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The Year 2000 Computer Problem: Congressional Issues

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The Year 2000 Computer Problem: Congressional Issues

SUMMARY

Many computers were designed to store a two-digit number for the year, which makes the year 2000 indistinguishable from 1900. Unless they are corrected, many computers will not be able to process dates beyond the year 2000, and may cause many costly problems in commerce and government.

Although some may still doubt the seriousness of the year 2000 (Y2K) problem, most business managers and government officials are now convinced that it proving to be difficult and time-consuming to correct. Federal agencies have established year 2000 (Y2K) program offices, and an interagency committee has overseen several government-wide actions. State and local governments, private sector businesses, and foreign organizations also face the year 2000 problem for their computer systems.

Since 1996, many congressional hearings have helped raise awareness of the year 2000 problem in both government and the private sector. Several provisions were enacted in the 104th and 105th Congresses. In FY1998, funds were reprogrammed to perform year 2000 work, and supplemental appropriations were provided for year 2000 efforts at federal agencies. In the 105th Congress, the Defense Authorization Act (P.L. 105-261) directs the Defense Department on its year 2000 conversion program; P.L. 105-164 enables all financial regulatory agencies to examine year 2000 efforts of institutions they oversee; the Year

2000 Information and Readiness Disclosure Act (P.L. 105-271) encourages companies to disclose information on the year 2000 readiness of their products and services; and the Omnibus Appropriations Act (P.L. 105-277) includes \$3.35 billion of emergency funds for year 2000 conversions of federal systems. Although Congress did not give federal agencies increased autonomy to reprogram appropriated funds, agencies may use the emergency appropriations, with White House approval, to supplement their year 2000 conversion programs.

In February 1998, the President established a Year 2000 Conversion Council and appointed a director for year 2000 conversion efforts in the federal government. The Council is working with federal agencies and private sector groups to address year 2000 problems at a national level.

In the 106th Congress, hearings are being held and will continue to provide the public with the most accurate information available on the status of Y2K remediations at federal agencies, state and local agencies, private sector entities, and international organizations. Congress may also consider additional legislation to ensure that private sector systems are year 2000 compliant, to establish emergency preparedness measures to address problems that might occur, and to limit liability associated with Y2K failures for manufacturers and industry groups.

MOST RECENT DEVELOPMENTS

Recent year 2000 hearings include the following: on April 13 the House Subcommittees on Technology and on Government Management, Information, and Technology hearing on the Y2K readiness of critical programs of the federal government; on April 13, the House Banking Committee hearing on finalizing the preparedness of banks and other financial institutions, including testing, credit risk, contingency planning and liquidity, and customer confidence; on April 14 the Senate Y2K Committee hearing on federal government Y2K preparedness, focusing on those agencies that missed OMB's March 31 target deadline for reaching 100% Y2K compliance; on April 15 the House Veterans Affairs Committee, Subcommittee on Oversight and Investigations hearing on Department of Veterans Affairs Y2K readiness. Planned hearings include: Senate Y2K Committee hearings on April 22 (international oil industry), April 29 (911 emergency services), and May 10 (chemical manufacturing and processing industry). Y2K liability legislation (S. 96 amended, [<http://www.senate.gov/~commerce/legis/legis.htm>]) is expected to go to the Senate floor on April 26.

Other recent events include: on March 30, the Federal Communications Commission released a comprehensive assessment of the telecommunications industries Y2K preparedness, concluding that the Commission is "guardedly optimistic" that disruptions in telecommunications services will be minimal. On March 31, the American Hospital Association released its survey of the Y2K readiness of hospitals, stating that most hospitals and pharmaceutical companies expect to be Y2K compliant by January 2000. On April 2, the Office of Management and Budget released an additional \$199 million from the federal Emergency Y2K Conversion Account for Y2K efforts of federal agencies, leaving \$491 million in the Emergency Y2K Account for non-defense agencies and \$135 million for defense agencies. On April 21, the President's Y2K Council released its second Quarterly Summary of Assessment Information, providing a mixed review for Y2K status the various service sectors and industrial components of the U.S. economy.

BACKGROUND AND ANALYSIS

For over three years, Members and committees of Congress have helped focus national attention on the year 2000 (Y2K) computer problem, the inability of many computer systems to process dates correctly beyond December 31, 1999. The problem results from a common design scheme for computers in which dates are stored and processed using only the last two digits for the year field (e.g., 98 for 1998). The two-digit year field is very common among older systems designed when memory storage was more expensive, but it is also used in many systems built recently. With this format the year 2000 is indistinguishable from 1900. The year data-field in computer programs can perform various functions such as calculating age, sorting information by date, and comparing dates. When years beyond 1999 are entered in the two-digit format, those functions will often fail to operate properly.

While correcting a single year field is technically simple, the process of analyzing, correcting, testing, and integrating software and hardware among all computer systems that must interact is a very complex management task. In most cases, it is too expensive to

purchase a completely new system, and the software must be modified to accommodate four-digit years or to incorporate some other interim solution. To determine whether a computer system needs to be modified, all of its software must be reviewed, which in some cases entails reading millions of lines of code. The process of reading and interpreting the code is made more difficult by the many computer languages in use and the shortage of programmers with skills in older languages. In addition, many older programs no longer have the accompanying documentation, such as source code (text-files of computer language instructions written by programmers). Source code cannot be directly executed, but must be compiled into object code that cannot be translated back into source code.

A further complication is that there is no single solution to correct computer systems of the Y2K problem. Rather, there are dozens of standards, public and proprietary, for storing and processing dates in computers. Also, the year 2000 is a special leap year that only occurs every 400 years to keep the calendar accurate. (Leap years occur every 4 years except years divisible by 100. However, century years are leap years if they are divisible by 400, such as 2000.) Products that are designed incorrectly will not account for the extra day needed in the year 2000. As analysts investigated the Y2K problem, other date-related problems have been identified that must be corrected to prevent computer system failures. Other dates expected to be vulnerable to computer failures include the beginning of fiscal year 2000 for many states and foreign countries, and September 9, 1999 (read 9999), which was commonly used by software programmers to indicate the termination of a function.

Many managers initially doubted the seriousness of this problem, assuming that an easy technical solution would be developed. Despite concerns that industry was exaggerating the situation, the vast majority of research has refuted this view, concluding that inspecting all computer systems, converting date fields where necessary, and then testing modified software will be very time-consuming and costly. Research firms predict that, due to a lack of time and resources, the majority of U.S. businesses and government agencies will not be able to fix all of their computer systems by January 1, 2000. The Gartner Group, an information technology research firm, estimated a cost of \$30 billion to correct the problem in federal agencies and up to \$600 billion worldwide. Most agencies and businesses have come to understand the difficulties involved, but some smaller firms have not yet started implementing changes. Many companies offer Y2K conversion services, and software analysis products are readily available to assist with finding and converting flawed software. While software tools can assist in solving the problem, however, most of the work must be done by humans. Some are concerned over a possible shortage of skilled programmers to perform the work, although that situation has not been widely reported.

The widespread reliance on computer systems by federal, state, and local governments, and by the private sector, raises the level of urgency for solving the problem for all systems in use. Even if the problem is corrected for a given computer system, interactions with other systems that are not Y2K compliant could result in false information corrupting the corrected database. Flawed data can enter from the private sector into government agencies' databases, and from foreign countries into U.S. computer systems. Testing is particularly laborious because the modified software must be tested in conjunction with all possible combinations of other software programs with which it interacts, to ensure that functioning has not changed. As a result of difficulty convincing executive management that this problem needed to be addressed, many companies and agencies may not be able to complete their software conversion and testing by January 1, 2000. For systems that process dates into the future,

there is even less time. Many Y2K computer errors have already occurred. For additional information on media coverage of the Y2K problem see CRS Report 98-781, *Year 2000 Computer Problem: Selected Internet Addresses*; and CRS Report 98-994, *Year 2000 Computer Problem: Selected References*.

The Y2K problem exists in computer software as well as hardware components called integrated circuits (ICs), or chips, store or process data. ICs are sometimes pre-programmed or “hard-wired” by the manufacturer to store or process year data using only two digits, producing the same errors as the software that controls large computer systems when processing dates beyond 1999. ICs are used in all computer hardware (PCs, minis, and mainframes) and in many electronic devices that are not typically considered computers. Some of these “embedded chips,” such as the read-only-memory (ROM), are used to store data. Other embedded chips, called microprocessors, are used to control many different types of systems such as industrial machinery, thermostats, lighting, sprinklers, medical equipment and devices, building security systems, telephone services, electric power grids, public transit systems, and other utility distribution systems.

Although most ICs do not store or process dates, those that do must be inspected and replaced, if necessary, to avoid malfunctions from Y2K incompatibility. (For the case of ROMs, some can be reprogrammed by the user to handle four digit years, but others must be physically removed and replaced with Y2K compliant ROMs.) Billions of ICs are produced and sold globally each year, leading to the possibility that great damage could result even if only a tiny fraction of them malfunction. Furthermore, ICs are produced by hundreds of different companies, some of which are located overseas. Even some ICs being produced today and embedded in other systems, may not be Y2K compliant.

Federal Efforts

Federal agencies maintain many computer systems that manage large databases, conduct electronic monetary transactions, and control numerous interactions with other computer systems. For well over a year (and in some cases for many years) federal agencies have been converting their systems to achieve Y2K compliance. Time constraints have forced agencies to focus on fixing only the highest priority, or “mission critical” systems, and to shift resources from other projects to work on Y2K efforts. In 1995, the Office of Management and Budget (OMB) established an interagency committee, led by the Social Security Administration, to facilitate federal efforts. These include the General Services Administration (GSA) requirement that vendor software listed in federal procurement schedules be Y2K compliant, and the National Institute of Standards and Technology (NIST) recommendation that four-digit year fields be used for any federal electronic data exchange (Federal Information Processing Standard 4-1). NIST has also developed specifications for use in testing date and time functions of computer systems for Y2K compliance.

The interagency committee developed a world-wide web site to provide information on Y2K conversion activities [<http://www.itpolicy.gsa.gov/mks/yr2000/y201toc1.htm>]. This web site, managed by GSA, is linked to other federal agency Y2K web sites and those of non-federal organizations that discuss activities and available resources on Y2K conversion. The committee also developed a “best practices” report, describing how agencies can best implement a solution. The report includes a comprehensive conversion plan, setting

milestones for federal agency progress up to January 1, 2000, and provides a method for dividing Y2K conversion activities into five phases: 1) awareness — gaining executive level support and sponsorship; 2) assessment—conducting an inventory of core business areas and processes that could be affected by the problem and prioritizing their conversion or replacement; 3) renovation—converting, replacing, or eliminating systems, applications, databases, and interfaces; 4) validation—testing converted systems applications or databases for performance and functionality; and 5) implementation—testing for interoperability and formal acceptance, and developing contingency plans. These five phases were adopted by federal agencies and the General Accounting Office as a way of measuring progress toward correcting the problem. Much of the private sector has adopted the five phase terminology, as well as other information disseminated by the interagency committee.

In December 1996, OMB designated the interagency committee as an official subcommittee of the newly established Council of Chief Information Officers (CIOs). Through that subcommittee, the Federal Acquisition Regulation (FAR) was amended to increase awareness of Y2K procurement issues and to ensure that solicitations and contracts address Y2K issues. The amendment has helped federal agencies to purchase Y2K compliant products by providing a uniform approach toward solutions and a single definition for compliance. In August 1997, the Federal Acquisition Regulation council adopted a final rule for Y2K purchases, requiring federal agencies to purchase systems that process all dates correctly. Noncompliant products must be upgraded by vendors before the earliest date at which they will fail to process dates correctly. However, systems will not be expected to produce correct results if corrupted data is used as the input.

The Department of Defense (DOD) has a particularly difficult challenge in inspecting, correcting, and testing all of its systems. With each military service and defense agency maintaining its own computer systems for military operations, acquisitions, and personnel functions, DOD originally took a decentralized approach to managing the Y2K problem. In 1998, however, a single individual was appointed to manage all DOD Y2K conversion efforts. DOD has several unique concerns apart from other federal agencies, such as its weapon systems that contain embedded chips that store two-digit dates, and its huge volume of computer-driven systems. With over one third of all computers in the federal government, DOD has identified 2,581 mission critical systems, 48% of which were not yet Y2K compliant as of November 15, 1998. Another problem caused by the inability of a DOD system to process dates has been found in its Global Positioning System (GPS), a satellite system that provides position and velocity information for many military and civilian aircraft (including missiles), and ground vehicles. Malfunctioning of GPS (which could occur on August 22, 1999, when the system clock resets) could cause a loss of control of these vehicles and systems.

In March 1997, at the prompting of the President's National Security Telecommunications Advisory Committee (NSTAC), the National Communications System (NCS) initiated a study of the impact of the Y2K problem on the nation's telecommunications infrastructure. NCS is a cooperative effort made up of 23 federal agencies, led by the Defense Information Systems Agency. Its mission is to coordinate national security and emergency preparedness telecommunications during any crisis or disaster. NCS is working with the telephone industry in studying the Y2K problem for public communications networks. NCS is working with the intelligence community to address these concerns and has not released further findings to the public.

As a result of increasing attention on the embedded chip problem, in May 1997, the Y2K Subcommittee formed a subgroup on medical devices and scientific equipment. The subgroup is chaired by the Department of Health and Human Services and has representatives from DOD, Food and Drug Administration, Centers for Disease Control, National Institutes of Health, Departments of Veterans Affairs, Agriculture, Justice, and the Nuclear Regulatory Commission. Their goal is to ensure that government-sponsored research and patient care are uninterrupted by Y2K problems. In January 1998, the subgroup sent a letter to over 16,000 manufacturers of medical and scientific products used by the government, to collect data on the Y2K compliance of their products. Over 1900 of those companies are manufacturers of equipment with computer components. Many of those companies still have not provided information on their products. The subgroup continues to collect additional information on medical devices and scientific equipment, and maintains a database of Y2K compliance status of products on its web site (<http://www.fda.gov/cdrh/yr2000/year2000.html>).

In February 1998, the President issued a directive requiring federal agencies to assure that critical federal programs are not disrupted by the Y2K problem. The directive established a Council on Y2K Conversion, led by a presidential appointee, John Koskinen (former Deputy Director of OMB), to oversee activities of all federal agencies, act as chief spokesman for the executive branch, coordinate with state, local, and tribal governments, international groups, and the private sector, and identify resources needed for agencies' Y2K conversion efforts. This appointment of a "Y2K Czar" represented a shift in Administration policy from a decentralized approach for the Y2K effort, to a more centralized management approach, as recommended by Members of Congress.

On July 14, 1998, President Clinton and Vice President Gore addressed the nation on the Y2K problem, citing several Administration initiatives underway to address the problem. These included a campaign by the Small business Administration to raise awareness among small businesses, the so-called "good Samaritan" legislation to promote information sharing in the private sector, a Department of Labor job bank for Y2K workers, a \$12 million contribution to the World Bank's Y2K program, and a national campaign by the President's Y2K Council. The legislation, amended and later named the Year 2000 Information and Readiness Disclosure Act, was enacted as P.L.105-271 on October 19, 1998.

The Administration has taken several actions this year, including introducing a new toll-free telephone number (888-USA-4-Y2K) to provide Y2K information to consumers, and creating a Senior Advisors Group of chief executive officers of major companies and trade associations to provide Y2K information to the public. With requests from several Members of Congress, on January 19 President Clinton discussed the seriousness of the Y2K problem in his State of the Union address, urging all businesses and government agencies at federal, state, and local levels to work diligently toward resolving it. The President's budget request, submitted February 2, included a total of \$433 million for Y2K remediations at federal agencies for FY 2000. The President's Y2K Council has identified individuals to represent each of 24 sectors of the Senior Advisors Group, which will provide updates to the Administration on the Y2K preparedness of their respective industries. The Y2K Council also established an International Y2K Cooperation Center to coordinate regional and sectoral efforts to address the Y2K problem.

Recent Administration activities include considering using some of the emergency Y2K funds from the appropriated \$3.35 billion to provide assistance to resolve Y2K problems at nuclear reactor facilities in Russia and other former Soviet countries; meeting with Canada and Mexico on February 23-24 to discuss cross-border Y2K issues; conducting its second national small business action week for March 29-April 2; establishing a Y2K Help Center at the National Institute of Standards and Technology to provide technical support to small business; planning an emergency coordination center to collect, analyze and disseminate information on problems occurring in January 2000; and developing a "toolkit" of information for local community use. On March 18, the Office of Management and Budget released its eighth Quarterly Report on federal agency progress on Y2K conversion. The report states that 79% of federal mission critical systems are now Y2K compliant, and that three agencies (down from five) are not making adequate progress in their Y2K conversion efforts. The updated total cost for Y2K conversion is estimated at \$6.8 billion.

State and Local Efforts

The status of Y2K remediations of state, county, and municipal governments varies widely, with many having made estimates of the costs anticipated to correct the Y2K problem for their own systems, and others not yet having completed inventories of their computer systems. In December 1996, the National Association of State Information Resource Executives (NASIRE) held a Y2K symposium, at which only 28 states were represented. Since then, awareness and information sharing on the Y2K problem by state governments has increased markedly. NASIRE continues to monitor Y2K conversion efforts of state governments, and provides detailed information on its web site (www.nasire.org/year2000). A November 1998 report by the General Accounting Office (GAO) stated that failure by states to complete Y2K conversions could result in billions of dollars of federal benefits payments not being delivered. Some states (e.g. Nevada, Virginia, Georgia, Hawaii) have enacted laws providing full or limited immunity to the state from liability for date related computer errors, and other states are considering similar legislation.

Many city and county government Y2K efforts lag behind state and federal agencies. Federal agencies are concerned because they often receive data directly from city and county offices. For example, local police forces regularly provide information to the Department of Justice, and local health departments send information to the Department of Health and Human Services. If city or county computer systems are not Y2K compliant, they could send corrupted data to federal databases. If solutions implemented for a local computer system are incompatible with solutions implemented for a given federal system, the data transmission may fail. Cities and counties also share electronic information among themselves and with states. Incompatibility between any of these systems can lead to system failures. A survey by the National Association of Counties, released December 8, 1998, stated that half of the nation's counties do not have Y2K strategic plans, and estimated that America's counties (not including cities or towns) will spend \$1.7 billion to achieve Y2K compliance. Many local groups are conducting "town hall" meetings to discuss potential problems and contingency plans at the city and community levels.

Private Sector Efforts

Major industry sectors must coordinate their efforts to correct their computer systems to insure that these sectors continue to function smoothly. The finance industry is particularly critical because it relies on many daily transactions across geographic and political boundaries. Banks, thrift savings institutions, credit unions, and stock markets must be sure that their transactions can interoperate accurately. Other industries that must coordinate their Y2K efforts include insurance companies, telecommunications providers (Federal Communications Commission web site at [<http://www.fcc.gov/year2000>]), utilities companies (web site on electric utilities industry at [<http://www.euy2k.com>]), computer manufacturers, and airlines. Many of those groups have been reluctant to discuss the Y2K status of their computer systems because of concerns over potential liability and a loss of trust by consumers. This situation may change with the recently enacted Year 2000 Information Readiness and Disclosure Act (P.L. 105-271).

According to estimates, companies are spending a significant portion of their information technology budgets on Y2K conversion. Scores of companies have emerged offering software tools or services to work on the Y2K problem. Some are new consulting firms specializing in Y2K conversion, while others are established software firms that have entered this potentially lucrative business. Nevertheless, a potential shortage of available, skilled software programmers could raise the cost for Y2K conversion services as the year 2000 approaches. The Information Technology Association of America, representing the information services industry, has a Y2K certification program to evaluate the processes and methods of companies developing products and services or performing Y2K conversions. No organization has offered to evaluate the Y2K compliance of specific software or hardware products. Industry analysts are particularly concerned about small and medium-sized businesses, many of which do not have enough staff to renovate and test all internal computers and develop contingency plans for alternate suppliers and business partners.

International Efforts

Researchers agree that most foreign companies and governments lag behind those in the United States in addressing the Y2K problem. Except perhaps in Canada, the United Kingdom, Australia, and a few other countries, the issue has not received as much attention as it has in this country. With the international economy increasingly reliant on electronic commerce, U.S. businesses and government agencies have an interest in ensuring that their foreign counterparts are addressing the problem. Concern is mounting that some foreign banks are not preparing adequately to correct their systems. The European Union's decision to introduce its common currency, the euro, beginning in 1999 required financial institutions to upgrade their computer systems to handle the new currency, causing additional delay in their Y2K conversion efforts. A thorough assessment is lacking on the status of the Y2K problem in foreign countries and the potential risks for U.S. citizens and organizations, although some private sector studies are available.

In June 1997, NIST sponsored an International Symposium on the Y2K problem, intended to bring together industries and governments to discuss strategies for managing the problem, and areas of possible international coordination. Representatives from only four

other countries attended the conference (Britain, Canada, Australia, and Sweden). Later in 1997, GSA attempted to raise international awareness of the problem by conducting a survey of countries to determine their level of preparedness and identify common concerns. Only two countries responded to the survey. In 1998 GSA sponsored an international Y2K “virtual conference” in which GSA received analyses and status reports of some countries, and posted reports on its web site.

Several international organizations are now involved in raising awareness of the Y2K problem. These include the United Nations (UN), the Organization for Economic Cooperation and Development, the Bank for International Settlements, the World Bank, and the European Commission, whose Y2K web sites are all linked to GSA’s web site. In May 1998, the Summit of eight industrialized nations (Britain, France, Germany, Italy, Japan, Canada, United States, and Russia), discussed the Y2K problem in the context of promoting sustainable growth and political stability in the global economy. The group agreed to work with businesses and international organizations to assist developing countries in addressing the problem. On December 11, 1998, Y2K coordinators representing over 120 nations met at the UN to discuss ways to work together on common problems.

Activity in Previous Congresses

The 104th and 105th Congresses focused on prompting federal agencies, state, local and foreign governments, and businesses to work on correcting the problem for their computer systems. (For a detailed chronology of congressional hearings and legislation, see CRS Report 98-377, *Year 2000 Problem: Chronology of Hearings and Legislation, updated regularly*.) These hearings, speeches, reports, and legislation have helped to increase media coverage of the Y2K issue and encourage action toward remediation.

The first congressional hearing on the Y2K problem was held in April 1996 by the House Government Oversight and Reform Committee, Subcommittee on Government Management, Information and Technology. The hearing focused on Y2K conversion issues for federal agencies. In May 1996 the House Science Committee, Subcommittee on Technology, conducted a hearing on potential technical solutions and possible roles for government in addressing the problem. These hearings revealed that major federal departments were still in initial planning stages, many agencies did not yet have cost estimates, and most agencies had not completed inventories of their code or developed plans to solve the problem. The two subcommittees began conducting joint hearing to investigate various aspects of the Y2K problem.

The 104th Congress enacted three legislative provisions regarding the Y2K problem. The FY1997 Defense Authorization Act (P.L. 104-201) directed DOD to assess risks caused by the Y2K problem, and urged DOD to purchase only Y2K compliant products. To avoid contract delays, DOD could purchase noncompliant products if vendors made them compliant at reasonable cost. The FY1997 Omnibus Appropriations Act (P.L. 104-208) gave DOD \$5 million to validate tools and methodologies for Y2K conversion. The FY1997 Treasury, Postal Service, and General Government Appropriations bill (P.L. 104-208) directed OMB to provide a cost estimate for Y2K work, a strategy to ensure that computer systems will operate in the year 2000, and a timetable for implementing the strategy.

Early in the 105th Congress, OMB submitted a report to Congress, to fulfill the requirements of P.L. 104-208, with \$2.3 billion as its first estimate of the cost to convert the software of all federal computer systems to enable the processing of dates beyond 1999. The estimate did not include upgrades or replacements of systems that would otherwise occur as part of the normal systems life cycle, or the federal share of the costs for state information systems that support federal programs. Federal agencies focused on systems they considered “mission critical” rather than all systems. The Administration’s strategy was for the CIO of each agency to address the problem for their respective organizations, noting that no single approach can be taken for all systems. Attention the Y2K problem increased, however, with GAO’s February 1997 report identifying the Y2K problem as a “high risk” for federal agencies, and recommending a process for agencies to achieve Y2K compliance.

In February 1997, the Senate Committee on Banking, Housing and Urban Affairs requested status information on the finance industry from the six financial regulatory agencies: the Federal Reserve Board (FRB), the Federal Deposit Insurance Corp. (FDIC), the Office of Thrift Supervision (OTS), the National Credit Union Administration (NCUA), the Office of the Comptroller of Currency (OCC), and the Securities and Exchange Commission (SEC). The Committee obtained information on the supervisory efforts of these agencies to ensure the Y2K readiness of the financial industry. Shortly after the Committee inquiry, the Federal Financial Institutions Examination Council, an interagency body made up of the FRB, FDIC, OTS, NCUA, and OCC, issued guidelines for financial institutions and federal examiners to address to avoid major service disruptions. As a result of efforts of the House and Senate Banking Committees, the six financial regulatory agencies began providing quarterly briefings to Congress on the status of the finance industry. In March 1998, the Examination Parity and Year 2000 Readiness for Financial Institutions Act (**P.L. 105-164**) was enacted to extend the authority of the Office of Thrift Supervision and the National Credit Union Administration to examine the operations of service corporations or other entities that perform services under contract for thrifts and credit unions, thereby giving those agencies statutory parity with the other financial regulatory agencies.

In March 1997 the House Subcommittee on Government Management, Information and Technology and Subcommittee on Technology conducted an inquiry on the Y2K vulnerability of chips used in electronic devices that are either owned, used by, or regulated by federal departments and agencies. Based on agency responses, the CIO Council agreed to form a Biomedical Subgroup of the Y2K subcommittee to study embedded chip issues in federal agencies. The CIO Council also agreed to have agencies submit quarterly reports on the status of their Y2K efforts, with updated cost estimates.

In April 1998, the Senate established a “Special Committee on the Year 2000 Technology Problem” to study the impact of the Y2K problem on the executive and judicial branches of the federal government, state governments, and private sector in the United States and abroad. In June, the House established a Year 2000 Task Force, co-chaired by Representatives Horn and Morella, to coordinate House efforts.

The Treasury, Postal Service, and General Government Appropriations Act for FY1998 (**P.L. 105-61**) directed OMB to report to Congress on a quarterly basis, on federal agency progress toward Y2K conversion. To date, OMB has sent eight quarterly reports to Congress on the progress of federal agency Y2K conversion efforts. OMB’s cost estimate for federal agency Y2K conversion has increased steadily and is currently \$6.4 billion. OMB has targeted

March 31, 1999, for federal agencies to have completed the renovation, validation, and implementation phases of all Y2K conversions. The latest report (released March 18, based on data received February 12) categorizes the 24 largest agencies into one of three tiers based on evidence of progress in their reports: three agencies are in tier 1 for not making adequate progress; eight agencies are in tier 2 for having evidence of progress, but with concerns; and 13 agencies are in tier 3 for making satisfactory progress. Tier 1 agencies include the Departments of Health and Human Services, Transportation (in particular the Federal Aviation Administration), and the Agency for International Development. Of the 6,399 mission critical systems in the 24 largest agencies, 79% are Y2K compliant. Of the remaining mission critical systems, 71% are being repaired, 20% are being replaced, and 9% will be retired. Government-wide issues OMB identified include, lack of independent verification and validation of Y2K compliance, contingency planning, and data exchanges with states and other entities.

In the final days of the 105th Congress, three additional legislative measures on the Y2K problem were enacted. The Defense Authorization Act (**P.L. 105-261**), enacted October 17, prohibits DOD from purchasing for systems that are not Y2K compliant; requires DOD to report on its Y2K compliance strategy, including contingency plans; requires DOD to develop Y2K simulations for training exercises; requires DOD and CIA to report on plans for ensuring continuity of operations, and to outline agreements with foreign countries to ensure that problems with strategic systems in those countries do not pose a threat. The Y2K Information and Readiness Disclosure Act (**P.L. 105-271**), enacted October 19, is intended to encourage companies to disclose information on the Y2K readiness of their products and services. On October 21, the Omnibus Appropriations Act (**P.L. 105-277**) was enacted, which included emergency Y2K funding for federal agency conversion efforts totaling \$3.35 billion. On December 18, the Senate Special Committee on the Y2K Problem held a field hearing on potential disruption of water services.

Activity in the 106th Congress

The Y2K problem continues to receive attention in hearings and legislation of the 106th Congress. On January 15, the Senate Appropriations Committee reviewed the status of federal agencies and other issues with the Chair of the President's Y2K Council. On January 20, a hearing by the House Government Management, Information and Technology Subcommittee and House Technology Subcommittee investigated the Y2K status of federal, state, local, and foreign governments. The Senate Commerce Committee held a hearing on February 9 to discuss whether to limit lawsuits resulting from product or system failures associated with the Y2K problem. The Senate Commerce Committee held a hearing on February 9 to discuss whether to limit lawsuits resulting from product or system failures associated with the Y2K problem. Several Y2K-related bills have also been introduced (see legislation section).

On February 24, the Senate Armed Services Committee, Readiness and Management Support Subcommittee hearing on the national security ramifications of the Y2K problem; on March 1, the Senate Judiciary Committee hearing on S. 461, Y2K Fairness and Responsibility Act; on March 2, the Senate Y2K Committee hearing on the Y2K preparedness of the food industry, March 5 on international Y2K issues, and March 11 on litigation issues associated with the Y2K problem; on February 19, the House Committee on Government Reform and

Oversight, Subcommittee on the District of Columbia hearing on the District's Y2K preparedness; on February 23, the Subcommittee on Postal Service and the Government Management, Information and Technology Subcommittee joint hearing on the Y2K preparedness of the U.S. Postal Service; on February 24, the House Ways and Means Committee hearing on selected federal agency Y2K conversion efforts and implications for beneficiaries and taxpayers; on March 2, the House Science Committee, Technology Subcommittee and the Government Management, Information and Technology Subcommittee joint hearing on Y2K issues for the Defense Department and national security systems; March 9, the two House Subcommittee's joint hearing on Y2K liability issues. The House Government Management, Information, and Technology held hearings on March 15 on the Federal Aviation Administration's Y2K preparedness, and on March 22, on Y2K emergency management preparations; the Senate Y2K Committee canceled its March 25 hearing on Russian nuclear issues and U.S. plans for early warning system cooperation.

Representative Horn has released several sets of grades to federal agencies, on their Y2K conversion status. The first grades, issued in July 1996, were based on reports by federal agencies on the status of their Y2K conversion programs. Subsequent grades have been based on progress made by the agencies. The most recent grades, released February 22, 1999, gave the Administration an overall grade of C+ (his highest grade to date). On February 24, the Senate Y2K Committee released a report summarizing the Committee's findings to date, detailing concerns with industry and service sectors that might be of greatest risk, and ranking foreign countries in terms of their Y2K preparedness. On March 8, Representative Markey and Senator Harkin sponsored a nuclear Y2K symposium to investigate Y2K issues for U.S. and foreign nuclear weapons and reactors.

Issues for Congress

Despite extensive media coverage and many congressional hearings, some businesses and individuals still doubt the seriousness of the Y2K problem. Numerous reports by GAO, however, identify problems with systems at every federal agency reviewed, and other non-federal systems. The vast majority of private sector studies reach similar conclusions. Some economists predict a worldwide recession caused by the Y2K problem. Virtually everyone agrees that the hearings held by Congress, along with letters to agencies, press conferences, reports, and legislation, have been effective in raising awareness. Yet many also feel that federal, state, and local agencies, and businesses have not made enough progress. The 106th Congress continues the oversight of efforts through hearings, public fora, and press releases.

In an attempt to mitigate the negative consequences of the Y2K problem, Congress has used several strategies. One was to provide additional funding to federal agencies beyond their usual information technology budgets to work on the Y2K problem. The FY1998 Supplemental Appropriations Act (P.L. 105-174, enacted May 1, 1998) added \$86 million for Y2K conversion work in the Federal Aviation Administration, the Treasury Department, and the Health Care Finance Administration. In addition, the President's FY1999 budget request included a \$3.25 billion discretionary allowance for emergencies including unforeseen defense and non-defense costs, natural disasters, and expenses of the Y2K conversion. The budget request did not specify what portion of that allowance would be used for Y2K conversion, or which agencies would use it. The Omnibus Appropriations Act for FY1999 (P.L. 105-277, enacted October 21) included \$3.35 billion of emergency funds for federal

agency Y2K conversion efforts (\$1.1 billion for DOD and \$2.25 billion for all other federal agencies), to remain available until September 30, 2001. Because they were designated as emergency funds, they did not require offsetting receipts from other appropriations. OMB controls all funds for federal agencies other than DOD and legislative branch agencies, and has already allocated most of those funds. Some speculate that additional FY1999 federal funding for Y2K conversion may become necessary.

Another approach used by Congress was to reprogram funds for Y2K work for specific agencies determined to need additional funds. For example, the FY1998 Treasury and General Government Appropriations Act (**P.L. 105-61**), directed the Internal Revenue Service (IRS) to use \$376.7 million from its information systems development account for century date change efforts, and reprogrammed \$87 million from other IRS programs to Y2K conversion efforts. The Departments of Veterans Affairs, Housing and Urban Development, and Independent Agencies Appropriations Act for FY1998 (**P.L. 105-65**) reprogrammed \$8 million from existing appropriations for the Veterans Benefits Administration to work on Y2K problems. The Departments of Labor Health and Human Services, and Education, and Related Agencies Appropriations Act for FY1998 (**P.L. 105-78**) made \$183 million available from existing appropriations for the Labor Department's Labor Unemployment Insurance program to assist states to convert their automated state employment agency systems to be Y2K compliant.

Some observers called for the more extreme measure of mandating a four digit standard for all federal electronic data exchange, modeled after the IRS policy requiring a four-digit standard for all of its transactions. Computer industry representatives, however, argued that any standard should be developed by the private sector rather than government. They also argued that there is no time for industry to develop a consensus standard, and furthermore, that a single standard would not be appropriate for all cases. Some Members suggested that Congress should do more to ensure that information technology products are Y2K compliant. Requiring Y2K compliance in products might be unrealistic, however, because it is impossible to test all of the components in a product with every possible interface to insure Y2K compliance in all applications. To help federal purchasers, as well as consumers, GSA maintains a list on its web site of commercial off-the-shelf (COTS) products for which the manufacturer has stated are Y2K compliant (using the FAR definition for Y2K compliance).

Congress is also concerned about liability issues. Some want Congress to require that companies disclose their Y2K status. Conversely, others want Congress to set limits on the liability that a company can face if it discloses Y2K vulnerabilities of its products. Several bills have already been introduced in the 106th Congress addressing these concerns (See CRS report RL30088, *Year 2000 Liability Legislation: A Legal Analysis*). The Administration does not have a policy to determine whether federal agencies or their contractors are responsible for damages resulting from Y2K errors, arguing that it is more important to focus on fixing the problem.

Some Members urged the SEC to require all publicly traded companies to submit Y2K compliance disclosures for new stock offerings. Many opposed such a policy, however, arguing that whether or not to require disclosure should be decided by private sector groups rather than the SEC. In May 1997, the SEC posted a statement for public discussion on the nature of disclosure made by publicly traded companies, stating that if the Y2K problem could cause "material adverse consequences," companies should provide their projected

expenditures and associated uncertainties as part of their quarterly report to the SEC. In June 1997, the SEC reported to Congress that most self-regulatory organizations (such as the stock exchanges) are making adequate progress on the Y2K problem. The SEC continued to monitor efforts of regulated entities (brokers, dealers, agents, and investment companies) and the Securities Industry Association. SEC rules require public companies to report in-house Y2K conversion costs as an expense, rather than capitalized over a period of years.

In January 1998, the SEC issued additional guidance to strengthen the requirements for public companies to disclose the status of their Y2K conversion efforts. After receiving the second quarterly reports with little increase in Y2K reporting, the SEC started unequivocally requiring Y2K readiness reporting, and prosecuting companies that failed to report their Y2K readiness. For further discussion, see CRS Report 98-966, *The Year 2000 Computer Problem: Legal Issues*.

Many Members are concerned about the efforts of foreign and international organizations to address the Y2K problem. Unless the problem is corrected within every country, both in government and the private sector, international commerce could be adversely affected. Research indicates that most of the rest of the world lags behind the United States in addressing the problem, although there is a lack of information or analysis on efforts in some countries. Some are concerned over whether foreign air traffic control systems will interoperate with U.S. systems after Y2K renovations are performed. Potential risks to safety systems of foreign nuclear energy reactors has also come into question.

Some countries, however, have strong Y2K programs in place. The British government's Action 2000 program in 1998 received £17 million for outreach and publicity, £70 million to help small and medium sized businesses address the Y2K problem, and £10 million to the World Bank to assist the Y2K conversion efforts of lesser developed countries. In FY1999 appropriations, the United States provided \$12 million to the World Bank's outreach effort to lesser developed countries.

Many have become concerned over the national security implications of the Y2K problem. The possibility of a weakened command, control, communications, and intelligence (C⁴I) infrastructure due to potential system failures, the diversion of resources away from information security efforts, and the possible sabotage of defense systems by individuals performing Y2K remediation, are all potential risks faced by military and intelligence operations. In addition, there is concern over the continued interoperability of U.S. systems with those of NATO allies and the proper functioning Russia's early warning systems. DOD officials are discussing these issues with NATO and Russian counterparts for collaborative operations and the sharing of data. The intelligence community is also investigating the potential impact of non-compliant systems in foreign countries on U.S. systems. Reports of the Administration's activities in this area, however, are not open to the public.

Congress has become increasingly concerned over potential risks posed by the Y2K problem to critical national infrastructures, such as utilities, telecommunications, transportation, financial services, and health care. For further discussion of this issue, see CRS Report 98-967, *Year 2000 Problem: Potential Impacts on National Infrastructures*. The President's Y2K Council has been working with the federal agencies that regulate sectors of the economy to help the critical infrastructures in achieving Y2K compliance. Legislation was introduced in the 105th Congress requiring the Y2K Council to produce an assessment of the

Y2K problem and a strategy to ensure that critical services will remain intact. On January 7, 1999, the Y2K Council issued its First Quarterly Summary of Assessment Information compiled by federal agencies. The report concludes that there will not be large-scale disruptions in key infrastructures, that the financial industry is especially well prepared, but that international failures are likely. Most of the data in the report, however, was compiled by industry groups and may not provide enough independent observation or analysis to evaluate the risks to the nation's critical services and infrastructures.

Some argue that if larger systems are not already close to becoming Y2K compliant, the companies or agencies responsible for those systems should shift their focus from compliance efforts to developing contingency plans. Only a small number of federal agencies, and very few private sector entities, have released contingency plans to the public. The Small Business Administration is implementing an outreach program to distribute Y2K informational materials to small businesses through its web page and with partners in the banking and insurance industries. Some have called for a leader from the private sector to act as a national spokesman in prompting all of the economic sectors to work together to correct and test critical infrastructures and develop contingency plans.

The Administration is also developing an emergency preparedness plan, to be implemented by several federal agencies and led by the Federal Emergency Management Agency (FEMA). The Administration has not yet released any details, however, and some observers question whether FEMA currently has the resources to respond to a potentially large number of demands for assistance that could arise in January.

In the past, although other computer-related problems have received national attention, Congress did not become deeply involved in their solutions. Two examples are computer viruses and the information systems security. The private sector was able to address these problems with virus detection software and encryption systems to provide information security, privacy, and authenticity. It is unclear, however, whether the market alone will provide the incentive for industry and government to eradicate the Y2K problem. In the future, other systemic computer problems might arise that would elicit a response from Congress, such as adapting to a new European monetary unit (EMU) or expanding the number of digits in social security numbers or telephone area codes. To lay the groundwork for addressing future computer-related problems, Congress may consider focusing more federal research on computer reliability.

LEGISLATION

H.J.Res. 14 (Linder)

Joint Resolution to designate Monday, January 3, 2000, as the day of the observance of the New Year's Day holiday in that year. The intention was to provide an extra day for government agencies to resolve Y2K problems before commencing normal operations in the new year. Several groups, however, including the Administration, have opposed this idea, arguing that the additional software changes necessary to implement the change in holiday observance would further complicate Y2K renovations and testing. Introduced January 6, 1999; referred to Committee on Government Reform.

H.R. 179 (Thurman)

Businesses Undergoing the Glitch Act, would allow small businesses to deduct Y2K conversion costs from their gross income for federal income tax reporting. Introduced January 6, 1999; referred to Committee on Ways and Means.

H.R. 192 (Manzullo)

Year 2000 Consumer Protection Plan Act of 1999, would establish judicial and administrative proceedings, a standard of proof, and damage limitations for legal actions brought in cases of Y2K processing failures. Introduced January 6, 1999; referred to Committee on the Judiciary.

H.R. 775 (Davis)

Year 2000 Readiness and Responsibility Act, to establish procedures and limitations for civil actions brought for damages relating to the Y2K failure of any device or system. Introduced February 23, 1999; referred to Judiciary Committee.

H.R. 1319 (Eshoo)

Y2K Fairness in Litigation Act, to foster incentives to settle year 2000 lawsuits that may disrupt significant sectors of the American economy. Introduced March 25, 1999; referred to the Committee on the Judiciary.

H. R. 1447 (Ford)

National Y2K Test Day Act, to provide for the coordinated end-to-end testing and disclosure of the readiness of certain Federal and non-Federal computer systems for the year 2000 computer problem. Introduced April 15, 1999; referred to the Committee on Science.

S. 96 (McCain)

Y2K Act, would limit liability and damages for defendants in suits involving Y2K failures. Introduced January 19; referred to Committee on Commerce, Science and Transportation. Reported to Senate from Committee on Commerce, Science, and Transportation, with amendment in the nature of a substitute, S.Rept. 106-10 (CR S2503), March 10; further amended April 22, sponsored by Senators McCain, Wyden, Gorton, Abraham, Lott, Frist, and Burns [<http://www.senate.gov/~commerce/legis/legis.htm>].

S. 174 (Moynihan)

Y2K State and Local GAP (Government Assistance Programs) Act of 1999, would provide funding for states to correct Y2K problems in computers used to administer state and local programs. Introduced January 19, 1999; referred to Committee on Finance.

S. 314 (Bond)

Small Business Year 2000 Readiness Act, to direct the Small Business Administration (SBA) to establish a loan guarantee program to address Y2K problems of small businesses at slightly higher amounts than SBA's existing 7(a) general business loan program. Introduced January 27, 1999; referred to Committee on Small Business; reported to Senate February 23 S.Rept. 106-5); passed Senate without amendment March 2; introduced in House (H.R. 1056) and referred to Small Business Committee March 3; hearing March 12; passed House under suspension of the rules March 23; signed by the President (**P.L. 106-8**) March 25.

S. 461 (Hatch)

Year 2000 Fairness and Responsibility Act, to foster an incentive to settle Y2K lawsuits that may disrupt significant sectors of the American economy by requiring procedures to be followed before and during Y2K civil actions and class actions. Introduced February 24, 1999; referred to Judiciary Committee; hearing March 1.

S. 738 (Dodd)

Y2K Fairness in Litigation Act, to foster incentives to settle year 2000 lawsuits that may disrupt significant sectors of the American economy. Introduced March 25, 1999; referred to the Committee on the Judiciary.

S. 544 (Stevens)

FY1999 Emergency Supplemental Appropriations bill. Contains provision (section 3002) that would reduce the non-defense Y2K emergency fund by \$973 million, eliminating the remaining balance in that fund. Reported by Committee on Appropriations March 4, 1999 (No. 106-8); passed Senate March 23 (with amendments).