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## ***The Gas Industry leads the way in adopting the Internet for Electronic Commerce***

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The deregulation of the natural gas industry coupled with the electric utilities unbundling of services is revolutionizing the way Energy companies conduct business. Unbundling causes more markets to open up which leads to a corresponding increase in the volume of information required to be communicated. It also creates competition, which means efficiency becomes a critical issue. The Energy industry, with multiple suppliers and customers, is already burdened with millions of transactions. Seeking a way to maintain total reliability without compromise, while still gaining the efficiency that cuts costs, the gas industry has become a leader in the adoption of standards utilizing high technology solutions.

The growth of electronic commerce, due to the Internet, has transformed the Energy industry. Traditional means of transmitting enrollments, purchase orders, invoices, etc. via facsimile or mail is paper and resource intensive. The obvious solution is to utilize the opportunities offered by electronic data transfer using the Internet. Energy companies choosing the Internet as the means to transmit data are succeeding in their mission critical goals of efficiency, cost-effectiveness, and meeting their service requirements.

"The Internet was created by the Defense Advanced Research Projects Agency (DARPA) so that government agencies could maintain communications during a nuclear attack. The Internet was designed to be a highly reliable, self healing network with the ability to "route around" network failures in order to keep communications flowing," says Dick Brooks, a member of the Internet's Engineering Task Force (IETF) and the Gas Industry Standard Board's (GISB) Electronic Delivery Mechanism Subcommittee. He is one of the founders of Group 8760, a leading provider of innovative solutions that utilize the power of the Internet for Energy companies.

Few anticipated the amount of business that will ultimately be conducted over the Internet. Initial predictions projected \$5 billion in e-commerce by the year 2000. Today, Forrester Research predicts that e-business sales will grow exponentially, reaching \$1.3 to \$1.7 *Trillion* by 2003. In 1999, IBM alone claimed that 25 percent of its revenues came from e-commerce, a total of \$25 billion. While estimates of the impact of the Internet vary dramatically, all agree that revenue generated through e-commerce is increasing dramatically. The Internet has proven its holding power and businesses are rushing to take advantage of it. Forrester Research estimates the utilities share of Internet trade will grow from 0.7% in 1997 to 25.8% in 2003.

Leading the deregulation movement in both the gas and electric industries is the state of Pennsylvania. The Pennsylvania Utility Commission in October 1998 ordered that all electric utilities must choose a method of Internet transmission of data by June 30, 2000. The commission issued the order without determining a specific protocol; instead letting the utilities themselves choose the best technology. In April 1999, the commission scheduled a conference.

Veronica Smith, the Executive Director of the Pennsylvania Public Utility Commission, said, "Instead of making a decision, we wanted the technology to evolve to another level. We

wanted the system to be interoperable, for there to be compatibility. The process is moving forward and we're pleased with the resulting technology."

"Pennsylvania was among the first to deregulate the electric utility industry. It has been an extraordinary event for historically risk-adverse utilities. In some ways, adopting the technology has been the easy part. The harder part has been properly aligning the technology with the business. While planning is good, it is designed for an age of stability that no longer exists in information technology. Therefore, in choosing to move EDI over the Internet for Customer Choice, we had to make some quick decisions in order to react quickly to opportunity. We are confident our decisions will result in long-term savings and efficiency," said Chris Navadauskas of Pennsylvania's Duquesne Light Company.

Currently 16 states are in the process of deregulation and many are close to completing the process. Another 20 states are in various stages in the process of deregulation.

### **EDI as a Standard**

There are several reasons why the move to Electronic Data Interchange – EDI, has become the standard. A standard serves to lessen confusion and ease communications between companies exchanging transactions via electronic commerce while lowering costs as compared to paper documents.

EDI is the computer-to-computer exchange of business documents in a standard electronic format. It replaces mail and facsimile purchase orders, invoices, purchase confirmations, virtually any paper document. Companies that exchange data electronically via EDI are called Trading Partners. They send and receive electronic versions of business transactions.

A business can prepare a transaction such as a purchase order with a database or other similar program. The program creates an electronic data file, which is then translated into an EDI file for transmission across the Internet. EDI allows companies to exchange documents electronically, without the necessity of paper forms.

This computer-to-computer exchange of data results in significant cost savings to the companies involved. Costs for generation, preparation and mailing of a typical paper utility bill run on the order of 1 to 2 dollars *per bill*. There are costs of a similar magnitude on the receivers end for processing, acceptance and authorization of payment. Once an EDI /Internet communication system is in place, this same transaction would probably cost each company only a few cents.

In addition to the cost savings, EDI has other advantages. It takes only seconds to send data electronically and it can be done automatically 24 hours a day, 7 days a week. Electronic communication also has the advantage of an essentially instantaneous transfer of data. Utility companies sending an EDI file over the Internet in Pennsylvania know immediately that the file was received by the other party, preventing any "lost in the mail" scenario.

Initially, EDI systems had some potential concerns from a legal standpoint because eliminating paper meant eliminating the authorizing signature as well as the Terms and Conditions statement found on the back of the purchase order. Attorneys settled on the Trading Partner agreement as the contract of both Trading Partners in the EDI relationship to protect them from potential legal problems. When an EDI relationship is entered into, both parties execute a Trading Partner Agreement.

As stated previously, EDI obviously reduces the paper pile. It also allows product to be moved faster, decreasing the purchase order-invoice-payment cycle from days or weeks to hours

or minutes. It simply improves the way that companies handle and process information. Most importantly it lowers transactional costs for Trading Partners.

### **Gas Industry Standards Board's Electronic Delivery Mechanism Standards**

GISB's Electronic Delivery Mechanism (EDM) standards require that all transaction data be exchanged in a standardized format. The format is in the form of X12 EDI, a computer file that is defined by American National Standards Institute (ANSI) X12 standards. ANSI chartered the Accredited Standards Committee (ASC), named X12 to develop and release an initial set of standards for EDI in the United States over 16 years ago. These standards created a structure and content of what now are over 187 different transactions sets.

These standards require outgoing files to be formatted as standardized EDI. Specified delimiting characters are used to logically separate the data. Data is translated and loaded into a trading partner's database for further processing.

The GISB EDM standards specify the Internet communication protocol used to exchange the files electronically. GISB choose secure HTTP, or HyperText Transfer Protocol, for its ability to securely and reliably transmit and receive EDI - as well as many other types of electronic files, over the Internet. The GISB EDM standards have proven over time to provide a secure, reliable, and cost-effective means to exchange electronic data over the Internet. These factors have proven to be a primary reason for the use of these standards in the deregulated electric industry.

A similar technology is being developed by the World Wide Web Consortium to create a universal e-commerce standard. Called XML for eXtensible Markup Language, this technology is capable of supporting both batch and interactive processing. However, XML is not currently as robust a technology as X12, and certainly not as mature. XML is not completely developed in its ability to define and store data. While X12 is the current standard, interest in XML is growing and the technology is progressing.

Group 8760 offers one of the few programs that can utilize both X12 and XML transactions and is currently one of only two that are GISB certified. "While XML and X12 can't directly talk to each other yet, our GISBAgent® product allows you to use both methods," said Brooks.

### **VANs vs. the Internet**

When the FERC Order No. 563 required that exchange of capacity release data between shippers and interstate natural gas pipelines be done via EDI, the only way to do so at the time was through value-added networks (VANs). This was prior to the GISB EDM standards. The gas industry has had significant experience exchanging data on both VANs and on the Internet using GISB standards since 1997.

The VANs have proven their reliability to a limited customer base, however, VAN charges, priced by the kilo character and per transaction, are expensive. This has made competitive energy pricing difficult. With only a 3% adoption rate, VAN services are very expensive to set up and maintain eliminating all but the largest players in the marketplace. As utilities collectively have millions of transactions, there has been a movement to seek a more cost efficient way to exchange transactions.

Summit Strategies predicts that the Internet, especially in combination with XML, is poised to bring about dramatic and rapid change to the EDI world. According to Summit, Internet EDI will bring down some of the barriers that have prevented companies from taking advantage of sophisticated data integration. It will reduce costs, introduce new capabilities for users,

expedite solutions to problems and be available to a broader range of companies than under VANs.

International Data Corporation projects that revenues for EDI services will increase from \$1.1 billion in 1999 to almost \$2.3 billion in 2003 and Internet EDI's share of EDI transactions will jump from 12% to 41% during the same time frame. Gartner Group estimates are more aggressive, predicting 80% of all EDI transactions will be delivered over the Internet by 2003.

Companies experience with the GISB EDM standards over the Internet has shown a slight, yet measurable, increase in reliability over the VANs by using the Internet. One company, Transcapacity Limited Partnership, over an 18-month period, found 99.4 percent availability on its VAN and a 99.9 percent availability level on the Internet.

How does a company know if their principal data was sent and received? For VANs, information being sent is dependent on the account types of the sender and the receiver. This time could range from under a minute to never being acknowledged. Utilizing GISB EDM, it takes an average of only 14.3 seconds for a gas nomination, the most time sensitive document sent. Within that time, the receiver's site is connected to, the document is transmitted, and the sender gets an acknowledgment of acceptance with a time stamp when receipt was completed.

Aside from knowing whether or not the company's valuable information has been sent and successfully received, GISB EDM is significantly more cost-effective than VANs. VANs charge a monthly fee to transmit data in addition to a per character charge. Companies can pay \$10,000 to \$20,000 per month on VAN charges. In some cases, companies find themselves running overnight shifts in order to take advantage of "off peak" reduced rates on VANs, however this must be balanced against the additional costs of personnel and the inconvenience of split shifts.

Investing approximately 4 to 5 months of VAN charges, a company can establish a GISB designated site, get a high-speed connection, purchase the required software and begin communicating over the Internet. Any monthly variable transaction costs after that is virtually nonexistent.

Like VANs, the GISB EDM standards support the PAIN principles of Privacy, Authentication, Integrity and Non-repudiation.

There are those who are concerned that sending information via the Internet might not be secure. No one wants "some kid in his garage" tapping into and corrupting essential data. The GISB EDM standards require encryption of data. Companies basically have an electronic "secret decoder ring" which allows only them to read the encrypted data. This privacy program is called Pretty Good Privacy, or PGP, and was adopted because it was secure, relatively inexpensive and available "off the shelf." In fact, Pretty Good Privacy has a reputation for very good privacy.

Pete Byrne, Business Process Consultant of GPU Energy and the chairman of the Utility Industry Group, is confident of the GISB standard. "We've come to understand that the GISB standard has been proven to work successfully in the gas industry. The Internet protocol that GISB uses is better for our needs than the old way of exchanging via VANs," he said.

GPU Energy has 2 million customers in Pennsylvania and New York and reported revenues of \$4.8 billion in 1999.

"Everybody is attracted to the Internet," Byrne added. "We're looking at using the software for other exchanges, not just deregulated utility transactions. Using it in other areas helps us realize more savings."

According to Group 8760's Brooks, "we are just beginning to see the power of the Internet. Our GISB Agent software is often the initial foray into Internet e-commerce for utilities. It is a relatively low risk exercise that has a measurable and quick payback. Energy companies may build on the success of this successful Internet experience and add more e-commerce functionality such as bill presentment and payment, energy trading and eventually back office functions.

New York, another forerunner in requiring all utilities to transfer information via EDI, projects the end of 2001 as the deadline for the switchover. "By the end of 2000, utilities will be entering preliminary stages of testing," said John D'aloia. He is the power systems operational specialist for the New York Public Service Commission.

"When you look at the business process there is no difference in transferring electric and natural gas data. When you get down to the detail data it's different, but overall it's the same," he said. D'aloia cites no major problems in the conversion. "We're trying to do it the most logical way. Everything is going straight to the Internet and we just want to get a piece of the action."

Executive Director of GISB Rae McQuade is pleased with the newest batch of EDI service providers. "The service companies have fulfilled a crucial role in our organization. They're providing companies with choices. Before there were standards, companies really didn't have a choice because the options were too expensive."

She added, "It's no cakewalk to get certified. Hats off to the providers who have. Group 8760 is one of them. These companies make the market work more efficiently. Having that choice is important." "Group 8760 played a key role in GISB. Without the support of companies such as Group 8760, I don't think we would be in existence," according to McQuade.

Utility companies are boldly revolutionizing their industry, in spite of their traditional risk-adverse nature. Through developments such as GISB Agent and others, they are providing even better and more reliable service to their customers. In the process, they are cutting costs and increasing efficiency. As a result, all market participants; the supplier, marketer and ultimately the consumer, are winning.

## **Standards History**

In 1992, the Federal Energy Regulatory Commission (FERC) issued Order 636. That order required interstate natural gas pipelines to post system information. This required information included service available through capacity release transactions as well as firm and interruptible capacity available directly from the pipelines. The information was to be posted on electronic bulletin boards.

This order forced a discussion on how electronic communications systems would work in the fast-developing competitive natural gas marketplace. In 1993, the Gas Industry Standards Board (GISB) was formed to respond to the natural gas industry's dramatic developments, both regulatory and technological, that have transformed the energy industry and its marketplace.

The Gas Industry Standards Board (GISB) is a voluntary, independent organization comprised of, and supported by, all segments of the natural gas industry. GISB is a non-profit, autonomous organization with three main goals: (1) Develop and maintain voluntary standards governing electronic communications for business transactions within the natural gas industry, (2) Serve as a forum for reaching market-responsive solutions, and (3) Enhance the reliability of gas service through easy access to information standards needed for critical business transactions.

The GISB Business Practice Standards represent a comprehensive set business rules and standards for conducting business and electronic communications over the Internet with interstate natural gas pipelines and the wholesale gas industry. The current version has over 300 standardized business practices broken down into Principles, Definitions, Standards, Datasets, Contracts, Models, and Interpretations.

These standards have helped the natural gas industry in improving customer relations, increasing service reliability and increasing the competitiveness of natural gas markets. Although these standards have been implemented on a federal level, it will probably take years before the majority of states are deregulated. However, several states are in various stages of unbundling today, with Pennsylvania being at the forefront for both gas and electric utilities.

GISB has published five versions of its standards manuals and has adopted more than 400 business practices, more than 50 interpretations and more than 40 transactions have been standardized for electronic communication via electronic data interchange using the Internet, interactive web sites, and flat file electronic transfer.

GISB is a membership-driven organizational structure that has given smaller companies in the industry a voice while protecting the larger segments when important issues arise. James Hoecker, the FERC chairman explained the relationship of the FERC and GISB in the 1996 GISB Review. "The characterization I would give is a public-private partnership. Setting terms and conditions of service is a matter of jurisdictional interest for this agency under the Natural Gas Act...we have taken a great deal of interest in how interstate pipelines provide open and nondiscriminatory access to their facilities and their services."

He added, "I think it's the involvement of all elements of the industry in helping us collect data and resolve some very arcane and technical issues that gives GISB its enormous value."

One of the first standards-related achievements by GISB was the completion of a model trading partner agreement for companies to use in exchanging business documents by means of electronic data interchange (EDI). This agreement intended to serve as a contractual foundation for electronic commerce within the gas industry. What the agreement does is define the electronic methods for exchanging information.

Those on the sending and receiving end of the agreement have the same rights and obligations of transactions completed electronically as they would under the conventional paper-based transactions. GISB even made an agreement with a Canadian EDI technical organization, GasEDI, to develop and maintain common North American gas information standards. The agreement helps ensure the seamless movement of natural gas across the U.S.-Canadian border.

Though the early road was not always smooth for GISB, in July of 1996, the FERC officially endorsed GISB saying that their standards "regularize the means by which the entire industry will conduct business across a interstate pipeline grid" declaring that the standards "represent a formidable step towards improved efficiency and competitiveness in the gas industry."

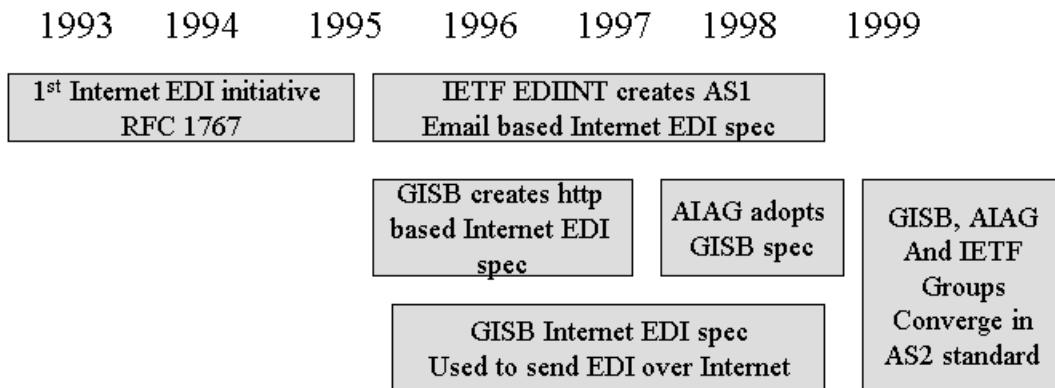
The FERC also said that GISB's communications standard is "at the forefront of the use of Internet-based protocols to conduct business transactions." In addition, the FERC said that the protocols "carry the potential for enhancing the effectiveness of communication between all members of the gas industry, including confirmations between pipelines and upstream point operators, confirmations among upstream and downstream pipelines, as well as business transactions involving local distribution companies, marketers and producers."

In 1998, the FERC issued Order 587-G, calling on pipelines to provide all electronic transactions with customers over the Internet. GISB put together a task force to respond to this order, marking June 2000 as the deadline.

“All industries, especially the gas industry, are at the beginning of a profound change in how we implement electronic commerce—a change that will have a dramatic impact on technologies, value propositions, design and especially business models. The natural gas industry is one of the first industries to recognize the added value of standardization and electronic commerce standards,” said Carl Caldwell, one of the chairmen of the GISB task force.

Information from the GISB Web Site was used in the preparation of this article. For additional information, please reference [www.gisb.org](http://www.gisb.org).

## GISB Standardization Timeline



Gas Industry Standards Board (GISB): [www.GISB.org](http://www.GISB.org)  
Automotive Industry Action Group (AIAG): [www.AIAG.org](http://www.AIAG.org)  
Internet Engineering Task Force (IETF): [www.IETF.org](http://www.IETF.org)

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