

Geofacilities Management System for Gas Distribution and Pipeline



Hong Kong and China Gas Company, Ltd.

Hong Kong and China Gas Company Limited (HKCG) uses a geospatial resource management (GRM) system based on Intergraph's G/Technology to provide gas and related services to 1.5 million households and businesses throughout Hong Kong. The system enables HKCG to more efficiently manage the transmission and distribution network in Hong Kong's densely populated territory and helps maintain the company's excellent track record on gas supply safety and reliability.



Geofacilities Management System for Gas Distribution and Pipeline



Intergraph's G/Technology™-based gas distribution and pipeline solution provides powerful tools to support geofacilities management. It consists of core technology and industryware that was created specifically for the gas distribution and pipeline industries, incorporating input from clients and industry partners combined with Intergraph's extensive project implementation experience. The multidimensional gas distribution and pipeline solution fits into the comprehensive IT environment Intergraph calls geospatial resource management (GRM).

As a geofacilities management system, G/Technology provides a much broader scope than AM/FM/GIS. It integrates with operational support and service-delivery applications, enabling these systems to cooperate seamlessly in managing the planning, design, construction, operations, maintenance, integrity, risk, and emergency response functions of gas distribution and pipeline networks. G/Technology 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/Technology 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. 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 strains solutions over time.

Open. Many competing solutions claim to be open.

G/Technology truly is open – all geometry, the network model, and transaction management are stored in an open geospatial database. No middleware is required to view, access, or update your data. A single database schema contains all information regarding existing data and proposed changes to that data. Having all information in a single data repository has many benefits, such as making it easier to conduct backups, interface to external applications, administer databases, and maintain data integrity.

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

Superior speed. Graphic display of the geofacilities model is the foundation for decision support.

G/Technology's architecture is optimized for speed of display and trace functions. 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/Technology software suite

Software modules at the core of G/Technology address the operations performed by utility and transmission personnel with varying responsibilities, skills, and expertise. The modules allow users to obtain exactly what they need. Each module can be configured to the company's needs, yet is maintained as a product by Intergraph. Optionally, users may select from other Intergraph product families, such as



Seoul City Gas Co., Ltd., Korea

Seoul City Gas uses G/Technology within an integrated GRM environment to serve more than 2 million customers throughout Korea. Meeting the unique needs of gas distributors, G/Technology provides Seoul City Gas with the powerful facility management capabilities needed to keep pace with the company's growth and demanding functional requirements.

GeoMedia® for extensive GIS capabilities and analysis, InService™ for mobile workforce management related to network operations, and IntelliWhere® TrackForce, which monitors and tracks vehicle movements, for mobile resource management.

The G/Technology modules are described in the following paragraphs.

Designer consists of the core G/Technology software and industry-specific functions and provides a structured, rule-based environment with basic viewing and access techniques; query, analysis, and tracing routines; placement and edit functions; and job management and plotting functions. Several Designer capabilities 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 master data repository.
- Designer supports **life-of-facility management** and the varying physical, accounting, operational, and maintenance characteristics of the gas/pipeline network systems throughout the geofacilities life cycle. Data maintenance tools allow users to record as-built changes quickly.

- **Data integrity and validation** are defined in the core model. All proposed changes to the network are validated against business rules that have been configured according to customer needs before incorporation into the master data repository. The openness of G/Technology allows these network changes to be introduced by the Designer seat or any external application accessing the open geospatial database.

Administrator provides software administrators and developers with the necessary tools to manage the G/Technology system, including commands to assist with defining, maintaining, and testing system configuration; building predefined queries, traces, and reports; and publishing data and metadata for use by client seats.

NetViewer provides high-fidelity enterprisewide viewing, analysis, and query access to the master geofacilities model. Using Internet Explorer, NetViewer connects in real time to the G/Technology database and presents smart graphics so that by clicking on a graphic element, users can retrieve all relevant attribute information. NetViewer is the ideal seat for casual users who need to create

E.ON Ruhrgas AG, Germany

The search for an efficient system to manage the technical administration of its pipeline system led E.ON Ruhrgas AG, Germany's leading gas transmission company, to Intergraph's G/Technology. Integrated with other E.ON Ruhrgas AG enterprise systems and configured to meet the company's requirements, G/Technology enables more than 200 field staff to access the latest data and send redline information back to the central office.





Madison Gas and Electric, USA

Using G/Technology to streamline day-to-day processes that maintain its service-delivery network, Madison Gas and Electric (MGE) is able to provide accurate, up-to-date information in a geospatially enabled warehouse – providing the workforce with access to information and the ability to share data. The company plans to use G/Technology's open architecture to help build interfaces to information sources in other MGE departments.

high-quality maps or analyze proposed network changes not yet incorporated into the master data repository.

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 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/Technology data with external entities. Users can view CAD data from other sources and export G/Technology data into other standard formats. NetExport Server provides a public API, enabling developers to produce Web pages or applications.

NetPlot Server enables map book production workflows in batch mode. NetPlot Server provides a public API for developers to produce Web pages or applications.

G/Technology productized interfaces

The geofacilities data model contains the structures needed to integrate with other systems. Interfaces

are productized, meaning they are optimized for G/Technology applications and are supported directly by Intergraph, not third-party providers or subcontractors.

InService Mobile Workforce Management System.

When Intergraph provides both geofacilities management and mobile workforce management, users benefit from a seamless, integrated solution.

Work management systems. G/Technology 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/Technology interfaces to third-party network analysis systems, such as SynerGEE Gas (thru MiddleLink). In addition to analyzing the network, users can build a gas/pipeline network model and perform advanced modeling and simulation analysis within a tightly integrated workflow.

Gaz Métro, Canada

Gaz Métro looked to G/Technology to plan and design its gas network and provide the quick response necessary for the company's "Call Before You Dig" program.

As the foundation for a complete GRM solution, G/Technology assists Gaz Métro in providing gas and services to more than 150,000 customers and maintaining an underground distribution and transmission system of almost 10,000 kilometers.



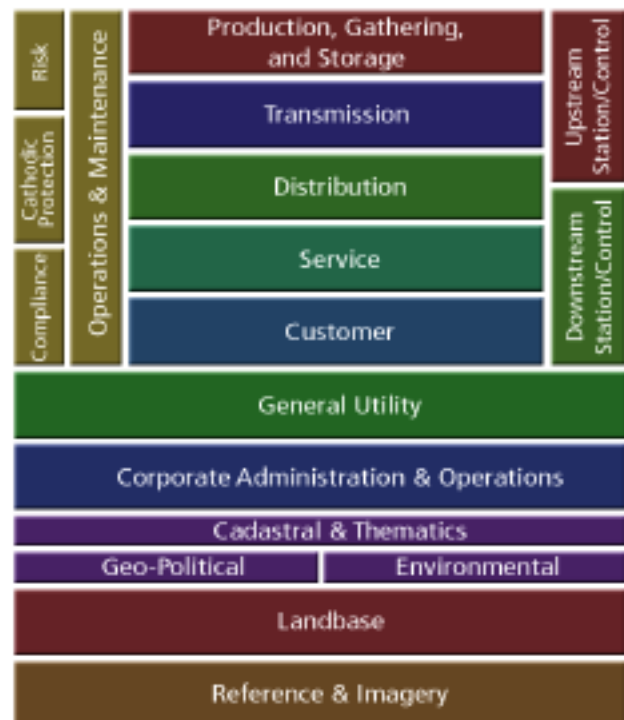
Pipeline applications. G/Technology's pipeline data model and data maintenance tools incorporate the linear referencing system (stationing model) commonly used by the pipeline industry. This model is compatible with PODS™ (Pipeline Open Database Standard), yet it incorporates additional capabilities, including giving multiple users read/write access to the same pipeline facilities and supporting gas connectivity that spans multiple pipelines. The stationing model supports interfaces to pipeline applications such as:

- Alignment Sheet Generation
- Pipeline Integrity
- Risk Management
- HCA (High Consequence Areas)
- MAOP (Maximum Allowable Operating Pressure)

Gas and pipeline industryware

Industryware is Intergraph's term for industry-specific data models. Industryware augments G/Technology's COTS functionality and provides a starting point for rapid solution implementation. Customers can perform configuration adjustments, customized enhancements, and interfaces to improve operations and streamline workflows.

The distribution and pipeline models are fully integrated. In order to comply with current regulatory mandates, security can be applied so that users will not be able to access distribution and pipeline data at the same time. The gas distribution and transmission models can be integrated with electric or telecommunication models to provide an integrated data repository and single graphic environment to support geofacilities management. The following diagram illustrates the data model for industryware.



Why choose Intergraph?

By integrating geospatial and other corporate data in our gas distribution or pipeline environment, you can:

- 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 the gas distribution and pipeline industries
- Shorten implementation time with pre-integrated solutions that are delivered with metadata and industry-specific functionality
- Reduce maintenance and upgrade costs through COTS solutions
- Optimize workflows and maximize resources

The Intergraph Solution

With 35 years of technology innovation to its credit, Intergraph understands the business challenges customers face every day. Our unique combination of pioneering technology and comprehensive professional services makes Intergraph Mapping and Geospatial Solutions the leading provider of customized geospatial solutions for local, regional, and national government entities; transportation and mapping agencies; utilities and communications companies; commercial remote sensing and photogrammetry organizations; military and intelligence agencies; educational institutions; and more.



Gasunie Technology & Assets (part of N.V. Nederlandse Gasunie)

Gasunie Technology & Assets is working toward a multi-phase initiative to improve its existing GRM solution by integrating an advanced Pipeline Integrity Management System (PIMS) to balance the safety, integrity, and cost of the Gasunie pipeline grid. PIMS gets pipeline data from G/Technology, which forms the enabling foundation to manage the company's grid data efficiently.

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

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