PEAK PERFORMANCE

Improving ATM efficiency

Peter Griffiths
European ATM: on target?

Eric Stefanello
The evolving landscape of ATM services and suppliers

PLUS: How crises create opportunities for change, collaboration in Africa and the Middle East, space-based ADS-B, airports accelerate CDM and the latest news and comment from the world of ATM.
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Safety and flight Economy passes through us.
The transformation of Global ATM performance is not easy, there are no quick fixes as the issues to be addressed are complex involving multiple stakeholders.

We listened with interest to the presenters at the ICAO Global Air Navigation Industry Symposium in Montreal, discussing the ICAO Aviation System Block Upgrades (ASBU). The ambition of this initiative is laudable, the greater integration and harmonisation of air navigation system improvement programmes.

CANSO members have worked with their fellow aviation industry stakeholders on the ASBU technical teams to build the concepts that make up each of the four blocks, to help ensure that the vision is achievable. In line with our Waypoint 2013 strategy we are already focused on the delivery of operational improvements required for ASBU Block 0 and 1. Our Operations Standing Committee is continuing to gather feedback from CANSO members to glean their input and help shape our thinking. The feedback will be provided to ICAO so that we do not lose the opportunity to contribute to this important debate.

Improving global ANS performance in air/ground data communications is one of the Waypoint 2013 deliverables. In response to industry demand we staged our first CANSO ATM / Aircraft Data Communications Policy Conference in Amsterdam in September. In spite of the fact that data communications has been around for many years and is proven to deliver improvements in safety, an increase in efficiency, a reduction in operating costs and environmental benefits, it was not being widely rolled out across the world. It is a not a lack of suitable technology that is creating the log-jam but rather the fact that there is no global consensus concerning how to move forward from the Air Navigation Service Providers (ANSPs).

CANSO made the commitment at the conference to work with our members to take the lead and develop a single ANSP vision and supporting data communications strategy. Not an easy task but it needed to be done.

It was not surprising that when we launched CANSO World ATM Congress as the definitive event for the ATM industry at the ATCA Exposition in October, most of the feedback didn’t revolve around why we would embark on such an initiative – after all our industry needs an event run by the industry and for the industry, with any surplus being retained for the future development of the industry – no, the main gist of the feedback we received related to the size of the challenge we are taking on as we are a very lean organisation.

Please be reassured we are not underestimating what is involved here, however if CANSO is going to transform our industry we should not be intimidated by the size or complexity of the challenge, because to shy away would be a disservice to the industry and specifically our members. Rather we see it as our role to step up to the challenges we face because only by doing so are we to really make any meaningful steps in the transformation of our industry.

Robert Hutchison
Director Communications & Marketing
ATM PRIORITIES IN LATIN AMERICA AND THE CARIBBEAN

Against the backdrop of increasing demand for air transport and mounting airspace capacity challenges, CANSO held its third annual Latin America and Caribbean Conference in Cancun, Mexico 7-9 November. Discussions focused on improving aviation safety, infrastructure and performance, Collaborative Decision Making (CDM), implementing RNAV/RNP, aviation’s effect on the environment, customer relations and stakeholder engagement. It was widely agreed that in each of these areas, increased collaboration and coordination could help accelerate progress towards a safer, more efficient and cost-effective ATM system in the region.

Ms Albertus-Verboom, Chair of the Latin America and Caribbean CANSO CEO Committee (LAC3) and CEO of NAATC, called on the delegates to work together to ensure better communication among states in the region and beyond.

SINGLE EUROPEAN SKY – EUROPEAN COMMISSION AND MEMBER STATES NEED TO ACCELERATE DECISIONS

Members of the European CANSO CEO Committee (EC3) have called on the European Commission and Member States to play their part in order that ANSPs can move ahead with the modernisation of the European ATM system. European ANSPs are waiting for the Commission to set a timeframe to be endorsed by the Member States relating to a number of crucial decisions. These include:

- System definition and implementation arrangements for the SES.
- The establishment of a new deployment model which will include the appointment of a Deployment Manager working with the ANSPs and the other industry partners in the driving seat.
- In the interim phase, the activation of the transitional working arrangements under the guidance of the Single Sky Committee, responsible for the implementation of ongoing projects.
- Ensuring adequate funding to meet both the immediate financial needs of the TEN-T (Trans-European Transport Network) to support the transitional working arrangements, and the financial commitments going forward through an integrated process established within the new deployment model.
- Committing to the continuation of a Public-Private-Partnership model after 2016, providing governance for research and development, similar to the one established for the SESAR Joint Undertaking.
- Instigating the institutional reform of EUROCONTROL.
- Reinforcing the importance of the Network Manager, the organisation established to coordinate European ATM operations.

‘CANSO WORLD ATM CONGRESS’ TO LAUNCH IN 2013

CANSO and ATCA have announced a major new event for the ATM industry: the ‘CANSO World ATM Congress in association with ATCA,’ launching in Madrid, 12-14 February 2013. CANSO World (www.cansoworld.org) will bring together CEOs, senior managers and technical experts from air navigation service providers, manufacturers and suppliers, airlines, and other key aviation stakeholders. The 18,000m² exhibition will give delegates the opportunity to find out about the latest trends and developments in air traffic management, while the conference will focus on discussing the priority challenges facing the industry.
**NEW CDM TARGETS FOR EUROPE**

CANSO, ACI Europe and Eurocontrol announced on 29 November their new target for A-CDM to be fully implemented at an additional 8 airports by the end of 2012. This target effectively sees an increase of 200% and would result in 400 million passengers a year (over 25% of European passenger traffic) benefitting from A-CDM. At present, four airports have fully implemented A-CDM and an additional 22 airports are engaged in the process. While the 2011 target was to have 10 airports fully implemented, several external factors have slowed down implementation at some airports. These include the impact of the financial crisis and difficulties in updating and integrating IT systems – a crucial enabler of A-CDM.

**KHABAROVSK CONSOLIDATED ACC ENTERS OPERATION**

The Khabarovsk Consolidated Area Control Centre (Russian Far East) of the Joint Air Traffic Management System in the Russian Federation has entered into operation. The advanced automated ATC provides air traffic management for an area of over 2.5 million km² of the Russian Far East territory, considerably enhancing the established safety levels and increasing airspace capacity by half. This further ensures integration of the Russian ATM System into the Global Air Navigation System based on the ICAO CNS/ATM Concept.

**RSM IN EASTERN EUROPE & EURASIA**

New RSM standards came into effect across Eastern Europe and Eurasia on 17 November 2011, almost doubling the number of available flight levels thus giving air traffic controllers more leeway to manage air traffic. Initial estimates of the environmental benefits of RSMV implementation in this airspace indicate a potential fuel reduction of between 10 to 18 per cent per flight, due to the availability of additional cruising levels which will enable airspace users to operate closer to their optimum flight profiles.

**AIRCRAFT DATA COMMUNICATIONS ESSENTIAL FOR CAPACITY GROWTH**

High level aviation stakeholders have expressed their frustration at the current state of aircraft data communications implementation. Delegates attending the CANSO ATM/ Aircraft Data Communications Policy conference on 6-8 September recognised that although data communications has been proven to deliver significant operational benefits; it is not being widely deployed around the world. The lack of a global consensus among ANSPs on how to move forward was cited as the main barrier to progress. CANSO committed to work with its Members to take the lead and develop a single ANSP vision and supporting data communications strategy.

** NATS, FERROVIAL TAKE OVER SERVICES AT 10 SPANISH AIRPORTS**

NATS and its Spanish partner Ferrovial have been awarded a contract to provide air traffic control services at 10 airports in Spain. The partnership, named ferroNATS, is one of only two bidders to be selected by Spanish Airport Authority, AENA, to take over air traffic control provision at 13 airports across Spain. These contracts represent the first step in the process of liberalising the provision of air traffic control at AENA’s airports. ferroNATS will become responsible for staffing and safe service provision at these towers. AENA will retain accountability for maintaining their technological and physical infrastructure.

** FLEXIBLE AIR ROUTES CUT FIGHT TIME, FUEL & CO2**

The implementation of iFlex between Johannesburg and Atlanta from 30 June to 25 August resulted in an average time saving of 8 minutes per flight. This equates to 900 kg of fuel and 2.9 tonnes of CO2. Over the course of a year – and on the basis of two flights per day—this translates to overall savings of 100 flight hours, 690 tonnes of fuel and 2,150 tonnes of CO2. iFlex provides airlines a greater and more flexible choice of routes on long-haul operations. It addresses challenges resulting from conventional air traffic management restrictions, which limit the flexibility of routing within fixed corridors.

**PREVENTING AIRCRAFT COLLISIONS AT SCHIPHOL**

Air Traffic Control the Netherlands (LVNL) and the National Aerospace Laboratory NLR have developed a new safety system to prevent the risk of collisions involving aircraft at Schiphol’s take-off and landing runways. The Runway Incursion Alerting System Schiphol (RIASS) warns air traffic controllers in the control towers of any imminent danger involving the unauthorised presence of an aircraft or vehicle on a take-off runway or landing runway already in use. RIASS is a supplement to current technologies and applicable procedures designed to prevent unsafe situations on runway crossings. The system is based on current radar technology currently in use at Schiphol Airport Amsterdam.

**IRELAND, UK AGREE NEW AIRSPACE POLICY**

The UK Civil Aviation Authority (CAA) and the Irish Aviation Authority (IAA) have approved a joint policy on Performance-based Navigation (PBN) to be implemented across UK and Irish airspace. PBN relies on new technology such as global navigation satellite systems, instead of more traditional ground based beacons, to enable aircraft to navigate to very high levels of accuracy. The two countries formed a ‘Functional Airspace Block’ in 2008 to co-ordinate airspace policy. The move is a significant step towards activating PBN in line with ICAO recommendations and ahead of any legislation from the European Commission.

**IRISH ATC COSTS FALL BY 40%**

Air traffic control service costs at Dublin, Cork and Shannon airports is set to fall by 40 per cent over the next four years following a price determination issued by the aviation regulator, Cathal Guimard. The charge, which is levied by the Irish Aviation Authority on airlines, will apply from January 1st next until the end of 2015. The charge will decline by 25 per cent next year and by 6 per cent annually for the subsequent years up to 2015.

**CANSO WELCOMES 10 NEW MEMBERS**

In the past three months CANSO has welcomed the Civil Aviation Authority of Bangladesh (CAAB) and the Kenya Civil Aviation Authority KCAA as Full Members, as well as 8 new Associate Members: BT Group plc, Iridium Communications Inc., INECO, Ingeniería y Economía del Transporte, S.A., The New Mexico State University Physical Science Lab, NLR, SENASA and STR-SpeechTech.
European Airspace Improvements: On target?

As a result of the Single European Sky (SES) performance scheme, European ANSPs are required by law to reduce their costs. Furthermore, as of 2012 ANSPs can no longer recover all their investments in equipment, infrastructure and staff on a full cost recovery basis. This will require increased cost efficiency and transparency, but what progress is being made? Peter Griffiths, Chairman of the Performance Review Body shares his perspective.

The Single European Sky II context: Delivering the Vision

The original vision for the performance scheme of the SES was formulated in 2004 under SES I. Since then, it has evolved as a fully fledged performance scheme with target setting as a key element of the SES II legislative package in 2009.

A central component of the performance scheme is, in Vice-President Kallas’s own words, the "keystone of the Single European Sky package". Its function is to provide independent advice and guidance on the delivery, as well as plot, the trajectory goals for the entire European ATM network.

The performance scheme will start on 1 January 2012 for a period of only three years (2012-2014) with a limited number of key performance indicators and targets. This first reference period is therefore a transitional one. Nevertheless, expectations are high amongst the aviation community so it has to deliver tangible performance improvements in the focus areas, whilst at the same time preserving or improving the level of safety.

The performance scheme has an extremely demanding timeline which reflects the high level of priority and urgency given to the setting up of the SES from the outset and approved by Member States. Factors such as the economic downturn of 2009 and 2010, the ash cloud crisis of April 2010 and the continued high level of en route ATFM delays notwithstanding overall traffic decrease, added an even stronger sense of urgency to the adoption and implementation of the SES II package at all levels of the community. Several Transport Councils and High Level Conferences (Madrid, Bruges, Budapest) gave all stakeholders and the political players the opportunities to renew their commitment to this ambitious performance scheme, with the high expectation that it would be implemented in an accelerated way.

The establishment of the EU-wide performance targets

Such tight schedules could not have been met without the PRB being able to utilise and build upon the enormous body of work, legitimacy and extensive experience that the Eurocontrol Performance Review Commission supported by the performance review unit had developed since 1998. It will be recalled that the PRB is the PRC supported by the PRU, with a Chairman appointed directly by the European Commission.

The preparatory work had started several months before the inauguration of the PRB by the PRC upon formal Commission request. A consultation paper, containing initial proposals for the EU-wide targets, was issued on 2 August 2010 (four calendar days after the PRB nomination!). Momentum was maintained thanks to Member States’ and stakeholders’ (including ANSPs) who accepted to work over summer and provide comments within one month only. As a result, valuable feedback could be taken on board and robust PRB proposals for your performance targets were delivered, on 27 September 2010 three months after its inauguration.
The PRB target setting strategy was to give time to States to examine key priorities but at the same time deliver against the undertakings the States had given on improving performance. When looking at the constituent blocks of Air Traffic Management, this meant that there had to be recognition that it will take a period of approximately three years to get the system ready for the delivery of the ATM master plan objectives. In addition, the introduction of the charging regulation with its risk sharing mechanisms is another fundamental change which had to be taken into consideration. Finally the targets needed to be considered in two directions. Top down for the EU wide targets but recognising the differences in Europe and challenges in each state by approval of a bottom up plan approval.

The target setting therefore was made to achieve in each of the key performance areas:

**Capacity:** Improving capacity to achieve an acceptable level of delay consistent with societal expectation. It should not be less than the performance target already in use.

**Safety:** No target was set but safety was not to be compromised by performance improvements which should preserve as a minimum the current level of safety.

**Flight Efficiency:** The future growth of the system should achieve minimum environmental impact by maintaining carbon neutral growth from air traffic causes.

**Cost efficiency:** To achieve all of the above whilst maintaining costs growth at zero.

This is illustrated in the graph (left):

These challenging and ambitious goals were strongly debated by Member States and the Commission through the Single Sky Committee, at plenary or working group levels, and targets were unanimously agreed by the Single Sky Committee on 3 December 2010.

The adopted targets consisted of: decreasing the adopted Eurocontrol target of 0.7 minutes per flight, to an EU-wide capacity to 0.5 minutes per flight to be reached in 2014, whilst accepting that the cost-efficiency target be lowered from 4.5% to 3.5% of weighted average reduction of unit rates in real terms per annum, taking into account the severe economic crisis of the previous two years and the acknowledgement that to deliver more would require more structural and long term changes.

These adopted targets were lower than the original targets proposed by the PRB but they still follow the strategic direction felt necessary by the PRB. The final figures recognise that Member States were to collectively “retain” the equivalent of 800 Million Euros over the reference period, and this should be used to secure the delivery of the EU-
wide capacity target and overcome the delay difficulties anticipated as from summer 2011. It should be noted that the average daily traffic is currently at an equivalent level as before the crisis (2007 – 2008), with more delays. Most of these delays come from peripheral areas, not the densest or more complex ones, and 50% of the delays come from 4% of sectors. The capacity issue is therefore not structural and should not require additional investments. Still, lack of capacity quickly generates huge costs to the community of airspace users (the minute of delay has been assessed by the PRB as costing about 800 million Euros per year to airspace users).

These EU-wide targets were formally accepted by the European Commission and materialised in its Decision 2011/121/EU of 21 February 2011. They were a substantial result demonstrating a European commitment to improving performance allowing carbon-neutral traffic growth with unit costs being kept flat in real terms and a preserving high level of safety.

The delivery and assessment of the performance plans

On this basis, Member States prepared and delivered their national or FAB performance plans by the set target, end June 2011, allowing the PRB to carry out its assessment work during summer 2011. This respect of a very demanding timing is in itself a demonstration of all stakeholders’ willingness to accept the new conditions demanded by the performance scheme and make ambitious contributions to the performance scheme. The PRB assessment was delivered to the European Commission on 20 September 2011, taking into account a large number of bilateral consultations held until the last possible moment with States and/or ANSPs.

For a first exercise, the results of the assessments are very encouraging as the aggregation of all the plans collected shows that there is only a little way to go in order to reach the agreed EU-wide targets. Whilst many States have efforts to make to improve their cost efficiency targets (but for many of them the effort is minimal as only 256 million Euros more, out of a 18.9 Billion total cost-base, have to be saved over the period), only 6 plans do not reach the capacity/delay reference value that was allocated to them.

What comes next?

Expectations in the airline industry are high that investments made in previous years and which were not stopped in years of crisis will now start to deliver benefits for capacity and cost-efficiency. The airline industry is just emerging from the worst economic shock in its history which, according to IATA figures, has removed 9% of traffic growth forever. The air transport industry is a key contributor to the European economy and is essential for the mobility of persons and goods. Its sustainability must be preserved and service providers in a need to take a proactive attitude to improve their performance as their contribution to the industry efforts. On their side, all of the European States’ economies are under pressure to reassess the size of their public expenses and deficits. Political will and economic necessity are therefore adding to the pressures to support increased cost effectiveness and should facilitate the adoption of adequate performance targets.

The plans that are deemed by the European Commission to not “contribute adequately” to the EU-wide performance targets now need to be revised. The ad hoc meeting of the Single Sky Committee of 24 October 2011 secured a positive vote from the Member States on the Commission’s draft recommendation to the relevant Member States or FABs to review their performance targets, and these have until 24 December 2011 to adopt and transmit revised targets. Again this has demonstrated the willingness towards the establishment of the Single European Sky which is starting its delivery phase. It will not be easy, but collectively it can be achieved. The key challenge over the next three years is two-fold:

• to build delivery mechanisms that recognise negative trends early;
• to build communications channels to ensure that the information is received in time to allow agility to contain costs while maintaining performance trend, and still deliver the changes necessary for future ATM programmes.

With a system this big, some implementation difficulties may occur. The performance plans provide the industry with new tools to address these challenges, to look for opportunities and to enable all concerned to become more adaptable to change.

Having witnessed the willingness of ANSPs to contribute to the establishment of a performing air transport, I am confident on our collective ability to close the gap between the performance plans and the EU-wide targets. Hard work and dialogue in the next weeks and months will be key to make it possible and I look forward to continuing an open, candid and fruitful discussion with all stakeholders and key players of the aviation industry as well as the key decision-makers who are supporting the programmes.
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The International Civil Aviation Organization’s recent Global Air Navigation Industry Symposium (GANIS) in Montreal marked an important step toward achieving a seamless and interoperable worldwide air transportation system. The symposium focused on meeting the modernisation challenges faced by the world’s air navigation service providers through the use of the Aviation System Block Upgrades (ASBU) initiative, paving the way for the upcoming ICAO Air Navigation Conference to endorse the Block Upgrade concept next year.

The theme of the 2012 Air Navigation Conference is “One Sky,” reflecting the vision of an integrated global air traffic management system. While we have made strides toward that goal since the last such conference in 2003, we have a long way to go. Today, air navigation still crisscrosses multiple national systems with different regulations, languages and technologies. To take full advantage of the many advances in aviation technology that enhance safety and efficiency, the world’s air traffic systems must harmonise their policies and operations. The One Sky concept involves conceiving solutions globally, developing implementation plans regionally and implementing infrastructure locally—the same approach that ASBU takes.

The most effective way to harmonise our efforts is for the international aviation community to embrace Aviation System Block Upgrades, a concept that was unanimously endorsed by GANIS delegates. These prepackaged operational improvements provide a flexible, modular approach that ensures the same capabilities are supported globally while allowing States to take into account their individual needs and financial resources. The FAA wholeheartedly supports this approach and has been instrumental in helping shape and advance the Block Upgrade initiative as part of the ASBU Technical Team and Future Aviation Challenge Team. A number of FAA representatives took part in ASBU presentations at the symposium.

ASBU offers immediate, short-term and long-term solutions to interoperability. The GANIS panel discussion on the longer-term Blocks 2 and 3, moderated by CANSO Director General Graham Lake, underscored the point that standards, regulations, certification and policy harmonisation are as important as technology in achieving the aims of the Block Upgrades.

The work done at GANIS on ASBU, including the valuable feedback from conference participants, will guide the 2012 Air Navigation Conference with the development and endorsement of a new Global Air Navigation Plan and associated roadmaps. The conference will have the opportunity to formally integrate the near-term, or Block 1, upgrades into the plan, and to agree on a strategic direction and research needs for Blocks 2 and 3. Block 1 upgrades will be available for deployment beginning in 2018, Block 2 in 2023 and Block 3 in 2028 and beyond.

In the United States, the FAA is making significant progress with its transformative Next Generation Air Transportation System, or NextGen. But as FAA Deputy Administrator Michael Huerta noted in his keynote address at GANIS, one aviation system cannot succeed in isolation in our interconnected world. Each system is a function of the next. All the major systems need to work in harmony.

One big step in that direction happened in March of this year. The FAA concluded an historic collaborative agreement with the European Union to ensure that our future systems – NextGen and SESAR – are fully harmonised. The agreement calls for both sides to research the interoperability of avionics, communications protocols and procedures, and operational methods. The agreement encourages industry participation on both sides of the Atlantic. The United States and the European Union are collaborating on five working groups and more than two dozen specific harmonisation programs to ensure that all the pieces work together.
Deputy Administrator Huerta also pointed out that, on a regional level, the FAA is working toward greater harmonisation of airspace through efforts like the Aviation Cooperation Program for the Mid-Americas and Caribbean. We hope to use private and public resources to enhance aviation safety and efficiency across 21 countries.

We envision Automatic Dependent Surveillance-Broadcast (ADS-B) from the Yucatan Peninsula in Mexico to the northern region of South America. And we want to use a system of data communications to cut down on misunderstandings on the radio.

With dramatic growth forecast for air traffic over the next few decades, international cooperation and harmonisation must be a priority for air navigation service providers.

The transition to satellite-based navigation from the decades-old radar-based system offers an unprecedented opportunity and an unprecedented challenge. ICAO estimates it will cost some $120 billion over the next 10 years alone to bring about the necessary transformation of the world’s air transportation system. GANIS laid the groundwork that will enable ICAO’s 12th Air Navigation Conference in November 2012 to adopt ASBU as a well-defined, flexible pathway to meet that challenge.
The ANSP Column
Mohey Ragheb Chairman
NANSC Egypt

NANSC – Egypt is one of the leading Air Navigation Service Providers (ANSPs) in Africa and the Middle East. NANSC, a state owned company, is committed to providing outstanding Air Traffic Management (ATM) services within Egyptian airspace, serving 22 airports across the country. Given Egypt’s strategic location, the provision of ATM services in Egyptian airspace helps bridge the three continents of Africa, Europe and Asia.

NANSC was originally set up as an independent entity affiliated with the Egyptian Holding Company for Airports and Air Navigation. However, NANSC is continually evolving, transforming itself to meet the needs of its customers. Indeed, NANSC has taken this approach since it was founded. NANSC runs its own business as well as managing huge projects, such as the modernisation of ATM systems, the construction of a new fabulous control tower, the construction of an extension to the new administrative premises... and much more, all in a self financing and cost effective manner.

Mindful of the important results of the regional and international collaboration, NANSC, plays a key role in the Middle East region, with effective and dynamic participation in several international bodies and organisations including ICAO, CANSO, EUR, AFI, ACAC, and NAFISAT. NANSC is adopting the forward-looking concept of bridging the gap between Europe on the one hand and Africa and Asia on the other hand. Moving north to Europe, NANSC has been an associate member in the Blue-Med FAB initiative to extend the Single European Sky concept beyond the geographical boundaries of Europe, as this will objectively achieve a safer, better performing air traffic network for airspace users.

In Africa, NANSC has extended a hand of cooperation to African Countries. Air traffic controllers of the Sudan have been trained in NANSC training facilities on RVSM Implementation, for example. NANSC is also playing a key role in COMESA, to exchange expertise in the field of CNS/ATM, and to establish Upper Airspace Control Center (UACC). NANSC is also an active member of CANSO’s Middle East Region. The Egypt-Saudi cooperation programme of ATM integration was launched in 2008 to achieve ATM priorities such as Radar Data Exchange, OLDI, AMHS, AXIM and e-TOD. In addition, ATCOs of Yemen have been trained by NANSC.

Recognising the desire of operators to make full use of aircraft capabilities, Performance-based Navigation (PBN) procedures have been implemented at the main international airports such as Sharm El-Sheikh, Hurghadah, Luxor, Aswan, Borg El-Arab, Taba, El-Arish and Asuit. NANSC is also consistently modernising the CNS/ATM systems to meet the ever-increasing flow of air traffic.

With all these initiatives I hope you can see that we, NANSC staff, spare no effort in achieving the highest level of safety, transforming the aviation industry and meeting our stakeholders’ expectations. Regional collaboration is vital to our success which is why NANSC is delighted to host the CANSO Middle East Conference in January. I look forward to meeting you there!
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Award Categories

- Enabling Technology
- Service Provision
- Industry
- Innovation
- Environment
- European ATM
- Runway Safety
- Human Factors

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Important dates for your diary

22 December 2011: Nomination deadline
5 March 2012: CANSO ATM dinner – Awards winners announced.
While the general public typically views ATM transformation as a sweeping set of technological changes in ANSP infrastructure, the transformation must run deeper and further if we are truly going to support safe and environmentally sustainable air transportation growth for the next decade and beyond.

This transformation must extend not only beyond political and geographic boundaries, but also beyond the lines of traditional separation among ATM suppliers, users and stakeholders. Seamless airspace and operations are needed to seize the opportunity to create a truly global ATM system, not an incrementally enhanced set of national systems. So while we tend to focus on particular NextGen and SESAR technologies, clearly the supplier landscape is evolving, and must change to support a new generation of ATM services. The supply of ATM products that are not only interoperable across borders, but seamlessly integrated for shared performance and environmental benefits, requires a transition on the part of the supplier community.

As one of the world’s leading manufacturers of aircraft, which increasingly serve as intelligent nodes in the global ATM network, Airbus is looking to support the long term growth of air transportation by expanding its role as an ATM solution provider. While the Airbus ATM strategy seeks to protect the company’s massive aircraft order book with long-term ATM efficiency and capacity improvements, it also aligns with the economic and environmental goals of other aircraft manufacturers and ATM stakeholders including ANSPs, airlines, airports and passengers. Earlier this year, Airbus launched our subsidiary, Airbus ProSky dedicated to supporting NextGen, SESAR and other global ATM modernisation programs. In support of that strategy, Airbus recently acquired Metron Aviation, a leading supplier of NextGen and SESAR research, as well as CDM-based Air Traffic Flow Management (ATFM) solutions for Airservices Australia, South Africa and other nations. In light of these and other industry acquisitions and developments, I have been given this opportunity to offer a perspective regarding the evolution of the ATM supplier landscape during this period of ATM transformation.

In my view, the most significant challenge to the ATM supplier is not the extension of their organisation’s products and services via acquisition in order to deploy solutions to more countries, but the extension of our businesses to transform the way we work together cooperatively as suppliers. If we seek to truly partner with the world’s ANSPs, who are challenged to transform not only their airspace but their organisations, I believe we will find our supplier organisations and industry groups must evolve as well.

I am struck by our industry’s repeated emphasis on collaboration and harmonisation. When you attend any of the numerous events in our industry, you will find keynote speakers and panel members extolling the benefits of harmonisation and collaboration. Yet the acquisition of two key American NextGen suppliers, Metron Aviation and Sensis, by two larger “European-based” firms seems to be met with resistance by some industry groups. In fact, some of these groups wish to exclude Metron Aviation from memberships and even participation in U.S. industry events, on the basis of foreign ownership. While I am certain that Europe and other parts of the world have also practiced exclusionary policies, the contradiction of excluding “foreign suppliers” from air transportation summits, while promoting international harmonisation, seems blatantly wrong and counter-productive to our global agenda. Clearly, Airbus and Boeing are fierce competitors in global markets and the marketplace benefits from open competition and innovation. Yet Airbus and Boeing are partners in NextGen and jointly support key programmes that increase safety, efficiency and environmental performance. Boeing and Airbus are working together on numerous fronts, including the FAA’s NextGen Greener Skies initiative. This cooperation is simply a result of recognising that we all benefit from our combined capabilities and unique perspectives when facing our common challenges. The main and immediate benefits will go to our customers, the airlines, because the ATM transformation is made for them, to reduce the cost of air navigation services and flight operations, through better flight profiles, more direct routes and efficient traffic flows.
As suppliers, we must view our value to the industry not as a provider of simply our own products, but as a collaborative partner to help harmonise the flow of air traffic, and that clearly knows no borders. As members of industry groups, we must promote an agenda of legitimate cooperation and collaboration. It is not enough to simply make speeches regarding harmonisation without that message transcending our people, our technology and our collaboration with customers and partners.

The themes of cooperation must run both technologically and culturally through NextGen, SESAR and global ATM programmes. Clearly, the future ATM system brings a new model of collaboration between ground-based and airborne capabilities that was not possible in the past. There is great momentum around CDM amongst airports, airlines and ANSPs sharing information for the benefit of the total system. In the past, organisations resisted sharing real-time information to protect their business practices; but with the proven benefits of shared CDM, these barriers are eroding. Likewise, the supplier community must strive to bring industry solutions and services that recognise a system-wide view of ATM performance.

The future supplier landscape needs to help usher in a new era of cooperation among ANSPs, airlines, airports and all stakeholders, including other suppliers. The business practices and politics of old must give way to a new sense of global leadership and partnership. Our industry needs ATM services that are not only interoperable, but seamlessly integrated. As suppliers, we must view our solutions as nodes in a global network, not standalone systems. The message of global harmonisation that finds its way into so many speakers’ Powerpoint slides needs to be found in the policies and practices of all organisations and industry groups. As suppliers, we share the responsibility for transforming a global ATM system with our customers and partners. The success of that transformation rests not only on the replacement of old technology with new, but by embracing new ways of collaborating for the benefit of all global stakeholders and the environment.

Airbus launched its subsidiary ‘Airbus ProSky’ in 2011 to support global airspace modernisation programmes.
TECHNOLOGY & OPERATIONS

Airports accelerate collaborative decision making

Efficiency savings on the ground promise benefits for the network as a whole with Airport-Collaborative Decision Making

Munich made headlines when it achieved 10 per cent reduction in taxi times as a result of introducing Airport-Collaborative Decision Making (A-CDM) in 2007. Since then, Brussels, Paris CDG and Frankfurt have all achieved A-CDM status while London Heathrow and Amsterdam Schiphol are on track for A-CDM approval in early 2012. After a slow start, A-CDM is accelerating and Eurocontrol predicts 16 airports will meet the approval process by the end of 2012.

Information sharing is the core element of A-CDM and requires participation by the airport operator, airlines, handling agents and air traffic control. It can improve the overall efficiency of operations at an airport, in particular the aircraft turn round and pre-departure sequencing process. This in turn contributes to more accurate target take-off times – data that can be used to improve en route and sector planning for the whole ATM network.

The Eurocontrol A-CDM manual details the concept elements and provides guidance for implementation, risk mitigation, and performance measurement. Its 16 milestones have been adopted by the FAA and are used in other parts of the world. Among airport pioneers outside Europe, New York JFK reports savings of USD10-15 million a year since introducing CDM measures in 2010.

The Port Authority of New York and New Jersey, the FAA, and airlines introduced the departure metering programme at JFK to mitigate the impact of a temporary runway closure on traffic flow. A sequencing tool, provided by Passur Aerospace, was used to calculate departure times to minimise the time spent queuing before take off. A study carried out by the Massachusetts Institute of Technology (MIT) compared taxi out times, fuel burn, and emissions before and after the implementation of the departure metering programme and concluded that airlines had 14,800 fewer departure taxi minutes. The Passur tool uses a combination of software, process management and an operations centre to create a virtual departure queue in which departures are metered by holding flights at the gate or in a common metering area rather than queuing in an extended line of aircraft with engines on. Once aircraft enter the active runway, they are ready to depart quickly with less emissions.

A-CDM offers more than fuel and emissions savings. The efficiency gains achieved at local level can have a positive impact on traffic flow generally and A-CDM show how airports contribute to performance of the ATM network overall. The concept was included in the European Flight Efficiency Plan developed by CANSO, Eurocontrol and IATA in 2008 and an A-CDM Action Plan was launched by Eurocontrol and Airports Council International-Europe (ACI-Europe) to engage more airports in the programme. ACI-Europe Director General Olivier Jankovec believes A-CDM brings operational gains on the ground and beyond, throughout the air transport network: “The result is a win-win for all partners involved: airports, airlines, air navigation service providers and ground handlers.” ACI-Europe promotes the concept to its membership, which includes over 400 airports in Europe. It can help members to apply for certification under its carbon management certification programme Airport Carbon Accreditation.

A Eurocontrol study estimates that introducing A-CDM at 42 airports would cut emissions by 10 per cent and bring some early benefits once 16 airports implement A-CDM. Results from pioneer airports like Brussels and Frankfurt indicate improved adherence to air traffic slots already has an impact on the local environment. Brussels reports a 15 per cent improvement in adherence to the departure times, with 94 per cent of flights departing within the slot tolerance window. The airport benefits from fewer moving aircraft on the apron with less peaks and troughs in the traffic. Controllers have a predictable traffic flow with few potential conflicts. Frankfurt reports improved usage of stands and gates and improved outbound punctuality and use of airport infrastructure.

A-CDM airports provide the Central Flow Management Unit (CFMU) managed by Eurocontrol in Brussels with departure planning information (DPI). This includes the expected time
the aircraft will push back, start up and a target take off time. Closing the gap between the target take off time and the actual take off time helps the CFMU to assess the traffic volume and manage the traffic flow between airports. It affects sector capacity, optimum flight paths and destination arrival times. As more airports submit DPI messages, the CFMU data becomes more accurate, and flights stand to benefit from the predictable traffic flow.

**Tactical tools**

Airports have access to an increasing number of tools to help meet A-CDM targets. French service provider DSNA teamed with Egis Avia following implementation of A-CDM at Paris CDG in 2011. The partners have developed a web-based platform and they provide project scoping, implementation and support. Paris CDG reports a 10 per cent improvement in slot adherence since implementing A-CDM and airlines save 14.5 tonnes of fuel each day as a result of more efficient operations. Meanwhile Frankfurt Airport worked with ATRiCS to install a sequence planner that enabled the airport to meet the A-CDM milestones. The technology is due to operate at other Germany airports including Dusseldorf.

Sensis’ Aerobahn resource management tool supports operations at New York JFK where it provides a common situational display of ground movements. The software is used to compare aircraft arrivals with gate availability, monitor taxi times and weather events and operates at several international airports including Hong Kong International and Paris CDG.

Several companies have launched web-based platforms that support data sharing and provide a common display to support collaborative decision making. UK company Rockshore is supplying its CDM solution to Rome Fiumiclo Airport to improve turn round procedures at the airport and partnered with Northrop Grumman Park Air Systems to develop the Airport Realtime Collaboration (ARC) solution introduced in 2010. Rockshore’s Ground View situational awareness platform to London Heathrow where it helps coordinate ground operations for British Airways.

Meanwhile, Frequentis is working with Hamburg Airport in Germany to develop a collaborative decision making tool in partnership with Avionix to help manage traffic flow during peak hours. The traffic data monitor integrates information from multiple airport sources including surveillance data, weather events, runway status and traffic demand.

US company ITT Exelis has installed its Symphony resource management platform at Philadelphia International Airport to provide a real-time situation display with visualisation and alert functions. In addition to tracking arrivals and departures, the system includes aircraft graphics and 3D views and can warn of potential departure delays.

Not only are more web-based tools becoming available, new graphics and user-friendly interfaces are easier to understand and simpler to apply in the busy airport environment. Meeting the needs of multiple stakeholders remains one of the most challenging aspects of A-CDM, but with advanced computing technology and growing evidence of the benefits, the concept is starting to gain ground.

In November CANSO, ACI Europe and Eurocontrol announced their 2012 target to have A-CDM fully implemented at an additional 8 airports by the end of 2012. This will result in 400 million passengers a year (over 25% of European passenger traffic) benefitting from A-CDM.
Reforming the Spanish air navigation system
Juan Ignacio Lema Devesa, President Director General of AENA

When I took over as President of AENA in April 2009 my organisation was one of the most inefficient ANSPs in Europe and with a view to the impending implementation of a performance evaluation scheme (out of the second legislative package of the SES), its future viability was seriously compromised.

According to data from the “ACE 2008 Benchmarking Report” from EUROCONTROL, AENA had total operational costs of €1,214 million compared to €654 million for ENAV (Italy), €726 million for NATS (UK), €824 million for DFS (Germany) and €1,125 million for DSNA (France). Out of the total costs and with a headcount of just over 2,300, €785 million corresponded to ATCO staff costs. Despite having more and better paid ATCO staff, with an average salary of over €330,000 per annum, the number of controlled operations was lower than that of Germany or the UK and the productivity was the lowest among the major ANSPs in Europe. Also, unbelievably, although the number of flights decreased from 2007 onwards due to the economic crisis, the number of ATCOs and the amount of additional work time hours continued to rise.

The high costs and low productivity laid in the ATCO Collective Agreement I, which only envisaged 1,200 regular working hours a year. According to schedules that were drawn up by the ATCOs themselves and paid at a rate nearly three times (2.67) the regular one, an average of 600 annual additional work time hours per ATCO were needed in addition. Another element was the Special Paid Leave, an early retirement paid leave scheme which ATCOs were entitled to at the age of 52 and after 30 years of service (or from the age of 55 without further requirement) whereas receiving their full basic salary (on average €170,000 a year) until reaching statutory retirement age.

An external organisation is providing apron services at Madrid Barajas airport T4. This will lead to a reduction in costs of more than 50%.
It was obvious urgent measures were required by 2009. Steps were taken to rationalise the organisation of work yet within the Control Agreement framework. Reference nominal operational configurations and a maximum limit of 200 working hours per month were set up accompanied with management oversight measures to ensure fulfilment of the effective workday.

The results were immediate and a 10% annual cost rising from the period 2000-2008 was turned into a 2% decrease in 2009; annual costs per ATCO increasing annually by 15% declined by 6%; average number of operating hours per ATCO fell 6.5% and delays were yet reduced during the summer period.

These improvements, although significant, were insufficient. In 2009 AENA was still not able to cover all its costs and had a negative operating margin with losses of €196 million. Having exhausted all the measures available under the existing labour and operating framework and against a background of stalled negotiations, the only way-out was a radical structural change to increase ATCO competitiveness and, where possible, liberalise services to introduce competition in activities that were hitherto a monopoly. This involved modifying the existing Spanish legal framework for an air navigation system which had become one of the most inefficient in Europe.

The Government of Spain approved Royal Decree-Law 1/2010 on 5 February 2010 which became approved as Law 9/2010 on 14 April. This regulation guaranteed the continuity and sustainability of the provision of air traffic services, provided for liberalisation of services and reorganised the ATCOs’ working conditions, allowing AENA to exercise full powers in organising ATCOs’ shifts and determining staffing needs. Basic annual regular hours were set at 1,670, plus 80 hours overtime; Special Paid Leave entitlement was suspended for three years and hiring of controllers from the market was authorised.

Other services which are not certified as ATS services such as apron control at the airports could be now carried out by the airport operator or a civil provider of air traffic services, other than AENA, designated by the airport.

Following the implementation of the new regulations, ATCO productivity improved substantially in 2010 and 2011 and changes in the ATCOs’ working conditions led to an annual ATCO staff costs saving of over €300 million if comparing year 2010 vs 2008 figures, a reduction of more than 35%. It can be said 2010 was the first time ever a profit was made in the history of AENA Air Navigation.

The en-route unit rate was reduced by 7.5% in 2011, decreasing from €84.14 (the highest in the EU) in 2010 to €78.00. This will fall a further 7.5% in 2012 so that next year the rate will be €72.00, below the average of the five major European providers.

As regards liberalisation measures, at the start of 2011 a public CFT was launched to permit the entry of new providers for ATC control towers services at 13 airports in the AENA network. The entry of the successful bidders, Ferronats and Saerco, will lead to significant cost savings since the final contract price was €18.1 million, almost 50% lower than AENA’s current costs of €33.9 million.

The AFIS is already in place at three of the airports in the AENA network and we are working towards implementing it at three others. The substitution of ATCOs by AFIS operators in these low-traffic airports has led to savings of €1.5 million, which is 75% of the total cost, while maintaining the same levels of safety.
In September 2011 the Government approved the liberalisation of apron control at airports with more than 250,000 annual operations and, since 24 November, an external supplier is providing these services at T4 of Madrid-Barajas airport. This will lead to a reduction in costs above 50%, giving annual savings of €3.5 million when fully implemented. It is foreseen its extension to Barcelona-El Prat in 2012.

This process has not been smooth at all due to the strong resistance of the ATCOs’ union, and industrial action led to the closure of Spanish airspace on 3 and 4 December 2010. In spite of all this and as a consequence of the Spanish authorities’ strong support for reforms, the conflict was resolved and in February 2011, following arbitration ruling, ATCO Collective Agreement II was approved.

Reform was necessary and urgently required in a sector which is vital for the Spanish economy as it is essential to the tourism industry, which accounts for 10.7% of Spanish GDP.

However, even though the substantial transformation of the provision and liberalisation of air navigation services in Spain has been a milestone at both European and global dimensions, I am sure we will have to overcome many more challenges in the future. Nonetheless, I am convinced AENA will continue to contribute to society by efficiently providing an essential service that ensures the mobility of citizens, connects the different regions, contributes to economic and social development, and meets its European commitments within the framework of SES.

1 Costs of provision of Air Traffic Management (ATM) and Communications, Navigation and Surveillance (CNS) infrastructure services.
2 Including both ATCOs in Operational Duty (in OPS) and ATCOs on other Duties, as well as ATCOs on training and ATCOs on Special Paid Leave.
3 In 2008, DFS had 1,716 ATCOs in OPS, with remuneration costs of €271.3 million and controlled 2.9 million movements; NATS had a staff of 1,377 ATCOs in OPS, at a cost of €167.7 million and controlled 2.5 million movements, and AENA had 2,005 ATCO in OPS, at a cost of €688.2 million and controlled 1.8 million movements in controlled airspace.
4 Number of hours worked over the total annual regular hours related to overtime and other related categorised services (overtime in practice) being paid at an average rate of 2.67 times the regular hour.
5 Royal Decree 1001/2010 of 5 August 2010 established 1,670 to be the maximum regular scheduled work hours per year/ATCO.
6 The total Gross Salary bill for ATCOS went from near €785 million in 2008 down to €480 million in 2010 whereas the average annual salary fell from €330,000 to €200,000.
7 With the only exception of year 2000 where financial results were a mere €5 million over break-even.
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Using crises to drive organisational change

Ed Sims, CEO of Airways New Zealand

2011 was perhaps not the best year to take the helm of an ANSP – especially one whose main operations centre was located in Christchurch, New Zealand. Ed Sims took over the role of CEO of Airways New Zealand earlier this year and despite the many challenges behind the organisation, and those still ahead of it, Sims is adamant the future looks bright.

Aviation is defined by change – it’s the industry’s status quo. What’s different now, however, is that changes in technology, route structures and operations have been compounded by higher operating costs due to oil price volatility; lower yields due to consumer uncertainty and latterly a swathe of natural disasters – the Japan and New Zealand earthquakes and Chilean volcano eruption are cases in point.

None of the above is news to anyone and as members of the aviation community, it’s vitally important for ANSPs not to see themselves as the eternal victim – ‘it’s hard for us because our customers are suffering…’ I think we need to change the view of ANS as being ‘downstream’ from the main aviation action and start to think of it as being at the forefront of the future. With relatively nimble capital profiles, ANSPs are better placed than any other player in the industry to effect real and profitable change.

Take for example, Collaborative Flow Management (CFM) tools: I can only speak for New Zealand here, but since the introduction of CFM into the country’s international airports, Airways has saved its customers around US$30 million. Of equal importance given governments’ appetite to impose travel taxes, it has also reduced CO₂ emissions by over 80 million kg.

Airways has taken the ‘NZ Inc’ approach to doing business domestically, which means embedding itself as one of the key players in the tourism, trade and economic growth of the country. Airways approach to doing business now is a sea change from its past approach – a dominant provider of essential service; delivered with an air of complacency stemming from our ‘protected’ status.

The current operating environment no longer supports this approach. Airways commercial future relies on innovation, collaboration and visibility – both within the industry and at a political level – so that we are able to not just effect change, but we are able to influence the decisions that ultimately affect us.

I believe the quality of our airspace should be considered as critical an asset as our motorways and our coastline. So on the back of that concept, I’m keen to explore another concept – that of tiered levels of ANS delivering real value to customers. I’m talking here about premium and economy class airspace: we package it and price it according to the demands of our customers.

It’s the same philosophy airports use to sell slots – except we’d be selling slots in the sky rather than on the ground. A low-cost ANSP model aligns to the more successful airlines’ business models and they would simply on-charge according to the product being purchased. Using the airlines’ LCC model to develop a contestable airspace product for ANSPs will help future-proof our business though I have no doubt it will take some very robust modelling and debate to turn this idea into a global reality.

Airways has proved in the past that New Zealand is the ideal testing ground not just for new products and services, but also for new ways of operating. Take ASPIRE (Asia Pacific Initiative to Reduce Emissions): in its early days, ASPIRE was a test of whether we could get all the different aviation ‘factions’ working together for a common cause. First
In February 2011 a 6.3 magnitude earthquake struck Christchurch; home to some 400 Airways staff. Restoring air traffic control was fundamental to the rescue operation and to delivery of national and international efforts.

In closing, the lessons we have learned from the events of 2011 – the global economic conditions and the natural disasters a little closer to (our) home, is that if necessity is the mother of invention, crises are the god parents of innovation.

What I have seen in my early days of leading Airways has been a remarkable revival of innovation and adaptability. Airways has emerged stronger, I believe, and with a greater commitment and drive to create more high quality roles in innovation and commercial growth, ensuring we play a leading role in the rebuild of our community and the future of the industry.

I am really looking forward to having face to face conversations with my new colleagues in CANSO, sharing more details on how Airways has recovered from such a huge disaster and hearing your thoughts on how our innovative skill set can best be utilised in your future strategies.
The ongoing transition from radar to ADS-B surveillance is undoubtedly one of the most positive steps taken to improve the world’s air traffic management systems. From terminal operations to en-route services, ADS-B surveillance technology offers a number of benefits that allow ANSPs to far more efficiently manage the traffic over their terminals and air space.

Although ADS-B technology will dramatically improve air traffic management, ADS-B still suffers from one limitation that radar systems have since implemented over a half century ago – that it’s primarily being deployed only over heavily trafficked land masses. This leaves the growing challenges of efficiently managing air traffic over oceanic and other remote flight routes largely unchanged from where it’s been for decades.

That may soon change, however, thanks to plans to launch a network of satellite-based ADS-B receivers, expected to provide the first opportunity for continuous, global ADS-B coverage starting as early as 2017.

ADS-B is already the way forward

Right now, numerous ANSPs, including the U.S. Federal Aviation Administration (FAA), Airservices Australia, NAV CANADA, and those in Brazil, Europe and parts of Asia, are already in the process of making major investments in ground-based ADS-B surveillance systems.

Indeed, terrestrial-based ADS-B is on pace to, within the next decade, replace outdated radar-based systems as the primary means for tracking air traffic over land. This is true especially in areas of congested airspace.

As just one example, the FAA has set aside nearly 10 percent of its $20 billion NextGen budget specifically for implementing a nationwide ADS-B station and receiver network. Additionally, the FAA has mandated that all commercial aircraft operating in U.S. airspace be equipped with ADS-B transceivers by 2020. Combined with similar mandates from other ANSPs across the globe, the cost to air carriers for ADS-B has already reached an estimated $3 billion.

Over-water coverage still lagging behind radar

At the same time, these upgrades and mandates do not cover the air traffic over oceans, nor do they cover polar or numerous mountainous and remote regions. Under the current ADS-B infrastructure plan, ADS-B-equipped aircraft rely on a network of land-based ADS-B receiver towers. Once over water, however, those aircraft will have to revert to procedural methods. Or, in some cases, they will have to revert to ADS-C. ADS-C can be expensive to both equip and use, and does not offer the minimal separation that ADS-B can achieve. ADS-C is also not a mandated technology, leaving the patchwork of global surveillance in place.

Yet it is well known that the oceans represent an important untapped source of real benefit for commercial aircraft to realise the value of their ADS-B equipage costs. The Gulf of Mexico, for instance, is one of only a handful of regions in which the FAA has had success implementing partial ADS-B coverage over water. In this case, it utilised oil platforms to house ADS-B receivers. Additionally, NAV CANADA – as part of a larger effort to dramatically reduce fuel consumption and emissions – in 2007 began installing the infrastructure to support ADS-B over the Hudson Bay, and the test system became operational in January 2009.

According to NAV CANADA, even that modest deployment of ADS-B stations over such a large body of water will be responsible for a nearly $200 million reduction in fuel costs. In addition, it should lead to a reduction in GHG emissions of more than 500,000 metric tons by 2016.

But until very recently, no one knew how to answer the question of how to extend ADS-B deployment globally to include high value oceanic and remote air routes.

Space-based solution for global ADS-B coverage

Iridium, the operator of the world’s furthest reaching satellite communications network, is in the process of developing the first global aviation monitoring system. Iridium is developing a plan to host ADS-B receiver payloads on its next-generation global satellite communications constellation, Iridium NEXT.

A space-based ADS-B solution, could expand geographic coverage of ADS-B terrestrial systems in order to provide
the only ADS-B coverage over vital oceanic, polar and remote land-mass routes. Such a network could also greatly enhance the limited ADS-B coverage provided over mountainous areas and at lower altitudes.

A space-based ADS-B surveillance system could allow air carriers to maximise their return on the $3 billion equipage investment ANSPs are requiring them to make. At the same time, it could give small and large, public and private, ANSPs the ability to maximise the benefits of recent advancements in ATM technology by accessing this global surveillance infrastructure.

“Space-based ADS-B is a real game changer for air traffic control,” said Russell Chew, Managing Partner at NEXA Capital Partners, LLC and previous COO of the FAA. “Air traffic control over remote areas is going to be revolutionised, because the ability to provide radar-like surveillance in these areas has never existed before.”

**Significantly lower costs to ANSPs and significant savings for air carriers**

The benefits of a global ADS-B network are not limited to just enhanced surveillance. For a number of ANSPs in the developing world, satellite-based ADS-B solves the problem of installing, protecting, and maintaining costly infrastructure in remote areas. And, a system such as space-based ADS-B would eliminate ADS-B interruptions due to maintenance or weather.

In almost all instances, satellite-based ADS-B would be able to deliver these benefits at a cost well below that of other upgrading options, including the building of tower-based ADS-B networks. And the more remote or mountainous an ANSP’s host country is, the more these savings become magnified.

Even for ANSPs in technologically advanced nations, an air-traffic surveillance network that doesn’t require tower construction and maintenance will produce substantial savings. The systems will expand to eliminate existing gaps in coverage over water or other difficult terrain.

Satellite-based ADS-B coverage also would help fill in the service and safety gaps over nations with developing ATM infrastructure. Additionally, a space-based ADS-B system would vastly improve air search-and-rescue capabilities in remote regions. It also would greatly minimise the air traffic control complexities when transitioning between different ATM operating procedures and systems.

For air carriers, the potential for cost savings from a global ADS-B network is enormous. A number of recent case studies, including a multi-year effort by NAV CANADA, paint a clear picture of the economic impact. This is especially true for air carriers anticipating expanding ADS-B systems over oceanic flight routes.

According to NAV CANADA, air carriers could save 2.7 million litres of fuel or $1.3 billion in fuel costs through 2016 just by taking advantage of more efficient polar flight routes. If only 3 percent of the 350,000 flights that cross the North Atlantic per year were able to vary speed and altitude in a way that maximises flight efficiency, NAV CANADA says, it “…would result in an annual reduction of approximately 7,200 metric tons of GHG emissions.”

“The goal is to leverage these partnerships to create a turn-key system that eventually all ANSPs can rely on,” said Chew. “This is a once-in-a-lifetime opportunity for the entire aviation community to make previously unthinkable strides in oceanic and remote operations and safety.”
Meeting the training challenge through e-Learning

Emerging technologies, policies and procedures will revolutionise air traffic control around the world – but they also present an immense training challenge. How do you prepare your entire controller workforce for a completely new way of doing things? And how do you do it quickly – with the least amount of disruption and expense? Jim Enders, Gayle Griffin and Cary Harr at Booz Allen Hamilton explore the options.

In the U.S., the Federal Aviation Administration has the added burden of training a large number of new controllers, who are replacing the generation – now nearing retirement – that was hired after the 1981 strike. But every country that is modernising its air traffic control faces the same unenviable prospect – changing the tires while the car is moving.

To meet this challenge, new approaches to training are essential. Training should be flexible enough to accommodate everyone who needs it – all at the same time. It should provide the opportunity for unlimited practice, so that controllers can build the “muscle memory” needed to become proficient in the new technologies, policies and procedures.

There is a growing recognition among air navigation service providers that e-learning is ideally suited to meet these requirements. If controllers are able, for example, to practice simulations and get classroom-type training on their desktop computers, laptops, and even tablets, e-learning can be a powerful tool in preparing the workforce for the new cutting-edge technologies. This is particularly true when e-learning is used to support and enhance current methods, including on-the-job training. Two other factors make e-learning especially feasible for this purpose. Recent technological advances – driven by video games – have brought new levels of sophistication and realism to the kinds of air-traffic simulations that can be played out on personal computers and laptops.

At the same time, e-learning is a natural extension of how the younger members of the workforce live now. They are comfortable with – and even expect – computer-based learning that is self-paced and is available anywhere, any time. This new generation of controllers is a rapidly increasing portion of the workforce, one that will significantly speed the introduction of these new learning techniques.

The benefits are substantial. Because e-learning helps train the workforce faster, better and more thoroughly, it enables controllers to provide service that is higher quality, and more consistent. In particular, e-learning shortens the time to certification, and standardises training so that everyone has access to best practices.

New Challenges for Controllers

There is no doubt that the next generation of air traffic control technologies, policies and procedures will have a significant impact on the controllers. Data Link (or Data Comm) will mean far less voice communication with the pilots, and far more text messaging. ADS-B will give planes greater ability to self-separate, and performance-based navigation will allow them to design their own routes – two innovations that will shift the controller’s role from command-and-control to shared decision-making and managing strategic flows.

Some changes will be physically taxing. Remotely staffed towers, for example, will require the ability to monitor runways and taxiways with television monitors – rather than through a window. Others will call for new ways of thinking, such as the move from specialised to blended operations and facilities – including the blending of tower and terminal, terminal and en-route, and en-route and oceanic.

One of the most effective ways to prepare for these and other challenges is the desktop simulator, which gives individual controllers the ability to get as much practice as they need in any particular set of tasks. They are particularly valuable in supplementing the full-scale simulations at large facilities, and can provide an entirely new level of training for controllers who have no access to the large facilities at all.

Full-scale simulations have some important advantages – because they employ real scopes, for example, and use other controllers to play the role of pilots, they are able to closely mimic actual situations. But they have drawbacks: they are expensive to run and maintain, and require instructors and technicians. Controllers may have to travel to use them, and often have to sit around for hours waiting their turn.

Simulations on desktops – or on laptops or tablets – give users the ability to practice any scenario at any time.
Controllers have the chance to hone their skills at specific tasks, such as using the keyboard, adjusting the scopes, and selecting the right buttons at the right times. If the controllers are to quickly learn the new technologies, they need many touches. And if they can practice at any time – such as while waiting their turn on the larger simulators, or during slow times such as Sunday mornings – they will become proficient much faster.

Because of their sophistication and realism, desktop simulations can be used by controllers without an instructor. However, instructors can be networked in to provide the same kind of guidance as in full-scale simulations.

In addition to offering limitless opportunities to practice, desktop simulations provide controllers the opportunity to experience situations that occur infrequently – but nonetheless require the highest level of skill. Desktop simulations can re-create, for example, an airport’s busiest day of the year – or an aircraft making an emergency landing in a river.

Quicker Certification, More Standardisation

Desktop simulations, like other e-learning techniques, can significantly reduce the time needed for on-the-job training and certification. Controllers don’t need to wait for peak travel seasons, for example, to practice in heavy air traffic, and they don’t need to wait for winter to practice in snowstorms.

An essential element of desktop simulations is sophisticated tracking and feedback, so that controllers do not end up practicing the same wrong things over and over. The simulations provide constant feedback on how performance can be improved – encouraging the controllers to keep trying until they get it right. And desktop simulations are ideal for providing monthly refresher training, as well as remediation training for controllers who are not performing adequately.

Just as important, the desktop simulations can help standardise training. Currently, the requirements for certification vary from facility to facility. Some instructors may be more familiar than others with how technologies can be used most efficiently. By incorporating best practices and lessons learned, desktop simulations can give ANSPs confidence that all controllers receive equally high-quality training. This is particularly important when new technologies, policies and procedures must be learned quickly by an entire workforce.

Standardisation also ensures that when controllers at different centres interact, they use the same procedures – a key requirement for interoperability. Consistent training provides yet another
Entertaining video games developed for mobile devices are introducing a new generation to the challenges of air traffic control...

benefit – it provides equal opportunity for everyone seeking certification.

ANSPs can speed the introduction of new technologies with another type e-learning – online course work. This approach can supplement and to some extent replace the classroom work currently taught by instructors. In particular, online course work – through the use of imagery and similar techniques – can speed rote learning, such as memorising frequencies, topographies, and the names and characteristics of runways and taxiways. Classroom-type training on computers can reduce the amount of time controllers are taken off the floor – they don’t have to travel to classes, for example, and scheduling is flexible. As with desktop simulations, controllers can repeat all or parts of courses if necessary.

Because the courses reside on centralised servers, content can be updated quickly if critical changes need to be made for air traffic safety or other reasons. And coursework can easily be modularised into smaller units – and assembled in various combinations – for specialties such as traffic management, weather and oceanic air travel.

While e-learning can significantly speed the introduction of emerging innovations in air traffic control, it can also be invaluable in countries that are updating to technologies, policies and procedures that are now in widespread use elsewhere. And in countries with limited full-scale simulations, desktop simulations can quickly train the entire workforce.

As e-learning becomes more widespread around the world, ANPSs could create a training technology bank, to share proven desktop simulations and course work. This would enable countries at any level of air traffic technology to take advantage of the best practices and experiences of others.

E-learning does not come without challenges. It requires a certain degree of computer literacy – something that is natural to younger workers, but less so for older generations, who may need some additional computer training. In addition, an ANSP’s computer network must have sufficient bandwidth to support coursework with high-fidelity graphics and video, as well as for sophisticated simulations.

Further, e-learning requires relatively high upfront design and development costs, compared to instructor-led training. However, much of those costs will be offset as the shorter time to certification reduces the need for instructors, and cuts off-the-floor training time. E-learning also lowers travel expenses.

No one expects that the coming changes in air traffic control will be entirely free of bumps for the controllers, or for ANSPs. But e-learning can significantly smooth the ride, so that everyone can get to the real task at hand – delivering the highest possible level of service.
What are your current priorities?

The first thing we need to do is encourage the current Members to embrace the office by inviting them to be part of a team which is going to plot a way forward for transforming air traffic management performance in the region. Together, we will develop a campaign which will create awareness of not only CANSO’s activities in Africa, but around the world as well.

Air traffic in Africa is forecast to grow by 6% in the next 20 years. How can CANSO support ANSPs meet this challenge?

CANSO is working to develop partnerships between major aviation organisations in the regions such as ICAO, IATA and ACI, while further facilitating the harmonisation of airspace among its members, in order to increase airspace capacity and improve efficiency.

What does the CANSO African office offer?

The establishment of an African Office provides a regional focus for ANSPs, airports, airlines and other industry stakeholders to come together and address common issues. We recently welcomed Mozambique and Kenya as full members so the value of this is clearly recognised.

There are several similarities between the challenges African and Middle Eastern ANSPs are facing. How do you see this relationship developing in the future?

We are going to learn from all other CANSO regions, not only the Middle East. Similarly, the African continent has much to offer in terms of experience and expertise and we are delighted by the opportunity to share this on the global level… we are very proud of what is called “UBUNTU” (Humaneness and Good neighbourliness.) This is what CANSO was created for.

CANSO’s Africa Member ANSPs will meet in January 2012 following CANSO’s Middle East conference in Cairo. What will be the main focus areas for discussion?

We are definitely going to be guided by CANSO’s global focus areas, per the Waypoint 2013 Strategy. These include Safety, Operations and Policy. We will investigate a broad range of issues such as airspace harmonisation, enhancing collaboration, using existing infrastructure, Upper airspace (UACC) and iFlex to name a few. However, we need the input of all regional stakeholders to assess which are the most pressing areas requiring our immediate attention.

What would you say to ANSPs who are not yet members of CANSO?

Come and join CANSO! This is the only international forum for discussing air traffic management issues, where all aviation stakeholders can work together to develop and exchange ideas. CANSO also represents its Members’ views at the relevant international institutions such as ICAO, the United Nations organisations for civil aviation so membership really does offer a strong and united voice!
The implementation of Performance-based Navigation (PBN) is essential to the transformation of ATM performance and a critical component of CANSO’s Waypoint 2013 Strategy. Bernard Gonsalves, Assistant Director Technical Affairs discusses the background and the need to move from concept to reality.

The Challenge

In these economically challenging times, it is understandable that ANSPs are expected to keep a tight rein on costs. Yet at the same time, they are under pressure from operators to support and supplement the ever-evolving aircraft-based avionics through the deployment of suitable instrument flight procedures. Being ‘FIR focused’ ANSPs are generally far removed from the planning or design process of new technologies and as a result, the industry is left with a number of ‘solutions looking for problems’.

A loosely federated suite of airborne technologies quickly morphs into specifications with associated operating requirements, which in turn leads to the proliferation of new terminology: SAAAR, Basic RNP, Advanced RNP, RNP-AR APCH, Baro-VNAV, Public and Private APCH, APV, P-RNAV, B-RNAV, DME-DME RNAV, to name a few. How can ANSPs cope with this explosion of technologies, standards and requirements and be expected to selectively adapt to, and derive the best benefits for the majority of the airspace users? How can they develop a sound business case for improving airspace efficiency?

Performance-based Navigation

In 2007, all 190 ICAO member States unanimously adopted a General Assembly Resolution A36-23 (eventually A37-11) recognising the urgency for States to publish their individual PBN implementation plans and to provide precision instrument approach paths to all runway ends as a substitute to relying on visual references.

The promotion of PBN was later integrated into CANSO’s Waypoint 2013 strategy and subsequently the association partnered with ICAO and IATA in a global PBN roll-out program, better known as the ‘Go-teams’ to promote its implementation.

PBN benefits

PBN is the next best airspace improvement programme since RVSM was introduced 10 years ago. It not only optimises the use of the airspace by safely containing airplanes into stricter control bounds, but also adds the much needed safety dimension, by ensuring that ground and air systems meet the lateral and vertical precision keeping performance required.

Through the proper utilisation of technology that is currently available today, PBN can deliver the greatest returns with minimal investment. PBN solutions can increase airport capacity 3-10%, reduce delays by up to 10%, reduce fuel and emissions by 8-10% and reduce noise by 30%.

As a concept PBN is also unique in that it is a non-prescriptive and sensor-agnostic system. GNSS, inertial systems, and ground navigation aids such as DMEs can be used independently or in combination, as long as the performance requirements can be demonstrated to have been met. RNAV (or RNP) procedures promise significant capacity and noise benefits.

Past implementations in Atlanta and Dallas Fort-Worth, US and Sydney, Australia have demonstrated throughput capacity increases of up to 10% or more.

The safety case

For an ANSP there can be no price on safety – it is priceless! Controlled flight into terrain (CFIT) serves as a stark reminder that there are hundreds and thousands of approaches being flown into airports everyday all over the world, due to lack of precision vertical instrument guidance.

Over 60% of the CFIT accidents today continue to occur because of lack of vertical precision, where pilots rely on visual references especially in night hours, often flying circling approaches and in marginal weather conditions. This must always serve as a safety recall item to any ANSP contemplating a PBN implementation plan in the terminal area.

The role of the regulator

The ANSP-regulator relationship is vital. The regulator determines the baseline requirements for availability and continuity being met at any point during the procedure, including the missed-approach. Varying regulatory approaches to essentially the same service can stand in the way of harmonisation. PBN remains at the forefront of ATM evolution. With an increased dependence on RNP procedures, the alerting and monitoring functions can now be devolved from the controller to the pilot.
From concept to reality

The transformation from embracing the PBN concept to demonstrating capability by means of an RNAV or RNP designators is achieved through a three stage process:

1. Leveraging the lateral and vertical guidance capability of a ‘critical mass’ of aircraft in the system
2. Applying the most practical procedure design to ensure obstacle protection, including the missed-approach to accommodate the needs of the airspace and publish the same
3. Determining the operational criteria for safely conducting these procedures.

In order to move forward, ANSPs need to ask two principal questions: What is the cost? And what are the benefits?

Keys to success

1. Collaboration
Take a collaborative approach. Recognise the safety requirements of the regulator towards the availability and continuity requirements of the procedure. This also involves recognising the needs of all airspace users, while and rationalising priorities to balance existing requirements and those of the supplemental PBN procedures.

2. “Know your airspace”
Assess the current Navaid infrastructure and aircraft capabilities – especially aircraft retrofits – and define an airspace concept. The ICAO PBN Manual – Volume II serves as an excellent baseline to determine the optimal navigation specification of each airspace, for adapting it to the procedure design requirements of ATM considerations, and the levels of communications and surveillance that go with it. Volume II also provides adequate guidelines to ANSPs for meeting the functional requirements of a variety of NavSpecs in each domain of TMA and Enroute.

3. Develop an implementation plan
A safety plan is embedded at every step of the concept, procedure design, validation and flight test stages. Controllers must always be included in the decision making process, especially human factor considerations, in the devolving role of alerting and monitoring from the controllers to the flight crews.

PBN solves many environmental challenges.
CANSO Members

CANSO – The Civil Air Navigation Services Organisation – is the global voice of the companies that provide air traffic control, and represents the interests of Air Navigation Services Providers worldwide.

CANSO members are responsible for supporting over 85% of world air traffic, and through our Workgroups, members share information and develop new policies, with the ultimate aim of improving air navigation services on the ground and in the air. CANSO also represents its members’ views in major regulatory and industry forums, including at ICAO, where we have official Observer status.

For more information on joining CANSO, visit www.canso.org/joiningcanso

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- Navair
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- ORO NAVIGACIJA, Lithuania
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Light area illustrates airspace controlled by CANSO members.
SAFER SKIES FROM TAKEOFF TO TOUCHDOWN.

For more than 60 years, Raytheon has delivered the most innovative Air Traffic Management (ATM) solutions. We invented or perfected many of the technologies that form the backbone of today’s global ATM infrastructure, and continue to pioneer training and innovation that provide safe transportation for more passengers than any company in the world. Raytheon solutions will make it possible for initiatives like NextGen to modernize the airspace and enhance customer safety.
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