

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

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

those of New York or Chicago, treat approximately 1.5 billion gallons of sewage per day.

Nationwide, approximately 42 billion gallons of sewage are treated per day.

About 31% of the U.S. population is served by facilities that provide secondary treatment of waste and another 31% is served by facilities that provide better than secondary. Fifty percent of the design capacity of existing treatment plants allows for better than secondary treatment.

The remaining population is served either by plants that have no discharge or by individual on-site disposal systems.

Municipal governments own 95% of wastewater treatment facilities, either as part of a local government's public works department, or as a separate authority or utility district.

Typically, in small to medium-sized cities, the water utility and wastewater treatment systems are operated jointly. In larger cities they are usually separate operations.²

Major Initiatives

The Committee assessed the Y2K vulnerability of the water and wastewater, and took steps to increase awareness about Y2K issues in this vital sector of service. These include staff networking with the major water and wastewater industry association

groups and the Environmental Protection Agency (EPA). The Committee also interviewed numerous industry experts, surveyed water and wastewater company Y2K preparedness, and monitored other industry surveys recently administered by the major water and wastewater industry associations.

The Committee staff has also participated with the EPA in tours of five local Washington, D.C. area water and wastewater treatment plants and worked with the major water and wastewater industry associations. These include

- the Association of Metropolitan Water Agencies (AMWA),
- the National Association of Water Companies (NAWC),
- the American Water Works Association (AWWA),
- the Water Equipment Manufacturers Association (WEMA), and
- the Association of Metropolitan Sewerage Agencies (AMSA).

On December 18, 1998, the Committee held a field hearing on Y2K preparedness in the water and wastewater industry in Anaheim, California. The City of Anaheim Public Utilities Department hosted this hearing. The witnesses were Dana Minerva, EPA Deputy Assistant Administrator for Water; James Brainerd, Chief Information Officer, Los Angeles Department of Water and Power; James Ellisor, Director of Information Systems, Las Vegas Water District; Patrick Miles Information Technology Director, Orange County Sanitation District; William Hetland, District Manager, El do-

² Congressional Research Service Briefing to Committee Staff on 06/02/98

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

rado Irrigation District; and James Bell, Vice President; Technical Services, Smith and Loveless, Inc., (a leading manufacturer of water and wastewater and pumping equipment). Following the hearing, Senator Bennett toured the City of Anaheim Water Services Lenain Water Filtration Plant.

One of the major topics of discussion during the hearing was the need for water and wastewater companies to obtain assurances from their electric power providers that they will be considered "uninterruptable" or priority customers in the event power supply problems occur. Currently, no legal authority exists to require that power utility companies consider water and wastewater companies as priority customers. Such agreements have customarily been negotiated on a case-by-case basis between power and utility companies.

Mr. Jim Ellisor, Director of Information Systems for the Las Vegas Valley Water District, noted in his testimony that some variability exists in water systems' reliance on electricity, depending on system design. He noted that some systems rely completely on gravity and require little or no electricity for their operation, including some large systems.

During her testimony, EPA Deputy Assistant Administrator Dana Minerva noted that the EPA does not consider reliance on switching to the manual mode of operation as the preferred solution to Y2K problems. Manpower limitations were cited during the testimony as one impedi-

ment to a company's ability to easily switch to the manual mode of operation. The possibility of creating some type of "reserve force" that could assist companies in need of additional personnel in the event of the need to default to manual mode was discussed. It was concluded that operation of water and wastewater plants in the manual mode requires skilled and certified operators. Consequently, a pool of unskilled reservists from outside of the water industry would probably not provide an effective solution to the manpower shortage problem.

It should also be noted that each water and wastewater treatment system requires operators to possess a body of knowledge specific to those individual systems. Mr. Bill Hetland, General Manager of the El Dorado Irrigation District, stated that most agencies would have to look to their own internal resources to solve the Y2K problem, that it would be unrealistic to think that a pool of labor would be available to assist in Y2K. He also stated that staffing would become an issue for his agency if manual operations were required for an extended period of time.

Mr. Hetland stressed the importance of providing information to the community about the problem. He also described the progress his agency had made and said such information is vital to community preparedness. He also expressed concern about regulatory compliance and the liability issue.

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

Deputy Assistant Administrator Minerva testified about EPA's implementation of a new policy aimed at encouraging Y2K testing in the water and wastewater industry. This policy waives penalties if violations occur during Y2K testing, provided specific conditions are met. Deputy Assistant Administrator Minerva further stated that testing and preparation would be taken into account if Y2K-related enforcement violations occur on January 1, 2000 or other "problem dates." According to Ms. Minerva, EPA cannot rule out any enforcement pertaining to Y2K problems, however it will take efforts to resolve the problem into account.

The new EPA policy is limited to testing-related violations disclosed to EPA by February 1, 2000. The policy is subject to conditions which include the need to design and conduct the tests well in advance of the dates in question and to correct any testing-related violations immediately to ensure the protection of human health and the environment.

The General Accounting Office, at the request of this Committee, is currently preparing a survey of state regulatory agencies with jurisdiction over public water and wastewater utility companies. This survey will determine the extent to which state regulatory agencies are assessing the Y2K readiness of public water and wastewater utilities.

In July 1998, Committee staff surveyed 20 water and 20 wastewater companies regarding their Y2K preparedness. About 25% of those contacted responded to the survey,

despite the fact that a confidentiality pledge was made to all survey recipients. The results indicate that of the 11 companies that responded to the survey, slightly over 25% stated that it was unlikely they would be Y2K compliant by January 1, 2000. More than 50% of the respondents had not yet completed the initial assessment phase, and 36% did not have contingency plans in place. Of the 64% that had contingency plans in place, the contingency consisted of either switching to manual operations or utilizing parent company operations. The table at the end of this section displays the results of the Committee's survey.

In July and August 1998, the American Water Works Association (AWWA), the Association of Metropolitan Water Agencies (AMWA), and the National Association of Water Companies conducted a joint survey of their memberships regarding Y2K readiness. Approximately 725 of the 4000 members of these associations responded to this survey.

- About 81% of the respondents expect to complete their internal Y2K work on time.
- About 89% of the community public water systems serving populations ranging from 100,000 to 1 million people expect to have Y2K compliance work completed on time.
- About 87% of the systems serving between 10,001 and 100,000 people expect to complete their work on time.

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

- About 76% of the systems serving less than 10,000 people expect to be completed on time.
- Only 26% of the respondents reported having fully assessed the compliance status of vital business partners such as power and telecommunications service providers and vendors upon whom they rely.
- About 83% of the respondents reported that they had not completed their Y2K contingency plans.
- About 39% of the respondents reported that they expect to spend less than \$10,000 on their Y2K programs.
- About 26% expect to spend \$10,000 to \$50,000 on their programs.
- About 80% expect to spend \$50,000 to \$100,000.
- About 10% expect to spend \$100,000 to \$1 million.
- About 4% expect to spend over \$1 million.

In June 1998, the Association of Metropolitan Sewerage Agencies (AMSA) conducted a survey of its 202 members. AMSA is a coalition of publicly owned wastewater treatment agencies. Its member agencies are responsible for collectively treating and reclaiming over 18 billion gallons of wastewater each day. AMSA re-

ceived 76 responses to its survey. Results indicated the following:

- The level of automation within each agency averaged 54%. (Not all aspects of each agency's operation are automated, i.e., an agency may utilize automated billing but its operational plant processes may be manually controlled.)

Eighty-eight percent of the respondents reported that they currently utilized some form of Supervisory Control and Data Acquisition System (SCADA) in their operations. It should be noted that while an agency might use SCADA in one aspect of its operation, such as monitoring a remote pumping station, this does not mean that its entire system is automated. These systems are pervasive in the power and water and wastewater utility industries and typically collect and transmit data about flow, pressure, and temperature. Computers can be utilized at any point in the system where measurements are made regarding pressure, water quality, chemical content, treatment, time, or billing.

- Nearly 100% of the respondents reported that they use computers for process control, laboratory research, industrial compliance, billing systems, and other administrative purpose, such as finances, inventory, and maintenance management.
- Ninety percent of the respondents have developed a plan to

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

assess and address the Y2K issue.

- Forty-five percent of the respondents reported estimated Y2K costs ranging from \$0 to \$100,000. Fifteen percent reported estimated costs in excess of \$1 million, with two respondents reporting estimates of \$15 million. Most of the agencies reporting costs in excess of \$1 million were relatively large systems, but 17 % of those reporting costs in excess of \$1 million were agencies which served under 250,000 people. Most agencies estimated Y2K costs between 0 and 2 percent of their operating costs.
- Approximately 95% of the respondents reported they had begun to implement Y2K solutions, and 26% reported they were complete or nearly complete in their Y2K preparation.
- Approximately 55% of the respondents reported having a backup plan should all or a portion of their systems fail as a result of Y2K.

Concerns

With very few exceptions, the ability of the water utilities to supply fresh, clean drinking water and to effectively treat wastewater is linked directly to the utilities' ability to obtain a continuous and reliable source of electric power. This fact underscores the importance of the topic of this Committee's hearing on June

12, regarding the Y2K problem and electric power utilities.

While some water and wastewater utilities can generate their own electricity in the event of a power outage, the ability to do so for an extended period of time would depend upon the availability of a steady supply of diesel or other alternative fuel to power the utilities' independent generators. In general, the larger water and wastewater utilities do maintain the ability to generate their own source of back-up electricity, but the duration for which this can be done varies widely within the industry.

There is no interconnectivity built into the water distribution system as with the electric power grid. Nevertheless, some citizens could be facing interruptions of water utility service on January 1, 2000 if water utility companies do not adequately address the Y2K problem.

Water industry Y2K issues are broader and more complex than simply whether electric power will be available to run the pumping stations. For example, wastewater treatment facilities and water supply utilities are interrelated. Upstream contamination caused by a malfunctioning wastewater treatment plant would have a direct impact on a fresh water treatment facility located downstream.

The EPA identified six major areas in water and wastewater treatment facilities where embedded computer chips might be located. These are communications infrastructure, instrumentation, facilities and sup-

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

port, materials tracking, production and process, and process controls. The list included 51 individual devices that potentially could contain embedded chip technology.

Of primary concern in the water and wastewater industry is the vulnerability of sensitive SCADA systems utilized in automated water and wastewater processes

The degree of automation in water and wastewater systems varies widely throughout the country, depending upon both the age and size of the individual systems. Many older systems are not highly computer dependent.

The Committee is concerned about the inability of some wastewater treatment facilities to properly operate in the event of power outages of even moderate duration. Committee staff reviewed numerous cases in which electrical power interruptions led to the discharge of untreated wastewater or raw sewage into rivers or the ocean. Such discharges currently occur on a sporadic basis throughout the country due to power outages and excessive rainfall.

As is true in all other aspects of the Y2K problem, the water and wastewater industry is also vulnerable to supply chain interruptions. Water treatment plants in particular rely on a regular supply of chlorine and other chemicals that are required in the water treatment process. Long-term interruptions in the means of production or delivery of these items due to other Y2K problems would directly impact the utilities' ability to

deliver their services. The stockpiling of some of these chemicals prior to the Year 2000 has been proposed by some as a means of alleviating concerns about supply chain interruptions. However, some of the chemicals used in the industry represent a public health hazard if accidentally discharged into the environment. The risk to public safety would be greatly multiplied if some of these chemicals were stockpiled.

Committee staff has reviewed numerous recent examples of computer-related or computer-induced failures in the water and wastewater industry. While the cases reviewed are not believed to be the result of Y2K induced problems, they clearly illustrate the sensitive and important role which computers play in the water and wastewater services area. Numerous water or wastewater companies could be confronted by similar computer-related failures on January 1, 2000, if proper steps are not taken now to address the Y2K issue.

Numerous representatives of the water and wastewater industry offered assurances to Committee staff that they could switch their operations to the manual mode in the event of a Y2K disruption. In their response to the AMSA survey, most wastewater agencies pointed out that switching to the manual mode would present little if any problems since many automated processes run in parallel with manual instrumentation and control. Switching to the manual mode of operation may represent a viable alternative to computer-controlled processes

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

under ideal conditions and in a controlled environment. However, the conditions that might require transition to a manual mode of operation are likely to be neither controlled nor ideal in the case of Y2K.

On its face the survey data cited here appear to present a somewhat optimistic picture of the Y2K readiness of the water and wastewater industry. However, attention must be paid to the fact that the response rate for each of these surveys was relatively low, and the status of those agencies that did not respond remains largely unknown.

Analysis of the July 1998 joint AMWA/NAWC/AWWA July 1998 survey of water agencies reveals that 14% of responding companies serving populations over 100,000 people reported that they would not have their Y2K compliance work done on time. The exact impact that this will have on their operations is not clear, as it is unknown whether this includes any of their mission-critical systems. Of the 11 companies who responded to the Committee's survey, over 25% indicated that they did not expect to be Y2K compliant by January 1, 2000.

INVESTIGATING THE IMPACT OF THE YEAR 2000 PROBLEM

Water Utility Sector Survey Conducted by Special Committee Staff

Company Type	Date Aware of Y2K Problems	Date Formal Project Started	Is Your Assessment Complete	Percent Systems Mission Critical	Contacted Service Providers/Vendors	Legal or Liability Concerns	Contingency Plans Complete	Contacted by Regulators	Contacted by Investors	Will You Finish In Time
1 water	1996	1996	80%	50%	Y	Y	Y	Y	Y	Y
2 water	1997	1997	N	90%	N	N	Y	Y	Y	Y
3 water	1997	1997	Y	50%	N	Y	Y	N	Y	Y
4 water	1996	1998	N	unknown	N	Y	N	Y	Y	N
5 water	1996	1998	N	unknown	N	N	N	Y	Y	unknown
6 waste water	1995	1996	Y	0%	N	N	Y	Y	N	Y
7 water/waste	1996	1997	Y	20%	Y	N	Y	N	Y	Y
8 water/waste	1996	1997	Y	100%	Y	Y	Y	N	Y	Y
9 water/waste	NR	NR	NR	NR	NR	NR	NR	NR	NR	Y
10 water/waste	1996	1996	N	unknown	Y	N	N	Y	N	Y
11 water/waste	1996	1996	Y	90%	Y	N	Y	Y	Y	N

Notes:

* MC = mission critical, NR = no reply.

- Only 27.5% of all water and wastewater companies surveyed responded.
- The 8 companies that reported their costs, project that they will spend over \$86 million collectively on Y2K.
- Of the 11 companies who responded, 27% reported they would probably not be Y2K compliant.
- More than 50% of the 11 respondents have not finished their companies' initial assessment of compliant.
- Of the 11 water and wastewater companies, 36% do not have contingency plans in place. The 64% who do intend to either use their parent company's system or operate manually.