

Geofacilities Management System for the Electric Industry



Kansas City Power & Light (KCP&L)

A subsidiary of Great Plains Energy Inc., KCP&L is a leading power company in the Kansas City metropolitan area and the first company to upgrade a production AM/FM system from Intergraph's flagship FRAMME to the G/Electric platform. G/Electric's open architecture easily supports the data-sharing requirements of a Geospatial Resource Management system. Because users need know only mainstream programming languages and systems, training costs and implementation time are cut dramatically.



Geofacilities Management System for the Electric Industry



Based on Intergraph's G/Technology™, G/Electric is a multidimensional solution that provides powerful tools to support the facilities/asset management needs of electric transmission and distribution companies. It was created specifically for the electric industry and incorporates input from clients and industry partners, combined with Intergraph's extensive project implementation experience. G/Electric fits into the comprehensive information technology (IT) environment we call Geospatial Resource Management (GRM).

A geofacilities management system that provides a much broader scope than AM/FM/GIS, G/Electric integrates with operational support and service-delivery applications, enabling these systems to cooperate seamlessly to manage the planning, design, construction, operations, maintenance, and emergency response functions of an electric utility. It incorporates complete deployment of geofacilities data across the enterprise with full integration at all levels of systems, applications, access, view, and update.

A configurable COTS solution

A parameter-driven solution, G/Electric allows you to take advantage of product enhancements without the programming and re-programming challenges you face with a system that is driven by an application programming interface (API). You can fine-tune your solution to fit your needs and avoid the creation of numerous customized applications. Additionally, G/Electric is a best-practices solution that Intergraph can support continuously. Our COTS commitment ensures that our clients will be able to take advantage of future software enhancements and avoid the risk of costly customization that strands solutions over time.

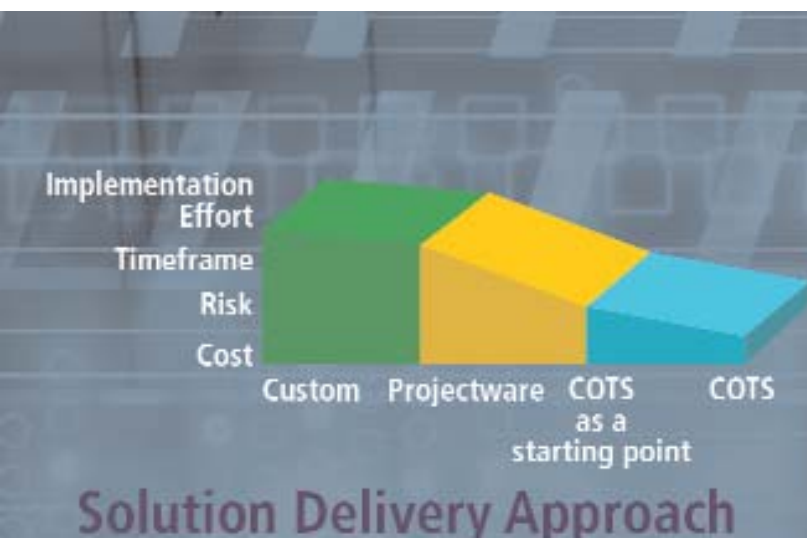
Open. Many competing solutions claim to be open; G/Electric truly is. Why? Because all geometry, the electric network facility model, and transaction management are stored in an open geospatial database. No middleware is required to view, access, or update your data.

Scaleable. G/Electric's proven scalability manages terabytes of data while supporting thousands of users at each of the design, Web, and mobile levels.

Superior speed. Rapid graphic display of the geofacilities model is the foundation for decision support. G/Electric's architecture is optimized for speed of display and trace. Its data access and memory management are built around an innovative high-speed graphics cache integrated with Oracle database technology. The results are fast and accurate, providing the ability to process millions of spatial records in seconds in a single enterprisewide database.

G/Electric software suite

Software modules at the core of G/Electric address the operations performed by utility personnel with varying responsibilities, skills, and expertise. The modules allow users to obtain exactly what they need, and each module can be configured to the company's needs, yet maintained as a product by Intergraph. Optionally, users may select from other Intergraph product families, such as GeoMedia and IntelliWhere, to augment their GRM environment. The G/Technology modules are described in the following paragraphs.



Solution Delivery Approach

The graph illustrates the comparison of the COTS approach over other methods. When compared to building a custom system, the COTS solution provides substantial savings.

Designer consists of the core G/Technology software and electric industry-specific functions and provides a structured rulebased environment with basic viewing and access techniques; query, analysis, and tracing routines; placement and edit functions; and job management and plotting functions. Several Designer applications are described below.

- Designer provides **undock-and-go capability** so that users can run disconnected from the corporate database while creating and editing data in the field on laptop computers. Back in the office, the changes are merged into the long term transaction data model. To ensure data integrity, G/Electric uses Oracle's data validation techniques.
- Designer supports **life-of-facility management** and the varying physical, accounting, operational, and maintenance characteristics of the electric network system throughout the geofacilities life cycle. Data maintenance tools allow users to record as-built changes quickly.
- **Design Tools**, a set of commands for design and design verification, help determine the correct piece of equipment to use in building and maintaining the electrical network. Design Tools perform standard engineering calculations that help determine cable pull tension, circuit load, pole moment and guying,

secondary network sizing optimization, and street light conductor sizing. Users can modify the formulas and parameters to meet their particular requirements.

- Designer supports **routine field inspections and damage assessment** inspections following storms and disaster-related events. During routine field inspections, crews can identify problems and report them through an easy-to-use interface. Damage Assessment is a specialized command for quickly estimating storm or disaster-related damage in a particular service territory.

Administrator provides software administrators with the necessary tools to manage the G/Electric system, including commands to assist with the definition, maintenance, and testing of metadata configuration; build predefined queries, traces, and reports; and publish all data and metadata for use by G/Electric clients.

NetViewer provides high-fidelity enterprisewide viewing access to the master geofacilities electric model. Using Internet Explorer, NetViewer connects in real time to the G/Technology database and presents smart graphics so that users can click on a graphic element and retrieve all relevant attribute information. Additionally, users can

Integral Energy

Integral Energy serves more than two million people in New South Wales, Australia. The utility chose a multi-phase implementation for an integrated asset management system based on Intergraph's G/Electric. The system will share asset information with corporate users to optimize the network, gain efficiency, and improve customer service. It will also meet additional challenges, such as the rapid growth of electricity demand per year and the requirement to manage supply interruptions from storms and other unplanned events.





Hawaiian Electric Company (HECo)

HECo serves more than 260,000 customers on Oahu. The utility is now in production with Intergraph's geofacilities management solution based on G/Electric. The solution incorporates select changes that accommodate HECo's standard operating procedures. Under a data-sharing agreement, HECo imports extensive landbase features from the city and county of Honolulu. This data, coupled with the electric network intelligence and customer information system, provides a wealth of geospatial information used in planning, engineering, and operations.

choose from a variety of standard tools to develop Web applications that may be accessed via the Internet or an intranet and customize NetViewer through specific Web page edits, metadata, and public APIs.

MobileViewer supports operations and maintenance activities in the field by providing view, navigation, query, trace, and redline capabilities. The application is governed by the corporate electric-specific metadata that operates on all G/Technology modules and can be customized through specific Web page edits, metadata, and public APIs.

NetExport Server enables the sharing of G/Electric data with external entities. Since this sharing is often done in a CAD format, users can view CAD data from other sources, as well as export the G/Electric data into other standard formats. NetExport Server is an ActiveX control that provides a public API for developers to produce Web pages or applications.

G/Electric productized interfaces

The G/Electric geofacilities data model contains the structures needed to integrate with other systems.

Our interfaces are productized, meaning they are optimized for our applications and are supported directly by Intergraph, not third-party providers or subcontractors.

InService™ Outage Management System. When Intergraph provides both geofacilities management and outage management, users benefit immediately from a seamless, integrated solution.

Work management systems. G/Electric has standard interfaces that support real-time integration to popular third-party work management systems. Specifically, these systems are Worksuite's STORMS and LogicaCMG's WMIS, as well as a generic interface that can be adapted to a utility's in-house or commercial WMS or AMS, such as SAP.

Network analysis. G/Electric has interfaces to third-party network analysis systems. In addition to analyzing the network, users can build an electrical network model and perform load flow operations within a tightly integrated workflow.

Kelag

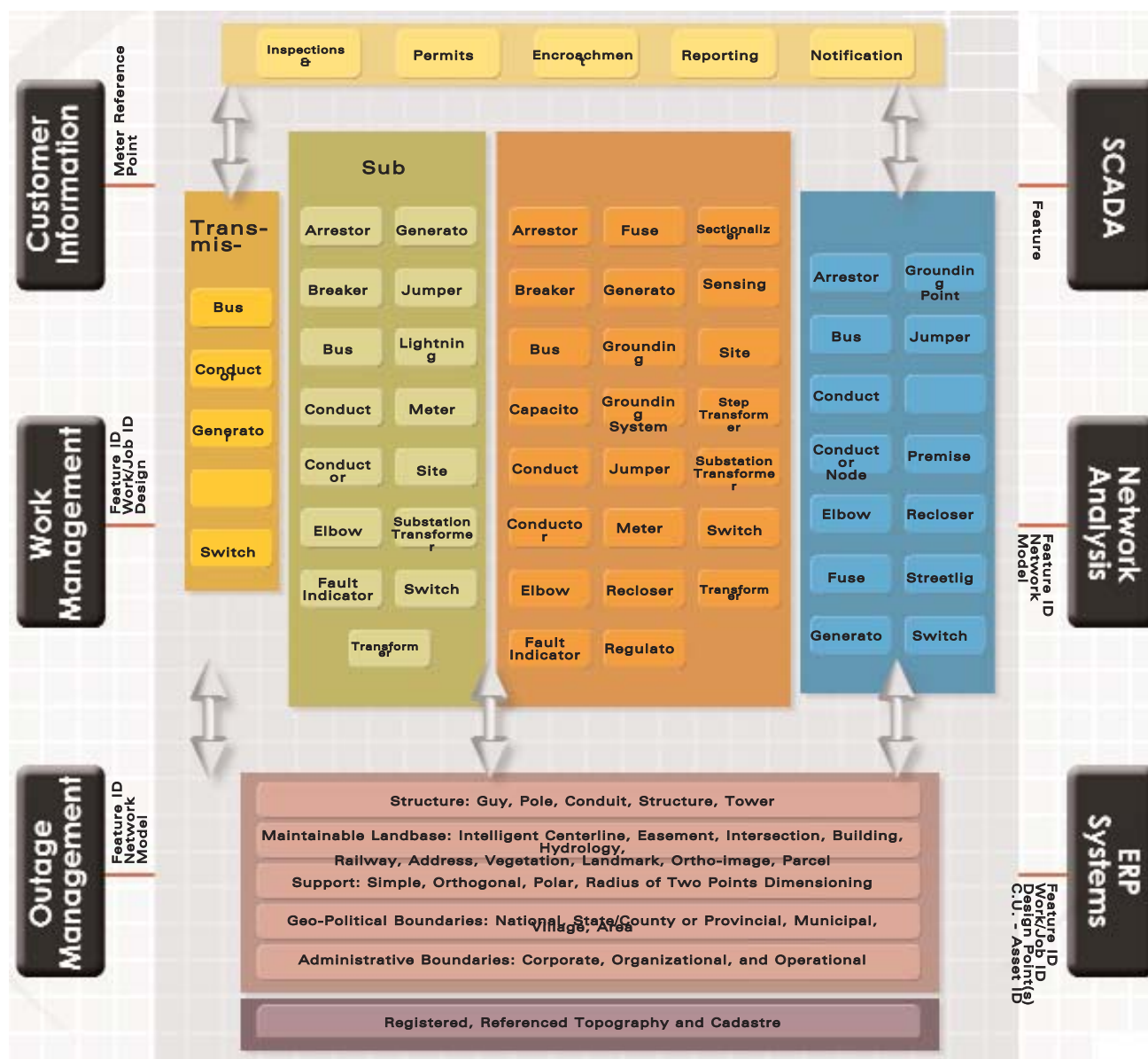
Kelag supplies electric power, gas, and district heating within Austria's federal state of Carinthia. The company also maintains a communications network that is used internally and sublet to telecommunications providers. Kelag serves 240,000 customers and manages a network of 17,000 kilometers. Intergraph's G/Electric solution, expanded to manage gas, district heating, and communications facilities, meets the company's information needs through integrated, seamless workflows and helps Kelag maximize resources by integrating geospatial and other data.



Electric industryware

Industryware is Intergraph's term for our industry-specific data model for electric utilities. It augments the COTS functionality and provides a starting point for rapid solution

implementation. Customers can perform software configuration adjustments, customized enhancements, and interfaces to improve operations and streamline workflows. The following diagram illustrates the data model for industryware.



Industryware offers significant out-of-the-box functionality and includes the facility features, network definition and connectivity, relationship management, menus, and functions necessary to build and maintain a model and physical configuration of the electrical network. It includes the functionality to identify, locate, and track operating and maintenance events that occur across the distribution system and throughout the life cycle of its associated facilities. The contents of this data model are expanded and enhanced as necessary, given the context of our customers worldwide, their localized regulations, and other technical circumstances.

Intergraph Security, Government &

Infrastructure

Intergraph Security, Government & Infrastructure (SG&I), headquartered in Huntsville, Alabama, serves a broad range of clients, including local, regional, and national governments; businesses, both public and private; and security and public safety organizations. Intergraph SG&I focuses on providing software and services to enable our clients to make the right decisions at the right time using the right information.

Added value through partners

Intergraph has developed a valuable partnering program, Intergraph Synergy, to create solutions around our technologies. The program provides consultants, value-added software developers, and research from implementation partners to support your electric utility projects. Visit <http://synergy.intergraph.com> to learn more about how our partners can help you.

Why electric utility industry leaders

choose Intergraph

By integrating geospatial and other corporate data in our electric environment, you can:

- Optimize workflows and maximize resources
- Benefit from open database access and a solution designed for unprecedented scalability and performance
- Store all data in a spatially enabled open database, eliminating dependency on proprietary programming languages
- Eliminate the need to have specialized staff trained in a proprietary format
- Leverage industry-specific functionality representing the best practices of Intergraph's electric customers
- Shorten implementation time with pre-integrated solutions that are delivered with metadata and industry-specific functionality
- Reduce maintenance and upgrade costs through COTS solutions



Niagara Falls Hydro

Niagara Falls Hydro chose Intergraph's G/Electric solution and consulting services to guide them in managing their utility requirements. The G/Electric solution platform took them through the phases of needs assessment, gap analysis, data conversion, system configuration, implementation and delivery, and on-site training to educate the users. The comprehensive system will also satisfy future information demands.

For more information, visit our Web site at
www.intergraph.com/sgi.

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