keep the Data up-to-date. With ELC, environmental and structural Data comes from one central source thereby eliminating source Data conflicts and multiple Data maintenance issues.

Point of Service

Point of Service provides Sierra with customer-transformer link information. By including customer information as part of the Distribution Network Model, other applications have a reliable reference in which to manage customer connection changes. It is business-critical for customer Data to be available for outage records, planned outage communications, green cross customers and billing.

Benefits Derived from Project *Operation FUSION*

- Improved safety to the field crews reading correct circuit attribution.
- Increased confidence in generated reports.
- Reduced labor costs by working with reliable information.
- Higher customer satisfaction numbers by keeping them better informed.
- Optimized business processes.

Conclusion

Taking this component-based approach enabled Sierra to exploit their Network Model Data to its fullest. They were able to deploy low-cost, high-functionality applications that met the needs of every department within the utility. Most importantly, Project *Operation FUSION* enabled Sierra Pacific to improve their daily-to-day operations and ensure that their customers receive the high quality, 24/7 service that they expect and deserve.

For more Information Contact:
Anna Cappello
JCMB Technology Inc.
450-632-5844 ext 236