

OIL & GAS UTILITIES

This sector covers both oil products and natural gas, however, the Committee's hearing focused primarily on natural gas as the principle source of residential heating. Oil provides about 40 percent of the energy Americans consume, including home heating. In addition, about 60 million American homes and businesses use natural gas for heating, cooking, and other applications.

Gas and oil utilities face a variety of Y2K problems in their administrative systems, as well as the microprocessors or computer chips embedded in the production, transportation and distribution systems used in this in-

dustry. Survey results published by the Federal Energy Regulatory Commission (FERC) in September 1998 show that this industry, like many others, started its Y2K efforts late.

According to the survey, most of the critical systems in this industry are still in the inventory and assessment phase, leaving little time for the more difficult phases of Y2K remediation and testing. As a result, the industry is not likely to complete repairs of all of its system in time, which in turn means that possible disruptions in the production, transportation, and distribution of gas and oil are possible.

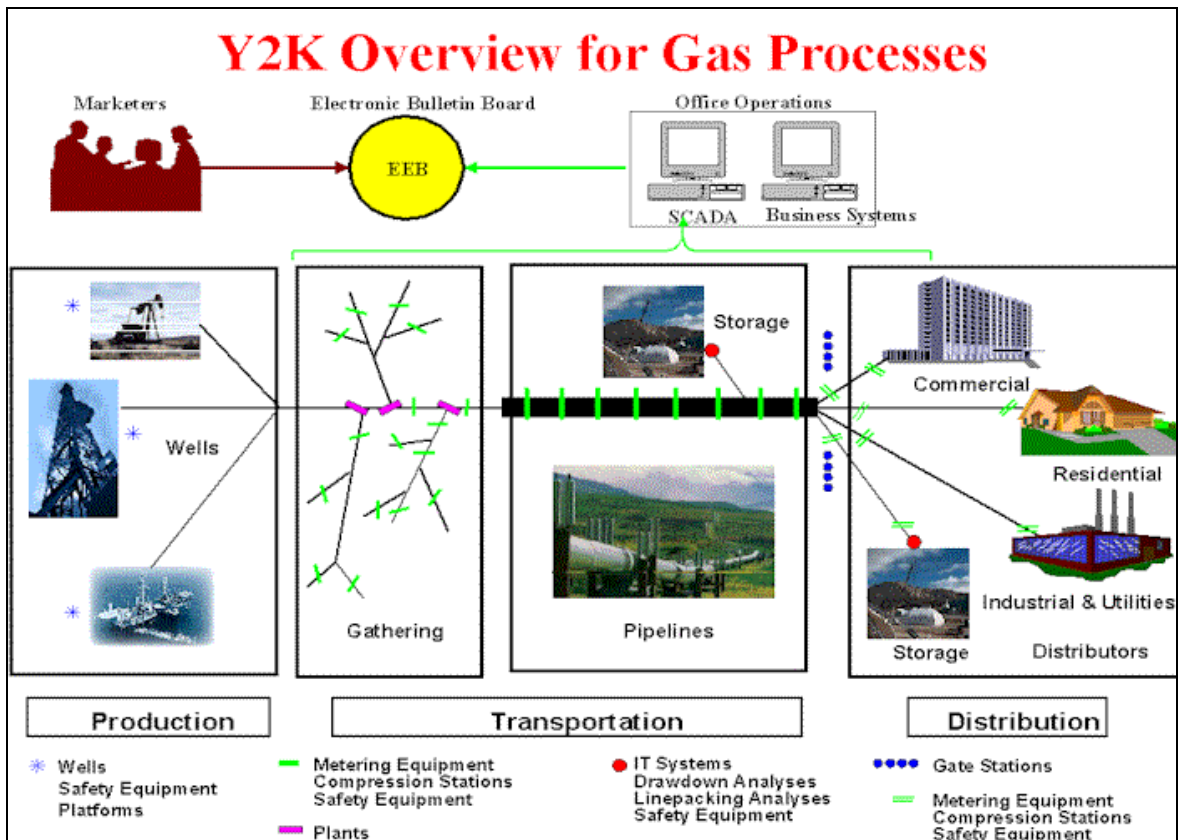


Figure 5

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

Automation and, thus, Y2K concerns are prevalent throughout both the gas and oil industries. As depicted in figure 5, FERC published a generic diagram that maps out the elements of gas and oil production, transmission, and distribution that must be checked for Y2K problems.

Note: This year, the Committee plans to increase attention to the oil industry, particularly the international Y2K implications on oil imports. The U.S. gets nearly 50 percent of its oil from imports, and several key oil producing countries are behind in their Y2K remediation efforts. If these countries are unable to sustain the level of imports because of Y2K failures in the pumping, refining, or transportation of crude oil, the implications on the price of gasoline may be significant.

Overview

Nearly all Americans rely on oil and gas in their everyday lives. Oil provides about 40 percent of the energy Americans consume. Besides the obvious gasoline, diesel fuel, and home heating oil, petroleum products are used in everything from toothpaste to raincoats. A barrel of crude oil (42 gallons) is refined into

Asphalt	1.3
Petrochemicals	1.2
Lubricants	0.5
Kerosene	0.2
Other	0.3

*Totals more than 42 gallons due to processing gains.

Almost 60 million American homes and businesses use natural gas for heating, hot water, cooking and other applications. Natural gas comes through a 1.3 million-mile underground system. The U.S. has about 58,000 miles of gathering lines in the gas production areas, 260,000 miles of long-distance pipelines, and nearly 1 million miles of distribution lines operated by local gas utilities that must all be checked for Y2K problems.

Thousands of embedded systems in millions of miles of pipelines all must be checked and, if necessary, replaced. Vulnerable systems include distributed control systems, programmable logic controllers, digital recorders, control stations, recorders, meters, meter reading and calibration software, and SCADA. PC-based applications such as control and work management software within a utility may also possess Y2K vulnerability. Any date-dependent application, system or component may experience problems that result in complete system or station shut-down.

The President's Council on Year 2000 Conversion assigned FERC responsibility for the gas and oil sector. Other federal agencies involved in this sector include the Department of Energy, the De-

<u>Product</u>	<u>Gallons*</u>
Gasoline	19.5
Fuel oil	9.2
Jet fuel	4.1
Residual fuel	2.3
Liquefied gas	1.9
Still gas	1.9
Coke	1.8

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

partment of Transportation (pipelines are a form of interstate transportation), the Department of the Interior, and the General Services Administration.

Trade associations representing the various gas and oil entities are also playing a key role in Y2K remediation efforts for this industry.¹

Major Initiatives

The Committee's energy utility hearing was held on June 12, 1998. As described in the previous section, both electric utilities and oil and gas utilities were addressed. Gas and oil witnesses included, the Honorable James Hoecker, Chairman, FERC, Mr. James Rubright, Executive Vice President, Sonat, Inc. representing INGAA, and Gary Gardner, Chief Information Officer, AGA, and Lou Marcoccia, energy industry consultant.

The hearing better defined the Y2K problem in the gas and oil sector, heightened awareness, and mobilized an industry that was not yet fully engaged in addressing the Y2K problem.

¹ The American Petroleum Institute (API), the Natural Gas Council (NGC), the American Gas Association (AGA), the American Public Gas Association (APGA), the Gas Research Institute (GRI), the Interstate Natural Gas Association of America (INGAA), the Independent Petroleum Association of America (IPAA), the Association of Oil Pipelines (AOPL), the Gas Processors Association (GPA), the National Gas Supply Association (NGSA), the Gas Industries Standards Board (GISB), the National Petroleum & Refiners Association (NPRA), the National Propane Gas Association (NPGA), the Petroleum Marketers Association of America (PMAA), and the Petroleum Technology Transfer Council (PTTC).

In his testimony, Mr. Hoecker indicated that the Y2K status of the gas and oil industry is essentially unknown. He was especially concerned about small and medium sized companies and focused on the need for the gas and oil industry to share Y2K testing and compliance information. He indicated that Y2K readiness information might be difficult to obtain because of fear that the information may be commercially sensitive, that certain liability issues may arise, or that collaboration on this problem may expose companies to anti-trust actions.

The Committee was key to passing Y2K information disclosure legislation and obtaining clarification from the Justice Department to exempt Y2K information exchange from anti-trust laws. Mr. Hoecker also suggested that a Y2K database be established. API has since set up such a database.

Mr. Rubright, representing the interstate gas pipeline companies, highlighted the extensive use of embedded chips in the computerized devices instrumental to the operation and monitoring of gas and oil pipelines. According to him, most pipeline companies contend they will be Y2K ready by October 1999, but are concerned over both upstream and downstream suppliers, as well as utilities and telecommunications providers on which they rely. He also expressed concern over litigation risks, the large number of congressional electronic commerce initiatives, and anti-trust issues.

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

Mr. Gardner, representing gas utilities, focused on the complexity of gas distribution systems. He indicated that a gas utility will typically have between 50 and 100 systems with embedded processing located in such areas as storage fields, gas control and management operations, metering and facilities, and SCADA systems. His industry's experience suggests that the process of identifying, replacing or upgrading, and testing takes 12 to 18 months to complete.

The Committee's hearing was instrumental in motivating the President's Council on Y2K Conversion to create an oil and gas working group. The kick-off meeting for the oil and gas group was held at FERC in June 1998.

FERC has held subsequent meetings on July 14, 1998, September 3, 1998, and November 13, 1998. Minutes of the Oil and Gas Working Group meetings and other proceedings and events are publicly available on FERC's website.

API, a national trade association representing all phases of the oil and gas industry, provides direct assistance to FERC in managing the working group. In 1997, the API formed a Year 2000 Task Force to facilitate Y2K readiness across the petroleum industry. The API Year 2000 Task Force currently represents over 50 industry companies and meets every 6 to 7 weeks.

One of API's primary functions is to alert and educate industry members about the potential impact of Y2K on

information, process control, automation and instrumentation systems, as well as concerns about other companies in the supply chain. API has also created a database to allow companies to share information about the readiness status of computer software and hardware, telecommunications networks, process control and electrical equipment, and embedded systems used by the petroleum industry.

AGA, a trade association of almost 300 natural gas transmission, distribution, gathering and marketing companies, and 181 local natural gas utilities that deliver gas to 54 million homes and businesses, has also been actively involved in Y2K. AGA members account for more than 90 percent of natural gas delivered in the United States.

AGA sponsors business television series, joint information technology conferences, and other forums to inform its membership of Y2K solutions.

Assessment

The Committee's survey, depicted in figure 3, included both electric and gas and oil utility companies. Concerns resulting from the survey expressed in the electric utility section of this report also apply to the gas and oil utilities. Progress is slow progress, assertions that they will complete Y2K remediation efforts in time are overly optimistic, the industry lacks knowledge about suppliers' Y2K status, and contingency planning is deficient.

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

The Committee's survey, although limited in scope, was the only available survey at the time. Since then, FERC released its first overall assessment of the Y2K status and preparedness of the gas and oil industry on September 18, 1998. AGA in coordination with the Gas Research Institute and the Interstate Natural Gas Association of America collected and analyzed surveys of its members to assess the industry's compliance with Y2K requirements. These surveys form the basis for the FERC assessment. Assessment results are depicted in figure 6 for business systems and figure 7 for embedded systems.

The survey was sent to over 8,000 gas and oil companies. Only 638 or less than 10% responded. Although the response was disappointing, it did represent 45% of oil and gas production, 78% of refining capacity, 70% of crude and product pipeline deliveries, and 43% of U.S. service stations.

The survey asked companies to indicate the stage their companies were in for business systems and for embedded systems. This required companies to summarize information at too high a level to be meaningful. In reality, a company may have hundreds or even thousands of business and embedded systems each at a different stage of remediation. Nevertheless, the survey results are still alarming. The survey indicates that 45% of companies who responded consider themselves to be in the assessment phase or earlier for business systems, and 60% for embedded systems.

The Committee can only conclude that, despite claims to the contrary, many companies in the gas and oil

Y2K Readiness As of September '98 Business Information Systems & Associated Software

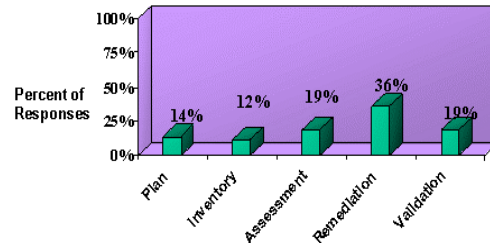


Figure 6

Y2K Readiness As of September '98 Embedded Systems

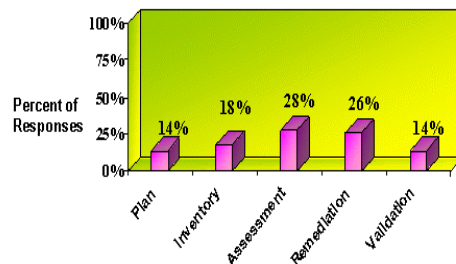


Figure 7

industry will not complete Y2K remediation efforts in time. This conclusion is based on the fact that only companies with the most robust programs typically respond to Y2K surveys. Y2K consultants estimate that remediation and testing are the most difficult phases, often consuming up to 40 to 70% of the entire Y2K effort.

Survey respondents all contend that they will be Y2K ready in time—76% by June 1999 and the remaining 24% by December 1999. However, based on the progress to date, and

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

the experience regarding the amount of time and resources it takes to complete the remaining phases, this contention may be unrealistic. The Committee recommends that the companies who are lagging this far behind, i.e., are still in the assessment phase or earlier, devote significant resources to contingency planning because they will not have sufficient time to repair and test all of their mission critical systems in the limited time remaining.

One of the biggest areas of concern for the Committee is the Y2K status of countries from which the U.S. imports oil. Nearly 50% of the oil used in the U.S. comes from foreign sources. Yet, as depicted in figure 8, many of the countries are significantly behind the U.S., and thus, have a high risk of failure. Indeed, 3 of the top 5 countries from which the U.S. imports oil are, according to the Gartner Group, 12 to 18 months behind the U.S. in their Y2K remediation efforts. This means that oil production and transportation may be at risk in these countries. Any disruption to oil imports could significantly impact oil availability and, thus, prices in the U.S. The oil industry and the federal government need to monitor this situation closely.

Concerns

- Y2K remediation in the gas and oil sector began too late and is progressing too slowly. The thousands of miles of pipeline

that must be checked and repaired and the proliferation of embedded chips and processors throughout the industry's production, transportation, and distribution systems make failure

Country	Percent U.S. Imports	Y2K Status (Months Behind U.S.)	Risk of Disruption
Venezuela	16.2	12-18	High
Canada	15.5	0-3	Low
Saudi Arabia	14.4	12-18	High
Mexico	12.9	12	Medium
Nigeria	7.3	12-18	High
Angola	4.2	Unknown	?
Colombia	3.0	12-18	High
Algeria	2.9	Unknown	?
Kuwait	2.9	12-18	High
Virgin Islands	2.9	Unknown	?
Norway	2.3	12	Medium
Iraq	2.2	Unknown	?
Gabon	2.0	Unknown	?
United Kingdom	2.0	0-3	Low
Ecuador	0.9	12-18	High
Argentina	0.9	12-18	High
All Others	7.5	Unknown	?

Figure 8: Imported Oil Country Y2K Status

of at least some mission-critical systems possible. The industry needs to step up its efforts and focus on developing contingency plans.

- The dependence of the gas and oil industry on other sectors—electric power and telecommunications—dictates better coordination with these sectors.
- While the large gas and oil companies are spending large amounts of money on Y2K remediation, the Committee is concerned about some of the smaller and medium-sized companies in this industry, including those up and down the supply chain. These small companies could be the linchpins for the

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

overall success of this industry.

- A Y2K assessment of oil producing countries is needed to determine the likelihood that U.S. oil imports will be disrupted, and, if so, what contingency planning will be needed.

WATER UTILITIES

Overview

Water:

There are approximately 200,000 public water systems (PWSs) regulated under the Safe Drinking Water Act that serve 243 million people in the United States. The remaining population obtains their drinking water from private wells.

PWSs are defined as community water systems, non-transient, non-community, or transient systems. Approximately 60,000 of the 200,000 public water systems are classified as community water systems. A community water system provides water to the same population year round. There are 3,687 community water systems in the U.S., which serve a population of 10,000 or more, and provide water to a total of 204 million people.

Approximately 75 percent of the American public is served by large community water systems covering populations of 100,000 or more.

There are over 30 community water systems serving populations in excess of one million people.

Although the community water systems collectively serve a large number of people, most community water systems serve less than 3,300 people. Many of those systems are privately owned and operated.

A transient non-community water system serves transitory customers in non-residential areas such as campgrounds, motels, and gas stations. Approximately 57 percent of public water systems are transient non-community systems. (Sources: EPA Report to Congress, EPA-810-R-93-1. September 1991, and AWWA/AMWA/NAAW 1998 Survey.)

Wastewater:

Seventy-two percent of the U.S. population (190 million people) is served by centralized wastewater treatment facilities; the remainder is served by on-site systems (e.g., septic systems).

There are 16,000 wastewater treatment facilities nationwide, with operations ranging from less than 100,000 gallons per day (about 1/3 of the total number of facilities) to systems that treat over 100 million gallons per day (less than 1% of the systems).

Systems such as Prince William County, Virginia, and Independence, Missouri, treat approximately 10 million gallons of sewage a day, while the largest systems, such as