

Written Testimony by
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Subcommittee on Aviation
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Good afternoon. I would like to thank Chairman LoBiondo and members of the Subcommittee for the opportunity to testify on the subject of “Modernizing the Aviation System: Leveraging the Assets of the William J. Hughes Technical Center.” CSSI, Inc. has worked with the Federal Aviation Administration (FAA) for the last 23 years and is honored to be recognized by this committee to represent our industry and its dedication to improving what is already recognized as the best aviation system in the world. CSSI credits its prominent industry status to employees, partners, academic relationships and customers, whose unique blend of academic knowledge, technical skills and operational experience have directly supported the Technical Center’s pivotal role in the FAA’s efforts to modernize the National Airspace System (NAS).

CSSI works with government and commercial clients to ensure that transportation systems are designed and equipped to safely and efficiently move people and materials. Leveraging deep roots in aviation, CSSI pioneers innovative analytics and best practices that increase capacity, improve reliability and maximize safety. We employ nearly 300 professionals, have offices in five locations and support clients throughout the United States and globally.

CSSI has participated first-hand in the evolution of the aviation industry over the last two decades. We’ve identified or instituted more than 140 operational improvements from our voluntary safety reporting programs. We’ve continued to improve the prospects of safe aviation travels with newer, stronger safety standards, and we’ve helped thousands of aircraft meet Reduced Vertical Separation Minimum (RVSM) certification requirements, thus maximizing airspace capacity, reducing fuel burn and saving millions of dollars in fuel costs. In addition, we drive research, test and evaluation efforts to identify how Unmanned

Aircraft Systems (UAS) can be safely integrated into the NAS, and we've supported NextGen initiatives that cut flight miles and increase fuel savings.

While we work with a number of organizations located at FAA headquarters in Washington, DC, as well as with FAA service areas and field facilities throughout the country, the Technical Center is one of our key partners. By working together, we help the FAA maintain the safest and most efficient aviation system in the world. A great deal of our work with the Technical Center directly contributes to aviation modernization efforts and drives results in three key areas: safety, UAS, and the Next Generation Air Transportation System or NextGen.

Improving Aviation Safety

Safety is the aviation industry's top priority and improvement initiatives are prevalent throughout all modernization efforts. It is critical to ensure that the United States continues to set the gold standard for aviation safety; an achievement which would not be possible without the dedication and collaboration of regulators, manufacturers, air traffic controllers, pilots, flight attendants and maintenance professionals.

Through the years, CSSI has fostered the development of safety management systems that enforce newer and stronger standards for managing safety risk and accountability and minimize the risk of safety incidents occurring. We have developed, enhanced and automated safety reporting processes to gain efficiencies, improved the use of information, and implemented easy-to-use web-based tools. We have developed or contributed to non-punitive safety reporting programs such as the Air Traffic Safety Action Program (ATSAP), Technical Operations Safety Action Program (T-SAP), and the Confidential Information Sharing Program (CISP). ATSAP, for example, provides a qualitative understanding of risk in the NAS and aids in the identification of hazards; as a result, it creates the opportunity to prevent risks in a developing and changing system before an active failure occurs in the aviation safety net. To date, over 70 percent of air traffic controllers use ATSAP and more than 70,000 safety event reports have been collected.

A cornerstone of CSSI's aviation safety work at the Technical Center is the development and implementation of global and regional separation standards, and the associated communication, navigation, and surveillance and air traffic management performance-based standards. As the performance of airborne and ground systems improves, the safe reduction in separation between aircraft provides additional capacity, more efficient operations and increased use of optimized, or user-preferred, flight profiles. We work with the International Civil Aviation Organization (ICAO), the North American Aircraft Approvals Registry and Monitoring Organization (NAARMO) and the Pacific Aircraft Monitoring Agency (PARMO) in every step of the international standardization process.

CSSI's work in separation standards includes the successful December 2013 implementation of reduced lateral and longitudinal separation in the New York Oceanic Flight Information Region for specific types of aircraft. In addition, as part of the North Atlantic Data Link Mandate, we've enabled an increase in the percentage of flights using future air navigation systems and text-message-like communications between pilots and controllers, where before there was only antiquated, high-frequency voice communication, thus enhancing operational safety in the North Atlantic.

Safe Integration of Unmanned Aircraft Systems into the NAS

The NAS is evolving rapidly as NextGen initiatives are refined and merged into current operations. The integration of UAS into the nation's airspace is a major challenge for both the FAA and the aviation community and introduces a new layer of complexity to this evolutionary process. The FAA's unwavering commitment to safety demands that technical support services understand UAS operations and new technologies, but remain focused on this important objective. CSSI works closely with the Technical Center to bring a real world perspective to modeling and simulation scenarios that emulate this complex air traffic control environment. This perspective is essential to the development of UAS operational concepts for testing and integration into the NAS. CSSI brings experience from former air traffic controllers and combines it with an understanding of new technologies. These skills and

knowledge help develop and evaluate realistic human-in-the-loop simulations of the manned and unmanned air traffic control environment. We use the lessons learned from these simulations to revise the simulation's event timing and to verify both communication workloads between the controller and UAS as well as trajectory based interactions between UAS and manned aircraft. The simulations can then be relied upon as accurately characterizing the workloads expected in a NextGen Air Route Traffic Control Centers (ARTCC) environment.

CSSI has played an important role in the development of operational requirements for integration of UAS into the NAS. We continue to refine these requirements for integration of smaller unmanned aircraft. In order to develop these requirements, we determine if a UAS would be able to enter the NAS from specific types of airspace and locations and help develop the operational scenarios that accurately portray UAS interactions with the air traffic management system. To make the models and simulations more accurate, we take into account all stakeholder and operator perspectives including weather conditions, pilots, air traffic controllers and system engineers. We will continue supporting the simulation development and evaluation process to achieve safe integration of UAS into the NAS. We will gauge our success through corroboration with stakeholders and by measuring the results against FAA-accepted safety and performance criteria. We will also continue to support and participate in UAS working groups across the various Tech Center lines of business to realize UAS integration and development of mid-term operational concepts.

CSSI is also an active participant in RTCA's Special Committee 228, Minimum Operational Performance Standards for Unmanned Aircraft Systems. This committee was established in May 2013 and works to develop the minimum operational performance standards for detect and avoid equipment, emphasizing an initial phase of standards development on civil UAS equipped to operate in Class A airspace under regulations governing all aspects of civil aviation aircraft operations.

Implementation of the Next Generation Air Transportation System

Maximizing the safe and efficient use of airspace and airports is critical to accommodating future aviation demand. The aviation industry is working hard to meet forecasted demand, which the FAA predicts will meet or exceed one billion passengers by 2015. CSSI has been a key industry partner in meeting this challenge by working closely with the Technical Center in support of NextGen concepts. Highlights of our work include hypothesizing solutions to airport capacity challenges and driving smart investments and decision-making; testing and implementing pilot projects under the Runway Incursion Reduction Program; and optimizing airspace and procedures in the metroplex in eight out of a targeted 21 regions.

Reducing runway incursions is one of the FAA's top priorities. Through infrastructure improvements and new technologies, we can work to further reduce incursions and increase airfield safety. CSSI uses airport simulation models to replicate the movement of aircraft, runway operations and air traffic control actions. We analyze these models to determine arrival and departure flow rates, travel times, delays, runway usage, occupancy times, fuel consumption and NAS performance metrics. This includes evaluation and development of various simulation models such as the Airport Delay Simulation Model, Runway Delay Simulation Model and FAA's Airport and Airspace Simulation Model. Under the Runway Incursion Reduction Program, we have also tested and implemented pilot projects designed to increase safety of operation in runway areas which tend to experience the most safety incidences due to proximity of aircraft and ground vehicles.

In response to recommendations from the aviation community through RTCA's NextGen Mid-Term Implementation Task Force, the FAA is implementing integrated NextGen capabilities to improve air traffic flow for an entire region, or metroplex. The FAA has identified 21 metroplexes that include several proximate commercial and general aviation airports serving large metropolitan areas. By optimizing airspace and procedures in the metroplex, the FAA provides solutions on a regional scale, rather than focusing on a single airport or set of procedures. The Optimization of Airspace and Procedures in the

Metroplex (OAPM) takes into account all airports and airspace that support each metropolitan area as well as how air traffic in those areas interacts with other metroplexes. It considers a myriad of factors including safety, efficiency, capacity, access and environmental impact.

Through our work on OAPM, we have optimized airspace procedures and structures that increase capacity and efficiency while maintaining safety in eight large metroplex areas, including the development of new performance-based navigation (PBN) procedures in those eight metroplexes. We are currently working on 10 more metroplex areas that are in various stages of completion. We ask air traffic controllers at associated airports to test new PBN procedures to ensure operational success in a real-time environment.

Additional Efforts that Leverage Assets of the William J. Hughes Technical Center in Aviation Modernization

At CSSI, we have been fortunate to provide assistance and technical expertise on other less well-known yet equally impactful projects that directly support aviation modernization efforts, including those of particular concern to air traffic controllers. One such project is the Wildlife Surveillance Concept, which examines how to integrate supplemental avian threat information into the air traffic control environment. We are working with pilots, controllers and front-line managers to identify a set of requirements for what avian radar and subsequent integration should look like. The incorporation of avian radar into the air traffic control environment could provide significant safety benefits as well as have positive environmental impacts on wildlife preservation efforts.

In conclusion, the FAA is working tirelessly to modernize what is already the safest and most progressive aviation system in the world. At CSSI, we are proud of how we have partnered with the Technical Center to integrate new technologies into the NAS, all of which will enhance safety, save fuel, reduce delays and increase capacity.

Today, we shared a few key examples of how CSSI, together with the Tech Center, has supported the FAA in advancing NextGen concepts: we have helped improve safety even while introducing more aircraft into the NAS; we are modeling, testing, evaluating simulation scenarios for safe UAS integration; and laying a solid foundation for long-term NextGen success.

Despite all that we have accomplished in partnership with the FAA, we recognize that there is still much work to be done. Government and industry must continue to collaborate closely to achieve key NextGen milestones in the face of tight deadlines and budget challenges – it is imperative for the future of air transportation, and for our nation’s economy. This is why it is so very important that the FAA and the Technical Center receive the support they need to stay at the leading edge of aviation technology, and to continue to set the gold standard for the rest of the world.

CSSI looks forward to partnering with the FAA at the Technical Center to achieve aviation modernization and NextGen goals over the next several years. I encourage you to support the important work being done to modernize the U.S. aviation system and ultimately improve the flying experience for the American public.

This concludes my testimony. I would be happy to answer any questions you may have.