

**YEAR 2000 PROBLEM AND TELECOMMUNICATIONS  
SYSTEMS**

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**HEARING**  
BEFORE THE  
SUBCOMMITTEE ON OVERSIGHT  
OF THE  
COMMITTEE ON WAYS AND MEANS  
HOUSE OF REPRESENTATIVES  
ONE HUNDRED FIFTH CONGRESS

SECOND SESSION

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JUNE 16, 1998  
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**TUESDAY, JUNE 16, 1998**

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON WAYS AND MEANS,  
SUBCOMMITTEE ON OVERSIGHT,  
*Washington, DC.*

The Subcommittee met, pursuant to notice, at 3 p.m., in room 1100, Longworth House Office Building, Hon. Nancy Johnson (Chairman of the Subcommittee) presiding.

[The advisory announcing the hearing follows:]

# **ADVISORY**

FROM THE COMMITTEE ON WAYS AND MEANS

## **SUBCOMMITTEE ON OVERSIGHT**

FOR IMMEDIATE RELEASE

CONTACT: (202) 225-7601

June 9, 1998

No. OV-18

### **Johnson Announces Hearing on the Year 2000 Problem and Telecommunications Systems**

Congresswoman Nancy L. Johnson (R-CT), Chairman, Subcommittee on Oversight of the Committee on Ways and Means, today announced that the Subcommittee will hold a hearing on the Year 2000 (Y2K) computer problems and telecommunications systems. The hearing will take place on Tuesday, June 16, 1998, in the main Committee hearing room, 1100 Longworth House Office Building, beginning at 3:00 p.m.

In view of the limited time available to hear witnesses, oral testimony at this hearing will be from invited witnesses only. Witnesses will include representatives from the U.S. General Accounting Office; the President's Council on the Year 2000 Conversion; and the telecommunications industry. However, any individual or organization not scheduled for an oral appearance may submit a written statement for consideration by the Committee and for inclusion in the printed record of the hearing.

#### **BACKGROUND:**

The United States, with almost half of the world's computer capacity and 60 percent of the world's Internet assets, is arguably the world's most advanced, and most dependent, producer and user of information and telecommunications technologies. Telecommunications are critical to the operations of nearly every public and private sector organization, including the Medicare, Social Security, customs, welfare, child support enforcement, and the Internal Revenue Service programs within the jurisdiction of the Committee on Ways and Means. The telecommunications infrastructure is composed of the public sector network (a network of hundreds of local telephone companies and long distance carriers), the Internet, and millions of government and private sector telecommunications and computer networks.

Although most of the attention concerning the Y2K problem has focused on its impact on information technology and computer systems, there is a growing recognition of the vulnerability of telecommunications. The Y2K problems affect virtually all telecommunications network components. Because a single noncompliant component could potentially shut down an entire network, rigorous testing will be necessary. To minimize the adverse consequences of noncompliant telecommunications systems, a massive logistical effort will be required—including closely monitoring the status of the Y2K readiness programs of the local and long distance carriers. The Executive Branch, in response to Congressional concerns, has recently begun to address the Y2K telecommunications issues. The key initiatives include the creation, in February 1998, of the President's Council on the Year 2000 Conversion and in April 1998, the FCC's Year 2000 Initiatives.

In announcing the hearing, Chairman Johnson stated: "Given the embryonic stage of the Administration's telecommunications initiatives, with only 19 months left, I am concerned that this may be too little, too late. The telecommunications infra-

structure is critical to Social Security checks getting to our seniors, our hospitals and doctors being paid by Medicare, and our taxpayers being served properly and efficiently by the Internal Revenue Service. It is imperative that we know the Y2K status of our telecommunications system. We need to assess the adequacy of the planning and management for Y2K readiness of the telecommunications system to avert a potential disaster for the programs within our Committee's jurisdiction."

#### **FOCUS OF THE HEARING:**

The hearing will explore the Y2K issues for the Nation's telecommunications infrastructure and its impact on the major programs within the jurisdiction of the Committee on Ways and Means. In particular, the Subcommittee will examine the implications of the Y2K risks posed by the telecommunications infrastructure, including those posed by critical infrastructure components failures.

#### **DETAILS FOR SUBMISSION OF WRITTEN COMMENTS:**

Any person or organization wishing to submit a written statement for the printed record of the hearing should submit six (6) single-spaced copies of their statement, along with an IBM compatible 3.5-inch diskette in WordPerfect 5.1 format, with their name, address, and hearing date noted on a label, by the close of business, Tuesday, June 30, 1998, to A.L. Singleton, Chief of Staff, Committee on Ways and Means, U.S. House of Representatives, 1102 Longworth House Office Building, Washington, D.C. 20515. If those filing written statements wish to have their statements distributed to the press and interested public at the hearing, they may deliver 200 additional copies for this purpose to the Subcommittee on Oversight office, room 1136 Longworth House Office Building, at least one hour before the hearing begins.

#### **FORMATTING REQUIREMENTS:**

Each statement presented for printing to the Committee by a witness, any written statement or exhibit submitted for the printed record or any written comments in response to a request for written comments must conform to the guidelines listed below. Any statement or exhibit not in compliance with these guidelines will not be printed, but will be maintained in the Committee files for review and use by the Committee.

1. All statements and any accompanying exhibits for printing must be submitted on an IBM compatible 3.5-inch diskette in WordPerfect 5.1 format, typed in single space and may not exceed a total of 10 pages including attachments. Witnesses are advised that the Committee will rely on electronic submissions for printing the official hearing record.

2. Copies of whole documents submitted as exhibit material will not be accepted for printing. Instead, exhibit material should be referenced and quoted or paraphrased. All exhibit material not meeting these specifications will be maintained in the Committee files for review and use by the Committee.

3. A witness appearing at a public hearing, or submitting a statement for the record of a public hearing, or submitting written comments in response to a published request for comments by the Committee, must include on his statement or submission a list of all clients, persons, or organizations on whose behalf the witness appears.

4. A supplemental sheet must accompany each statement listing the name, company, address, telephone and fax numbers where the witness or the designated representative may be reached. This supplemental sheet will not be included in the printed record.

The above restrictions and limitations apply only to material being submitted for printing. Statements and exhibits or supplementary material submitted solely for distribution to the Members, the press, and the public during the course of a public hearing may be submitted in other forms.

Note: All Committee advisories and news releases are available on the World Wide Web at '[HTTP://WWW.HOUSE.GOV/WAYS\\_MEANS/](http://WWW.HOUSE.GOV/WAYS_MEANS/)'.

The Committee seeks to make its facilities accessible to persons with disabilities. If you are in need of special accommodations, please call 202-225-1721 or 202-226-3411 TTD/TTY in advance of the event (four business days notice is requested). Questions with regard to special accommodation needs in general (including avail-

ability of Committee materials in alternative formats) may be directed to the Committee as noted above.

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Chairman JOHNSON of Connecticut [presiding]. Good afternoon. The United States has almost one-half of the world's computer capacity and 60 percent of its Internet assets. We are the world's most advanced producer and user of information and telecommunications technologies, and the most dependent upon them, in both the public and private sector.

In our May 7 Oversight hearing, we learned much about agency officials' efforts to renovate their mission-critical systems. While Y2K compliance is proving to be an all-consuming job, it is clear that even if the government is successful in making their systems Y2K compliant, and that is by no means a certainty, they may still not be able to provide continuous service to beneficiaries or taxpayers into the next century if others they rely upon are not Y2K compliant.

The agencies within our jurisdiction are particularly reliant on telecommunications, both for their own processes and those that cross organizational boundaries. Consequently, Y2K compliance is a massive technical challenge, a tremendous managerial challenge, and a serious logistical public-private problem.

Telecommunications capabilities are critical to the operations of nearly every public and private organization. We have become reliant on telecommunications for just about everything we do. Just the agencies within the jurisdiction of this Committee rely on telecommunications for critical activities, like Social Security benefit payments to the elderly, hospital and doctor payments through Medicare, and answering taxpayers' questions, as well as processing their refunds.

The telecommunications infrastructure is highly complex. It is made up of a public telecommunications network, millions of computer networks and systems for government, defense, commercial, and personal use. The public telecommunications network includes a web of interconnected networks operated by hundreds of local telephone companies and long-distance carriers, cellular networks, and satellite services. A growing number of private networks have also emerged and are supported by the public network. For example, the Treasury Department has agencies, including the IRS, rely heavily on their own private networks, as well as the public network to conduct mission-critical business.

A key feature of the telecommunications infrastructure is the seamless connection between a wide range of carriers and networks. The route of a Social Security benefit payment illustrates this. An electronic payment may move across several networks, operated by the Social Security Administration, Treasury, Federal Reserve, and the beneficiary's own commercial bank. The transaction's travels are not at all apparent to sender or recipient.

We are here today to learn from officials familiar with the telecommunications industry about the efforts underway to meet the Y2K challenge. We will be hearing from the Federal Communications Commissioner and a U.S. General Accounting Office Director about the Y2K issues facing the telecommunications industry and

those relying on its services. We will also be hearing from industry analysts and representatives of various sectors of the industry about the challenge presented by those Y2K issues and how they are being managed.

The more I learn about the Y2K problem, the more I understand those who equate it to peeling an onion. It seems that peeling a layer of the Y2K problem only produces another layer to be peeled. The later we discover new layers, the less time we will have to respond to their needs and peel remaining ones.

Our purpose today is to shed more light on the telecommunications layer and determine whether more action is needed, including legislative or congressional action to help insure that beneficiaries and taxpayers are not shedding tears at the turn of the century over lost services due to systems and network failures.

Mr. Coyne.

Mr. COYNE. Thank you, Madam Chairman. The Ways and Means Committee Oversight Subcommittee is going to hold its second hearing today to review the status of Federal agency efforts to address year 2000 systems conversions.

As we move closer and closer toward the new millennium, it is important that this Subcommittee continue to review our governmentwide conversion efforts.

As will be discussed by the witnesses that we have here today, just as private sector and government systems need to be updated by the end of next year, computer and telecommunications systems internationally must reach the same high standards of compliance by that date.

Telecommunications systems throughout the world are integrally linked. The interdependence of these systems needs to be recognized and thoroughly evaluated by the experts.

I would like to welcome the witnesses scheduled to appear before the Subcommittee today, including the U.S. General Accounting Office, the President's Representative on the Year 2000 Conversion Council, officials from several of the Federal agencies, and industry experts in the telecommunications field. I thank each of you for appearing today.

And finally, I thank the Subcommittee Chairman, Mrs. Johnson, for scheduling the followup session today. Thank you.

Chairman JOHNSON of Connecticut. Thank you, Mr. Coyne.

It's my pleasure to welcome our first panel. Joel Willemsen, the Director of Information Systems, Management Accounting, and Information Management of the U.S. General Accounting Office, and Hon. Michael Powell, Defense Commissioner, Federal Communications Commission.

Mr. Willemsen.

**STATEMENT OF JOEL C. WILLEMSSEN, DIRECTOR, CIVIL AGENCIES INFORMATION SYSTEMS, ACCOUNTING AND INFORMATION MANAGEMENT DIVISION, U.S. GENERAL ACCOUNTING OFFICE**

Mr. WILLEMSSEN. Thank you, Madam Chair. Thank you, Ranking Member Coyne. Thank you for inviting us to testify today on a critical issue, year 2000 and telecommunications. As requested, I'll briefly summarize our statement.



The consequences of not resolving year 2000 problems for telecommunications are potentially disastrous. Without compliant telecommunications, Federal agencies would be unable to provide basic services to the American public. For example, the IRS wouldn't be able to process electronic tax refunds and electronic Medicare payments would not be made.

In light of these types of risks, the Federal Government has recently begun to address year 2000 telecommunications issues. For example, the President's Council on Year 2000 Conversion has established a telecommunications working group, chaired by Commissioner Powell. The group reports that it's developing a strategy and plans to address the key issues facing the telecommunications sector.

In addition, within the past 2 months, FCC has initiated other activities, such as sending letters to over 200 telecommunications service providers and others, asking them to share information about their year 2000 compliant status.

Despite these recent efforts, critical areas remain to be addressed. Only 1½ years remain, but no one currently has an overall assessment of where we stand on year 2000 and telecommunications risks. It's therefore imperative that the executive branch take a more proactive approach in addressing this.

In line with producing a strategy with specific milestones and defined accountability, several major areas must be addressed. One is that information must be obtained on the current readiness status of the telecommunications industry. FCC has compiled general information on this, and on the various telecommunications segments. However, as of last week, the FCC was unable to provide us with information on the current status and anticipated readiness dates in areas such as satellite, cable, broadcast, wireless services, and long-distance and local exchange carriers.

Second, it's essential that FCC obtain this kind of data on telecommunications preparedness on a regular basis. Just as OMB and the Congress monitor Federal agencies' efforts on year 2000, FCC would benefit from such a mechanism that would provide recurring telecommunications year 2000 information.

Third, FCC has not yet developed schedules and milestones for the various segments of the telecommunications industry to achieve year 2000 compliance. Milestones for such activities as renovation, validation, and implementation can serve as useful benchmarks for evaluating progress in reaching compliance, especially as it relates to testing.

Fourth, it's important that FCC provide information to the public on telecommunications preparedness, to give assurance that this area is being adequately addressed.

And fifth, the private and public sectors must work in partnership to develop contingency plans to insure a minimum level of business continuity in the event that not all telecommunications systems are ready by 2000.

Finally, many major departments and agencies still do not yet know the year 2000 compliance status of their own telecommunications networks and systems. In fact, many agencies are still assessing the readiness of their telecommunications. As of last month's quarterly reports, we find that only 11 of 24 major Federal

agencies had reported that they had completed inventories and/or assessments of their telecommunications.

For example, Treasury reported that many of its bureaus are still inventorying their telecommunications. Regarding HCFA, HHS reported that HCFA had completed its inventory, however it was just now starting to develop plans to get its telecommunications systems compliant. With relatively little time left, this must be done as soon as possible.

Madam Chair, that concludes the summary of my statement. I'd be pleased to address any questions that you or the Members may have.

[The prepared statement follows:]

**Statement of Joel C. Willemsen, Director, Civil Agencies Information Systems, Accounting and Information Management Division, U.S. General Accounting Office**

Madam Chairwoman and Members of the Subcommittee:

We are pleased to join you today to discuss the computing crisis posed by the upcoming change of century, and its implications in one critical area: telecommunications. As you know, the year 2000 presents a particularly sweeping and urgent challenge for entities in this country.<sup>1</sup> For this reason, in February 1997 we designated the Year 2000 problem as a high-risk area<sup>2</sup> for the federal government, and have published guidance<sup>3</sup> to help organizations successfully address the issue. Since that time we have issued over 45 reports and testimony statements detailing specific findings and recommendations related to the Year 2000 compliance of a wide range of federal agency systems.<sup>4</sup> The common theme has been that serious vulnerabilities remain in addressing the federal government's Year 2000 readiness, and that much more action is needed to ensure that agencies satisfactorily mitigate Year 2000 risks to avoid debilitating consequences.

We have made many recommendations to the executive branch to reduce the risk of Year 2000-induced disruptions of critical services. Among these, we recommended that the Chair of the President's Council on Year 2000 Conversion develop a comprehensive picture of the nation's Year 2000 readiness. This effort would include identifying and assessing the risk of the nation's key economic sectors, including those posed by telecommunications.

The readiness of the telecommunications sector is one of the most crucial concerns. No one—large corporation, small business, government agency, family, or individual—is immune from the potential disruption of vital telecommunications services. The United States, with almost half of the world's computer capacity and 60 percent of Internet assets, is the world's most advanced—and most dependent—producer and user of information and telecommunications technologies.<sup>5</sup> In particular, such technologies have helped fuel the growth of the U.S. economy and have enabled major improvements in the nation's infrastructure. As a result, telecommunications service providers and their public- and private-sector customers have a lot at stake; the potential losses and disruptions that could accrue from noncompliant telecommunications systems could be staggering.

My testimony today will (1) describe our nation's telecommunications infrastructure; (2) discuss the risks we face if critical components of that infrastructure are not Year 2000 compliant by the turn of the century; (3) describe federal government

<sup>1</sup> For the past several decades, automated information systems have typically represented the year using two digits rather than four in order to conserve electronic data storage space and reduce operating costs. In this format, however, 2000 is indistinguishable from 1900 because both are represented only as 00. As a result, if not modified, computer systems or applications that use dates or perform date- or time-sensitive calculations may generate incorrect results beyond 1999.

<sup>2</sup> *High-Risk Series: Information Management and Technology* (GAO/HR-97-9, February 1997).

<sup>3</sup> *Year 2000 Computing Crisis: An Assessment Guide* (GAO/AIMD-10.1.14, September 1997), which includes the key tasks needed to complete each phase of a Year 2000 program (awareness, assessment, renovation, validation, and implementation); and *Year 2000 Computing Crisis: Business Continuity and Contingency Planning* (GAO/AIMD-10.1.19, March 1998 [exposure draft]), which describes the tasks needed to ensure the continuity of agency operations.

<sup>4</sup> A listing of our publications is included as an attachment to this statement.

<sup>5</sup> *Critical Foundations: Protecting America's Infrastructures* (President's Commission on Critical Infrastructure Protection, October 1997).

actions relating to national, international, and governmental telecommunications infrastructure; and (4) present issues that must be addressed.

#### THE TELECOMMUNICATIONS INFRASTRUCTURE

The telecommunications infrastructure comprises the public telecommunications network, the Internet, and the millions of computer systems for government, defense, commercial, and personal use. The public network includes a complex web of interconnected networks operated by local and long distance carriers, cellular networks, and satellite services. The Internet is a global network of networks interconnected by routers<sup>6</sup> using a common set of protocols.<sup>7</sup> Significant portions of the Internet rely on services provided by the public telecommunications networks.

The rich array of reliable telecommunications services is made possible by a complex web of highly interconnected networks supported by switches<sup>8</sup> and other telecommunications devices. Along with national and local carriers and service providers, other important links in the chain are the equipment manufacturers and suppliers and customers, some of whom have specific telecommunications devices installed on their premises, such as private branch exchanges (PBX),<sup>9</sup> and voice mail systems. The key is connectivity: all of the pieces must work together.

#### SERVICES VITAL TO THE NATION DEPEND UPON RELIABLE TELECOMMUNICATIONS

Telecommunications are critical to the operations of nearly every public- and private-sector organization. All other major sectors rely on it: banking and finance; health, safety, and emergency services; transportation; utilities; and manufacturing and small business. For example, it (1) enables the electronic transfer of funds; (2) is essential to the service economy, manufacturing, and efficient delivery of raw materials and finished goods; and (3) is basic to responsive emergency services.

The federal government depends on the telecommunications infrastructure to deliver a wide range of services. Many agencies, including those in the Department of the Treasury and Department of Health and Human Services (HHS), rely on both their private networks and on the public telecommunications network to conduct mission-critical business. For example, the route of an electronic Medicare payment may traverse several networks—those operated by the HHS, Treasury's computer systems and networks, and the Federal Reserve's Fedwire electronic funds transfer system. Seamless connectivity among a wide range of networks and carriers is essential nationally and internationally.

Recent nationwide telecommunications failures remind us of our dependence on telecommunications—and the fragility of complex communications systems. On April 13, 1998, a software error in a single switch caused a major carrier to fail nationwide. According to press reports, during the 24-hour outage, the carrier's corporate customers were unable to complete critical network-based business; retailers were unable to authorize credit card payments; and financial institutions could not complete electronic transactions.

Another failure occurred on May 19, 1998, when a communications satellite went into an uncontrolled spin after failure of a control system. The satellite's failure disrupted the operations of credit card authorization services, paging services for 80 to 90 percent of all pagers in the United States, and the distribution of television programs. While these failures were not caused by a Year 2000 problem, they illustrate the degree to which we depend upon reliable, available, interoperable telecommunications.

Major disruption in the service provided by the public telecommunications network can affect millions of users and cause massive financial losses. The cost of disruptions and outages caused by noncompliant computer or telecommunications systems was discussed in a recent study of the potential impact of Year 2000-related foreign exchange settlement failures.<sup>10</sup> According to the study, the market costs of a single major bank's inability to settle its trades could reach \$3.3 billion in a single

<sup>6</sup>Routers are devices that direct messages. Routers receive packets of information from computers or other routers on the network; they then send these packets to their destinations based on "addresses" at the beginning of the packets and a road map of the other computers and peripherals on the network.

<sup>7</sup>Protocols are a set of procedures for establishing and controlling data transmission.

<sup>8</sup>Switches are electronic or mechanical devices that allow connections to be established as necessary and terminated when there is no longer a session to support.

<sup>9</sup>A PBX is a telephone switch located on a customer's premises that primarily establishes voice-grade circuits between individual users and the public switched telephone network. A PBX also provides switching within the customer premises local area.

<sup>10</sup>*Sustaining Stable Financial Markets Through the Millennium*, Computer Sciences Corporation.

week. Business dependence on the public telecommunications infrastructure is particularly evident in the retail and financial sectors, where financial transactions with a combined value in the billions of dollars are made every day. Businesses and financial institutions rely heavily on telecommunications networks to participate in the global payments system, to exchange information with trading partners and regulatory agencies, and to manage their internal control systems and sophisticated computer equipment.

The consequences of not resolving Year 2000 problems in the telecommunications infrastructure are broad-based and potentially disastrous. For example, if critical telecommunications systems fail:

- The Internal Revenue Service would be unable to receive electronic tax returns or process electronic tax refunds.
- HHS would be unable to make electronic Medicare payments.
- Financial institutions and brokerages would be unable to process financial transactions and trades.
- The manufacturing and retail sectors would be unable to manage inventories.
- Air travel would have to be severely curtailed because air traffic control systems would fail.
- Credit card transactions would be hindered if communications links with point-of-sale systems fail.
- Emergency services would suffer if 911 calls were not properly routed in a timely manner.
- International voice and data services would be disrupted.

Telecommunications problems can affect virtually all network components—switches, routers, PBXs, and Internet servers—all of which must be assessed and tested. Compounding the risk is the global nature of today's telecommunications, which rely on seamless connections among widely scattered and widely diverse networks.

#### FEDERAL ACTIVITY RELATED TO THE YEAR 2000 READINESS OF THE TELECOMMUNICATIONS SECTOR

In light of the potential risks involved, the federal government has recently begun to address the Year 2000 readiness of the telecommunications sector. The government is undertaking telecommunications initiatives from three perspectives: national, international, and governmental.

##### *National initiatives*

On February 4 of this year, the President's Council on Year 2000 Conversion was created, with the mandate to cooperate with private-sector operators of critical national and local systems, including telecommunications, in addressing the Year 2000 crisis. The council's recently established telecommunications working group—chaired by a Federal Communications Commission (FCC) commissioner—held its first meeting on April 29, 1998; membership includes representatives of the Departments of Agriculture, Commerce, Defense, and State; FCC; the General Services Administration (GSA); and the National Science Foundation. The group reports that it is developing a strategy and an action plan to address the key issues facing the telecommunications sector. These include raising industry awareness of the problem and disseminating information on best practices and contingency planning.

In addition to its role on the council, within the past 2 months FCC has established a Year 2000 Internet web site, formed a task force to coordinate the activities of FCC bureaus to provide Year 2000 information for consumers and industry, and coordinated an outreach effort to state public utility commissions. Its specific national efforts are focusing on raising the Year 2000 awareness of companies under its jurisdiction, monitoring the status of Year 2000 readiness of the telecommunications sector, and helping telecommunications users obtain information from individual telecommunications service providers needed for testing.

As part of this campaign, FCC in late April sent letters to over 200 telecommunications service providers, industry associations, and other interested organizations, advising them of the seriousness and potential impact of the Year 2000 problem and asking them to share information about the Year 2000-compliance status of their services with FCC and with others in the telecommunications industry, and with the public—including making such information available on the Internet. FCC is also contacting additional service providers and equipment manufacturers, and is working with industry associations to reach the hundreds of small and mid-sized telecommunications service providers.

The Securities and Exchange Commission also has an initiative to gather information on companies' Year 2000 activities. In October 1997 and January 1998, the

Commission urged public operating companies (which would include those in the telecommunications sector) to disclose their anticipated costs, problems, and uncertainties associated with the Year 2000 issue.

#### *International initiatives*

FCC is also working on the international front, by coordinating with the International Telecommunications Union to reduce the risk of disruption to international telecommunications services. In addition, the Department of State has initiated discussions between embassies and public telecommunications network providers worldwide to determine the potential impact of the Year 2000 problem. In July 1997 the department's Diplomatic Telecommunications Services Program Office sent a cable to foreign posts asking them to determine whether the local telecommunications carriers—the national post, telephone, and telegraph companies—are aware of the problem and whether they are making plans to ensure the availability of telecommunications services on January 1, 2000.

#### *Governmental initiatives*

Year 2000 actions concerning the federal government's telecommunications networks have been initiated by the Chief Information Officers (CIO) Council's<sup>11</sup> Year 2000 Committee, GSA, and federal agencies. The CIO Council Year 2000 Committee has a telecommunications subcommittee to focus on telecommunications issues in addressing the Year 2000 problem. This subcommittee, chaired by GSA, has adopted a Year 2000 telecommunications compliance program that lays out a framework, including milestones, for agencies to use in addressing telecommunications issues. This compliance program also focuses on enhancing partnerships with industry to identify Year 2000-compliant products and services, develop test methodologies and processes, perform collaborative testing of network elements/systems, and share compliance information and test results. The subcommittee is also addressing contingency planning for telecommunications.

In addition to its role chairing the Subcommittee on Telecommunications, GSA owns, manages, or resells consolidated telecommunications services to federal agencies throughout the United States; it controls about 25 percent of all federal telecommunications services. GSA's Year 2000 program addresses three service areas: FTS 2000<sup>12</sup> services, other federal telecommunications services, and commercial services. In the FTS 2000 area, GSA plans to complete assessment of Year 2000 compliance by this September, renovation by March 1999, and validation and testing between April and December 1999. In the other federal services area, GSA is supporting agencies in hardware testing; is conducting Year 2000 telecommunications working group meetings with agency representatives; and is managing its Year 2000 web site. In the area of commercial services, GSA plans by March 1999 to conduct interoperability testing between government systems and network service providers.

### ISSUES SURROUNDING YEAR 2000 TELECOMMUNICATIONS READINESS

Key federal initiatives are in their early stages on a national, international, and governmental level, and critical issues remain to be addressed. Less than 19 months remain, yet no one currently has an overall assessment of the degree of Year 2000 risk in the telecommunications infrastructure. Accordingly, it is imperative that the executive branch, and particularly FCC and the Conversion Council's telecommunications working group, take a more active approach to addressing the Year 2000 issues of the domestic and international telecommunications sectors.

#### *National Issues*

The federal government is uniquely positioned to publicize the Year 2000 computing crisis as a national priority; take a leadership role; and identify, assess, and report on the risks and necessary remediation activities associated with the nation's key economic sectors, such as telecommunications. Accordingly, in an April 1998 report, we recommended that the President's Council on Year 2000 Conversion establish public/private partnership forums composed of representatives of each major sector that, in turn, would rely on task forces organized along economic sector lines

<sup>11</sup>The CIO Council comprises CIOs and Deputy CIOs from 28 large federal departments and agencies, 2 CIOs from small federal agencies, agency representatives from the Office of Management and Budget (OMB), and the Chairs of the Government Information Technology Services Board and Information Technology Resources Board.

<sup>12</sup>The Federal Telecommunications System (FTS 2000) is a nationwide telecommunications network providing long-distance voice and data services to federal agencies.

to help (1) gauge the nation's preparedness for the Year 2000, (2) periodically report on the status and remaining actions of each sector's Year 2000 remediation efforts, and (3) ensure the development of contingency plans to assure the continuing delivery of critical public and private services.<sup>13</sup>

In disagreeing with this recommendation, the Chair of the Conversion Council stated his belief that the council needs to be a catalyst, facilitator, and coordinator. He did, however, establish five new working groups—telecommunications among them; while not providing specific guidelines or expectations, the Chair told them to focus on developing a coordinated outreach plan and establish communications with public and private parties within each sector, and to monitor the Year 2000 readiness of each sector.

Given the inarguably critical nature of telecommunications services to the functioning of our nation, coordinated oversight is essential. In order to gain confidence that our telecommunications infrastructure will be ready for the next century, accountability must be established; this includes a broad strategy as well as specific milestones and defined accountability.

We see several major areas that must be addressed: (1) obtaining information on the current readiness status of various segments of the telecommunications industry for the next century, (2) establishing a mechanism for obtaining such readiness information on a regular basis, (3) setting milestones for achieving Year 2000 compliance, (4) disseminating readiness status information to the public and the Congress, and (5) developing—in conjunction with the private sector—contingency plans to ensure business continuity, albeit at reduced levels, in the event that not all telecommunications systems are fully operational on January 1, 2000.

#### *Current status*

Based on data from industry associations and telecommunications companies, FCC has compiled general information on the status and activities of various segments of this sector. In late April of this year, the agency asked the telecommunications industry for Year 2000-compliance information; however, as of last week, FCC was unable to provide us with information on the current status and anticipated readiness dates in areas such as satellite, cable, broadcast, and wireless services. As a major example, FCC could not provide us with data on when major interexchange (long distance) and local exchange carriers were expecting to be Year 2000 compliant.

Because FCC did not have such data readily available, we attempted to obtain Year 2000 milestone information from the major interexchange (long distance) and local exchange carriers. We focused on these 12 carriers because they hold key positions within the telecommunications sector and account for over 90 percent of the market.<sup>14</sup> We obtained this information from the carriers' World Wide Web sites, or through telephone interviews with carrier representatives.

Table 1 provides a summary of the information we gathered. The table shows that most major carriers expect to achieve Year 2000 compliance of their networks by December 1998, although for some it is either later than that date or we were unable to obtain this information. The table also shows that most major carriers plan to be fully compliant—including support systems—by mid-1999.

In addition to the individual carrier information shown in the table, some interoperability testing is planned. This laboratory-based testing, sponsored by the Telco Year 2000 Forum and by the Alliance for Telecommunications Industry Solutions (ATIS), is scheduled to begin later this year and continue throughout 1999. The forum-sponsored testing will focus on interoperability between local exchange carriers, while the ATIS-sponsored tests will focus on common equipment interoperability between a local exchange carrier and a long-distance carrier.

#### *Recurring status information*

Not only is it important that FCC know the current status of telecommunications preparedness, it is imperative that such information be obtained on a regular basis. Just as OMB and the Congress monitor individual agency progress through quarterly reports on the status of Year 2000 systems compliance, FCC would benefit from a mechanism that would provide updated status data on a recurring basis. Without this information, FCC will find it more difficult to address major problems that may occur. FCC's recent letters to the industry are a start, but ongoing receipt of information will be essential to effectively monitor sector readiness.

<sup>13</sup>Year 2000 Computing Crisis: Potential for Widespread Disruption Calls for Strong Leadership and Partnerships (GAO/AIMD-98-85, April 30, 1998).

<sup>14</sup>According to FCC, there are over 1,300 companies that provide local telephone service in the United States. More than 700 firms buy access from these companies.

Table 1: Year 2000-Compliance Status of Major Telecommunications Carriers.

Service providers	Date expected to be Year 2000 compliant	
	Network services <sup>1</sup>	Support services <sup>2</sup>
<b>Interexchange carriers</b>		
AT&T .....	December 1998 .....	June 1999
Excel .....	(did not respond) .....	(did not respond)
Frontier .....	December 1998 .....	December 1998
MCI .....	December 1998 .....	June 1999
Sprint .....	December 1998 .....	June 1999
Worldcom .....	April 1999 .....	April 1999
<b>Local exchange carriers</b>		
Ameritech .....	January 1999 .....	January 1999
Bell Atlantic .....	July 1999 .....	(not specified)
BellSouth .....	December 1998 .....	December 1998
GTE .....	December 1998 .....	December 1998
SBC .....	December 1998 .....	December 1998
Sprint .....	December 1998 .....	June 1999
US West .....	June 1999 .....	June 1999

<sup>1</sup> Network services are key systems and network elements affecting customer services.

<sup>2</sup> Support services are services and systems supporting carrier operations.

Source: individual carriers. We did not independently verify this information.

#### *Milestone setting*

While telecommunications service providers are establishing their own Year 2000 schedules, FCC has not developed schedules and milestones for the various segments of the telecommunications industry to achieve Year 2000 compliance. Milestones for activities such as renovation, validation, and implementation are important to overall Year 2000 telecommunications planning and for evaluating progress in reaching compliance.

#### *Information dissemination*

Beyond obtaining current and ongoing status information, it is important that FCC make such information available to the public—including telecommunications customers—and the Congress. The dissemination of this information could provide continuous information about the preparedness of this essential sector for the century change. Potential vehicles for such dissemination include regular reports to the Congress.

#### *Contingency planning*

Contingency plans should be formulated to respond to two types of failures: predictable (such as repairs or replacements that are already far behind schedule) and unforeseen (such as a system that fails despite having been certified as Year 2000 compliant or one that, it is later found, cannot be corrected by January 1, 2000, despite appearing to be on schedule today). Given the central nature of telecommunications to the ability of other sectors to be Year 2000 ready, a public/private partnership could be formed to develop and test necessary contingency plans, critical to ensuring the continuity of service in the event of failures.

### INTERNATIONAL ISSUES

Little is known about the Year 2000 readiness of foreign telecommunications carriers and their ability to continue to provide telecommunications services after December 31, 1999. In September 1997 the Gartner Group conducted several surveys to determine how companies around the world were dealing with the Year 2000 problem. The study did not focus on the telecommunications sector; however, its findings provide an indication of the overall Year 2000 readiness of the various geographic regions of the world. According to the study, “[t]hirty percent of all companies have not started dealing with the year 2000 problem. Small companies, health care organizations, educational institutions, and many companies in 30 percent of the world’s countries are at a high risk of seeing year 2000 mission-critical failures due to a lack of readiness.”<sup>15</sup> A more recent survey focusing on foreign tele-

<sup>15</sup> *Year 2000-World Status* (Gartner Group, Document #M-100-037, November 25, 1997).

communications service providers was conducted by the International Telecommunication Union; its results are not yet available.

FCC has also noted that Year 2000 issues have not received the same level of attention abroad as in the United States, with the exception of the United Kingdom. This was confirmed by the results of the State Department's initiative to assess the Year 2000 readiness of foreign carriers. As shown in table 2, the department received information from 113 countries, updated through March 1998. Of those, 25 countries (22 percent) expected to be compliant by this December; 26 countries (23 percent) expected to be compliant by December 1999; 33 countries (29 percent) stated that they were addressing the Year 2000 issue but were having problems; and 29 countries (26 percent) were unaware of or had not begun to address the problem. The State Department is continuing its activities to determine the Year 2000 readiness of its foreign posts, and is developing contingency plans to ensure continuity of diplomatic telecommunications services.

Table 2: Year 2000-Compliance Status of International Post, Telephone, and Telegraph Companies.

Region	Compliance expected by the end of 1998	Compliance expected by the end of 1999	Addressing Year 2000, but having problems	Unaware or not begun	Total
Central and South America .....	4	2	4	5	15
Europe and Canada .....	8	15	9	9	41
Africa .....	2	1	10	9	22
East Asia and the Pacific .....	8	6	5	4	23
Near East and South Asia .....	3	2	5	2	12
<b>Total .....</b>	<b>25</b>	<b>26</b>	<b>33</b>	<b>29</b>	<b>113</b>
<b>Percentage .....</b>	<b>22%</b>	<b>23%</b>	<b>29%</b>	<b>26%</b>	<b>100%</b>

Source: Department of State. We did not independently verify this information.

The World Bank is reporting similar findings. In an informal survey of foreign Year 2000 readiness conducted this month, only 18 of 127 countries (14 percent) had a national Year 2000 program; 28 countries (22 percent) report working on the problem; and 16 countries (13 percent) report only awareness of the issue. No conclusive data were received from the remaining 65 countries surveyed (51 percent). The World Bank is now planning to appoint a field Year 2000 representative for each country.

The Year 2000 readiness of international telecommunications networks and carriers is clearly an area of concern. All sectors of the global economy depend upon reliable communications networks to handle billions of dollars in financial transactions. Current and ongoing information to monitor the compliance status of foreign carriers would, therefore, allow the federal government and the private sector to identify troubled regions and develop contingency plans for ensuring the continuity of vital telecommunications services.

#### GOVERNMENTAL ISSUES

Without compliant telecommunications, federal agencies will be unable to provide basic services to the American public. However, many major departments and agencies do not yet know the Year 2000 compliance status of their own telecommunications networks and services. In fact, many federal agencies are just beginning to assess the readiness of their telecommunications. As of last month's quarterly reports to OMB, only 11 of 24 major federal agencies reported that they had completed inventories and/or assessments of telecommunications. The Department of Agriculture, for example, does not expect to complete its telecommunications inventory until next month—a critical assessment task that should have been completed last summer.

In closing, let me reiterate that the importance of the telecommunications infrastructure in the successful functioning of our nation cannot be overemphasized; it is the linchpin of our economy and critical citizen services. Yet the telecommunications industry faces a massive challenge to make sure that it can finish the Year 2000 job in time. While the federal government must take a stronger, more active oversight role to help ensure that this central sector is prepared, much of the responsibility inevitably lies with the industry and other countries around the world.



Madam Chairwoman, this concludes my statement. I would be pleased to respond to any questions that you or other members of the Subcommittee may have at this time.

#### GAO REPORTS AND TESTIMONY ADDRESSING THE YEAR 2000 CRISIS

*Year 2000 Computing Crisis: Actions Must Be Taken Now to Address Slow Pace of Federal Progress* (GAO/T-AIMD-98-205, June 10, 1998)

*Defense Computers: Army Needs to Greatly Strengthen Its Year 2000 Program* (GAO/AIMD-98-53, May 29, 1998)

*Year 2000 Computing Crisis: USDA Faces Tremendous Challenges in Ensuring That Vital Public Services Are Not Disrupted* (GAO/T-AIMD-98-167, May 14, 1998)

*Securities Pricing: Actions Needed for Conversion to Decimals* (GAO/T-GGD-98-121, May 8, 1998)

*Year 2000 Computing Crisis: Continuing Risks of Disruption to Social Security, Medicare, and Treasury Programs* (GAO/T-AIMD-98-161, May 7, 1998)

*IRS' Year 2000 Efforts: Status and Risks* (GAO/T-GGD-98-123, May 7, 1998)

*Air Traffic Control: FAA Plans to Replace Its Host Computer System Because Future Availability Cannot Be Assured* (GAO/AIMD-98-138R, May 1, 1998)

*Year 2000 Computing Crisis: Potential For Widespread Disruption Calls For Strong Leadership and Partnerships* (GAO/AIMD-98-85, April 30, 1998)

*Defense Computers: Year 2000 Computer Problems Threaten DOD Operations* (GAO/AIMD-98-72, April 30, 1998)

*Department of the Interior: Year 2000 Computing Crisis Presents Risk of Disruption to Key Operations* (GAO/T-AIMD-98-149, April 22, 1998)

*Year 2000 Computing Crisis: Business Continuity and Contingency Planning* (GAO/AIMD-10.1.19, Exposure Draft, March 1998)

*Tax Administration: IRS' Fiscal Year 1999 Budget Request and Fiscal Year 1998 Filing Season* (GAO/T-GGD/AIMD-98-114, March 31, 1998)

*Year 2000 Computing Crisis: Strong Leadership Needed to Avoid Disruption of Essential Services* (GAO/T-AIMD-98-117, March 24, 1998)

*Year 2000 Computing Crisis: Federal Regulatory Efforts to Ensure Financial Institution Systems Are Year 2000 Compliant* (GAO/T-AIMD-98-116, March 24, 1998)

*Year 2000 Computing Crisis: Office of Thrift Supervision's Efforts to Ensure Thrift Systems Are Year 2000 Compliant* (GAO/T-AIMD-98-102, March 18, 1998)

*Year 2000 Computing Crisis: Strong Leadership and Effective Public/Private Cooperation Needed to Avoid Major Disruptions* (GAO/T-AIMD-98-101, March 18, 1998)

*Post-Hearing Questions on the Federal Deposit Insurance Corporation's Year 2000 (Y2K) Preparedness* (AIMD-98-108R, March 18, 1998)

*SEC Year 2000 Report: Future Reports Could Provide More Detailed Information* (GAO/GGD/AIMD-98-51, March 6, 1998)

*Year 2000 Readiness: NRC's Proposed Approach Regarding Nuclear Powerplants* (GAO/AIMD-98-90R, March 6, 1998)

*National Weather Service: Budget Events and Continuing Risks of Systems Modernization* (GAO/T-AIMD-98-97, March 4, 1998)

*Year 2000 Computing Crisis: Federal Deposit Insurance Corporation's Efforts to Ensure Bank Systems Are Year 2000 Compliant* (GAO/T-AIMD-98-73, February 10, 1998)

*Year 2000 Computing Crisis: FAA Must Act Quickly to Prevent Systems Failures* (GAO/T-AIMD-98-63, February 4, 1998)

*FAA Computer Systems: Limited Progress on Year 2000 Issue Increases Risk Dramatically* (GAO/AIMD-98-45, January 30, 1998)

*Defense Computers: Air Force Needs to Strengthen Year 2000 Oversight* (GAO/AIMD-98-35, January 16, 1998)

*Year 2000 Computing Crisis: Actions Needed to Address Credit Union Systems' Year 2000 Problem* (GAO/AIMD-98-48, January 7, 1998)

*Veterans Health Administration Facility Systems: Some Progress Made In Ensuring Year 2000 Compliance, But Challenges Remain* (GAO/AIMD-98-31R, November 7, 1997)

*Year 2000 Computing Crisis: National Credit Union Administration's Efforts to Ensure Credit Union Systems Are Year 2000 Compliant* (GAO/T-AIMD-98-20, October 22, 1997)

*Social Security Administration: Significant Progress Made in Year 2000 Effort, But Key Risks Remain* (GAO/AIMD-98-6, October 22, 1997)

*Defense Computers: Technical Support Is Key to Naval Supply Year 2000 Success* (GAO/AIMD-98-7R, October 21, 1997)

*Defense Computers: LSSC Needs to Confront Significant Year 2000 Issues* (GAO/AIMD-97-149, September 26, 1997)

*Veterans Affairs Computer Systems: Action Underway Yet Much Work Remains To Resolve Year 2000 Crisis* (GAO/T-AIMD-97-174, September 25, 1997)

*Year 2000 Computing Crisis: Success Depends Upon Strong Management and Structured Approach* (GAO/T-AIMD-97-173, September 25, 1997)

*Year 2000 Computing Crisis: An Assessment Guide* (GAO/AIMD-10.1.14, September 1997)

*Defense Computers: SSG Needs to Sustain Year 2000 Progress* (GAO/AIMD-97-120R, August 19, 1997)

*Defense Computers: Improvements to DOD Systems Inventory Needed for Year 2000 Effort* (GAO/AIMD-97-112, August 13, 1997)

*Defense Computers: Issues Confronting DLA in Addressing Year 2000 Problems* (GAO/AIMD-97-106, August 12, 1997)

*Defense Computers: DFAS Faces Challenges in Solving the Year 2000 Problem* (GAO/AIMD-97-117, August 11, 1997)  
*Year 2000 Computing Crisis: Time is Running Out for Federal Agencies to Prepare for the New Millennium* (GAO/T-AIMD-97-129, July 10, 1997)  
*Veterans Benefits Computer Systems: Uninterrupted Delivery of Benefits Depends on Timely Correction of Year-2000 Problems* (GAO/T-AIMD-97-114, June 26, 1997)  
*Veterans Benefits Computers Systems: Risks of VBA's Year-2000 Efforts* (GAO/AIMD-97-79, May 30, 1997)  
*Medicare Transaction System: Success Depends Upon Correcting Critical Managerial and Technical Weaknesses* (GAO/AIMD-97-78, May 16, 1997)  
*Medicare Transaction System: Serious Managerial and Technical Weaknesses Threaten Modernization* (GAO/T-AIMD-97-91, May 16, 1997)  
*USDA Information Management: Extensive Improvements Needed in Managing Information Technology Investments* (GAO/T-AIMD-97-90, May 14, 1997)  
*Year 2000 Computing Crisis: Risk of Serious Disruption to Essential Government Functions Calls for Agency Action Now* (GAO/T-AIMD-97-52, February 27, 1997)  
*Year 2000 Computing Crisis: Strong Leadership Today Needed To Prevent Future Disruption of Government Services* (GAO/T-AIMD-97-51, February 24, 1997)  
*High Risk Series: Information Management and Technology* (GAO/HR-97-9, February 1997)

Chairman JOHNSON of Connecticut. Thank you, Mr. Willemssen. Mr. Powell.

**STATEMENT OF HON. MICHAEL K. POWELL, COMMISSIONER,  
 FEDERAL COMMUNICATIONS COMMISSION**

Mr. POWELL. Thank you, Madam Chairman, and Members of the Subcommittee. Let me first of all commend you for holding a hearing on, to what is in my mind, one of the most pressing issues facing our Nation. And in particular, to recognize the criticality and the fundamental importance of the telecommunication infrastructure, as well as other critical infrastructures, such as energy and transportation.

I thought I would take this opportunity with my comments to do a number of things for you in our discussion about this important issue. First of all, I'd like to give you a brief background about our approach, especially in light of some who would suggest a slightly more activist heavy regulatory approach than the one that we've chosen.

Second, I would like to point out some of the unique attributes of the telecommunications industry, which provides some level of confidence that they are better prepared to deal with this problem than a significant number of other industries in our economy.

Third, I'll give you a rough general assessment where telecommunications carriers are and how they're progressing. And finally, a little bit about our ongoing efforts to assess the status.

I first would say that our approach to this issue is to leverage our existing regulatory relationship with industries and to encourage and promote a cooperative mission-oriented relationship that will allow us to actually get this problem licked, rather than set up for regulatory consequences.

We've elected this approach, rather than a top-down regulatory one, for a number of reasons. I think they're important to point out. First and foremost among them is that there is very little time to get this job done. Only private firms can fix these problems, and we must have their cooperation and we must have their timely and candid disclosure of information to get it done.

We at the FCC are of the opinion, and our experience shows, that a heavy regulatory approach will lead to guarded communications,

the involvement of lawyers rather than technologists and managers, and a huge loss of time while we haggle over requests and regulatory demands. Significant time to my mind would be lost to developing, issuing, evaluating, and compiling lengthy data requests, and such efforts would divert both the agency's limited resources and those of companies from actually working the problem, which after all, is what matters most.

The FCC has been working this problem for a number of years. More importantly, so have most of the major carriers. Indeed, I think it would be important to understand that this industry is probably better equipped and positioned to address this issue than most in our economy. And let me give you a few reasons why.

First and foremost, this industry is dependent upon a highly complex technical network that is engineered for near unfailing reliability. The Bellcore standard is 99.9999-percent uptime. Indeed, the average switch is supposed to be operational and only be down for 3 minutes in any given year. Thus, these companies have a strong stable of trained experts in network reliability issues. They have experience with identifying threats to network reliability, planning corrections, and executing those corrections. They also have experience doing similarly herculean tasks, such as having pulled apart the network after the AT&T divestiture, and re-engineering that network when we changed the area code system.

Second, because of the importance of network reliability and interoperability, there are a number of first-class technical consortiums that have a long history of developing standards and addressing network issues, and then sharing that work with its members. Bellcore has served in this role for the phone system since days of old. In the area of cable, for example, there is CableLabs, a research and development consortium of cable television system operators which currently represent more than 85 percent of all subscribers in the United States.

Third, the industry has a number of very influential umbrella associations that serve as important contact points for the FCC, and they are optimized to provide timely dissemination of information to its members.

Fourth, though in the throes of deregulation telecommunications has been heavily regulated at both the State and Federal level. This means there are well established relationships between the industry and the government.

And fifth and perhaps most importantly, for once the industry's own self-interest happens to be congruent with that of regulators. They well understand that they potentially face financial ruin, diminished good will and brand name, regulatory trouble, and perhaps most importantly, legal liability. All at a time when the Telecommunications Act of 1996 is ushering in new competition.

Let me offer you a general assessment of the telecommunications industry. Given the factors I've just discussed and other things we've observed, our general assessment of the industry is positive. While there are problems and concerns, we are quite confident that the basic phone net will be able, in year 2000, to provide phone service of similar quality and reliability as that that's being provided today.

Madam Chairman, I see my time is up. Could I briefly conclude?

Chairman JOHNSON of Connecticut. Thank you both. Are you close to conclusion? Did you cut yourself off?

Mr. POWELL. Well, I can either give you a general assessment of the telephone industry as part of the opening statement, or just in response to your question.

Chairman JOHNSON of Connecticut. I would prefer you conclude.

Mr. POWELL. Though others and we are concerned about the network because of its importance, no one I'm aware of believes the telephone network is headed toward catastrophic failure.

And let me just briefly share with you the partial basis of our positive assessment. First, most major carriers anticipate completing the mission-critical changes by the end of this year, with most others confident they will wrap it up in the first half of next year. The time they have dedicated to these issues, on average 3 to 4 years; the expenditures for working the issue, on average \$300 to \$400 million; the personnel being dedicated; and the strength of the assessment and executive plans we have seen, gives us some confidence that these timelines are realistic. Moreover, they comport with what we hear from State regulatory agency and key users of the system.

Second, manufacturers of critical equipment, such as switches and software, report that they have corrected and tested most of their products and have them available for customers. Major manufacturers have extensive programs in place and are working closely with the carriers. Most have targeted the end of this year, the beginning of next, for general availability of all their products.

And finally, there are well organized efforts to conduct mission-critical testing. The Telco Y2K Forum, comprised of eight major ILECs, including Ameritech, Bell Atlantic, Bell South, and the others, is conducting component integration testing. The forum allows companies to share resources information solutions. The Alliance for Telecommunications Industry Solutions, ATIS, is another major forum that is conducting critical interoperability testing in January and February 1999. ATIS reports that such testing should encompass network configurations that serve over 90 percent of the Nation. Indeed, we heard recently that wireless carriers are planning to test off the ATIS effort.

These efforts are critical because it is nearly impossible, and this must be understood, to conduct end-to-end testing on the network, which everyone must understand must run 24 hours a day, 7 days a week, and will not have the luxury of being taken offline for testing.

With that, I will conclude, Madam Chairman, and await your questions. Thank you.

[The prepared statement follows:]

**Statement of Hon. Michael K. Powell, Commissioner, Federal Communications Commission**

Good afternoon, Madam Chairman, and distinguished members of the Subcommittee. I commend you for holding a hearing on the critical issue of the Year 2000 problem, and I welcome this opportunity to discuss the potential impact of the Year 2000 problem on our nation's telecommunications networks.

In the seven months that I have been at the Federal Communications Commission (FCC), I have been struck by the fact that almost every sector of our economy and every part of our government depends upon our telecommunications system. Many of the critical programs that the Ways and Means Committee oversees, such as So-

cial Security and Medicare, also depend upon this ubiquitous communications infrastructure and consequently could be seriously affected if the Year 2000 problem interrupts telephone and data networking services.

Today, I would like to: (1) summarize what we know about the Year 2000 problem and how it might affect the nation's telecommunications networks; (2) list what we do not know; and (3) describe what the FCC has done, and intends to do, to ensure that our nation's critical telecommunications infrastructure still functions at its full capacity and effectiveness on and after January 1, 2000.

My comments today will focus primarily on wireline telecommunications services. However, it is important to note that the FCC is engaged in outreach and assessment initiatives in each of the different subsectors of the communications industry, including terrestrial wireless, radio and television broadcast, cable television, international telecommunications and satellites. Attached to my testimony is an appendix summarizing how each of these different industries may be affected by the Year 2000 problem and what industry and the FCC are doing to address these problems.

#### WHAT WE KNOW ABOUT THE YEAR 2000 PROBLEM

The FCC has been monitoring the telecommunications industry's efforts to meet the Year 2000 problem for the past several years, and has developed an understanding of the scope of problem and how it may affect the nation's telecommunications networks. Let me elaborate briefly on some of our observations.

*The Year 2000 problem is simple to understand.*

The cause of the Year 2000 problem is very simple. It is caused by the fact that many computer programs use only two digits to store the year (e.g., the program translates "67" to mean "1967"). At the turn of the century when the date changes from 1999 to 2000, there are concerns that these systems will fail to recognize the millennial change, thereby erroneously assuming "00" to be "1900," not "2000."

*The Year 2000 problem has complicated consequences.*

While the cause is simple, because so many computer and communications systems are interlinked and interdependent, the consequences could be complex, unpredictable, and in some cases very serious. The recent AT&T frame-relay network outage and the failure of PanAmSat's Galaxy IV satellite highlighted how many different systems can be affected by the failure of a single piece of hardware. Fortunately, telecommunications networks are designed to be fault-tolerant and there is no reason to believe that one or two Y2K-related failures could lead to a chain reaction that could disable large parts of the nation's telecommunications networks.

*The Year 2000 problem does not affect every computer.*

After reading some articles on the Year 2000 problem, it would be understandable that one would conclude that every computer chip, every software program, and every computer had a Year 2000 problem. That is not the case. Most devices do not care what time it is and thus are not affected.

*Most Year 2000 glitches will be annoying, not disastrous.*

For those systems that have a Year 2000 problem, it will often be the case that the problem will not disrupt the whole system, it simply will make some features or functions, which are not "mission-critical," difficult or impossible to use.

#### WHAT WE KNOW ABOUT FIXING THE YEAR 2000 PROBLEM

As part of the FCC's outreach and assessment initiatives, the Commission's Bureaus and Offices have been communicating with the various industry players who are individually responsible for ensuring that their networks and systems are Year 2000 compliant. We are reminded daily of the fact that carriers, manufacturers, licensees, and users of telecommunications services—many of whom are assembled here today—have been working on the problem for many years and have invested substantial capital and manpower.

We are also reminded of the many technical and management-oriented challenges that lie ahead. *First*, the telecommunications network is a tremendously complicated thing and consists of millions of interconnected parts. When you make a phone call from here to New York, every element along the established circuit has to work: the telephone itself, the Private Branch Exchange (i.e., switchboard) in your building, the central office switch, the computers that connect your call to its destination, the long-distance trunk lines, as well as the central switch and the telephone on the other end. If any one of those components is affected by the Year 2000 problem, your call might be disrupted.

*Second*, there are literally thousands of companies to engage in the wireline telecommunications industry. Simply put, there are the major telecommunications carriers like the Bell Operating Companies, GTE, AT&T, MCI and Sprint. But there are also 1,400 small to mid-size telephone companies that serve many rural, insular and underserved parts of the country as well as the U.S. territories and possessions. Telecommunications carriers alone, however, cannot solve the whole problem. For example, manufacturers of central office switches and other customer premises equipment are vital participants in the collective Year 2000 effort. And, finally, we cannot forget about the telecommunications users who have to take action to ensure that their telecommunications equipment—their telephones, their voice mail systems, their Private Branch Exchanges (PBXs), their local area computer networks—are all Year 2000 compliant. It will not do much good if all the telephone companies fix all their networks, but then major corporations and governmental organizations cannot call out of their buildings because their internal systems do not work.

*Third*, it will be long and hard work to fix the Year 2000 problem. There are no magic bullets that will automatically fix software affected by the Year 2000 problem, and it is unrealistic to expect that one will be invented between now and the year 2000. There will also be a profound management challenge to deploy technical solutions in a timely fashion without affecting the quality and level of communications service.

*Fourth*, testing is (and will continue to be) the hardest part. Most telecommunications companies estimate that testing comprises 50 to 70 percent or more of their Year 2000 efforts. And, testing often uncovers more problems that need to be fixed.

*Fifth*, we cannot get an extension on this deadline. Time is of the essence with only 564 days left till January 1, 2000.

#### WHAT WE KNOW ABOUT TELECOMMUNICATIONS INDUSTRY Y2K EFFORTS

In the last few weeks, public attention has started to focus on the Year 2000 problem. There have been illustrative examples of non-Year 2000 related network failures, such as the AT&T data network incident and the Galaxy IV satellite incident, that have been prominently featured in the general media. These events have hastened public concern about the telecommunications industry's readiness and capacity to implement Year 2000 compliance remedies. Unfortunately, we hear more Year 2000 horror stories than Year 2000 success stories. Horror stories get repeated and reprinted, success stories get filed away and forgotten.

The subcommittee should know (and it is my understanding) that U.S. telecommunications carriers are very motivated to fix the problem. However, this is a dynamic process. Simultaneously, the equipment manufacturers have to develop upgrades and patches for their products, telecommunications carriers have to assess and prepare their systems for change and when technical "fixes" arrive they must install and test the equipment in their networks, and they also have to conduct interoperability tests with other carriers and with their customers.

I have been told that U.S. equipment manufacturers have already tested and fixed most of their products. The major manufacturers have had extensive Year 2000 programs in place for some time, and have been working closely with both local and long distance carriers to develop strategies for Year 2000 readiness. Manufacturers report that most of their software and hardware products are already Year 2000-ready and have been made available to customers. They have targeted end-of-year 1998 or first quarter 1999 for general availability for all Year 2000-ready products.

The carriers report that the manufacturers' schedules will enable them to meet their compliance objectives. According to information submitted by the carriers to the FCC, the major local and long distance carriers have been working on the Year 2000 problem since 1995 or 1996 and generally plan by late 1998 or early 1999 to have completed internal testing of all systems that are critical to the passage of telecommunications traffic.

The carriers are also cooperating on interoperability and end-to-end testing. The Telco Year 2000 Forum, which is comprised of eight large regional local exchange carriers, is performing integration testing on Year 2000-ready equipment throughout 1998. The Alliance for Telecommunications Industry Solutions (ATIS), which is an industry-funded organization whose mission is to advance new telecommunications technologies, will conduct inter-network interoperability testing in January and February 1999. According to ATIS, the interoperability tests should encompass network configurations that serve over 90 percent of the country. This type of cooperative industry testing is very important because it is nearly impossible to conduct interoperability and end-to-end tests on the public-switched telephone network. The nation's phone network has to be up and running 24 hours a day, 7 days a week

and it involves millions of different elements. The telephone companies cannot disconnect their network and turn the clock ahead to the year 2000 to do a test.

Of course, there are areas of concern to the FCC. For example, although the largest 20 phone companies provide 98% of U.S. phone lines, there are over 1,400 telephone companies, and each one needs to address the Year 2000 problem. The small to mid-size telecommunications carriers have further to go, and the FCC is working with the various trade associations to ensure that these smaller carriers also meet the challenge.

There is also the international dimension to the Year 2000 problem. The United States, Canada, and the United Kingdom are ahead of the rest of the world, but the FCC is concerned that some international telecommunications carriers, especially those in developing countries, are just realizing the seriousness of the problem and have not yet taken the necessary steps to prevent system failures. Because global telecommunications rely upon seamless interconnection of networks, the international dimensions of the Year 2000 problem are especially significant.

On the international front, the FCC is taking an active role in the International Telecommunication Union's ("ITU") Year 2000 Task Force to promote international awareness and provide guidance on Year 2000 readiness. The ITU Year 2000 Task Force is establishing "Y2000 Ambassadors" who will serve as regional coordinators for assistance on Year 2000 problems and activities, and the FCC will assist in the region of the Americas.

#### WHAT WE KNOW ABOUT THE GOVERNMENT'S ROLE

The FCC's role is important, but our power to force carriers, manufacturers, and telecommunications users to address the Year 2000 problem is limited. Consequently, we are working to promote an effective public-private partnership.

We believe that the FCC can play an important role by encouraging companies to share information with each other and with their customers. This will increase the sharing of solutions, avoid duplicative testing, help companies spot undetected problems, and reduce customer uncertainty and anxiety. Fortunately, the World Wide Web provides a very powerful tool for information sharing. We have discovered over 2000 Year 2000 Web sites, including the FCC's own Web site at <http://www.fcc.gov/year2000/>, which has received over 10,000 hits to date.

There may also be a significant role to be played by the Administration and Congress with regard to the legal liability issue which has slowed the information flow. Some companies have been reluctant to divulge information due to concerns about liability. Several companies and organizations have developed very useful Web sites and databases, which are not available to the general public because of liability concerns. In addition, antitrust concerns have discouraged some cooperative efforts. I understand that the Justice Department recently released a letter designed to allay antitrust concerns, but uncertainty still exists.

#### WHAT WE DO NOT KNOW YET

The real problem with the Year 2000 problem is what we do not know.

*How serious are the cascade effects?*

At this point, we just do not know all the ways that the failure of one piece of the network could trigger failures elsewhere in the system.

*Can we make sure that all the fixed systems work together properly?*

It is essential that companies do interoperability testing to make sure that their systems will function on January 1, 2000. But unfortunately, such tests cannot be done until all the individual pieces of the system are fixed.

*How long will it take to fix problems that occur in January 2000?*

If too many problems are overlooked or ignored, there just will not be enough technicians and equipment to fix everything. Unless companies are willing to be offline for months, they cannot wait until the Year 2000 to fix their problems.

#### WHAT THE FCC HAS DONE

The FCC has been aware of the Year 2000 problem for many years. In 1995, we started to examine and fix our internal computer systems. In early 1997, the FCC made a coordinated effort to find out what industry was doing about the problem. At that time the responses were: (1) "It is not that serious. . ." (2) "We are taking care of it. . ." and (3) "There is not much the FCC can or should do. . ." Prior to 1997, the FCC's individual Bureaus and Offices were following the issue.

By late 1997, we were starting to hear increased concern as more companies did more tests and discovered just how pervasive the problem is and realized that they could be vulnerable if their partners, suppliers, and customers were adversely affected by the Year 2000 problem. Earlier this year, many telecommunications users came to the FCC seeking more information on the seriousness of the problem and what the telecommunications companies were doing about it. We determined we could play a valuable role by promoting information dissemination.

In mid-March, the Commission created its Year 2000 Working Group. In mid-April, at the request of FCC Chairman William Kennard, I agreed to oversee the FCC's Year 2000 efforts and represent the agency on the President's Council on Year 2000 Conversion, which was established on February 4, 1998. I also co-chair with Dennis Fischer of the General Services Administration (GSA) the Council's Working Group on Telecommunications, which met for the first time on April 30, 1998.

We have been encouraged because telecommunications companies have been providing more information on how the Year 2000 problem could affect their systems and services and what they are doing to ensure they are Year 2000 compliant. This is partly in response to pressure from customers, the FCC and the Securities and Exchange Commission, but primarily due to the fact that the companies are making good progress, and are more willing to share the good news.

#### WHAT THE FCC INTENDS TO DO

I want to emphasize that the FCC takes very seriously its responsibility to work closely with the communications industry to ensure that the Y2K challenge is successfully met. As part of the Commission's sector outreach initiative, the FCC is engaged in activities divided into three distinct but interrelated operational modes: (1) outreach and advocacy; (2) monitoring and assessment; and (3) regulatory actions and contingency planning.

The FCC's first operational mode is to encourage private sector compliance efforts and to foster information sharing. Accordingly, we will continue efforts to ensure all companies understand the seriousness of the problem. We have set up a Web site and sent over 200 letters to major companies and organizations in all sectors of the telecommunications industry. Chairman Kennard, myself, the other commissioners, and FCC staff are all mentioning this problem in speeches and in meetings with leaders in the telecommunications industry.

Our second mode is to monitor industry Year 2000 compliance efforts and to assess the pace and extent of the implementation of remedial actions. In June alone, we organized five roundtables with representatives of different sectors of the telecommunications industry to facilitate information sharing and see how the FCC can assist industry efforts to tackle the Year 2000 problem. The Commission is asking the National Reliability and Interoperability Council, a private-sector committee that advises the FCC on technical issues, to take steps to foster industry cooperation on Y2K compliance testing and other related problems.

Finally, if we learn in coming months that some companies are not making enough progress in addressing the Year 2000 problem, we may decide to use our regulatory authority to gather additional information or to accelerate Year 2000 compliance efforts. We have done a thorough review of how we might use our regulatory authority to ensure that companies in all sectors of the telecommunications industry are adequately addressing the Y2K problem and are fully informing their customers about their efforts. Of course, we view regulation as a last resort.

Because we know that not every problem will be fixed and because we cannot anticipate all the consequences of Murphy's Law, we intend to encourage contingency planning by service providers and customers.

#### CONCLUSION

Without a doubt, it is critical that the U.S. telecommunications community take prompt, comprehensive and effective action to address the Year 2000 problem. Our national well-being is dependent upon the reliability of all the nation's telecommunications networks, and government and industry must work together to ensure that whatever disruptions occur do not lead to widespread outages and failures. To that end, the FCC is committed to taking whatever actions it can to facilitate information sharing and industry compliance efforts.

Once again, I commend the committee for holding this hearing and focusing attention on this critical issue. I would be happy to answer any questions you might have.



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**Attachment**

**Overview of the Year 2000 Problem in the Communications Sector:  
Concerns and Actions**

COMMON CARRIER BUREAU

*Biggest concerns:*

- Upgrading network switches (although manufacturers are on schedule to provide fixes).
- Upgrading Customer Premises Equipment (CPE), voice mail systems, Private Branch Exchanges (PBXs), ensuring interoperability with the network.
- Ensuring telephone companies (telcos) cooperate fully with major customers and each other to facilitate Year 2000 interoperability testing.
- Ensuring small telcos have the resources and expertise needed to fix the problem.
- Dealing with billing and other internal systems.

*What the FCC is doing:*

- Meeting with large and small telcos, telephone trade associations, switch manufacturers, financial interests (banks and clearing houses), and other major users.
- Requesting information from telcos, equipment manufacturers, trade associations, and Bellcore, and encouraging the sharing of Year 2000 information among industry participants.
- Planning interindustry roundtables to facilitate the sharing of solutions to Year 2000 problems and identify barriers to solving Year 2000 problems. Telcos, equipment manufacturers, and users have been invited to participate.
- Assessing possible regulatory actions to facilitate Year 2000 readiness, including requiring detailed information on Year 2000 compliance, if necessary.
- Sharing information with other Federal agencies, and improving the FCC Year 2000 website with updated information and links to other Year 2000 websites.
- Analyzing responses to detailed information requests sent to all local exchange carriers and interexchange carriers, as well as to some smaller carriers and to the major telephone equipment manufacturers, on their Year 2000 efforts. Responses have begun arriving. As of June 11, 1998, nineteen companies had filed responses. These efforts will help develop a clearer picture of the Year 2000-readiness of the telecom sector.
- Meeting with Year 2000 project managers from manufacturers and telcos to impart the Commission's concern and to obtain additional information about their Year 2000 programs.
- Encouraging companies and industry trade associations to make more information about their Year 2000 efforts available to the public through their websites.
- Planning an interindustry roundtable forum for late-June 1998 to facilitate dialogue among manufacturers, carriers and major users on Year 2000 issues.
- Continuing outreach efforts to ensure that all companies understand the seriousness of the problem, as well as monitoring to obtain as much information as possible.
- Assessing regulatory actions that could be taken, if necessary, to gather additional information and/or accelerate Year 2000 compliance efforts.

*What industry is doing:*

- Major telephone companies have been devoting significant resources to ensuring that primary telecommunications networks continue to function on and after January 1, 2000.
- Eight regional telcos have formed the Telco Year 2000 Forum to share information and facilitate intranetwork testing of remediated systems.
- The Alliance for Telecommunications Industry Solutions (ATIS), funded by exchange and interexchange carriers, is undertaking the development of laboratory tests (now scheduled for January-February 1999) of inter-network interoperability of remediated systems.
- Bellcore is providing expertise, leadership, testing facilities, and technical standards for Year 2000 compliance.
- U.S. Telephone Association sent out an advisory to its members in mid-1997.

## CABLE SERVICES BUREAU

*Biggest concerns:*

- Power system failures could disrupt cable service, including the cable system's emergency alerting system messages.
- Billing systems could generate faulty data.
- Satellite telecommunications links could be disabled.

*What the FCC is doing:*

- Sent inquiries to major cable television companies, cable equipment manufacturers and cable trade associations regarding Y2K.
- Posted questions on the Internet regarding Year 2000 problems in cable systems to more than 1500 cable engineers and technicians.
- Conferred with CableLabs, the research arm of a consortium of cable companies, which has established an industry task force to address Y2K issues. Will continue this dialogue.
- Trained Cable Services Bureau telephone contact representatives to answer questions from the public and operators regarding Y2K problems and compliance.
- Continued dialogue with cable operators and equipment manufacturers, including informal sessions with multiple system operators (MSOs).
- Scheduled to hold an open forum for the public and the cable industry.

*What industry is doing:*

- CableLabs has formed a Year 2000 working group that consists of the major cable multiple system operators. These MSOs encompass a significant number of cable subscribers and a large majority of the nation's cable systems. Cable operators who are not members of the Year 2000 Working Group will still benefit from the group's efforts because CableLabs is conducting a nationwide assessment and will share information with all cable operators.
- To our knowledge, the CableLabs group intends to meet every two months to monitor the progress of the industry and to provide the industry with CableLabs' research. In addition, CableLabs will monitor the equipment of cable suppliers to determine Y2K compliance. In September, 1998 in Denver, CableLabs plans to hold a cable vendors conference at which cable equipment suppliers, cable billing systems vendors, and vendors of television commercial insertion equipment are invited to attend and confer on their progress in achieving Y2K compliance.

## MASS MEDIA BUREAU

*Biggest concerns:*

- Emergency Alert System may fail just when it is needed most.
- Lack of broadcast news may result in misinformation and mass panic.
- Old transmitters and other systems may be hard to test or fix.

*What the FCC is doing:*

- Speaking out on Year 2000 issues at National Association of Broadcasters (NAB) convention and other forums.
- Writing to broadcasters and trade associations.
- Meeting with broadcasters and equipment manufacturers.

*What industry is doing:*

- NAB has created a Web site on Year 2000 issues and assigned a Senior Vice President to work on the issue.

## WIRELESS TELECOMMUNICATIONS BUREAU

*Biggest concerns:*

- Radios for police, fire, and other emergency services could fail due to Year 2000 problems. Many of these systems are quite old and manufacturers may not be able to provide fixes for all of them.
- Wireless systems could fail, just when they might be needed as backup to wireline telephones.

*What the FCC is doing:*

- Writing the major wireless companies, equipment manufacturers, and trade associations.
- Meeting with representatives of different part of the wireless industry to assess their efforts.

- Planning future forums on the Year 2000 problem and the wireless industry. The FCC has already held three of these forums.
- Considering options to condition licenses, renewals, and auctions on Year 2000 compliance.

*What industry is doing:*

- The public response of the wireless industry to the Year 2000 problem has been uneven.
- Major manufacturers and large companies have tested almost all of their products and intend to have fixes available by the end of the year.
- Many users of wireless devices, most notably police and fire departments, are just starting to assess their Year 2000 problems.

#### INTERNATIONAL BUREAU

*Biggest concerns:*

- Whether foreign telecommunications companies, especially large segments of the developing world, will be able to provide service on January 1, 2000. This could have a huge impact on international trade, foreign investment, the global economy, and even national security.
- Whether satellite links are Year 2000 compliant.
- In many foreign countries, particularly in Asia and Africa, telecommunications companies are only now becoming aware of the Year 2000 problem, and they lack the resources to fully address it.

*What the FCC is doing:*

- Writing to international telecommunications companies and satellite and HF service providers.
- Publishing letters in industry publications and ITU publications.
- Working with the International Telecommunications Union to educate and motivate foreign telephone companies as well as with the Department of State.
- Planning roundtable discussions to raise awareness, seek solutions, and informally survey progress of industry's efforts to ensure that industry is doing all it can to avoid any disruptions in service. A roundtable with international telecommunications carriers will occur June 29. A roundtable with the satellite industry will be July 14.
- Raising issues with foreign delegates, in tandem with these roundtables, in the context of the FCC's Visitor's Program and Foreign Regulator Workshop.
- Speaking out about the Year 2000 problem at international telecommunications meetings.
- Increasing international awareness through the ITU Year 2000 Task Force and providing direction on Year 2000 readiness by hosting workshops. FCC is participating in these.

*What industry is doing:*

- Telecommunications companies are working hard to fix Year 2000 problems.
- Satellite companies have set up "war rooms" to deal with the Year 2000 problems.
- Most, if not all, U.S. telecommunications companies have established an office for Year 2000 compliance.
- Several countries, including the United Kingdom, Canada, and Australia have high-profile efforts under way to tackle the Year 2000 bug, and their telecommunications companies (e.g., British Telecom) are working with foreign partners on the problem.

#### COMPLIANCE AND INFORMATION BUREAU

*Biggest concerns:*

- Ensuring that internal database systems and equipment used by the Bureau for enforcement purposes is Year 2000 compliant.
- Preparing the National Call Center to collect data and respond to inquiries relating to Year 2000.

*What the FCC is doing:*

- Checking CIB database software and computers used in the enforcement program, such as mobile and fixed direction finding systems, Global Positioning System (GPS) receivers and the software used to operate these systems.

- Preparing to collect data regarding calls received by the National Call Center and to provide information to the Call Center personnel from other Bureaus and Offices to use in responding to incoming Year 2000 calls.

## OFFICE OF ENGINEERING AND TECHNOLOGY

*Biggest concerns:*

- Telecommunications equipment testing labs may close down or generate faulty data due to Year 2000 problems

*What the FCC is doing:*

- Sending letters to testing labs.
- Directing the Network Reliability and Interoperability Council to focus on Year 2000 issues and facilitate Year 2000 testing of telecommunications networks.
- Coordinating construction of the FCC's new Year 2000 Web site.

## OFFICE OF THE GENERAL COUNSEL

*What the FCC is doing:*

- Reaching out to the Communications Bar to increase their awareness of Year 2000 issues and urge them to press telcos to increase their efforts to address the problem.

## OFFICE OF PLANS AND POLICY

*What the FCC is doing:*

- Coordinating the FCC's efforts to work with industry on Year 2000 issues.
- Examining whether the Internet will be affected by Year 2000 problems.
- Contacting Internet organizations and Internet equipment vendors.

## OFFICE OF INSPECTOR GENERAL

*Biggest concern:*

- The possibility that the Commission's mission-critical systems will not be Year 2000 compliant.

*What the FCC is doing:*

- Participating on a Year 2000 task force addressing the Commission's mission-critical information systems and Information Technology infrastructure.
- Participating on a Year 2000 task force monitoring the telecommunications industry.
- Monitoring the activities of other Inspectors General, the Office of Management and Budget, and the General Accounting Office.

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Chairman JOHNSON of Connecticut. I thank you very much, both of you, for your testimony this morning. I do think an interesting aspect of private sector compliance is the enormous motivation that every private sector company has to make sure that they are compliant. On the other hand, I don't think that the problems of interconnectedness and the enormous complexity of the interactive systems can be underestimated.

Let me ask both of you whether or not it's your opinion—this is in followup from our hearing in May—when you look at what the Federal agencies are doing, do you think they have sufficient in-house expertise in the telecommunications area to be able to both assess and correct the problems?

Mr. WILLEMSSEN. I'd say, Madam Chair, the answer is very mixed. We see varying degrees of strength at different agencies. An example of one of the strongest information technology organizations among the civilian agencies would be the Social Security Administration. They've got generally quite a bit of talent in this

area. They've taken a lot of initiative, not just on telecommunications, but on year 2000 in general.

In other areas, that strength is not always so apparent in-house, and therefore it's obviously critical to get additional contractor and consultant help to address the issue.

Chairman JOHNSON of Connecticut. How effective is OMB in supporting the agencies in getting the quality contractor that they need and in coordinating the inventory and movement toward solution?

Mr. WILLEMSSEN. I think we've seen very recently more efforts on the part of the administration, centrally led by Mr. Koskinen's group, to get the necessary support, especially in the personnel area. There has been some movement in this area. For example, OPM has recently allowed waivers of recent retirees to come back to work for the Federal Government without financial penalties, if they have the capabilities to help on the year 2000 issue. So I think we're seeing more movement on that. If you'd asked me that question 6 months ago, I would have been more pessimistic.

Chairman JOHNSON of Connecticut. Do you think it's sufficient to meet the challenge?

Mr. WILLEMSSEN. Not in all cases at this point. We still have major challenges at several agencies. But I think there's a much greater degree of attention to those challenges and responsiveness to take the action that's necessary. I'll hold in suspense my judgment until I see that action—but at least we're seeing more of a willingness to move in that direction.

Chairman JOHNSON of Connecticut. Mr. Powell.

Mr. POWELL. Based on my responsibilities and my position, I have very little information about how individual agencies are doing with respect to their own telecommunications systems.

I do think that what I can add to your question, which you rightly recognize, is that in the telecommunications network it's going to be critical to understand that while even if we were able to ensure the reliability of the basic network, there are critical gateways to that network that are in the possession of private parties within their own internal systems.

Whether it be a government agency or a major end user, like the bank, the average large institution has a pretty sophisticated internal network that's solely their property and their possession, and indeed their responsibility. PBX systems, internal networks and connections, phone systems, phone equipment all must be compliant and able to properly access the network as well.

So, AT&T or your local phone company may do all that it needs to do, or is capable of doing, in terms of the network, but you still may not be able to communicate or use that network because of equipment within your possession.

Unfortunately, the FCC doesn't have much regulatory authority with respect to that kind of equipment. But, what we've been trying to do is to sort of use the bully pulpit and urge the service providers to make its major customers aware that it needs to do inventory and assessments of those systems and needs to bring them into compliance if they have hope of communicating effectively, and to get the equipment manufacturers to play a critical role of making sure a lot of these customers understand that a serious amount

of the equipment is within their own possession. Some of which hasn't been upgraded in a very, very long time, and is unlikely to be compliant.

Chairman JOHNSON of Connecticut. Is it—you say in your testimony that you've been told that U.S. equipment manufacturers have already tested and fixed most of their products. How confident are you that they'll be able to produce the volume of product needed, when all of these inventories and assessments are complete?

Mr. POWELL. I would say that we have some guarded optimism in that respect for a number of reasons. I think first and foremost, largely what we're talking about in many cases is software patches and fixes, which has the benefit of being able to be distributed in some cases electronically. We also have a community of pretty sophisticated operation folks who are very accustomed to doing such network upgrades, and sophisticated operations like this, so I'm confident that they can execute it efficiently.

There will be a number who actually need real equipment in the sense that you and I would understand it. That is, a big box, a big switch, a big computer. I think that's a much smaller number of carriers and private companies, but nonetheless, that will be a much more significant logistical and capital challenge.

Chairman JOHNSON of Connecticut. Is the FCC working with the International Telecommunications Union?

Mr. POWELL. Yes, indeed we are. I think as Congressman Coyne pointed out, one of the areas we are most profoundly concerned about is the network in the international sense. It will be a significant blow to the economy if AT&T is not able to terminate traffic in significant capitals around the world. It will be a very significant blow to the financial system if monetary payments are inhibited because of the international telecommunications systems.

Chairman JOHNSON of Connecticut. Certainly given the seriousness of the consequences of inability to communicate internationally, is this organization developing or moving toward the development of international standards so that there will be broad compliance?

Mr. POWELL. My evaluation would be that the international forums are moving, but moving very slowly. Significantly slower than domestic efforts in the United States and progressive countries such as Canada and the United Kingdom. What we see in the ITU, International Telecommunications Union, is at least a serious acknowledgment now of the issue. They've created the appropriate forums, they had deputized what they call, I believe, Y2K ambassadors, whose mission and role it is to begin to push international telecommunications companies toward doing this.

We work very hard with those companies we do regulate to push them in their business and commercial relationships with foreign carriers to try to press this issue. But it's difficult to underestimate how serious it is, because there are many challenges facing some of the key parts of the world that are distracting from this problem.

As the president of Deutsche Telecom recently said to me, we have two year 2000 problems—one is this, and one is the Euro. These are things that are really diverting energy and efforts from this issue, and we're going to have to find every forum possible to push that.

Chairman JOHNSON of Connecticut. Is the EC pushing it, along with Euro? I mean, what's happening? You mentioned the United Kingdom, but—

Mr. POWELL. Madam Chairman, I don't have specific information about the EU specifically, but I will say that this issue has begun to be put on the agenda of major multilateral and bilateral forums.

Indeed, while I don't speak for the administration, it's my understanding that this issue was placed on the agenda at the recent G8 Summit. It's my understanding that the State Department has been working to provide communiques and make contacts with foreign government ambassadors in order to raise and place the issue at the height of the foreign policy agenda.

I know Secretary Albright has spoken out about the issue. I think we are in the heavy awareness stage, and again, that's important. But where we're not, from my general assessment, we're not yet in the significant implementation phases in key parts of the world.

Chairman JOHNSON of Connecticut. Just one last question. In preparing for this hearing, the Congressional Research Service did some background work for us. They say, based on currently observed measures, the telecommunications and networking infrastructure of small companies would have an 80-percent probability of experiencing a failure, compared to a 50-percent probability of large companies.

Now the disturbing thing about this—these are pretty strong numbers—80 percent—but their definition of a small company is an employer under 2,000. And I can name on one hand, the number of employers I have in my district who have more than 2,000 employees. So, by far, the majority of American employers and by far the majority of the American workers work for companies that are in the 80-percent probability range, rather than the 50-percent probability range.

I found that startling, and you, in a sense, government people who follow this issue and who are directly involved in our trying to meet this as a society, would you comment on that figure. Mr. Willemsen.

Mr. WILLEMSSEN. Yes, I'll comment on that figure. That's one of the reasons that we'd like to see more information on exactly the status of key sectors within the telecommunications area. And not to say that we want FCC to be overly burdensome, but to collect the kind of information that should already be readily available by telcos that are doing the year 2000 job that should be done. And it's just a matter of sharing that information which should already be readily available with other parties, so that an assessment can be made of where we stand on risks and we can make some conclusions about the probability of failures, along the lines of what you just mentioned.

Chairman JOHNSON of Connecticut. Mr. Powell.

Mr. POWELL. If I understand the figure correctly, it was companies as a whole as opposed to specifically telecommunications companies.

Chairman JOHNSON of Connecticut. Right.

Mr. POWELL. I guess my response to that would be that I think there's a tendency to try to oversimplify how complex Y2K is in

order to give snapshot pictures of the problem. Problems can range from being serious and catastrophic to relatively minor nuisances.

The questions I would have when we think about statistics like that is curiously, what are we talking about. What kinds of experiences we're talking about. How mission-critical are they. Because I think what's going to be really critical is that with 19 months to go, here's the sober truth to my mind.

Everything isn't going to make it, and there's a limited amount of resources, money, time, people, and effort available, and how are we going to prioritize those things. How are we going to make sure that we are using our time productively?

Chairman JOHNSON of Connecticut. I guess a follow-on question, or perhaps one that would focus the issue a little bit more specifically, is beyond your work with the big telephone companies, what do you know about the smaller telephone companies? What do you know about local compliance, and is anybody that you know of in government talking with, in a sense, the chambers of commerce across the country about what kind of program they're implementing, and whether it complies with what you think they ought to be doing in order to assure that all of these telecommunications users in remote areas are going to be compliant.

Because, I don't think, at least I gather from the information I've read, we really don't know what is going to be the impact of non-compliant companies on the system as a whole, and whether there will be ramifications for the system that would be hostile to the interests of the compliers and even a complying communication system. So, certainly given that, we ought to pay, I think, a good deal of attention to both local telecommunications networks and small users, and the educators of the small users.

Mr. POWELL. No, it's an absolutely valid concern and indeed one of the things I had originally hoped to say in the outset of my comments, that we have much more significant concerns with respect to the small- and medium-sized telephone companies. Indeed, once you get past the majors there's still some 1,400 telephone companies in America serving the areas that you described.

We are working in our own efforts, I would say, just as diligently to try to bring solutions to them as well, or bring assistance to them as well. We're trying to work—there are a number of critical umbrella organizations, trade associations, and forums with which we're able to communicate and work through them. They too are heavily regulated, just like large companies are, and have ongoing regulatory relationships with the Federal Government, but more importantly, with the State government regulatory agencies.

One of the things we've done since I began working on this problem several weeks ago, is at our request, we've asked the National Association of Regulatory and Utility Commissioners, NARUC, to form a companion Y2K operation in order for us to interface with—that would allow us to work through them to help deal with the problem of smaller and local companies that are better known say in Texas, to the Texas PUC, Public Utilities Commission, than they are to the Federal Communications Commission. We're pretty hopeful that we will be able to set up mechanisms to allow us to work as effectively with them as we do the large companies.



I believe—it's my understanding that through Mr. Koskinen and the council's effort, there's an attempt to try to get Governors involved in order to get some sort of top-down pressure within States, if you will, for every level of State and local government assistance to be working on these problems as well.

But there's no question it's a very complex multidimensional problem, and we will have to try to hit every spot that we can.

Chairman JOHNSON of Connecticut. I thank you.

Mr. Coyne.

Mr. COYNE. Thank you, Madam Chairman. Director Willemsen, we've heard predictions of the year 2000 disaster predicated on the assumption that computer glitches will shut down the country's electric utilities. I think we've all heard those predictions. And I wonder if you could give us your assessment of how likely that is.

Mr. WILLEMSSEN. I'm not in a position to give an assessment on the utility sector, because we've not completed any work on that. We have some recently initiated work that we're going to embark on with the Bureau of Reclamation, and the Department of Interior, some of the hydroelectric power in the Western United States, and some of the power marketing administrations.

But I think my assessments here should be based on the work we've done, and we just haven't done that work yet. And we're now going to embark on that very quickly, so that we can have a better assessment of where we're at with the utilities area.

Mr. COYNE. Do you think there's enough time left?

Mr. WILLEMSSEN. I think that the most important thing we can remember, and the Commissioner touched on this, whether it's the utilities or telecommunications, we've got to set priorities. With the amount of time left, priority setting has to be primarily based on the level and severity of adverse impact that would happen, and we've got to put our resources in those areas where the impact would be most severe.

So I think it's a bit problematic to put percentages on futuristic events, where we still have an opportunity to shape those events by making priorities and acknowledging that, as the Commissioner said, there's no way everything is going to get done in time.

Mr. COYNE. How many of the Federal Government's most critical systems still need to be repaired?

Mr. WILLEMSSEN. What we've seen over the last year is the first quarterly reports that came in from the 24 major Federal departments and agencies—about 21 percent of the total mission-critical systems were compliant at that point. One year later, as of last month, we were at 40 percent. So, you can see in a year, we've gone from about 21 to 40. At that rate, for mission-critical systems, we're obviously not going to make it in time.

It again reinforces the point that we've got to set priorities—priorities based on factors such as health, safety, national defense, and adverse economic repercussions. The administration has not done that yet, and we're hoping that Mr. Koskinen will eventually move in that direction.

Mr. COYNE. Commissioner Powell, to what extent does the Federal Government have control or lack of control over our telecommunications systems conversions, recognizing that the systems are privately owned?

Mr. POWELL. If I understand the question, there is a huge range of what we would categorize as customer premises equipment and internal network configuration that are purely privately owned. And as a pure regulatory matter, we have absolutely no authority whatsoever over those systems.

That said, I don't think that we would responsibly stop trying. That is, we do have some oversight and some ongoing relationships with many people who do interact with those users on a daily basis, whether they be your major service provider, AT&T, Sprint, Bell Atlantic, Nynex, or any of the many small companies that would actually be providing service to these end users who could help convey information or point out the urgency of having internal systems.

I think something really important to remember is, while there is this huge layer of complexity on top of it, there are some very critical key systems that are in the control of a few. The heart and soul of the telephone network is the switch, and there really are not that many major manufacturers of central office switches. And if Lucent, and Nortel, and Siemens do a yeoman's job in having their systems upgraded and they're able to distribute those upgrades, through those actors alone, you can reach a lot of people.

And we're also trying to use our bully pulpit to get them to be active in providing through Web pages or other distribution channels, detailed information about it. If you have the following switch, 5EES, model number whatever—v.2—you're not compliant and here's the steps we would recommend you taking, or here's who you should contact to get that done.

Mr. COYNE. Thank you.

Chairman JOHNSON of Connecticut. Mr. Portman.

Mr. PORTMAN. I thank the Chair and commend her for having this hearing. I'm sorry I was late. I was held up by bad weather in Cincinnati. I'd like to announce that at 3 today when this hearing began and I was dodging thunderstorms, we had 563 days and 10 hours left until January 1, 2000. Clearly, time is running short. Just over 500 days.

My concerns, Mr. Willemsen, have mostly been focused on the IRS, as you know. And you've testified before us before, and I know you looked at a lot of the different agencies. Let me ask you whether you think my assessment is correct or not. But, as I've looked at this more over the last year or so, mostly in relationship to the IRS, it seems to me that what I initially thought, that this is a technology problem, really is not so. It's more of a management problem. Would you agree with that?

Mr. WILLEMSSEN. It is predominantly a management problem from our perspective. Not to say that there aren't significant technological challenges to surmount, especially in the sector we're discussing here on telecommunications. But it is primarily a management issue.

Mr. PORTMAN. Now the other thing that I'm seeming to find, and not just at the IRS, but in our agencies and in a lot of the private sectors, is that I find that managers tend to be quite optimistic. And that perhaps a bunch of managers in the room here are probably working on this, but are too optimistic. I just wonder if you, as a general matter, would find that you think managers' assess-

ments of the ability of their organizations to meet the Y2K problem are too optimistic?

Mr. WILLEMSSEN. We have seen some level of optimism that later did not bear out, even in our work over the last 18 months. That's why one of the things that we think is important in making those assessments is having the necessary data in hand—data that should already be available as part of management practice to understand what's going on. Not putting an extra burden on folks in taking them away from the work they should be doing.

Mr. PORTMAN. And that concerns me. I guess the one issue that I think we haven't focused on maybe as much as we could have up here, is the importance of not just compliance in the eyes of the managers—and I'm talking about the Federal agencies here—but also to have independent verification and independent validation of Y2K compliance. Could you tell the Subcommittee if you think that is important to have that kind of independent verification as part of the critical steps?

Mr. WILLEMSSEN. Yes, sir. We definitely do think that's important. We've made the recommendation to Mr. Koskinen, the Chair of the Council, in our April 30 report, to put together a strategy to have independent verification and validation strategies. And on a positive note, we are seeing much more of that in the Federal agencies, just in the last couple of months—of getting additional support to assist them in that area.

Mr. PORTMAN. The IRS—again, to focus on that for a moment, Commissioner Powell, has major telecommunications problems, as you know. Cincinnati has a service center, for instance, and once we get the Cincinnati computers Y2K compliant and the mainframes are compliant in West Virginia or here in Washington, DC, then the issue is how do you test it. Well, the only way you can test it is to have the two work together. And that involves the telecommunications link being Y2K compliant. Again, I think that's an area where I applaud the Chair for having the hearing today, because we haven't focused enough on the key linkage.

Also with regard to the IRS, all these service centers then didn't feed into the mainframe, and that often is a three step process—from the district office or service center to the mainframe, and this is all really linked by telecommunications.

And so the other thing I would ask both of you is whether you're satisfied that our Federal agencies have looked into that step. Not just independent verification, but really a third step in the process of having computers in two places Y2K compliant, but then in the third step, making sure that telecommunications systems are compliant. As a general matter, are you satisfied that that is being done? The question is for either.

Mr. WILLEMSSEN. Congressman, I would say the results at this point are mixed. Again, one of the areas of emphasis that we've had on this year 2000 issue is the need to perform such end-to-end testing, to make sure that all of the necessary systems are in place. It's not like we can take down the public switch network totally and test it. We've got to rely a lot on lab-based testing, but we still have opportunities, in some cases, to take components and segments of the network down and fully test those.

Mr. POWELL. I would just echo those comments, which I think are completely correct. I can't really offer an assessment about particular independent agencies, but I will say that the complexity of the network is that sometimes it is only as good as the nodes that are on it, and you are recognizing that fact, and it's very important to do some level of interconnectivity and interoperability testing. Within the telecommunications industry itself they have established forums in order to do that for their key functionalities and their own interoperability, but what is more of a challenge is to try to provide some sort of interoperability exercises that provide confidence to key end users or key agencies, like the IRS, like the banking or financial community, that when their systems hook into all of this it still works. Even in the best of circumstances on that day we are all going to hold our breath, but I think, from what I hear from some of these key telecommunications industry forums, they are getting their own stuff taken care of but they are beginning to examine ways in which they can sort of expand the envelope on their operability testing to sort of increase their confidence. And that may, at some point, include selective, smart interoperability testing with very, very key sectors, key client sectors or key government agencies. I certainly am encouraging that effort to see if there aren't ways that that can be done.

Mr. PORTMAN. My time is up, but we're not very good up here in Congress at programming or at testing telecommunications networks so maybe we can't help too much, but you need to tell us, perhaps you've done that already earlier before I got here, but specifically where you think we can be more helpful in this to be able to meet this challenge in the next 563 days and 10 hours. And I think my time is up. Perhaps I should ask that you give me that in writing.

Mr. WILLEMSSEN. I can comment if you'd like, sir.

Chairman JOHNSON of Connecticut. Briefly?

Mr. WILLEMSSEN. I would say having hearings such as this can serve an especially useful purpose in raising the issues and, in many cases, getting actions done that would otherwise not have been taken.

Chairman JOHNSON of Connecticut. Thank you.

Congresswoman Thurman—

Ms. THURMAN. Thank you, Madam Chairman.

Chairman JOHNSON of Connecticut [continuing]. A very diligent Member of this Subcommittee, I might add.

Ms. THURMAN. Commissioner, you mentioned that you would suggest to them toward the time that they think they have come into compliance that you should do some of this testing. What kind of response have you gotten from industry in trying to set that up?

Mr. WILLEMSSEN. The process of testing?

Ms. THURMAN. Right. From once they say they are in compliance and being able to network throughout some of the governmental agencies or other folks that they may need to have their services for. Have they been reluctant? Have they come forth? I mean, what kind of an attitude are we seeing?

Mr. POWELL. I think to use the word of the day is mixed. First of all I think they are doing a pretty decent job with recognizing the importance of interoperability testing within their own net-

works and their interconnectivity and compatibility with adjacent networks, that is, say, an AT&T being able to terminate traffic with a local exchange carrier. I think the more difficult issue that still needs some work is the idea of being able to provide the public switch telephone network for testing with key customers. One worry, and you can ask them themselves when they come up—

Ms. THURMAN. I will.

Mr. POWELL [continuing]. Is that there are just, there would be trillions of people who would want to do that. I mean, everybody uses the phone system and so if you start going down that road, I think you have to be very, very selective and thoughtful about how and who you do that kind of testing with. I think the second component is the concern and reluctance that, you know, we still do have a live network that has to be working, unlike, say, Wall Street, who might on the weekend be able to take the whole system down and exercise it, you can't really do that with the fundamental switch phone network, and I think that's another problem.

And, I think a third problem, which I think we would be remiss if the hearing didn't go by and we talk to, is the really serious concerns about legal liabilities as barriers to information. Companies, I think in part rightfully, and sometimes overstated, are very, very worried about legal and regulatory consequences of compliance and we have seen a very, you know, that be a very significant barrier to providing candid, detailed information about testing and compliance. We, from our small part, have been doing everything we can to try to eliminate some of those fears. For example, we pursued with the antitrust division the issuance of a business advisory letter that would say you can cooperate on Y2K compliance and you won't be in violation of antitrust laws. Hopefully, that will help. Some have suggested at some point Congress may have to be prepared to provide some levels of indemnification. I don't offer an opinion on that, but that's a demonstration about how worried people are about that as an obstacle to those things. So I think that also has been getting in the way of the comfort of opening up to your critical customers and the competitive consequences, your weaknesses, and strengths. And so we just have to work that process to the end I think.

Ms. THURMAN. Mr. Willemsen, let me ask you a question that has somewhat bothered me over the last couple of months as we've gotten involved in this and as we've heard from different agencies and particularly because you have made recommendations to the administration. In your recommendations, the Commissioner probably needs some money to also do his own shop, let alone worry about all the rest of the world that's out there, but have you made any recommendations, as we get ready to go into appropriations, for these agencies and departments to be able to get additional dollars other than the dollars that they already have in their agency for just running their computer systems?

Mr. WILLEMSSEN. We have not made any recommendation specific to an agency on particular dollar amounts. What we have seen is in selected instances where agencies have said they've needed more. Their particular authorizing and appropriations committees have asked them, Please tell us now if you need more. We don't

want to hear about it later, please tell us now. And I think in many cases that has occurred.

Ms. THURMAN. Commissioner, you made a comment and I don't know what's happening in other States, but I can tell you in Florida, in this past legislative session, there were several millions of dollars put forth for this project to help both our State agencies. One last question that I have, and this is also very troubling. This is a new era, this is a time when everybody wants to come into compliance. What are we doing to ensure that those folks that say they can, you know, do 2000, what kind of criteria is being used to pick these vendors? Or is there just this list? You said something to the effect that if you don't have that switch, this is who you should call, or this is who you should use. What criteria are we using for vendors? Is it just come here and sign up, put your name on, and that's it, without any—I mean, I'm just kind of curious.

Mr. POWELL. It's an excellent question; unfortunately, there's no easy answer, at least with respect to the telecommunications industry. It's a phenomenally large and complex network and if I began to recite to you the number of components we would call critical we would be in the thousands very quickly. You also have telephone companies, let's say, for example, that have very, very different business models and have very, very different priorities about components within their system. They might emphasize certain features and functionalities that another company doesn't; they may do it a different way. You know, you take one phone company, I mean, I'd take, say, GTE as an example. It has 25.2 million digitally switched access lines, 658 unique systems, 2,400 central office switches—that's one company. And, you know, they all have different components and different emphasis.

But the benefit we have, as I mentioned at the outset of my testimony, with telecommunications is there have always been historically some critical-clearing forums. Bellcore is just a tremendous institution that has always provided standards and technical interoperability components and they are very heavily involved. The companies naturally come together because they have a self-interest in being interconnected with each other, so there has to be a degree of standardization for it to all work, and it's a sort of live by the sword, die by the sword. You can't exactly cut off your competitors, or you cut off your own nose. So I think we have some benefits in that regard, and so I think that that's one way.

What I would be remiss if I didn't say is what we can't do, at least the FCC can't do. You heard the numbers for one phone company. We have no ability to go out and audit systems or evaluate systems in any meaningful way. Not only do we not have resources, or time to do that, we don't have the expertise to do that. I mean, while we regulate them, we are not the experts on how a network works. We do not have someone in the Commission who could walk up, there may be an exception, who would walk up to a switch and start sort of testing it. And so what we've had to do is, in a sense, we bracket what we hear. That is, we try to find independent verifications of whether the rosy assessments we're hearing track with reality.

For example, if a local phone company says it's ready, you know, one good place to talk to is the long-distance companies who have

a very serious interest in making sure their traffic can be terminated locally. So if they're saying, we don't buy it, we have a real problem, then that makes us more doubtful.

State commissions can be incredibly helpful in giving us a sense of whether this optimism is justified. And key end users, like the financial community, are critical in that regard.

Ms. THURMAN. Thank you.

Chairman JOHNSON of Connecticut. Just a couple of brief follow-up questions. Mr. Willemsen, do you, are you aware, or do you have any reason to believe that OMB is not willing to back the amount of the requests from the agencies? I've heard some sort of miscellaneous comment about agencies having a hard time getting OMB, OMB, to really support them in the amount of money they think they'll need.

Mr. WILLEMSSEN. I don't have strong evidence of that, but I have anecdotal evidence, folks in agencies coming up to me and saying so forth and so on. But my recommendation, my suggestion is that they need to get Mr. Koskinen involved. And I can assure you that if Mr. Koskinen believes that somebody needs more resources, I think at this point in time he is going to make a case for it, given how little time is left and the major challenge that we face.

Chairman JOHNSON of Connecticut. Thank you. The other question that I just want to ask you is that Treasury—Treasury, IRS, and TRW have formed a slightly different partnership or a really pretty new partnership since our last hearing to ensure that managing the telecommunications compliance program will work better. In your estimation, is that going to make a difference?

Mr. WILLEMSSEN. I think the level of attention that has recently been paid to telecommunications at Treasury will make a very positive difference. They've made a number of changes in approach and management and we're encouraged that it is a major priority and that they plan to pay the necessary attention to it. I just hope that we have enough time to get every critical thing done that we have to get done.

Chairman JOHNSON of Connecticut. And, Mr. Powell, I just wanted to ask you briefly. The FCC sent out 200 letters to major companies and organizations in all sectors of the telecommunications industry. Could you just briefly share your analysis with us and then there's more provided for the record, the responses to those letters.

Mr. POWELL. Well it's fair to say that we are sort of in the early-to mid-phase of the assessment so it is difficult to give a total comprehensive picture, but I would say that we're generally satisfied that we're getting a fair amount of useful information giving us some sense of where we think the industry as a whole is. Again, with respect to wire line telephone companies, we're pretty confident, and when I say that I mean to be defined as in light of what we see in terms of their efforts, the amount of money they're spending, the seriousness and strengths of their plans, how long they've been working on the problem, and their stated deadlines, we're relatively confident that they will more likely than not be complying.

Chairman JOHNSON of Connecticut. But, when you conclude your analysis of these responses, will you share it with the Committee please?

Mr. POWELL. Yes, we'll be happy to try to provide that to you.  
[The following was subsequently received:]

27 October 1998

The Honorable Nancy L. Johnson  
United States House of Representatives  
343 Cannon House Office Building  
Washington, D.C. 20515

Dear Congresswoman Johnson:

At the House Ways and Means Subcommittee Hearing on June 16, 1998, you expressed your interest in the responses the FCC received to the over 200 letters sent to various industry members regarding Year 2000 preparedness. In this letter I will summarize what we learned from those responses. Please be aware that this summary represents a snapshot of what we learned from the responses to our letters, and is not representative of all that we have learned since those responses were received.

#### METHODOLOGY

The FCC has adopted a standard lifecycle model for Year 2000 remediation. This model consists of five steps:

- 1) Inventorying computer and telecommunication systems,
- 2) Assessing these systems and determining whether they need repair, replacement or no change,
- 3) Remediating as required,
- 4) Performing individual tests (unit test phase), and
- 5) Integration and Systems Testing.

Once the first step is completed, the others proceed in parallel. We are carefully tracking industry progress by measuring the percentage completion and estimated completion dates in each phase of the lifecycle model.

#### COMMON CARRIER

With respect to the wireline telephone industry we queried over 20 companies that account for more than 97% of the access lines in the United States. Letters were also sent to major equipment manufacturers. Responses to these letters were mandatory, and we received a 100% response rate. Overall, we are relatively confident that this segment of the Telecommunications industry is seriously addressing Year 2000 conversion issues. (We have also sent an informational letter to the more than 1300 smaller carriers).

According to the responses, the carriers have completed the inventory and assessment phases of their Y2K conversion efforts, and set completion dates for remediation, testing and integration by the second-quarter of 1999. One carrier states that remediation will be completed in the 1st quarter of 1999, and two carriers will finish this phase during the 2nd quarter of 1999. Carriers are already engaged in, or are in the process of planning, their unit test phases. Most are targeting late this calendar year, or early next year for the completion of their unit tests. The Telco Year 2000 Forum, which is comprised of eight large regional local exchange carriers, has contracted with Bellcore and is presently performing integration testing on Year 2000 ready equipment; initial results from this testing will be available in the first quarter of 1999. ATIS, which is an industry-funded organization whose mission is to advance new telecommunications technologies, will conduct interoperability testing in January and February 1999, and is also working with Bellcore.

#### CABLE

The Cable Services Bureau sent 25 letters to the 10 largest multiple systems operators ("MSOs"), 6 manufacturers, 5 cable network programmers, and 4 trade associations. These letters asked companies to share information on a voluntary basis. We received a healthy 68% response rate.

All respondents have initiated an inventory phase, with the majority of the MSOs far along towards completing the review of their inventories. Cooperative efforts among members of a Y2K group set up by Cablelabs should help provide a common framework and should expedite the development of common solutions to Y2K remediation efforts.

Based on the responses that have been received, there appears to have been less progress on remediation, unit testing, or integration (based upon data as of the date



of those responses). However, several respondents state that they will achieve Year 2000 compliance well ahead of the century date rollover.

#### WIRELESS

The Wireless Telecommunications Bureau sent a letter to licensees, associations, and other entities involved with wireless communications. The letter shared Y2K information and made a voluntary request for information. The response to this voluntary inquiry has been insufficient to do an analysis of the responses. The Bureau is engaged in active follow up which has produced additional responses. The current response rate is at 78% and we are in the process of completing our assessment.

#### MASS MEDIA

According to the responses received by the Mass Media Bureau, the major broadcasting networks have been addressing the Year 2000 problem for some time, with the earliest reported effort beginning in 1996. These and other broadcasting networks responded that they are well aware of the Y2K problem and have formed teams and reporting structures to insure adequate project monitoring and risk assessment. Networks have been communicating the importance of being Y2K ready to their affiliates. Most of the broadcasters who responded provided information that suggests that they are taking the Year 2000 problem seriously, and are devoting resources, systematically, to insure that they will be Y2K ready. Most respondents indicated that they are working closely with equipment and software vendors to ensure Y2K readiness and/or ascertain the need for fixes or new products.

Broadcasters have found that their entire equipment inventory must be thoroughly checked. For example, transmitters were described as essentially "dumb" devices that should not cause a problem. However, remote control, cooling and other systems that may be computer controlled could render the transmitter inoperative should they fail as a result of Y2K problems. Thus, it was widely agreed that every piece of the broadcasting process must be working and must be tested in an integrated fashion to best assure compliance.

FCC is also concerned about the Emergency Alert System (EAS). Under 47 CFR Part 11, all broadcast stations (14,000+) had to have FCC certified EAS equipment on January 1, 1997. Cable systems with 10,000 or more subscribers (1,200+) must have the equipment by December 31, 1998. All seven EAS equipment manufacturers have stated that their systems will correctly process dates; in some cases, equipment will have to be upgraded to current versions.

#### INTERNATIONAL

The following information regarding the international arena stems mostly from forums that were conducted earlier this summer, and is included for your information only. Developing a comprehensive understanding of international telecommunications readiness for Year 2000 is a difficult task. The wide range of companies and countries involved creates difficult logistic problems, not only in collecting data but also in developing and integrating solutions across disparate networks.

Some governments were characterized by forum participants as being apathetic with respect to Year 2000 assessment, remediation, and testing. The ITU, however, is taking a strong leadership position. The ITU has a Y2K task force that has sent a mailing to more than 5,000 members—governments, telecom carriers, and operators—to which there has been a low number of responses.

Regarding satellite carriers, there is little concern with the satellites themselves which do not, according to the industry, have much, if any, date sensitive information in them. However, ground equipment needs to be carefully checked because antenna controls are date and time dependent and ground stations contain complex electronics and larger computers. Companies are confident they will complete conversion in time, but cite interoperability testing as difficult.

We hope you find this information helpful. If you would like a briefing on these issues or any other information regarding the telecommunications industry and Y2K, please do not hesitate to call me.

Sincerely,

MICHAEL K. POWELL  
*Commissioner*

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Chairman JOHNSON of Connecticut. And then second, you note in your testimony that the FCC has adopted a three-prong year 2000 strategy, including awareness and outreach, monitoring and assessment, and regulatory action and contingency planning. Is the FCC going to publish an outline of the plan, of its plan to carry out this strategy? Will there be milestones in that plan? Will it be published soon?

Mr. POWELL. I think that's to be determined. I mean, we balance what we release publicly again with this concern about stifling the flow of candid information to be perfectly honest. We are happy to publish the general outlines of all that you just described, but I think I would have to be responsible and reserve some judgment with respect to some of the details, lest we sort of inhibit the ability to continue to get good information.

Chairman JOHNSON of Connecticut. Thank you, and I thank this panel very much. I appreciate your input today.

Mr. POWELL. Thank you very much.

Mr. WILLEMSSEN. Thank you very much.

Chairman JOHNSON of Connecticut. It is my pleasure to welcome the second panel. David Baker, managing director of Schwab Washington Research Group; A. Gerard Roth, vice president of technology programs, GTE; A. John Pasqua, program management vice president of AT&T Year 2000 Program; Ronnie Lee Bennett, program management vice president for Lucent Technologies; Priscilla Guthrie, vice president and general manager, TRW Business Enterprise Solutions and Telecommunications; William O. White, member of Telco Year 2000 Forum.

We appreciate your joining us this afternoon and look forward to your testimony.

Mr. Baker.

**STATEMENT OF DAVID E. BAKER, MANAGING DIRECTOR,  
SCHWAB WASHINGTON RESEARCH GROUP**

Mr. BAKER. Madam Chairman, good afternoon; distinguished Members and guests. Thank you for the opportunity to discuss the challenges facing the telecommunications industry in solving the year 2000 computer problem. While Schwab never says buy, sell, or hold on a stock, Madam Chairman, the Washington Research Group does cover the year 2000 problem and its impact on the industry.

My area of expertise is global information operations and I first became involved with the millennium bug about 4 years ago while serving on the Joint Staff as a Deputy Director for Operations, National Systems Support. In that capacity I was aware early on of the absolute requirement for the computer systems that operate and fly our national constellation of intelligence satellites to be totally year 2000 compliant.

Since retiring the Air Force and joining the Schwab Washington Research Group, one of the areas I cover is Y2K from a global perspective, as well as an industry perspective. It is beyond question that the telecommunications capability of this country is critical to our economic health and security. Each day billions of dollars flow

across State and national borders. The massive increase in electronic commerce underscores the radical shift in how Americans conduct business. The future will ride on the digital bits traveling through high bandwidth facilities being built throughout the world.

Public safety, of course, is even more critical. Fire, police, and ambulance services depend on satellite infrastructure to reach individuals in need of assistance. With the year 2000, as was pointed out, just 563 days away, telecommunications companies and the FCC have been focusing on the potential disruption that could result if mission-critical systems are noncompliant.

In the communications sector a number of critical, social, and regulatory goals could be derailed or at least suffer severe setbacks if computer systems tying together the world's networks are not ready to handle the year 2000. With the passage of the 1996 Telecommunications Act, Congress commenced the process of shifting our communications industry from a monopoly environment to a competitive and deregulated one.

Competition in telecommunications services promises to bring innovation, improve service quality, and lower prices to consumers and businesses. If healthy competition in the telecommunications industry is a long-term goal of this country, a seamless transition to the year 2000 is mandatory. A colleague of mine at MetaGroup points out that the year 2000 compliance in this industry is about a lot more than just switching gear and billing systems.

Year 2000 compliance in the telecommunications sector requires companies to also be sure they take a hard look at the provisioning systems, network management, and intelligence, as well as their physical facilities and IT, information technology, infrastructure. If any one of these elements is neglected in the process of upgrading and fixing year 2000 problems, the entire network may be slowed down or negatively effected due to a lack of interoperability.

Most of us are aware of what happened when the Galaxy 4 satellite turned away from the Earth on May 19 of this year. Businesses suffered significant disruptions as paging operations, Internet access, and wire service news transmissions were shut down. We live in a high-tech world depending on computers and high bandwidth transmission technologies. The economic consequences of a disruption will be even more substantial by the year 2000. Internet retailing, for example, generated about \$3 billion in sales last year. By 2000 some estimates project that to reach \$16 billion.

I would like to briefly comment on some observations from a global perspective on Y2K. I recently published a special report for the Research Group on the progress of different countries and regions in preparing their computer systems for the year 2000. As a general statement, my research shows that the United States is way ahead of other countries in addressing this problem. Many will soon find themselves well behind where they should be and scrambling to catch up. Much of the expertise available to fix noncompliant computer systems is already actively employed working on other computer programs, and will not be available when the call for help is made. Those who have elevated awareness of this problem to the senior level of their organizations and countries and have taken action to develop a roadmap to compliance with ade-

quate time for testing will have a definite advantage in the global market as we approach the year 2000.

An exception to the negative progress reports by foreign countries are in the efforts of our neighbors to the north, the Canadians. Last fall, at the invitation of their Industry Minister, they formed a Year 2000 Task Force. The members of this organization are chief executive officers from a number of key Canadian economic sectors. Banking, insurance, transportation, manufacturing, and telecommunications, are all represented.

They recently came to a very early conclusion and I'd like to share that today. No business is immune from the year 2000 problem. Every firm is affected either directly in its own operations or indirectly by the actions of others. I make note of these efforts by the Canadians because they really are making some great progress in increasing both the awareness of and action taken on squashing the millennium bug.

As a technology analyst at the Research Group, I receive a lot of questions about the status of publicly owned companies. An OMB official told me its what they call "an absolute silence from corporate America" on this issue. Panels such as this one will start to eradicate the enormous uncertainty about the status of different sectors of our economy and promote both the sharing of relative information and an undertaking of remedial action.

We have to act now, Madam Chairman; this is the last year to do something about it.

Thank you very much for the opportunity to discuss the year 2000. I look forward to questions. Thank you.

[The prepared statement follows:]

**Statement of David E. Baker, Managing Director, Schwab Washington Research Group**

Chairman Johnson, distinguished members and guests. Thank you for an opportunity to discuss the challenges facing the telecommunications industry in solving the Year 2000 computer problem. While it is a Charles Schwab corporate policy to never give a buy or sell recommendation on a stock, the Schwab Washington Research Group does cover the Year 2000 computer problem and its impacts on industry. My area of expertise is global information operations and I first became involved with the Millennium Bug about four years ago while serving in the Pentagon on the Joint Staff as the Deputy Director for Operations (J3), National Systems Support. I was also the Deputy Director Military Support at the National Reconnaissance Office and in that capacity was aware early on of the absolute requirement for the computer systems that operate and fly our national constellation of intelligence satellites to be year 2000 compliant. Since retiring from the Air Force and joining the Schwab Washington Research Group, one of the areas I cover is Y2K, from a global, macro perspective, as well as an industry perspective.

It is beyond question that the telecommunications capability of this country is critical to our economic health and security. Each day, billions of dollars flow across state and national borders. The massive increase in electronic commerce underscores that a radical shift in how Americans conduct business will ride with the digital bits traveling through high bandwidth facilities being built throughout the world. Public safety, of course, is even more critical. Fire, police and ambulance services depend on a reliable telecommunications infrastructure to reach individuals in need of assistance.

With the Year 2000 only 563 days away, telecommunications companies and the FCC have been focusing on the potential disruption that could result if mission critical systems are non-compliant. In the communications sector, a number of critical social and regulatory goals could be derailed or at least suffer severe setbacks if computer systems tying together the world's networks are not ready to handle the Year 2000.

With the passage of the 1996 Telecommunications Act, Congress commenced the process of shifting our communications industry from a monopoly environment to a

competitive and deregulated one. Competition in telecommunications services promises to bring innovation, improved service quality, and lower prices to consumers and businesses. Critical to this process is the opening of telecommunications infrastructure controlled by incumbent phone carriers to new competitors seeking to enter the market. By leasing parts of existing phone networks, competitors hope to build sufficient scale to justify the additional capital investments essential to the construction of independent and advanced facilities.

To accomplish this, back office systems, often referred to as operation support systems, must be capable of transferring customer lines, billing information and other account data to new competitors struggling to gain market share. Ultimately, the systems of competitors must be capable of accomplishing the same tasks, as customers switch carriers in what is hoped to be a vibrant competitive market in the years ahead. Obviously, the failure of these computer systems would have a chilling effect on the progress of creating a competitive environment. Although new computer systems should be Year 2000-compliant, disruptions or other publicized failures could seriously impact the growth of competition.

If healthy competition in the telecommunications industry is a long-term goal of this country, a seamless transition to the year 2000 is mandatory. In order for that to happen carriers must ensure they are compliant in several distinct areas. A colleague of mine at META Group points out that year 2000 compliance in this industry is about more than just switching gear and billing systems. Year 2000 compliance in the telecommunications sector requires companies to also be sure they take a hard look at provisioning systems, network management and intelligence, as well as their physical facilities and information technology (IT) infrastructure. If any one of these elements is neglected in the process of upgrading and fixing year 2000 problems the entire network may be slowed down or negatively affected due to a lack of interoperability.

Similarly, the massive increase in electronic commerce underscores our economic dependence on a reliable system of interconnected telecommunications networks. As noted by FCC Chairman Bill Kennard, the recent failure of an advanced data network offered a glimpse of what a network failure could mean. Stores were unable to process credit card transactions and the Red Cross encountered difficulty processing blood donations.

Of course, we are all aware of the recent failure of the Galaxy 4 satellite on May 19th of this year. Businesses suffered significant disruptions as paging operations, Internet access, and wire service news transmissions were shut down. We live in a high-tech world dependent on computers and high-bandwidth transmission technologies. The economic consequences of a disruption will be even more substantial by the year 2000. Internet retailing, for example, generated about \$3 billion in sales last year. By the year 2000, some estimates project sales to reach \$16 billion.

As we approach 1999, it becomes more and more apparent that this country and the rest of the world will experience computer system disruptions with the new millennium. It is vital that we minimize these disruptions in the communications area. Our investments in newer and faster telecom technologies, and the promotion of policies that foster new carriers with their own networks, render us increasingly vulnerable to the consequences of a Year 2000 breakdown.

I would like to briefly comment on some observations from a global perspective on Y2K. I recently published a special report for the Schwab Washington Research Group on the progress of different countries and regions in preparing their computer systems for the year 2000. As a general statement, my research shows that the US is well ahead of other countries in addressing this problem. Many countries and foreign companies will soon find themselves well behind where they should be and scrambling to catch up. Much of the expertise available to fix non-compliant computer systems is already actively employed working on other computer programs and will not be available when the call for help is made. Those that have elevated awareness of this problem to the senior levels of their organizations and countries and have taken action to develop a road map to compliance with adequate time for testing will have a definite advantage in the global market as we approach the year 2000.

An exception to negative progress reports by foreign countries are the efforts of our neighbors to the north, the Canadians. Last fall, at the invitation of Industry Minister John Manley, an organization called Task Force Year 2000 was formed. The members of this organization are CEOs from a number of key Canadian economic sectors. This includes representatives from banking, insurance, transportation, manufacturing, information technology, resource-based, retail and service, small and medium-sized businesses, and telecommunications. A recent letter from this group to business executives and business owners across Canada explains the seriousness of Y2K and the fact that they have come to an early conclusion. No busi-

ness is immune from the Year 2000 problem; every firm is affected—either directly in its own operations, or indirectly, by the action or inaction of others. In addition, the Task Force's reports and recommendations are brought to the attention of Prime Minister Jean Chretien and the provincial premiers. I make note of these Year 2000 efforts by business leaders in Canada because they are making great progress in increasing both awareness of and action taken on squashing the Millennium Bug.

As a research analyst at the Schwab Washington Research Group I receive many questions regarding the status of publicly owned companies in preparing their computer systems for the year 2000. Visibility into this area is limited in many cases and I believe liability is the issue. A staff member at the OMB described this to me as "an absolute silence from Corporate America on Year 2000 preparations." I expect this will change and soon because of shareholder demands as well as Congressional help. Panels such as this one will start to eradicate the enormous uncertainty about the true status of the different sectors of our economy and promote both the sharing of relevant information, and the undertaking of remedial action. We have to act now, as this is the last year to do something about it.

Thank you again for the opportunity to discuss the Year 2000 Problem and its challenges to the telecommunications industry. I look forward to answering any questions you might have.

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Chairman JOHNSON of Connecticut. I'm very impressed with getting through that many pages almost on time, I'd have to say, Mr. Baker.

Mr. Roth.

**STATEMENT OF A. GERARD ROTH, VICE PRESIDENT,  
TECHNOLOGY PROGRAMS, TECHNOLOGY AND SYSTEMS, GTE**

Mr. ROTH. Thank you, Chairman Johnson, Members of the Subcommittee.

My name is Gerard Roth, vice president for Technology Programs, responsible for GTE's Year 2000 Program. I'd like to commend you for having this hearing to open up the awareness issue.

While GTE has a variety of interests here, it has represented itself principally as a local exchange carrier in the context of this hearing. We've prepared written testimony, but I'd like to, in the interest of time, summarize if I may.

As properly stated in the background you provided for this hearing, the public switched network is truly comprised of smaller networks supplied by hundreds of local exchange carriers and several long-distance companies. These networks, in turn, connect millions of government and private sector telecommunications computer networks. The Y2K compliance of each of these pieces is exclusively the responsibility of its owner. As you will see in my testimony today, network functionality provided by the major telephone companies and their suppliers is progressing well, with first network testing beginning as early as July 1998.

My presentation today focuses on the simple question that I was asked to address by your staff: Why can't you simply certify the public switch network for the year 2000 and tell us by what date it will be compliant? I believe the answer to this is that it is not possible for three principle reasons.

First is ownership. There is no one owner as we all have stated earlier. There are only pieces of this network all individually owned. The second is mathematics. The transactions, the events, the potential routing paths are too numerous to validate with 100-percent testing.

And last, which you've heard earlier, is the limitations on testing in a live network. We cannot perform Y2K clock advance testing in a live network without corrupting or disrupting the operations of the current network itself. This does not mean that the public switch network will not work in the year 2000; it simply means that each of us must do our portions and then verify them through operability testing.

Work has been underway for several years throughout the telecommunications industry. That work is thorough, well-thought-through, cooperative with interactive involvement with the industry, being accomplished at an exceptional rate, and represents the best known solution to the year 2000 and the public switch network.

As requested by your Subcommittee staff, I would like to depict the complexity, interdependency, and interoperability issues affecting the public switch network and, in doing so, I will attempt to "build the onion" from the inside out.

First, the core of the basic physical system, and I have a chart here to my right, your left, to address this. Chart one represents the basic, generic system. As you can see this hierarchy starts at the bottom with the computer hardware and moves up through individual operating systems all the way through to communications protocols. The physical computer-based system is best described as the combination of hardware, firmware, software products and applications.

Each element of each system must be, in turn, verified by each company involved. Whether this is a telephone switch or a customer contact system, this is the basic structure of all of our systems which first need to be year 2000 compliant. A typical company or agency will have hundreds of these. GTE's current plan, by way of example, is for year 2000 compliance of all of our systems at this level by December 1998.

Chart two depicts the functional thread. In looking at this chart, its complexity precludes my trying to explain it; but each of those circles could be an individual system as I described in chart one. To provide major functions, several systems must work together both logically and physically in a continuously reliable fashion. It should be noted that these threads or clusters must also be verified Y2K compliant after their individual components have been certified.

Chart two in this example is a real customer service thread comprised of 17 separate systems, 26 formal communications channels, and 10 separate data bases. A typical company or agency will have hundreds, if not thousands, of these threads.

The third chart depicts the logical local exchange carrier. There are actually three parts to this diagram: The first, at the bottom is the legacy, the business, and back office support system. The middle layer consists of the network management systems: The controls for the public switch network itself. The top layer are the fully integrated, network elements which do not stand alone.

Using the logic of this chart, GTE processes thousands of calls per minute on 21.5 million access lines in the United States alone. To accomplish this, we have several hundred systems, a few thousand central office switches, thousands of supplier products, tens of

thousands of client server desktops, and extensive local and wide-area networks. GTE's present plan for fully tested compliance at this level of the network is by the end of June 1999.

Our last chart is the logical public switch network. This expands to include all of the local exchange carriers, interexchange carriers, and private networks into one logical picture. There are hundreds of local exchange carriers in the United States alone; plus several interexchange carriers, millions of pieces of customer premise equipment and private network emplacements and gateway connectivity to international telephone companies. This network processes millions of transactions per minute; its complex, realtime, dynamic call routing prohibits us from knowing in advance where any particular component will play.

I'd just like to point out parenthetically that the largest external dependency on this is the ubiquitous power cord coming off of the end of this network.

In conclusion, I would like to say year 2000 compliance is a gigantic ongoing task. In the last Securities and Exchange Commission disclosures, seven telephone companies projected more than \$2 billion for year 2000 expenditures. More than 50 percent of that effort is expected to be testing of all types. We need to keep in mind year 2000 must occur simultaneously with operations and maintenance of the public switch network, without degradation of quality of service or the variety of features we've all come to take for granted.

Today's testimony will show that we are dealing with this in a responsible fashion, targeted for a mid-1999 completion. If I may continue, I have just a few more statements for conclusion.

Collectively and individually, the telephone companies understand the year 2000 challenge they face. They have plans in place to address these issues in a timely fashion as you will hear today. Our testing strategies provide verification for the public switch network year 2000 compliance to the maximum extent possible, and the work remaining is hard, it is complex, and it is of significant volume. However, based on the status to date, we have reasonable expectations that we will be successfully completing our essential systems on time.

Chairman Johnson, I thank you for the opportunity to testify.  
[The prepared statement follows:]

**Statement of A. Gerard Roth, Vice President, Technology Programs,  
Technology and Systems, GTE**

Chairwoman Johnson and members of the Subcommittee. Good afternoon, my name is A. Gerard Roth. I am Vice President, Technology Programs, GTE, responsible for GTE's Corporate Year 2000 Program Management Office (PMO). I am here to discuss Year 2000 (Y2K) as it relates to telecommunications interdependencies and interoperability. I commend the Subcommittee on Oversight for conducting hearings focused on the telecommunications industry interdependency and ask that a copy of my written remarks be entered into the record.

INTRODUCTION

The focus of this testimony is to bring perspective from GTE's considerable Y2K experience and apply it to this important discussion of telecommunications interdependency. GTE, and other telecommunications providers, are continually being asked, "Why can't you simply certify your network and tell us when it will be compliant?" The following discussion will describe the complexity and interdependencies



that make that question so difficult to answer. Three principal issues come into play in addressing this question:

1. *Ownership*—There is no one owner of the whole network.
2. *Mathematics*—The permutations and combinations of calling events, service requests and routing possibilities exceed the industry's ability to do 100% testing of Y2K.
3. *Testing cannot be done on the live network*—Out of cycle—clock roll-ahead testing would disrupt current operations, create unacceptable outages.

Nevertheless, the work being done to remediate and test the Public Switched Telephone Network (PSTN) is well thought through, is being accomplished at an acceptable rate, and represents the best known solution to Y2K we are able to accomplish. I believe you will be reassured today that the telecommunications industry understands the importance of the Y2K challenge and is working aggressively to meet it.

#### Y2K BACKGROUND

Year 2000 is unique in the history of this the telecommunications and information technology industries. Left unattended, it could simultaneously undermine the operation and reliability of the computer and network infrastructure at a specific, known, future point in time. However, it is also true that the precise impact on our information-based economy and society cannot be predicted in part due to the complexity and interdependency of systems. Nor can we accurately predict the full extent of successful remediation of Y2K due to the interoperable, multi-path nature of the PSTN.

We can, however, significantly reduce the likelihood of the apocalyptic scenarios sometimes predicted for January 1, 2000. You will hear from me and my colleagues at this hearing some of the measures underway to address your Year 2000 concerns.

Let me quickly summarize some of the major lessons of Y2K that contribute to the complexity:

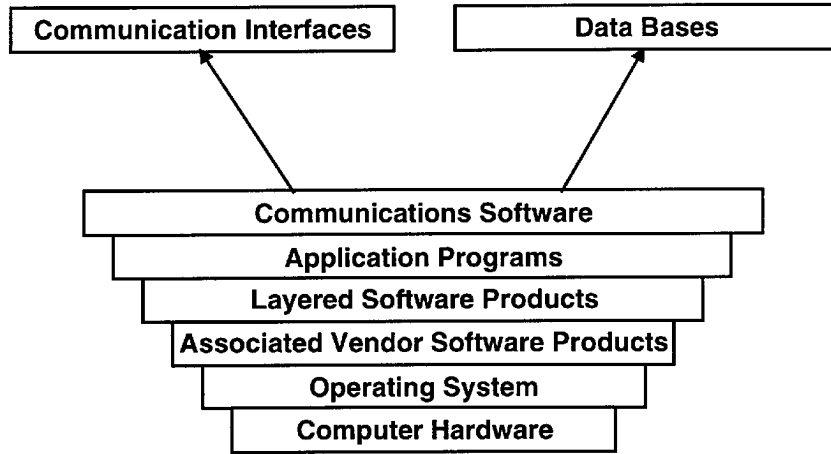
- Schedule is not just important; it is the *only* thing.
- Y2K is truly a “weakest link” problem—the single system or date conversion we miss may be the undoing of the 99% we did find.
- Normally, development and maintenance activities introduce incremental change into an otherwise stable environment; however, in Y2K, modified systems are reintroduced into an environment which has been universally and simultaneously de-stabilized.
- Since it is impossible to recreate an “off-line” PSTN for testing, complex Year 2000 interoperability must be tested in pieces by various companies separately and can be actually proven compliant only once those pieces are in operation together on January 1, 2000.
- There is an increasing recognition of the need to devote more time and effort to enterprise and interoperability testing than was previously planned.
- Testing of all types constitutes greater consumes more than 50% of required cost and effort; actual conversion of applications or products is relatively minor.
- Completion of conversion prior to the end of 1998 should be a priority. This allows for validation of year-end close transactions in the operational environment, and provides up to 12 months of Y2K verification testing.
- Test everything you can.

#### COMPLEXITY AND INTERDEPENDENCY

In discussing the complexity and interdependency of the PSTN, I intend to gradually “build the onion” from the center using four models. To demonstrate an increasing complexity and interdependency, each model builds upon the one before like the currently popular “nesting dolls.” The end result points to the conclusion that the PSTN is not readily certifiable due not only to ownership issues but also to mathematical complexity and test scenario limitations.

##### 1. *The Basic System*

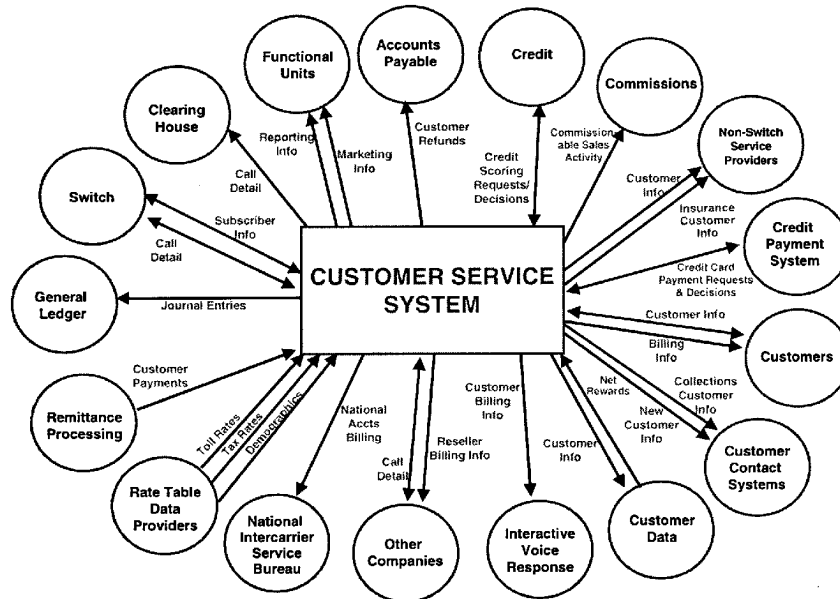
Telecommunications complexity begins with the essential, computer-based systems used in telecommunications. Chart 1 depicts a representative, physical system, best described as a combination of hardware, firmware, software products and applications. A typical company will have hundreds of these. Each component in Chart 1 must be assessed for Y2K impact; remediated, if required, and tested and verified compliant at the system level.



**Chart 1 - Basic System**

*2. The Functional Thread*

To perform a “function” (such as customer contact, service provisioning, call routing), these physical systems must work with others. Chart 2 depicts a real customer service provisioning cluster as an example of system interdependencies. This example portrays the relationships of among 17 separate systems or users, 26 formal communications channels, and more than 10 separate data bases needed to provide a basic service. This also includes the actual linkage of support functions to the physical PSTN and to other companies.

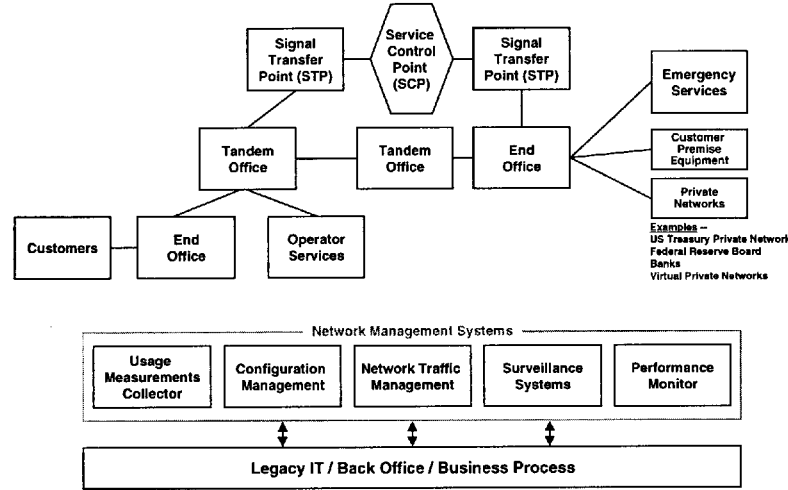


**Chart 2 - The Functional Thread**

Each of the elements depicted here can also be represented in some version of Chart 1. As such, assuring that each of the core components is Y2K compliant precedes the verification of this functional thread. A medium-sized company will have hundreds of these threads.

3. The Core Interoperability of the PSTN-Logical Topology

Chart 3 expands the interdependency model to include network elements of the PSTN.



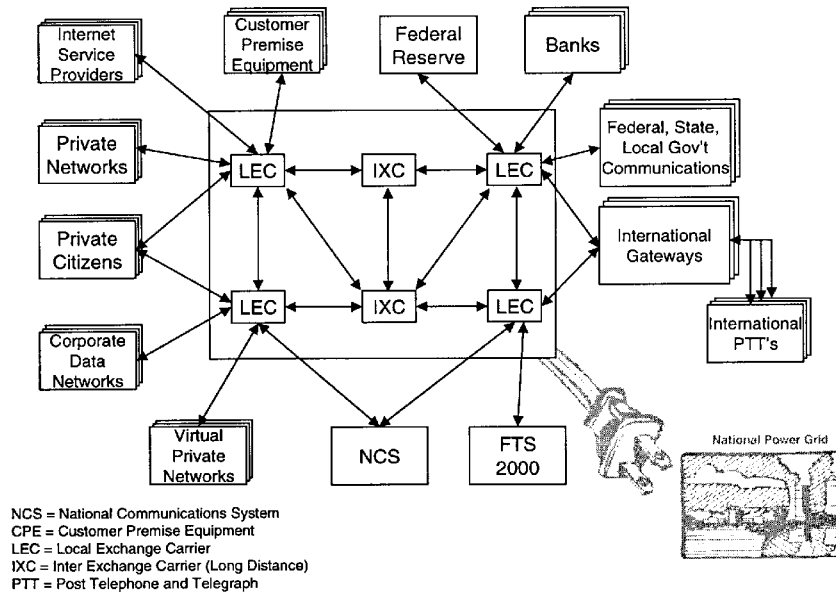
**Chart 3 – Local Exchange Carrier (LEC) Logical Network Topology**

Logically, each component on this chart can be described functionally as a thread or cluster. This schematic simply integrates the elements of the legacy software systems. The systems manage the Network, the signaling, data and voice components of the switched network. This complex hierarchy of systems and interaction of function provides an example of a single company’s network interdependency. The actual LEC portion of the Public Switched Telephone Network provides for random, multi-path, real-time interaction of these elements, simultaneously processing thousands of calls each minute of each day.

By way of example, a typical local exchange carrier may have several million digitally switched access lines in the U.S. Depending upon the LEC, it may have also hundreds of unique systems worldwide, representing millions lines of computer code (LOC), all of which must be Y2K tested in thousands of functional test clusters. In addition, to verify Y2K readiness, the typical LEC must assess and test perhaps a couple of thousand of central office (e.g., end office) and, possibly, international gateway switches and associated support systems in not only domestically but, depending upon the company, in overseas locations as well.

4. The Expanded PSTN

The final illustration, (the outside of the “onion”) depicted in Chart 4, captures the logic of the Public Switched Telephone Network overall by incorporating the essential logic of Chart 3 for each of several Local Exchange Carriers (LECs), Inter-exchange Carriers (IXCs), International PTT Interfaces, Customer Premise Equipment (CPE), and Private Network installations. Within the U.S. alone there are hundreds of local exchange carriers, several inter-exchange carriers; and perhaps millions of private networks or customer premise emplacements. The obvious interconnectivity potential of these network relationships points to the mathematical limitations on 100% test. It should not go unnoticed that the largest external risk to the operational integrity of the PSTN is the continued availability of electric power across the national power grid on January 1, 2000.



**Chart 4 – The Logical Public Switched Telephone Network**

#### THE CALL/VIRTUAL NETWORK CIRCUITS

The Nationwide PSTN processes millions of calls per minute. In order to complete a telecommunications transaction beyond a local exchange, “calls” are spontaneously routed in advance to take advantage of the most efficient call-processing path. Furthermore, in addition to routine voice/data traffic and wireless access, the PSTN provides a myriad of additional services including call waiting, directory assistance, 800-number look-up, and 911 emergency support. Because of this complexity, a “virtual” network circuit is dynamically defined for each transaction such that advance prediction of specific circuit connectivity is impossible to determine. The process creates a continuously changing pattern within and between LECs and IXCs. Consequently, it is impossible for any one company to verify the whole network Y2K compliant.

Nonetheless, the worldwide telecommunications Year 2000 remediation effort is proceeding, with LEC's, IXC's and others actively and cooperatively working to implement Y2K readiness at all levels of this model. You will hear more today from my colleagues on this panel on what the industry is doing to respond to Y2K.

#### COST

It is useful in closing to give this technical issue a context or grounding with respect to cost. GTE currently expects to spend about \$350 million on Y2K compliance;—more than 50% of which is focused on the testing of these products, applications, or and the interoperability test of the functions they provide.

As of March 1998, a sample of SEC filings indicates seven (7) telecommunications companies (LECs and IXCs) have estimated a combined expenditure in excess of \$2 billion for Year 2000 remediation. This is a gigantic task; one that I fear is often trivialized by the casual media and unfairly criticized by otherwise well-intentioned Y2K experts. Nothing is to be gained by public chanting of doomsday scenarios formed out of ignorance.

It should be noted that this massive Year 2000 remediation activity is occurring at the same time as we continue operating the live PSTN and maintaining it with the quality of service and variety of features we have all come to take for granted.

Chairwoman Johnson, I thank you for the opportunity to present this testimony.

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Chairman JOHNSON of Connecticut. Thank you very much, Mr. Roth.

Mr. Pasqua.

**STATEMENT OF A.J. PASQUA, PROGRAM MANAGEMENT VICE PRESIDENT, AT&T YEAR 2000 PROGRAM, WARREN, NEW JERSEY**

Mr. PASQUA. Madam Chairman, Members of the Oversight Subcommittee, my name is John Pasqua and I am the program management vice president of the AT&T Year 2000 Program. I'm pleased to be here with you to share the approach AT&T is taking to meet this global challenge and I'll try to summarize my submission.

There are no competitors when it comes to Y2K. We all need to be working collaboratively on the issues. AT&T launched its Y2K program in 1996 with the establishment of a corporate Y2K program office answerable to AT&T senior leadership team, including chairman and chief executive officer, Michael Armstrong, and Frank Ianna, executive vice president of Network and Computing Services.

The overall process framework for our program is based on proven and accepted industry models. We monitor and track progress of the Y2K program through a series of metric scorecards. Program status is reviewed monthly at all management levels in our corporation. AT&T has an embedded base of more than 3,000 internally developed applications. I am pleased to report that through May of this year, we have assessed 91 percent of our application lines of code, repaired 72 percent of those that needed modification, and application-certified over 40 percent.

AT&T is committed to a target of December 31, 1998, for the completion of assessment, revision and testing of all customer-affecting systems, and has reinforced that commitment with associated funding of approximately half-a-billion dollars through 1998.

Relative to the AT&T networks, our overarching goal is to avoid any degradation to network reliability due to the millennium change. Our year 2000 program addresses not only the core public switched network but also the AT&T wireless network, our data networks, the AT&T government networks, including FTS 2000, and all other AT&T-branded networks.

In addition to internally developed applications that support our networks, we have inventoried over 800 externally purchased network elements, including switches, network control processors, and signal transfer points. Approximately 97 percent of the network elements have been assessed, and more than 80 percent are already Y2K-compliant or planned for retirement.

AT&T is on target to complete network element certification by yearend 1998, with full deployment in the first half of 1999.

A comprehensive testing strategy is a key component of our program. Our overall approach is to test any claims of Y2K-compliance from suppliers and partners. We are also independently validating

the testing programs using peer reviews, internal audit reviews, program office reviews which I lead, and external audits.

We are leveraging AT&T's participation in a variety of industry forums and standards-setting bodies as a framework for external interface and testing agreements.

Within North America, AT&T is partnering with the Alliance for Telecommunications Industry Solutions, or ATIS, to plan and conduct necessary Y2K signaling interoperability tests. For international bilateral relations, we will use the International Telecommunications Union, or the ITU, to develop international standards regarding network planning activities and as a sponsor for interoperability testing.

In addition, we plan to perform end-to-end call tests across our network and selected domestic and international access and egress provider networks, using a sample of call types, access configurations and geographical dispersions. AT&T has also proposed the re-establishment of the NRIC, the Network Reliability and Interoperability Council, as an advisory committee to the FCC to assess the impact of year 2000 on our Nation's networks and to encourage sharing of information solutions.

To further mitigate risk, contingency plans will be established well in advance of the millennium.

In summary, we are confident that AT&T will be successful in meeting the year 2000 challenge. At the most fundamental level, our year 2000 initiative is dedicated to ensuring business continuity, providing our customers with services that will work at the requisite level of performance in the year 2000 and beyond. AT&T's Y2K program is designed to achieve that goal.

But it's also about helping others—our network partners, our suppliers, and indeed, our customers—to prepare for year 2000. We believe our approach encompasses that broader view, too.

I want to thank you for inviting AT&T to participate in this hearing. We think your interest in this area will increase cooperation and openness within the telecommunications industry. We have been meeting with representatives of the FCC and other government agencies, and are committed to work with our industry colleagues on the year 2000 opportunity.

AT&T is aggressively attacking this logistically complex situation and we won't let you down. Thank you very much.

[The prepared statement follows:]

**Statement of A.J. Pasqua, Program Management Vice President, AT&T  
Year 2000 Program, Warren, New Jersey**

Madame Chairwoman, Members of the Oversight Subcommittee,

My name is John Pasqua, and I am the Program Management Vice President of the AT&T Year 2000 Program. I'm pleased to be here with you to share the approach AT&T is taking to meet this global challenge.

The Year 2000 issue is possibly the most critical problem we have ever faced at AT&T. It spans all aspects of our business and goes well beyond the boundaries of any one company ...; and, for that matter, beyond the boundaries of any one country. However, I believe it is a challenge we will deal with successfully.

There are no "competitors" when it comes to Y2K. Today, many businesses and industries are so interdependent that the failure of any one can cause serious problems for the others. We all need to be working collaboratively on the issue and I welcome this opportunity to share some of our AT&T Y2K experiences with you.

AT&T launched its Y2K Program in the fall of 1996 with the establishment of a Corporate Y2K Program Office answerable to AT&T's senior leadership team, in-

cluding Chairman and CEO Michael Armstrong, and Frank Ianna, Executive Vice-President of Network and Computing Services.

We established several fundamental operating principles as the framework for the program:

- A governance and oversight model with *enterprise-wide* program management;
- Responsibility for “fixing” the problem distributed to our operating units; and
- Outsourcing some of the Y2K work to vendors who have demonstrated the required core competencies.

Our Y2K Program is focused on four inter-related areas:

- Internally-developed applications, which support business functions such as ordering, provisioning and billing;
- AT&T’s information technology infrastructure, which includes the hardware, software and communications platforms and components that support these applications;
- AT&T’s voice and data networks; and
- Building automation components and embedded systems.

The overall process framework for AT&T’s program is based on accepted industry models. The key milestones include: assessment, repair, application-certification, integration testing, deployment and environment-certification.

We monitor and track progress of the Y2K program through a series of metric scorecards. Program status is reviewed monthly at all management levels in our corporation.

AT&T has an embedded base of more than 3,000 internally developed applications, of which:

- Approximately 400 directly support AT&T’s voice and data services;
- 800 are critical to the provisioning, administration, maintenance and customer service; and
- The balance represent applications supporting AT&T’s sales and marketing organizations and internal administrative functions.

I’m pleased to report that—through May of this year—we have assessed 91% of our application lines of code, repaired 72% of those that needed modification, and application-certified over 40%.

AT&T is committed to a target of December 31, 1998 for the completion of assessment, revision and testing of all customer-affecting systems, and has reinforced that commitment with associated funding of approximately half-a-billion dollars through 1998.

Relative to the AT&T Networks, our overarching goal is to avoid any degradation to network reliability due to the millennium change. Our Year 2000 Program addresses not only the core public-switched network but also the AT&T wireless network, our data networks, the AT&T government networks and all other AT&T-branded networks.

In addition to the AT&T-developed applications that support our networks, we have inventoried over 800 externally-purchased network elements, including switches, network control points and signal transfer points. Approximately 97% of the network elements have been assessed, and more than 80% are already Y2K-compliant or planned for retirement.

AT&T is on target to complete network element certification by year-end 1998, with full deployment no later than June 1999.

A comprehensive testing strategy is a key component of our program. AT&T’s overall approach is to test any claims of Y2K-compliance from suppliers and partners. Each AT&T organization that supports a system is accountable for prioritizing and certifying all components of that system to ensure the most important components are addressed first.

We are also independently validating the testing programs using peer reviews, internal audit reviews, program office reviews, and external audits.

We are currently defining the requirements for inter-system testing and certification for our critical business processes, focusing on two phases of validation:

- Business process testing, which involves applications and components that comprise a business function to insure the integrity of the business process; and
- End-to-end product and service testing, which includes all systems and network elements involved in offering the service to our customers.

These phases of testing will start in mid-1998 and continue into 1999.

We are also leveraging AT&T’s participation in a variety of industry forums and standards-setting bodies as a framework for external interface and testing agreements. I’d like to highlight some examples in this area.

Within North America, AT&T is partnering with the Alliance for Telecommunications Industry Solutions, or ATIS, to plan and conduct necessary Y2K signaling interoperability tests. The ATIS Network Testing Committee has proposed a series

of tests during which each test network advances the network clock relative to different time zones and critical Y2K-related dates.

For international bilateral relations, AT&T will use the International Telecommunications Union, or the ITU, to develop international standards regarding network planning activities and as a sponsor for interoperability testing. The ITU has established a Year 2000 Task Force as well as an Inter-Carrier Testing Task Force to address Y2K assurance of customer services involving multiple networks.

For AT&T-branded networks and global partnerships, additional interoperability testing will be conducted, as necessary.

In addition, AT&T plans to perform end-to-end call tests across its network and selected domestic and international access and egress provider networks, using a sample of call types, access configurations and geographical dispersions. The timeframe for these tests will be during 1999, after the involved networks have achieved Y2K-compliance.

AT&T has also proposed the re-establishment of the NRIC—the Network Reliability and Interoperability Council—an advisory committee to the FCC to assess the impact of Year 2000 on our nation's networks and to encourage sharing of information solutions. This council could meet on a quarterly basis and membership would include the 20 or so major carriers, suppliers and LECs in the telecommunications industry.

To further mitigate risk, contingency plans will be established well in advance of the millennium. In addition to existing operational safeguards and “common sense” practices like prioritization of test schedules to certify mission-critical systems first, we are in the process of establishing Y2K-related contingency plans, including:

- Business resumption teams, on call during the millennium change, to react immediately to facilitate repairs and activate emergency alternate processes;
- Time zone “quiet periods” to de-activate some systems and processes during the 24-hour transition period when regional time zones pass through the millennium change period;
- Network capacity expansion engineered to accommodate demand peaks; and
- Alternate suppliers and implementation plans to replace third-party products or services that fail to meet commitment schedules.

In summary, we are confident that AT&T will be successful in meeting the Year 2000 challenge.

At the most fundamental level, our Year 2000 initiative is dedicated to ensuring business continuity—providing our customers with services that will work at the requisite level of performance in the year 2000 and beyond. AT&T's Y2K Program is designed to achieve that goal.

But it's also about helping others—our network partners, suppliers and customers—to prepare for Year 2000. We believe our approach encompasses that broader view, too.

I want to thank you for inviting AT&T to participate in this hearing. We think your interest in this area will increase cooperation and openness within the telecommunications industry. We have been meeting with representatives of the FCC and other government agencies, and are committed to work with our industry colleagues on the Year 2000 opportunity.

Thank you.

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Chairman JOHNSON of Connecticut. Thank you very much.  
Mr. Bennett.

**STATEMENT OF RONNIE LEE BENNETT, PROGRAM MANAGEMENT VICE PRESIDENT, LUCENT TECHNOLOGIES, INC.**

Mr. BENNETT. Madam Chairman, Congressman Coyne, and Members of the Subcommittee, good afternoon.

I appreciate this opportunity to discuss the impact of the year 2000 date change on government communications systems and the national telecommunications infrastructure.

Lucent Technologies is the world's largest communications systems and technology company. We have more than 100,000 employees in the United States with a significant presence in 18 States. Our more than \$12 billion in annual purchasing supports more



than 100,000 additional jobs in the United States. We have been designing and manufacturing telecommunications equipment for more than 100 years. With that history and experience we fully appreciate the magnitude of the challenge hosted by the year 2000 date change.

Lucent has embarked on a full-scale effort to minimize the impact of the year 2000 date change on Lucent and our customers. We are aggressively working toward making our internal information technology and manufacturing infrastructure year 2000 ready. We believe that the year 2000 date change will not significantly affect our ability to deliver products and services to our customers.

Lucent has made significant progress in preparing both our switched network products and our business systems products for year 2000. For example, the year 2000 upgrade for the current Lucent 5ESS switch became available last month. This switch is one of the most important and widely deployed Lucent products in the public network. By the end of the third quarter of 1998, more than 90 percent of our currently supported network products will be year 2000 compliant or have available upgrades.

We have also committed that all customer communications systems, manufactured and sold by our business communication systems unit that were introduced on or after September 30, 1996, will be year 2000 compliant.

Lucent has conducted year 2000 impact tests on many of our products that are not currently year 2000 ready and we're sharing those results with our customers. Lucent year 2000 tests are performed in laboratories that follow clearly specified processes and methodologies. However, the public switched network and customer communication systems are complex, custom-designed systems that are assembled using equipment and software from many, many vendors. As a result, it is important that the owners of telecommunications equipment investigate the interoperability of their equipment.

To support the interoperability testing of the public switched network, we are working the Telco Year 2000 Forum to test our network and products and their interoperability with other vendors' products. We are working in many ways to make our customers aware of the year 2000 challenge including reaching out to the industry groups, individual customer meetings and through direct mailings.

Our goal is to understand the customers installed base of Lucent products, provide relevant product information and jointly develop year 2000 strategies.

Lucent has a dedicated government solutions division that supports sales to the Federal Government, serving more than 1,000 agencies, departments and offices. Within that division, a year 2000 team has been established to coordinate and support the efforts of these customers to meet the government's year 2000 deadlines.

We're also working with the GSA. We have provided information on the status of relevant products for the GSA year 2000 telecommunications database. We've participated in two GSA government industry forums, and in addition, we've actively participated through presentations and survey responses in the year 2000 ef-

forts of the FCC and the President's Council on the Year 2000 Conversion.

Identifying year 2000 issues and implementing and testing solutions is time consuming. We believe we have sufficient resources to provide our customers with the year 2000 support that they require, but success can only be achieved in concert with our customers. Time is of the essence, therefore, we urge all involved parties to act with speed.

Thank you.

[The prepared statement follows:]

**Statement of Ronnie Lee Bennett, Program Management Vice President,  
Lucent Technologies, Inc.**

INTRODUCTION

Thank you, Madam Chairwoman, Congressman Coyne and members of the Subcommittee, for the opportunity to appear before you to discuss the impact of the Year 2000 date change on government communications systems and the national telecommunications infrastructure.

Lucent Technologies, headquartered in Murray Hill, New Jersey, became a fully independent company on September 30, 1996. Lucent has over 100,000 employees in the United States and a significant presence in eighteen states. In addition, Lucent's more than \$12 billion in annual purchasing supports over 100,000 additional jobs in the U.S.

Lucent has a more than one-hundred-year heritage of designing and manufacturing telecommunications equipment. Central to this heritage is Bell Labs, the research and development arm of Lucent Technologies.

Lucent is the world's largest communications systems and technology company, with over \$27 billion in sales. Lucent supports a broad line of products—from network switches supporting local and long-distance carriers to voice and data business systems for enterprises. Business systems handle the communications needs of businesses and other multi-user environments, including, for example, the systems found in the offices of the agencies overseen by this Subcommittee. Lucent's products support the transmission of voice, video and data over wireline and wireless networks.

The past hundred years have seen great changes in the design of Lucent's products. Today, software is the engine that drives virtually all of Lucent's products and supports all of Lucent's internal operations. As such, Lucent fully appreciates the magnitude of the challenge posed by the Year 2000 date change.

LUCENT'S RESPONSE TO THE YEAR 2000 CHALLENGE

Lucent has embarked on a full-scale effort to minimize the impact of the Year 2000 date change on Lucent and its customers. Lucent's Year 2000 effort is coordinated by a company-wide program office. This office is charged with verifying that the multiple Year 2000 teams within Lucent have sufficient resources and are progressing in this effort in a timely fashion.

Lucent is aggressively working toward making its internal information technology and manufacturing infrastructure Year 2000 ready. Based on our current progress, Lucent believes that the Year 2000 date change will not significantly affect Lucent's ability to deliver products and services to its customers on a timely basis into the next century.

Lucent has committed significant resources to make its current product offerings Year 2000 compliant, as well as to provide evolution paths for its customers who have non-Year 2000 ready equipment. Lucent has several distinct product lines with very different customer groups. As a result, Lucent is organized into several business units that are structured to best support the needs of their respective customers. Lucent has established Year 2000 program offices in each of its business units. These program offices have identified non-Year 2000 ready products and developed evolution strategies that include the upgrade of some products and the replacement of others. In addition, these program offices support Lucent's customer teams, who are working with their customers to develop customer-specific Year 2000 solutions.

## PRODUCT STATUS

Lucent has made significant progress in preparing both its switched network products and its business systems products for the Year 2000. For example, the Year 2000 capability upgrade for the current Lucent 5ESS® Switch became available last month. This switching equipment is one of the most important Lucent network products used in the public switched network. These 5ESS® upgrades are now being tested by customers or have been deployed in their networks. By the end of the third quarter of 1998, Lucent believes that in excess of 90 percent of its currently supported network products will either be Year 2000 compliant or have available upgrades. Virtually all of the remaining supported network products are targeted to be Year 2000 compliant or to have available upgrades by the end of 1998.

Lucent also has committed that all products manufactured and sold by its Business Communications Systems business unit that were introduced as generally available on or after September 30, 1996 will be Year 2000 compliant. With respect to products generally available for sale prior to that date, Lucent has developed migration strategies as needed that call for either replacement or upgrade of the products. Lucent expects that the necessary upgrades will be available before the end of the third quarter of this year.

In addition to preparing its products for the Year 2000, Lucent has conducted tests to understand the functional impact of the Year 2000 date change on many of its products that are currently not Year 2000 ready. The impacts vary widely by product and the significance of the impacts also varies by the type of equipment and customer application. Lucent is sharing this impact information with its customers.

Both Lucent's product determinations and impact information are generated as a result of tests performed in laboratories that follow clearly specified processes and methodologies. However, the public switched network and many customer in-house communications systems are complex, custom-designed systems that are assembled using equipment and software from multiple vendors. As a result, it is important for the owners of telecommunications equipment to investigate the interoperability of their equipment.

Lucent is working with its customers to provide information and other support to help customers' investigations. Further, to support the interoperability testing of the public switched network, Lucent is working with the Telco Year 2000 Forum, a group that includes many of the major local telephone companies, to test Lucent networking products and their interoperability with other vendors' products. Lucent supports the Telco Forum's interoperability testing by providing product information, reviewing test plans and providing access to Lucent's testing facilities. Lucent is working with the Telco Forum and Bell Communications Research, commonly known as Bellcore, to define Year 2000 interoperability test requirements for all telecommunications equipment manufacturers. Bellcore is the entity that creates many of the technical specifications and standards for the public switched network.

## SUPPORT OF CUSTOMERS

Effective communication and coordination are important to minimizing the impact of the Year 2000 on Lucent's customers. For example, Lucent is working with the Organization for the Promotion and Advancement of Small Telecommunications Companies (OPASTCO) to communicate Year 2000 product information to its members. In addition, Lucent's Business Communications Systems business unit successfully demonstrated a clock roll-over to January 1, 2000, on all of its major products last week at its International DEFINITY® User Group meeting here in Washington, attended by 2500 of Lucent's enterprise and government customers.

Lucent does not rely exclusively on public presentations to convey Year 2000 information to its customers. Lucent's communications and coordination efforts with its customers are primarily handled through direct contacts, ranging from individual meetings to general mailings to its customers. Common to all of these contacts is an effort by Lucent to understand the customer's installed product base of Lucent products, provide relevant product information and jointly develop a strategy for migrating the customer as appropriate.

## LUCENT YEAR 2000 SUPPORT OF THE FEDERAL GOVERNMENT

In support of the U.S. Government, Lucent has a dedicated Government Solutions division that supports its sales to the Federal Government. Through this unit, Lucent serves more than 1,000 agencies, departments and offices of the Federal Government. Lucent supports the Government through dedicated sales, customer service and maintenance teams. A Year 2000 team has been established within Government Solutions to coordinate and support these efforts. By providing product in-

formation and migration strategies, Lucent is working with its Government customers to support their efforts to meet or exceed the Government's various deadlines.

Lucent began contacting its Government customers who have non-Year 2000 compliant products in the second half of 1997 to begin Year 2000 coordination and planning for these products. Lucent began a direct mail campaign in December 1997 to specifically notify its Government customers that they may need to update or replace some of their Lucent products. These customer communications efforts are continuing.

Lucent has also supported the General Services Administration (GSA) in addressing Lucent telecommunications products within the Government agencies. At the end of 1997, Lucent provided information on the status of relevant products to GSA for inclusion in its Year 2000 Telecommunications database and participated in two GSA government industry conferences to facilitate information sharing between Government agencies and the telecommunications industry. Lucent is actively working with GSA and other agencies in their efforts to conduct Year 2000 demonstrations.

In addition to Lucent's work with its government customers and the GSA, Lucent has also participated in the valuable, proactive Year 2000 efforts of the Federal Communications Commission (FCC) and the President's Council on the Year 2000 Conversion. Lucent has made presentations in several Year 2000 meetings held by these organizations. In addition, Lucent was among several telecommunications industry companies that responded to an FCC survey relating to Year 2000 readiness.

#### CONCLUSION

The Year 2000 date change is a significant technological and management challenge, requiring full commitment by both the private and public sectors of a variety of industries. Lucent believes it has sufficient resources to provide its customers, both in the Government and in the private sector, with the Year 2000 support they require, but the assistance of Lucent's customers is essential. If a significant percentage of Lucent's customers wait until 1999 to act, it will be difficult for Lucent to provide the necessary engineering, installation, demonstration and testing services for their Year 2000 support. Therefore, we are urging all involved parties to act with urgency to address this fundamentally important issue.

This Subcommittee and Congress generally can play a very important role in raising awareness within Government and relevant industry sectors about the need for prompt action. The process of identifying products with Year 2000 issues and developing and implementing evolution strategies is very time consuming. Time, therefore, is of the essence. However, with careful planning and timely execution of readiness strategies, Lucent believes that its customers can successfully prepare themselves for the impact of the Year 2000 challenge.

Thank you.

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Chairman JOHNSON of Connecticut. Thank you very much, Mr. Bennett.

Ms. Guthrie.

**STATEMENT OF PRISCILLA E. GUTHRIE, VICE PRESIDENT AND  
GENERAL MANAGER, BUSINESS ENTERPRISE SOLUTIONS &  
TELECOMMUNICATIONS STRATEGIC BUSINESS UNIT, TRW,  
FAIRFAX, VIRGINIA**

Ms. GUTHRIE. Thank you, Chairman Johnson and distinguished Members of the Subcommittee.

My name is Priscilla Guthrie and I am the vice president and general manager of TRW's Business Enterprise Solutions & Telecommunications Strategic Business Unit. TRW is a premier provider of systems engineering and integrations services and has solved complex problems of national significance for over 40 years. Our network integration business is a critical component of these services.

I have been asked to present a network integrator's insights into the year 2000 conversion effort. I've provided a written statement. In the interest of time, I'll summarize my statement by providing several rules of thumb which we have learned which apply to network Y2K compliance initiatives.

The first rule of thumb is that a network's Y2K compliance schedule is contingent on the compliance schedules of those who supply the network's components. Suppliers of these components establish their own Y2K compliance schedules to meet their own unique business objectives and these schedules are obviously not always in tune with user schedule requirement.

The second rule of thumb is to anticipate and prepare for a cascading effect when a single Y2K noncompliant application or device impacts other interfacing applications or devices, resulting in a need to replace them all. A well-thought-out plan for prioritized upgrades, integration and tests is essential.

The third rule of thumb addresses an issue raised in testimony at previous hearings. The issue is risk and contingency planning. In spite of an integrator's best efforts, there will be items that are unique to a changing operational environment and could not be reasonably anticipated. Because of this, risk management and contingency planning are essential.

As a final point, I'd like to address the issue of liability. There is no precedent for Y2K liability. Full cooperation of all organizations in business and government is critical to timely resolution of Y2K problems. The threat of litigation is currently an impediment to full cooperation. It is in the government's best interest to pass legislation protecting technology suppliers from undue litigation associated with Y2K issues.

Thank you for the opportunity to testify today and I will be happy to answer any questions.

[The prepared statement follows:]

**Statement of Priscilla E. Guthrie, Vice President and General Manager, Business Enterprise Solutions & Telecommunications, Strategic Business Unit, TRW, Fairfax, Virginia**

Chairwoman Johnson and distinguished members of the Subcommittee, my name is Priscilla Guthrie and I am the Vice President and General Manager of TRW's Business Enterprise Solutions & Telecommunications Strategic Business Unit. TRW is a premier provider of systems engineering and integration services and has solved complex problems of national significance for over 40 years. Our network integration business is a critical component of these services because the movement and management of digitized information is a dominant force in our society. It is a pleasure to be here today to talk about TRW's experiences with the Y2K conversion problem.

I have been asked to present a network integrator's insights into the Year 2000 conversion effort. For the purposes of this discussion, a network is defined as a collection of hardware, software, and transport media that supports the movement and management of information between geographically dispersed locations. Networks are normally configured to meet the requirements of a specifically defined customer community and can vary in complexity from a private intercom system within your Congressional office to a worldwide public network such as the Internet.

The value and function of a network integrator lies in its ability to design, implement, maintain and operate a network that is reliable, flexible, secure and responsive. To accomplish this goal, a network integrator must select and use products and services from multiple sources. These sources include network hardware suppliers, transport media and local connection providers, and software developers. TRW provides network integration services to customers and, as part of these services, we are directly involved in the evaluation and implementation of Y2K-related activities. Network Y2K compliance is subject to the same basic activities as all Y2K efforts: accurate inventory; correct evaluation and assessment (including risk); rigorous test;

aggressive remediation; and, on-going validation. The difficulty of a large-scale network Y2K compliance effort lies in the sheer number of components, many of which are legacy systems, spread over a wide geographic area and interfacing with numerous systems controlled by other companies or agencies. These factors make it extremely difficult, if not impossible, to perform end-to-end tests. Through our Y2K efforts, we have found several basic "rules of thumb" that apply to network compliance initiatives.

The first rule of thumb is that a network's Y2K compliance schedule is contingent on the compliance schedules of those who supply the network's components. Suppliers of these components establish their own Y2K compliance schedules to meet their own unique business objectives. Those schedules are not always consistent with their users' schedule requirements. This is particularly true for large-scale limited access networks, where Commercial Off The Shelf (COTS) and Non-Development Items (NDI) dominate the network and applications software arena. For example, as an integrator, we may desire Y2K compliant network operations for a full year prior to the millennium date. This operational time allows for the identification and resolution of issues that could not be adequately evaluated and tested in a simulated environment. To do so, all elements of the system must be compliant and available as much as 16-18 months in advance of the millennium date. Unfortunately, the inability of suppliers to provide compliant products on time often keeps us from meeting milestones. We do not always have the luxury of following our optimum plan.

The second rule of thumb is to anticipate and prepare for a cascading effect when a single Y2K non-compliant application or device impacts other interfacing applications or devices, resulting in a need to replace them all. This issue is fundamental to all networks. In one example, a network's database management system (DBMS) must be upgraded with a new version that is Y2K compliant. The new DBMS is not compatible with the current operating system, and the operating system must then be upgraded. Unfortunately, several compliant applications are incompatible with the new operating system and must be replaced. Because the upgraded operating system is designed to operate with the newer/faster processors and requires more memory than current hardware can support, the hardware must also be replaced. At a certain point, the most cost-effective long-term solution is to "bite the bullet" and go forward with a complete modernization effort. It is TRW's role to analyze tradeoffs and assist the customer in making appropriate decisions.

In addition, the integrator must be prepared for problems resulting from a network's interface with systems of other individuals, companies or agencies. For financial institutions this could be a big problem due to the large number of individuals and small business customers over whom they have little or no control. Because of efforts undertaken in the telecommunications industry, these compliance issues are not expected to disrupt network operations. However, application compatibility between these users will be essential to assure data integrity. Discerning the difference between network problems and applications problems will be difficult, time consuming, and costly.

The third rule of thumb addresses an issue raised in testimony at previous hearings. The issue is risk and contingency planning. In spite of an integrator's best efforts, there will be items that are unique to a changing operational environment and that could not be reasonably anticipated. Although the one-year, on-line verification mentioned above is a reasonable risk mitigation approach, it may not be realistic. In situations where the availability of critical Y2K compliant elements is uncertain, risk assessment and planning includes evaluation of alternative hardware and software solutions that will meet operational schedules. Another risk mitigation approach is the prioritization of Y2K activities into either 'technical compliance' or 'failure mode' categories. 'Failure mode' issues will either disrupt the operation of the network or cause the network to deliver or act upon inaccurate information. Elements of a network which present Y2K issues but do not create failure modes fall into the 'technical compliance' category. 'Technical compliance' issues are reasonable candidates for waivers and/or deferrals when schedule and resource problems cannot be resolved by other means.

As a final point, I would like to address the issue of liability. There is no precedent for Y2K liability. Network integrators address performance liability issues on a continuing basis. As a network integrator, the limitations on our liability regarding network performance are defined in our contracts. We expect that Y2K liability will be handled in the same fashion as other contract requirements, such as availability and throughput.

Liability issues faced by individual hardware, software, and transport media providers are not fully defined. Many customers require vendors to provide certification of Y2K compliance before they buy or continue to use a supplier's products. The li-

ability implications of these certifications are obvious. Unfortunately, the specter of liability has caused many organizations to defer certification of their products. Some suppliers have even refused to consider written certification due to the liability implications. These are straightforward business decisions, but they are not necessarily in the government's best interest. Unfortunately, delays in certification delay the ability of networks to be brought into full compliance. Full cooperation of all organizations—in business and government—is critical to the timely resolution of Y2K problems. The threat of litigation is currently an impediment to full cooperation. It is in the government's best interest to pass legislation protecting technology suppliers from undue litigation associated with Y2K issues.

Thank you for the opportunity to testify today, and I would be happy to answer any questions.

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Chairman JOHNSON of Connecticut. Thank you very much.  
Mr. White.

**STATEMENT OF WILLIAM O. WHITE, MEMBER, TELCO YEAR  
2000 FORUM**

Mr. WHITE. Madam Chair, Members of the Subcommittee, on behalf of the Telco Year 2000 Forum, I'd like to provide testimony on its purpose and activities to address year 2000 issues in the telecommunications industry.

First, the Forum would like to commend the Ways and Means Committee for conducting hearings on this critical issue. We have heard how the year 2000 is an issue of worldwide concern and it will be the largest single project impacting companies, and in fact, it affects customer computer systems, hardware, operating environments and networks. It is a strategically important process for the telecommunications industry to make sure that we have addressed that.

To that end, the Telco Year 2000 Forum was formed approximately 2 years ago as an outgrowth for Bellcore's CIO Forum which holds discussions on industry trends. The purpose of the Telco Forum is to focus and share information on common industrywide issues and to discuss and come up with solutions for potential impacts of the year 2000.

The Telco Forum consists of Ameritech, Bell Atlantic, Bell South, Cincinnati Bell, GTE, SBC, Southern New England Telephone, and U.S. West. Its purposed is to act as an informal working Committee to address year 2000 issues and to share information. Our discussions are focused exclusively on technical and operational aspects of the year 2000. Our intent is to identify common challenges and solutions in order to facilitate and accelerate responsive actions by each of the member companies.

Our principle activities are to pool and to share testing resources for common network components and to perform interoperability testing. The key in all this activity is that each member company is responsible for its own year 2000 plan and activity. Each member company has a very detailed and company specific plan to address their particular year 2000 issues.

Our process is that we meet six times a year, every other month with numerous conference calls and submeetings in between. We have focus areas within the public switched network, information technology and communication issues.

The primary objection is network interoperability testing or, in other words, intranetwork testing. This is a voluntary effort by the member companies and is funded by the member companies and the intent is to test components of the public switched network. It will verify the operation of a multivendor multicompany environment. It is based on a standard issued by Bellcore called GR-2945. It is becoming the industry standard for meeting Y2K requirements for the telecommunications industry.

As the process continues, each of the companies will configure its labs to support this interoperability testing. The basic types of components or services that the testing will comprise will be emergency services, basic enhanced and intelligence services, network management services, and data networks.

For example, we'll be testing 7-digit calling, 10-digit calling, 800 numbers, operator-assisted completion calls, and so forth. Testing will be performed for approximately 21 suppliers and 82 network elements and/or management systems. These configurations represent common deployed telecommunications capabilities in northern America.

Our goal is to minimize risks of network failures, to minimize the risk of service interruptions, and to test the functionality of daytime sensitive operations. This process has been going on for 1½ years. We have been spending the last year organizing and defining these equipment configurations and the testing schedules. We have been negotiating with each of the member companies to utilize their laboratories.

We anticipate our testing to begin in the third and fourth quarter of 1998 and to be done in our analysis by the early part of the first quarter of 1999.

Some of the company's labs also support some of the Internet work testing being performed by the Alliance for Telecommunications Industry Solutions through its national test committee.

The benefits of our forum is to improve the timeliness of deploying Y2K ready releases by working with major telecommunication equipment suppliers. We represent a unified force in working with companies as Lucent's Northern Telecom, and so forth, to make sure that we can have early access to their releases and software, such that we may conduct our testing and more quickly move them into the public network. This also reduces the need for each company to test each configuration by defining this in a common fashion we can expedite and achieve testing results much earlier than if each company had stood on its own.

This allows each company to direct resources to other areas within the company to address other year 2000 issues. The forum also provides an area to discuss contingency planning on a joint basis.

In conclusion, the year 2000 is a significant challenge to business and governments. And a Telco Forum demonstrates the degree in which our members are committed to being ready for the year 2000 and sets an example of cooperation within an industry.

Thank you.

[The prepared statement follows:]

**Statement of William O. White, Member, Telco Year 2000 Forum**

Chairwoman Johnson and members of the Subcommittee, on behalf of the Telco Year 2000 Forum, I would like to submit the following written testimony on its pur-



pose and activities to address Year 2000 issues in the telecommunications industry. First, the Forum would like to commend the Ways and Means Committee for conducting hearings on this critical issue.

#### BACKGROUND

The Year 2000 issue is a worldwide concern, which has been identified by many industry experts as the largest single project that companies will have to face. Many aspects of technology will be impacted including a variety of computer systems, hardware, operating environments and networks.

As the end of the 20th Century approaches, it is becoming more evident that the Year 2000 will cause problems for some systems due to the limitation of the date field on some "legacy" and other older systems. In a number of these older systems, the developers used a two-digit year field with the assumption that the century is nineteen (19). With the turn of the 21st century the need to differentiate between the 20th and 21st century (19 versus 20) will be required in some applications.

The Chief Information Officer (CIO) Forum sponsored by Bellcore has been discussing the Year 2000 issue at its meetings for some time. The Telco Year 2000 Forum was created as an outgrowth of these Bellcore CIO Forum discussions. The Telco Year 2000 Forum was created to focus and share information on a common, industry wide issue: the potential impact of the Year 2000 on the telecommunication industry.

#### TELCO FORUM PARTICIPANTS

The Telco Year 2000 Forum was formed with participation from some of the largest U.S. telecommunication companies. The present participants include the following companies:

Ameritech Corporation	SBC
Bell Atlantic	Southern New England
BellSouth Telecommunications, Inc.	Telecommunications Corporation
Cincinnati Bell Telephone Company	US West Communications Group, Inc.
GTE	

The Forum has also invited AT&T, MCI, SPRINT and USTA to be participants in the Forum activities. In addition, it has invited some of the major telecommunications equipment suppliers to attend the Forum meetings to discuss mutual concerns and issues.

The Forum acts as an informal working committee to help address Year 2000 issues in the telecommunications industry. Its purpose is to share relevant Year 2000 information. The discussions are focused on issues exclusively relating to the technical or operational aspects of the Year 2000 problem. The intent of the information sharing is to identify potentially common challenges and solutions to address the Year 2000 issue and thereby facilitate and accelerate necessary responsive actions by each of the member companies.

A principal activity of the Forum is to pool and share testing resources for common network components and to perform interoperability testing.

Although the companies share relevant Year 2000 information, each company is responsible for its own Year 2000 plan and activities. Each member company has a very detailed and company specific plan to address its particular Year 2000 issues.

#### TELCO FORUM STRUCTURE

The Forum meets approximately six times a year (every other month). Sub-groups are established to focus on some of the major issues in a more timely and efficient manner. At the present time there are sub-groups in place to address:

- Network issues
- Information technology issues
- Communications issues

The entire Forum and/or its sub-groups also participate in conference calls to address specific issues or concerns between its regularly scheduled meetings

#### NETWORK INTEROPERABILITY TESTING INITIATIVE

A major initiative being undertaken by the Telco Year 2000 Forum is the Network Interoperability Testing Project. This intra-network testing initiative is a voluntary project, which is entirely funded by the member companies to test the network and various services for Year 2000 Readiness. Its purpose is to verify the operation of a multi-vendor, multi-company environment.

The goals of the testing project are to:

- Minimize risk of network failures
- Minimize risk of service failures
- Test the functionality of date/time sensitive operations

The testing initiative is based on Bellcore's GR-2945 which has emerged as an industry standard for telecommunications products for the Year 2000 issue. The participating company laboratories are to be configured for Year 2000 Interoperability testing to include:

- Emergency services
- Basic, enhanced, and intelligent services
- Network management systems
- Data networks

Within these test configurations, a number of individual services such as 7 digit calls, 1+ 10 digit calls, operator-handled calls, 800 calls, etc. will be tested and documented. The test configurations will test the Year 2000 readiness of approximately 21 suppliers and 82 network elements and/or management systems. Collectively this equipment represents the suite of equipment commonly deployed in the network for Northern America.

The Forum has already contracted with a project manager and has concluded contract negotiations with an independent testing laboratory to validate and document the test results. Detailed schedules are being developed with the member company test laboratories and the equipment suppliers to test the Year 2000 ready releases. It is anticipated that the testing will be conducted in the 3rd and 4th quarter of 1998.

In addition to this testing initiative, Forum participants' laboratories will be used to support some of the inter-network testing being performed by the Alliance for Telecommunications Industry Solutions (ATIS) through its National Test Committee (NTC). The co-chair of the NTC is also a Telco Forum participant working on the Interoperability Testing Initiative. This will help ensure that there is a linkage between the two testing initiatives, which are intended to be complementary.

The benefit of the interoperability testing approach is that it improves the timeliness of deploying Year 2000 ready products. It reduces the need for each Company to test every aspect of every new release and permits each to focus work efforts on the deployment of Year 2000 ready equipment. As noted previously, the interoperability testing initiative is a completely self-funded voluntary undertaking. It will supplement individual supplier testing and individual company testing of critical network elements and systems.

In addition to the major interoperability testing efforts of the Forum, some of the other on-going activities and accomplishments of the Forum are outlined below.

#### OTHER ACTIVITIES AND ACCOMPLISHMENTS OF TELCO FORUM

##### *Sharing information regarding best/representative practices*

This is the purpose and major activity of the Forum. The sharing of information on best/representative practices facilitates and accelerates responsive actions by each of the member companies. The sharing of information regarding the approach being used to take responsive action and/or test some of the "industry standard" systems permits individual companies to focus their resources on company unique systems.

##### *Working with major equipment suppliers*

The Forum has met with and/or contacted some major telecommunication equipment suppliers regarding their Year 2000 Ready Releases. It has worked with some of these suppliers to improve delivery dates and/or for an earlier testing date on some of their products. The Forum plans to continue to work with suppliers to address identified Year 2000 equipment issues.

##### *Sharing information regarding network products*

The network representatives on the Forum have developed an internal data set of suppliers' Year 2000 ready releases and their availability dates. This data set contains approximately 93 vendors and 470 network elements. The database is a valuable resource to help ensure all participants are receiving and using consistent information regarding Year 2000 product release and availability dates.

##### *Meeting with various government and industry groups*

Forum participants have met with various government and industry groups to share the Forum's concept and benefits. It has been useful to demonstrate the coop-

erative efforts being undertaken by the industry to help minimize the risk of network or service failures.

*Starting discussions on contingency planning*

Although the individual members are responsible for their own Year 2000 plan and activities, the Forum has recently started discussing the issue of contingency planning. Also, since GTE has a close affiliation with the Canadian telecommunications industry, it has been able to share some of the contingency planning concepts being used there. It is expected that the issue of contingency planning will be addressed in greater detail in the months ahead.

CONCLUSION

The Year 2000 issue represents a significant challenge to business, its customers, and the government. As noted at the outset, it is a worldwide concern, which has been declared by many industry experts as the largest single project that companies will have to face. It requires cooperation within industry and across industry boundaries. It also presents an opportunity to work with others on a common issue. The Telco Year 2000 Forum is a cooperative effort governed as a limited liability corporation actively working to address the Year 2000 issue in the telecommunication industry.

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Chairman JOHNSON of Connecticut. Mr. White, you've invited AT&T, MCI, Sprint, and USTA to be participants in the forum and a number of suppliers as well, why have these four major telephone companies not participated?

Mr. WHITE. AT&T was a member for approximately 1 year, withdrew last fall, and I'm unable to comment on their reasons for withdrawing. Comments like Lucent have been very cooperative attending a number of our meetings and presenting their status, and we've had ongoing discussions with USTA.

Chairman JOHNSON of Connecticut. Is the Bellcore GR-2945 that you say is emerging as an industry standard, is that a divisive development?

Mr. WHITE. It's a document that was developed in late 1996 that provides the requirements for the network equipment to be year 2000 compliant. It is the specifications provided to the industry vendors.

Chairman JOHNSON of Connecticut. And are the other companies, whether they're in this group or not in this group using that as their standard?

Mr. WHITE. I know for a fact that Lucent is and most of the equipment suppliers to the forum have adopted that and are complying with that standard.

Chairman JOHNSON of Connecticut. Mr. Pasqua, could you comment?

Mr. PASQUA. Yes, we are using that standard, for one. The question about AT&T being in the Telco Forum are not—the gentleman is correct. We chose not to continue participation in Telco Forum. For what it's intended to do we think it's an excellent forum for its membership. It's primarily focused, if I could characterize it, on intranetwork testing. Mainly, testing the components that make up the network, as the gentleman indicated.

We're doing that anyhow at AT&T. We have the wherewithal, as I mentioned in my submission, to independently test all of our vendor products in our test environments with our test suites, ways that we use those products to assure ourselves and our customers

that those components are compliant, and if they're not, to get a supplier that does have compliant components.

So the benefit to AT&T to participate in this joint testing of components was not significant. Rather, we're focusing our attention, to build on the Telco Forum when that's completed its testing, on internetwork testing. We think that's the critical testing and testing that's required, not only between AT&T, but the other players in our industry, not only domestically but internationally. That's why we're focusing our attention there.

Chairman JOHNSON of Connecticut. And are the standards you are using the same standards as they are using?

Mr. PASQUA. Yes, they are.

Chairman JOHNSON of Connecticut. And what influence has this had on the development of international standards? This level of agreement among American companies?

Mr. PASQUA. I believe these standards are being reviewed by standards bodies like the ITU for consideration on the international front. But, you'd have to speak to the ITU representatives as to what the status of that is.

Chairman JOHNSON of Connecticut. Does it concern you that there are not yet any international standards?

Mr. PASQUA. No, there is still time. It's not a time to panic. There is time to be successful with Y2K. I think we're well beyond the awareness stage. I think most corporations, certainly domestically, are making the investment in terms of critical skills, dollars, resources and priorities to get Y2K on track. I think the initiatives we've launched with the ITU and other correspondent relationships that we have are making great progress in defining test plans and to ensure that compliancy will be in time for us to implement those standards.

Chairman JOHNSON of Connecticut. And are the standards, for instance, that have emerged in Canada and the United Kingdom such that they are similar to these standards? And, am I offbase in assuming that if you're all using the same standards, it's more likely that we'll have interoperability or are they unrelated?

Mr. PASQUA. This is perhaps, giving it more time than it might deserve. We are talking standards for compliancy. It's pretty simple, at least to my simple brain. You have to have your system work before, during and after the millennium change. Millennium change may not be for your system 12/31/99. It may, in fact, occur earlier in 1999 because you're running a system that has transactions that will span a year.

To make sure that your system works before, during, and after, we know how to do that. We have regression tests and we've supplemented our regression test suites with specific Y2K scenarios running certain dates. For instance, 12/31/99, 1/1/2000, 1/3/2000—the first business day of the new millennium; 2/28 and 2/29 because as you know, the year 2000 will be a leap year because it's divisible by 400.

So there are some unique Y2K scenarios, if you will, that we will supplement our existing regression tests to ensure this thing works before, during, and after the millennium change.

Chairman JOHNSON of Connecticut. Ms. Guthrie, could you comment on this issue of standards and the national and international acceptance of standards and the implications for interoperability?

Ms. GUTHRIE. Yes. I would agree that the actual test execution is fairly simple. It's not too much of an issue. There are some issues with international standards. We're obviously a global company. We find that Europe especially, is lagging a little behind in their Y2K compliance. They tend to be more focused on the Euro, and because of that, their standards aren't in place immediately. It would be helpful to have international standards.

Chairman JOHNSON of Connecticut. Could you elaborate on the portion of your statement that says the second rule of thumb is to anticipate and prepare for the cascading effect when a single Y2K noncompliant application impacts other interfacing applications or devices. It sound to me like you know a lot about devices; you know a lot about testing; and why is there such a fear of cascading?

Ms. GUTHRIE. Well, it's very easy to look at the set of things that you think are on the table when you look at Y2K compliance. You may have to make a change with one component which then won't run with another component. You have to track these things all the way back to the root, and it's a very interesting problem. Some of the products, they're not there yet, or they haven't been completed, so you don't know exactly what they'll run with.

So when you put together a baseline plan to do your Y2K compliance, you have to not only look at the things right before you, but the next level back.

Chairman JOHNSON of Connecticut. And how much do we know about the things that are not compliant? About how many products are there that are not yet compliant and what is the timeframe for those products to be compliant?

Ms. GUTHRIE. Let's see, we're learning more everyday. I think that from a telecommunications only perspective, it's not such a difficult problem. I think that the real trouble will be when we do or don't do the end-to-end tests because the environment's not available. There will be a tremendous opportunity for fingerprinting because not all of the system components will work in concert with one another.

I guess the easy analogy is that most of us have tried to print something off our computers and had the printer not work. We spend an inordinate amount of time trying to figure out whether it was the connectivity between the computer and the printer or it was the printer problem, whether it was an application problem, or whether it was user error. And those are the kinds of problems that end-to-end tests should help us find early. If we don't have an opportunity for end-to-end tests, there are liable to be a lot of small problems that require a lot of time and effort and are very costly to find that probably have nothing to do with telecommunications, per se. But it will be difficult to discern the difference between an applications compatibility issue and a telecommunications issue.

Chairman JOHNSON of Connecticut. I'm going to yield to Congresswoman Thurman.

Ms. THURMAN. Thank you, Madam Chairman. I apologize for not being here for all of the testimony.

This is probably not a question that private industry always likes to hear, and to say that here, we're with the government and we're here to help, but as folks are involved in this, and listening to GAO and listening to the Commissioner: What do you see as our role in this process within the private sector as far as—I think, Ms. Guthrie, what you were talking about earlier, it's not only what you're doing but what's going on beyond that with those people that will integrate into your system—what can we do to help this process? Or is it best for us to just stay out of it totally? I mean, I don't know.

Mr. PASQUA. I think, you can obviously help keep awareness up as to the nature of the problem. I think you can help by sorting through—what we call, the chaff from the hard bodies—sorting through what the facts are regarding where we are and what remains to be done as opposed to sometimes the claims as to where we are. My experience has been, at least in some areas, the claims are not as positive as reality.

But doubling back to a previous question: How much do we know about our supplier products? AT&T has over 4,000 products supplied from outside suppliers. We either have the compliant product and have integrated it into our system or we're testing it or we're about to get it in a timeframe that's consistent with our overall program milestones.

The reason that's true, is that suppliers that wouldn't give us the information have been replaced. So, along that front, are we declaring victory? Absolutely not. But we have a handle on the problem. We have the data we need to be successful.

But I think the other things that I mentioned and some of the other speakers mentioned about the support with the ITU, a part of the UN, the NRIC, the advisory board we could meet perhaps, and I know my colleague from GTE supports this. We could meet on a quarterly basis or as frequently as the FCC would deem warranted to share progress on our Y2K plans against our baseline plan, to share lessons learned and barriers that we may be having that perhaps, the government can help us with. So there are things, but they are so obvious, I shouldn't have taken this much time.

Ms. THURMAN. But none of those things are happening now?

Mr. PASQUA. No, I think they are happening now. If I could, in the spirit of candor, mention a point, however, we need to keep working with the Federal agencies and regulators—I'll speak for AT&T—and share information on a regular basis. If there would be a way to facilitate, to coordinate that dialog, that ongoing status reporting in a focused way to minimize responding to—and this is a future potential—responding to the same questions again that we've responded to another agency or another group, that would be very helpful.

I don't know if that's something I should say here, but that would be helpful for all of us.

Ms. THURMAN. We asked the question, we want an honest answer.

Mr. PASQUA. Thank you.

Ms. THURMAN. Anybody else?

Mr. BENNETT. Also, continuing to press the need to move quickly. As I mentioned we feel that there are enough resources to manage the problem to make sure that our customers have what they need. But as time moves on, if there is an action, really this year, then you start to run out of the ability to support and that's when we get into real trouble. So I think, encouraging moving now is very important.

Ms. THURMAN. Mr. Baker.

Mr. BAKER. I think your keeping the awareness up and keeping panels like this is also very important. But some bad things can happen if we get down the road where the media plays year 2000 and it's the movie of the week, and we want this on the Learning Channel, the Discovery Channel, not Jerry Springer, I think the efforts in that area, because there is a lot of uncertainty out there. And clearly the people representative at this table and the companies I've talked to have not been asleep at this wedge for 2 years. They have senior people with a roadmap compliance and adequate time for tests.

There's a lot of uncertainty out there and across the board, the large companies that I speak to, they're not worried about themselves so much, it's about the other guy. We're worried about the other guy. Something that they are not visible, down in the food chain that comes up and then it bites them.

I think there's a lot of positive things going on but it needs to be increased. It's the very last and we've got something to do about it, and I think that's a very important part of this. In the United Kingdom, Tony Blair has put his country on an emergency footing. Clearly, I think the discussions inside the beltway in Washington are going to stop real quickly asking the question: Will your mission-critical systems be compliant in time?

Some probably will not. The shift has to go to contingency plans to work around to minimize the impacts, and I think that's an important thing to keep in mind.

Ms. THURMAN. Can I take this one step further? Because all of you are making that point that we need to be focused. We need to have these things happen. We need to make sure these things are happening. Are there incentives, penalties or anything that you see that we should be looking at for those that are not? I'm just curious. I mean, sometimes, the Chairman has been working for years on trying to get compliance with the IRS just to be able to do electronic filing and we end up backtracking every other year, that well, we're going to now just worry about this group, and then we'll worry about this group, now, we find out that it's going to save millions of dollars and just easier for everybody. Somebody was saying we put in some penalties or we might say, give them some incentives.

Are there some things that we should be looking at in that direction?

Mr. BAKER. Well, I could give you a few examples of some things that just happened in the last week actually, that proved to be some pretty positive steps.

Back to our friends up north in Canada, they figured out slowly and we probably will here too, that the impacts are going to be to the smaller companies that don't have the senior vice president in

charge or a year 2000 staff or an IT budget. Companies like that were recognized to give them an incentive for information technology upgrades, computers, and things like that they buy because of the year 2000. Small and medium companies were given some tax credits. That was very well received. That just happened in the last 3 to 4 days, I believe. And that's across the country to Canada and we failed to break any news on that.

I think we're going to have to get involved in the liability question. That's going to have to come up. You hear the figures that are out and unbelievable. Some people are saying that the corporate lawyers are saying, show me the carcass to feed from. We can't let that happen. That's why our visibility, I think, ma'am, is shallow in a lot of areas because of liability. It's not the fact that they don't want to show their hands, it's the liability question. I think you ought to get involved in this Subcommittee with that issue this year.

Ms. THURMAN. Well, I thank you for your openness. I appreciate it. Thank you.

Chairman JOHNSON of Connecticut. Thank you. That is a question I wanted to turn to. Ms. Guthrie brought up the liability issue. I have heard that the legal profession is already offering workshops on how to sue whom if there are problems. I am very concerned about the statements you made in your testimony, Ms. Guthrie, regarding the reluctance of companies to certify because they can only certify the performance of their own equipment and they can't certify the performance of their equipment's interoperability with other equipment.

So would any of you like to comment further on the liability issue and what we need to do to fix it? What is it that's needed? Would you like to answer in writing?

Mr. PASQUA. I could make a comment on that. We're from the school just tell the truth and get on with it, especially when we have a global situation. This is, and I know it sounds trite and obvious, it's the most unique project we've ever experienced in our lifetime. That's why I volunteered to take over this role. Because it's one program you can't debate whether it's deferrable, and we can't slip the date. That gets us through a lot of issues that tend to trip us up.

There are certain contractual arrangements we have with some of our suppliers built into the contracts that say, information that you develop by testing our product, you cannot release that to the public unless you have our approval in advance. Tell us, so we can fix it. So, those contracts have to be honored.

In terms of public disclosure, with that one exception to the rule of what we're doing at AT&T, we're now coming out, bigtime, on announcing what we're doing, how we're doing it, where we are, where we want to be. We have an external Web site now and plan on substantially improving it with score cards showing where we are. I must sign 100 to 200 customer letters and inquiries a week responding to customers as to where we are. I meet with customers, and my other colleagues at AT&T meet with customers on a daily basis, in large groups and small groups trying to share not only where we are as a supplier, but our approach and our tech-



nique because maybe they can benefit from it in improving their Y2K program.

And similarly, in some cases, they share their Y2K program approach with us and we will steal shamelessly to improve our program. So it's a collective benefit.

Chairman JOHNSON of Connecticut. Ms. Guthrie—I'm sorry. Mr. Bennett.

Mr. BENNETT. We've been asked to participate through the Special Assistant of the President on some legislation comment we've done. We also recognize if we work with our customers that there may be a need for such legislation. We're still monitoring and watching it.

But importantly, we've been sharing information with our customers all along and will continue. In particular, sharing information about the impact of our products that aren't Y2K compliant, our test plans, and summaries about our test results are the data that we are passing. So, we haven't seen a need to change laws in that case to be able to pass that information. And our intent is to continue to share that information with our customers as we move forward.

Chairman JOHNSON of Connecticut. Mr. Baker, would you like to comment further?

Mr. BAKER. Say it again, Ms. Johnson?

Chairman JOHNSON of Connecticut. Would you like to comment further, share your level of concern, and why you think it's going to be such a big problem?

Mr. BAKER. On liability and what that's going to be. Well, the way you look at it. A couple of States, and you're probably aware of this, have put Y2K in an act of God category. Nevada has done that and there are several others that are looking at that. Real danger flags come up when you see something like that. That's a real incentive not to do something. Hopefully, that's not going to catch on.

It's hard for people to come out into the open to talk about Y2K because of liability. That's why you don't see a lot of CEO's raising their hands and coming to Washington to talk about their 3-year program and the millions and millions of dollars spent on it.

I will comment that AT&T is one of the very companies that actually have an external Y2K Web site. What a breath of fresh air it is to see something where someone's interested in the company, or a shareholder in the company, and you can actually ask questions and you can get answers back. I've tried it and it actually works. Things like that really would help and be a real incentive to get through the liability issue. The more disclosure the better. It's a real positive thing to down play the liability question, itself.

Chairman JOHNSON of Connecticut. So, you think it would be in the interest of companies as well as in the interest of the level of awareness in the business community and in society as a whole if everybody were very open about the information?

Mr. BAKER. Oh, absolutely, I think so. I think there's a potential, talking about the stock market, to drive people out of the market. I think there's a logic trail we can follow here. Where there is uncertainty because of the lack of disclosure on Y2K, it would drive people away from the market. Where there is disclosure and open-

ness about it, I think that confidence, that shareholder confidence, would clearly be there and the liability will go to small L, rather than a large L. Disclosure and the cooperative efforts are positive things because the shareholders and the public out there sure are interested in this.

Before the media gets hold of it and puts a bad spin on it, we have the opportunity now to start initiatives and to get the word out. Start in open forums to bring confidence up, and then you'll see liability be a much smaller issue I think, at the end of the day.

Chairman JOHNSON of Connecticut. Mr. Pasqua.

Mr. PASQUA. Madam Chair, I have one followup cautionary note I'd like to add though. That is, some of this information needs to be analyzed and used carefully. I can tell you I've tested a product and it's compliant, you can assume it's compliant. I don't have to test it, you don't have to test it in your environment and be lulled perhaps into a false sense of security because my tests were not as extensive as your tests, my test environment, my test scripts, our different use of that same technology. So we have to be guarded in terms of is there really a silver bullet here?

Chairman JOHNSON of Connecticut. I guess that's why I was so interested in this issue and standards. And perhaps, I'm hearing your testimony on the issues of standards as somewhat more definitive and assuring than perhaps I should.

Mr. PASQUA. Yes, standards give guidelines for defining what is compliance and the types of test scenarios or cases you should consider using. We don't consider those spelled out test cases sufficient. We do additional testing than what the minimal standards suggest, and that's a local call by an individual business and group as to what's really your priorities, how are you triaging, what are your business processes, what's important to your customers—and so forth.

So standards is a start but it's not the definitive end of specifying every test case that you need to run.

Chairman JOHNSON of Connecticut. Well, I appreciate that. But certainly, when we set standards in any area it's just to advise its positions or technology or certify any level of capability. There is sort of a general level at which you determine everyone must reach. And above that there are additional levels, but would you say, Mr. White, that the standards that have been generally agreed to in your group are specific enough so that if a company uses them or if they say they meet those standards, that should give it some confidence?

Mr. WHITE. Yes, they should. But they do go through and specify the types of dates and the type of test scenarios and requirements that go along with that. However, if you take a look that maybe on a component-by-component basis, if I go and take 10 components and put them together, that's where you have to take a look at the usage. So, the gentleman from AT&T is correct. That's where you start and that does provide a high level of assurance within the telecommunications—

Chairman JOHNSON of Connecticut. And so, do we have no standards that govern the use of a number of different components?

Mr. WHITE. There are standards on how the network is actually put together, what elements talk to another.

Chairman JOHNSON of Connecticut. Are the standards well enough to go up so that you could say anything that has met these standards that there would be a presumption of innocence on liability?

Mr. WHITE. I wouldn't be able to comment on the liability issue within the Telco Forum, that we have been working on the last 6 months is not just the tests per component, but the actual complete integration of those components and how we want to test those integration—those connection points—just to ensure ourselves as we went through each level of component testing and that passed, then we add all the pieces back together. So we have taken the standard as a foundation and gone well beyond that.

Chairman JOHNSON of Connecticut. Ms. Guthrie, would you comment on this?

Ms. GUTHRIE. Yes, I think that all the standards that are available today have problems with them. You can get products that meet standards and yet, they don't interface properly. So, yes. It would be beneficial if there were strong standards about Y2K. But I think that interoperability and end-to-end testing will still be required because there is no standard that's going to be sufficient to assure that you have an interoperable system just because you've worked off—

Chairman JOHNSON of Connecticut. But how can you hold that individual producer or provider of service liable for the affects of interoperability when really all they can do is test their components and systems and the product within a certain point within their system.

Can we define the level of accountability that individual producers of parts and systems and providers of services should be accountable for, recognizing that then as things are integrated, we are going to have problems? And there are going to be failures. I don't see any way that you can move into this, the interlocking of this repaired, accommodated, adjusted system as we must deal with, and imagine that you won't have some glitches.

So, if you're going to get people out there doing the very best job they can to avoid glitches, I think, we are going to have to begin thinking about what is any one company liable for and what's the state of the art that we can hold people for? We can't hold people liable for things they have no control over.

Would you say, Ms. Guthrie, that you could actually define those levels?

Ms. GUTHRIE. No, I'm not saying you can. System development is an arena that still has a lot of problems associated with it. There are many programs that have had difficulties because of these very many issues. And to mandate a set of standards that allows you to take an installed legacy base and make modifications across the board in this very short timeframe and have no glitches is not reasonable.

What's important is that everyone work together to try to resolve the issues and be open and communicate so that there's not a withholding of information.

Chairman JOHNSON of Connecticut. And yet, you say that the threat of litigation is currently an impediment to full cooperation. That's certainly the impression I got from Mr. Baker. It is also the

comment that people walk up and make at home after the formal discussion of these issues.

Ms. GUTHRIE. Yes, it very much is. And I think that we're seeing it more in our commercial business rather than in our government business. We're seeing companies pull back from Y2K conversion—

Chairman JOHNSON of Connecticut. But you can't sue the government? It's real easy.

Ms. GUTHRIE. Well, yes. And there's still a question about how will government respond to their vendor base when Y2K issues do arise, because they will arise. I think that it's better understood how commercial companies are going to respond. But we need the openness to solve the problems.

Chairman JOHNSON of Connecticut. Well, I don't want to beat that issue to death, but I do offer to you the opportunity to put any comments you may have in writing. We will treat them confidentially. I am convinced that this is an area we are not getting the input we need for a lot of very good and logical reasons and I have talked to a number of other Committee leaders about this and it only stands to reason, and I was truly horrified to hear the legal profession is already holding workshops on how to go about this.

So, we can only damage ourselves as an economy and a community and a market if we expend our resources in that fashion over this problem which is far beyond the dimensions of any problem we have ever been confronted with. It's far beyond the capability of any one company, or any individual, or bureaucracy to handle. And if we do to ourselves in Y2K what we did to ourselves in Superfund—because we've done this before—in the Superfund. We wrote a law that penalized people and held them liable for things they could not have known and for abiding by standards that actually, we set.

So totally irrational things can happen intentionally. And we've seen that. So, I'm very concerned about the possibility through, in a sense, neglect and an unwillingness to face the seriousness of this aspect of the problem we could create for ourselves an extraordinarily costly and diversionary sector of the economy—of economic activity. So, I am very concerned about it. I will treat your comments respectively and assure that they will be treated with confidence unless we decide to go ahead, and then we would check with you. But, we do need input. I can tell you that.

Last, Ms. Guthrie, do you think the Treasury in the IRS have sufficient in-house expertise in telecommunication technology to be able to assess and implement the solutions to their problems?

Ms. GUTHRIE. No, and that's why they're using their contractor base.

Chairman JOHNSON of Connecticut. And is their use of their contract base broad enough now to give you some confidence they will be able to succeed?

Ms. GUTHRIE. Let's see. They are starting to involve their contractor base. I believe the new Commissioner of IRS has taken some fairly aggressive steps to work Y2K. He's very focused on it and we're pleased with what he's doing.

Chairman JOHNSON of Connecticut. I am too. I am very impressed with what he is doing and I want to know from your point

of view as an insider in that operation, whether you think it is as strong as it needs to be. And I hear the answer to that is yes.

Ms. GUTHRIE. Yes.

Chairman JOHNSON of Connecticut. Mr. Bennett and anyone else who might like to comment very briefly: Do you think that private sector is going to be capable of delivering in an adequate and timely fashion telecommunication components to allow their installation throughout the many levels of the system that we have, in a timely fashion, both public and private sector to renovate the networks? I'm sorry that was sort of a backhanded question.

Mr. Bennett.

Mr. BENNETT. Sure. First, I do believe that resources are available both from us, Lucent, as a manufacturer, but I believe from the other manufacturers as well, to solve the Y2K problem. What I'm concerned most about is getting it done quickly because as we kind of push this bough wave—if I can use the term—forward through the year, all of it becomes much more difficult. So the issue is to move quickly and to get what needs to be done now.

As I work with the Telco Forum and others, I see that happening.

Chairman JOHNSON of Connecticut. Time is certainly of the essence and it's one of the reasons why we've been holding this hearing and some of the other Committees have to try to give the kind of focus and pressure that will develop a greater urgency.

But last, let me just ask you whether or not, through your contacts and experience out there in the private sector, whether you are concerned about compliance in the small business sector. You heard me quote earlier the CRS report that says "80 percent of small businesses will probably experience some failure." They're defining small as under 2,000 employees. So, that's extremely concerning to me. What do you see in terms of business compliance out there?

Mr. BENNETT. Based on the information we provided to the FCC, for example, with the Lucent products rollover, half of our products as we began our process of making sure Y2K was ready—our products were ready—we're already there, over half of the products. So, I am a little surprised by the numbers that I heard earlier today.

As we move forward making many of our products, the majority them now ready, I am surprised as I heard the numbers. So, I don't have any basis to support the numbers I heard earlier. I believe we're moving better than that. But I don't know from which basis they drew their—

Chairman JOHNSON of Connecticut. Anyone else have any comment on that?

Mr. White.

Mr. WHITE. I think what Commissioner Powell's alluding to always needs to be asked is: "80 percent of the businesses may experience a year 2000 problem, what kind of problem will they experience?" If they have a file that they print that's got the wrong date at the top of the paper, is that of significant consequence to the business versus a more significant one that they can't produce bills to send out to their customers? So, I think that's always the key question to ask any analyst who touts very large numbers is to break that answer apart into multiple categories.

Chairman JOHNSON of Connecticut. Well, thank you very much for testifying before us today. I appreciate your input and I invite your follow-on comments on any aspect of these problems that you might observe in the coming weeks ahead.

Thank you very much.

This hearing is adjourned.

[Whereupon, at 5:15 p.m., the hearing was adjourned subject to the call of the Chair.]

