



POSITION STATEMENT

UPGRADING THE NATIONAL AIRSPACE SYSTEM (NAS)

*Adopted by the IEEE-USA
Board of Directors, 20 June 2008*

Growth in air traffic is stressing an Air Traffic Control system that has not kept pace with available, modernized technology in communications, navigation, surveillance (CNS) and air traffic management automation. Maintaining the status quo will result in gridlock and significant losses to the nation's economy, if airspace demand triples by 2025, as projected. In December, 2003 the Congress passed, and President George W. Bush signed in law the "Vision 100 Act (P.L. 108-176), which calls for an integrated, multi-agency plan to transform the United States' air transportation system to meet airspace demand needs by 2025.

In keeping with the intent of P.L. 108-176 we call on Congress and the Administration to provide funding for upgrading the National Air Space system by incorporating the latest technology in communications, navigation, surveillance (CNS) and air traffic management automation. IEEE-USA believes that focusing on technological investments can achieve long-term benefits. Improvements will prepare the NAS for continued growth in air traffic, and IEEE-USA recommends the following:

- **Upgrade the Air Traffic Control (ATC) Centers.** Accelerate replacement of outdated ATC systems in the Terminal Control centers. The lack of system automation imposes limits on U.S. airspace and airline efficiencies, and constrains technological advances. The absence of systems automation imposes heavy workloads on air-traffic controllers; potentially increases the risk of accidents in heavy traffic situations; and stifles the infusion of additional air-traffic management technologies.
- **Modernize NAS communication and surveillance systems.** Accelerate implementation of next-generation communications systems that replace outdated, analog voice communications with digital voice and data systems. As an example, ADS-B-equipped aircraft broadcast their precise positions in space via a digital data link. They can also pass along information, such as airspeed, altitude and direction, to receivers in the air traffic control system or aboard other aircraft. Using ADS-B in Alaska has reduced accidents 43 percent during a recent three-year period in the Yukon-Kuskokwim River Delta, an area not served by conventional radar. Therefore, we should pursue rapid

implementation nationwide of Automatic Dependent Surveillance-Broadcast (ADS-B) which improves pilot situational awareness and aviation safety, both in-flight and during airport surface operations.

- **Support efforts to bring current graphic weather and weather forecasts economically to the flight deck of all classes of aircraft.** For example, System-Wide Information Management (SWIM) would ensure that all information regarding aircraft operations is directly available to everyone who needs it, including airline dispatchers, controllers, and Federal Air Marshalls and ground personnel.
- **Give priority to reliance on satellite navigation in the NAS.** Accelerate adopting and implementing the FAA's satellite augmentation systems to the Global Position System (Wide-Area and Local-Area Augmentation Systems). This will improve NAS navigation capabilities and maintain U.S. dominance in this field, while providing user benefits to the flying public. The long-term goal is to enable pilots to make precision landings at airports not served with control towers, radar, or instrument landing systems. At the same time, we must remain vigilant to current and future vulnerabilities and threats to disruptions of the system.

This statement was developed by the IEEE-USA Committee on Transportation and Aerospace Policy and represents the considered judgment of a group of U.S. IEEE members with expertise in the subject field. IEEE-USA advances the public good and promotes the careers and public-policy interests of the more than 215,000 engineers, scientists and allied professionals who are U.S. members of the IEEE. The positions taken by IEEE-USA do not necessarily reflect the views of the IEEE or its other organizational units.

BACKGROUND

Recognizing that the current approach to managing air transportation is becoming increasingly inefficient and operationally obsolete, congress created the Joint Planning and Development Office (JPDO) to plan the Next Generation Air Transportation System (NGATS). NGATS is being organized to address at least a two-fold increase in air traffic operations by the year 2025, and a three-fold increase by 2035.

This position paper supports the goal to transition from the current system to NGATS. Funding availability is crucial to NGATS' success; and congress needs to understand what it will take to fund NGATS. Currently, NGATS receives formal funding from the FAA, and also informal funding from several separate federal government bodies, each with its own important, non-aviation program priorities. Establishing the federal government's commitment to NGATS should help JPDO maintain the interest and enthusiasm of numerous nonfederal stakeholders participating on a pro bono basis in the NGATS effort.

Expecting a similar increase in air traffic, Europe is moving in a parallel direction, with its Single European Sky ATM Research (SESAR) program. In 2004, the European Commission launched the Single European Sky legislation (SES). SES set the political framework for action in Europe to support the need for doubling ATM capacity by 2020. SESAR is jointly founded by the European Commission and EUROCONTROL. At the beginning of 2006, the European aviation players have come together to execute the project, beginning with the first step of SESAR: the

definition phase. The SESAR consortium, represented by a balanced group of about 30 partners, draws upon the expertise of all major organizations within the aviation industry, including airspace users, air navigation service providers, the supply industry and airports.

As noted in Recommendation 2, implementing Automatic Dependent Surveillance-Broadcast (ADS-B) is a major step forward. Euro control has stated it will use ADS-B as one of the primary pillars for future air-traffic management. The agency's CASCADE (Co-operative ATS through Surveillance and Communication Applications Deployed in ECAC) program will lead and implement the use of ADS-B. Euro control expects initial operation of ADS-B in 2011. The U.S. timeframe for system operations is 2018-2020.

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