

**THE TESTIMONY OF PETER F. DUMONT,
PRESIDENT AND CEO OF THE AIR TRAFFIC CONTROL ASSOCIATION
BEFORE THE COMMITTEE ON TRANSPORTATION AND
INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION,
MOVING NEXTGEN FORWARD: LEVERAGING THE ASSETS OF THE
WILLIAM J. HUGHES TECHNICAL CENTER.
March 11, 2014**

I am here representing the Air Traffic Control Association (ATCA), which has had a long relationship with the William J. Hughes Technical Center (Tech Center). We are a professional association, established in 1956 in Washington, D.C., by a group of air traffic controllers at what is now known as Ronald Reagan Washington National Airport. ATCA is dedicated to promoting the science of air traffic control (ATC) and the preservation of aviation safety.

ATCA has a membership of over 3,000 from every aspect of the domestic and international aviation community – air traffic controllers, government employees, researchers, scientists, pilots, academics, students, airlines, as well as representatives of the leading companies in the field. Some of our members can be found right here in Atlantic City working for and on behalf of the FAA.

We have three large events a year: an Annual Conference and Exposition in the Washington, D.C. area (that we have held for nearly 60 years); the World ATM Congress, an international exposition and conference in Madrid; and the ATCA Technical Symposium held each May right here in Atlantic City. NASA and FAA serve as technical co-chairs of the Symposium. It affords the opportunity for people to see, hear, and experience the important work that goes on here.

We also hold more specific and focused symposia throughout the year on subjects like budget, unmanned aerial systems (UAS), cyber security in the National Airspace System (NAS), and civil/military ATC. These are normally in response to the needs and desires of our members and the aviation community.

ATCA publishes both *The ATCA Quarterly*, a blind peer reviewed scientific publication, and a quarterly technical magazine, *The Journal of Air Traffic Control*. ***(Copies have been provided with the testimony.)*** Our current issue of the Journal has articles on privatization and user fees, as well as sense and avoid technology for UAS.

In addition to publishing and staging programs that enhance dialogue between ATC stakeholders, ATCA has both an award program and a scholarship foundation. The awards recognize exemplary research and accomplishments in the field. The ATCA Scholarship Fund awards more than \$75,000 in scholarships annually to help students achieve their goals in aeronautical and STEM-related pursuits.

At the heart of all ATCA's activities is the mission to promote the science of ATC and advance the safety and efficiency of aviation. The challenges of aviation today cannot be tackled by

one organization or by the government alone. We have learned that the most effective solutions come from collaboration between government, academia, users, and industry. The Tech Center embraces collaboration; in that spirit, ATCA has worked with the Tech Center for the past 50 years in an effort to improve our aviation system.

The Tech Center's Capabilities in NextGen Development

The FAA Tech Center is a state of the art facility with world-class scientists, technicians and technologies. I am here today to discuss the Tech Center's importance to aviation and ATCA, as well as ways we can leverage its assets.

ATCA members have long turned to the Tech Center to partner in developing new approaches to keep the air traffic system safe and efficient as demands on the aviation system increase and as the NAS transforms. When stakeholders understand better what the Center has to offer, they will see opportunities to support those efforts.

The FAA has recently appointed a new Assistant Administrator for NextGen: Mr. Edward Bolton. Along with this appointment the aviation community expects that a needed strategic reorganization of the NextGen office will occur. The Tech Center is a very important piece of the NextGen solution that should be considered carefully when crafting any organizational changes. It has always been the FAA's hidden gem, sometimes underutilized and not always getting the attention that a prestigious facility with so much capability should receive.

Only in his position a few months, Mr. Bolton has already visited the Tech Center four times, the first after only two days. We think he understands the importance of the Center and its value to the success of NextGen. In fact, he recently used an aircraft simulator there to ready himself for an Airbus familiarization flight in preparation for attending a NextGen Advisory Committee (NAC) meeting. With your visit today, you can also attest to the vast and varied resources and experts here.

I would recommend that all senior FAA management visit the Tech Center periodically. Sometimes, we have to get out of our daily tasks to see the broader mission and the capabilities of our counterparts; making sure that FAA managers visit the Tech Center will in turn raise the awareness of this resource within the entire Agency and help leverage this facility to continue improving aviation.

The Tech Center has state of the art laboratories, talented people, experience, processes and technology to support the research and development, verification and validation, implementation, and ongoing maintenance of the next generation air traffic system. The Tech Center provides the facility and people to bridge an idea from paper to product and from concept to near operational deployment.

One key feature of the Tech Center is that it has one of every piece of equipment currently deployed and operational in the NAS. This seems logical, and on the surface not too consequential, but when you consider all of the different components that make up today's ATC system the value becomes readily apparent. As we begin transformation we must incorporate new procedures and

new technologies into the existing system. You do not turn off the current NAS at midnight and turn on the new system at 12:01. There is a transition period where new and old technologies and procedures coexist.

Introduction of technology occurs in a waterfall. A priority is established where certain facilities and airborne platforms (aircraft) receive the new equipment before others and the refresh flows down until the entire system is transformed.

During the waterfall it is important that we do not introduce technologies or procedures into the NAS that have an adverse effect on other operational systems. The benefit of having all the varying pieces of equipment at the Tech Center is the ability to test, evaluate, verify and validate that the new system performs against specification as well as integrates with the multitude of current systems. The pieces of equipment are not just standalone or siloed – they are connected. If the validation and verification is done in the field, it could jeopardize public safety in a catastrophic way.

Technology and procedures, facilities, and aircraft do not create the whole picture. The NAS is a system of systems and one of the components is the human. The equipment has to be developed with the operator and end user in mind – sometimes referred to as “human in the loop.” A solution that controllers or pilots can’t use, or makes them less efficient, or worse yet – reduces safety – is not a solution at all. The Tech Center’s ability to evaluate human factors is unparalleled.

So how does the Tech Center test all the different elements to ensure they operate as advertised (against specification) and interact with current operational systems? One way is with the NextGen Integration and Evaluation Capability (NIEC).

The NIEC leverages existing NAS operational systems and high fidelity, real-time simulation capabilities to create an integrated, flexible, and reconfigurable environment that can be tailored for NextGen research as well as test and evaluation. The NIEC Display Area (NDA) provides a futuristic NextGen gate-to-gate visualization environment with advanced data collection capabilities to support integration and evaluation of new technologies and concepts. The ability to provide a combined environment of legacy systems with future technologies and capabilities also enables the NIEC to support the transition to NextGen.

The NDA collocates and integrates key air traffic components into a single environment at the Technical Center to address emergent research questions. Existing Center capabilities were leveraged for initial NIEC operation. Additional NextGen capabilities will also be obtained through partnerships with federal agencies, industry and academia. The NIEC platform continues to evolve as research requirements emerge. The potential of this resource is tremendous and, utilized to its full potential, can do much to speed NextGen implementation in a safe and sound manner.

The NIEC is a perfect example of how the Tech Center can move NextGen forward more efficiently than can be done in the field. It is capable of supporting human-in-the-loop testing for both controllers and pilots on multiple systems simultaneously. It simulates the current system and shows us how the changes we make with NextGen will affect the entire NAS. It has the capability to record audio, video, and data for more detailed analyses. The lab can be used 24 hours a day. This is

significant because in the field, air traffic ebbs and flows. You can only test the system at max capacity a couple times a day for a limited period of time. This increase in air traffic is called “the push.” The advantage of an around-the-clock lab is that you can simulate the push anytime for as long as you wish. You can also access the lab from outside of the facility. This means that you can collaborate in the NIEC in real time with multiple participants regardless of their location.

The capabilities here will always be relevant because the nature of the NAS dictates that there will continue to be multiple versions of systems operating. Their unique ability to test the impact of NAS transformation on all these components at one time in one facility is the essence of what makes it such a valuable tool for leveraging NextGen implementation.

Another point that should be made clear is NextGen is not an effort with a final “on switch” that is thrown at completion. There are many phases of a project this large and comprehensive. As I indicated earlier it is a transitional transformation occurring incrementally. NextGen – like the current antiquated systems and procedures – is an entity that requires care and feeding. It will continue to be tweaked forever. As we develop new procedures and technologies they will continue to require integration. It is unlikely, but should we reach a stage where NextGen is fully implemented throughout the NAS with no pending upgrades, it will still require maintenance.

Sometimes we think of NextGen as a refresh of old technology or just as procedural changes. The things we often overlook are the new platforms that are being introduced into the NAS at a rapidly increasing rate; one is the pressing need to safely integrate UAS into the NAS. UAS use will create jobs and fuel our economy. Industry, government, and academic collaboration will be key to addressing the challenges surrounding this issue. UAS implementation and integration is the most difficult platform introduction into the NAS we have ever attempted. It requires a whole new way of thinking, new procedures, regulations, and technology. The FAA recently released the location of the six UAS test sites around the country. This is very encouraging because for all of the things we do know, there is much we do not know.

One of the biggest obstacles to advancement of new technology and new ways of operating is big data. Big data is the phenomenon of having too much data to assimilate and analyze in time for it to be useful. This is a possible problem with the UAS test sites. One of the ways we can and should leverage the Tech Center is to use it as a collection point for all UAS test site data. The Center has all the required people, processes, and technology to manage big data and perform verification and validation.

There are so many different types of UAS and so many different missions and business models that a central location for the collection, collation, analysis, and results reporting must be managed by one central clearing house. This will enable collaboration and avoid the sites becoming silos. This big data capability directly capitalizes on the Tech Center’s talents and moves NextGen forward significantly and deliberately.

A body of work related to UAS already exists at the Tech Center – this was the result of industry and government collaborating. The FAA signed a cooperative research and development agreement with Insitu Inc., and the New Jersey Air National Guard to study and address UAS integration into

the NAS. Insitu Inc., a subsidiary of The Boeing Company, provided two ScanEagle aircraft and their related support hardware and data to the FAA for two years. The research was managed by the FAA's Research and Technology Development office and conducted at the Technical Center. The two-year agreement enabled FAA scientists to study and better understand UAS design, construction, and functionality. The collection of data from the national test sites is a logical extension of this work.

UAS is just one piece of the puzzle, as there are many platforms and systems that will need development and testing before integrating into the NAS. Two additional examples are Datacom and ADSB. Datacom will provide an end-to-end communication system including leveraging existing equipment on commercial aircraft for air-to-ground voice and data communication. In the case of Datacom, development and integration required end-to-end testing using NAS technology, aircraft, and controllers. As you can imagine, controllers and airlines don't want to beta test something in a live environment where lives are at stake. The Tech Center is the only place in the world where industry and FAA can test systems in a fully simulated environment.

For other opportunities to use the Tech Center, we can look at the current recommendations for NextGen implementation priorities as outlined by the NextGen Advisory Committee (NAC). The Tech Center is the most logical place to test and evaluate NAC priorities with existing facilities and airborne platforms. The tier 1A (high benefit, high readiness – to be completed regardless of budgets) recommendations are:

- Performance Based Navigation (PBN)
- Closely Spaced Parallel Operations (CSPO)
- Surface Operations –Data Sharing
- Time-Based Flow Management (TBFM)
- Wake Recategorization
- Optimization of Airspace & Procedures in the Metroplex (OAPM)

We have also seen that new technology alone does not produce benefits to the users; workable policies and procedures must be in place to assure success. The Tech Center has the ability not only to test the technologies on the ground, in the ATC System, and with the aircraft; but also has the expertise to help develop the policies and procedures for full implementation.

That brings me to the point of collaboration. With all the capabilities of the Tech Center you cannot move NextGen forward in a bubble. No one entity can or should do it alone. We have seen instances in the FAA where new systems or procedures were developed without all of the necessary stakeholder involvement. This resulted in “false starts” that delayed implementation and cost much more than originally budgeted.

Collaboration Between the Tech Center, Aviation Stakeholders, and ATCA

Today's aviation challenges are too complicated, expansive, and costly to overcome in an isolated laboratory – collaboration with stakeholders is key to finding solutions. We applaud the Tech Center when they engage in joint efforts with industry and academia, however, the results still need to be shared with the larger aviation community.

ATCA has worked in many ways to access the talent and the research done here. The problem with a hidden gem is no one benefits from the work done unless they know about it. Communication and collaboration avoids duplication of efforts and leverages best practices and lessons learned that exist inside as well as outside of government. Better communication regarding the work underway here will go a long way to improve leveraging results.

ATCA's membership first met in Atlantic City in 1964 when the Tech Center was known as the Atlantic City Systems Research and Development Facility. We have continued that relationship for the past 50 years, most recently by holding the Annual ATCA Technical Symposium.

ATCA provides a neutral platform for the entire aviation community, focusing on the latest research, products, and services in air traffic control with more than 500 participants from industry, controllers, airlines, NASA, members of academia, and the FAA. Chairman Lobiondo has attended and spoken at the event in the past. Discussion with the government and their industry partners highlight lessons learned as well as current struggles with new technology. ***Every significant air traffic challenge the aviation industry has faced in the last 58 years has been discussed and debated at ATCA symposiums.***

Last year we brought attendees from the Symposium directly to the Tech Center – many for the first time. They heard about and saw the wide range of research that is underway here. The full scope of activities was a surprise even to some who had been involved in the industry for many years. ATCA's Symposium is for us the most efficient, cost-effective, and structured way to educate the industry on the facilities and expertise at the Tech Center. This event is key for FAA and industry employees as well as academics because it exposes participants to different aviation research areas, highlighting to a wider audience the broader collection of aviation issues and providing an opportunity for testing the strength of a particular idea or research approach.

This convergence of so many industry stakeholders often results in partnerships that provide the solutions to the most complex issues facing NAS transformation. Open discussions and debates around possible solutions have also highlighted approaches that need additional stakeholder vetting. With so many expert minds in one place it is readily apparent when an idea is ill conceived.

Every year I hear feedback from both government and industry participants who are attending our events that they were surprised at how much they learned about Tech Center capabilities and efforts.

Please don't underestimate the importance and benefits of simply attending and meeting other experts in the aviation field. For a small business, for instance, the three day Symposium can expose you to dozens of possible partners ranging from large companies to universities. These meetings and contacts could take a company months to generate outside of this environment.

Conferences in general have come under increased scrutiny over the last few years. I want to stress the work that gets done at professional symposiums and conferences that organizations like ATCA provide. Our feedback surveys tell us that during the Symposium, participants are able to conduct six months' worth of business and meetings in just a few days. The economic benefit to government and industry is quantifiable. Compare the cost of a three-day conference versus

traveling to 20 meetings. Just the logistics to bring the right people to the table at multiple locations throughout the year is an example of the cost savings.

The Tech Symposium and Technical Exchanges could not happen without the Tech Center. ATCA has worked successfully with past Center directors and we have continued that tradition with Dennis Filler, the current Director. Dennis, in his past roles here, reached out to educational institutions to establish working relationships and encouraged technology transfer efforts. Working with stakeholders is key to leveraging the Tech Center – and Dennis has not only said he supports those relationships– he has implemented them.

The technical exchanges that take place benefit the industry as a whole. Bringing the stakeholders together here enables collaboration that leads to improved NextGen implementation. Simply put, when you come to an ATCA event, you come to work – and the work benefits aviation and NextGen.

Stakeholder Partnerships are Key to the Tech Center's Success:

One of the keys to the Tech Center's success, but even more importantly, to the success of the air traffic system, is the use of partnerships between the FAA, the industry, and academia. The Tech Center is often the hub of these partnerships.

The Tech Center partners with its stakeholders in many ways – through Centers of Excellence (COE); cooperative research agreements; and other contract vehicles. The important feature is that these partnerships pool resources, expertise, and facilities to improve the aviation system.

There are several COE agreements FAA has signed. FAA uses COEs to leverage universities and sometimes industry to help with key research. The Tech Center is intimately involved in these agreements with research occurring both on-site and at academic institutions. These agreements combine the benefits of the best minds and facilities in the field. Projects on advanced material safety; general aviation safety; and air transport noise and emissions are all included in COE agreements.

Embracing these partnerships between the FAA's Technical Center, the users, the technology industry, and academia is another way to leverage the resources found here. Under these partnership agreements, we pull together a powerful aviation team to solve our toughest issues. By the same token, the COEs leverage technical expertise and facilities located elsewhere to maximize resources for solving our pressing aviation challenges.

Conclusion:

ATCA will continue to work with the Tech Center during our annual Technical Symposium. However, even an intense three-day event cannot summarize the annual activities and accomplishments from this impressive 5,000-acre facility. The resources of our membership are always available to support the many success stories here at the Tech Center.

Thank you for holding this hearing and highlighting the aviation facilities and experts in Atlantic City – it has offered insight into the Tech Center’s capabilities for a different audience. As NextGen ramps up, technology must be scalable; larger workload is an inevitable consequence of the continuing rapid developments across all of aviation. Additional support and expansion along with maximum leverage of what, in my view, is an underutilized facility will be key to successful and, most importantly, safe implementation. I will be happy to answer any questions you might have.