How Safe Are Our Skies: The Future of Airline Safety

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INTRODUCTION

Travel with me for a moment on a short journey. First stop: an oceanic air traffic control position at New York Center. Essential tools consist of paper flight strips, grease pencils, tissue, Plexiglas plotting boards and no radar control – a situation described by a member of the U.S. House of Representatives as "barbaric." Second stop: Houston Intercontinental Airport on June 2, 1996. Severe microbursts, torrential rain, high winds and wind shear hit the airport with no warning due to faulty equipment designed to accurately predict weather patterns. Third

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stop: Indiana's Monroe County Airport. When Midwest Air Traffic Control Service took it over February 1, 1997, it reduced the two controllers to one lone employee. Fourth and final stop: the year 2010 and the time free flight is slated to become a reality.

What is free flight? At its broadest, today's discussions of the concept describe airplanes of any shape and size backing away from the terminal gate or taking off from the smallest grassy runway and then flying to anyplace at anytime without restrictions from the ground. It is impossible to address the issue of the future of airline safety without talking about free flight. But to jump from today's ancient air traffic system described above fraught with staffing shortages and technology problems, is like transporting Fred and Wilma Flintstone, along with Dino the Dinosaur, to coexist in futuristic times with George Jetson and his family – a place where super advanced technology is a normal part of daily life. ·

Some groups see free flight as the divine answer to today's air traffic dilemmas. Others, like NATCA, take a more reserved approach. To ensure a smooth transition to free flight, several things must first occur: equipment must be modernized, additional controllers must be hired, the Federal Aviation Administration's quest to contract out air traffic control facilities must stop, and human factors must always be taken into consideration. Primarily, in all stages of free flight, safety must remain paramount.

DEFINING AND UNDERSTANDING FREE FLIGHT

In October 1995, the RTCA, a not-for-profit corporation formed a 225-member task force of which NATCA was a member, and produced the most comprehensive free flight study to date. The report included 46 recommendations. After analyzing the document, the FAA must have been impressed. By 2010, the agency said it wants a seamless air traffic management system, with, at least by implication, goals of free flight included in it and most RTCA recommendations completed.

RTCA officially defined free flight as, "A safe and efficient flight operating capability under instrument flight rules in which operators have the freedom to select their path and speed in real time. Air traffic restrictions are only imposed to ensure separation, to preclude exceeding airport capacity, to prevent unauthorized flight through special use airspace, and (otherwise) to ensure safety of flight. Restrictions are limited to extent and duration to correct the identified problem. Any activity which removes restrictions represents a move toward free flight."

RTCA Task Force 3 adopted 10 guiding principles to guide us on our journey toward free flight. Among them: ensure the transition does not compromise safety; emphasize the need for collaborative planning; ad-

dress human factors during all stages of development; assess benefits prior to implementation whenever possible; and consider end-to-end impact and benefits when planning improvements. If these models are followed throughout the free flight progression, we will be on the road to the future. If not, the destination is disaster.

FUTURE TRAFFIC INCREASES AND STAFFING SHORTFALLS

Free flight seeks to resolve how to handle the nation's expected air traffic increase of at least 40 percent in the next eight years. FAA projections foresee a 64 percent surge in the number of U.S. passengers by 2005, and the amount of flights will rise 38 percent at the nation's largest airports. More than one billion passengers will be flying by 2013.

Using today's rate, the projection is, by the year 2010, accidents worldwide could increase to one jet transport hull loss every week. This figure is a projection from the five-year period from 1989 to 1993, taking into consideration an expansion in the number of aircraft in the skies.

The air traffic system is approximately 3,000 air traffic controllers short of what is required to handle the current volume of traffic. And it's getting worse. Air transit quantity in the United States has increased 36 percent in the past 15 years, yet we have approximately 2,000 fewer controllers today than 15 years ago.

NATCA daily informs Congress of the immediate urgency to hire additional controllers due to drastic understaffing. Recently, our efforts paid off when senators and representatives authorized the hiring of 500 additional controllers. While this represents a great start at building a sufficient pipeline, it is not nearly enough. We need, at the very least, 2,000 employees right now and should currently be training 1,000 to 2,000 per year. Some of these are required to account for the 80 percent of controllers who will be eligible for retirement after the turn of the century.

If and when free flight becomes a reality, even more personnel will be needed. At least several hundred controllers must be available annually for testing and validation of equipment models to train on free flight oriented technology as it is phased in, such as Display System Replacement or the Standard Terminal Replacement System. These assignments will require they be pulled off air traffic positions, leaving an already understaffed work force to pick up the slack.

EQUIPMENT AND TECHNICAL TRANSITIONS

A second question free flight seeks to resolve is how to bring an aging air traffic control system—much of it 50 or more years old—into the 21st century. Free flight, the concept, provides the means for transi-

tion to a mature air traffic management system. Benefits-driven and time-phased, its advantages over the existing band-aid approach to air traffic control will accrue from greater flexibility. But, before the level of versatility envisioned in free flight can be accomplished, controllers must have highly sophisticated automation tools to assist in the identification of aircraft conflicts.

While it's unclear how each piece of equipment will fit into the big picture, one thing is certain – integrated technology is desperately needed. This system of the future cannot coexist with ancient relics of the past.

The good news is several new pieces of technology are currently in development. The Center TRACON Automation System is a series of tools and concepts intended to improve air traffic control efficiency at busy terminal radar approach control facilities, as well as their counterparts in en route traffic control centers.

The Future Air Navigation System is a moving target and considered a platform for other free flight technology. Present navigation options in aircraft are capable of doing much more than the current navigation system requires of them. The FANS concept includes tools for precision spacing between and among aircraft as well as probes that help pilots and controllers predict conflict points.

The Global Positioning System provides instant position information to a special GPS receiver. The technology provides more precise positioning than present ground based radar, and it can work in a variety of ways for pilots and controllers, from take off to landing.

Particularly worrisome are two key systems scheduled for deployment in the near future: Display System Replacement (DSR) and the Standard Terminal Replacement System (STARS). DSR will provide new displays and computers for controllers working in en route centers while STARS will do the same in terminals. The bad news is both are designed to monitor air traffic, not separate and organize large quantities of aircraft into a good organized flow. This is problematic because any step in the next journey to free flight is dependent upon more productivity and increased capacity throughout the system. DSR and STARS, in their present condition will not enhance productivity and/or capacity, but reduce both. The same hold true for many future concepts.

But, we may not have to worry about STARS debilitating effect – the equipment may not make it out of the starting gate if it continues on its current path. Due to neglect of human factors issues in STARS development and skyrocketing costs, Rep. Frank Wolf, R-Va., has called for an Inspector General investigation of STARS. Representative Wolf states, "I find it incredible to believe that the FAA may not have learned one of the fundamental lessons of the Advanced Automation System debacle –

that air traffic controllers must be involved in automation design and human factors issues,"

And even if technology is compatible, the delay in equipment unveiling is years from now. For example, the current mainframe host computer is not due for replacement until 2005 – a certain obstacle to any movement toward advanced free flight.

Assuming there was no such concept as free flight, new equipment would still be an immediate necessity. Controllers cannot continue to work with unreliable 1960s technology. The margin of air safety must not continue to be diminished by equipment failures and unreliability. A perfect example is the aforementioned Automated Surface Observing System malfunction in 1996. The equipment reported good weather all around. So you can imagine controllers surprise when 80 mph winds struck. Luckily, quick thinking and good coordination by all involved diverted dozens of inbound aircraft and consequently averted a disaster.

Stop for a minute and imagine you are sitting on your front porch enjoying a beautiful night filled with "good weather all around." Then out of nowhere, the winds pick up and quickly increase to 125 mph, the rain begins, beating so hard it makes your skin sting. As you race in the house to tape your windows so they don't smash from the wind pressure, you think, "How could a hurricane strike with no advance warning." If this situation were to ever occur, it would be similar to what controllers cope with due to the unreliability of ASOS. Fortunately for the public, the National Weather Service has advanced weather mechanisms. Unfortunately, controllers do not have similar equipment in the control room.

Now imagine you are a controller at Washington National Airport. You're working traffic on Aug. 5, 1997, when suddenly the airport's main radar system fails for one hour. This comes one day after lightning struck the main radar, knocking it out for two hours. Unfortunately, the airport's radar system was not part of the facility's recent $1 billion renovation.

The FAA's antiquated computers and power supplies have broken down dozens of time in the past few years at the nation's busiest air traffic control facilities. During these breakdowns, controllers often carry slips of paper around darkened control rooms or invent other ways to communicate with each other and pilots. Obviously, one way is to keep planes in the air or on the ground until computers come back online, translating into lost time on runways, in holding patterns in the sky or airport lounges. Passengers frequently assume most of 20,000 or so flight delays per year are attributable to bad weather, broken down aircraft or electronic flaws. In actuality, delays are largely due to the sum and total of a badly managed air traffic system.

Air traffic controllers seem to have an innate ability of detecting faulty technology and equipment. We recognized the $3.5 billion Advanced Automation System as a flop. We also saw flaws early on with ASOS. In these circumstances and several others, equipment was developed without input from controllers. If we were an active player in technology development, these problems could have been avoided. Let's not see a repeat of the Advanced Automation System occur with free flight. All involved parties must remember controllers are a vital part of the air traffic system and must be consulted in *every* stage of the free flight progression.

CONTRACTING OUT OF AIR TRAFFIC CONTROL SERVICES MUST BE STOPPED

Although free flight in its very innate stages may have already begun, the concept truly will not be fulfilled for years to come. But, another trend of the future is already occurring. And in contrast to free flight, the contracting out of air traffic control towers, must be stopped.

The National Air Traffic Controllers Association is opposed to contracting out, a product of recent efforts to reinvent government. Opponents believe service is decreased and cost savings (if they do exist) are at the expense of public safety. We do not believe in a bottom line orientation over safety and quality. Although its proponents claim contracting out is inexpensive, this contrasts several General Accounting Office studies showing contracting out of federal services is often more expensive. One report stated, "Reliable information does not exist with which to assess the soundness of savings estimates." In another report, GAO found substantial savings could have been achieved, if the work had been kept in house.

Contract controllers also don't have to follow all the air traffic control union work rules and agreements, meaning the tower can operate with fewer people. Here is where cost saving will be realized. But take into consideration, these fewer people are working longer hours, possibly with fewer or no breaks and for lower pay. Look at what happened at Indiana's Monroe County Airport when Midwest, a private contractor, took it over. The company reduced the two controllers to one. But, it didn't stop there. The controller was also placed in charge of overseeing tower operation and maintenance, work previously done by the FAA manager. Need another example? When the airport in Appleton, Wisconsin, was contracted out in 1995, the previous eight controllers were reduced to three.

Let's use the power of imagination once again. Picture yourself as a controller at Appleton during the Oshkosh Air Show. Although opera-

tions more than double to over 3,000 during the event, the same number of air traffic controllers staff the control tower. This means you may be working as much as 25 to 50 planes at a time – alone. If you have to use the restroom – hold it. If you're hungry – deal with it. If you're tired – wake up. There's no one here to relieve you.

You may be thinking, "Although traffic may be heavy, I can handle it, I've received years of training." Think again. The FAA conducts a rigorous training program which could last up to three years at some facilities. But, when compared to the minimal instruction administered at contract facilities, the difference is frightening. Midwest only requires controllers to satisfy up to 70 hours of training. That's the maximum number of hours. The minimum is 18. This training deficiency most definitely reduces the margin of safety.

Some believe contracting out is a hint of full scale privatization of the FAA. NATCA will vehemently oppose these efforts. We will not allow Congress or the FAA to further chip away at safety margins. The FAA is a perfect example of how dollars and cents rule decision making. Public safety should never be secondary to a primary goal of generating profits, the driving force of private enterprise.

Other proposals exist aimed at some sort of FAA reorganization. The question stands: Should the air traffic system and the FAA remain within the Department of Transportation, become an independent agency, a government corporation or private company. Before a solution is found, the "family" of interested parties must fully debate in an open forum facilitated by an unbiased moderator. NATCA's concern is that such an exchange has not existed and, to date, does not.

Based on previous proposals, NATCA prefers the federal corporation, believing it best merges the entrepreneurial and innovation of business with the government's clear responsibility of placing safety above profits, competition or compelling interests of users. A federal corporation offers an ability to fund the system without going through the congressional appropriations process by taking it off budget. It allows the corporation to leverage debt. Not many successful companies operate out of their own pockets; why should any organization charged with raising billions of dollars a year to ensure the most advanced, sophisticated air traffic control in the world? Long term planning including research, development, implementation, modifications, as well as funding are essential, as is a strong, objective arm of public watchdogs armed with authority to enforce safety regulations. A federal corporation most appropriately addresses these three prongs.

HUMAN FACTORS AND SAFETY CONSIDERATIONS MUST REMAIN PARAMOUNT

NATCA will push hard for restructuring because it would directly benefit the flying public, air carriers, controllers and other employees by bringing about a more modern, efficient and ultimately safer system. But, in any debate about reconstruction of a federal agency, people must be remembered. The same holds true for the journey toward free flight: The people working the system daily must not be cast aside.

In free flight, air traffic controllers must remain the decision-makers even as free flight fanciers take the concept to its most outlandish limits. Today, controllers are given a piece of equipment and told, 'Make this work.' This mindset must be changed and human factors need to be placed at the top of the priority list. This is important now and will be increasingly vital as we proceed on the free flight journey.

Officially, NATCA supports the free flight concept and joins with other aviation leaders in exploring ways to meet its goals: more efficient operations that save taxpayers, passengers, airlines or other users time and money. However, NATCA places safety first, well ahead of lucrative gains sought by airlines. Free flight is just one component in a multifaceted, complicated set of issues, all leading to one goal: ensuring the highest levels of safety. We can create the most advanced technological solutions, but, if we ignore the people who hold the system together – controllers, engineers and technicians – we will fail.