

Testimony

Before the Subcommittee on Government Management,  
Information and Technology, Committee on Government  
Reform, House of Representatives

For Release on Delivery  
Expected at  
9 a.m. CDT  
Thursday,  
July 8, 1999

YEAR 2000 COMPUTING  
CHALLENGE

Readiness Improving Yet  
Avoiding Disruption of  
Critical Services Will  
Require Additional Work

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G A O

Accountability \* Integrity \* Reliability

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Mr. Chairman and Members of the Subcommittee:

Thank you for inviting us to participate in today's hearing on the Year 2000 problem. According to the report of the President's Commission on Critical Infrastructure Protection, the United States--with close to half of all computer capacity and 60 percent of Internet assets--is the world's most advanced and most dependent user of information technology.<sup>1</sup> Should these systems--which perform functions and services critical to our nation--suffer problems, it could create widespread disruption. Accordingly, the upcoming change of century is a sweeping and urgent challenge for public- and private-sector organizations alike.

Because of its urgent nature and the potentially devastating impact it could have on critical government operations, in February 1997 we designated the Year 2000 problem a high-risk area for the federal government.<sup>2</sup> Since that time, we have issued over 120 reports and testimony statements detailing specific findings and numerous recommendations related to the Year 2000 readiness of a wide range of federal agencies.<sup>3</sup> We have also issued guidance to help organizations successfully address the issue.<sup>4</sup>

Today I will highlight the Year 2000 risks facing the nation; discuss the federal government's progress and challenges that remain in correcting its systems; identify state and local government Year 2000 issues; and provide an overview of available information on the readiness of key public infrastructure and economic sectors.

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<sup>1</sup>Critical Foundations: Protecting America's Infrastructures (President's Commission on Critical Infrastructure Protection, October 1997).

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

<sup>3</sup>A list of these publications is included as an appendix to this statement. These publications can be obtained through GAO's World Wide Web page at [www.gao.gov/y2kr.htm](http://www.gao.gov/y2kr.htm).

<sup>4</sup>Year 2000 Computing Crisis: An Assessment Guide (GAO/AIMD-10.1.14, issued as an exposure draft in February 1997 and in final form in September 1997), which addresses the key tasks needed to complete each phase of a Year 2000 program (awareness, assessment, renovation, validation, and implementation); Year 2000 Computing Crisis: Business Continuity and Contingency Planning (GAO/AIMD-10.1.19, issued as an exposure draft in March 1998 and in final form in August 1998), which describes the tasks needed to ensure the continuity of agency operations; and Year 2000 Computing Crisis: A Testing Guide (GAO/AIMD-10.1.21, issued as an exposure draft in June 1998 and in final form in November 1998), which discusses the need to plan and conduct Year 2000 tests in a structured and disciplined fashion.

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## The Public Faces Risk of Year 2000 Disruptions

The public faces the risk that critical services provided by the government and the private sector could be severely disrupted by the Year 2000 computing problem. Financial transactions could be delayed, flights grounded, power lost, and national defense affected. Moreover, America's infrastructures are a complex array of public and private enterprises with many interdependencies at all levels. These many interdependencies among governments and within key economic sectors could cause a single failure to have adverse repercussions in other sectors. Key sectors that could be seriously affected if their systems are not Year 2000 compliant include information and telecommunications; banking and finance; health, safety, and emergency services; transportation; power and water; and manufacturing and small business.

The following are examples of some of the major disruptions the public and private sectors could experience if the Year 2000 problem is not corrected.

- With respect to aviation, there could be grounded or delayed flights, degraded safety, customer inconvenience, and increased airline costs.<sup>5</sup>
- Aircraft and other military equipment could be grounded because the computer systems used to schedule maintenance and track supplies may not work. Further, the Department of Defense could incur shortages of vital items needed to sustain military operations and readiness.<sup>6</sup>
- Medical devices and scientific laboratory equipment may experience problems beginning January 1, 2000, if their software applications or embedded chips use two-digit fields to represent the year.

Recognizing the seriousness of the Year 2000 problem, on February 4, 1998, the President signed an executive order that established the President's Council on Year 2000 Conversion, chaired by an Assistant to the President and consisting of one representative from each of the executive departments and from other federal agencies as may be determined by the Chair. The Chair of the Council was tasked with the following Year 2000 roles: (1) overseeing the activities of agencies, (2) acting as chief spokesperson in national and international forums, (3) providing policy

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<sup>5</sup>FAA Systems: Serious Challenges Remain in Resolving Year 2000 and Computer Security Problems (GAO/T-AIMD-98-251, August 6, 1998).

<sup>6</sup>Defense Computers: Year 2000 Computer Problems Threaten DOD Operations (GAO/AIMD-98-72, April 30, 1998).

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coordination of executive branch activities with state, local, and tribal governments, and (4) promoting appropriate federal roles with respect to private-sector activities.

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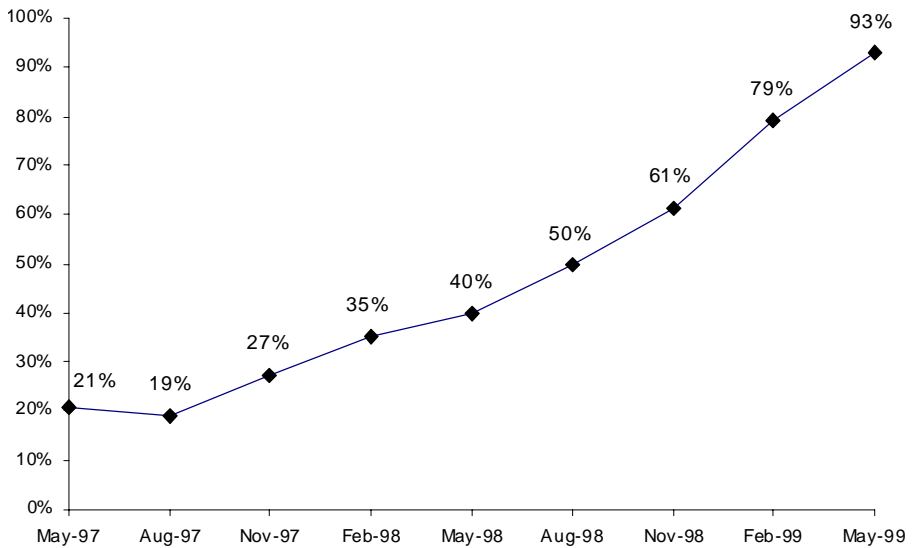
## Improvements Made But Much Work Remains

Addressing the Year 2000 problem is a tremendous challenge for the federal government. Many of the federal government's computer systems were originally designed and developed 20 to 25 years ago, are poorly documented, and use a wide variety of computer languages, many of which are obsolete. Some applications include thousands, tens of thousands, or even millions of lines of code, each of which must be examined for date-format problems.

To meet this challenge and monitor individual agency efforts, the Office of Management and Budget (OMB) directed the major departments and agencies to submit quarterly reports on their progress, beginning May 15, 1997. These reports contain information on where agencies stand with respect to the assessment, renovation, validation, and implementation of mission-critical systems, as well as other management information on items such as costs and business continuity and contingency plans.

The federal government's most recent reports show improvement in addressing the Year 2000 problem. While much work remains, the federal government has significantly increased its percentage of mission-critical systems that are reported to be Year 2000 compliant, as figure 1 illustrates. In particular, while the federal government did not meet its goal of having all mission-critical systems compliant by March 1999, as of mid-May 1999, 93 percent of these systems were reported compliant.

**Figure 1: Mission-Critical Systems Reported Year 2000 Compliant, May 1997-May 1999**



Source: May 1997 through May 1999 data are from the OMB quarterly reports.

While this reported progress is notable, OMB reported that 10 agencies have mission-critical systems that were not yet compliant.<sup>7</sup> In addition, as we testified in April, some of the systems that were not yet compliant support vital government functions.<sup>8</sup> For example, some of the systems that were not compliant were among the 26 mission-critical systems that the Federal Aviation Administration (FAA) has identified as posing the greatest risk to the National Airspace System—the network of equipment, facilities, and information that supports U.S. aviation operations.

Additionally, not all systems have undergone an independent verification and validation process. For example, in April 1999 the Department of Commerce awarded a contract for independent verification and validation reviews of approximately 40 mission-critical systems that support that

<sup>7</sup>The 10 agencies were the departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Justice, Transportation, Treasury; the National Aeronautics and Space Administration; and the U.S. Agency for International Development.

<sup>8</sup>Year 2000 Computing Challenge: Federal Government Making Progress But Critical Issues Must Still Be Addressed to Minimize Disruptions (GAO/T-AIMD-99-144, April 14, 1999).

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department's most critical business processes. These reviews are to continue through the summer of 1999. In some cases, independent verification and validation of compliant systems have found serious problems. For example, as we testified this past February,<sup>9</sup> none of 54 external mission-critical systems of the Health Care Financing Administration (HCFA) reported by the Department of Health and Human Services (HHS) as compliant as of December 31, 1998, was Year 2000 ready, based on serious qualifications identified by the independent verification and validation contractor.

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## Reviews Show Uneven Federal Agency Progress

While the overall Year 2000 readiness of the government has improved, our reviews of federal agency Year 2000 programs have found uneven progress. Some agencies are significantly behind schedule and are at high risk that they will not fix their systems in time. Other agencies have made progress, although risks continue and a great deal of work remains. For example:

- In March we testified that FAA had made tremendous progress over the prior year.<sup>10</sup> However, much remained to be done to complete validating and implementing FAA's mission-critical systems. Specifically, the challenges that FAA faced included (1) ensuring that systems validation efforts were adequate, (2) implementing multiple systems at numerous facilities, (3) completing data exchange efforts, and (4) completing end-to-end testing. Because of the risks associated with FAA's Year 2000 program, we have advocated that the agency develop business continuity and contingency plans.<sup>11</sup> FAA agreed and has activities underway, which we are currently reviewing.
- In April 1999, we testified<sup>12</sup> that HCFA had been responsive to prior recommendations.<sup>13</sup> For example, HCFA had (1) more effectively

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<sup>9</sup>Year 2000 Computing Crisis: Readiness Status of the Department of Health and Human Services (GAO/T-AIMD-99-92, February 26, 1999).

<sup>10</sup>Year 2000 Computing Crisis: FAA Is Making Progress But Important Challenges Remain (GAO/T-AIMD/RCED-99-118, March 15, 1999).

<sup>11</sup>FAA Computer Systems: Limited Progress on Year 2000 Issue Increases Risk Dramatically (GAO/AIMD-98-45, January 30, 1998), GAO/T-AIMD-98-251, August 6, 1998, and GAO/T-AIMD/RCED-99-118, March 15, 1999.

<sup>12</sup>Year 2000 Computing Crisis: Readiness of Medicare and the Health Care Sector (GAO/T-AIMD-99-160, April 27, 1999).

<sup>13</sup>Medicare Computer Systems: Year 2000 Challenges Put Benefits and Services in Jeopardy (GAO/AIMD-98-284, September 28, 1998).

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managed its electronic data exchanges, (2) continued to define its testing procedures, (3) begun to use several Year 2000 analysis tools to measure testing thoroughness, and (4) demonstrated progress in its business continuity and contingency planning. Nevertheless, HCFA still faced many risks and challenges. For example, although reported compliant, HCFA's mission-critical systems were due to undergo a significant amount of change, which would require a complete retest to ensure that they were not contaminated by the changes and that they were still compliant. Another risk that HCFA faced was that its thousands of data exchanges were not yet compliant. We concluded that given the considerable amount of work that HCFA faces, it is crucial that development and testing of its business continuity and contingency plans move forward rapidly to avoid the interruption of Medicare claims processing next year.

- Our work has shown that the Department of Defense and the military services face significant problems.<sup>14</sup> In March we testified that, despite considerable progress made in the preceding 3 months, Defense was still well behind schedule.<sup>15</sup> We found that Defense faced two significant challenges: (1) completing remediation and testing of its mission-critical systems and (2) having a reasonable level of assurance that key processes will continue to work on a day-to-day basis and key operational missions necessary for national defense can be successfully accomplished. We concluded that such assurance could only be provided if Defense took steps to improve its visibility over the status of key business processes.

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## End-to-End Testing Must Be Completed

While it is important to achieve compliance for individual mission-critical systems, realizing such compliance alone does not ensure that business functions will continue to operate through the change of century—the ultimate goal of Year 2000 efforts. The purpose of end-to-end testing is to verify that a defined set of interrelated systems, which collectively support an organizational core business area or function, will work as intended in an operational environment. In the case of the year 2000, many systems in the end-to-end chain will have been modified or replaced. As a result, the

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<sup>14</sup>Defense Computers: Year 2000 Computer Problems Put Navy Operations at Risk (GAO/AIMD-98-150, June 30, 1998); Defense Computers: Army Needs to Greatly Strengthen Its Year 2000 Program (GAO/AIMD-98-53, May 29, 1998); GAO/AIMD-98-72, April 30, 1998; and Defense Computers: Air Force Needs to Strengthen Year 2000 Oversight (GAO/AIMD-98-35, January 16, 1998).

<sup>15</sup>Year 2000 Computing Crisis: Defense Has Made Progress, But Additional Management Controls Are Needed (GAO/T-AIMD-99-101, March 2, 1999).



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scope and complexity of testing--and its importance--are dramatically increased, as is the difficulty of isolating, identifying, and correcting problems. Consequently, agencies must work early and continually with their data exchange partners to plan and execute effective end-to-end tests. (Our Year 2000 testing guide sets forth a structured approach to testing, including end-to-end testing.<sup>16</sup>)

In January we testified that with the time available for end-to-end testing diminishing, OMB should consider, for the government's most critical functions, setting target dates, and having agencies report against them, for the development of end-to-end test plans, the establishment of test schedules, and the completion of the tests.<sup>17</sup> On March 31, OMB and the Chair of the President's Council on Year 2000 Conversion announced that one of the key priorities that federal agencies will be pursuing during the rest of 1999 will be cooperative end-to-end testing to demonstrate the Year 2000 readiness of federal programs with states and other partners.

Agencies have also acted to address end-to-end testing. For example, our March FAA testimony<sup>18</sup> found that the agency had addressed our prior concerns about the lack of detail in its draft end-to-end test program plan and had developed a detailed end-to-end testing strategy and plans.<sup>19</sup> At the Department of Defense, last month we reported<sup>20</sup> that the department had underway or planned hundreds of related Year 2000 end-to-end test and evaluation activities and that, thus far, it was taking steps to ensure that these related end-to-end tests were effectively coordinated. However, we concluded that Defense was far from successfully finishing its various Year 2000 end-to-end test activities and that it must complete efforts to establish end-to-end management controls, such as establishing an independent quality assurance program.

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<sup>16</sup> GAO/AIMD-10.1.21, November 1998.

<sup>17</sup> Year 2000 Computing Crisis: Readiness Improving, But Much Work Remains to Avoid Major Disruptions (GAO/T-AIMD-99-50, January 20, 1999).

<sup>18</sup> GAO/T-AIMD/RCED-99-118, March 15, 1999.

<sup>19</sup> GAO/T-AIMD-98-251, August 6, 1998.

<sup>20</sup> Defense Computers: Management Controls Are Critical To Effective Year 2000 Testing (GAO/AIMD-99-172, June 30, 1999).

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## Business Continuity and Contingency Plans Are Needed

Business continuity and contingency plans are essential. Without such plans, when unpredicted failures occur, agencies will not have well-defined responses and may not have enough time to develop and test alternatives. Federal agencies depend on data provided by their business partners as well as on services provided by the public infrastructure (e.g., power, water, transportation, and voice and data telecommunications). One weak link anywhere in the chain of critical dependencies can cause major disruptions to business operations. Given these interdependencies, it is imperative that contingency plans be developed for all critical core business processes and supporting systems, regardless of whether these systems are owned by the agency. Accordingly, in April 1998 we recommended that the Council require agencies to develop contingency plans for all critical core business processes.<sup>21</sup>

OMB has clarified its contingency plan instructions and, along with the Chief Information Officers Council, has adopted our business continuity and contingency planning guide.<sup>22</sup> In particular, on January 26, 1999, OMB called on federal agencies to identify and report on the high-level core business functions that are to be addressed in their business continuity and contingency plans, as well as to provide key milestones for development and testing of such plans in their February 1999 quarterly reports. In addition, on May 13 OMB required agencies to submit high-level versions of these plans by June 15. According to an OMB official, OMB has received almost all of the agency plans. This official stated that OMB planned to review the plans, discuss them with the agencies, determine whether there were any common themes, and report on the plans' status in its next quarterly report.

To provide assurance that agencies' business continuity and contingency plans will work if needed, on January 20 we suggested that OMB may want to consider requiring agencies to test their business continuity strategy and set a target date, such as September 30, 1999, for the completion of this validation.<sup>23</sup> Our review of the 24 major departments' and agencies' May 1999 quarterly reports found 14 cases in which agencies did not identify

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<sup>21</sup>Year 2000 Computing Crisis: Potential for Widespread Disruption Calls for Strong Leadership and Partnerships (GAO/AIMD-98-85, April 30, 1998).

<sup>22</sup>GAO/AIMD-10.1.19, August 1998.

<sup>23</sup>GAO/T-AIMD-99-50, January 20, 1999.

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test dates for their business continuity and contingency plans or reported test dates subsequent to September 30, 1999.

On March 31, OMB and the Chair of the President's Council announced that completing and testing business continuity and contingency plans as insurance against disruptions to federal service delivery and operations from Year 2000-related failures will be one of the key priorities that federal agencies will be pursuing through the rest of 1999. Accordingly, OMB should implement our suggestion and establish a target date for the validation of these business continuity and contingency plans.

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## Recent OMB Action Could Help Ensure Business Continuity of High-Impact Programs

While individual agencies have been identifying and remediating mission-critical systems, the government's future actions need to be focused on its high-priority programs and ensuring the continuity of these programs, including the continuity of federal programs that are administered by states. Accordingly, governmentwide priorities need to be based on such criteria as the potential for adverse health and safety effects, adverse financial effects on American citizens, detrimental effects on national security, and adverse economic consequences. In April 1998 we recommended that the President's Council on Year 2000 Conversion establish governmentwide priorities and ensure that agencies set agencywide priorities.<sup>24</sup>

On March 26, OMB implemented our recommendation by issuing a memorandum to federal agencies designating lead agencies for the government's 42 high-impact programs (e.g., food stamps, Medicare, and federal electric power generation and delivery). (OMB later added a 43rd high-impact program.) Appendix I lists these programs and their lead agencies. For each program, the lead agency was charged with identifying to OMB the partners integral to program delivery; taking a leadership role in convening those partners; assuring that each partner has an adequate Year 2000 plan and, if not, helping each partner without one; and developing a plan to ensure that the program will operate effectively. According to OMB, such a plan might include testing data exchanges across partners, developing complementary business continuity and contingency plans, sharing key information on readiness with other partners and the public, and taking other steps necessary to ensure that the program will work. OMB directed the lead agencies to provide a schedule

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<sup>24</sup>GAO/AIMD-98-85, April 30, 1998.

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and milestones of key activities in the plan by April 15. OMB also asked agencies to provide monthly progress reports. As you know, we are currently reviewing agencies' progress in ensuring the readiness of their high-impact programs for this subcommittee.

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## State and Local Governments Face Significant Year 2000 Risks

Just as the federal government faces significant Year 2000 risks, so too do state and local governments. If the Year 2000 problem is not properly addressed, for example, (1) food stamps and other types of payments may not be made or could be made for incorrect amounts; (2) date-dependent signal timing patterns could be incorrectly implemented at highway intersections, with safety severely compromised; and (3) prisoner release or parole eligibility determinations may be adversely affected. Nevertheless, available information on the Year 2000 readiness of state and local governments indicates that much work remains.

According to information on state Year 2000 activities reported to the National Association of State Information Resource Executives as of June 17, 1999,<sup>25</sup> states<sup>26</sup> reported having thousands of mission-critical systems.<sup>27</sup> With respect to completing the implementation phase for these systems,

- 5 states<sup>28</sup> reported that they had completed between 25 and 49 percent,
- 13 states<sup>29</sup> reported completing between 50 and 74 percent, and
- 30 states<sup>30</sup> reported completing 75 percent or more.<sup>31</sup>

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<sup>25</sup>Individual states submit periodic updates to the National Association of State Information Resource Executives. For the June 17 report, over half of the states submitted their data in May and June 1999. The oldest data were provided on March 4 and the most recent data on June 16. All but three states responded to the survey.

<sup>26</sup>In the context of the National Association of State Information Resource Executives survey, the term "states" includes the District of Columbia, Guam, and Puerto Rico.

<sup>27</sup>The National Association of State Information Resource Executives defined mission-critical systems as those that a state had identified as priorities for prompt remediation.

<sup>28</sup>Three states reported on their mission-critical systems, one state reported on its processes, and one reported on its functions.

<sup>29</sup>Eleven states reported on their mission-critical systems, one reported on all systems, and one reported on projects.

<sup>30</sup>Twenty-five states reported on their mission-critical systems, two states reported on their applications, one reported on its "priority business activities," one reported on its "critical compliance units," and one reported on all systems.

<sup>31</sup>Of the states that responded to the survey, two did not respond to this question.

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All of the states responding to the National Association of State Information Resource Executives survey reported that they were actively engaged in internal and external contingency planning and that they had established target dates for the completion of these plans; 14 (28 percent) reported the deadline as October 1999 or later.

State audit organizations have also identified significant Year 2000 concerns. In January, the National State Auditors Association reported on the results of its mid-1998 survey of Year 2000 compliance among states.<sup>32</sup> This report stated that, for the 12 state audit organizations that provided Year 2000-related reports, concerns had been raised in areas such as planning, testing, embedded systems, business continuity and contingency planning, and the adequacy of resources to address the problem.

We identified additional products by 15 state-level audit organizations and Guam that discussed the Year 2000 problem and that had been issued since October 1, 1998. Several of these state-level audit organizations noted that progress had been made. However, the audit organizations also expressed concerns that were consistent with those reported by the National State Auditors Association, for example:

- In December 1998 the Vermont State Auditor reported<sup>33</sup> that the state Chief Information Officer did not have a comprehensive control list of the state's information technology systems. Accordingly, the audit office stated that, even if all mission-critical state systems were checked, these systems could be endangered by information technology components that had not been checked or by linkages with the state's external electronic partners.
- In April, New York's Division of Management Audit and State Financial Services reported that state agencies did not adequately control the critical process of testing remediated systems.<sup>34</sup> Further, most agencies were in the early stages of addressing potential problems related to data exchanges and embedded systems and none had completed substantive work on contingency planning. The New York audit office subsequently

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<sup>32</sup>Year 2000: State Compliance Efforts (National State Auditors Association, January 1999).

<sup>33</sup>Vermont State Auditor's Report on State Government's Year 2000 Preparedness (Y2K Compliance) for the Period Ending November 1, 1998 (Office of the State Auditor, December 31, 1998).

<sup>34</sup>New York's Preparation for the Year 2000: A Second Look (Office of the State Comptroller, Division of Management Audit and State Financial Services, Report 98-S-21, April 5, 1999).

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- issued 7 reports on 13 of the state's mission-critical and high-priority systems that included concerns about contingency planning and testing.
- In February, the California State Auditor reported<sup>35</sup> that key agencies responsible for emergency services, corrections, and water resources, among other areas, had not fully addressed embedded technology-related threats. Regarding emergency services, the California report stated that if remediation of the embedded technology in its networks were not completed, the Office of Emergency Services might have to rely on cumbersome manual processes, significantly increasing response time to disasters.
  - In March, Oregon's Audits Division reported<sup>36</sup> that 11 of the 12 state agencies reviewed did not have business continuity plans addressing potential Year 2000 problems for their core business functions.
  - In March, North Carolina's State Auditor reported<sup>37</sup> that resource restrictions had limited the state's Year 2000 Project Office's ability to verify data reported by state agencies.

In the case of Illinois, on June 30, 1999, the Office of the Auditor General reported<sup>38</sup> that the state's Department of Central Management Services had taken the lead to increase agency awareness of the need to ensure that computer systems are Year 2000 compliant, for example,

- monthly meetings were held with agency representatives,
- a central repository of information was developed to share information on, among other items, available tools, and

beginning this past April, state agencies were required to submit monthly status reports to the Governor.

The Office of the Auditor General urged the Department of Central Management Services to continue to work with the governor's office and to

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<sup>35</sup>Year 2000 Computer Problem: The State's Agencies Are Progressing Toward Compliance but Key Steps Remain Incomplete (California State Auditor, February 18, 1999).

<sup>36</sup>Department of Administrative Services Year 2000 Statewide Project Office Review (Secretary of State, Audits Division, State of Oregon Report No. 99-05, March 16, 1999).

<sup>37</sup>Department of Commerce, Information Technology Services Year 2000 Project Office (Office of the State Auditor, State of North Carolina, March 18, 1999).

<sup>38</sup>Department of Central Management Services Bureau of Communications and Services: Third Party Review For The Year Ending June 30, 1999 (Office of the Auditor General, State of Illinois, June 30, 1999).

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coordinate the state's efforts in addressing and reporting on the Year 2000 issue. Further, the audit office stated that the department should continually assess its progress in completing its conversion efforts and develop contingency plans for any systems or applications that may not be Year 2000 ready.

It is also critical that local government systems be ready for the change of century since critical functions involving, for example, public safety and traffic management, are performed at the local level. Recent reports on local governments have highlighted Year 2000 concerns, for example:

On June 23, the National Association of Counties announced the results of its April survey of 500 randomly selected counties. This survey found that (1) 74 percent of respondents had a countywide plan to address Year 2000 issues, (2) 51 percent had completed system assessments, and (3) 27 percent had completed system testing. In addition, 190 counties had prepared contingency plans and 289 had not. Further, of the 114 counties reporting that they planned to develop Year 2000 contingency plans, 22 planned to develop the plan in April-June, 64 in July-September, 18 in October-December, and 10 did not yet know.

- The National League of Cities conducted a poll during its annual conference in March 1999 that included over 400 responses. The poll found that (1) 340 respondents stated that over 75 percent of their cities' critical systems would be Year 2000 compliant by January 1, 2000, (2) 35 stated that 51-75 percent would be compliant, (3) 16 stated that 25-50 percent would be compliant, and (4) 16 stated that less than 25 percent would be compliant. Moreover, 34 percent of respondents reported that they had contingency plans, 46 percent stated that they were in the process of developing plans, 12 percent stated that plans would be developed, and 8 percent said they did not intend to develop contingency plans.
- In January 1999, the United States Conference of Mayors reported on the results of its survey of 220 cities. It found that (1) 97 percent had a citywide plan to address Year 2000 issues, (2) 22 percent had repaired or replaced less than half of their systems, and (3) 45 percent had completed less than half of their testing.

Of critical importance to the nation are services essential to the safety and well-being of individuals across the country, namely 9-1-1 systems and law enforcement. For the most part, responsibility for ensuring continuity of service for 9-1-1 calls and law enforcement resides with thousands of state

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and local jurisdictions. On April 29 we testified that not enough was known about the status of either 9-1-1 systems or of state and local law enforcement activities to conclude about either's ability during the transition to the year 2000 to meet the public safety and well-being needs of local communities across the nation.<sup>39</sup> While the federal government planned additional actions to determine the status of these areas, we stated that the President's Council on Year 2000 Conversion should use such information to identify specific risks and develop appropriate strategies and contingency plans to respond to those risks.

Recognizing the seriousness of the Year 2000 risks facing state and local governments, the President's Council has developed initiatives to address the readiness of state and local governments, for example:

- The Council established working groups on state and local governments and tribal governments.
- Council officials participate in monthly multistate conference calls.
- In July 1998 and March 1999, the Council, in partnership with the National Governors' Association, convened Year 2000 summits with state and U.S. territory Year 2000 coordinators.
- On May 24, the Council announced a nationwide campaign to promote "Y2K Community Conversations" to support and encourage efforts of government officials, business leaders, and interested citizens to share information on their progress. To support this initiative, the Council has developed and is distributing a toolkit that provides examples of which sectors should be represented at these events and issues that should be addressed.

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## State-Administered Federal Human Services Programs Are At Risk

Among the critical functions performed by states are the administration of federal human services programs. As we reported in November 1998, many systems that support state-administered federal human services programs were at risk, and much work remained to ensure that services would continue.<sup>40</sup> In February of this year, we testified that while some progress had been achieved, many states' systems were not scheduled to become

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<sup>39</sup>Year 2000 Computing Challenge: Status of Emergency and State and Local Law Enforcement Systems Is Still Unknown (GAO/T-AIMD-99-163, April 29, 1999).

<sup>40</sup>Year 2000 Computing Crisis: Readiness of State Automated Systems to Support Federal Welfare Programs (GAO/AIMD-99-28, November 6, 1998).



compliant until the last half of 1999.<sup>41</sup> Accordingly, we concluded that, given these risks, business continuity and contingency planning was even more important in ensuring continuity of program operations and benefits in the event of systems failures.

Subsequent to our November 1998 report, OMB directed federal oversight agencies to include the status of selected state human services systems in their quarterly reports. Specifically, in January 1999, OMB requested that agencies describe actions to help ensure that federally supported, state-run programs will be able to provide services and benefits. OMB further asked that agencies report the date when each state's systems will be Year 2000-compliant. Tables 1 and 2 summarize the information gathered by the Departments of Agriculture and Health and Human Services, respectively, on the compliance status of state-level organizations. The information indicates that a number of states do not plan to complete their Year 2000 efforts until the last quarter of 1999.

**Table 1: Reported State-level Readiness for Federally Supported Programs, Department of Agriculture, May 1999<sup>a</sup>**

Program	Compliant	April-June	July-September	October-December	Unknown <sup>b</sup>
Food Stamps	25	12	14	3	0
Child Nutrition	29	9	10	4	2
Women, Infants, and Children	33	11	7	3	0

<sup>a</sup>This chart contains readiness information from the 50 states, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands.

<sup>b</sup>Unknown indicates the state did not provide a date or the date was unknown.

Source: Department of Agriculture.

<sup>41</sup>Year 2000 Computing Crisis: Readiness of State Automated Systems That Support Federal Human Services Programs (GAO/T-AIMD-99-91, February 24, 1999).

**Table 2: Reported State-level<sup>a</sup> Readiness for Federally Supported Programs, Department of Health and Human Services<sup>b</sup>**

Program	Compliant <sup>c</sup>	Jan.- March	April- June	July- Sept.	Oct.- Dec.	Unknown <sup>d</sup>	N/A <sup>e</sup>
Child Care	24	5	5	8	2	6	4
Child Support Enforcement	15	4	13	8	8	6	0
Child Welfare	20	5	9	11	3	5	1
Low Income Housing Energy Assistance Program	10	0	3	7	1	32	1
Medicaid – Integrated Eligibility System	20	0	15	15	4	0	0
Medicaid – Management Information System	17	0	19	14	4	0	0
Temporary Assistance for Needy Families	19	3	12	15	1	4	0

<sup>a</sup>This chart contains readiness information from the 50 states, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands.

<sup>b</sup>The OMB report stated that this information was as of January 31, 1999. However, OMB provided a draft table to the National Association of State Information Resource Executives which, in turn, provided the draft table to the states. The states were asked to contact HHS and provide corrections by June 1, 1999. For its part, HHS submitted updated state data to OMB in early June.

<sup>c</sup>In many cases the report indicated a date instead of whether the state was compliant. We assumed that states reporting completion dates in 1998 or earlier were compliant.

<sup>d</sup>Unknown indicates that, according to OMB, the data reported by the states were unclear or that no information was reported by the agency.

<sup>e</sup>N/A indicates that the states or territories reported that the data requested were not applicable to them.

Source: Progress on Year 2000 Conversion: 9th Quarterly Report (OMB, issued on June 15, 1999).

In addition, in June 1999, OMB reported that, as of March 31, 1999, 27 states' unemployment insurance systems were compliant, 11 planned to be completed between April and June 1999, 10 planned to be completed between July and September, and 5 planned to be completed between October and December.

Along with obtaining readiness information from the states, agencies have initiated additional actions to help ensure the Year 2000 compliance of state-administered programs. About a quarter of the federal government's programs designated high-impact by OMB are state-administered, such as Food Stamps and Temporary Assistance for Needy Families. In response to OMB's March memorandum regarding the high-impact programs, the

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departments of Agriculture, Health and Human Services, and Labor reported on various actions that they are taking or plan to take to help ensure the Year 2000 compliance of their state-administered programs, for example:

- The Department of Agriculture reported in May that its Food and Nutrition Service requested that states provide their contingency plans and had contracted for technical support services to review these plans, as needed, and to assist in its oversight of other state Year 2000 activities.
- The Department of Health and Human Services reported that its Administration for Children and Families and Health Care Financing Administration had contracted for on-site assessments of state partners, which will include reviews of business continuity and contingency plans.
- The Department of Labor reported that states are required to submit a certification of Year 2000 compliance for their benefit and tax systems along with an independent verification and validation report. In addition, Labor required that state agencies prepare business continuity and contingency plans, which will be reviewed by Labor officials. Further, the department plans to design and develop a prototype PC-based system to be used in the event that a state's unemployment insurance system is unusable due to a Year 2000-induced problem.

An example of the benefits that federal/state partnerships can provide is illustrated by the Department of Labor's unemployment services program. In September 1998, we reported that many state employment security agencies were at risk of failure as early as January 1999 and urged the Department of Labor to initiate the development of realistic contingency plans to ensure continuity of core business processes in the event of Year 2000-induced failures.<sup>42</sup> Just last month, we testified that four state agencies' systems could have failed if systems in those states had not been programmed with an emergency patch in December 1998. This patch was developed by several of the state agencies and promoted to other state agencies by the Department of Labor.<sup>43</sup>

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<sup>42</sup>Year 2000 Computing Crisis: Progress Made at Department of Labor, But Key Systems at Risk (GAO/T-AIMD-98-303, September 17, 1998).

<sup>43</sup>Year 2000 Computing Challenge: Labor Has Progressed But Selected Systems Remain at Risk (GAO/T-AIMD-99-179, May 12, 1999).

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## Year 2000 Readiness Information Available in Some Sectors, But Key Information Still Missing or Incomplete

Beyond the risks faced by federal, state, and local governments, the year 2000 also poses a serious challenge to the public infrastructure, key economic sectors, and to other countries. To address these concerns, in April 1998 we recommended that the Council use a sector-based approach and establish the effective public-private partnerships necessary to address this issue.<sup>44</sup> The Council subsequently established over 25 sector-based working groups and has been initiating outreach activities since it became operational last spring. In addition, the Chair of the Council has formed a Senior Advisors Group composed of representatives from private-sector firms across key economic sectors. Members of this group are expected to offer perspectives on cross-cutting issues, information sharing, and appropriate federal responses to potential Year 2000 failures.

Our April 1998 report also recommended that the President's Council develop a comprehensive picture of the nation's Year 2000 readiness, to include identifying and assessing risks to the nation's key economic sectors--including risks posed by international links. In October 1998 the Chair directed the Council's sector working groups to begin assessing their sectors. The Chair also provided a recommended guide of core questions that the Council asked to be included in surveys by the associations performing the assessments. These questions included the percentage of work that has been completed in the assessment, renovation, validation, and implementation phases. The Chair then planned to issue quarterly public reports summarizing these assessments. The first such report was issued on January 7, 1999.

The Council's second report was issued on April 21, 1999.<sup>45</sup> The report stated that substantial progress had been made in the prior 6 to 12 months, but that there was still much work to be done. According to the Council, most industries had projected completion target dates between June and September and were in, or would soon be moving into, the critical testing phase. Key points in the Council's April assessment included the following:

- National Year 2000 failures in key U.S. infrastructures such as power, banking, telecommunications, and transportation are unlikely.

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<sup>44</sup>GAO/AIMD-98-85, April 30, 1998.

<sup>45</sup>Both of the Council's reports are available on its web site, [www.y2k.gov](http://www.y2k.gov). In addition, the Council, in conjunction with the Federal Trade Commission and the General Services Administration, has established a toll-free Year 2000 information line, 1-888-USA-4Y2K. The Federal Trade Commission has also included Year 2000 information of interest to consumers on its web site, [www.consumer.gov](http://www.consumer.gov).

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- Organizations that are not paying appropriate attention to the Year 2000 problem or that are adopting a “wait and see” strategy—an attitude prevalent among some small businesses and local governments—are putting themselves and those that depend upon them at great risk.
  - International Year 2000 activity, although increasing, is lagging and will be the source of the greatest risk.

The Council’s assessment reports have substantially increased the nation’s understanding of the Year 2000 readiness of key industries. However, the picture remained incomplete in certain key areas because the surveys conducted did not have a high response rate, the assessment was general, or the data were old. For example, according to the assessment report, only 13 percent of the nation’s 9-1-1 centers had responded to a survey being conducted by the Federal Emergency Management Agency in conjunction with the National Emergency Number Association, calling into question whether the results of the survey accurately portrayed the readiness of the sector. In the case of drinking water, both the January and April reports provided a general assessment but did not contain detailed data as to the status of the sector (e.g., the average percentage of an organization’s systems that are Year 2000 compliant or the percentage of organizations that are in the assessment, renovation, or validation phases). Finally, in some cases, such as the transit industry, the sector surveys had been conducted months earlier.

The President’s Council is to be commended on the strides that it has made to obtain Year 2000 readiness data critical to the nation’s well-being as well as its other initiatives, such as the establishment of the Senior Advisors Group. To further reduce the likelihood of major disruptions, in testimony this January, we suggested that the Council consider additional actions such as continuing to aggressively pursue readiness information in the areas in which it is lacking.<sup>46</sup> If the current approach of using associations to voluntarily collect information does not yield the necessary information, we suggested that the Council may wish to consider whether legislative remedies (such as requiring disclosure of Year 2000 readiness data) should be proposed. In response to this suggestion, the Council Chair stated that the Council has focused on collaboration and communication with associations and other groups as a means to get industries to share information on their Year 2000 readiness and that the Council did not

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<sup>46</sup>GAO/T-AIMD-99-50, January 20, 1999.

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believe that legislation would be necessary. The Council's next sector report is expected to be released later this month.

Subsequent to the Council's April report, surveys in key sectors have been issued. In addition, we have issued several products related to several of these sectors. I will now discuss the results of some of these surveys and our reviews.

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## Energy Sector

In April, we reported that while the electric power industry had concluded that it had made substantial progress in making its systems and equipment ready to continue operations into the year 2000, significant risks remained since many reporting organizations did not expect to be Year 2000 ready within the June 1999 industry target date.<sup>47</sup> We, therefore, suggested that the Department of Energy (1) work with the Electric Power Working Group to ensure that remediation activities were accelerated for the utilities that expected to miss the June 1999 deadline for achieving Year 2000 readiness and (2) encourage state regulatory utility commissions to require a full public disclosure of Year 2000 readiness status of entities transmitting and distributing electric power. The Department of Energy generally agreed with our suggestions. We also suggested that the Nuclear Regulatory Commission (1) in cooperation with the Nuclear Energy Institute, work with nuclear power plant licensees to accelerate the Year 2000 remediation efforts among the nuclear power plants that expect to meet the June 1999 deadline for achieving readiness and (2) publicly disclose the Year 2000 readiness of each of the nation's operational nuclear reactors. In response, the Nuclear Regulatory Commission stated that it plans to focus its efforts on nuclear power plants that may miss the July 1, 1999, milestone and that it would release the readiness information on individual plants that same month.

Subsequent to our report, on April 30, 1999, the North American Electric Reliability Council released its third status report on electric power systems. According to the North American Electric Reliability Council, as of March 31, 1999, reporting organizations, on average, had completed 99 percent of the inventory phase, 95 percent of the assessment phase, and 75 percent of the remediation/testing phase.

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<sup>47</sup>Year 2000 Computing Crisis: Readiness of the Electric Power Industry (GAO/AIMD-99-114, April 6, 1999).

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In May, we reported<sup>48</sup> that while the domestic oil and gas industries had reported that they had made substantial progress in making their equipment and systems ready to continue operations into the year 2000, risks remained. In particular, a February industrywide survey found that over a quarter of the oil and gas industries reported that they did not expect to be Year 2000 ready until the second half of 1999—leaving little time for resolving unexpected problems. Moreover, although over half of our oil is imported, little was known about the Year 2000 readiness of foreign oil suppliers. Further, while individual domestic companies reported that they were developing Year 2000 contingency plans, there were no plans to perform a national-level risk assessment and develop contingency plans to deal with potential shortages or disruptions in the nation's overall oil and gas supplies. We suggested that the Council's oil and gas working group (1) work with industry associations to perform national-level risk assessments and develop and publish credible, national-level scenarios regarding the impact of potential Year 2000 failures and (2) develop national-level contingency plans. The working group generally agreed with these suggestions.

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## Water Sector

As I previously mentioned, the Council's January and April assessment reports provided only a general assessment of the drinking water sector and did not contain detailed data. Similarly, in April we reported<sup>49</sup> that insufficient information was available to assess and manage Year 2000 efforts in the water sector, and little additional information was expected under the current regulatory approach. While the Council's water sector working group had undertaken an awareness campaign and had urged national water sector associations to continue to survey their memberships, survey response rates had been low. Further, Environmental Protection Agency officials stated that the agency lacked the rules and regulations necessary to require water and wastewater facilities to report on their Year 2000 status.

Our survey of state regulators found that a few states were proactively collecting Year 2000 compliance data from regulated facilities, a much larger group of states was disseminating Year 2000 information, while another group was not actively using either approach. Additionally, only a

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<sup>48</sup>Year 2000 Computing Crisis: Readiness of the Oil and Gas Industries (GAO/AIMD-99-162, May 19, 1999).

<sup>49</sup>Year 2000 Computing Crisis: Status of the Water Industry (GAO/AIMD-99-151, April 21, 1999).

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handful of state regulators believed that they were responsible for ensuring facilities' Year 2000 compliance or overseeing facilities' business continuity and contingency plans. Among our suggested actions was that the Council, the Environmental Protection Agency, and the states determine which regulatory organization should take responsibility for assessing and publicly disclosing the status and outlook of water sector facilities' Year 2000 business continuity and contingency plans. The Environmental Protection Agency generally agreed with our suggestions but one official noted that additional legislation may be needed if the agency is to take responsibility for overseeing facilities' Year 2000 business continuity and contingency plans.

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## Health Sector

The health sector includes health care providers (such as hospitals and emergency health care services), insurers (such as Medicare and Medicaid), and biomedical equipment. With respect to biomedical equipment, on June 10 we testified<sup>50</sup> that, in response to our September 1998 recommendation,<sup>51</sup> HHS, in conjunction with the Department of Veterans Affairs, had established a clearinghouse on biomedical equipment. As of June 1, 1999, 4,142 biomedical equipment manufacturers had submitted data to the clearinghouse. About 61 percent of these manufacturers reported having products that do not employ dates and about 8 percent (311 manufacturers) reported having date-related problems such as an incorrect display of date/time. According to the Food and Drug Administration, the 311 manufacturers reported 897 products with date-related problems. However, not all compliance information was available on the clearinghouse because the clearinghouse referred the user to 427 manufacturers' web sites. Accordingly, we reviewed the web sites of these manufacturers and found, as of June 1, 1999, a total of 35,446 products.<sup>52</sup> Of these products, 18,466 were reported as not employing a date, 11,211 were reported as compliant, 4,445 were shown as not compliant, and the compliance status of 1,324 was unknown.

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<sup>50</sup>Year 2000 Computing Challenge: Concerns About Compliance Information on Biomedical Equipment (GAO/T-AIMD-99-209, June 10, 1999).

<sup>51</sup>Year 2000 Computing Crisis: Compliance Status of Many Biomedical Equipment Items Still Unknown (GAO/AIMD-98-240, September 18, 1998).

<sup>52</sup>Because of limitations in many of the manufacturers web sites, our ability to determine the total number of biomedical equipment products reported and their compliance status was impaired. Accordingly, the actual number of products reported by the manufacturers could be significantly higher than the 35,446 products that we counted.



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In addition to the establishment of a clearinghouse, our September 1998 report also recommended that HHS and the Department of Veterans Affairs take prudent steps to jointly review manufacturers' test results for critical care/life support biomedical equipment. We were especially concerned that the departments review test results for equipment previously deemed to be noncompliant but now deemed by manufacturers to be compliant, or equipment for which concerns about compliance remained. In May 1999, the Food and Drug Administration, a component agency of HHS, announced that it planned to develop a list of critical care/life support medical devices and the manufacturers of these devices, select a sample of manufacturers for review, and hire a contractor to develop a program to assess manufacturers' activities to identify and correct Year 2000 problems for these medical devices. In addition, if the results of this review indicated a need for further review of manufacturer activities, the contractor would review a portion of the remaining manufacturers not yet reviewed. Moreover, according to the Food and Drug Administration, any manufacturer whose quality assurance system appeared deficient based on the contractors review would be subject to additional reviews to determine what actions would be required to eliminate any risk posed by noncompliant devices.

In April testimony<sup>53</sup> we also reported on the results of a Department of Veterans Affairs survey of 384 pharmaceutical firms and 459 medical-surgical firms with whom it does business. Of the 52 percent of pharmaceutical firms that responded to the survey, 32 percent reported that they were compliant. Of the 54 percent of the medical-surgical firms that responded, about two-thirds reported that they were compliant.

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## Banking and Finance Sector

A large portion of the institutions that make up the banking and finance sector are overseen by one or more federal regulatory agencies. In September 1998 we testified on the efforts of five federal financial regulatory agencies<sup>54</sup> to ensure that the institutions that they oversee are ready to handle the Year 2000 problem.<sup>55</sup> We concluded that the regulators

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<sup>53</sup>Year 2000 Computing Crisis: Action Needed to Ensure Continued Delivery of Veterans Benefits and Health Care Services (GAO/T-AIMD-99-136, April 15, 1999).

<sup>54</sup>The National Credit Union Administration, the Federal Deposit Insurance Corporation, the Office of Thrift Supervision, the Federal Reserve System, and the Office of the Comptroller of the Currency.

<sup>55</sup>Year 2000 Computing Crisis: Federal Depository Institution Regulators Are Making Progress. But Challenges Remain (GAO/T-AIMD-98-305, September 17, 1998).

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had made significant progress in assessing the readiness of member institutions and in raising awareness on important issues such as contingency planning and testing. Regulator examinations of bank, thrift, and credit union Year 2000 efforts found that the vast majority were doing a satisfactory job of addressing the problem. Nevertheless, the regulators faced the challenge of ensuring that they are ready to take swift action to address those institutions that falter in the later stages of correction and to address disruptions caused by international and public infrastructure failures.

In April, we reported that the Federal Reserve System--which is instrumental to our nation's economic well-being, since it provides depository institutions and government agencies services such as processing checks and transferring funds and securities--has effective controls to help ensure that its Year 2000 progress is reported accurately and reliably.<sup>56</sup> We also found that it is effectively managing the renovation and testing of its internal systems and the development and planned testing of contingency plans for continuity of business operations. Nevertheless, the Federal Reserve System still had much to accomplish before it is fully ready for January 1, 2000, such as completing validation and implementation of all of its internal systems and completing its contingency plans.

In addition to the domestic banking and finance sector, large U.S. financial institutions have financial exposures and relationships with international financial institutions and markets that may be at risk if these international organizations are not ready for the date change occurring on January 1, 2000. In April, we reported<sup>57</sup> that foreign financial institutions had reportedly lagged behind their U.S. counterparts in preparing for the Year 2000 date change. Officials from four of the seven large foreign financial institutions we visited said they had scheduled completion of their Year 2000 preparations about 3 to 6 months after their U.S. counterparts, but they planned to complete their efforts by mid-1999 at the latest. Moreover, key international market supporters, such as those that transmit financial messages and provide clearing and settlement services, told us that their systems were ready for the date change and that they had begun

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<sup>56</sup>Year 2000 Computing Crisis: Federal Reserve Has Established Effective Year 2000 Management Controls for Internal Systems Conversion (GAO/AIMD-99-78, April 9, 1999).

<sup>57</sup>Year 2000: Financial Institution and Regulatory Efforts to Address International Risks (GAO/GGD-99-62, April 27, 1999).

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testing with the financial organizations that depended on these systems. Further, we found that seven large U.S. banks and securities firms we visited were taking actions to address their international risks. In addition, U.S. banking and securities regulators were also addressing the international Year 2000 risks of the institutions that they oversee.

With respect to the insurance industry, in March we concluded that insurance regulator presence regarding the Year 2000 area was not as strong as that exhibited by the banking and securities industry.<sup>58</sup> State insurance regulators we contacted were late in raising industry awareness of potential Year 2000 problems, provided little guidance to regulated institutions, and failed to convey clear regulatory expectations to companies about Year 2000 preparations and milestones. Nevertheless, the insurance industry is reported by both its regulators and by other outside observers to be generally on track to being ready for 2000. However, most of these reports are based on self-reported information and, compared to other financial regulators, insurance regulators' efforts to validate this information generally began late and were more limited.

In a related report in April,<sup>59</sup> we stated that variations in oversight approaches by state insurance regulators also made it difficult to ascertain the overall status of the insurance industry's Year 2000 readiness. We reported that the magnitude of insurers' Year 2000-related liability exposures could not be estimated at that time but that costs associated with these exposures could be substantial for some property-casualty insurers, particularly those concentrated in commercial-market sectors. In addition, despite efforts to mitigate potential exposures, the Year 2000-related costs that may be incurred by insurers would remain uncertain until key legal issues and actions on pending legislation were resolved.

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## Transportation Sector

A key component to the nation's transportation sector are airports. This January we reported on our survey of 413 airports.<sup>60</sup> We found that while the nation's airports are making progress in preparing for the year 2000,

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<sup>58</sup>Insurance Industry: Regulators Are Less Active in Encouraging and Validating Year 2000 Preparedness (GAO/T-GGD-99-56, March 11, 1999).

<sup>59</sup>Year 2000: State Insurance Regulators Face Challenges in Determining Industry Readiness (GAO/GGD-99-87, April 30, 1999).

<sup>60</sup>Year 2000 Computing Crisis: Status of Airports' Efforts to Deal With Date Change Problem (GAO/RCED/AIMD-99-57, January 29, 1999).

such progress varied. Of the 334 airports responding to our survey, about one-third reported that they would complete their Year 2000 preparations by June 30, 1999. The other two-thirds either planned on a later date or failed to estimate any completion date, and half of these airports did not have contingency plans for any of 14 core airport functions. Although most of those not expecting to be ready by June 30 are small airports, 26 of them are among the nation's largest 50 airports.

On June 18, the Federal Aviation Administration issued an air industry Year 2000 status report that included information on airports and airline carriers. Table 3 provides the assessment, renovation, validation, and implementation information contained in this report.

**Table 3: Industry Segment Percentage Completion of Year 2000 Remediation Phases**

Industry segment	Assessment	Renovation	Validation	Implementation
Large hub airports	98	63%	31%	26%
Medium hub airports	100%	70%	43%	37%
Small hub airports	94%	61%	55%	48%
Non-hub airports	93%	67%	67%	70%
Major carriers	100%	75%	50%	<sup>a</sup>
Low-cost carriers	73%	38%	19%	18%

Note: Airport information was based on data as of March 15, 1999, from the American Association of Airport Executives and the Airports Council International/North America. The major carrier information was based on data as of February 22, 1999, from the AirTransport Association of America, and the low-cost carrier information was based on data as of November 30, 1998, from the National Air Carriers Association, Inc.

<sup>a</sup>Implementation was occurring as validation and testing were completed.

Source: Federal Aviation Administration.

## Manufacturing and Small Business Sector

The manufacturing and small business sector includes the entities that produce or sell a myriad of products such as chemicals, electronics, heavy equipment, food, textiles, and automobiles. With respect to the chemical industry, table 4 contains the latest survey data by Chemical Manufacturers Association--which represents over 190 primarily large chemical companies--and shows that while some companies' systems are Year 2000 ready, others are in varying stages of completion. This survey provided information on the Year 2000 readiness stage of 123 respondents with respect to their business systems, manufacturing, inventory, and

distribution systems, embedded systems, and supply chain as of May 12, 1999.

**Table 4: Results of May 12, 1999 Survey of Chemical Manufacturers Association<sup>a</sup>**

<b>Function</b>	<b>Year 2000 ready</b>	<b>Planning</b>	<b>Inventory/assessment</b>	<b>Remediation</b>	<b>Validation</b>
Business systems	26	1	5	51	27
Manufacturing, inventory, and distribution systems	18	2	7	53	28
Embedded systems	15	2	26	52	13
Supply chain	10	4	51	22	21

<sup>a</sup>Some respondents did not provide information to all questions or stated that the question was not applicable.

Source: Chemical Manufacturers Association statement before the Senate Special Committee on the Year 2000 Technology Problem, May 14, 1999.

Since the Chemical Manufacturers Association represented mainly large companies, a survey of small and mid-sized chemical companies was sponsored by several industry associations<sup>61</sup> to assist the Congress, the administration, and the U.S. Chemical Safety and Hazard Investigation Board by obtaining information on the preparedness of this segment of the industry. Table 5 contains the results of the survey, which was conducted between March and May 1999.

<sup>61</sup>The sponsors of the survey were the American Crop Protection Association, Chemical Producers & Distributors Association, Chemical Specialties Manufacturers Association, International Sanitary Supply Association, National Association of Chemical Distributors, Responsible Industry for a Sound Environment, and the Synthetic Organic Chemical Manufacturers Association.

**Table 5: Readiness Stage of Small and Medium-Sized Chemical Companies<sup>a</sup>**

<b>Function</b>	<b>Year 2000 ready</b>	<b>Planning</b>	<b>Inventory/ Assessment</b>	<b>Remediation</b>	<b>Validation</b>
Business systems	147	8	4	24	12
Manufacturing, inventory, and distribution systems	133	8	3	21	13
Embedded systems	83	3	7	13	6
Supply chain	80	17	29	17	25

<sup>a</sup>Some respondents did not provide information to all questions or stated that the question was not applicable.

Source: Year 2000 Readiness Disclosure Survey of Small & Mid-Sized Chemical Companies, June 9, 1999.

Another key segment of the economy are small businesses. The National Federation of Independent Business and Wells Fargo sponsored a third survey of the Year 2000 preparedness of small businesses between mid-April and mid-May 1999. This survey found that 84 percent of small businesses are directly exposed to a possible Year 2000 problem. Of the small businesses directly exposed to the Year 2000 problem, 59 percent had taken action, 12 percent planned to take action, and 28 percent did not plan to take action (the other 1 percent responded that the question was not applicable). In addition, 43 percent of the small businesses that were aware of the Year 2000 problem had made contingency plans to minimize the impact of potential problems.

In summary, while improvement has been shown, much work remains at the national, federal, state, and local levels to ensure that major service disruptions do not occur. Specifically, remediation must be completed, end-to-end testing performed, and business continuity and contingency plans developed. Similar actions remain to be completed by the nation's key sectors. Accordingly, whether the United States successfully confronts the Year 2000 challenge will largely depend on the success of federal, state, and local governments, as well as the private sector working separately and together to complete these actions. Accordingly, strong leadership and partnerships must be maintained to ensure that the needs of the public are met at the turn of the century.

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

# Federal High-Impact Programs and Lead Agencies

Agency	Program
Department of Agriculture	Child Nutrition Programs
Department of Agriculture	Food Safety Inspection
Department of Agriculture	Food Stamps
Department of Agriculture	Special Supplemental Nutrition Program for Women, Infants, and Children
Department of Commerce	Patent and trademark processing
Department of Commerce	Weather Service
Department of Defense	Military Hospitals
Department of Defense	Military Retirement
Department of Education	Student Aid
Department of Energy	Federal electric power generation and delivery
Department of Health and Human Services	Child Care
Department of Health and Human Services	Child Support Enforcement
Department of Health and Human Services	Child Welfare
Department of Health and Human Services	Disease monitoring and the ability to issue warnings
Department of Health and Human Services	Indian Health Service
Department of Health and Human Services	Low Income Home Energy Assistance Program
Department of Health and Human Services	Medicaid
Department of Health and Human Services	Medicare
Department of Health and Human Services	Organ Transplants
Department of Health and Human Services	Temporary Assistance for Needy Families
Department of Housing and Urban Development	Housing loans (Government National Mortgage Association)
Department of Housing and Urban Development	Section 8 Rental Assistance
Department of Housing and Urban Development	Public Housing
Department of Housing and Urban Development	FHA Mortgage Insurance
Department of Housing and Urban Development	Community Development Block Grants
Department of the Interior	Bureau of Indians Affairs programs
Department of Justice	Federal Prisons
Department of Justice	Immigration
Department of Justice	National Crime Information Center
Department of Labor	Unemployment Insurance
Department of State	Passport Applications and Processing
Department of Transportation	Air Traffic Control System
Department of Transportation	Maritime Safety Program
Department of the Treasury	Cross-border Inspection Services
Department of Veterans Affairs	Veterans' Benefits
Department of Veterans Affairs	Veterans' Health Care
Federal Emergency Management Agency	Disaster Relief

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**Appendix I  
Federal High-Impact Programs and Lead  
Agencies**

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<b>Agency</b>	<b>Program</b>
Office of Personnel Management	Federal Employee Health Benefits
Office of Personnel Management	Federal Employee Life Insurance
Office of Personnel Management	Federal Employee Retirement Benefits
Railroad Retirement Board	Retired Rail Workers Benefits
Social Security Administration	Social Security Benefits
U.S. Postal Service	Mail Service

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# GAO Reports and Testimony Addressing the Year 2000 Crisis

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Defense Computers: Management Controls Are Critical to Effective Year 2000 Testing (GAO/AIMD-99-172, June 30, 1999).

Year 2000 Computing Crisis: Customs Is Making Good Progress (GAO/T-AIMD-99-225, June 29, 1999).

Year 2000 Computing Challenge: Delivery of Key Benefits Hinges on States' Achieving Compliance (GAO/T-AIMD/GGD-99-221, June 23, 1999).

Year 2000 Computing Challenge: Estimated Costs, Planned Uses of Emergency Funding, and Future Implications (GAO/T-AIMD-99-214, June 22, 1999).

GSA's Effort to Develop Year 2000 Business Continuity and Contingency Plans for Telecommunications Systems (GAO/AIMD-99-201R, June 16, 1999).

Year 2000 Computing Crisis: Actions Needed to Ensure Continued Delivery of Veterans Benefits and Health Care Services (GAO/AIMD-99-190R, June 11, 1999).

Year 2000 Computing Challenge: Concerns About Compliance Information on Biomedical Equipment (GAO/T-AIMD-99-209, June 10, 1999).

Year 2000 Computing Challenge: Much Biomedical Equipment Status Information Available, Yet Concerns Remain (GAO/T-AIMD-99-197, May 25, 1999).

Year 2000 Computing Challenge: OPM Has Made Progress on Business Continuity Planning (GAO/GGD-99-66, May 24, 1999).

VA Y2K Challenges: Responses to Post-Testimony Questions (GAO/AIMD-99-199R, May 24, 1999).

Year 2000 Computing Crisis: USDA Needs to Accelerate Time Frames for Completing Contingency Planning (GAO/AIMD-99-178, May 21, 1999).

Year 2000 Computing Crisis: Readiness of the Oil and Gas Industries (GAO/AIMD-99-162, May 19, 1999).

Year 2000 Computing Challenge: Time Issues Affecting the Global Positioning System (GAO/T-AIMD-99-187, May 12, 1999).

Year 2000 Computing Challenge: Education Taking Needed Actions But Work Remains (GAO/T-AIMD-99-180, May 12, 1999).

Year 2000 Computing Challenge: Labor Has Progressed But Selected Systems Remain at Risk (GAO/T-AIMD-99-179, May 12, 1999).

Year 2000: State Insurance Regulators Face Challenges in Determining Industry Readiness (GAO/GGD-99-87, April 30, 1999).

Year 2000 Computing Challenge: Status of Emergency and State and Local Law Enforcement Systems Is Still Unknown (GAO/T-AIMD-99-163, April 29, 1999).

Year 2000 Computing Crisis: Costs and Planned Use of Emergency Funds (GAO/AIMD-99-154, April 28, 1999).

Year 2000: Financial Institution and Regulatory Efforts to Address International Risks (GAO/GGD-99-62, April 27, 1999).

Year 2000 Computing Crisis: Readiness of Medicare and the Health Care Sector (GAO/T-AIMD-99-160, April 27, 1999).

U.S. Postal Service: Subcommittee Questions Concerning Year 2000 Challenges Facing the Service (GAO/AIMD-99-150R, April 23, 1999).

Year 2000 Computing Crisis: Status of the Water Industry (GAO/AIMD-99-151, April 21, 1999).

Year 2000 Computing Crisis: Key Actions Remain to Ensure Delivery of Veterans Benefits and Health Services (GAO/T-AIMD-99-152, April 20, 1999).

Year 2000 Computing Crisis: Readiness Improving But Much Work Remains To Ensure Delivery of Critical Services (GAO/T-AIMD-99-149, April 19, 1999).

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