

AirTraffic

STRATEGY, TECHNOLOGY AND MANAGEMENT FOR THE WORLD'S MOST GLOBAL INDUSTRY

Management

MAPPING NEXTGEN

RTCA'S TASK FORCE 5

NORM FUJISAKI

NEXTGEN: COMING
TOGETHER AS A
COMMUNITY

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TF5 ROUNDTABLE

THE TECH PROVIDERS

IRISH AVIATION AUTHORITY

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NEXTGEN TECH NOW

Air Traffic Management asked leading technology providers for their views on the significance of RTCA's recommendations to the FAA – probing potential obstacles, implications for long term implementation of new technologies such as ADS-B and, naturally, what weapons from their armouries they are honing now.

TF5: the tech providers air their views

■ Bill Colligan

Vice president, Era systems Corporation

■ Ken Kaminski

Vice president of Advanced Development, Sensis Corporation

■ Mike Ball

FAA account manager, Northrop Grumman

■ Jack Kies

President, Metron Aviation

In your opinion, what do the RTCA Task Force 5 recommendations mean, relative to NextGen? Why are they significant?

Jack Kies, Metron

The TF5 recommendations are the clearest message, to date, that the airline industry and other National Airspace System (NAS) stakeholders require near-term FAA actions that translate into greater system efficiency.

I attended an Air Transport Association industry and partners meeting recently, and the message that echoed throughout the briefings was that if an airline is expected to purchase avionics or any other equipment in the near-term, it was not going to happen.

Recently, US Airways released a letter written by CEO Doug Parker, to DOT Secretary Ray LaHood, suggesting the best thing the department can do for aviation is to “do no harm.” He went on to say that not imposing any new taxes, fees or unfunded mandates, as well as

allowing the industry to make rational business decisions and to take actions, such as self-help mechanisms, is the best way to proceed.

Concerning the latter, he said this could include a broad spectrum of initiatives, but most visibly, “trading or selling assets to allow more productive use, the formation of alliances or joint ventures and mergers.”

Parker also said that while US carriers are expected to rebound in 2010, they have no extra money for additional investments, such as NextGen. He said that although the industry is supportive of NextGen, “if the cost of deploying NextGen has to be covered by even higher taxes or fees imposed on the airlines, we prefer to live without it at the current time,” because the industry “currently lacks the financial wherewithal to finance costly projects like this.” I suspect if Parker were the only industry CEO espousing this, there would be room for doubt. But we're seeing an industry clearly in crisis.

The TF5 recommendations are an amalgamation of many, many industry members, and its recommendations are clear – change can and should occur in the near-term, improving on the current system as we transition into NextGen, without cost to system users. TF5 has little in the way of any additional user cost associated with its recommendations.

Bill Colligan, Era

The TF5 recommendations emphasize the need for NextGen technologies to be deployed as quickly as possible in order to

“We're seeing an industry clearly in crisis”

initiate a systemic change in the US that is required in order for us to remain competitive on a global basis.

Many of the recommendations refer to practices and technologies that are quite common outside the US, including common situation awareness, surface CDM, RNAV/RNP, etc.

TF5 also recommended that benefits be achieved, quantified and validated every three to five years in order to demonstrate the economic imperatives to the stakeholder community.

The recommendations are significant in that they represent the most plausible plan offered to date for implementing substantive advances in the air transportation system.

Ken Kaminski, Sensis

The task force recommendations have identified the near term benefits of importance to stakeholders in the national airspace system, have highlighted significant obstacles which currently stand in the way of implementation, and have defined actionable steps which can be taken immediately.

They have shifted the focus from new systems and technologies to the policy, procedural, and organizational changes necessary for significant improvements in performance to be realized with existing systems and technology.

By doing so, the task force has made the concept of NextGen a little less

abstract and has provided the framework for the business cases which will enable stakeholder buy-in during the critical early phases of NextGen implementation.

Mike Ball, Northrop Grumman

The RTCA TF5 recommendations represent a pragmatic approach to energizing progress on NextGen.

It is clear that aircraft equipage is the key to NextGen and SESAR.

Under current practice, the decision to equip with the various required avionics involves individual decisions by thousands of fleet or individual aircraft owners.

By seeking detailed user inputs on their perceived issues and focusing the recommendations on specific solution sets, the report has generated a lot of commitment from users and FAA as well as significant interest from Congress.

The significance of the recommendations is that they are backed by detailed analysis of the steps that must occur to actually implement specific capabilities.

What obstacles might stand in the way of implementing the report's findings?

Bill Colligan, Era

Significant obstacles include funding, equipage, and resistance to change. The US airline industry has lost tens of billions of dollars since 9/11 and implementing change requires investment. To get the industry to invest in NextGen technologies will require the building of a solid value proposition.

The TF5 report touches on a number of different plans for incentivizing airlines and aircraft operators to adopt NextGen technologies but many of the group's recommendations require nearly 100% compliance in order to achieve substantial systemic benefit.

The concept of best equipped best served works only in certain situations where one aircraft can be singled out for specific advantages not provided to others. This may work in severe weather landings but is not helpful on the surface when large queues of departing aircraft are in single file waiting their turn to depart.

It may be very difficult, expensive, and counterproductive to design a system that provides substantial benefit to the best equipped aircraft as opposed to small benefits to all. Individual stakeholder's business models may become an obstacle to implementation as well.

The current system may not be optimal but it is what the industry knows and trusts. TF5 made a number of recommendations related to operational issues aimed at

increasing throughput at airports with non-optimal runway layouts.

These types of changes could be the most difficult to implement as they directly relate to safety issues (more aircraft closer together), introducing risk into a well-established, reliable, and proven system.

The resistance to change comes into play when an advocate tries to convince the industry that it is possible to increase safety while simultaneously increasing capacity and efficiency and was identified as a significant challenge by TF5.

Jack Kies, Metron

There are a number of well-meaning, “can do” performers in and around the FAA, all of whom are forward-thinking, with the best of the system and its users in mind. I believe the biggest challenge is to get our best people, our best teams focused on what can be done now. There is ample opportunity to affect positive change in the way the current system operates, and without an appreciation for that, getting to NextGen and the TF5 recommendations will be difficult.

The first recommendation suggests a serious focus on surface operations. Without a doubt, this is an area rife with near-term opportunities that would pay enormous dividends to system users. We learned a valuable lesson when Collaborative Decision Making (CDM) first occurred in 1994. Transitioning from OAG data to real-time information exchange, shared by the airlines improved system performance during Ground Delay Programs (GDP) dramatically. We not only improved the accuracy of the numbers of aircraft going to airports, but found that we ran fewer GDPs, and when they were run, with shorter delays.

There is real value for the system in listening to all stakeholders, from the airlines to ramp tower operators, to airport operators, to the service providers. We need to leverage each element, bringing the whole to bear on the problems, as opposed to a piecemeal approach.

Changing the culture of each of these organizations is the biggest roadblock we'll face. The current disjointed surface efforts at many of our major airports beg for information and greater system connectivity.

The delay reporting rules are an example of this lack of connectivity. The FAA does not count minutes of delay from gate pushback while in a non-movement area, rather the clock starts when an aircraft is at the “spot” (the location where ramp control hands off to the FAA tower).

A significant, positive contribution to the passengers could be made if each service provider (gate agent, ramp and

ATC tower) were collectively responsible for the total time between pushback and wheels up. The current disparity is often dramatic, and the only ones who know the real delay, are those on the airplane.

This gap must be addressed. We must get back to basics and reduce the reliance on the well meaning engineers building future technology, when a few simple procedures and accountability would clearly do the trick.

Mike Ball, Northrop Grumman

The biggest obstacle to implementation of the recommendations is well meaning, but unfounded objections raised by various parties who have not fully read the recommendations.

Related to this is the concern that there is a lot of detail to be absorbed by FAA.

The report does recommend some changes in priority. So any party to the overall modernization who chooses to focus on their “stovepipe” or their product/technology can become an obstacle to implementation.

The current discussion of how to incentivize equipage is also a critical area for success.

Ken Kaminski, Sensis

The most significant obstacle may be insufficient funding to accomplish the near term objectives of the recommendations while simultaneously supporting progress on the long term system and technology developments needed in the coming decade.

The time involved with writing and revising operational policy and procedures and conducting the necessary training will also slow the realization of the near-term improvements.

Broad-based public support will be needed to obtain the necessary funds and also to overcome obstacles which are outside the direct control of the FAA or aviation community, such as the likely need for Environmental Impact Statements when making some of the changes recommended in the report.

The report is focused solely on deriving benefits from existing equipage and technology. What implications does this have for long-term progress on ADS-B and other new technologies?

Mike Ball, Northrop Grumman

The report does focus on NowGen Next, but not solely on deriving benefits from existing equipage.

The key argument of the report is that achieving real capabilities will build the confidence needed for decision makers to equip with requisite avionics.

In fact, there are several recommendation sets which have an early recommendation that does leverage existing equipment but also have next steps that require new equipment and even longer term steps which complete standards development for the next phase of equipment.

This report will help achieve operational capabilities which will sustain and increase support and equipment for all the NextGen elements, to include ADS-B, datalink, etc.

Ken Kaminski, Sensis

Near term success is the best foundation upon which to build for the long term. Getting and keeping stakeholder buy-in throughout the various phases of NextGen implementation requires achieving a series of incremental successes (realized performance improvements that match or exceed the postulated business cases).

Successful implementation of the report's recommendations should aid in the creation of business cases which support long term system and technology rollouts.

Jack Kies, Metron

In the long-term, there won't be any significant implications. If the kind of change TF5 has asked for is delivered, it will be far easier for the FAA and industry stakeholders to embrace the business cases necessary to make maximum utilization of ADS-B and other new technologies.

Rushing headlong into buying new technologies while anticipating the benefits has been done before and it wasn't successful, and won't be embraced again.

The FAA will have to clearly demonstrate a ROI for those who would have to invest in fleet upgrades, along with a surefire implementation plan. There are opportunities to better serve segments of the fleet, for example, international North Atlantic operations. These aircraft are already the best equipped and should receive the best possible service.

That may mean a new sense of prioritization, giving these operators unbridled airspace access, that is to say, afford airspace corridors just for their use to expedite their arrival, precluding extended routings and vectoring from competing interests.

There are a significant number of arrivals and departures accessing the Tracks System everyday. For these relatively short time periods we can and should look at providing a higher priority to these operators. This activity is little more than a procedural change, and clearly an early achievable activity. It would open the door for additional ideas



Jack Kies, Metron Aviation
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and practices, while improving system performance along the way.

With each step toward NextGen, we have an opportunity to discover additional building blocks and technological improvements that make good business sense for the system user, as well as developing a committed implementation plan for the service provider.

Bill Colligan, Era

In his message, TF5 Chairman Stephen Dickson describes the role of "NowGen" as a transition step required to prove the benefits of NextGen while increasing stakeholder confidence in the technology.

This cautious approach of learning to walk before you run has a number of benefits that can only help lead to a full transition to NextGen in an industry that is historically resistant to change due to the supreme cost of failure.

The only drawback with this approach may be that if the industry perceives walking as good enough, the transition to running may never occur. But what is the alternative? Never taking the first step?

TF5 sees "NowGen" as the most likely path to NextGen and the implications are that if you want to get to NextGen, you must start now.

The RTCA recommendations seem to emphasize the most acute problems (e.g. surface) in the most demanding areas (large metropolitan area airports). What could your company or organization do to help relieve congestion and reduce delays in New York or Chicago, using existing technologies and based on current aircraft equipment?

Ken Kaminski, Sensis

Sensis offers a suite of sensors and auto-

mation tools which can provide the situation awareness, operational insight, and decision aids necessary to relieve congestion and reduce delays at major metropolitan airports. In fact, some of our products (ASDE-X, Aerobahn) are currently in use at JFK by all primary stakeholders – the FAA, the airlines, and the Port Authority – and have demonstrated their ability to aid in improved efficiency and reduced delays.

In addition to the important role it plays in the safety of operations on the airport surface, Sensis' ASDE-X system provides the surveillance data necessary to actively manage and improve such operations. It gives an operator the type of detailed knowledge of what is happening on the surface that is required to make more effective decisions.

Sensis' Aerobahn combines operational information, such as flight schedules, with the exact location and identification of aircraft and vehicles on the surface of the airport for a real-time, comprehensive view of surface operations. This information enables users to proactively reduce taxi times for greater fuel savings and less environmental impact, facilitate on-time arrivals and quickly recover from inclement weather operations for an improved passenger experience.

Aerobahn enables users to observe departure queues, view actual arrival demand and contrast the demand with available gates for arriving aircraft. All events are recorded for future playback, providing users with the ability to identify trends, develop new procedures to mitigate delays or similar events in the future and provide justification for process improvements. For irregular operations, such as bad weather, users will have better situational awareness of aircraft location and the elapsed time of specific events, such as de-icing operations.



Bill Colligan, Era
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Sensis' Precision Runway Monitoring – Alternative (PRM-A) solution is operational at Detroit Metropolitan Wayne County Airport (DTW).

The highly accurate multilateration surveillance is providing controllers with the precise aircraft position needed to simultaneously separate aircraft on approaches to closely spaced parallel runways. PRM-A enables more flights to land per hour for increased throughput at the airport and illustrates the flexibility of ASDE-X to serve as the surveillance platform for additional airport efficiency advancements.

In addition to these fielded systems, Sensis is developing automation tools to further enhance ground operations. For example, Sensis is currently developing a Departure Manager for JFK, with the intent of using this capability at all major airports. At capacity-constrained airports, non-optimal departure sequencing can contribute to long taxi times and departure delays. The Sensis Departure Manager will automatically provide air traffic controllers and airline ramp managers with a departure sequence to maximize runway use and minimize taxi times and emissions.

Mike Ball

Surface problems are certainly one of the five key areas in which specific operational improvements are called for. The approach in the recommendation detail includes a "tiger team" concept for each location where very specific solution steps can be developed in concert with the two cross cutting and four overarching recommendations.

One of the key areas in which Northrop Grumman might help would be to provide participation on one or more of these tiger teams, as we did on the Task Force itself. The collaborative approach in the subgroups enabled people to draw

on their operational, technical, financial and other areas of expertise to examine the problems and develop ideas for implementation of operational capabilities in a manner that leveraged technology but was not product specific. Northrop Grumman has significant product capability (such as surface movement guidance and control systems and tower automation), but the importance of our participation in solutions will be in the high quality of our system integration expertise and our experience based on the implementation of technology key to NextGen in areas of network-enabled weather, system-wide information management and information security for the U.S. Department of Defense.

Bill Colligan, Era

Era systems Corporation, an SRA International, Inc. subsidiary, focuses on bringing future-proof hardware and software technologies to the aircraft surveillance market. Multilateration sensors that are ADS-B capable are an example of this type of hardware.

Era's Symphony software fuses disparate surveillance data from "NowGen" and NextGen surveillance technologies to provide a common situation awareness platform for all airport stakeholders to use securely, and forms a common base on which advanced technologies and procedures can be built.

Through that architecture and those security features, Symphony allows airlines and other stakeholders to achieve NextGen benefits while allowing them to continue their individual business models. Symphony was developed before the TF5 recommendations for Surface Operations were published, but it is qualified to support the goals of this objective.

Specifically, the installation of Symphony, along with supporting sur-

face surveillance technologies, would allow large metroplex airports, like New York and Chicago, see a common situation awareness picture that could be easily disseminated to all stakeholders.

Symphony would serve as the underlying tool used to provide a single collaborative coordinated real-time management capability to the airports, providing all stakeholders with reliable, predictable, and timely access to surface operation data.

This capability is available from Era today by fusing data from existing surveillance technologies, such as ASDE and ASDI, with additional surveillance technologies, such as passive multilateration, millimeter wave radar and optical tracking systems, to fill-in the surveillance coverage in the ramp and gate areas not usually covered by existing surface surveillance systems in the US.

Jack Kies, Metron

When we talk about the surface problem, we are tempted to give a surface answer. But focusing on optimizing surface operations at a busy airport is inherently limited. The power of integrated ATM comes from the merging of not just situational data, but operational and predictive information from multiple domains. For example, a traffic flow manager needs to see predictive surface congestion, arrival and departure operations to optimize the merging of traffic into the overhead en route stream. The combination of this information enables advanced decision support without the negative effects of stove-piped systems and information silos, while using only existing technology.

Metron Aviation has significant experience in ATC operations; en route, terminal and surface. We have experts with dispatch, Air Traffic Flow Management and cockpit experience, allowing us to focus on the system – seeing the whole, while appreciating its parts. Our products and solutions embrace the entire spectrum of system operations.

We've been in the business of flow management for quite a while. We see ourselves dedicated to the science of harmonizing air traffic. We are practiced at bringing stakeholders together to address the toughest problems in the most demanding environments, like large metropolitan areas, and believe these are the places to focus our attention. In the past, the challenges of these areas drove new concepts and yielded new collaborative technology to dramatically improve efficiency. Metron Aviation worked with the FAA to develop that technology, and we continue as the world's leader in ATFM. It's one system after all.