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

U.S. House of Representatives

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Readiness for the Year 2000 Aviation Industry--Domestic and Foreign and the Federal Aviation Administration

Statement of

The Honorable Kenneth M. Mead

Inspector General

U.S. Department of Transportation

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Mr. Chairman, Madam Chairwoman, and Members of the Subcommittees:

We appreciate the opportunity to testify today on the Federal Aviation Administration (FAA) and the aviation industry's readiness for safe operations into, and after, the Year 2000. Our testimony will address these areas:

- Actions to fix FAA internal computer systems and remaining challenges,
- FAA's proposed business continuity and contingency plan,
- FAA's assessment of the aviation industry's Year-2000 readiness, and
- Foreign air traffic control services' Year-2000 readiness.

First, this is our fourth testimony before these two Subcommittees on the FAA Year-2000 computer program. In February 1998, we reported that FAA was 7 months behind schedule in assessing its computers for Year-2000 problems. There were serious questions as to whether the Host computer, which is used for control of high altitude air traffic, could make it to the Year 2000 or be made compliant. The FAA program lacked central leadership, and FAA was planning to have its mission-critical systems fixed and ready to go by November 1999. All this has changed with strong Congressional oversight, leadership by the Secretary and Deputy Secretary of Transportation, the FAA Administrator, and hard work on FAA's part.

FAA established a strong central management for its Year-2000 efforts, established a sense of urgency, made a prompt decision to repair and replace the Host computers, moved up the scheduled completion date to June 1999, and met the June 30 milestone. These actions were responsive to recommendations by the Office of Inspector General and others.

As of August 31, 1999, FAA replaced the Host and Oceanic computers at 19 of 23 sites, with the other 4 scheduled to be installed by September 30, 1999. FAA has done a commendable job getting its 152 mission-critical systems, which had Year-2000 problems, repaired and installed at over 4,000 sites. FAA is now concentrating its efforts in the following areas.

Before installing the Year-2000 fixes into the online air traffic control systems, FAA tested the repaired systems at its test facilities and conducted a "live" test at the Denver airport. Over the years, FAA field staff have developed local programs to supplement centrally deployed systems. FAA recognizes the possibility that local programs could cause Year-2000 compliant systems to not work as intended. Upgrades continue to be made to Year-2000 compliant systems after they were installed at field sites. For example, after Year-2000 fixes were made to the Oceanic Automation System software, it was modified to achieve

better data transfer between the Oceanic and Host computers. FAA must exercise extreme caution to ensure local programs and upgrades do not "undo" the tested and compliant work. FAA is putting plans in place to ensure this does not happen.

Second, no matter how extensive the search, there are no guarantees that all Year-2000 glitches have been found in internal systems, or systems provided by external sources, such as network service providers. While the work to date has shown that nothing significant is expected to happen, FAA is taking no chances, and is developing a workable business continuity and contingency plan. FAA's proposed Year-2000 business continuity strategy relies primarily on existing contingency procedures, coupled with a newly developed Business Resumption Process.

In the unlikely event of major Year-2000 related system failures, air traffic controllers would use special contingency procedures, such as non-radar (or manual) procedures to separate aircraft. While the non-radar contingency procedure is valid for handling Year-2000 failures, controllers will need refresher training in using this procedure on a large-scale basis. FAA has begun testing its contingency procedures.

FAA has made significant progress with its air traffic controllers union. Although the union representing employees responsible for maintaining air traffic control systems has been invited to participate in this important effort, it has not yet played a significant role. In the unlikely event of system failures, these union members will have to restore the systems. Both FAA and its union members need to agree on a contingency plan that will be used if systems should fail.

Third, FAA has taken an active role working with domestic aviation industry associations. U.S. airports got a late start on fixing Year-2000 computer problems. In June 1998, FAA sent a letter to over 5,300 public airports to alert them to Year-2000 computer problems. Based on airport associations' reporting, the airports handling about 90 percent of passenger enplanements are making good progress and will be ready in time. Smaller airports, while their number is significant, handle about 10 percent of passenger enplanements. Year-2000 readiness status of these smaller airports still needs to be reported.

Under the Federal Aviation Regulations, 563 public airports have to be certified by FAA for airport safety operations, such as airfield lighting. FAA surveyed all these airports for readiness to comply with its regulatory requirements, and visited the top 150 airports. The survey reported, as of August 31, 1999, 83 percent of airport safety systems are Year-2000 compliant. The remaining systems are still being evaluated. If not Year-2000 ready by October 15, 1999, FAA plans to send airport operators warning letters with possible actions FAA may take on

January 1, 2000. FAA also plans to require airports to perform readiness test of systems critical to airfield safety and efficiency within the first hours of January 1, 2000.

As part of FAA's survey of about 14,000 certificate holders, FAA surveyed over 3,300 certified carriers for their readiness in April 1999. FAA received responses from 41 percent of the air carriers, including most large carriers. The higher response rate from large carriers confirmed industry associations' claim that large air carriers (representing 95 percent of U.S. passenger and cargo services) will be Year-2000 ready by September 30, 1999. Our sense is that large carriers are handling preparation for the Year 2000 well.

FAA plans to follow up with those carriers that did not respond. With just over 100 days to go, this will be a very challenging plan to accomplish. This was why in March we testified that our confidence level with respect to the entire industry, particularly small carriers and suppliers, would be stronger if certification of Year-2000 compliance was required of them. FAA decided not to impose such a requirement on the industry, and is now faced with the challenging task of getting assurances of Year-2000 readiness from those who did not, or refused to, voluntarily respond.

Lastly, in our March 1999 testimony, we recommended that policy be developed as to whether U.S. carriers or U.S. code share flights, cargo and passengers, will be allowed to fly to countries that are not known to be Year-2000 compliant. DOT established an interagency committee with the Departments of Defense and State to evaluate foreign countries' Year-2000 readiness and make recommendations on safety of international air travel. This committee plans to resolve different opinions through consultation, and to give countries the opportunity to enhance readiness. With just over 100 days to go, two significant "uncertainties" still exist with international air travel.

First, as of August 31, 1999, a total of 53 countries had not responded to the International Civil Aviation Organization's (ICAO) survey. By region, they are: Asia and Pacific (18), central and south America (12), Africa (10), the former Soviet Union/Eastern Europe (8), Middle East (4), and Europe (1). In Fiscal Year 1998, over 5 million passengers (4.6 percent of total passengers for international travel) were flown between the United States and these countries. Second, policy still needs to be established as to whether U.S. carriers or U.S. code share flights will be allowed to fly to countries that either did not respond or cannot give sufficient assurance that they are Year-2000 ready. Time is running out. In our opinion, these "uncertainties" should be resolved by October 15, 1999.

FAA Systems Status and Remaining Challenges

FAA met the significant challenge of implementing 152 repaired systems at over 4,000 sites. We sampled 14 systems, and verified that documentation supported system implementation, validation problems had been resolved, an independent verification and validation was performed for all 152 repaired systems, data exchange issues were resolved, vendor-supported systems were compliant, acceptance testing was performed, and affected databases had been addressed.

We also visited field sites to determine whether Year-2000 compliant fixes had been installed for 10 systems. In all cases, the Year-2000 compliant version was operating on the systems we checked. Now that implementation is complete, FAA needs to ensure that Year-2000 compliant versions in the field are not adversely affected by local programs or upgrades to compliant systems.

Local Programs

For the 152 air traffic control systems which had Year-2000 problems that needed to be fixed, FAA performed extensive Year-2000 testing at its test facilities. FAA also conducted a "live" test at the Denver airport. FAA requires local programs be centrally approved, documented, and monitored. Because of the millions of lines of software code in the National Airspace System, there is the possibility that local programs could cause Year-2000 compliant systems to not work as intended. FAA is aware of the issue with local programs, and is developing a plan to adequately assess these local programs. For example, FAA is determining whether all local programs for its Automated Radar Terminal System (IIIA) have been identified and are Year-2000 compliant.

Modifications to Year-2000 Compliant Systems

To ensure Year-2000 compliant status is maintained, FAA issued guidance requiring the monitoring of changes made to Year-2000 compliant systems. This policy requires, when a Year-2000 compliant system is modified, that the system owner assess the modification to determine if it affects Year-2000 compliance. If the assessment identifies problems, the system owners need to revalidate and re-certify the system. During our on-site review of 10 systems, we found 3 systems were modified subsequent to the Year-2000 modification without support to show the changes did not "undo" the compliance work. For example, the Oceanic Automation System software was modified, after being made Year-2000 compliant, to achieve better data transfer between the Oceanic and Host computers. FAA is working with its system owners to adequately assess modifications to Year-2000 compliant systems.

Testing of Interfaces with Foreign Air Traffic Control

FAA plans to test interfaces with 23 foreign air traffic control systems which handle 51 percent of U.S. passengers' international travel. These interface tests focus on voice transmissions and data transmissions of weather information, flight plans, and Airmen Notices. These tests are time consuming. With just over 100 days to go, completing all these interface tests will be very challenging. For example, FAA plans to conduct seven pre-tests (each of which requires 2 weeks) in preparation for the interface tests. FAA is attempting to accelerate these tests.

Business Continuity and Contingency Plan

FAA developed a business continuity and contingency plan to ensure continued air traffic operations in case of system failures during transition to the new

millennium. The plan is composed of two parts--FAA's existing contingency procedures and a newly developed Business Resumption Process.

Non-radar Contingency Procedures

The air traffic control systems contain six core processes--automation, surveillance, communications, navigation, traffic flow management, and infrastructure, such as public utilities. All core processes are supported by automated systems subject to potential Year-2000 failures. Although unlikely, major system failures in automation and surveillance areas would have the most significant impact.

• Automation systems are used to display aircraft location and flight identification on the controller's screen. Examples include the Host computers used to direct high altitude traffic and the Automated Radar Terminal Systems used for lower altitude traffic.

• Surveillance Systems are used to identify aircraft locations. Examples include long-range Air Route Surveillance Radar used to support high altitude traffic and short-range Airport Surveillance Radar for lower altitude traffic.

In the unlikely event of major Year-2000 related system failures in either automation or surveillance areas, FAA plans to rely on non-radar procedures to direct air traffic. According to FAA, non-radar procedures are rarely used to support normal traffic operations, let alone high traffic volume. Representatives of the National Air Traffic Controllers Association (NATCA) have expressed concern that its members are not proficiently trained to use non-radar procedures on a large-scale basis.

<u>Union Participation</u>

FAA's Business Resumption Process calls for each system failure, regardless of type or impact, to be resolved quickly. FAA established a business resumption team that is responsible for determining causes of system failures, the severity of failures, and the actions to restore operations.

Union participation in development of this plan is important to FAA's success. NATCA is now participating. Although Professional Airways System Specialist (PASS)--the union representing employees responsible for maintaining air traffic control systems--has been invited to participate in this important effort, it has not yet played a significant role. In the event of Year-2000 related system failures, these union members will have to restore the systems. Both FAA and its unions need to develop a plan acceptable to, and agreeable by, all parties.

<u>Testing of the Plan</u>

FAA, with the assistance of contractors, recently conducted a small-scale contingency planning exercise. Preliminary results indicate the exercise went well. However, this exercise provided no "hands on" testing for controllers. FAA is in process of preparing a lessons-learned document to incorporate the information learned to be used for a larger-scale exercise in September 1999. FAA should use these opportunities to test the use of non-radar procedures.

Industry Readiness

In our March 1999 testimony, we reported that our confidence level with regard to the entire aviation industry, particularly small carriers and suppliers, would be stronger if certification of Year-2000 compliance was required. FAA decided not

to impose such a requirement on industry. Instead, FAA is relying primarily on airport and air carrier operators' self-reporting of Year-2000 readiness to their trade associations and the FAA.

Airport Associations' Survey of Year-2000 Status

Under the direction of the President's Council on Year 2000 Conversion, an FAA-Industry Year-2000 Steering Committee was formed to coordinate industry-wide progress reporting. Major airport associations include the American Association of Airport Executives (AAAE) and Airports Council International-North America (ACI-NA).

AAAE and ACI-NA surveyed their member airports. Table 1 shows the 728 member airports account for 14 percent of U.S. public airports.

Table 1
U.S. Public Airports' Year-2000 Readiness Reviews

Public Airport Type	Number of Airports
Member Airports	
Large Hubs	27
Medium Hubs	45
Small Hubs	77
Total Hub Airports	149
Member Airports Non-hub & General Aviation	579
Total Member Airports (14%)	728
Non-member Airports (86%)	4,624
Total Public Airports (100%)	5,352

Based on the AAAE/ACI-NA status report to the Steering Committee, and FAA's status report for submission to ICAO, the most current status is that airports handling about 90 percent of U.S. passenger enplanements reported they should be ready by December 31, 1999. However, there are two issues concerning airports:

- Of the 579 non-hub and general aviation airports, only 107 reported completion of Year-2000 work as of March 15, 1999.   More current information is needed.

- Other than getting a letter from FAA alerting them to Year-2000 problems, the 4,624 public airports not associated with AAAE/ACI-NA were not surveyed by either FAA or the trade associations. Year-2000 readiness of these smaller airports still needs to be reported.

FAA's Survey of Airport Certificate Holders

In June 1998, FAA sent a letter to over 5,300 public airport operators to alert them to Year-2000 computer problems.   Of these, under the Federal Aviation Regulation, about 500 airports are required to be certified by FAA for safe operations, adequate airport security, and adequate screening of passengers, baggage, and cargo. Automated systems often are used to meet these objectives.

- Airport Safety Systems: In October 1998, FAA sent a letter to 563 public airport certificate holders indicating FAA was going to conduct on-site visits or telephone interviews of Year-2000 readiness of systems used to ensure safe airport operations, such as runway lighting. FAA performed on-site reviews at the top 150 airports and conducted telephone interviews with the remaining 413 airport operators.

As of August 31, 1999, survey results indicate 83 percent of airport safety systems are Year-2000 compliant. The remaining systems are still being evaluated. In November 1999, FAA plans to issue warning letters to airport operators, who failed to provide the readiness assurance by October 15, 1999, that FAA will consider appropriate actions on January 1, 2000, including emergency certificate suspension or issuance of a Notice to Airmen restricting airport operations.

FAA also has proposed a rulemaking requirement for airports to perform a one-time readiness test of systems (to be selected by FAA regional representatives in consultation with airport management) critical to airfield safety and efficiency. These tests would be performed within the first hours on January 1, 2000. FAA is analyzing comments received from industry and plans to finalize the requirement by early October 1999.

- Airport Security Systems: In 1998, FAA collected information from 459 certified airport operators relating to Year-2000 readiness of computer systems used to support airport security, such as access systems. The survey indicated 109 airports were working on security systems to become Year-2000 complaint by June 30, 1999. A follow-up review showed 71 operators were repairing their security systems as of August 31, 1999.

In recent years, FAA has sponsored development of three advanced security systems to enhance airport security, including two explosive detection systems and one trace detection equipment. One of the explosive detection systems had to be upgraded to become Year-2000 compliant. According to FAA, all 66 airports with this equipment have completed the upgrade.

Air Carrier Associations' Survey of Year-2000 Status

Major air carrier associations in the FAA-Industry Year-2000 Steering Committee include the Air Transport Association (ATA) representing major carriers, Regional Airline Association (RAA) representing regional air carriers, and the National Air Carrier Association (NACA) representing charter and small airlines.

ATA, RAA, and NACA surveyed their member carriers. Table 2 shows the 101 member carriers account for 3 percent of the 3,343 U.S. air carriers.

Table 2
U.S. Air Carriers' Year-2000 Readiness Reviews

U.S. Air Carriers	Number of Air Carriers
ATA Members (representing 95% of U.S. passenger & cargo services)	23
RAA Members (representing 98% of regional airline passenger services)	71
NACA Members	7

Total Member Air Carriers (3%)	101
Non-member Air Carriers (97%)	3,242

Total Air Carriers (100%)	3,343
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Although these members account for only 3 percent of the total U.S. air carriers, they handle about 95 percent of U.S. passenger and cargo services. The most current status indicated major carriers reported they should be Year-2000 ready by

September 30, 1999. While ATA and NACA reported when their members plan to complete Year-2000 work, RAA had not yet provided such information.

FAA's Survey of Air Carrier Certificate Holders

In April 1999, FAA sent a questionnaire to all 3,343 certified air carriers requesting information about their systems and components that may be affected by Year-2000 computer problems. Submission of the information is voluntary. As of August 31, 1999, FAA received a 41 percent response rate, which included responses for 9 of the top 10 air carriers. Continental is the only major carrier that did not respond.

Table 3
FAA's Survey of U.S. Air Carriers' Year-2000 Readiness

Carrier Category	Surveyed	Responded	Response Rate
Large	10	9	90%
Medium	205	97	47%
Small	3,128	1,255	40%
Total	3,343	1,361	41%

The high response rate from large carriers confirmed the general observation that they are managing the Year-2000 preparation well. The large carriers provide about 95 percent of U.S. passenger service. Status of many medium and small carriers still needs to be reported.

As of August 31, 1999, FAA is in process of compiling the data it received. FAA has not yet determined how to report the survey results, but plans to provide specific guidance to its inspectors for follow-up review. FAA will concentrate its activities on air carriers not responding to the questionnaire, air carriers that submitted inconsistent data, or air carriers identified as having significant Year-2000 problems. With just over 100 days to go, obtaining Year-2000
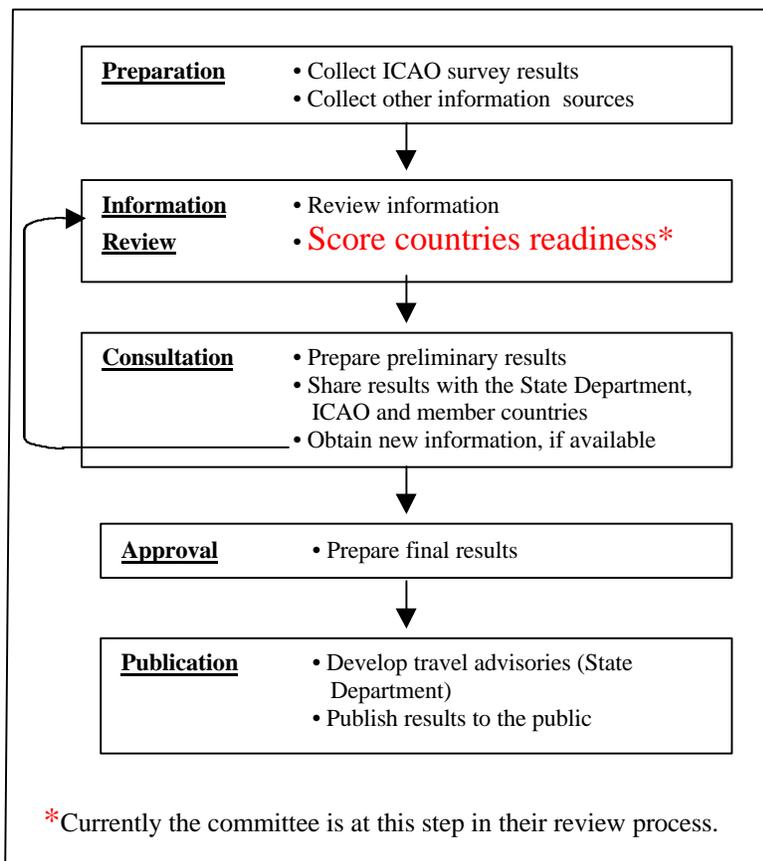
readiness assurance from the non-responding certificate holders will be a very challenging plan to accomplish.

Foreign Air Traffic Control Readiness

In March 1999, we recommended that FAA develop a policy as to whether U.S. carriers or U.S. code share flights, cargo and passengers, will be allowed to fly to countries that are not known to be Year-2000 compliant. FAA has since developed the International Year-2000 Civil Aviation Readiness Information Review process. DOT is leading an interagency committee, including DOT, Department of Defense, and the State Department, to evaluate the Year-2000 readiness for flying to foreign countries.

The interagency committee developed a comprehensive process which places emphases on collecting information from multiple sources, having representatives from multiple agencies review the information, sharing evaluation (scoring) results with all related parties, and giving countries the opportunity to enhance Year-2000 readiness through the consultation process described in Table 4.

Table 4
Interagency Committee Review Process

Preparation	• Collect ICAO survey results • Collect other information sources
Information Review	• Review information • Score countries readiness*
Consultation	• Prepare preliminary results • Share results with the State Department, ICAO and member countries • Obtain new information, if available
Approval	• Prepare final results
Publication	• Develop travel advisories (State Department) • Publish results to the public

*Currently the committee is at this step in their review process.

Since this is a new process, issues from how scoring should be weighted, to how the information should be reported, are being discussed and resolved as the first set of countries are being reviewed.

ICAO Survey on Year-2000 Status

ICAO surveyed its 185 member countries to identify Year-2000 issues and readiness. The interagency committee plans to rely on ICAO's survey as a key information source for evaluating the international aviation community's readiness for the Year 2000. Survey results were due from ICAO member countries by

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July 1, 1999. ICAO planned to issue a report summarizing members' status by the end of July 1999. However, 53 of the 185 member countries have not reported their results to ICAO as of August 31, 1999.

Table 5
ICAO Member Survey

ICAO Member Countries	Number of Countries	Countries Not Responding	Regions
90 Countries (accounting for 97 percent of international passengers)	90	17	Caribbean & Central America (9) South America (3) Asia & Pacific (3) Middle East (1) Former Soviet Union (1)
Other ICAO Countries	95	36	Asia & Pacific (15) Middle East (3) Africa (10) Europe (1) Former Soviet Union or Eastern Europe (7)
Total	185	53	

At this point, ICAO has deferred issuance of its status report. In Fiscal Year 1998, over 5 million passengers were flown between the United States and the 53 countries.

The interagency committee planned to issue its first review results for the 90 countries (accounting for 97 percent of U.S. international travel passengers) by September 15, 1999. As of August 31, 1999, the interagency committee is in the review stage, and has not started the consultation process. The consultation process is expected to be time consuming because it requires reconciliation of all parties' opinions, giving member countries the opportunity to provide additional information for analysis, or obtaining commitment for enhanced Year-2000 work.

It is uncertain as to whether the interagency committee will be able to complete its evaluation as currently planned. Meanwhile, the interagency committee has not yet developed a policy as to whether U.S. carriers or U.S. code share flights will be allowed to fly to countries that either did not respond or cannot provide sufficient assurance that they are Year-2000 ready. Time is running out. In our opinion, these "uncertainties" should be resolved by October 15, 1999.

We are working closely with the Secretary, Deputy Secretary, and the FAA Administrator as we close in on the new millennium. We will continue to monitor the issues we have discussed, and advise all parties of any progress or problems.

Mr. Chairman, Madam Chairwoman, this concludes our statement. I would be pleased to answer any questions.