



*FAA's first priority - passenger safety*

## Chapter 7: A Quest for Improved Safety and Security

George H. W. Bush became President of the United States on January 20, 1989. On February 6 Samuel Skinner became his first secretary of transportation. FAA Administrator T. Allan McArtor resigned on February 17, 1989, and Robert Whittington, executive director for policy, plans, and resource management, became the agency's acting administrator. In that capacity, Whittington helped to engineer the first labor agreement between FAA and the National Air Traffic Controllers Association (NATCA), to which the union agreed on May 1, 1989.

The following month, **JAMES BUSEY [TERM: 06/30/89 – 12/04/91]** became the eleventh FAA Administrator. During a 37-year military career, this U.S. Navy officer had risen from enlisted ranks to become a four-star admiral. An experienced pilot and a winner of the Navy Cross for combat action in Vietnam, Busey also had served for two years as Commander-in-Chief of U.S. Naval Forces in Europe and the North Atlantic Treaty Organization's Commander-in-Chief of Allied Forces in Southern Europe. Busey retired from the service shortly before assuming his new appointment. Although he had been on active duty when selected by President Bush, enactment of Public Law 101-47



*Administrator James Busey*

exempted him from the legal provision barring active or retired military officers from becoming FAA Administrator.

### Organizational Changes

In February 1990 Administrator Busey announced a major FAA reorganization. He established an executive director for acquisition, a move designed to streamline the agency's procurement process. The action brought the number of executive directors to five. The position managed two new offices: acquisition policy and oversight and independent operational test and evaluation oversight. Another reorganization in September 1991 reduced the number of executive directors to three by abolishing the roles of the executive director for administration and resource management and the executive director for regulatory standards and compliance.

On November 20, 1991, the White House announced Administrator Busey had been selected to become Department of Transportation (DOT) deputy secretary. Two days later, the White House announced the choice of Jerry Curry to succeed Busey as FAA Administrator. A retired U.S. Army major general, Curry was then serving as administrator of the National Highway Traffic Safety Administration. On March 20, 1992, however, Curry withdrew as a nominee for the FAA post.

Prior to beginning his new duties as deputy secretary, in late November 1991, Administrator Busey announced another reorganization at FAA headquarters. He created positions for an assistant administrator for information technology and a new assistant administrator who would oversee the offices of budget and accounting. In addition, he changed the title of the former executive director for acquisition to that of executive director for acquisition and safety oversight.

Upon James Busey's departure from the FAA, deputy administrator Barry Harris became the agency's acting administrator. On

December 6, 1991, President Bush announced the choice of DOT Secretary Samuel Skinner to become his chief of staff on December 16, replacing John Sununu. Admiral Busey became acting secretary upon Skinner's departure.

On June 27, 1992, General (USAF, Ret.) **THOMAS RICHARDS** [TERM: 07/27/92 – 01/20/93] became FAA's twelfth



*Administrator Thomas Richards*

administrator. President Bush had first announced his candidate on March 31, following the withdrawal of Jerry Curry, and formally nominated him on May 1. The Senate confirmed Richards' nomination the following month, and the full Congress later passed legislation exempting him from the statute barring military officers from serving as FAA Administrator.

General Richards received a B.S. from Virginia Polytechnic Institute, a M.A. from Shippensburg State College, and also graduated from the

U.S. Army War College. His military career began with the infantry in 1948 and included combat service in the Korean War. He received a commission as a distinguished graduate of the Air Force Reserve Officer Training Corps program at Virginia Polytechnic Institute in 1956 and earned his pilot's wings in 1957. During his Air Force career, he flew over 600 combat missions as a forward air controller in the Vietnam War. Upon retiring from the military in 1989, he became a corporate consultant and served on the President's Commission on Aviation Security and Terrorism.

## Globalization of the Airways

In late 1989 a revolutionary wave swept across Central and Eastern Europe that ended in the overthrow of Soviet-style communist states within the space of a few months. On December 2-3, 1989, a few weeks after the fall of the Berlin Wall, President Bush met with Soviet leader Mikhail Gorbachev in Malta. During this meeting, the two leaders declared an end to the Cold War. On February 16, 1990, representatives of FAA and the Soviet aviation ministry signed a memorandum promoting cooperation on air navigation between Alaska and the Soviet Far East.

With peace returning to Europe, the president turned his attention to the Middle East. On August 2, 1990, Iraq invaded and seized control of Kuwait. President Bush immediately placed restrictions on air transportation between the U.S. and Iraq. Six days later, the United States began to deploy Army, Navy, Marine, Air Force, and Coast Guard units to Saudi Arabia (Operation Desert Shield), while at the same time urging other countries to send their own forces to the scene. On August 9 President Bush extended the air transportation prohibitions to include occupied Kuwait.

To speed the movement of increasingly large numbers of U.S. troops to the Middle East, for the first time in history, the Department of Defense (DoD) activated the Civil Reserve Air Fleet (CRAF) on August 17, 1990. Comprised



*Civil Reserve Air Fleet aircraft transports soldiers*

entirely of domestic commercial airliners and cargo aircraft, this fleet included 78 aircraft drawn from 22 companies. On January 16, 1991, one day after the expiration of a United Nations deadline for Iraqi withdrawal from Kuwait, military aircraft of the American-led coalition began Operation Desert Storm, striking targets in Iraq and occupied Kuwait. Shortly after the attacks began, FAA declared Level 4 airport/airline security, the highest domestic level ever imposed. On January 17 the DoD activated Level 2 of the CRAF program, calling upon U.S. airlines to provide additional transport aircraft. By the time Operation Desert Shield/Storm ended, 27 U.S. carriers had flown 5,441 CRAF missions, carrying 709,000 people and 126,000 tons of equipment and supplies. American and allied troops routed Iraqi forces in a ground assault that began on February 24, and a ceasefire took effect at midnight on February 27.

Even before the Gulf war ended, DOT began negotiating aviation agreements with counterparts around the world. For example, a March 1991 agreement between the United States and the United Kingdom included permission for United and American Airlines to succeed Pan American and Trans World Airways in serving London Heathrow. In return, airlines based in Great Britain gained increased access to U.S. airports. In November Secretary Skinner and his Mexican counterpart signed an agreement expanding aviation opportunities. The accord permitted each country to designate a carrier to fly between any U.S. city and any Mexican city, a level of flexibility unique in U.S. international aviation relations.

In April 1991 FAA oversaw a series of Northwest Airlines 747 test flights in Soviet airspace as part of a cooperative program to develop a satellite navigation system in which aircraft would receive signals from both the Soviet Global Orbiting Navigation Satellite System and the U.S. Global Positioning System (GPS), then being developed by DoD. The test flights proved so successful that the Soviet Union agreed to open its Far East airspace. Northwest Airlines became the first western airline to operate scheduled flights through Russian

airspace when it flew from Detroit to Tokyo on October 8, 1992. The new route saved thousands of dollars in fuel and flight time.

Aviation collaboration with Russia continued throughout the Bush Administration. On June 17, 1992, Department of Transportation Secretary Andrew Card and Russia's Foreign Minister signed a memorandum of understanding on airspace use, air navigation, and air traffic control. Features of the agreement included joint cooperation in opening shorter Far Eastern routes and FAA assistance in establishing a joint civil-military air traffic system for Russia. In September Secretary Card announced the U.S. and the Netherlands had agreed to open their international aviation markets to one other's airlines — the first such agreement under DOT's "Open Skies" initiative.

On March 31, 1992, DOT announced the United States would explore aviation agreements with all European countries willing to allow free access to their markets. In the past, the United States had offered such agreements to only a few of its largest aviation partners.



*Open Skies agreements facilitate global partnerships*

On August 5 the Department established a definition of “open skies” that included:

- Unrestricted entry to all U.S. routes,
- Unrestricted capacity and frequency on all U.S. routes,
- Flexibility in setting fares,
- Liberal charter arrangements,
- Liberal cargo arrangements,
- Open code-sharing opportunities,
- Nondiscriminatory operation of and access to computer reservations systems,
- Rights of foreign carriers to enter into commercial transactions related to their flight operations,
- Rights of foreign carriers to perform their own ground handling in host countries,
- Freedom from restrictions on converting earnings into hard currency or returning a carrier’s earnings to its homeland, and
- Rights of foreign carriers to operate between any U.S. airport and any point in the European country without restriction.



*United codeshares with Lufthansa*

In response to the announcement, Northwest Airlines and KLM Royal Dutch Airlines agreed to create what they called “a unified global airlines system.” Although KLM already had a 20 percent stake in Northwest, the agreement enabled the two carriers to integrate their operations worldwide. On

January 11, 1993, DOT gave Northwest and KLM immunity from antitrust laws so they could operate as one airline. The trend toward greater collaboration with foreign carriers was further illustrated



*Many airlines form global partnerships*

by cooperative plans announced in 1993 by the following U.S. airlines: Delta (with Swissair); Continental (with Air France); United (with Lufthansa); and USAir (which announced a scaled-back version of a plan

for partnership with British Airways that had first been proposed in July 1992).

## Security

In the aftermath of the December 1988 Pan American Flight 103 bombing, FAA instituted a number of measures designed to prevent future acts of terrorism. In March 1990 FAA assigned its first



*Tightened airport security results from the Pan Am 103 bombing*

permanent, overseas civil aviation security liaison officer (CASLO) to the American Embassy in London. This was followed by the establishment of 12 more CASLO positions at key international locations to assist in the timely implementation of new security requirements.

Recommendations from the President's Commission on Aviation Security and Terrorism, created in 1988, also spurred FAA activity. In its final report, released on May 15, 1990, the commission recommended FAA elevate its security division to a position reporting directly to the administrator, appoint federal security managers to manage security at domestic airports, launch a research and development (R&D) program to produce techniques and

equipment to detect small amounts of plastic explosives, and make public notification of threats to civil aviation under certain circumstances. FAA and DOT moved quickly to carry out the recommendations.

On June 14, 1990, Secretary Skinner announced plans to create a DOT office of intelligence and security. At the same

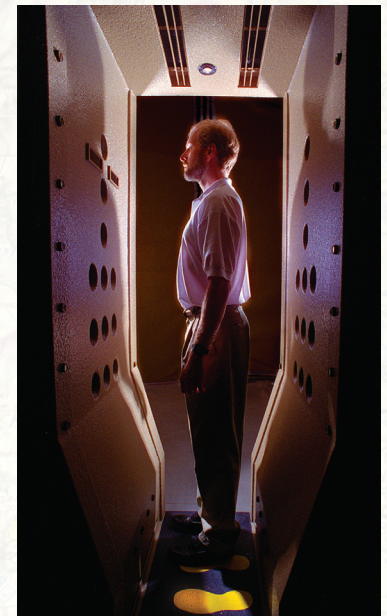
time, FAA Administrator Busey announced the new FAA position of assistant administrator for civil aviation security. In November he revealed the structure of this new organization, which included a scientific staff and four offices: policy and planning, program and resource management, operations, and intelligence.



*1993, FAA aviation security laboratory opens*

President George H. W. Bush signed the Aviation Security Improvement Act of 1990 (Public Law 101-604), in November 1990. Among its provisions, the law empowered FAA to conduct an accelerated R&D program in support of aviation security. On August 13, 1991, FAA broke ground for an aviation security laboratory at its Technical Center in New Jersey. The new research facility opened in 1993. During the remainder of 1990s FAA sponsored research on new equipment to detect bombs and weapons and made incremental improvements to aviation security that included efforts to upgrade the effectiveness of screening personnel at airports.

In June 1991 FAA issued a security regulation for foreign air carriers operating into or out of airports in the United States. The new rule required such carriers to provide a level of protection similar to that of U.S. carriers serving the same airports. Two months later — as mandated by the Aviation Security Improvement Act — FAA issued a rule prescribing more stringent standards for hiring, training, and performance of airline and airport security personnel. Then, in October, FAA inaugurated the Federal Security Manager (FSM) program. Senior FAA security employees selected as FSMs approved airport security programs, acted as focal points for FAA security operations at airports, and provided security information to the aviation community at each of the largest airports where they were assigned. Officials sponsored by this program approved airport security programs, acted as focal points for FAA



*Government and industry partners develop new security screening equipment*

security operations at airports, coordinated government and law enforcement activities in domestic security areas, and provided security information to the aviation community at each of the 18 airports where FAA stationed FSMs.

On November 14, 1991, the U.S. Justice Department indicted two Libyans for the bombing of Pan American Flight 103. Because Libya reportedly detained the suspects but refused to extradite them, on April 15, 1992, the United Nations imposed sanctions on Libya, including a cut-off of air transportation links. The next day, FAA issued a special regulation implementing a presidential order prohibiting any aircraft on a flight to or from Libya from taking off from, landing in, or overflying the United States. Since commercial air links with Libya had already been prohibited for several years, the action expanded the ban to business and private aircraft and to overflights of U.S. territory.

### Mother Nature Disrupts Air Traffic

While FAA officials worked together with their colleagues at DOT to increase international safety and security, a number of natural disasters immediately commanded the agency's attention.



*Hurricane Hugo winds*

On September 17, 1989, Hurricane Hugo slammed into the U.S. Virgin Islands before moving on to Puerto Rico and then South Carolina. Many FAA facilities in the storm's path suffered damage and service interruption. Destruction was

especially heavy in the Virgin Islands, where heavy rain and wind badly damaged two airport towers and destroyed a radar facility.

FAA Southern Region Headquarters took charge of the recovery effort, which included establishing temporary mobile towers on the islands. The agency's DC-9 carried relief supplies to the disaster zone and evacuated four FAA employees and 35 dependents, as well as other federal personnel and their families. Damage to FAA facilities on the mainland proved less severe than in the Caribbean, although many employees suffered personal losses. Agency personnel established a relief fund to assist their co-workers affected by the storm. By the end of September most airports in the devastated areas had resumed operation.

Exactly one month after Hurricane Hugo hit the Virgin Islands, an earthquake registering 7.1 on the Richter scale shook northern California, damaging runways, disrupting airline service, and causing approximately \$50 million damage to FAA facilities and equipment. The affected facilities included the San Francisco tower cab, which lost windows and its ceiling, and the San Jose tower, which lost a window and air conditioning unit. Despite the damage, controllers remained on duty to ensure the safety of flights aloft.



*1989, Loma Prieto, California, earthquake destroys an apartment building, which collapses on an automobile*

Two months later, on December 14, 1989, Alaska's Redoubt Volcano began a series of eruptions, emitting ash that hampered aviation. FAA used a satellite-based system, recently developed with the

National Oceanic and Atmospheric Administration, to track the ash and warn aviators. On December 15, however, a Boeing 747 temporarily lost all engine thrust after encountering an ash cloud from Redoubt and the ash damaged four other airliners during the following three months.

Another volcano erupted on June 15, 1991. Ash from Mt. Pinatuba damaged airports within the Philippines and emitted a huge cloud that disrupted aircraft operations over a wide area. Ash damaged



*Workers clean volcanic ash from an aircraft*

at least 17 airliners in flight, most at distances over 600 miles from the volcano. The eruption lent urgency to the First International Symposium on Volcanic Ash and Aviation Safety, held on July 8-12 in Seattle, Washington. FAA, one of the symposium's sponsors, reported on its work to improve volcanic hazard

notification procedures. The problem was illustrated again in Alaska, when Mt. Spurr erupted on August 18, 1992, depositing almost a quarter inch of ash on Anchorage airport. One of the airport's runways reopened the following afternoon, and the other reopened two days later.

On August 24, 1992, Hurricane Andrew swept through south Florida, causing devastation that included damage to airports. Among the worst hit FAA facilities were the Richmond Long Range Radar site and the tower and International Automated Flight Service Station at Tamiami airport, all of which were severely damaged. Facilities at Key West lost communication lines, and other agency

installations experienced significant damage, power loss, and outages. By the following day, however, Miami, Key West, West Palm Beach, and Fort Lauderdale Executive airports reopened. The hurricane moved into Louisiana on August 26. During the height of the storm, most FAA facilities in the affected part of that state shut down or were placed on standby status, and several airports were temporarily closed.



*Hurricane Andrew damage*

The hurricane destroyed or badly harmed the homes of about 144 FAA employees in the Miami area, and the agency organized an airlift to provide emergency relief. A committee representing local agency organizations coordinated the distribution of supplies and of funds donated by FAA workers throughout the country, while the agency provided such benefits as administrative leave, counseling, and emergency loans. At the same time, FAA rushed the restoration of airspace system facilities and supported the overall federal relief program.

Typhoon Omar struck Guam on August 28, 1992, with winds of up to 150 miles an hour, causing major damage to an estimated 75 to 90 percent of all buildings. The island completely lost power. By August 30 FAA helped reopen the airport for daylight operations. No FAA families were injured, although the typhoon severely damaged the housing area. Less than a month later, Hurricane Iniki hit parts of the state of Hawaii severely damaging the control tower cab at Kauai's Lihue airport.



## Modernization

FAA continued to address a variety of technical issues and pursue its strategic goal to modernize the air traffic control system during the Bush Administration. Acquisition and deployment of new technologies designed to automate the air traffic system, enhance capacity, and improve safety kept pace with the rapid evolution of aeronautics. The agency worked steadily to connect airplanes by radio and satellite link to a global information system that could



*1980s, modernization of air traffic control facilities begins*

provide controllers and operators with information on the weather and aircraft in their immediate vicinity. Controllers gained the ability to view, on their radar screens, information generated by aircraft transponders. By automating some routine tasks, the system allowed controllers to focus their attention on the critical task of providing aircraft separation services.

FAA continued work on the Microwave Landing System (MLS), an all-weather, precision landing system originally intended to replace or supplement the Instrument Landing System (ILS). The new MLS had a number of operational advantages over the older system, including a wider selection of channels to avoid interference with nearby airports, excellent performance in all weather, and a much smaller space requirement at the airports. The improved system was designed to allow pilots to enter a path to land from more directions than with the ILS and descend at a choice of paths best matched to

their type of aircraft. Different landing patterns facilitated reducing noise around airports and keeping small aircraft away from the dangerous vortices behind large aircraft.

FAA commissioned the first permanent, federally-funded MLS at a commercial airport in April 1989. The Hazeltine Corporation delivered the system to the Lebanon, New Hampshire, airport under a contract for 178 MLS units. In August, however, FAA notified Hazeltine that it was terminating the contract because of the company's failure to meet the specified delivery schedule. Although many European nations adopted MLS as a replacement for ILS, the FAA subsequently halted development of MLS because of funding issues, aircraft equipage concerns, and uncertain developments from competing technologies such as the GPS.

In May 1989 FAA commissioned the first operational airport surveillance radar-9 (ASR-9) installation. The new radar employed advanced Doppler technology to filter out radar reflection to detect a one square meter target at a distance of 60 nautical miles. FAA planned to equip every major airport with ASR-9 capabilities. Also in May, another agency-sponsored technology, the National Data Interchange Network 1A, became fully operational. This innovation supplanted several independent communications networks with a single, efficient means of transmitting weather and flight plan data.



*ASR-9*

To gain greater congressional and public support for its modernization efforts, FAA released its first strategic plan on September 25, 1990. Presented as part of Secretary of Transportation Samuel Skinner's National Transportation Policy, this pivotal document presented 169 guidelines and 65 legislative, regulatory, budget, and program initiatives to improve the nation's transportation network. Among other things, the plan outlined a path for aviation in the 21st Century.

The advanced automation program FAA began in the early 1980s, was a key program in the new transportation policy. Under this ambitious development and acquisition program, FAA set out



*Modernization of ARTCCs help controllers meet growing demand for service*

to replace its aging air traffic control system with improved communications and computer networks, and provide new tools and displays to aid controllers. When completed, the program would modernize the functions at two FAA facilities. Not only would the innovations improve the terminal radar approach control (TRACON) facilities that handled airport arrivals and departures, they also would upgrade the

air route traffic control centers (ARTCCs) that handled the en route portion of a flight. To help speed these developments, on September 28, FAA and the MITRE Corporation signed a five-year agreement under which MITRE was to operate a new Center for Advanced Aviation System Development at the firm's facility in McLean, Virginia.

Funding for work on the advanced automation program was among the provisions authorized by the Omnibus Budget Reconciliation Act of 1990 (Public Law 101-508). Title IX of the legislation included three subparts specifically addressing aviation:

- The Aviation Safety and Capacity Expansion Act — authorized FAA to draw on the Aviation Trust Fund, supported by user fees, for up to 75 percent of the agency's operations and maintenance costs and authorized \$5.5 billion for modernization of air traffic facilities and equipment over two years. It also empowered DOT to allow airports to levy Passenger Facility Charges of up to \$3.00 per enplaning passenger and gave FAA greater flexibility in negotiating procurement contracts.
- The Federal Aviation Administration Research, Engineering and Development Authorization Act — further defined FAA's research functions. It included a mandate to establish a Catastrophic Failure Prevention Program that would develop technologies to prevent the failure of parts and equipment that could result in aircraft accidents.
- The Airport Noise and Capacity Act — required airlines to phase out most stage 2 noise-level jets by mid-1999, stipulating that only those carriers that met this deadline for 85 percent of their fleet might apply to operate their remaining stage 2 aircraft until the end of 2003. The law also directed the Secretary of Transportation to prepare a national noise policy by mid-1991 and placed limitations upon airports' authority to impose noise restrictions.

In February 1991 FAA issued its first annual Capital Investment Plan (CIP), which replaced the National Airspace System Plan. While the Advanced Automation System (AAS) remained the cornerstone of FAA's long-range modernization plans, the new CIP included

timely projects designed to provide higher levels of automation as well as urgently needed radar, communications, and weather forecasting systems.

In the following month, March 1991, FAA began construction of the Development Demonstration Facility in Gaithersburg, Maryland. The agency would use the new facility to assess the operational suitability of segments of the AAS. FAA accepted delivery of the facility on May 31, and the first feasibility demonstration began on August 13. On the same day, FAA held ground-breaking ceremonies for a new AAS laboratory at its Technical Center.

FAA commissioned the first operational element of the advanced automation system on October 1, 1991, at the Seattle ARTCC. The Peripheral Adapter Module Replacement Item (PAMRI) combined radar and flight plan information for display on air traffic controller computers. PAMRI, the only part of the AAS implemented, became operational at the remaining 20 ARTCCs in May 1993.

While work on the advanced automation program continued, FAA also began to consolidate and upgrade its TRACON facilities. In October 1991 FAA began building a new Southern California TRACON to consolidate five existing TRACONs in the area. FAA also began planning several similar TRACON consolidations. A ceremony at the Salt Lake City ARTCC in March 1992 commemorated the completed installation of meteorologist weather processors at the 21 ARTCCs and the central flow control facility in Washington, DC. The system helped air traffic controllers by combining data from the National Weather Service, FAA radars, and a satellite.

By late 1992 the advanced automation program was plagued with cost overruns and delays. Early in November IBM informed FAA

that, because of software difficulties and other problems, the Initial Sector Suite System (ISSS) would not be ready for delivery and acceptance until September 1994. This added another 14 months to an already delayed timetable. On November 10 FAA gave a “cure notice” to IBM stating that, unless the company provided a plan to remedy deficiencies within 10 calendar days, the government would withhold progress payments under the contract. IBM quickly submitted an initial and then later a final cure plan. Steps to remedy the situation required the project to change its management structure and to seek no further changes in user requirements for the ISSS.

## Safety

A July 1989 crash highlighted the need for careful inspection of rotating engine parts. After debris from a failed engine damaged its control system, a United Airlines DC-10 crashed while attempting an emergency landing in Sioux City, Iowa, killing 110 of the 296 people on board. Preliminary investigation of the accident indicated that one of the two titanium disks holding the engine’s fan blades had separated, either intact or in fragments, from the rest of the engine. FAA moved quickly to find a way to prevent the recurrence of this type of accident. On August 3 the agency announced formation of an agency/industry task force on improving aircraft survivability following major in-flight



*Example of damage to rotating engine parts*

structural damage. Then, on September 15, FAA issued the first of several directives requiring fan disk inspections.

Soon after that several incidents pointed out the need for a more robust human factors research program. On January 18, 1990, during a landing at Atlanta Hartsfield airport, an Eastern Air Lines Boeing 727 collided with a Beechcraft King Air 100 that had landed just before it. The accident killed the pilot of the King Air. On April 2, 1991, the majority of the National Transportation Safety Board (NTSB) members cited controller error as the accident's probable cause. The following month, NTSB announced a revised finding expanding the probable cause to include the failure of air traffic control procedures to take into consideration occasional lapses in human performance.

On January 25, 1990, while attempting to land at New York Kennedy airport, a Boeing 707 operated by the Colombian airline, Avianca, ran out of fuel and crashed on Long Island, fatally injuring 73 of the 158 people on board. NTSB subsequently cited the probable cause of the accident as the crew's failure to manage their fuel load or alert controllers to their fuel emergency. It pointed to a lack of clear, standardized terminology on fuel emergencies, as well as inadequate traffic flow management as contributing factors. FAA's actions in response to the accident included steps to both address NTSB concerns and stress the need for clear pilot/controller communication.

In a night approach to Los Angeles International Airport, on February 2, 1991, a USAir Boeing 737 landed atop a Sky West commuter Fairchild Metroliner III. Both planes were engulfed in flames as they slid into a nearby building. Fatalities included all 12 persons aboard the commuter flight and 22 of the 89 aboard the USAir flight. NTSB listed the accident's probable cause as air traffic control management deficiencies that led a controller to issue inappropriate clearances. FAA actions after the accident included

assigning additional controllers to the tower and adjusting runway lights to prevent glare from obstructing the view from the tower. In addition, FAA

announced a runway incursion plan that would test advances in runway marking, lighting, and signs at the Boston, Seattle-Tacoma, and Pittsburgh airports, and the new Denver



*Runway incursion prevention includes airport signs*

under construction). The agency also amended its air traffic control handbook to prohibit controllers from authorizing aircraft to hold at a taxiway/runway intersection at night or when the intersection was not visible from the tower.

To study the effects of aging on aircraft structures, in August 1991, FAA joined Sandia National Laboratories in opening an aging aircraft nondestructive inspection validation center at Albuquerque International Airport, New Mexico. The agency dedicated the center on February 10, 1993. FAA also established the Center of Excellence in Computational Modeling of Aircraft Structures as a joint effort with Rutgers University and Georgia Institute of Technology. This was the first Air Transportation Center of Excellence created by the agency through a program in which selected institutions received long-term matching grants to conduct research under cooperative agreements.

The Aging Aircraft Safety Act (Public Law 102-143), enacted in October 1991, required FAA to research and impose new rules

requiring certain airworthiness reviews and inspections for airliners in service more than 15 years. The act also directed FAA to establish programs to ensure that U.S. air carriers properly maintained their older aircraft and to encourage foreign airlines to do the same. Although the legislation did not specifically address commuter aircraft, FAA later extended its aging aircraft program to that sector.

As the result of an accident in March 1992, FAA began studying ways to combat aircraft icing. A USAir Fokker F-28 4000 jet crashed at New York's La Guardia Airport while taking off during a snowstorm, killing 27 of the 51 persons aboard. NTSB cited the probable cause as a combination of failures. The airline industry and FAA had failed to provide flight crews with procedures and requirements compatible with departure delays in conditions conducive to icing, but the flight crew had also failed to exercise caution, deciding to take off without positive assurance that the airplane's wings were ice-free after 35 minutes exposure to precipitation following deicing.

In May FAA opened a two-day international conference on airplane ground deicing.

The conference reflected global concern about icing and produced a series of recommendations for combating this hazard. On September 25 FAA announced a requirement for airlines using large aircraft (Part 121) to have an approved ground de-icing/anti-icing program in place by November 1, 1992. On December 29, 1993, FAA announced stronger deicing requirements for commuter and air taxi pilots to check aircraft surfaces before taking off in adverse weather. The agency also mandated certain new training and checking requirements for pilots for commuter aircraft and larger private planes.



*New aircraft deicing rules improve safety*



*Ice is particularly hazardous to commuter aircraft*