

AIRMAIL

News, views and opinion for the aviation industry

Enhancing Safety Cases in Estonia

NATS is one of the leading ANSPs in ATM Safety Management, with operational and technical experts experienced in developing and maintaining safety management systems and safety cases.



NATS is using this experience through a consultancy contract to facilitate the development of a Unit Safety Case (USC) methodology and promote formal safety management activities within Lennuliiklusteeninduse AS (Estonian Air Navigation Services). Lennuliiklusteeninduse AS is a modern, flexible and rapidly developing company whose main function is to provide air traffic management services for domestic and international flights in the Tallinn FIR and at Estonian aerodromes. They are committed to the reduction of risk in aviation and aircraft safety is the focus of their operations. In 2006 they introduced a flight safety management system to reassert this focus.

The first stage was to develop a USC Report that demonstrated how Lennuliiklusteeninduse AS is safely managing their ATM operations, namely; Air Traffic Services, Communications Navigation and Surveillance / ATM Services and Aeronautical Information Management. This is a natural step considering their strong safety culture within all elements of the organisation.

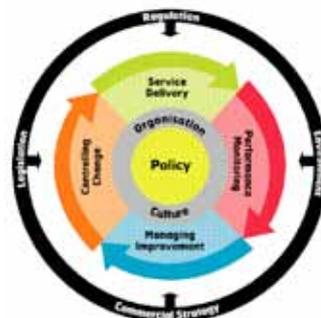
Lennuliiklusteeninduse AS is now equipped to use the goals within the USC as specific tools to proactively manage safety within their operations. The challenge has been to ensure that the USC was presented in a clear and concise way such that it can be understood by all of Lennuliiklusteeninduse AS staff. Importantly the USC has been structured to ensure clear ownership within the management team – and to ensure that it is not just a document that sits on a bookshelf! The methodology used to develop the USC Report was to employ the principles behind the current NATS Safety Management System (SMS), a system developed and refined over 20 years. The principles form a structured set of activities that when linked together form a continuous improvement cycle. This is depicted diagrammatically in the figure opposite. The principles are described as follows:

1. **Safe Service Delivery.**
2. **Performance Monitoring.**
3. **Managing Improvement.**
4. **Controlling Change.**

At the heart of these principles is a policy that is focussed on operational risk. All principles are supported by an effective safety organisation which is working within an appropriate safety culture.

The process of developing the USC Report has resulted in a systematic examination of the safety processes in place at Lennuliiklusteeninduse AS. This has revealed a number of areas where the safety processes could be further strengthened through improvement activities. These activities have been collated to form a safety management improvement plan which will be implemented over the coming months.

NATS has also ensured that the Unit Safety Case methodology aligns with current regulatory requirements [(EC) No 1035/2011 laying down common requirements for the provision of air navigation services] and also international best practice [CANSO Safety Management System, A CANSO Standard of Excellence – July 2009.] NATS continues to support Lennuliiklusteeninduse AS to ensure that Unit Safety Case methodology is embedded into its operation.



Welcome to the second issue of the NATS newsletter, Airmail. It's designed to keep you up to date with news and latest developments from the global leader in air traffic control and airport performance.

NATS provides answers to the critical issues faced by airports, ANSPs and the aviation industry around the world. And we don't simply address the issues in isolation: we always bear in mind the bigger picture.

If there are any topics that you would like further information on or general enquiries, please contact us at: Airmail@nats.co.uk

Contents

Enhancing safety cases in Estonia	1
Rapid expansion of the Middle East presents new aviation challenges	2
All systems go for London 2012 Olympic Games	3
Master planning with ATM in mind	4
Events a top priority for NATS	7

Rapid expansion of the Middle East presents new aviation challenges

Sitting on the North East edge of the Arabian Peninsula, Oman's sovereign airspace is one of the major thoroughfares for an increasing amount of traffic between Asia, the Middle East and Europe. The need for resectorisation to cope with the increased traffic volumes had been recognised, and in 2010 Oman's Directorate General of Meteorology and Air Navigation (DGMAN) asked for NATS' support with their airspace and air traffic enhancement project. Using predicted 2015 traffic levels as a starting point, a team of NATS airspace designers, safety experts, trainers and simulation staff spent 13 months in the Sultanate working to:

- Redesign Oman's airspace from four to seven sectors (optionally nine);
- Review its Safety and Quality Management Systems

The NATS team collaborated closely with DGMAN to review the current airspace and to propose changes that increase capacity and make traffic flows more efficient. The airspace is dominated by traffic climbing and descending into and out of neighbouring airports, such as those in UAE, with high peak demands and large traffic growth. This creates particularly difficult challenges and a comprehensive redesign required thorough fast-time and real-time simulations.

"There was a clear and urgent need to make the airspace fit for purpose which meant working to an extremely tight schedule, often altering our simulations two or three times a day," said Jesse Yuen, Project Manager in Muscat. "This process enabled us to validate the new airspace structure quickly, and with a high degree of confidence that it could be easily implemented and scaled to meet future demand."

A new Safety Management System and Quality Management System were also produced and a further year-long contract is underway to put these into practice. Gary Lloyd, leading the project, said, "Implementing new Safety and Quality Management systems presents a whole array of challenges to an ANSP. Fundamentally it involves bringing about a change in culture. NATS is working hand-in-hand with the staff of DGMAN to make this happen and to enable improvements to the safety of their operations that will be both real and measurable."

As of today, Oman has initiated the resectorisation process by splitting their largest sector in two to alleviate short term capacity issues. Specification and procurement of the equipment needed to manage all of the new sectors is also underway. As Muscat and its neighbouring airports expand, the new airspace structure and management systems will facilitate better and safer utilisation of Oman's airways which, in turn, enables the expanding traffic flows that must be realised to accompany economic growth in the region.



All systems go for London 2012 Olympic Games

As preparations for the London 2012 Olympic Games gather pace, we look at the progress of some of the key NATS projects that are underway to ensure the smooth handling of this once in a lifetime, Olympic-sized challenge.

Overnight operation to deliver phase one

The first phase of the London 2012 Olympic Games Airspace Development Programme (ADP) was delivered without a hitch during an overnight operation at NATS en route control centre at Swanwick on 7 March. This involved the delivery of a number of software adaptations to enable NATS to control new airspace sectors created specifically for the Games. Transition Manager for the Olympics ADP Bob Brady said: "Our engineers have also built new workstations from scratch and converted some existing hardware to manage the new high and low level airspace sectors.

"The first phase delivery followed extensive testing and validation across all our systems and means that they are now ready for the training of Air Traffic Controllers in April. We are on track thanks to good collaboration across all teams to ensure a seamless air traffic control interface for the Games. Although the new functionality has been delivered, it will remain deactivated until go-live in July. Project Manager Coral Boyne said: "To ensure that there are no glitches, we have planned four software delivery phases before the Games. We have a fantastic team of experts working on the project and are confident of a smooth transition for go-live. We are not complacent."

Olympic Ops room opens

NATS has reached a major milestone in its preparations for the London 2012 Olympic Games with the opening of a fully-capable operations room at Swanwick. The facility is part of our dedicated Olympics Airspace Management Cell (OAMC) and will support the Department of Transport and CAA's proposed airspace restriction around the London area to safeguard the Olympic stadiums.

Olympic rings land at Birmingham

The control tower at Birmingham Airport will be providing an Olympic-sized welcome to passengers this summer after being emblazoned with the Olympic rings. The rings were installed to coincide with the completion of the first phase of the new air traffic control tower building. The nearby City of Coventry Stadium will host a number of football matches for the Games.

Swanwick welcomes overseas delegations

A delegation of Russian air traffic control specialists visited Swanwick in early March to gain an insight into NATS' preparations for the London 2012 Olympic Games. Russia is hosting the Winter Olympics in 2014 and Sochi airport is undergoing extensive work in the run up to the Games, including an additional runway. NATS ATC lead for the London 2012 Olympics, Steve Patterson, said: "The delegation was keen to share our experiences in the run-up to the London 2012 Games in preparation for their own event. We gave the visitors a tour of two operations rooms and an overview of the commercial services we offer, such as airspace design and engineering."

European Business Development Manager Paul Campbell added: "We were pleased to host the Russian delegation at Swanwick. It was a great opportunity to share our learning and expertise with our Russian colleagues as we start to build our relationship with them. I will be visiting Moscow to see what preparations have been made for the Winter Olympics and to highlight how our services can assist them."

And the Russians weren't the only overseas visitors to NATS in recent months – a delegation from Brazil, hosts of the Summer Olympics in 2014, has also been getting an insight into preparations for their event. Among the interested visitors were ministers, regulators, airport operators and air traffic controllers. Head of NATS Consultancy Fergus Cusden said: "The visitors were impressed with our plans to cope with the huge extra capacity that will be generated by the Games and will return to see operations underway in July. Brazil is one of the fastest-growing economies in the world and aviation is expanding in double digits."



Master planning with ATM in mind

The commercial imperative today's ANSPs face demands that they plan for 10, 20 or 30+ years into the future. How do you know what your airport should look like to successfully accommodate all of the expected traffic growth and changes? And out of all the different options you could go for, which is optimal and how do you get there?

NATS' capability

These are questions that NATS' Operational Analysis (OA) department has invested in and developed a wide range of capabilities to help answer. But importantly they do not work alone. Key to the success of the assessments that NATS OA is able to perform is the close collaboration with operational staff that can input to the evaluation and provide their operational expertise and guidance based on years of experience in air traffic management. The ultimate goal being to ensure that senior airport managers across the world are able to make informed and sound decisions about which master plan options they should take through to implementation and when. As NATS operates some of the most complex airspace in the world, we have many different insights as to what works best as well as having considered options that might not work so well. So we're very pleased to be able to use this capability to support others through their times of change.

Using the right tools

Airports are highly dynamic systems and changes to their infrastructure and operation need to be managed very carefully to ensure an on-going optimum operation can be achieved. NATS has been using fast time modelling for many years to help with this type of planning. We've been able to successfully support a number of airports around the world using our simulation and analytical experience to get an in depth understanding of their future operations. The importance of the use of operational analysis techniques and tools to consider the options is that a variety of scenarios can be assessed and compared quickly so that alterations can be made to select and perfect the best solution. To enable this, OA has a range of modelling tools and methodologies and we work closely with all of our customers to understand their positions and to determine what we can offer to best support their needs.



The main three tools now being used are the Total Airport and Airspace Modeller (TAAM), our in-house Heuristic Runway Movement Event Simulator (HERMES) and the Air Traffic Optimisation (AirTOp) tool. These are used by OA for assessment of airport ground movement infrastructure, detailed runway capacity and airspace master plan assessments. The choice of simulator is determined by the individual requirements of each study and in some scenarios we have found it can be beneficial to use them in combination.

Depending on the level of detail required for the Master Plan, NATS OA has capabilities to carry out airport service rate calculations, stand capacity assessments and schedule optimisation techniques. We also have ways to identify potential bottlenecks and conflict points so that they can be identified and mitigated in the proposed plans.

AIRMAIL

How does master planning work?

The general master plan modelling process tends to start with the customer supplying OA with a current layout and an existing traffic schedule. This information is used to create a baseline model with guidance from the airport personnel on what the operational rules should be. This is then reviewed by our in-house operational staff before being passed to the airport's operational experts for validation.

This model is then updated to represent the future layout options and proposed operational procedures over the timescales of interest to the customer (+10 years, +20 years, +30 years, or whatever the interval may be). The other key input is the forecast traffic schedules. These can either be supplied by the airport's schedulers or NATS can work with the client to create a representative schedule based on the information that is available. Analysis of different layout options can show which one will maximise capacity at the same time as minimising delays. By involving our operational experts too, they can give an objective assessment of how easily the proposed layouts will be to operate and if they anticipate any issues, in which case recommendations can be made to adjust the layout to avoid them. If desired by the client, sensitivity modelling runs can then be carried out to assess more minor, finer detail alternations based on the feedback received to achieve the final master plan.

If the client is aiming to have a phased development plan, taking them from the current to the master plan layout, then the modelling can be very useful to help produce an optimal development timeline. This is because the results will indicate when specific parts of the new layout will be required to meet the demands of the increasing/changing traffic. It can also be a useful way to illustrate and communicate the planned order of changes to others and to minimise the disruption to the operation. Alternatively, some clients may prefer to go straight to their master plan layout, in which case the phased assessment is not required. We're always happy to scope our work to meet our client's needs.



Master planning Benefits – a real example

An example where the modelling has really made a difference for our customers is the development of Terminal 5 at London Heathrow. NATS Operational Expert, Spike Bainbridge, who was involved in the simulation, describes the benefits:

“In terms of the Terminal 5 modelling, I think it's fairly safe to say that the most important thing that the modelling demonstrated was the fact that our customer needed to rethink their plans for using some of the Terminal 5 taxiway infrastructure as overflow parking for Terminal 3. The simulation showed the project team that with the proposed operation during Easterly operations, a high number of the outbound aircraft would need to be routed “the long way round” to the Runway Holding Area (as opposed to going by the most direct route). With the then current plan in place, Terminal 5 would have seen very high delays due to the bottle necks created by closed taxiways. Using the modelling output we were not only able to demonstrate this scenario and find alternative operating solutions but, we were also able to create real time simulator exercises to provide useful training for the controllers.”

“Another very important thing that the modelling showed us was that following the opening of Terminal 5, the movement of other airlines around the remaining terminals became critical. The original plan had been to move the whole of one operator's operation into Terminal 5 before other airlines had started vacating Terminal 3. The assessment pointed us towards the fact that this was unsustainable and following simulation we were able to demonstrate this to the customer. The result was a slight change in the airline move sequence and measures being put in place to reduce congestion in and around the Terminal 3 complex. By a combination of measures the potential problem was resolved.”

NATS

AIRMAIL

Combining the expertise of our analytical modellers with the operational experts was critical to providing our customer with a comprehensive solution. Brendan Kelly who was also part of the project team added:

“It is possible to buy the software and produce outputs, but it’s the experience gained from years of working in ATM that makes high quality added value output achievable. NATS is able to do this because for decades we have used fast time simulations to help in our decision making and have learnt the criticality of ensuring that the information that goes into the model in terms of operational constraints is complete.”

Other places where master plan work has been carried out by NATS OA team in collaboration with our Operational Experts include Birmingham Airport, UK, Delhi Indira Gandhi International Airport and Mumbai International Airport, India.

For more information on master planning please get in touch at Airmail@nats.co.uk



NATS

4000 Parkway
Whiteley, Fareham
Hants PO15 7FL UK
Airmail@nats.co.uk
www.nats.co.uk

Events a top priority for NATS

Over the past year NATS has been sponsoring, exhibiting and speaking at some of the major events within the ATM industry. Our presence at these events has not only served to raise awareness of the company and the services we offer, but has also allowed us to gain directly a real understanding of the key priorities and challenges faced by our customers.

International

Back in 2009 NATS' attendance at exhibitions was primarily concentrated in the UK and Europe. Today NATS' focus for growth extends to the wider international market place and this is reflected in the types of events we are now starting to attend. Key events this year have ranged from the ATCA 56th annual conference and exposition in Washington DC to the IFATCA 51st annual conference in Kathmandu.

International Accounts Director Simon Leary said: "What we are continuously seeing at such events is that sustained double digit growth in the international aviation sector is generating the demand for capacity both on the ground and in the air. This in turn is creating explicit customer needs for NATS capabilities to optimise airport and airspace asset utilisation and maximise a return for all stakeholders.

"Our attendance at these exhibitions provides a crucial platform for face-to-face engagement with customers, allowing us to best present NATS and its value to a broad audience, covering both our expertise as a regulated ANSP and also as a provider of expert, value added ATC Services. One particular example is India Aviation 2012, held last month in Hyderabad. The show attracted over 5,000 ATC industry professionals and offered a platform for key decision makers to come together and share views on the emerging opportunities in the Indian civil aviation market and the challenges faced by the industry. Our presence at the event demonstrated commitment to the local market and helped to reinforce projects currently being carried out in Mumbai and Delhi."



This year, we hope to see some of you at the following events where we will be participating:

**NextGen Ahead Conference & Showcase,
Washington DC, USA
24-25th April**

**7th ACI Asia Pacific Regional assembly,
Singapore
22-25th May**

**ATCA Technical Symposium,
Atlantic City, USA
22-24th May**

**Global AIM Congress,
Buenos Aires, Argentina
28-30th May**

**ATCA 57th Annual Conference & Exposition
Conference,
Washington DC, USA
30th Sept-3rd Oct**