



*Maintenance and inspection keep the fleet safe*



## Chapter 8: Into the 21st Century

On January 20, 1993, William Jefferson Clinton became the forty-second President of the United States, succeeding George H.W. Bush. FAA Administrator Thomas Richards left office with the Bush Administration, and Joseph Del Balzo became acting administrator. The following day, Federico Peña became Secretary of the Department of Transportation (DOT), succeeding Andrew Card. He served as DOT secretary until February 14, 1997, when President Clinton nominated him to become Secretary of Energy. Rodney Slater then became Secretary of Transportation on February 17, 1997.

**DAVID HINSON [TERM: 08/10/93 – 11/09/96]**, a former naval aviator, became the thirteenth FAA Administrator. Holding a



*Administrator David Hinson*

bachelor's degree from the University of Washington, Hinson had been a pilot for Northwest Airlines and flight instructor for United Airlines. He later was a captain and director of flight training for West Coast Airlines, eventually becoming director of flight standards and engineering for West Coast's successor, Air West. In 1973 he founded Hinson-Mennella, Incorporated, a partnership whose acquisitions included Flightcraft, Incorporated, the Beech aircraft distributor in the Pacific Northwest. He was one of four founders of Midway Airlines in 1978, and served

as chairman and chief executive officer from 1985 until the airline ceased operations in 1991. When selected to head FAA, Hinson was executive vice president for marketing and business development with Douglas Aircraft, a subsidiary of McDonnell Douglas.

### Growing Safety Concerns

David Hinson took over the FAA during one of the safest years in civil aviation history. During calendar year 1993, no major (Part 121) scheduled airline experienced passenger or air crew fatalities. The only fatal accident in Part 121 scheduled operations involved a ground crew-member's being struck by a propeller — resulting in a fatal accident rate for this segment of aviation of 0.013 per 100,000 departures, the lowest since 1980. The following year, however, ushered in daunting challenges for the new administrator.

On July 2, 1994, a USAir DC-9 crashed while attempting to land at Charlotte-Douglas International Airport, killing 37 of the 57 persons aboard. The accident illustrated the continuing problem of wind shear. As part of ongoing efforts to combat this hazard, FAA commissioned the first Terminal Doppler Weather Radar (TDWR) on July 20. By the end of 1996 the agency commissioned a total of 22 of these systems.



*USAir accident site*

Another USAir tragedy followed the Charlotte crash in 1994. As it approached Pittsburgh airport, a USAir Boeing 737 crashed in Aliquippa, Pennsylvania, on September 8. All 132 persons aboard



died in the accident. Although the cause of this tragedy proved difficult to determine, FAA conducted a critical design review of the 737 flight control system. While the investigating team found no critical flaws, it made a number of recommendations for improving the aircraft's safety margin.

The following month, on October 31, 1994, an American Eagle commuter flight crashed near Roselawn, Indiana, with the loss of all 68 persons aboard. The aircraft, an Avions de Transport Regional



*American Eagle accident site*

ATR-72, had been in a holding pattern due to weather delays at Chicago. The National Transportation Safety Board (NTSB) subsequently cited the probable cause as a loss of control due to icing, as well as failures by the manufacturer to provide information on the icing hazard to the aircraft and by the French aviation authorities to ensure

the flight's airworthiness under icing conditions. Following the accident, FAA took a variety of steps to reduce hazards to ATR-72 aircraft. On December 9, 1994, the agency prohibited flight by models 72 or 42 into attested or forecast icing conditions. On January 11, 1995, FAA eased this ban, subject to certain requirements, to apply only to freezing rain and freezing drizzle. The agency also required the installation of improved deicing boots on the aircraft by June 1995. Subsequent FAA

actions on the broader issue of combating icing included the issuance in May 1996 of 18 new airworthiness directives affecting pilots of 29 different aircraft types.

On December 13, 1994, an American Eagle commuter flight crashed on approach to the Raleigh-Durham, North Carolina airport, killing 15 of the 20 persons aboard the BAE Jetstream 3201 aircraft. Capping a series of fatal airline accidents during 1994, the tragedy heightened public concern about the safety of commuter as well as major air carriers. The day after the crash, Transportation Secretary Federico Peña announced a three-point safety initiative that included accelerating FAA efforts to increase commuter safety standards to the level for large airlines, sponsoring a major government/industry meeting on airline safety, and performing a national airline safety audit (completed in December 1995).

As Transportation Secretary Peña had announced, FAA sponsored a two-day "summit" aviation safety conference in January 1995 to discuss ways to improve safety measures and increase public confidence in airline transportation. More than 950 government and industry representatives attended the event, at which Secretary Peña and Administrator Hinson urged cooperation to achieve a goal of zero accidents. Participants attended workshops and produced recommendations on crew training, air traffic control and weather issues, safety data collection and use, applications of emerging technologies, aircraft maintenance procedures and inspections, and flight operating procedures.



*Mechanics ensure regulations are met*



In February 1995 FAA published an aviation safety action plan that identified 173 safety initiatives. Noting that many airlines were voluntarily establishing safety offices that reported directly to their chief executives, the agency stated its intention to require airlines with aircraft seating more than nine passengers to create similar independent safety offices. The action plan emphasized training



*New safety initiatives enhance confidence in aviation*

and called for the increased sharing of safety data. At the same time it released the plan, FAA announced that it had reached agreement with the Air Line Pilots Association and Air Transport Association on a program that allowed the use of information from flight data recorders to analyze safety trends. FAA would have access to the data, with the pilots' identities having been deleted.

That month FAA also announced a strengthened campaign against the use of suspected unapproved parts (SUP) in aviation. The agency had expanded its SUP program in recent years, but those efforts

had been criticized by the DOT Inspector General. FAA published a notice warning of its policy to enforce full compliance with relevant regulations and giving non-compliant firms until May 30 to apply for approval to manufacture aviation parts. On May 24 the agency announced a plan for an industry-operated accreditation program for aircraft parts brokers and distributors. On October 12 FAA issued a task force report that proposed a SUP program plan be developed and a national Suspected Unapproved Parts Program Office be established. FAA created such an office in November 1995.

FAA unveiled the National Plan for Civil Aviation Human Factors, a joint FAA-DoD-NASA initiative, in June 1995. The plan outlined a national agenda to eliminate aviation accidents caused by human error. Its elements included identifying needs and problems involving human performance, guiding research programs to address the

human element, involving the nation's top scientists and aviation professionals, and sharing the resulting information with the aviation community.



*One level of safety for commuter aircraft and jumbo jets*

many commuter airlines, formerly operating under Federal Aviation Regulations Part 135, to operate under the stricter Part 121 governing major airlines. This change applied to scheduled passenger operations



involving airliners having 10 to 30 passenger seats or using turbojets. The rules also contained provisions on standards for airplane performance and for flight crew training and qualifications.

Despite attempts to achieve an immediate decline in aviation accidents, FAA faced a new set of challenges in 1996. On May 11 of that year, a ValuJet DC-9 crashed into the Florida Everglades shortly after takeoff from Miami, killing all 110 persons on board. An intense fire, most likely caused by activation of oxygen generators carried in the forward cargo compartment, caused the crew to lose control of the aircraft. On the day after the crash, FAA announced an expansion of its ongoing review of ValuJet. At FAA's urging, on May 23, the DOT Research and Special Programs Administration issued an immediate ban on the transportation of chemical oxygen generators as cargo on passenger airlines.

On June 17, 1996, FAA announced that ValuJet Airlines would cease operations as of midnight, pending safety improvements required under a consent decree. The agency based its action on an intensified inspection of the carrier undertaken since the Florida



*Wreckage from ValuJet*

crash. This heightened scrutiny had revealed serious safety deficiencies in the areas of airworthiness, maintenance, quality assurance of contractors, and engineering capability. FAA returned ValuJet's

certificate to the airline on August 29, 1996, after the carrier completed the safety improvements outlined in the consent order.

On June 18 Administrator Hinson announced a series of new steps intended to improve aviation safety. He tasked Deputy Administrator Linda Daschle to lead a review of pertinent regulatory issues. The following month, he announced initiatives to improve FAA's oversight of the transportation of hazardous materials by air. The initiatives called for a seven-fold increase in resources devoted to the issue, funding to upgrade the agency's hazardous materials program, and the hiring of 130 additional FAA hazardous materials inspectors and legal personnel.

Two months after the ValuJet accident, on July 17, 1996, Trans World Airlines Flight 800 exploded in midair and crashed into the Atlantic

after taking off from New York Kennedy airport for Paris. All 230 persons aboard the Boeing 747 died. Initial speculation as to the cause focused on terrorism, and on July 25 President Clinton announced increased security for air

travel. New security steps included more intensive screening of passengers on international flights, increased screening of carry-on bags for both international and domestic flights, as well as other actions not disclosed to the public. Clinton also announced Vice



*TWA Flight 800 reconstruction*



President Albert Gore would head the White House Commission on Aviation Safety and Security, formally established on August 21, 1996, to work with government and industry to make recommendations to improve aviation safety and security.

Despite painstaking recovery and reassembly of the wreckage, the TWA disaster proved difficult to explain. Throughout 1996, NTSB refused to rule out any of three possible causes, a bomb, a missile, or mechanical failure. As the investigation progressed, however, the possibility of an accidental fuel tank explosion received increased attention. On December 13, 1996, NTSB announced recommendations for improving the safety of the Boeing 747 fuel system. FAA, which had been conducting a review of 747 safety issues in the wake of the crash, issued an airworthiness directive ten days later, on December 23, requiring inspection of certain wiring in the fuel systems of older 747s.

On September 2, 1998, another accident rocked confidence in the aviation system. A Swissair jumbo jet en route from John F. Kennedy International Airport in New York to Geneva, Switzerland with 228 people on board crashed off the southern coast of Nova Scotia late at night while trying to make an emergency landing. Canadian aviation officials said the three-engine McDonnell Douglas MD-11 had been diverted to Halifax International Airport after its flight crew reported smoke in the cockpit or passenger cabin about two hours after takeoff.



*Swiss Air wreckage*

On July 16, 1999, public attention turned to general aviation safety when John F. Kennedy, Jr., his wife Carolyn Bessette Kennedy, and her sister, Lauren Bessette, were killed as their small aircraft crashed into the Atlantic Ocean. Kennedy, a relatively inexperienced pilot, was flying the Piper Saratoga, a moderately complex plane that he bought the previous April. Investigators determined the probable cause of the accident was pilot error.

Two crashes in 2000 highlighted the need for additional safety measures. On January 31, 2000, Alaska Airlines Flight 261, a MD-83, crashed into the ocean off Point Magu, California, killing all 88 on board. Before the plane suddenly dived 17,900 feet into the water, the crew had reported a stabilizer jammed in a position that pushed the aircraft downward. The subsequent accident investigation determined that the probable cause of this accident was the loss of airplane pitch control resulting from an in-flight failure of the horizontal stabilizer. The component had failed because of excessive wear resulting from the carrier's insufficient lubrication of the jackscrew assembly.

On March 5, Southwest Airlines Flight 1455, a Boeing 737-300, overran the departure end of Runway 8 after landing at Burbank-Glendale-Pasadena Airport in California. The airplane touched down at approximately 182 knots. About 20 seconds later, at approximately 32 knots, the airplane collided with a metal blast fence and an airport perimeter wall. The airplane came to rest on a city street near a gas station beyond the airport property. Of the 142 persons on board, two sustained serious injuries; 41 passengers and the captain sustained minor injuries; and



94 passengers, three flight attendants, and the first officer sustained no injuries. The airplane sustained extensive external damage and some internal damage to the passenger cabin.

In an effort to improve passenger comfort and to reduce the risk of a cabin fire, in June 2000 DOT banned smoking on all scheduled passenger flights by U.S. airlines and on scheduled passenger flights of foreign carriers into and out of the U.S. In 1990 FAA had banned smoking on all U.S. flights, except for those to or from Alaska or Hawaii and lasting six hours or more.



*2000, smoking is banned on all scheduled passenger flights*

## A Strengthened Security System

In January 1994 an explosive device detonated aboard a domestic Philippine Airlines flight. One passenger was killed, but the flight landed safely. Investigators determined the explosive device had been hidden under the seat of the deceased passenger. This incident proved to be a terrorist test that foreshadowed the largest, most complicated plot against civil aviation to date, a plan to destroy 12 U.S. air carrier aircraft flying in East Asia



*New security research results in a strengthened security system*

during a 48 hour timeframe. In each case the plan was similar. The terrorist would take the first leg of the flight out of a city in East Asia, plant the device aboard the aircraft, and then get off the plane at an intermediate stop. The aircraft, continuing on a subsequent leg of the flight, would be destroyed en route by the explosive device. A misstep, however, in the manufacture of explosives in a Manila apartment in January of 1995 alerted law enforcement to the plot, codenamed Bojinga by the terrorists. FAA civil aviation security explosives experts joined other federal investigators in Manila and helped identify parts of explosive devices. Details of the plot emerged, and the FAA civil aviation security organization developed and issued security directives (SDs) that required air carriers to implement additional security measures designed to counter the emerging threat. FAA adjusted these SDs



*New security threats bring new security measures*

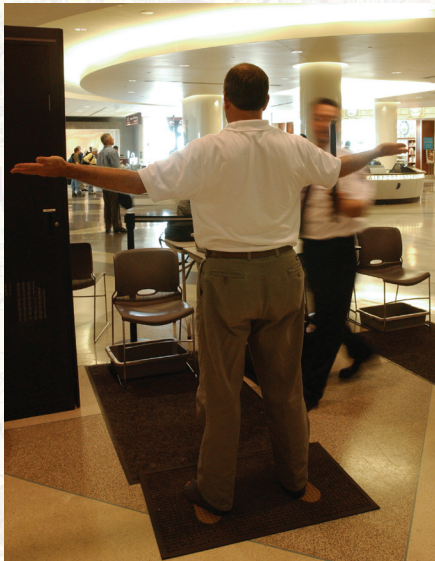
almost daily as the agency received new threat information from the Intelligence Community.

FAA aviation security specialists were dispatched to Asia and elsewhere to oversee and coordinate the implementation of the new measures. These security specialists and intelligence analysts worked 24/7 to ensure that the air carriers were



knowledgeable about the threat and armed with effective security counter measures until law enforcement captured the terrorists. In February, Ramzi Yousef, the ringleader, was arrested in Islamabad and subsequently convicted in federal court of charges stemming from the airline bombing plot. Yousef had been on the FBI's Most Wanted List since summer of 1993 for his role in the bombing of the World Trade Center.

On June 28, 1995, FAA directed airlines and airports in California to increase security measures and warned passengers to be alert for suspicious baggage and parcels. The precautions responded to a threat from the so-called "Unabomber" received by the *San Francisco Chronicle* the previous day. Postal authorities also implemented certain temporary restrictions on mailing packages from California. This was not the first alleged Unabomber crime related to aviation. He was also believed to be responsible for an explosion in an American Airlines cargo hold in November 1979 that caused twelve persons to suffer smoke inhalation. The mail bomb had been sent from a post office in Chicago and placed aboard an American Airlines flight bound for Washington, DC. The bomb, equipped with a barometer to measure altitude, exploded as the plane reached 34,500 feet. Smoke filled the cabin and the pilots made an emergency landing at Dulles International



*FAA increases airport security*

Airport in Virginia. On April 3, 1996, federal agents detained Theodore Kaczynski as a suspect in the Unabomber cases.

The unexplained crash of TWA Flight 800 in July 1996 sparked new concern about aviation security. The White House Commission on Aviation Safety and Security issued a draft report on September 9, 1996, containing twenty



*Additional bomb detection equipment is deployed to airports*



*Trace detection equipment*

recommendations to strengthen aviation safety and security, including suggested federal funding levels to implement some of them. With the release of the draft report, President Clinton called

on Congress to appropriate more than \$1 billion for a variety of anti-terrorism measures. Proposed programs related to security included:

- Deploying improved airport bomb-detection equipment,
- Conducting more FAA security research,
- Hiring additional FAA security personnel,



- Developing a computerized passenger profile screening system,
- Conducting immediate criminal background checks for airport workers with access to secure areas,
- Deploying explosive-detection dog teams at airports, and
- Testing a system for matching luggage and passengers on all domestic flights.

For fiscal year 1997, Congress appropriated \$144.2 million for FAA to purchase and install explosives detection devices at U.S. airports, along with an additional \$21 million for associated research and development (R&D) activities. The commission's final report, issued in February 1997, recommended that FAA be appropriated \$100 million annually to continue purchasing security screening devices.

At the beginning of fiscal year 1997, in October 1996, FAA created the Security Equipment Integrated Product Team (IPT) to purchase and deploy explosives detection devices. The IPT brought



#### *New security measures at airport terminals*

together FAA staff from the offices of civil aviation security and research and acquisitions, as well as airport and airline industry representatives. On December 26, 1996, FAA announced it had ordered 54 CTX-5000 explosives detection systems. Using

computer tomography and high-quality X-ray technology to locate automatically suspicious objects in baggage, the CTX-500 was initially the only explosive detection system to meet the agency's certification requirements. In November 1998 FAA certified a second system, the eXaminer 3DX 6000 system manufactured by L-3 Communications.

FAA announced plans to purchase more than 150 additional security devices for the nation's airports in March 1999. The purchase of 21 FAA-certified explosives detection systems and 135 trace explosives detection devices added to the multi-year deployment of innovative security equipment. Total purchases included 95 FAA-certified explosives detection systems, 20 automated dual-energy X-ray machines, two quadrapole resonance devices, and 462 trace explosives detection devices. The trace explosives detectors were being deployed primarily at airport security checkpoints for screening carry-on bags. The other machines were used to examine checked baggage.

The 1999 EgyptAir Flight 990 crash again raised questions about possible terrorism. On October 31 the aircraft plunged into the Atlantic Ocean 60 miles south of Nantucket Island, Massachusetts, in international waters, killing all 217 people on board. Under the International Civil Aviation Organization (ICAO) treaty, the investigation of an airplane crash in international waters fell under the jurisdiction of



#### *Wreckage from the EgyptAir accident*



the country of registry of the aircraft. At the request of the Egyptian government, NTSB took the lead in this investigation, with the Egyptian Civil Aviation Authority participating. Two weeks after the crash, NTSB proposed declaring the crash a criminal event and handing the investigation over to the FBI. Egyptian government officials protested. On March 22, 2002, NTSB determined that the probable cause of the crash was not a bomb, but rather the result of crew error — the first officer's flight control inputs. The reason for the first officer's actions was not determined, although there was speculation that he had intentionally crashed the airplane.

FAA tightened security at the nation's airports in December 1999 in response to the arrest, the previous week, of a man allegedly trying to smuggle explosives into the United States. The agency announced it would make more use of devices that check airline passengers for trace amounts of explosives. Also, more bomb-sniffing dogs and uniformed police would begin patrolling airports, both inside and outside. The measures came amid concern about the possibility of acts of terrorism in the United States and abroad during the holidays.

On January 5, 2000, FAA proposed a new rule that would require companies performing aviation security screening for air carriers to be certified by FAA. Managers, instructors, and screeners would have to be better qualified, in general, and skilled in the use of new threat image projection associated with all X-ray and explosive

detection equipment. The proposed rule would make screening companies directly accountable to FAA, with air carriers continuing to oversee the operations of these service providers. In November President Clinton signed the Airport Security Improvement Act of 2000 (Public Law 106-528), which required FAA to issue a final rule on the certification of commercial screening companies. FAA planned to issue the final rule on the certification of screening companies during the week of September 10, 2001, but the terrorist attacks on September 11, 2001, led to the federalization of the screener workforce.



*Matching luggage and passengers begins curbside*

An incident in mid-2000 put FAA's enhanced airport security measures to the test. Able to get a gun through security, Aaron Amartei Commey tried to take hostages on a National Airlines Boeing 757 at John F. Kennedy International Airport headed for Las Vegas, Nevada. He demanded to be taken to Miami, Antarctica, or Argentina, and to speak to the Argentinean ambassador. Negotiators from the FBI, the Port Authority of New York and New Jersey, and the New York Police Department joined forces to persuade Commey to release the pilot and then the co-pilot. Passengers and crew had escaped from the plane while Commey was in the cockpit. Some of the 143 passengers aboard the flight to Las Vegas and Los Angeles used an emergency chute deployed by flight attendants to exit the aircraft. A federal magistrate subsequently charged Commey, who authorities said had been planning for months to take over a plane, with one count of air piracy and ordered him held for psychiatric evaluation.



## From the Advanced Automation System to Free Flight

### Advanced Automation System (AAS)

Upon becoming FAA Administrator David Hinson not only faced a number of critical safety issues, but also had inherited other problems. When he began his tenure, he faced problems with major acquisition programs that were over budget and facing significant delays. With programs undergoing increasing congressional and



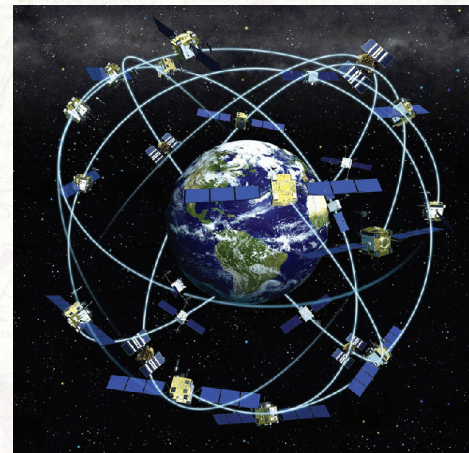
*GPS satellite*

public scrutiny, the administrator moved quickly to remedy problems. On December 13, 1993, he ordered an extensive review of the Advanced Automation System (AAS), a multi-billion dollar program designed to help modernize the nation's air traffic control system. The contractor, IBM, was far behind schedule and was logging major cost overruns. Hinson further recommended a review process to determine the impact of the company's plan to sell its unit in charge of the pending AAS contract to Loral Corporation. On March 3, 1994, FAA announced initial actions as a result of the review that included a new AAS management team and suspension of the portion of the program called the Area Control Computer Complex (ACCC).

On June 3 Hinson announced a major overhaul of the AAS program. He terminated the ACCC program and cancelled another AAS element, the terminal AAS, stating that the agency would substitute a new procurement for modernization of terminal radar approach control (TRACON) facilities. In addition, he reduced the number of towers planned to receive the tower control computer complex, a program subsequently cancelled, and revealed plans to review the software for the Initial Sector Suite System (ISSS), a program to provide new workstations for en route controllers. FAA subsequently decided to replace ISSS with a new program, the Display System Replacement (DSR) program.

### Global Positioning System (GPS)

On June 2, 1994, Administrator Hinson announced FAA would halt further development of the Microwave Landing System, saying that the agency instead would concentrate on the development of the U.S. Global Positioning System (GPS). FAA had earlier implemented civil use of GPS and had granted approval for certification of two types of GPS signal receivers.



*GPS satellite constellation*



On June 8 FAA issued a request for proposals for a Wide Area Augmentation System (WAAS) to enhance GPS signals. WAAS



*GPS technology increases safety*

Association landed at the Frederick, Maryland, airport using the first FAA-approved public “stand alone” GPS instrument approach. On October 17 the administrator formally offered free use of GPS for ten years to ICAO member states, reconfirming a previous verbal offer. On December 8, 1994, he approved GPS as a primary means of navigation for oceanic/remote operations.

In August DOT announced the availability of a GPS signal specification defining performance standards for civil aviation use. That same month, FAA awarded a contract to a consortium led by Wilcox Electric to develop and field WAAS. On April 26, 1996, however, FAA cancelled the contract with Wilcox Electric because of project management problems and projected cost overruns. On May 1 FAA entered into a letter contract with Hughes Information Technology Systems regarding WAAS. This was followed by the October 29 announcement of a comprehensive contract with Hughes for WAAS development and implementation.

would consist of a network of 24 ground stations and associated communications systems. Combined, these systems would enhance the integrity and availability of GPS signals. On July 16 Administrator Hinson and President Phil Boyer of the Aircraft Owners and Pilots

Although FAA moved ahead rapidly to assure the infrastructure and procedures for civil aviation use of GPS would be ready, many system users expressed concern about the availability of the military GPS satellites for civil use. On March 29, 1996, President Clinton issued a presidential directive assuring the availability of GPS signals to civilian users. The new policy included a planned end to the practice of degrading civil GPS signals, within a decade, in a manner that would allow the U.S. military to prepare for this eventuality.

In late February 1997 officials from the Departments of Transportation and Defense (DoD) announced an agreement to provide a second civil frequency for GPS. They also guaranteed uninterrupted availability of the second frequency for civil users. A year later, in March 1998, Vice President Al Gore announced that two civilian GPS signals would be provided by the U.S. free of charge.



*LAAS facilitates precision landings*

FAA announced findings in January 1999 that, with anticipated improvements, GPS could serve safely and reliably as the only navigation system installed in aircraft and the only navigation system provided by FAA. The findings came from an independent assessment of GPS capabilities conducted cooperatively for the FAA by the Johns Hopkins Applied Physics Laboratory, the Aircraft Owners and Pilots Association, and the Air Transport Association. Both WAAS and the Local Area Augmentation



System (LAAS) would provide the improved accuracy, integrity, and availability of the GPS signal.

At this time, Raytheon Systems was already supporting WAAS development, and in April 1999, the firm completed the first of three major system integration tests established for the system. The test proved the ability of WAAS to provide augmentation to the U.S. GPS system. During the test, the system operated continuously for 72 hours using WAAS ground and space components. Raytheon and FAA examined data from several locations, including Denver, Oklahoma City, and Dayton in assessing the test results.



*New technologies and procedures reduce delay and congestion*

for the development and FAA would provide the specifications and expertise on development and certification. By August FAA, UPS, and the Air Transport Association conducted successful flight tests of the prototype LAAS at the FAA William J. Hughes Technical Center.

In August 2000, after a successful 21-day test of the WAAS signal in space, FAA declared the system immediately available for some aviation uses. The test demonstrated that the system provided a

In April 1999 FAA also announced an agreement to join with Raytheon Systems and Honeywell Incorporated, in the development of LAAS. The two commercial firms would provide funding

stable and reliable signal and delivered one to two meters horizontal accuracy and two to three meters vertical accuracy throughout the contiguous United States. Raytheon operated the system for FAA on a continuous basis, interrupting it only as needed to install upgrades.

### Free Flight

With AAS largely cancelled because of cost overruns, lengthy schedule delays, and significant performance shortfalls, Administrator Hinson worked to get the modernization effort back on track. In consultation with the aviation community, FAA determined the best approach to modernizing aviation would be a phased process eventually leading to a new way to manage air traffic. Under an innovative program to be called “free flight,” FAA planned to introduce a host of new technologies and procedures that would remove many restrictions on operators.

The agency would move gradually from its established use of highly structured rules and procedures for air traffic operations to a more flexible system in which decisions for conducting flight operations would be based on collaboration between FAA and aviation system users. New technologies and associated procedures would give pilots and controllers more precise information about the location of aircraft and allow them to exchange information



*Constant vigilance keeps passengers safe*



more efficiently. With more precise and efficiently exchanged information, pilots would have more flexibility to change route, speed, and altitude (under permitted conditions), thus saving users time and money and allowing FAA to improve system safety and use airspace and airport resources more efficiently.

To address concerns about its modernization agenda, and to develop consensus on and commitment to its future approach to modernization and free flight, the agency focused as never before on partnering with the full aviation community. FAA officials at all levels worked with commercial and private system users, major trade organizations, representatives of air traffic control personnel, equipment manufacturers, DoD, and others to design the free flight initiative. In October 1994, at FAA's request, RTCA, Inc., convened a government/industry committee to study and refine the free flight concept. *[In 1935, the Radio Technical Commission for Aeronautics was created when the Department of Commerce invited a group of government and industry representatives to help coordinate R&D of aeronautical radio. As it evolved, the organization made two changes to its name. In 1942 it adopted a constitution and changed the word "Committee" to "Commission." In 1991 it became a non-profit corporation and shortened its name to RTCA, Inc.]*

In their January 1995 report, a government/industry committee, under the leadership of RTCA, defined free flight and considered the first steps for its implementation. This initial definition was followed

in October by a more detailed report. These early efforts led to a set of recommendations — most of which contained implementing initiatives — and an action plan to gradually move the national airspace system (NAS) to free flight. While working to implement the recommendations, FAA and stakeholders agreed on the need to focus efforts on deploying technologies that would provide early benefits to users.

Confident of free flight possibilities, on January 15, 1997, FAA announced plans for a two-year evaluation, beginning in 1999, of free flight air traffic management concepts and technologies for application in selected aviation environments in Alaska and Hawaii. The goal of this Alaska Free Flight Demonstration Project was to show that existing technologies could support the free flight concept. FAA believed that the demonstration would help identify and mitigate the risks associated with implementing free flight. While many

stakeholders agreed with the need to mitigate risks, they had strong reservations about conducting this demonstration in the remote Alaskan locations that had been chosen, believing that the lessons learned there would not transfer well to more complex operations in the continental United States.



*Improved traffic management remains a goal*



FAA and stakeholders — working under the leadership of RTCA — developed a roadmap for restructuring Ha-laska and presented it to FAA in September 1998. Among other things, they recommended that the program be conducted in the Ohio Valley and Alaska, tested with nine major operational capabilities implemented, and renamed the “Free Flight Operational Enhancement Program.” In developing the roadmap, both FAA and stakeholders emphasized the critical role of safety. Ultimately, FAA renamed the demonstration projects Capstone for the Alaska initiative and Safe Flight 21 for the Ohio Valley tests.

Also in 1998, RTCA’s Free Flight Steering Committee recommended, and FAA agreed to, a phased approach for implementing the free flight program, established a schedule for phase 1, and created a special program office to manage this phase. During phase 1, which FAA expected to complete by the end of calendar year 2002, the agency planned to deploy five new technologies to a limited number of locations and carefully measure the resulting benefits. The five selected technologies were: the Surface Movement Advisor, the User Request Evaluation Tool, the Traffic Management Advisor, the passive Final Approach Spacing Tool, and a technology supporting Collaborative Decision Making. All five tools were already under development.

*Surface Movement Advisor (SMA).* FAA development of SMA began in 1994. The system provided aircraft arrival information to airline ramp towers and operation centers — information that included aircraft identification and position in terminal airspace, and details used to compute estimated time to touchdown to better manage gates and other ground operations. Following system development, testing, and integration, FAA first demonstrated the promise of SMA to the airline industry in February 1996, and commissioned the system at the Atlanta airport tower in January 1997. In December 1999 FAA made SMA available to the Dallas-Ft. Worth, Chicago O’Hare, Newark, and Teterboro (New

Jersey) airports. Staff at Northwest Airlines estimated that the enhanced situational awareness they received through SMA allowed them to avoid three to five costly diversions per week at Detroit Metropolitan airport.

*User Request Evaluation Tool (URET).* MITRE’s Center for Advanced Aviation System Development created the prototype URET for FAA and had deployed it to the Indianapolis and Memphis air route traffic control centers (ARTCCs) for testing by November 1997. Also called a conflict probe, the URET software gave controllers a strategic 20-minute look ahead to detect potential



*URET helps controllers detect and resolve potential conflicts when considering pilot requests for changes in altitude and route*



conflicts when considering pilots’ requests for altitude and route changes. FAA announced in September

1999 that Lockheed Martin Air Traffic Management would develop and deploy a free flight version of URET. FAA planned to make the system available to controllers beginning in late 2001.



*Traffic Management Advisor (TMA).* This system being developed by NASA, would assist controllers in planning and managing streams of arrival traffic into selected terminal radar approach control (TRACON) facilities, and to ARTCCs that received traffic from two or more centers. In March 2000 controllers at the Minneapolis TRACON started testing TMA. The tool looked at



*TMA evaluation at the Dallas/Ft. Worth airport*

planes as they came in from all directions, while still several hundred miles from selected airports. As the aircraft got closer, TMA helped controllers develop plans to handle the traffic effectively according to the spacing requirements for each airport. Together with the passive Final Approach Spacing Tool, the new system would comprise about half of FAA's envisioned Center-TRACON Automation System.

*passive Final Approach Spacing Tool (pFAST).* The pFAST tool, developed by NASA, was a decision support tool for TRACON air traffic controllers. The TRACON typically encompassed the airspace within approximately 40 nautical miles of a major airport. The tool provided landing sequences and landing runway assignments, as well as speed and heading, to help controllers manage arrival traffic and achieve an accurately spaced flow of traffic on final approach. FAA had begun testing an early prototype in 1996 at the Dallas/Ft.

Worth TRACON. The updated, free flight version of the tool began operational testing at the same TRACON on February 1999. FAA never certified the tool for operational use.

*Collaborative Decision Making (CDM).* FAA had begun development of the CDM tool in 1994. Airlines, government, private industry and specialists from academia worked together to develop the new technology that improved air traffic management through information exchange, data sharing, and improved automated decision support tools. FAA began testing CDM concepts in 1996 with major airlines. In late 2000 the Ground Delay Program Enhancement (GDPE) tool, developed under the CDM program, became fully operational. GDPE significantly reduced delays, improved the flow of air traffic into airports, improved compliance to controlled times of departure, and improved data quality and predictability. FAA estimated that from January 1998 through January 2000, almost 90,000 hours of scheduled delay were avoided thorough the use of GDPE.

With the free flight tools under development and testing, FAA and industry conducted the first large-scale test under the Safe Flight 21 program. On July 10, 1999, FAA and the Cargo Airline Association tested Automatic Dependent Surveillance-Broadcast (ADS-B), a technology designed to enhance safety by giving pilots and air traffic controllers more information about aircraft locations. The Wilmington, Ohio, tests evaluated how well ADS-B helped pilots to be more aware of aircraft in their vicinity. Using an aircraft's



*ADS-B display*



GPS sensor, ADS-B equipment sent accurate position information, along with speed and identification data, to other similarly equipped planes and ADS-B ground receiving stations. During the test, participating flight crews used a special cockpit display to monitor aircraft in their area. Air traffic control facilities received combined radar and ADS-B information for evaluation. Ground receiving stations in Wilmington and Louisville, Kentucky, provided coverage throughout the 500-square-mile test area. Approximately 25 planes participated. This ADS-B operational evaluation was the first in a series of tests planned for the next three years under the Safe Flight 21 program. In late October 2000, FAA, again in conjunction with the Cargo Airline Association, conducted a second successful test of ADS-B at the airport in Louisville, Kentucky, to determine the technology's ability to improve flight safety while increasing capacity.

On January 1, 2001, as part of FAA-industry Capstone partnership, FAA began the first use of ADS-B technology to track and service traffic near Bethel, Alaska — an area that had no radar coverage. The new system used ground-based transceivers to pick up transmissions from ADS-B equipped aircraft. The information was then transmitted via phone line and satellite to the Anchorage ARTCC, where controllers could view it on their screens.

### **Building the Infrastructure**

While many of FAA's modernization efforts, such as replacing controller workstations and supporting equipment, were not a direct part of the free flight initiative, those efforts were still necessary to provide the infrastructure critical for free flight implementation. Hence, in April 1995, FAA announced an agreement with Loral Corporation on contract modifications regarding air traffic control modernization under the former AAS program. Loral would develop and implement the new DSR automated workstations for controllers at ARTCCs. On December 5, 1996, FAA announced that

Loral had delivered the first DSR to the Seattle ARTCC, ten months ahead of schedule. By July 2000 FAA dedicated the 20th and final DSR at the Washington ARTCC in Leesburg, Virginia.

FAA awarded another contract to Loral on August 30, 1995, for production and installation of the display channel complex rehost system to replace aging IBM 9020E computers at five ARTCCs: Chicago, Dallas-Fort Worth, Washington, Cleveland, and New York. Those facilities had experienced 20 display channel complex failures in the previous four months.

With work on new DSR workstations for en route controllers underway, FAA focused attention on new technology for its TRACONS. On September 16, 1996, FAA announced the award of a contract, to a team led by Raytheon, to build the Standard Terminal Automation Replacement System (STARS). Under a joint FAA/DoD contract, the team would develop and install new computers, displays, and software at up to 172 FAA and 199 DoD facilities. The work on STARS, however, did not proceed as smoothly as that on DSR. On May 28, 1997, FAA sent a letter to Raytheon indicating its concern about delays in the STARS project. FAA proposed to elevate STARS software development to high risk status because of delays in meeting project milestones.



*STARS display*



Being over budget and behind schedule were not the only issues troubling the STARS program. Two FAA unions, labor groups that were not involved in the system's development, but who were expected to use and maintain it, expressed grave concerns about its usability and maintainability. On October 30, 1997, the National Air Traffic Controllers Association (NATCA) president told the Subcommittee on Aviation, a permanent part of the Committee on Transportation and Infrastructure in the U.S. House of Representatives, that problems with STARS had to be rectified before the system could be a workable product within the terminal environment. At the urging of Representative Frank Wolf (R-VA), FAA agreed to work with the DOT Inspector General in an attempt to resolve these issues.

On April 26, 1999, FAA, along with representatives from NATCA and the Professional Airways Systems Specialists, announced a revised implementation plan for STARS. The plan focused on developing the full STARS as soon as possible, while simultaneously meeting short-term requirements for new controller displays at a small number of FAA facilities. Under the revised plan, the first STARS would go into the Syracuse, New York, and El Paso, Texas, TRACONs. Initially, those sites would receive the early display configuration of STARS. Development would continue in parallel on the full STARS, which would include a new computer system. Once STARS had the capability to handle the needs of higher-level facilities, it would

be deployed throughout the country. Four months later, the early version of STARS entered operational test and evaluation.

FAA started in December 1999 to manage arriving and departing air traffic in El Paso with the early version of the STARS air traffic controller workstations. This was the first component to become operational as part of a phased strategy to deploy this state-of-the-art, full-service system nationwide. Controllers and technicians at the TRACON successfully integrated the new workstations, featuring high-resolution color monitors, with the existing automation system.

As the new century approached, FAA also fielded a number of innovative technologies in addition to the new ARTCC and TRACON controller workstations. In 1999, for example, FAA began using electronic air/ground communication services for aircraft flying over Pacific Ocean airspace. The multi-sector oceanic data link system provided air traffic controllers two-way electronic communications with aircraft equipped with data link. This system eliminated the need for voice communication and improved the reliability and timeliness of message delivery.



*TRACON at Miami International Airport*

In May 2000 FAA completed the final installation of a new air route surveillance radar that could detect a one-square-meter object out to 250 nautical miles, a 50 nautical mile increase over previous long-range radar models, and also provide weather data to the agency as well as the National Weather Service. That same month, FAA announced operational use of a new tool designed to help reduce delays at major airports in the northeastern part of the U.S. Installation of the departure spacing program was one of the first milestones in the Spring 2000 Initiative, announced in March by President Clinton and Transportation Secretary Rodney Slater. This program drew pertinent air traffic information from airports equipped with a new



coordination and planning tool to separate departing aircraft more evenly. The innovation allowed the best use of existing capacity information to expedite the flow of air traffic and minimize delays.

## A New Way of Doing Business

In April 1993 President Clinton signed legislation creating a “National Commission to Ensure a Strong, Competitive Airline Industry” to study the problems facing commercial aviation. Former Virginia Governor Gerald Baliles chaired the commission, which

had 11 non-voting and 15 voting members. The group met for the first time on May 24, and delivered their final report



*Salt Lake City Airport*

to the president on August 19. Among their recommendations was the creation of an independent federal corporate entity within DOT to manage and fund air traffic control and related functions. Other recommendations included establishing an advisory committee to further the airlines’ financial health, bankruptcy code reforms, tax breaks for airlines, possible use of oil reserves when needed to control sharp increases in fuel prices, efforts to create a multi-national operating

environment for airlines free of discrimination and restrictions, and limiting the liability of general aviation aircraft manufacturers to 15 years from the date of manufacture.

During this time, Vice President Al Gore had been heading the National Performance Review to study federal government operations. On September 7, 1993, he released the findings of the review. The recommendations were intended to streamline government and make it more cost beneficial. Proposals concerning aviation included creating a government-owned corporation to provide air traffic control services.



*New technologies help controllers better manage traffic*



*FAA safety inspectors*

In a press conference held on January 6, 1994, representatives from DOT, FAA, and the Council of Economic Advisors unveiled the Clinton Administration’s plan to revitalize the aviation industry. The plan entailed action on most recommendations of the National Commission to Ensure a Strong Competitive Airline Industry. Reforming the air traffic control organization became a key component of the aviation plan, which included efforts to move ahead with conversion of the FAA air traffic control function to a government



corporation. Other elements of the proposal aimed at: achieving bankruptcy reform, increasing foreign investment in U.S. carriers (contingent on reciprocal opportunities), encouraging new entrant carriers, heightening scrutiny of airline financial fitness, and promoting employee ownership of airlines.

Within four months, on May 3, 1994, Vice President Gore and Transportation Secretary Federico Peña announced a proposal to create a new Air Traffic Services Corporation to operate, maintain, and modernize the air traffic system. Under the proposal, 38,000 FAA employees involved in providing air traffic services would become part of a new not-for-profit government corporation.



*Paine Field Airport, Everett, Washington*

Support for the corporation would be derived from fees levied upon commercial aviation, subject to approval by DOT. On the same day that Gore and Peña unveiled the plan, President Clinton wrote letters urging Congress to make the new corporation a reality.

During the following months, however, Congress considered a variety of plans for restructuring FAA. These proposals included calls to make the agency independent of DOT.

President Clinton signed the Federal Aviation Administration Authorization Act of 1994 on August 23. The new legislation provided fiscal year 1994-1996 funding and authorization for FAA's programs. Also, to give the agency greater leadership stability, it specified a five-year term of office for the FAA Administrator.

While waiting for presidential and congressional action on FAA reform, Administrator David Hinson announced, on November 30, his own reorganization. Hinson restructured the agency along its key lines of business, making better use of resources, consolidating functions, and increasing management accountability. The reorganization abolished the three remaining executive director slots to eliminate an entire layer of management. The remaining positions reporting to the administrator and deputy administrator included the:

- Chief counsel
- Assistant administrator for civil rights
- Assistant administrator for government and industry affairs
- Assistant administrator for public affairs
- Assistant administrator for system safety *[a new position charged with analyzing safety data and making recommendations for improvement]*
- Assistant administrator for policy, planning, and international aviation
- Associate administrator for administration *[a new position assuming the responsibilities of the abolished offices of the assistant administrators for budget and accounting and for human resource management]*
- Associate administrator for airports
- Associate administrator for civil aviation security



- Associate administrator for regulation and certification
- Associate administrator for air traffic services *[a new position responsible for the air traffic service, the airway facilities service, the office of independent operational test and evaluation, and the office of system capacity and requirements]*
- Associate administrator for research and acquisitions *[a new position responsible for the technical center and the offices of acquisitions; air traffic systems development; aviation research; communications, navigation, and surveillance systems; information technology; and system architecture and program evaluation]*

To ensure life cycle responsibility for programs, in April 1995 the associate administrators for research and acquisition, regulation



*FAA reorganization facilitates safety innovations*

and certification, air traffic services, and airports signed an agreement that created the Integrated Product Development System. This innovation called for the use of integrated product teams, or IPTs, as part of a

tiered system of teams in research, acquisition, and the management of equipment life-cycles. The multidisciplinary IPTs cut across organizational lines to bring together customers and suppliers with the goal of improving products and services and expediting their delivery.

On September 12, 1995, legislation was introduced in the Senate to reform FAA while keeping it within DOT. The proposed legislation

would give the agency more flexibility in personnel and acquisition matters. The bill also provided for a system of financing FAA that emphasized fees for services. The Secretary of Transportation and FAA Administrator immediately endorsed the bill, a position that marked the Clinton Administration's shift away from its drive to create a government corporation for air traffic control. Although the bill never became law, the Clinton Administration continued work to create a more efficient FAA.

President Clinton quickly signed the fiscal year 1996 DOT appropriations bill after receiving it from Congress on November 15, 1995. The legislation provided \$8.216 billion for FAA, and included important provisions for FAA personnel and procurement reform. FAA instituted the mandated reforms, and on April 1, 1996, announced creation of a new acquisition management system aimed at reducing the time and cost of acquiring systems and services while making the acquisition workforce more accountable. The new personnel system was intended to speed recruitment and reward outstanding employees while dealing effectively with substandard performance. All FAA employees became part of a new Federal Aviation Service (FAS). While the agency was no longer subject to certain Office of Personnel Management rules, its employees continued to enjoy a range of legal protections that applied to other federal workers. Unionized FAA employees retained their representational status.

On October 9, 1996, President Clinton signed the Federal Aviation Reauthorization Act of 1996 (Public Law 104-264). This legislation established a National Civil Aviation Review Commission to report to Congress on the state of aviation safety and on providing long-term funding for the agency. It also directed the establishment of a Federal Aviation Management Advisory Council to advise the FAA Administrator and function as an oversight resource for management policy, spending, and regulatory matters. The Council ultimately consisted of 18 members, ten appointed by the president



to represent specific aviation interests. Five members, appointed by the Transportation Secretary, served as a subcommittee, with emphasis on air traffic services. There also was one designee each from DOT, DoD, and an air traffic services union. The Secretary of



*Philadelphia International Airport tower*

Transportation swore in the first seven members of the FAA Management Advisory Council in September 2000. Initially, advisory council members served from one- to three-year terms. Subsequent appointments were for three years.

To address public perceptions about FAA's "dual mission," the Federal Aviation Reauthorization Act of 1996 specified safety as the agency's highest priority. FAA remained responsible for encouraging and developing civil aeronautics, but references to a promotional role were eliminated from its mandate. The law also contained provisions aimed at expanding FAA's financial accountability and increasing its autonomy within DOT. As required by the legislation, on February 28, 1997, FAA released an independent 90-day assessment of its financial needs through 2002. The assessment, performed by the Coopers & Lybrand consulting firm, found that the agency lacked a system to account for its costs. In response, FAA agreed to develop a system that could help identify the gap between its projected responsibilities and its anticipated resources.

David Hinson resigned as FAA Administrator on November 9, 1996, and Deputy Administrator Linda Daschle became acting

administrator, a post she held until resigning from the agency on January 31, 1997. FAA executive Barry Valentine followed Linda Hall Daschle as acting administrator.

On August 4, 1997, **JANE GARVEY [TERM: 08/04/97 – 08/02/02]** became the fourteenth FAA Administrator, the first to be appointed to a five-year term. Previously, Garvey had served as deputy administrator, and then, from 1993 to 1997, as acting administrator of the Federal Highway Administration (FHWA). From 1988 to 1991, she was commissioner of the Massachusetts Department of Public Works, and before joining FHWA, she was director of Boston's Logan International Airport. Garvey received a Bachelor's degree from Mount Saint Mary College and a Master's degree from Mount Holyoke College.



*Administrator Jane Garvey*

Garvey had been in office only four months when, on December 11, 1997, the National Civil Aviation Review Commission, chaired by former Representative Norman Mineta, issued its final report, "Avoiding Aviation Gridlock and Reducing the Accident Rate: A Consensus for Change." Commission members express concern about the current state of the aviation industry and FAA. They said airline passengers were doomed to massive airport congestion and more dangerous skies unless FAA underwent a radical overhaul. The 21-member panel urged a partial privatization of the agency as well as steps to shield aviation regulation from partisan budget battles — and it called on lawmakers and the White House to improve FAA management and finances.



The Commission's report recommended FAA and industry work together to develop a comprehensive integrated safety plan to prioritize existing safety recommendations and develop performance measures and milestones to assess progress in meeting safety goals. The Commission also pointed out that the global nature of aviation demanded that safety be addressed worldwide, not just in the United States. In response to those recommendations, Administrator Garvey established the Safer Skies initiative and created the Commercial Aviation Safety Team (CAST). CAST developed an integrated, data-driven strategy to reduce the commercial aviation fatality risk in the United States and promote new government and industry safety initiatives throughout the world. The goal was to reduce the risk of fatal accidents by 80 percent.

Administrator Garvey also took action to address organizational concerns. On June 5, 1998, a reorganization went into effect that:

- Abolished the office of the associate administrator for administration
- Created an assistant administrator for financial services, serving as CFO
- Created a deputy assistant administrator for financial services, serving as the budget director
- Established an assistant administrator for human resource management
- Created an assistant administrator for region/center operations
- Abolished the office of business information and consultation
- Transferred the Freedom of Information Act office to the assistant administrator for region/center operations
- Transferred the headquarters facilities management office to the office of acquisitions under the associate administrator for research and acquisitions

- Moved the Washington flight program office (Hangar Six) to the aviation systems standards office within the airway facilities organization

On June 15, 1998, Transportation Secretary Slater and the NATCA president announced a new labor agreement between FAA and the union. In August FAA and NATCA formally signed the new five-year pact in which a federal labor union negotiated wages, for the first time, with a government agency.

The agency would soon find itself negotiating with other employees. On June 17, 1998, Administrator Garvey unveiled the next part of FAA's congressionally authorized personnel reform efforts — a test of a new pay plan, called core compensation, for about 1,200 agency employees. The new plan replaced the traditional grade and step based pay method with a structure of pay bands, the value of which were determined by comparison with similar jobs in government and private industry. The program linked compensation with performance.

When the agency announced its intention to expand the pay program, employees at FAA headquarters began to unionize for the first time. When Congress released FAA from many civil service rules, it had said that unionized workers could bargain with management over salaries. It also gave FAA the option of lowering salaries of unorganized workers via a core compensation plan. Despite large numbers of employees joining unions, on April 23, 2000, FAA transferred approximately 6,500 employees into the new market- and performance-based compensation system closely linked to the strategic goals of the agency. An executive compensation system became effective on the same date for senior executives.

FAA reform continued throughout the Clinton Administration. In April 2000 the president signed into law the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century. The bill

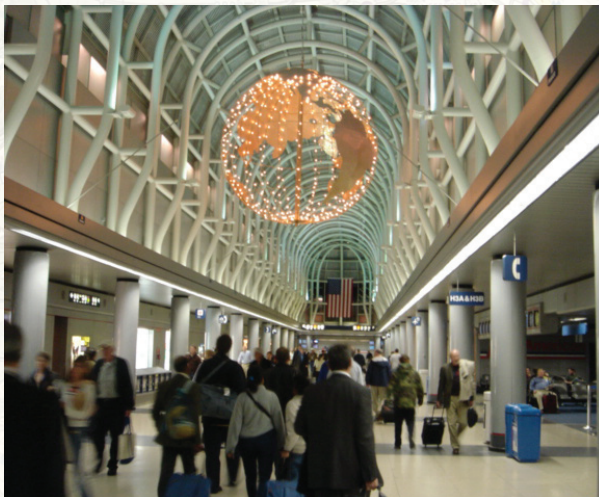


contained provisions to advance aviation safety and provided for the appointment of a chief operating officer. In a December executive order, President Clinton directed FAA to create a performance-based organization to focus solely on efficient operation of the air traffic control system, to appoint a group of business and labor leaders from outside of the aviation industry to serve as a board of directors for this new organization, and to conduct a review of impediments to congestion pricing at airports. He also called on Congress to reform the way air traffic control services were financed.

## International Cooperation

The Clinton Administration continued work started by the Reagan Administration to increase U.S. leadership in aviation and enhance international aviation safety. In September 1995 the United States and the Netherlands signed the world's first bilateral aviation safety agreement. The document included provisions on increased

cooperation in such areas as aircraft certification and the approval and/or monitoring of airmen, training, flight operations, and maintenance facilities. By the end of 1996 the United States had concluded five more such agreements with Great Britain, Germany, France, Malaysia, and Switzerland.



*Aviation is a global business*

To create a single level of international safety, in February 1996 FAA and Europe's Joint Aviation Authorities announced they had developed a common set of certification standards for newly designed small airplanes. The achievement was part of an ongoing effort to reduce or eliminate duplicative requirements harmonize international standards.

The following year, as part of a continuing "Open Skies" initiative, DOT announced a U.S.-German agreement relaxing limitations on air travel between the two countries. By February 1996 the United States had concluded ten additional open skies agreements with: the Netherlands, Austria, Denmark, Finland, Iceland, Luxembourg, Norway, Sweden, Switzerland, and Belgium. In addition, the United States and Canada had signed an important agreement on transborder air travel.

## Expanding into Space

In a move to consolidate all aerospace safety activities into one administration, on August 7, 1995, DOT announced that the office of commercial space transportation would move to FAA. Since the transfer required legislative approval, the move did not take effect until November. The fiscal year 1996 DOT appropriations bill, signed by President Clinton on November 15, 1995, cleared the way for the transfer of



*Rocket launch from the Mid-Atlantic Spaceport*



the office to FAA. The transfer became effective the following day, and the director of this new FAA organization became an associate administrator reporting to the administrator.

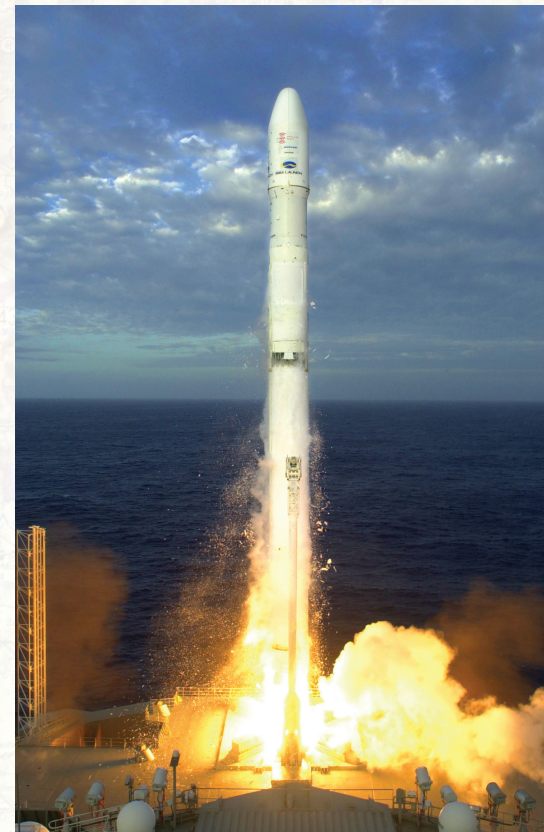
Originally established within DOT in 1984, the new FAA office regulated the U.S. commercial launch industry, licensed commercial launch operations to ensure public health and safety and the safety of property, and protected national security and foreign policy interests of the United States during commercial launch operations. The first U.S. licensed launch was a suborbital launch of a Starfire vehicle on March 29, 1989; the one-hundredth launch occurred on September 8, 1998. To date, the office has licensed almost 200 launches. The organization had responsibility as well for licensing the operations of non-federal launch sites, or spaceports. On September 19, 1996, FAA issued the first license to Spaceport Systems International, allowing it to open the world's first privately-operated space launch facility, California Spaceport, located at Vandenberg Air Force Base in California.

FAA held its first annual commercial space transportation forecast conference on February 10-11, 1998. The meetings provided a forum for FAA and commercial space industry representatives to discuss a variety of issues that included new technologies, space commerce, and regulatory issues and policies. Two months after the conference, FAA published a final rule on licensing requirements for the launch of expendable vehicles from federal sites.

In August another rule mandated financial responsibility and insurance coverage requirements for commercial space launch activities. The new regulations required a launch licensee to obtain insurance or otherwise to demonstrate financial responsibility to protect itself, the customer, the U.S. Government, and contractors and subcontractors against claims for third-party losses and federal property damage resulting from the licensed launch activities. On a case-by-case basis, the agency would set the insurance requirements

according to a risk-based determination of the maximum probable loss that might result from the licensed activities. The new rule required launch participants, whether from industry or government, to enter into reciprocal waivers of claims in which each party agreed to absorb certain losses it might sustain as a result of the licensed activity. In addition, subject to the funds being appropriated, the U.S. Government agreed to consider paying third-party claims in excess of the required insurance, up to a legal ceiling of \$1.5 billion.

By the end of September 1998 FAA had issued its fourth space launch site operator's license to the Alaska Aerospace Development Corporation. The license allowed commercial rocket launches on the southern tip of Kodiak Island. Alaska joined California, Florida, and Virginia as states with FAA-licensed state or commercially operated space launch facilities. The Alaska site, however, was the first spaceport not co-located with a federally operated launch range.



*Rocket launch from sea-going platform*



FAA issued a launch license to a Boeing-led international consortium to conduct a first-of-its-kind demonstration space launch in March 1999. The consortium launched its rocket from a sea-going platform in the Pacific Ocean. The 40 percent Boeing-owned partnership used a Ukrainian-built Zenit booster rocket and a Russian-built upper stage rocket. The launch platform, a converted self-propelled oil drilling platform, was accompanied to the launch site by an assembly and command ship designed and built by Kvaerner Maritime of Norway, another partner in the undertaking.

On October 19, 2000, FAA issued new rules that established a specific licensing and safety requirement for operating a commercial space launch site, whether the site was located on or off a federal launch range. The regulation outlined who must obtain a commercial launch site operator's license, set application requirements, and delineated licensee responsibilities. It built upon prior rulemakings that governed operation of reusable launch vehicles (RLVs) and reentry and recovery of RLVs and reentry vehicles. A companion rule covered the financial responsibility requirements, such as insurance, for licensed reentry activities. Together, the rules completed the process of establishing FAA's responsibility for licensing and regulating reentry of returning space vehicles and reentry sites authorized by congressional legislation passed in 1998. Previously, the Commercial Space Launch Act had provided authority over only the launching of commercial launch vehicles, not their return to Earth.

## Environmental Challenges

In the early 1980s, FAA realized that it would be impossible for the existing air traffic routes over the East Coast to handle the growing demand for airline travel brought by deregulation. The biggest delays in the East Coast airspace system was the New York-New Jersey metropolitan area. Bottlenecks in this airspace had a ripple



*FAA looks for ways to reduce airport noise*



effect throughout the entire national air traffic system. To ease traffic congestion in the region, FAA developed the Expanded East Coast Plan (EECP) to change the aircraft routes and air traffic procedures in a way that would permit each of the major New York-New Jersey airports to handle air traffic in a more efficient manner. This was an ambitious plan, which required some of the most far-reaching changes FAA ever made to the air traffic system.

Implementation of the EECP reduced delays, resulted in better flight planning, and allowed controllers to handle more traffic without compromising safety. However, the EECP also produced unavoidable consequences. These new air traffic routes began to take aircraft over parts of New Jersey, which, until 1987, had not experienced significant levels of air traffic. As a result, communities throughout northern New Jersey began to experience increases in noise levels they found unacceptable.

Pursuant to the Aviation Safety Capacity Expansion Act of 1990, FAA undertook an environmental impact statement, an EIS, to assess the effects of changes in aircraft flight patterns at altitudes of 3,000 feet above ground level caused by the implementation of the EECP over New Jersey. Believing the EIS process took too long, in late 1992,

at the urging of Senator Frank Lautenberg (D-NJ), the Senate prohibited pay raises for approximately 16 FAA employees whose responsibilities included noise abatement policy, aircraft route design or change, or the preparation, management, or oversight of the environmental impact statement until FAA completed the EIS. After an extensive and lengthy process of study, including opportunities for public comment for approximately 500 days and

including a public hearing on Staten Island, FAA took final action on the EIS by issuing a record of decision on October 31, 1995. While FAA decided to continue the broad procedures of the EECP, in April 1996 it adopted a specific measure, called the Solberg Mitigation Proposal, to reduce noise for residents of New Jersey. Still, citizens in communities in New Jersey and New York continued to experience levels of noise that they found unacceptable.

In addition to the Solberg Mitigation Proposal, FAA committed to undertake a follow-on regional study to address the metropolitan New York area. In 1996, based on a request from the Port Authority of New York and New Jersey,

a test over a four-month period in 1993, and an environmental assessment, FAA revised the standard instrument departure procedures for Newark's airport. In 1998, again at the request of the Port Authority, FAA examined the viability of changing



*Noise remains a concern for communities near airports*



the airport's standard instrument departure. Agency researchers found an industrial area south of Newark Airport where flights could be diverted to reduce noise over the City of Elizabeth. The change required a variation in the heading from 220 degrees to 260 degrees. FAA tested the 260-degree heading from March until September 1998 and then conducted an environmental assessment of the proposed change. At the onset of the preparation of the environmental assessment, FAA requested comments from a variety of public agencies and other interested parties. As a result of the analyses conducted and continued operational evaluation of the departure routing, FAA found no significant environmental benefit derived from the alternative routing to 260 degrees.

In April 1998 Administrator Garvey announced the National Airspace Redesign Project to maintain and improve system safety, improve the efficiency of the air traffic management, and reduce delays. The project would increase system flexibility and predictability, and it would seek to reduce adverse environmental effects on communities in and around our Nation's airports. The Agency expected the project would take approximately eight years to complete. The New York-New Jersey Metropolitan Airspace Redesign Project portion of the project encompassed the New York,

New Jersey, and Philadelphia metropolitan areas and included air traffic affecting Connecticut, Delaware, and Pennsylvania. As part of the study, FAA planned to examine possible revisions to departure patterns at Newark, including an ocean routing concept for day and night traffic, as well as the straight-out departure concept.



*FAA researchers study ways to protect the environment*