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A Conversation With ... Enrique Beltranena, Volaris Chief Executive Officer and Managing Director

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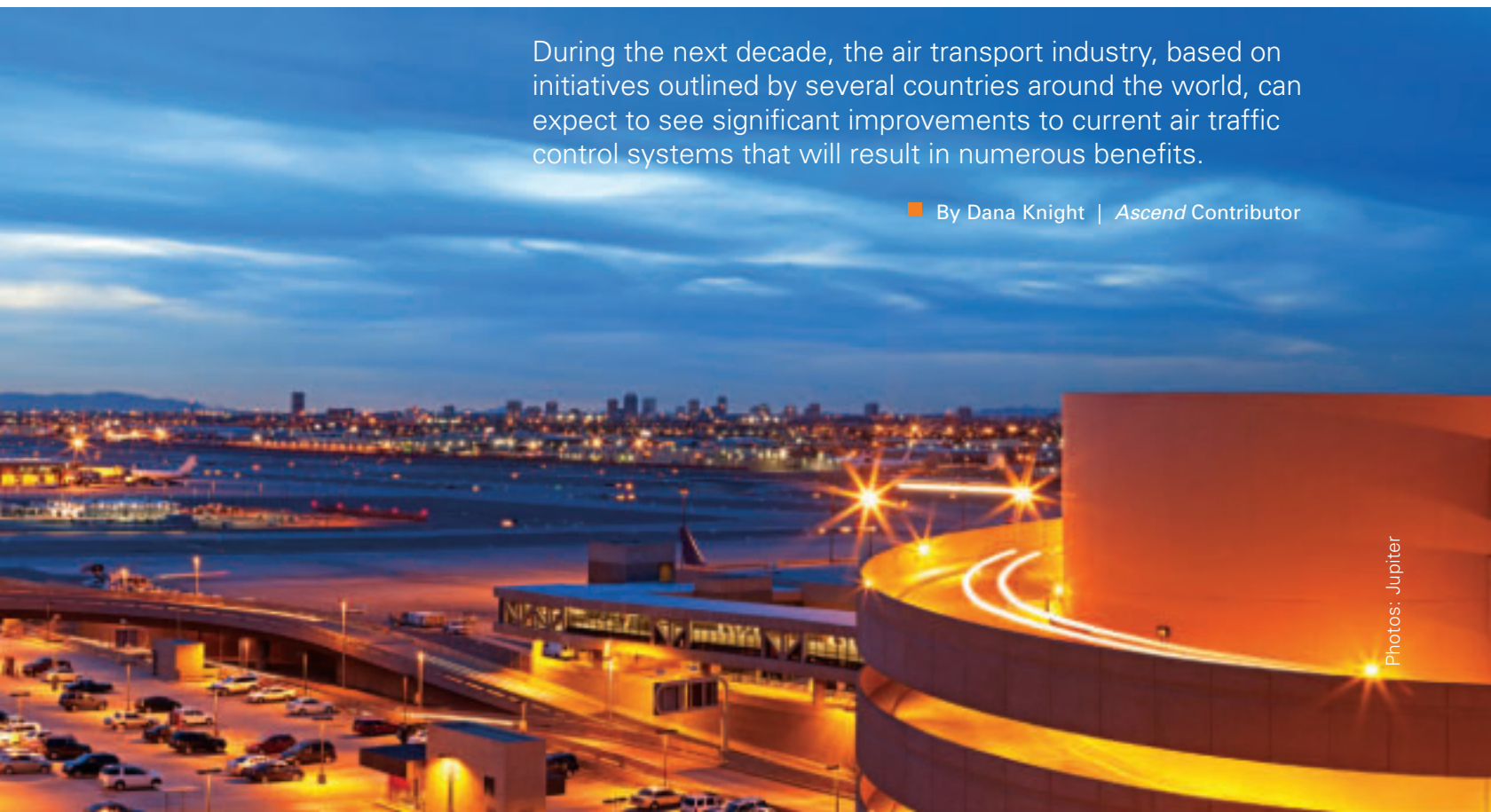
During the next decade, the air transport industry, based on initiatives outlined by several countries around the world, can expect to see significant improvements to current air traffic control systems that will result in numerous benefits.

By Dana Knight | *Ascend* Contributor



Photos: Jupiter

Three initiatives — NextGen and NowGen in the United States and SESAR in Europe — are in various states of development as the world searches for a better way to move people by air to where they want to go, when they want to go, in the least amount of time.

To a large extent, aircraft continue to follow the same "highways in the sky" that have been in existence for decades. The GPS navigation system in an automobile today is far superior to the technology that many aircraft currently use to navigate airspace in North America. Some of the emerging technologies being explored and developed to enhance future air traffic systems include system-wide information manager (SWIM), automatic dependent surveillance-broadcast (ADS-B), multilateration and trajectory-based planning. These terms will increasingly become familiar as this technology moves from concept to reality.

NextGen

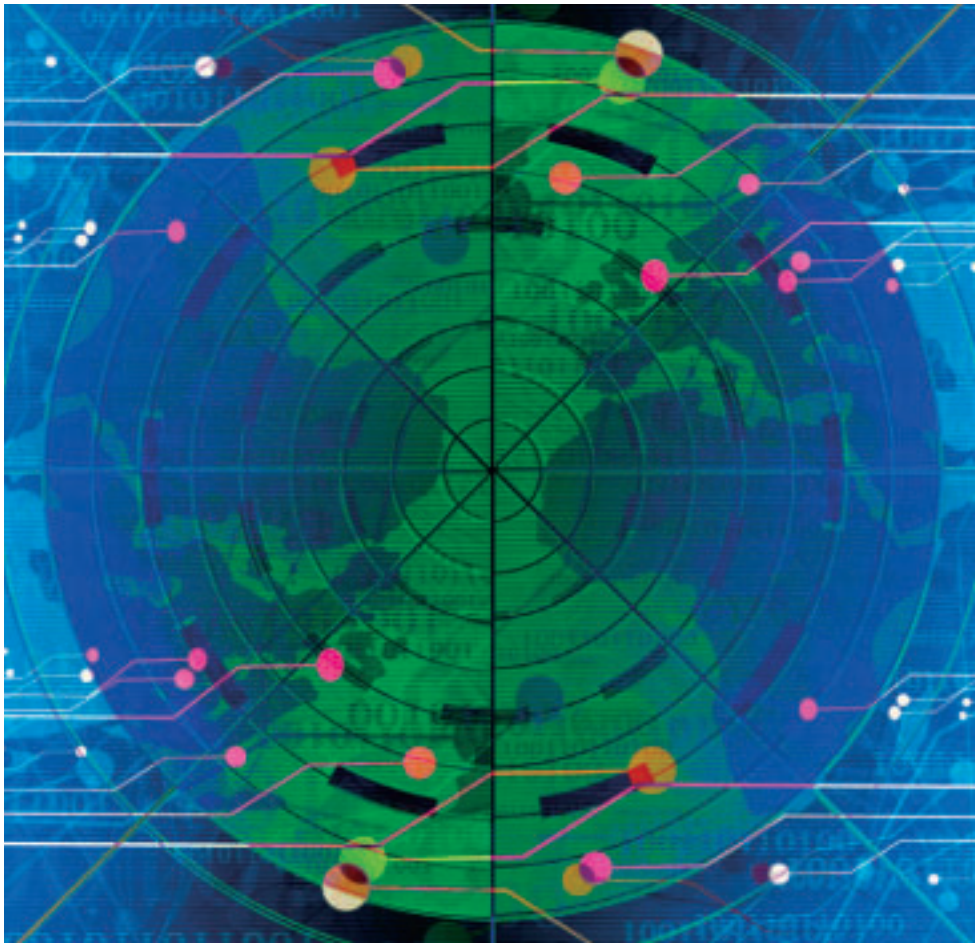
The realization that the air traffic control system needed an overhaul started during the first years of the century. Then in 2007, the term NextGen began to be widely used as the U.S. Federal Aviation Administration started discussing the major overhaul planned for the U.S. air traffic control system. The primary focus of NextGen is to shift from ground-based navigation and surveillance systems to a satellite-based system.

Today, air traffic controllers use traffic management initiatives to reroute or delay aircraft to manage demand with limited capacity resources. In the ultimate end state of NextGen, operators, such as a scheduled airline, corporate flight department or aircraft charter company, that use the ATC system will be more responsible for de-conflicted trajectory-based planning as there will be massive sharing of data between ATC and operators via SWIM. Schedules will be built far in advance that will consider all imposed limitations. As the actual day of operation approaches, additional adjustments will be made based on prevailing conditions to ensure as few disruptions to the schedule as possible.

These were the grandiose ideas that were initially presented when NextGen was first discussed. Airplanes would fly where the operators wanted them to fly, there would be no flight delays and air traffic controllers would know where all aircraft were at all times because they would be in constant communications via satellite. The unanswered question was how and when could air traffic nirvana be achieved? The date that was floated was 2025 with no phased-in approach conceptualized or at least communicated. The general perception was that there would be a technological miracle, and everyone would wake up at some point in 2025 with airplanes navigating via space-based navigation aids, there would be no more ATC delays and the world would be a happier place.

Initially, the U.S. Joint Planning and Development Office was tasked with bringing NextGen to fruition. There were initial meetings held with all concerned parties, but the process was not moving quickly, if at all. Although the JPDO is still ultimately tasked with making NextGen a reality, the FAA formed a task force to put the process in motion. The task force enlisted the expertise of a broad segment of operators from airline, charter, corporate and general aviation as well as government and industry personnel to come up with a plan on how some benefits could be realized before this magical day in 2025. In mid 2009, this diverse group committed a lot of time and energy to produce a plan that would result in some tangible benefits. There were guiding principles, and the task force was committed to:

For decades, aircraft have followed the same "highways in the sky," but promising new technologies that will include SWIM, ADS-B, multilateration and trajectory-based planning are expected to result in numerous operational benefits for industry operators.



Initiatives, such as Europe's SESAR and the United States' NextGen and NowGen, will bring much-needed change to an air traffic control system that needs a complete overhaul to catch up and keep pace with the future direction of the industry.

- Foster collaboration and consensus on critical NextGen issues between now and 2018;
- Focus on maximizing NextGen benefits and facilitating a business case for industry investment;
- Provide recommendations on strategies and means to maximize benefits, strategies to encourage equipage, and policies and other means to implement governing principles.

NowGen

Last September — stemming from the question, "How can we get to NextGen now?" — in a report the task force delivered to the FAA, the term NowGen was introduced. The report highlighted some relatively dramatic objectives that, prior to being released to the FAA, went through an assessment (acid test) to ensure the feasibility of implementing a particular item and its potential value. Possibly more groundbreaking were the "sponsors" who agreed to take on the implementation of particular tasks if the opportunity were available to them. For instance, Alaska Airlines, American Airlines, Continental Airlines, Delta Air Lines and others have agreed to test new procedures at Port Columbus International Airport, Dallas Love Field, Fort Lauderdale-Hollywood International Airport, John F. Kennedy International Airport and other select airports to enable more simultaneous approaches to parallel runways. If this carefully controlled test proves as expected, there will be a ripple effect of decreasing delays throughout the National Airspace System once the concept is put into operation.

The task force brought forth some interesting points that potentially make one pause and wonder why some things are as they are. For instance, parallel runway approach procedures that enable simultaneous approaches to multiple runways are based on the capabilities of man and aircraft 20 years ago. The term "blunder assumption" — an incorrect assumption that leads to a sizeable mistake — is accepted as part of this particular current procedure. There is enough leeway in the specified procedure to account for possible errors on behalf of interested parties executing or controlling the procedures. Regardless of other issues that are wrong with the system, aircraft operating in the system are technically more advanced than they were 20 years ago, and the people operating them and the air traffic controllers guiding them are better trained so the blunder assumption can probably tighten up without compromising safety.

There are several other current processes and procedures operators currently endure that could be tightened up to realize some operational benefits without making major infrastructure or equipage changes.

This naturally led to a discussion about the fact that at some point operators using the U.S. National Airspace System must invest in aircraft equipment to fully take advantage of the benefits that NextGen technology will afford. There will be a push, in the not too distant future, for economic incentives for operators to invest in necessary equipment. This will undoubtedly be in the form of low-interest loans or other incentives such as income tax credits, reductions in fuel taxes or user fees. The concept of "best-equipped, best-served" (BEBS) is also part of the overall plan to encourage operators to participate. Under this concept, operators that have equipped their aircraft with the technology will be afforded as yet undefined, higher levels of service.

With the current state of the airlines still in a mode of scaling back, it begs the question, "Why pursue this now?" Delays are not gone by any stretch of the imagination, but with the reduced traffic and investments in airport infrastructures, the delays are far less than they were mid-year 2008.

The best analogy is that if the FAA waits to start fixing the ATC system at the time of maximum delays it will be like trying to change the wheels on a moving vehicle … it is as next to impossible as one can imagine. This current period of reduced operations is the exact time for this undertaking. Other countries, such as Australia, are already ahead in this area, and the United States needs to do everything possible to keep pace. NextGen is estimated to cost US$20 billion, and hundreds of millions of dollars have already been allocated to fund various research initiatives and key infrastructure developments such as the ADS-B network.

SESAR

As with the U.S. ATC system, Europe has acknowledged that the air traffic control system is in dire need of revitalization. In 2004, the Single European Sky initiative was launched with the hopes of harmonizing Europe's air traffic system. This was further refined in 2007 with the establishment of the Single European Sky ATM Research (SESAR) initiative that is the technological dimension of the Single European Sky. It will help create a paradigm shift, supported by state-of-the-art and innovative technology. The SESAR Joint Undertaking is a body of members that was created in February 2007 under European Community law. EUROCONTROL and the European Community are the founding members and will manage the SESAR development phase.

In many respects, the SESAR project is ahead of NextGen from a planning standpoint. Whereas NextGen is really focused on the technology to improve the system in the form of ADS-B, Multilateration, SWIM and other technology solutions, SESAR is more focused on the fact

that information sharing and planning are just as important as the systems.

The key to the SESAR concept is the "business/mission trajectory" principle in which airspace users, air navigation service providers and airport operators define together, through a collaborative process, the optimal flight path from gate to gate. What does that mean? Operators will submit their planned schedules at the time they are conceptualized and provide continual updates to the day of operation.

SESAR has been broken into three phases: definition, development and deployment.

Definition Phase

The definition phase ran from 2005 through 2008 and produced the SESAR ATM (air traffic management) master plan. Stakeholders of ATM identified the future needs of aviation and conceptualized the actions from research to implementation that will be required to implement SESAR.

Development Phase

The development phase will run through 2013. This is, by definition, a feasibility study. Some long-term results of this phase will produce criteria and requirements that will be further validated and consolidated during the next SESAR phase. During the early stages of this phase, the SJU has broken up the development phase into a series of work packages, numbering more than 15, that "slice and dice" the core areas of the SEASAR master plan that will need to be addressed. Four main threads of WPs have been identified: transversal, operational, SWIM and system threads with work packages ranging from WP1 that is program management and support to WP8 and WP14 that cover the information management that will be part of SWIM requirements. There are individual companies as well as consortiums that are hard at work to produce:

- Required operational procedures and preparation of an implementation process,
- Operational/technological research and validation,
- Large-scale validation activities for mature concepts and solutions such as real-time simulations and flight trials,
- Prototypes required for pre-operational validations,
- The provision of material to support standardization and implementing rules,
- The development, upgrade and integration required for the validation infrastructure, methods and tools,
- The performance assessment (operational and system) including the cost benefit analysis.

Deployment Phase

The third and final phase of SESAR is the deployment phase that will run from 2014 through 2020. This phase includes the large-scale production and implementation of the new air traffic management infrastructure that will approach the same nirvana state expected in the United States in 2025. This infrastructure is expected to comprise fully harmonized and interoperable components guaranteeing high-performance air transport activities in Europe. Key performance indicators include:

- Enable a threefold increase in capacity of the ATM,
- Improve safety by a factor of 10,
- Reduce the environmental impact per flight by 10 percent,
- Cut ATM costs by 50 percent.

Around The World

China has announced plans to overhaul its air traffic control system that will most likely take the region down a similar path as Europe and the United States.

Australia, with its privatized air traffic control system in Air Services Australia, has unceremoniously been deploying ADS-B so aircraft can be tracked while over the vast stretches of uninhabited territory of the continent. ASA is also rolling out a ground-based augmentation system that is a satellite-based precision approach and landing system. It augments GPS signals to provide aircraft with very precise positioning guidance, both horizontal and vertical, which is especially critical during the approach and landing phase of flight. This allows a safer, more efficient descent and landing.

Regardless of the different approaches being taken by those governing the world's air traffic control systems, at some point all these initiatives will need to converge as aircraft operators cannot be expected to have vastly different equipment to navigate from country to country. SESAR and NextGen have formalized agreements to assure this and ICAO is, of course, keeping a watchful eye on all developments.

The main question at this point is whether or not these initiatives will come to fruition. History shows that some programs and initiatives start up and never take hold by the larger industry but rather are only adopted by a small sector of the community. ADS-B is definitely a reality and areas such as the Gulf of Mexico in the United States and open areas in Australia are now tracking aircraft that previously couldn't be tracked via radar.

Going forward, will ATC systems be able to accommodate double or triple the number of operations that now cause gridlock? There are skeptics, of course, but some benefit can be expected by migrating from ground-based technologies the industry has been relying on since the 1960s.

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+count it up

210 million
The number of passengers served through *Sabre® AirVision™ In-flight* last year, equal to serving the fifth-largest country in the world behind China, India, Indonesia and the United States.

1927
The year in which the first concrete runway was built in the United States, by Henry Ford.

841
The record, held by Edward Shackleton, for piloting the most aircraft types.