FactSheet

National Aeronautics and
Space Administration

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NASA Aviation Safety Program

Initiative Will Reduce Aviation Fatalities

The $500 million NASA Aviation Safety Program (AvSP) is a partnership with the Federal Aviation Administration, the Department of Defense and the aviation industry.

AvSP is working to develop advanced, affordable technologies to help make travel safer on commercial airliners and smaller aircraft.

To meet the national goal of reducing the fatal aircraft accident rate by 80 percent in 10 years and 90 percent in 25 years, the NASA Aviation Safety Program is focusing on three areas recommended by a national team of more than 100 government and industry organizations:

- **Accident Prevention**
- **Accident Mitigation**
- **Aviation System Monitoring and Modeling**

Accident Prevention is attacking the issue of airplane accidents from human, mechanical and engineering perspectives.

Researchers and industry teams in one element, **Weather Accident Prevention**, are working to bring a sort of weather channel to the cockpit; better weather datalink systems to pilots, air traffic controllers and airline dispatchers; and better ways to detect, warn of and minimize turbulence. Weather is a contributing factor in about 30 percent of all aviation accidents. Turbulence is the greatest cause of airline injuries and costs airlines at least $100 million a year.

Synthetic Vision would address the single largest contributing factor in fatal worldwide airline and general aviation crashes: limited visibility. NASA engineers and their industry partners are developing an advanced cockpit display that will use technologies such as Global Positioning System signals and terrain databases to give pilots a clear out-the-window picture, no matter what the weather or time of day.

With the help of company teams, **Single Aircraft Accident Prevention** is developing on board technologies to help planes monitor their own systems, including engines and airframes. The idea is to detect and diagnose abnormalities, then fix them before they become big problems.

System-wide Accident Prevention is looking at changes that could affect the entire aviation system. NASA researchers are focusing on the human side of accidents. They are developing models to better predict human error and working to improve training and other procedures for maintenance and flight crews.

Accident Mitigation researchers are working to make accidents more survivable. AvSP drop tests of full scale airplanes help engineers determine how to make aircraft seats, restraining systems and structures better able to withstand crashes. Researchers are also developing new technologies to prevent in-flight fires and minimize fire hazards after an accident.

NASA engineers dropped a Lear Fan composite aircraft 150 feet to test whether design changes can help pilots and passengers better survive an accident.

Finally **Aviation System Monitoring and Modeling** is looking at the aviation system as a whole with modern data gathering techniques. AvSP is helping airlines monitor their own equipment and performance to better predict where accidents might happen. This kind of extensive monitoring will help the aviation system assess known and heretofore unknown issues.

The Aviation Safety Program is NASA's primary, but not only, investment in aviation safety technologies. It is a "focused" program. That means it concentrates on longer term, high risk research and development but with a greater emphasis on application and shorter term results than so-called "base" NASA programs. "Base" research and technology projects are doing work in icing, aging aircraft, rotorcraft pilot aiding, human fatigue and aerodynamic design principles.

The aviation safety initiative was created in the summer of 1997 in response to a report from the White House Commission on Aviation Safety and Security. NASA has designated about $500 million over five years for aviation safety research and development, with more funding expected to follow.

Researchers at four NASA field installations are working with the FAA and industry to make flying safer: Langley; Ames Research Center at Moffett Field, Calif.; Dryden Flight Research Center in Edwards, Calif.; and Glenn Research Center in Cleveland, Ohio.

The NASA Aviation Safety Program is working on eight technology strategies:

1. **Make every flight the equivalent of clear-day operations.**
2. **Bring intelligent weather decision-making tools, including worldwide real-time moving map displays, to every cockpit**
3. **Eliminate severe turbulence as an aviation hazard**
4. **Continuously track, diagnose and restore the health of on-board systems, leading to self-healing and "refuse to crash" aircraft**
5. **Improve human/machine integration in design, operations and maintenance**
6. **Monitor and assess all data from every flight for both known and unknown issues**
7. **Increase survivability when accidents do occur**
8. **Anticipate and prepare for future issues as the aviation system evolves**

For more information on the NASA Aviation Safety Program, please check the Internet at:

http://avsp.larc.nasa.gov