



Highlights of [GAO-10-824](#), a report to the Committee on Science and Technology, House of Representatives

Why GAO Did This Study

To address challenges to the aviation industry's economic health and safety, the Federal Aviation Administration (FAA) is collaborating with the National Aeronautics and Space Administration (NASA) and other federal partners to plan and implement the Next Generation Air Transportation System (NextGen). NextGen will transform the current radar-based air traffic control system into a satellite-based system. Pilot and air traffic controller roles and responsibilities are expected to become more automated, thereby requiring an understanding of human factors, which studies how humans' abilities, characteristics, and limitations interact with the design of the equipment they use, environments in which they function, and jobs they perform. FAA and NASA are tasked with incorporating human factors issues into NextGen.

As requested, this report discusses the extent to which FAA's and NASA's human factors research (1) is coordinated and (2) supports NextGen. To address these issues, GAO reviewed coordination mechanisms and planning documents and synthesized the views of nine aviation human factors experts.

What GAO Recommends

FAA should (1) create a coordination plan and (2) give priority to filling vacant leadership positions and provide the positions with authority for prioritizing human factors. FAA agreed to consider the recommendations.

[View GAO-10-824 or key components.](#) For more information, contact Gerald L. Dillingham at (202) 512-2834 or dillinghamg@gao.gov.

NEXT GENERATION AIR TRANSPORTATION SYSTEM

FAA and NASA Have Improved Human Factors Research Coordination, but Stronger Leadership Needed

What GAO Found

While FAA and NASA officials are coordinating their NextGen human factors research efforts in a variety of ways, they lack a cross-agency human factors plan for coordination. FAA and NASA have participated in research advisory committees and interagency research transition teams, signed interagency agreements, and held cross-agency meetings and conferences focused on human factors issues. FAA also created a human factors portfolio to identify and address priority human factors issues but not a cross-agency human factors coordination research plan in cooperation with NASA, as previously recommended by FAA's Joint Planning and Development Office (JPDO)—an interagency organization responsible for planning NextGen. As a result, FAA has not established an agreed-upon set of initial focus areas for research that identifies and capitalizes on past and current research and establishes focus areas for human factors research and development, among other things.

The experts GAO contacted generally agreed that FAA's and NASA's human factors research efforts adequately support NextGen, but made several suggestions, including enhancing human factors research leadership, for further incorporating human factors issues into NextGen systems. FAA and NASA have undertaken a variety of human factors efforts to support NextGen, including, among other things, creating planning documents detailing how human factors research will be incorporated into NextGen and dedicating financial resources specifically to NextGen human factors research. While the human factors experts GAO interviewed stated that these efforts support NextGen, a majority offered the following suggestions for further integrating human factors issues into NextGen:

- Better ensure that human factors issues are fully integrated throughout the development of NextGen systems. FAA did not do this in the development of past systems, a fact that led to schedule slippages and cost increases.
- Improve collaboration of human factors efforts within FAA departments.
- Establish strong leadership. A 2008 National Academy of Public Administration's report identified leadership as the single most important element of success for large-scale systems integration efforts like NextGen. FAA has not prioritized consistently staffing the top two human factors positions. Specifically, the position of the Chief Systems Engineer for Human Factors (now referred to as the human factors integration lead) has been vacant since January 2010. Moreover, FAA did not have a permanent program director of its Human Factors Research and Engineering Group from January 2009 until June 2010. These two positions currently lack the authority to ensure that human factors issues are addressed early and throughout the NextGen system development process to prevent the need to redesign these systems after implementation, which can cause delays and add costs. As a result, FAA may lack consistent leadership with the sufficient authority to not only prioritize human factors issues but ensure that human factors issues are addressed throughout NextGen.