

Testimony of

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**FAA Reauthorization:
NextGen And The Benefits Of Modernization**



Introduction

The National Air Traffic Controllers Association (NATCA) is the exclusive representative of more than 15,000 air traffic controllers serving the Federal Aviation Administration (FAA), the Department of Defense and the private sector. In addition, NATCA represents approximately 1,200 FAA engineers, 600 traffic management coordinators, 500 aircraft certification professionals, agency operational support staff, regional personnel from FAA's logistics, budget, finance and computer specialist divisions, and agency occupational health specialists, nurses and medical program specialists. NATCA's mission is to preserve, promote and improve the safety of air travel within the United States, and to serve as an advocate for air traffic controllers and other aviation safety professionals. NATCA has a long history of supporting new aviation technology, modernizing and enhancing our nation's air traffic control system, and working to ensure that we are prepared to meet the growing demand for aviation services.

NATCA's Recommendations

It is our understanding that this hearing is the first of several on the topics covered by FAA Reauthorization. As this hearing is focused on modernization, NATCA's remarks are intended to specifically address the FAA's efforts in implementing the Next Generation Air Transportation System (NextGen). We look forward to the opportunity to testify before you in the future and are prepared to address the many other important issues facing the FAA including the need for fair dispute resolution between labor and management, realignment of FAA facilities and services, staffing and the need for scientifically based standards, the designee program and the FAA certification process, and other topics.

NATCA remains, as ever, completely committed to the safety and efficiency of the National Airspace System (NAS). New technology has the potential to improve safety, expand capacity, and increase efficiency of the NAS. Therefore, we support the FAA's willingness to undertake the large-scale and long-term research, development and modernization project that it has labeled NextGen. Yet the complexity and the risk of this program should not be underestimated. The GAO has stated that NextGen is a high risk effort because of its dollar cost and complexity¹. Therefore it is imperative that the FAA proceed in a way which maximizes the chances of success. At present, there are several outstanding shortcomings with the FAA's methodology and plans that must be addressed at this early stage of the process.

1. **The FAA must collaborate meaningfully with stakeholders** – The inclusion of NATCA is critical to the success of NextGen and all projects relating to modernization, technology and procedures. The Government Accountability Office and the Inspector General of the Transportation Department have both testified before Congress that controller involvement prevents cost overruns and implementation delays. NATCA must be included in all stages, from inception to implementation.
2. **NowGen must not be neglected as we prepare for NextGen** – The current air traffic control system has fallen into disrepair. Both the human infrastructure, including staffing levels of air traffic controllers, inspectors, engineers, and other aviation safety professionals, and physical infrastructure, such as poorly-maintained and deteriorating air traffic control facilities, need attention in the near term.

¹ House Transportation and Infrastructure Subcommittee on Aviation Summary of Subject Matter for hearing on *Air Traffic Control Modernization and the Next Generation Air Transportation System: Near-Term Achievable Goals*. March 16, 2009.

3. **Human factors must be addressed** – Several of NextGen’s proposals raise serious concerns regarding human factors, including the increased complexity and safety risk inherent in a best equipped, best-served policy. These issues must be addressed during the development stages in order to avoid delays, cost overruns, and safety failures.
4. **Safety requires redundancy** – NATCA is concerned that the system being proposed by the FAA, which is centralized and lacking a viable backup, is unacceptably vulnerable to attack or natural disaster. Human intervention must not be the first and only layer of redundancy. The FAA must build redundancy into the system in order to ensure that in the event of an attack, natural disaster, or technological failure, safety is not compromised.

Collaboration is Critical

The participation of NATCA throughout all stages of NextGen’s development and implementation is critical to the success of this project. NATCA’s members are frontline workers who are able to provide vital insight to help the team identify and address human-interface issues and other concerns. Doing so on the front end rather than during implementation will save the Agency time, taxpayer money and resources while avoiding potential damage to the integrity of the air traffic control system. Because NATCA’s members have an intimate understanding of frontline air traffic control, they are uniquely qualified to provide insight into the needs of the system, the utility of the FAA’s proposed technology, and the usability of the products included under the NextGen umbrella. As Peter Bunce, President and CEO of General Aviation Manufacturers Association (GAMA) said, “If we are going to have full implementation [of NextGen] somewhere in the range of 2025, it is absolutely imperative that we still get the controllers and pilots together and decide what type of architecture is actually going to exist in the end state.”²

The FAA’s go-it-alone strategy has come under criticism throughout the aviation industry. Last month, the FAA announced that it has committed to launching a NextGen Implementation Panel, through the RTCA Inc. (formerly the Radio Technical Commission for Aeronautics). Despite this gesture, to date we have received no indication from the FAA that the Agency has any intention of meaningfully collaborating with NATCA.

During the late 1990s and into the early part of this decade, the FAA completed more than 7,100 projects to install and integrate new facilities, systems and equipment into the NAS, as well as more than 10,000 hardware and software upgrades. During this time, NATCA had representatives on more than 70 modernization and procedure development projects³ through the Controller Liaison Program. This program allowed controllers to provide crucial insight and guidance for the development and implementation of some of the most effective technological and procedural advancements including: Advanced Technologies and Oceanic Procedures (ATOP), Display System Replacement (DSR), User Request Evaluation Tool (URET), Voice Switching Control System (VSCS), Domestic Reduced Vertical Separation Minimum (DRVSM), and Standard Terminal Automation Replacement System (STARS). Despite its success, the Liaison Program was terminated in 2005. Throughout the rest of the Bush Administration, the FAA resisted any meaningful input from NATCA – to the detriment of the NAS.

The labor-management environment that developed during the Bush administration continues to make

² Peter Bunce, President and CEO of GAMA, testimony before House Transportation and Infrastructure Committee, Subcommittee on Aviation. March 18, 2008 hearing on “ATC Modernization and NextGen: Near Term Achievable Goals.”

³ National Air Traffic Controllers Association, *2002 Air Traffic Modernization Tools*.

meaningful collaboration nearly impossible. The contempt with which all levels of agency management has treated and continues to treat the air traffic controller work force makes it clear that the Agency does not value the professionalism of NATCA's members. It is our hope that after the imposed work rules are addressed by the Obama Administration and NATCA and the FAA reach a mutually-accepted collective bargaining agreement, we can again return to an era of cooperation and collaboration that will best serve the needs of the FAA, air traffic controllers, stakeholders, and the flying public.

Status of Near-Term NextGen Collaboration Efforts: ERAM

One of the earliest NextGen projects to be deployed will be the switch from the Host computer system, which currently serves as the technological backbone of en route air traffic control, to En Route Automation Modernization (ERAM). Host, which was originally deployed in the 1980s, is the mainframe computer processor which provides data to display terminals at en route air traffic control positions. It is expected to become unsustainable within the next two years, as the availability of new technology has made replacement parts for older computers harder to find. It is also incapable of handling the satellite-based ADS-B system around which NextGen has been developed. In contrast, ERAM is designed to process data from both radar and satellite sources. Rather than rely on a single processor, ERAM will be a network of computers in which the old Host display terminals will be replaced by individual PC processors. Once it is properly implemented, this distributive processing will allow the system to handle a significantly larger volume of data and provide a more seamless backup system than the one currently in place.

While NATCA supports ERAM as a good concept and necessary for the future of air traffic control, confidence is low in the product in its current state. ERAM testing has yielded more than 40,000 problem reports (PRs), over 100 of which are considered to be Initial Operating Capability (IOC) critical, meaning they must be resolved prior to deploying the system for use with live traffic. As of less than two months ago, officials on the ERAM team disclosed that ERAM had yet to remain stable and functional for a full twenty-four hours of continuous operational testing. Additionally, air traffic controllers have come across significant problems with the human interface of ERAM, as they found the new formats cumbersome, confusing, and difficult to navigate. NATCA is very concerned about the risk to the NAS if ERAM is implemented before these problems are comprehensively addressed. Short-term, piecemeal fixes or work-arounds are unacceptable. ERAM must be deployed only when the technology is stable and fully functional because failure of ERAM, particularly during peak traffic hours, would create extreme confusion and put the safety of the flying public at risk.

This February, the FAA has approached NATCA with what we hoped would be a genuine invitation seeking our collaboration in the implementation phase of ERAM. We embraced the opportunity to substantively contribute to finding solutions cooperatively with the FAA. Unfortunately, despite the Agency's repeated promises to work with NATCA in a more collaborative manner on the ERAM issue, we are running into the same obstructionist attitude that we have become so familiar with over the last eight years. NATCA has acted swiftly and eagerly, submitting comprehensive proposals about the terms of our collaboration within nine days of receiving the full ERAM briefing from the Agency, and we are prepared to work with the Agency to come to an agreement. For their part the FAA has required weeks of delay to respond to our proposals, while engaging in unfair labor practices in soliciting bargaining unit members to work on the transition team. At this time, it is unclear as to whether or not the Agency is prepared to reach agreement or work with NATCA.

NATCA is disappointed with the Agency's stance on collaborating with our organization. As with all NextGen and modernization efforts, we believe that our expertise would serve the Agency and the flying public well. We remain committed to continuing the effort to reach an agreement with the Agency over the deployment of ERAM.

Status of Near-Term NextGen Collaboration Efforts: Airspace Redesign

In the 1990s, the FAA collaborated with the National Air Traffic Controllers Association (NATCA) to address the issue of airspace congestion. Working together the group identified chokepoints, analyzed weaknesses in the system, and developed a multilateral and comprehensive approach to improving the system. However, during the Bush Administration the FAA abandoned this collaborative approach and instead chose to unilaterally implement piecemeal changes to air traffic control functions and procedures. Recent events pertaining to airspace redesign for the New York, New Jersey and Philadelphia areas have also shown that the FAA still does not intend to include NATCA in this project.

Last year, the FAA implemented Phase I of the NY-NJ-PHL airspace redesign effort, which included new dispersal headings for Philadelphia International Airport (PHL) departures. These new procedures were implemented without input from system users including air traffic controllers. As a result, the new procedures were plagued by several serious inadequacies, including a lack of published procedures, incomplete testing, insufficient training for both controllers and pilots, and frequent miscommunication between controllers and pilots.

Now the FAA is ready to begin implementation of Phase II, which will involve the terminalization of airspace currently controlled by Boston Air Route Traffic Control Center (ARTCC) and New York ARTCC. This shift is highly complex and will require changes not only to procedures but also to technology, personnel, facilities and training. Yet it appears that the FAA has not learned its lesson from Phase I. Despite outreach attempts from NATCA, the FAA has refused to collaborate with the frontline controller work force.

History has shown us that successful modernization efforts require the input and involvement of all stakeholders, and airspace redesign is no exception. NATCA believes that without the collaboration of the air traffic controller work force in developing and implementing the airspace redesign, the FAA's plans will be expensive, unsafe, inefficient, and unlikely to significantly improve the capacity of the New York area airspace. This is a belief not limited to air traffic controllers or unions. Jim May, President and CEO of the Air Transport Association (ATA) spoke about the importance of "controller acceptance of implementation and new procedures" at a hearing before the House Transportation and Infrastructure Subcommittee on Aviation. Of airspace redesign he said, "you've got to bring Pat [Forrey, President of NATCA] and his guys into the process...We can't do New York without his folks."⁴ With NATCA's help, the FAA may be able to avoid the shortcomings that were present during Phase I of airspace redesign and, by so doing, may be able to transition more smoothly to the new procedures and reduce the risk to the flying public during the transition.

NowGen: Human Infrastructure

While NATCA believes that NextGen may hold some promising plans and technology for the future of

⁴ Jim May, President and CEO, Air Transport Association. Testimony before House Transportation and Infrastructure Committee, Subcommittee on Aviation. March 18, 2008 hearing on "ATC Modernization and NextGen: Near-Term Achievable Goals."

air traffic control, we are concerned that the Agency's focus on NextGen comes at the expense of the current air traffic control system, or NowGen. There are some very pressing problems facing the air traffic control system of today that can be addressed using available technology and infrastructure.

Air traffic control facilities across the nation are severely understaffed as a result of the wave of retirements and resignations following the Agency's unilateral imposition of work and pay rules on the air traffic controller work force. Rampant fatigue in the work force is undermining safety across the system as those controllers that remain are required to work excessive amounts of overtime, have fewer opportunities for rest on and off the shift, and are often required to do a job designed for two to four controllers when Radar Associate positions are eliminated and positions are combined. The FAA's recent hiring efforts intended to combat the staffing problem have resulted in an unsafe ratio of trainees, a training backlog, and an overreliance on developmentals, or trainees, to work live traffic.

Over 46,000 years of experience has been lost since the imposed work rules.⁵ Along with that experience, vital institutional knowledge and qualified instructors have been sacrificed over the past two and a half years. The FAA must make addressing the work force issue its top priority; returning to the bargaining table to reach a legitimate and mutually-acceptable collective bargaining agreement would go a long way towards stabilizing today's air traffic controller work force and setting a solid foundation for the training and development of the air traffic controller work force of tomorrow.

NowGen: Physical Infrastructure

In addition to the deterioration of the human infrastructure, the FAA must contend with the deterioration of the physical infrastructure. According to a recent report by the Department of Transportation Inspector General, 59 percent of FAA facilities are beyond their 30-year design life, while all 23 En Route centers are over 40 years old. Several air traffic control facilities including Detroit Metropolitan Airport Tower and TRACON (DTW), O'Hare International Airport Tower (ORD), Kansas City Tower/TRACON (MCI), Miami ARTCC (ZMA), and Memphis ARTCC (ZME) have reported problems with mold contamination. At DTW inspectors have confirmed the presence of stachybotrys, a toxic form of mold believed to be a contributory factor in health problems experienced by controllers at the facility, including cases of occupational asthma as well as seven cancer diagnoses during the past six years.

The FAA has also fallen behind in the installation of vital runway incursion prevention technology. Airport Surface Detection Equipment-Model X (ASDE-X) is a developed and proven surface radar system that has been used to great effect where it has been installed. Unfortunately, the FAA has allowed this demonstrated technology to take a back seat to NextGen and is on track to miss its delivery benchmarks. While the FAA estimated that ASDE-X would be deployed at the 35 busiest airports by the end of 2010, to date they have installed only 13 of the 35 (having taken four years to install the first 11)⁶, and several of those that have been installed are still experiencing serious implementation glitches.

The FAA must make the maintenance and appropriate equipage of existing air traffic control facilities a

⁵ Calculation assumes 25 years experience for every retiree. Twenty-five years of services is the minimum for retirement eligibility for most air traffic controllers.

⁶ Dillingham, Gerald, *Aviation Safety: FAA Has Increased Efforts to Address Runway Incursions* Government Accountability Office Testimony before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives September 25, 2008

priority. Air traffic controllers must be provided with safe and secure facilities and up-to-date equipment so that they can continue to maintain the safest and most efficient air traffic control system in the world.

Potential Advantages of NextGen Technology and Systems

NATCA believes that there is great potential in Automatic Dependent Surveillance – Broadcast (ADS-B). As the FAA has stated, satellite-based technology is capable of providing a more accurate depiction of aircraft location and eliminating the lag time of traditional radar scans. This degree of precision can help ensure greater safety and efficiency by allowing air traffic controllers the ability to make better-informed decisions regarding aircraft movements. If aircraft were equipped with ADS-B displays, pilots would have additional tools with which to process and understand their location and flying conditions, allowing pilots to maintain greater situational awareness, particularly during periods of poor visibility.

This capability will give controllers greater flexibility and provide predictability to the users. For example, controllers will be able to more frequently instruct pilots to proceed to the airport visually, utilizing the ADS-B in weather currently requiring instrument flight rules (IFR). A visual approach, which is granted at the discretion of air traffic controllers, requires pilots to utilize a simple “see and avoid” method of separation, allowing them to follow more closely than instrument guided approach standards permit. With current technology, controllers may only grant visual approaches during good weather and when visibility is unobstructed, as pilots must safely see the runway, ground, surrounding terrain, and other aircraft in the vicinity. With ADS-B displays, pilots would be able to artificially “see” other aircraft even during inclement weather, giving controllers greater flexibility to use these less complex and more efficient approach rules, increasing the arrival rates regardless of the weather. There would no longer be a need to reduce arrival rates during IFR weather. The users could more accurately predict scheduling, reduce delays, and increase capacity.

Concerns over NextGen

Based on the public documents that the FAA has made available on NextGen, NATCA has several outstanding concerns for both the long and short term that we believe the FAA must address comprehensively before it can begin the roll-out of any major NextGen technology or policy changes. As previously stated, we believe that these and other issues can be most effectively addressed in a collaborative environment, and we sincerely hope that NATCA can be a part of developing the solutions to the problems facing the current air traffic control system and plan for the future system. Below are the concerns NATCA believes must be addressed immediately, which will be discussed in greater depth in the sections that follow.

1. The FAA must retain a backup system: Redundancy is the essential element of any safety operation. The FAA’s published plans contain no viable backup should the satellite fail due to natural or criminal activity. Limited frequency availability further complicates this situation.
2. Safe and viable plan for equipage: The success of NextGen is dependent on the equipage of thousands of aircraft with new technology, an expensive undertaking that would be a major financial strain on airlines, general aviation and business aviation, particularly in the current economic climate. The FAA has tried to address this by instituting a new “best equipped, best served” policy for air traffic control. This policy has serious implications for safety, as it adds an untenable level of complexity to air traffic control operations. If the FAA wishes to incentivize equipage, it must do so in a way that does not compromise safety.

3. Full consideration of human factors: Many of the proposed changes to the air traffic control system place significant demands on the people who make the system work. The usability of the technology and the accompanying procedures must be a priority.
4. Research before rulemaking: Many of the plans and promises made in the FAA's NextGen documents are based on assumptions about technology that has yet to be developed. While the ideas are a good basis for research and development projects, it is misleading for the FAA to describe its plans for operations as if the required technology were already available.

Redundancy: The Need for a Viable Backup System

While we believe ADS-B has tremendous potential and is capable of providing precise, accurate, and instantaneous information on aircraft positions to air traffic controllers, it is particularly vulnerable due to its single-site source. ADS-B is satellite-based technology, with information broadcasting from a single source satellite orbiting the earth. While this allows it to be more precise than the current ground-based radar, the singularity of its source makes it vulnerable to natural disasters and criminal or terrorist acts. If the satellite were to cease functioning for any reason, the entire U.S. air traffic control system would be crippled.

The current ground-based radar system gathers its information from numerous radar sights located throughout the country. If one radar sight were to fail, another site could act as a back up. For example, if a terminal radar site were to fail, Center Radar, or CENRAP, from the nearest en route radar site would be able to provide the relevant data. In most cases when this occurs, FAA separation requirements are increased from three miles to five miles, but safety is maintained and service is uninterrupted.

Until redundancy can be incorporated into the new technology, the easiest option for creating the system redundancy necessary to maintain the safety of the NAS is to maintain the existing ground radar coverage as a backup for the ADS-B system. However, due to financial considerations, the Agency wants to decommission many of the current radar sites, which would result in an incomplete backup system with gaps in coverage.

Further complicating this is the issue of frequency congestion. ADS-B transmits its information in the same frequency spectrum as the current radar systems, TCAS, ASDE-X, and other critical aviation safety technology. There are simply not enough frequencies available to transmit all of the necessary information. According to a briefing before the Aviation Rulemaking Committee (ARC) on February 24, 2009, the FAA would have to decommission all existing radar sites and reduce TCAS surveillance to 60 percent in order to safely utilize ADS-B⁷ in future NextGen applications. This further limitation of the available redundancy makes the NAS more vulnerable to failure and puts the safety of the flying public at risk.

Before ADS-B is implemented, the FAA must develop a safe and viable means of providing a backup system. Redundancy and workable backup systems are vital to the safety of the NAS, and must not be discounted in the fervor to introduce new technology.

⁷ Capezzuto, Vincent, *Surveillance and Broadcast Services: Aviation Rulemaking Committee Briefing*, Federal Aviation Administration, February 24, 2009.

Near-term Redundancy Concerns: FAA Realignment Initiatives

In the near term, we have similar concerns regarding the loss of redundancy due to facility and service realignment initiatives. By proceeding recklessly with de-consolidation initiatives, the FAA has delivered a serious blow to redundancy in knowledge and training. In combined tower/Terminal Radar Approach Control (TRACON) facilities each air traffic controller is trained on all aspects of arrivals and departures. With this overlapping knowledge, controllers are able to more safely and efficiently coordinate with one another and control aircraft. The redundancy in training also gives managers more flexibility in staffing. This redundancy is being removed through the FAA's realignment initiatives, diminishing the safety and efficiency of air traffic control operations and making facilities more vulnerable to the effects of the staffing crisis.

The FAA is also moving forward on a number of consolidation initiatives, in which the FAA would first split tower/TRACON functions in current combined facilities and then consolidate the radar functions into a larger facility. In these instances, not only is training and knowledge redundancy sacrificed, but security also becomes a serious concern. As with the single ADS-B site, consolidating air traffic control facilities and eliminating radar capabilities at many airports leaves regions vulnerable to attack, natural disaster or technological malfunction. If a consolidated facility were to fail, not only would a single airport be out of service, but the entire region would be shut down to air travel as well.

The House Transportation and Infrastructure Committee recently introduced the HR 915, the *FAA Reauthorization Act of 2009*, which created a process for evaluating realignment decisions and involving all stakeholders in the planning process. NATCA believes that this is the correct approach and urges this Committee to include similar language in their companion legislation. Working together, stakeholders can help mitigate the redundancy loss and ensure that realignment initiatives are undertaken only when they present an operational benefit to users, improve safety, efficiency and capacity, while also saving taxpayer money.

Equipage: A Major Hurdle in Tough Economic Times

In order to utilize the technology and procedures that create the foundation of NextGen, aircraft must be equipped with new technology. For general and business aviation, the process of equipage may be cost-prohibitive. Encouraging voluntary compliance for these fliers may prove to be a fruitless effort, and mandatory equipage may cripple the general aviation industry beyond repair. One NATCA member and private pilot echoed the sentiments of many when he said, "I'll stop flying before I spend \$35,000 on new equipment for my \$50,000 plane." Particularly during these difficult economic times, when private pilots are struggling to pay for regular maintenance and fuel costs, the added expense will be cost prohibitive to most.

For the commercial airline industry, moving forward with NextGen means undergoing the expensive process of retrofitting a fleet of aircraft, a major challenge for airlines struggling to continue operations despite the economic downturn. Early equipage difficulties may be exacerbated by the FAA's history of changing technological requirements and delaying or abandoning modernization efforts. American Airlines, for example, retrofitted its fleet to install the Controller Pilot Data Link Communication system (CPDLC) only to see the FAA abandoned its efforts in 2004, leaving the airline to foot the bill for technology it would never use.

Airlines may be reluctant to equip their fleets until they can see a clear operational or economic benefit and until the FAA has demonstrated a firm commitment to a particular set of equipage standards.

NextGen will be delayed until the FAA is able to effectively address the legitimate concern of airlines and aircraft owners and convince them that the technology is a good investment.

“Best Equipped, Best Served”: Implications on Human Factors

In an attempt to create artificial economic incentives for early equipage, the FAA has announced that it will implement a policy that would “provide 'best-equipped, best-served' priority in the NAS to early adopters.” This has serious implications for safe and efficient operations and for the workload and complexity for air traffic controllers.

Currently, air traffic controllers provide service on a first-come, first-serve basis. Air traffic controllers instruct aircraft to merge onto airways or disburse to their destinations in the order which comes most naturally, the order in which they arrive. Giving priority to particular aircraft would require complex maneuvering on the part of air traffic controllers, who would have to vector aircraft around one another in order to give preferential treatment. This is an unnecessary level of complexity introduced into the already complex air traffic control environment. As with any additional complexity, it brings with it an increased risk in terms of both safety and delays.

Air traffic controllers are also taught to maximize the efficiency of the NAS to the maximum extent practicable without sacrificing safety. This often means granting requests from pilots to proceed directly to particular navigation points of reference, VORs, rather than continuing along the prescribed route. Currently, this is done whenever air traffic and weather conditions permit. As there is no way to increase the use of these on-the-fly improvements to efficiency, the only way to provide incentives is to instruct controllers to avoid giving direct routes to aircraft without the new equipment. This means decreasing the overall efficiency of the NAS, and increasing flight delays for unequipped aircraft.

Lastly, differential treatment from air traffic control based on level of equipage requires the controller to know the level of equipage. This would mean an additional piece of information in an already-cluttered data-block. According to a Civil Aerospace Medical Institute (CAMI) study, the quantity of information in the display has a direct relationship to the time it takes for a controller to scan that display. Similarly, when a display is cluttered with information, it takes additional time to scan and parse out the relevant data.⁸ Therefore, adding this additional information to the data blocks will increase the complexity of air traffic control even before one accounts for the preferential maneuvering.

Human Factors Considerations for “Trajectory Management”

The FAA’s NextGen plans include increased automation and eventual self-separation of aircraft, resulting in a shift in the “traditional responsibilities and practices of pilots/controllers.” Under the proposed system, air traffic control would shift to what the FAA is euphemistically referring to as “Trajectory Management.” Essentially, air traffic controllers would discontinue active air traffic control and shift instead to air traffic monitoring and route management. This could have serious implications for the safety of the NAS.

Studies have shown that “when acting as a monitor of an automated system, people are frequently slow in detecting that a problem has occurred that necessitates their intervention. Once detected, additional time is also needed to determine the state of the system and sufficiently understand what is happening

⁸ Xing, Jing, *Information Complexity in Air Traffic Control Displays* Civil Aerospace Medical Institute, Federal Aviation Administration. September 2007.

in order to be able to act in an appropriate manner. The extra time associated with performing these steps can be critical, prohibiting performance of the very activity the human is present to handle.”⁹ Safe air traffic control depends on the ability to quickly assess situations and make split second decisions.

Training and experience would also be a serious issue in this scenario. After this changeover of duties is completed, it won't be long before the system is staffed entirely by individuals with no active air traffic control experience or on the job training. Even those who might remain in the profession and remember active air traffic control would quickly fall out of practice. Currently, controllers and managers who are working off the floor are required to work positions for 16 hours to maintain currency. Maintaining this level of currency would be impossible should automated separation become the standard. This too, would make it difficult for air traffic monitors to safely perform air traffic control functions should automated separation fail.

Research Before Rulemaking

At this stage of NextGen's progress, it is difficult to talk about near-term benefits of the system. Although this Committee is justified in looking for short-term improvements to help alleviate delays and improve capacity of the NAS, NextGen may not be the best place to look. Right now, NextGen is little more than a very ambitious research and development project. While the technology being developed may eventually produce great benefit to the system, it is misleading for the FAA to speak of plans as if the technology already existed.

For example, on January 29th of this year, the FAA published a PowerPoint presentation entitled “Delivering NextGen: Trajectory Based Operations.” This document included statements such as “ANSP uses scheduling tools and trajectory based operations to assure a smooth flow of traffic and increase the efficient use of airspace,”¹⁰ implying the availability of 4-D scheduling tools (three traditional directions plus time) that are, in fact, still in the early stages of developments. It is still unknown when these scheduling tools will be fully developed or even how they will function, yet the FAA continues to publish descriptions of how flight paths will be changed and how the new procedures will look.

To create and outline the procedures at this early stage of the development process is both disingenuous and irresponsible. The FAA is misleading its stakeholders into thinking the process is already further along than it actually is. It is also spending time, money and manpower developing procedures and plans when it is unknown precisely how the necessary tools will function. This means that FAA is either developing broad and non-specific procedures, which are largely useless except as a public relations tool, or they are developing specific procedures which will likely need to be rebuilt once the technology is available.

Conclusion

In NextGen, the FAA has undertaken a large-scale and long-term research and development project to overhaul the technological infrastructure of the air traffic control system. This ambitious undertaking has serious implications for the future of the National Airspace System and should therefore include the meaningful participation of all NAS stakeholders.

⁹ Parasuraman, R and Mustapha Mouloua, *Automation and Human Performance: Theory and Applications*. Lawrence Erlbaum Associates, 1996.

¹⁰ Federal Aviation Administration, *Delivering NextGen: Trajectory Based Operations*” January 29, 2009, pg 4.

NATCA supports the FAA's modernization efforts and is eager to be a part of the team developing and planning the technology that will bring us into the next generation of air traffic control. We look forward to working with the FAA to help them address the serious outstanding issues including human factors, equipage and redundancy concerns. It is essential for us to be included as partners in this ongoing modernization effort.