

# GIS Conversion Brings Maps into the Future

Holy Cross Electric Cooperative (HCE) is a member-owned utility serving nearly 55,000 customers in the Glenwood Springs, Colorado and surrounding area. They own and maintain more than 2,725 miles of underground and overhead conductor lines in a 2,858 square mile area. With such significant infrastructure in place, asset management can be very challenging but can be handled more effectively with a well-implemented GIS (geographic information system). HCE's outdated CAD-based GIS was proving to be a challenge to use and maintain, and it became clear that the GIS needed to be moved forward to be an effective tool.

## SUMMARY: GIS Conversion for Electric Cooperative

### GOALS:

- Replace obsolete maps with new easy to use formats
- Replace CAD-based GIS with industry-standard approach
- Combine multiple data sources into single, centralized database
- Improve ease-of-use and maintenance of data sources
- Integrate systems for single point of data entry

### SYSTEM COMPONENTS:

- ESRI personal geodatabase
- MultiSpeak2 Compliant ESRI ArcSDE enterprise geodatabase on Microsoft SQL Server
- Shapefile formats
- Real-time and XML data interchanges

### HIGHLIGHTS:

- Multiple data sources including legacy data and paper documentation were converted into a consistent set of formats
- System database was integrated with other systems essential to the operations of the utility: Milsoft's Windmil Enterprise, NISC's IVue, and Itron's DDS
- Training and setup for extended client maintenance and success

## APPLICATION:

HCE's current GIS solution was an outdated system on a CAD-based platform. It used numerous and disconnected sources of data to create the electrical system map of their territory.

The downside to the existing system was that HCE did not have one source from which their whole system could be viewed. The system was difficult to maintain due to the myriad of data stores, sources, and formats. Potential issues included updating certain types of data and overlooking others, leading to loss of data integrity in the system. This often resulted in a lack of confidence among employees in the system's accuracy.

ESC engineering recommended centralizing all data into a single, consistent data structure. The data structure would be based on an industry-standard format to ensure that HCE would have flexibility in the future for additional extensions and interfaces with other systems. This open approach would also provide HCE with the security of various support paths because the data source is not constructed in a proprietary or "one off" manner. Consolidating the data into this structure would streamline operations by allowing staff to concentrate on results, rather than focusing on aligning data sources and methods.

## REQUIREMENTS:

- Update the electrical map system
- Consolidate systems and map data into a single centralized, easy-to-use source and standardized format
- Create a modern GIS database of the entire electrical distribution system of the cooperative's territory, taking the utility out of an outdated CAD-based system
- Ensure flexibility to interface with other relevant applications

## CHALLENGE:

ESC engineering encountered a mountain of data, consisting of AutoCAD drawing files as well as paper maps, location documents, schematics, and one-line diagrams. All of this data had to be captured, reviewed and converted into useable information.

In addition, there were a number of legacy systems containing data that had to be converted into one consistent format. These systems spanned platforms and formats, and included Windmil models, Manifold GIS, Microsoft Access databases, and billing data from the existing NISC system.



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### SOLUTION:

To arrive at an effective solution for HCE, data was first converted into common and easy-to-use formats, represented by shapefiles and an ESRI personal geodatabase, to meet the requirement of centralized data.

Following the conversion, additional steps of standardization, QC, and validation took place to ensure data integrity. The data was then loaded into a MultiSpeak2 Compliant ESRI ArcSDE geodatabase on Microsoft SQL Server. The geometric network was built to support tracing functionality, following the standards of the ESRI electric data model. This phase of the project resulted in an industry-accepted standardized format.

Finally, the logical data model was customized to meet HCE's requirements, and to hold all the information necessary for utility operations, leading to improved ease-of-use and streamlined workflow.

### RESULTS:

The execution went as planned and ESC engineering was able to meet the client's expectations.

With the GIS conversion now in place, the client is experiencing improved ease-of-use and easier system maintenance that comes with a centralized database, as well as increased safety, faster processes and better communication. One of the most notable aspects to the system is how it centralizes and automates information in the cooperative. In addition, ESC engineering's solution allowed for the database to be integrated with the other systems essential to the operations of the utility, including Milsoft's Windmil Enterprise, which generates ready-to-run Milsoft models for engineering analysis, NISC's IVue for customer information management and accounting, and Itron's DDS for automated staking and work order management.

### FOLLOW-UP:

At the client's request, ESC engineering provides ongoing expertise to help maintain their system and guide them in the proper use of data and integrations. HCE has three full-time employees maintaining the system, ensuring that everything is kept up-to-date. With ESC engineering's assistance, the system should not expire as long as software upgrade paths are followed and data is kept current. ESC engineering plans to keep a long-standing relationship with HCE and is committed to helping them when and where needed.



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