NATS

Performance
through Innovation

Delivering Customer Value

Customer Report
2013/14

Contents

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Selected Projects

XMAN
First ever cross-border arrival management trial

View the project here >

FAS Deployment
10 key FAS deployment initiatives linked to SESAR

View the project here >

Time Based Separation
World first deployment of TBS planned for Heathrow in Spring 2015

View the project here >

1 Introduction

Watch the video here >

Over the past year we have been living our promise to keep customers at the heart of our decision making.

Whether airspace design, new procedures or other initiatives to improve airport capacity or airline efficiency, or our major consultation with airlines on our business plan for the next five years, we have never worked more closely with you.

Our performance plan for the next five years will be submitted by the UK to Europe and outstrips the Europe-wide targets by some margin and still enables us to commit to delivering the service improvements that matter to you – and a sizeable price reduction too.

So why is it that while airports are always ready to invest in infrastructure and airlines in new aircraft, there is an apparent reluctance to invest more in ATM with a constant focus on reducing cost rather than considering the value it can add?

A recent report by PWC concluded that adding one summer slot at a busy airport could be worth up to £1m in added value. We have already proved through the "perfect flight" trials that we can save some 10% in fuel. And we know that you value the contribution that effective ATM can make to your own bottom line through fuel savings and capacity improvements.

NATS will continue to focus on delivering the best possible service to our customers recognising that we do have a reliance on Governments and Regulators to create the right environment for us to do that.

Globally ATM is viewed purely as a cost, particularly where the opportunity to work with airlines to deliver real added value is not addressed. The Airspace and ATM service is the invisible infrastructure that can deliver benefit throughout the whole network. It is also crucial that we consider the value chain from cruise-to-cruise as the airport experience is an intrinsic part of overall measurable performance.

The order book tells us the world fleet is going to double very quickly, and that today's infrastructure simply won't be able to support it. Within the UK, the kind of investment we are making in delivering the Future Airspace Strategy is going to be very important. And globally we're working with airline, airports, ANSPs and Governments in over 30 countries, harnessing our experience across the ATM domain to deliver benefits across every phase of flight.

Our relationship with our customers is absolutely key to this future and we look forward to working with you throughout the journey.

Richard Deakin
Chief Executive Officer

2 Customer Priorities

Putting customers at the heart of what we do

We believe we deliver an excellent service in some of the world's most complex airspace, with minimal delays compared to much of Europe. Our safety and service record speaks for itself, having been achieved while also reducing our costs by a third.

However meeting, and sometimes managing, customer expectations will always be challenging.

In 2013/14, we have been continuing to involve customers more in what we do, to make sure your views and expectations are factored into our plans.

The feedback we receive enables us to better focus our attention on customers' strategic priorities for delivering air traffic services, namely:

- **Safety**
  We've developed a new forward-thinking Safety Strategy, building on what we already do and adding another level to expand best practice around the "things that go right". And through the Safety Partnership Agreement (SPA) we work in partnership with customers and other industry stakeholders to identify and resolve specific safety issues.
- **Operational Performance**
  We have implemented the first ever example of cross-border arrival management to absorb airport arrival delay during the en-route and descent phases of flight and have accelerated the implementation of Time Based Separation (TBS) at Heathrow. We have been working in partnership with Gatwick Airport and airlines to fully implement Gatwick's A-CDM55 project, a worldwide benchmark for single runway operations. And our Operational Partnership Agreement (OPA) hotspot programme keeps the focus on shorter term operational performance.
- **Fuel Savings**
  The Flight Efficiency Partnership (FEP) is now an established forum delivering fuel savings for customers; this year a further c. 19,000 tonnes of fuel savings were enabled through the FEP. We've also introduced a new Taxi Time Monitoring Tool to help improve environmental efficiency on the ground. Since our environmental programme began, we've enabled cumulative fuel savings of over 400,000T equivalent to around £270m.
- **Cost**
  We consulted customers on our Business Plans for the next regulatory period (RP2) which starts in 2015 and have put forward a challenging plan including 18% cost savings and delivery of 130,000T of fuel savings.
- **Implementing the Future**
  We have established the Lead Operator Working Group and Carrier Panel to enable airlines to work with us in the early stages of the major airspace change programmes that are a part of the UK's Future Airspace Strategy (FAS).

2 Customer Priorities
Cont'd

Despite overall operational performance in 2013/14 being excellent, service resilience has been particularly challenging:

- Severe storms and flooding impacted some airport operations and our ATC infrastructure; our technical and operational contingency measures enabled us to safely maintain operations;
- A daytime failure in Swanwick Area Control's ground-ground communications system on 7th December 2013 had a disproportionate effect on flights, and we sincerely regret inconvenience to our airline and airport customers and their passengers.

We have therefore included in our **2013/14 Delivery Report** an extra section on **Resilience** to highlight the level of contingency in our operations and how lessons learned from events are being implemented.

2 Customer Priorities
Cont'd

How customers rated our performance in our annual survey

2.1 Customer Feedback on Performance

Thank you to everyone who responded to our 2013 customer survey.

Responses were received from 37 organisations, corresponding to 69% of NATS customers by revenue (and 63% by movements). This is a significantly larger target group of customers than in previous years, reflecting a broader spectrum of views.

The overall score was 7.9 out of 10, a 0.3 decrease on the 2012 score which had previously increased year-on-year. 7.9 represents a good satisfaction score with scope for improvement in some areas, which we will be focussing on this year.

2 Customer Priorities

Cont'd

NATS Customer Satisfaction Score

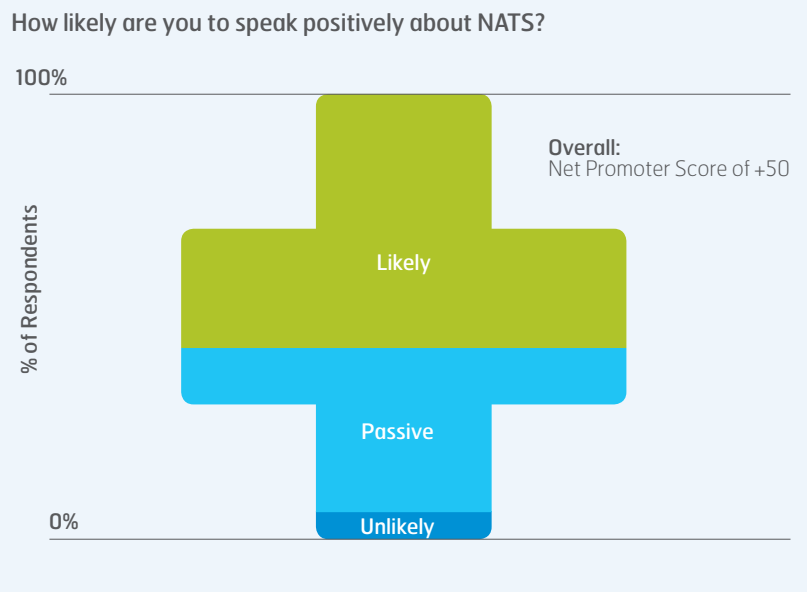
Positives

- Safety – proactive management of safety and NATS' responses to safety events
- Customer communications – in particular ATICCC, tactical operational support and responses to queries
- Future Airspace Strategy (FAS) – our proactive engagement in the Industry Implementation Group (FASIIG)
- Project delivery – with minimal impact on operations.

Main Areas for Improvement

- Environment – the need for greater fuel saving opportunities, with more cross-border collaboration
- Cost efficiency – reflecting customers' key requirement for lower ATC prices
- UK/Ireland FAB – customers would like to see more progress towards deeper operational efficiencies and communications enhanced.

2 Customer Priorities
Cont'd



New Feedback in the 2013 Survey

'Net Promoter Scores' (NPS) are widely used as a measure of overall customer satisfaction. We therefore asked *whether you would speak positively about NATS*? The resulting NPS of +50 indicated good support for what NATS does for its customers, but still shows that around one third of our customers are not sufficiently enamoured with our performance to consider passing a positive comment.

Responses are categorised as follows:

Promoters (who score 9-10 out of 10, shown in green) are enthusiasts, passives (who score 7-8 out of 10, shown in mid-blue) are satisfied but unenthusiastic customers whilst detractors (who score 0-6 out of 10, shown in dark blue) are unhappy customers who can damage the brand through negative word-of-mouth.

The overall NPS score is calculated by subtracting the proportion of detractors from the proportion of promoters and thus can range from -100 (all detractors) to +100 (all promoters).

Priorities for NATS and ATM

Customers identified their top three priorities for NATS and ATM – the emerging key themes were:

- Flight & fuel efficiency
- Safety
- Cost / value
- Capacity / delay
- LAMP (/ NTCA)
- Customer engagement
- Datalink
- Heathrow operations
- En-route airspace
- Queue Management

3 2013/14 Delivery Report

3.1 Performance vs Key Indicators

NATS Wide Indicators

Financial Year 2013/14

		2013/14	2012/13	Change v. 12/13
Traffic	UK Flights (000s)	2,162	2,125	+37
	Oceanic Flights (000s)	405	395	+10
Safety	Risk Bearing Airprox (Cat A & B) NATS Attributable	1	0	+1
	Risk Bearing Airprox (Cat A & B) Any Culpability	6	3	+3
	Weighted Safety Significant Event Index	312	285	+27
Fuel / CO_2	Reduction in ATM CO_2 emissions	2.2%	1.4%	+0.8%
Delays	% of Flights With No NATS Delay	99.7%	99.9%	-0.2%

Notes:

Whilst the SSE Index has increased since FY2012/13, it is within the target profile to achieve a 10% reduction over CP3. This has been driven by an increase in the number of infringement losses of separation.

The increase in Risk Bearing Airprox (CAT A & B) Any Culpability has no discernible pattern in the causes, aircraft types or operators.

Long term strategic target is to reduce ATM CO_2 emissions by an average of 10% per flight by 2020, against a 2006 baseline, with an interim target of 4% by end 2014..

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OPA Service Quality Priorities and Targets

The table shows performance against OPA targets, the 'stretch' target reflecting the OPA's view of an 'excellent' service performance standard.

Financial Year 2013/14

OPA Priority	2013/14 Target		Performance	
	Target	Stretch		
Average En-Route Delay Per Flight (Secs) Including En-Route Weather Related Delay	8.5	7.0	6.9	
STAM Regulations (% applied of ≤ 45 mins duration)	95%	96%	96%	
Fuel Savings Enabled (tonnes fuel)				
> Flight Efficiency Partnership	12,000	18,000	19,237	
> London Arrival Metering (Extended AMAN)	5,000	10,000	10,000	

Notes:

STAM regulations = Short Term ATFCM Measures

Extended AMAN benefits based upon initial data analysis.

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Cont'd

CP3 KPIs for NERL

The table shows two sets of delay targets (T1,T2 and T3) for 2013 – the original PAR value set by the CAA and a Modulated target based on actual traffic in 2013.

Calendar Year 2013

CP3 Metric		2013 Target		Performance	
		Modulated	CAA PAR		
T1	**Average Delay** Secs per flight	8.8	12.5	5.2	
T2	**Delay Impact** Score	24.6	35	3.8	
T3	**Delay Variability** Score	1411	1500	3784	
3Di	**CO_2 3D Inefficiency** 12 month moving average (units)	24		23.7	

Notes:

The delay variability score (T3) is particularly sensitive to days with significantly higher than average delay and the out-turn performance for this metric is almost exclusively a result of the 7 December VCS failure.

The 3Di metric accurately measures the efficiency of every flight in UK airspace in three dimensions, helping us to ensure that we route flight paths as close to the environmental optimum as possible.

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3.2 Adding value around the world for our customers

Catherine Mason, Managing Director Services

Our research shows that airlines are satisfied with much of our services. However customers also highlight areas in which we could do better. We will continue our efforts to better meet their needs. The real opportunity for the future lies in working closely with our customers to add value by delivering innovative solutions that enhance the end-to-end performance across the whole ATM network.

Watch the video here >

Delivering first rate and innovative air traffic services to our customers in the UK is critical to our business, including creating partnerships and alliances to accelerate delivery of European ATM integration. We are also working with airlines, airports, ANSPs and governments in over 30 countries to provide answers to the critical issues faced by the aviation industry around the world. Applying our operational expertise and capabilities, in collaboration with key industry partners, is delivering solutions that can benefit airlines and airports across the globe.

3 2013/14 Delivery Report
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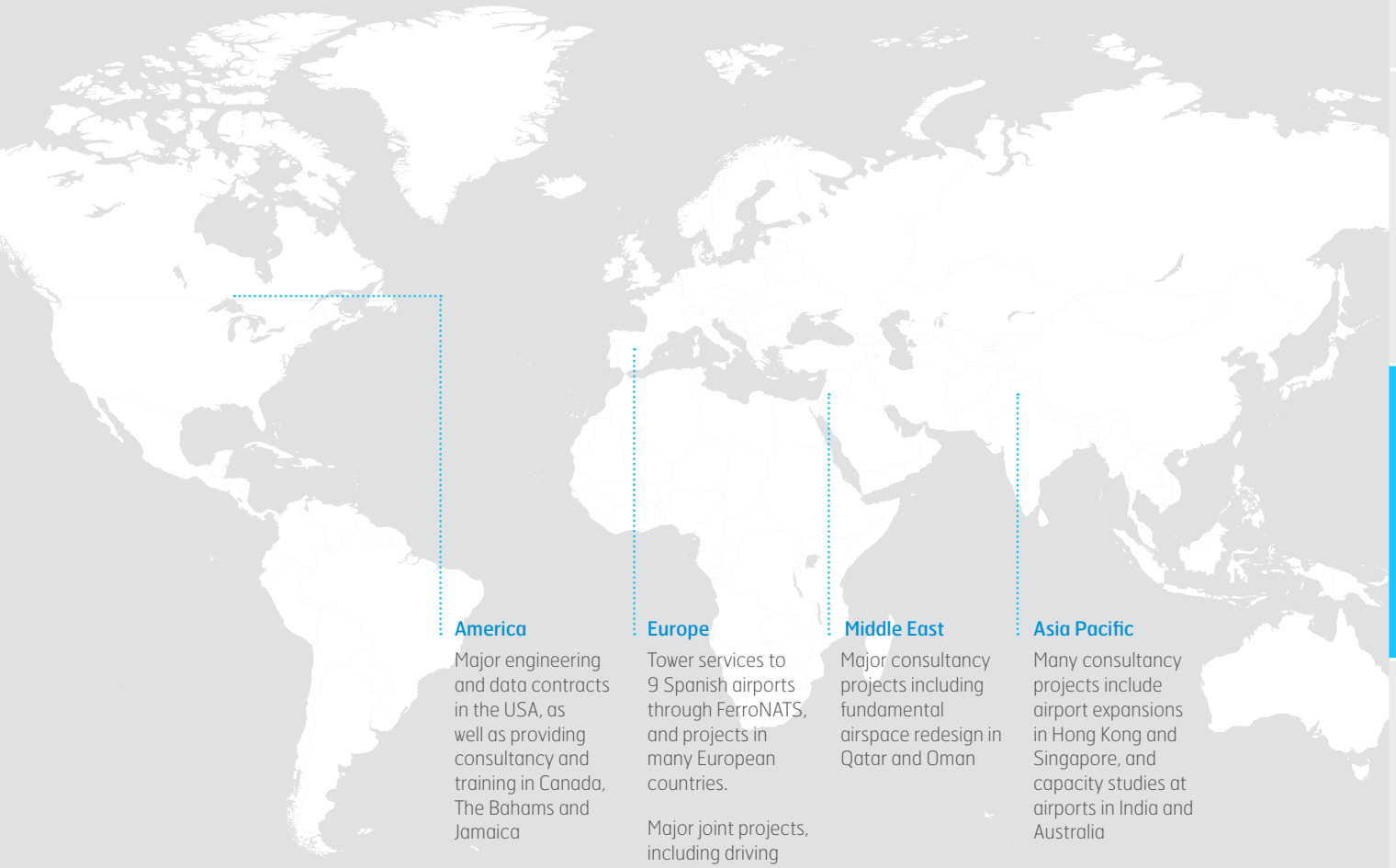
Where we operate



America
Major engineering and data contracts in the USA, as well as providing consultancy and training in Canada, The Bahams and Jamaica

Europe
Tower services to 9 Spanish airports through FerroNATS, and projects in many European countries.

Major joint projects, including driving forward the modernisation of the European ATM network through the SESAR Joint Undertaking and A6 Alliance

Middle East
Major consultancy projects including fundamental airspace redesign in Qatar and Oman

Asia Pacific
Many consultancy projects include airport expansions in Hong Kong and Singapore, and capacity studies at airports in India and Australia

2013/14 Headlines

- Airport contracts renewed at Belfast, Cardiff and RAF Gibraltar, with provision of the Engineering Service at RAF Gibraltar added to the ATC service
- FerroNATS transitioned 3 more airport ATC services in Spain – Valencia (July), Seville (Sep) and Ibiza (Nov) – and the Jerez ATC training centre in partnership with FTEJerez
- Gatwick Airport redesign of inbound and outbound routes for PBN and LAMP
- PBN advanced procedure design services for 5 Swedavia airports
- Specialist ATM support on design of Hong Kong International Airport's planned third runway

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Cont'd

Service
Sustainment
Cost Reduction
Fuel Savings
SES / SESAR Alignment
Safety
Obligations

3.3 Our Main Achievements

2013/14 Delivery – at a glance...
For clarity, we have sub-divided our main achievements into the en-route, terminal and runway environments as shown below.

	En Route Airspace UK – FAB – Network – Oceanic	Terminal Airspace Interface	Airports & Runways
	OPA Hotspot Projects New Safety Projects SPA Working Groups Flight Efficiency Partnership & 4% CO_2 Action Plan		
Significant Projects	En-Route Datalink Military En-Route at Swanwick Radar Replacement Programme PENS Ground Comms (SESAR)	Extended AMAN TMA Resilience LAMP Phase 1a public consultation	A-CDM Capacity Management Tools Taxi Time Monitoring
Trials	FAB Dynamic Sectorisation Oceanic Topflight	Departure Efficiency Lightweight ADS-B transceiver for GA	Runway Incursion & Alerting Systems Heathrow Noise Respite Trial

3 2013/14 Delivery Report
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Working jointly to address immediate issues

Operational and Safety Partnerships

In responding to customers' near-term operational needs, we are actively engaged in customer partnerships where we work together towards delivering service improvements and collaboratively agreeing priorities and 'hotspots' for joint action:

- Operational Partnership Agreement (OPA)
- Safety Partnership Agreement (SPA)
- Flight Efficiency Partnership (FEP).

On a strategic level, we have the annual Service and Investment Plan (SIP) consultation, which has been recognised as best in class by IATA, and we are working jointly in the UK industry's Future Airspace Strategy (FAS). This year we also established the Lead Operator Working Group and Carrier Panel to enable airlines to work with us in the early stages of the major airspace change programmes.

	Summary	Outputs
OPA Operational Partnership Agreement	Co-chaired by airline representatives, the OPA focusses on near term operational priorities for the next 12-18 months	OPA Hotspot projects and priorities (operational performance targets) – 7 Hotspot projects delivered during 2013
FEP Flight Efficiency Partnership	Bringing together airline, ATC and flight planning providers to jointly consider and implement new proposals for improvements in airspace efficiency	Agreeing quick win improvements that can be made to vertical and lateral route profiles in and around UK airspace c. 20 improvements enabling c 19,900 fuel savings delivered in 2013
SPA Safety Partnership Agreement	Working in partnership with customers and other industry stakeholders to identify and resolve specific safety issues	Working groups to focus on particular safety topics

3 2013/14 Delivery Report Cont'd

3.3.1 OPA Hotspot Projects for 2013

Each year the OPA agrees a set of Hotspot Projects focussing on specific short-term priority issues. Each project aims to deliver tangible improvements within 12 months and is jointly sponsored by NATS and airline representatives.

2013 Hotspot	Benefit delivered
Flight Efficiency Partnership	OPA sub-group established. FEP is now an on-going process, enabling airlines to discuss flight efficiency issues face to face with ATC who can make changes on their behalf. During 2013/14 c.20 improvements have been identified enabling fuel savings of over 19,000 tonnes.
Olympics Lessons Learned	Enhanced network management techniques employed during Olympics are embedded into our operations for handling future summer season traffic. LAMP Phase 1 incorporates lessons from airspace change/delivery processes, including Thames airspace.
En Route and Oceanic Airspace	
Flexible Use of Airspace (FUA) – Conditional Route (CDR) Usage	CDRs through airspace used by the military supplement the permanent route network. The project has increased the scope for operator planning/use of CDRs, enabling aircraft to fly fewer track miles and carry less fuel. Work has included proposals to Eurocontrol for improving CDR processes and reporting.
Swanwick AC: Sector 17 Lydd Airspace	At the London FIR boundary with French airspace, S17 (Lydd) is a key sector for traffic arriving into the London TMA. Despite capacity increases from iFACTS, S17 generates delays due to constantly high traffic demand. This project has: > Developed proposals for delegation of French airspace to Swanwick to improve the traffic flow into S17 airspace > Implemented improved route scenarios worked directly with the French ANSP (DNSA) to make maximum use of network capacity and reduce delay > Identified further airspace changes to be incorporated into LAMP design. Overall, there has been a significant reduction in the number of times re-route scenarios have been used compared to previous years.
Swanwick AC: Compton/ West End Airspace	A major crossroads for East-West and North-South traffic flows with large areas of military airspace, this project has implemented improvements that reduce delays for flights departing from the London TMA, including: > Better end-to-end interfaces between airports, Swanwick sectors and network managers that minimise application of MDI delays > Identifying improvements to departure routes and airspace to be carried forward in the DEP and LAMP programmes. Delays caused by Short Term ATFCM measures to address bunching in this area have reduced significantly.

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3.3.1 OPA Hotspot Projects for 2013 Cont'd

2013 Hotspot	Benefit delivered
Terminal Airspace Interface	
LTMA Weather Resilience	A continuation of improvements in 2012, delivering additional benefits: > 5-day Met forecasts for thunderstorm activity > Route/network options for managing traffic during thunderstorms > Controller awareness of pilot behaviour when encountering weather.
Airports & Runways	
Bristol RNAV Procedures	Following airspace changes in 2012, this project has delivered: > A set of RNAV approach and APV final approach procedures for Bristol, consistent with SESAR's release of capabilities > A standardised approach to airspace change consultation for this procedure type and the local safety case so that they are re-usable at other airports.

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3.3.2 New Safety Projects

The table below summarises key safety projects implemented in 2013/14. This is in the context of NATS' safety strategy (see below) together with all our units having their own Unit Safety Plans which set out their local actions to address key risks and drive safety improvement. Additionally, the SPA has a number of on-going activities by their working groups to address specific safety issues.

Safety Project	Benefit delivered
Pilot Controller Interface	The pilot/controller interface is vulnerable to flights being unfamiliar with operations in complex and densely used airspace, where any non-compliance or misunderstanding can cause safety incidents. Industry action in 2013 to reduce interface risk has been coordinated by an SPA Pilot–Controller Interface Working Group jointly led by NATS and Flybe. It includes a new set of training initiatives to improve pilots' and controllers' understanding of each other's operating environments.
Operational Interfaces	Risks stem from ineffective ATC procedures, non-compliance with agreed procedures and the ineffective presentation of traffic. During 2013, our day to day safety observations initiative has examined key interfaces with adjacent Centres (Brest, Reims, Maastricht, Dublin and Shannon) and introduced changes to reduce interface issues. We have also formed joint Operational Techniques Groups (OTGs) with ANSPs to share data, address issues and reduce risks.
Civil-Military Interaction	Unexpected interactions between civil and military aircraft are a key risk. Building upon work undertaken at Prestwick in 2012, enhanced coordination implemented in 2013 includes: > New information for pilots and controllers on activities in Danger Areas > Criteria for de-conflicting and co-ordinating both civil and military flights > Multi Crew Resource Management (MCRM) courses between NATS and Military to improve understanding of each other's operating environment.
Terminal Airspace Interface	
Level Busts	As part of on-going industry-wide initiatives to reduce level busts, we have extended the coverage of our Barometric pressure setting Advisory Tool (BAT) which alerts TMA controllers when there is a large difference between the downlinked pressure set on the flight deck and the QNH. BAT was extended in 2013 to cover all arriving aircraft in Terminal Control sectors and all departing aircraft below Transition Altitude, providing additional protection where the potential for a level bust arises.
Airspace Infringements	We are part of the CAA-led industry programme to reduce the likelihood and impact of airspace infringements by GA pilots. We have a Controlled Airspace Infringement Tool (CAIT) which warns controllers that an infringement has occurred based on the primary radar return of the intruding aircraft. In 2013 we introduced a number of CAIT enhancements to improve detection of intruders. We also carried out an initial trial of a light weight, low cost ADS-B transceiver for the GA community to augment radar data in further improving detection of intruders.

3 2013/14 Delivery Report Cont'd

3.3.2 New Safety Projects Cont'd

Safety Project	Benefit delivered
Airports & Runways	
Runway Incursions	As a part of on-going UK, European and global runway safety initiatives, we are introducing – in conjunction with airport operators – technology-based runway safety nets designed to mitigate errors made by pilots, drivers and ATC. In 2013, we implemented a joint Airport/NATS operational trial at Aberdeen Airport of a Runway Incursion Alerting System (RIAS). RIAS monitors runway holding points and works in conjunction with H24 stopbars, sending an immediate alert simultaneously to pilots and controllers if an aircraft starts to cross a stopbar. The Aberdeen RIAS trial continues into 2014.
Ground Safety	Airport ground safety incidents arise from taxiway conflictions, incorrect pushbacks, airfield works and winter operations. In line with joint industry action being coordinated by a CAA-led Ground Handling Operations Safety Team (GHOST), in 2013 we deployed a NATS Airport Safety Improvement Team to focus on solutions to trends in safety significant events (SSEs) relating to ground safety at NATS' airport ATC units.

A New Safety Strategy

David Harrison, Safety Director NATS

NATS continues to deliver excellent safety performance in some of the most complex airspace in the world. With growing traffic, increasing cost pressures and unprecedented advances in technology we need to ensure that our commitment to the safety of our services is unwavering. We have recently developed a new Safety Strategy which builds upon what we already do well, but also challenges us to think about safety in a different way. By implementing our new strategy we will evolve in how we measure and control safety in our operations, strengthen the role our people play in delivering safe services and ensure our resources are used effectively.

Watch the video here >

Find out more about the **Safety Strategy** here

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Reducing aviation's environmental impact and saving fuel are high on our agenda

3.3.3 Our Main Deliverables Flight Efficiency

Flight efficiency improvements come from two main lines of action:

- Our strategic ATM CO_2 Plan to reduce air traffic related emissions by an average 10% per flight by 2020 (from a 2006 baseline);
- Our joint work with customers in the newly formed Flight Efficiency Partnership (FEP) to meet near-term fuel saving targets set by the OPA which feed directly into the overall strategic target.

4% Action Plan

We are committed to meeting a 4% CO_2 reduction target by 2015 on the journey to our 10% by 2020 target.

However, because some of our strategic programmes will be delivered later than originally planned (LAMP especially), this 4% target is extremely challenging. Therefore, a '4% Action' project has been established to focus our ideas and resources on meeting the 4% target.

Examples of measures being incorporated into the 4% Plan include:

- A number of small scale airspace changes
- Extending the flexible use of airspace with MOD
- Further improvements in continuous descent approaches (CDAs)
- Environmentally focused network management
- NATS' focus on flight efficiency 'best practice' across all its operations.

Flight Efficiency Partnership

During 2013, our Airspace Efficiency Groups based at Swanwick and Prestwick have been working with customers through the FEP to implement better ways of using our airspace and new ways of working that enable extra fuel savings. This has included more efficient use of level caps, night time routes and flight profiles, as well as making greater use of military danger areas when not in use.

The ideas generated by the FEP in 2013 were provided by representation from 16 airlines and flight planning providers and include:

- Truncation of Standard Instrument Departure (SID) routes enabling earlier climbs to be flight planned
- Scottish TMA/airports interface to improve continuous climbs and descents
- Specific proposals in Swanwick and Prestwick airspace for increased route availability, shorter routes, better profiles and fewer level caps.

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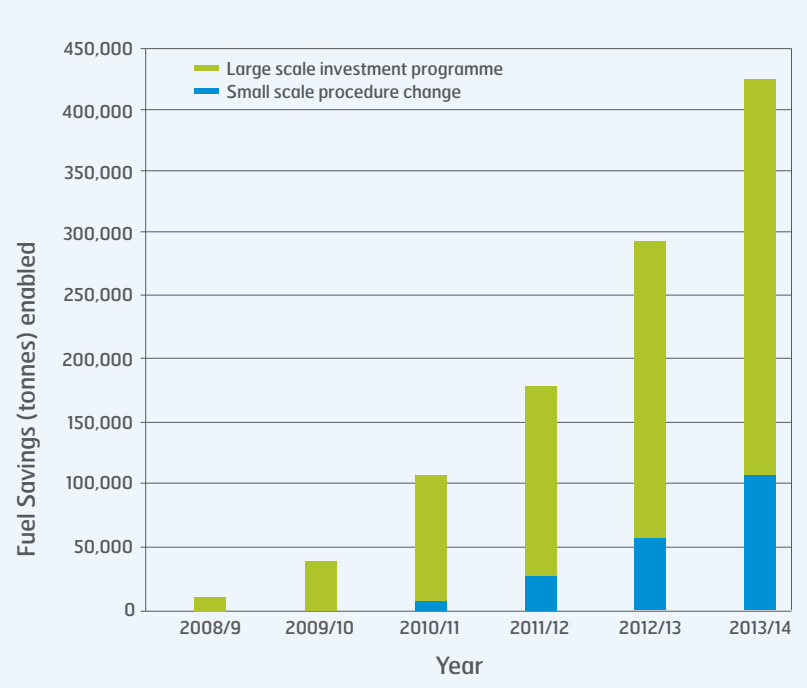
> The Flight Efficiency Partnership has proved to be a great success, bringing airlines, ATC and flight planning providers together to discuss, identify, and deliver fuel saving opportunities and to understand each others constraints and needs in a flexible high density traffic environment.
>
> Chris Woodland,
> Air Traffic Services Manager, Thomas Cook Airlines

Find more info on our **environmental programme** and our latest Corporate Responsibility Report here

Fuel Savings Enabled

During 2013/14 we enabled fuel savings of 59,000 tonnes worth £38m to our airline customers. These savings are the result of both small scale changes and larger scale investments, as well as improved analytical technology which have allowed us to better understand the benefits of its airspace efficiency programmes.

And since the programme began in 2006 these savings cumulatively add up to over 400,000 tonnes of fuel savings enabled corresponding to over 1,300,000 tonnes of CO_2 enabled, saving £270m in fuel burn.



Notes:

For conservatism, in the calculation of the overall cumulative figure, the benefits of fuel savings enabled in a given year are deemed to be realised during the following year.

A figure of £650 per mT is used to derive the equivalent monetary savings.

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2013

Project of the Year by the Association of Project Management (APM) for the Radar Replacement Programme.

En Route Airspace: UK - FAB - Network - Oceanic

En-Route Datalink

In August 2013 we completed the roll-out of datalink technologies at Swanwick and Prestwick enabling us to provide controller-pilot datalink communication (CPDLC) to suitably equipped ATN aircraft above FL285 anywhere in our airspace, and in most areas down to FL195. This exceeds Single European Sky requirements.

Undertaken in 2 phases, the roll-out required a significant investment, including large scale upgrades to existing legacy systems; the training of every en-route controller in the UK; and changes to radio stations across the UK in some very remote locations. We also ran three airline workshops, with representation from a number of customers.

Our roll-out provides a corridor of CPDLC services in high density airspace from Ireland through the UK, Belgium and Holland (Maastricht airspace) to Germany and Switzerland.

From an ATC viewpoint, CPDLC reduces controller workload and therefore provides potential benefits of safety risk reduction, additional capacity and improved flight efficiency.

Radar Replacement Programme

The 10 year programme to replace the UK's radar network was completed in summer 2013. Carried out across the length and breadth of Britain, with some radars located in the most remote and inaccessible parts of the country, this major engineering and logistical challenge was completed without any major operational impact on ATC services. NATS, working with wind farm developers, is now able to deploy a new mitigation to some interference to radars caused by wind farms, helping green technologies to co-exist alongside safety-critical aviation infrastructure.

This impressive achievement did not go unnoticed, being awarded 2013 Project of the Year by the Association of Project Management (APM).

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Military En-Route at Swanwick

The Ministry of Defence (MOD) completed its transition of control of Scottish Military airspace from Prestwick to Swanwick in December 2013, part of its strategy to consolidate all Military Area Radar Services on a common platform at Swanwick by 2015 to achieve efficiencies.

NATS worked closely with the MOD to implement the changes and complete the transition against tight timescales, demonstrating the strength of the joint and integrated relationship between NATS and the military.

SESAR Ground Communications

We took a significant step towards SESAR System Wide Information Management (SWIM) by implementing in October 2013 a new communications infrastructure which makes it easier to share flight information across borders. Known as PENS (the Pan-European Network Service), it incorporates a new standard for ATM message exchange that enables data to be readily used by different IT systems. It opens the door for improving interoperability not only within Europe but right around the world.

Oceanic Topflight – 'perfect' transatlantic flights

TOPFLIGHT is a SESAR trial project led by NATS that has successfully demonstrated environmentally 'perfect' flights over the North Atlantic.

During 2013, 100 British Airways flights across the North Atlantic were subject to gate-to-gate optimisation which included: providing an initial Oceanic profile before departure; the use of continuous climb and descent profiles and direct routings; use of more flexible Oceanic clearances; the flexible use of military airspace; and reduced engine taxiing.

Results varied flight to flight, with 25% able to achieve every element of optimisation while 70% were able to achieve at least half. Overall, the trial enabled an estimated saving of c. 500kg fuel per flight.

Conclusions have been fed back into the SESAR programme, proving that the concept is scalable and could be implemented for many flights at the same time without penalising those in the surrounding airspace.

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> From an airline perspective the Dynamic Sectors Operational Trial is one of the most exciting recent developments within the UK/Ireland FAB.
>
> Tobin Miller,
> Airline Representative UK/Ireland FAB Management Board, American Airlines

FAB Dynamic Sectorisation

A central part of Single European Sky and Functional Airspace Blocks (FABs) is to manage cross-boundary blocks of Europe's airspace far more efficiently than today.

The UK and Ireland, through NATS and our FAB partner the Irish Aviation Authority (IAA), launched Europe's first Dynamic Sectorisation Operational Trial (DSOT) to take place in high intensity airspace.

This landmark trial will gather information on efficiencies to be gained through the SESAR concept of tactical switching of air traffic services between providers.

The first phase of the trial began in January 2014 involving delegation of a portion of Prestwick's Rathlin West sector (above Northern Ireland) from NATS to the IAA. This airspace is an important gateway for flights to and from the North Atlantic.

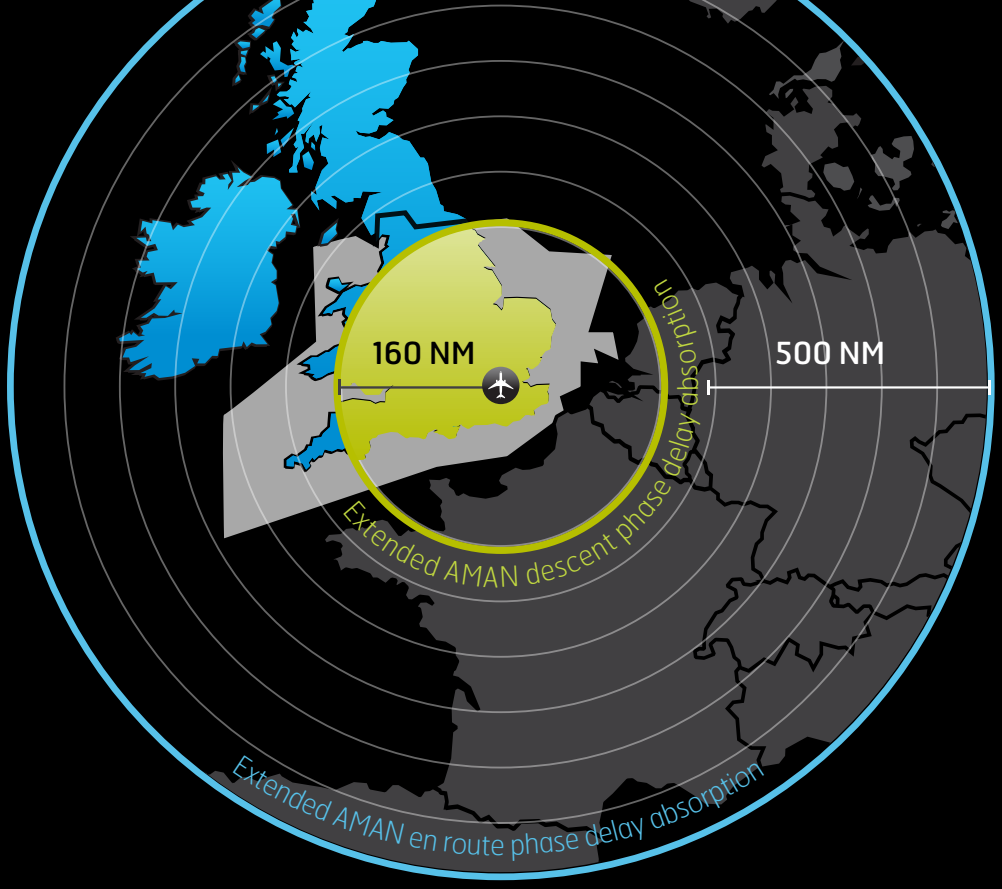
It is one of the most challenging and complex projects that the UK-Ireland FAB has undertaken, and is expected to make a substantial contribution towards deploying SESAR concepts most effectively.

Martin Rolfe, Managing Director NERL

If we ever needed proof of the importance of our partnership with our customers, this year provided it. The Topflight trials on the Atlantic demonstrated fuel savings of around 500kg a flight and that has been fed back into SESAR proving the concept is scalable. Roll-out of Datalink has created a corridor of controller-pilot datalink comms from Ireland through to central Europe and is another delivery on Single Sky commitments. We're running a complex dynamic sectorisation trial across our FAB. And of course we are continuing to deliver service every day at far from everyday performance levels – our delay is less than one fifth of the European average. This is all part of our commitment to shaping future ATM that delivers on what matters to you.

Watch the video here >

3 2013/14 Delivery Report
Cont'd



World leading cross-border arrival management trial

Terminal Airspace Interface

Extended Arrival Management (AMAN)

In 2012/13 we began a trial to extend the AMAN horizon for traffic inbound to Heathrow. By slowing streams of arriving aircraft during descent when delay is anticipated, fewer flights enter holding stacks close to the airport, reducing fuel burn and emissions.

In July 2013, extended AMAN became part of normal operational procedures, with controllers applying speed constraints (270 or 250 knots) to inbound flights during the descent phase. Initial data analysis has indicated that holding for Heathrow has reduced by an average two minutes per flight since January 2013, corresponding to an estimated fuel saving of 10,000T pa.

An important part of this concept has been to ensure that speed constraints are applied equally to all inbound aircraft and from all directions, to ensure that individual flights are not unfairly disadvantaged. This has involved in 2013/14 greater cross-border collaboration with other European air navigation service providers (ANSPs) – referred to as 'XMAN'. XMAN entered a new trial phase with adjacent ANSPs in 2014 (see 2014/15 Forward Plan later). We will consider extending the trial to Gatwick.

Extended AMAN, which is a key SESAR concept, has demonstrated the substantial fuel and emissions reductions it enables. Furthermore, reducing the volume of sky taken up by holding arriving aircraft in stacks also means we can offer better climb profiles for departing aircraft, providing even more fuel efficiency.

Heathrow ATFM Trial

A FAS trial led by NATS demonstrated the positive impact on stack holding of tying flights to their scheduled departures slots to increase arrival punctuality. The trial used Air Traffic Flow Management (ATFM) measures to reduce the variance in departure times versus schedule for traffic arriving into Heathrow. ATC reported a smoother delivery of traffic during the trial hours. The average number of aircraft entering the stack fell by 22% and the average time each delayed flight spent holding fell by 20%. In total the trial saved 23,000 minutes of holding between 9am and 1pm for the 50 days it was in place during the period November 2012 - April 2013.

Find out more about XMAN with our infographic

3 2013/14 Delivery Report
Cont'd

Re-writing the CAA/ICAO rules for route spacing in the TMA

Departure Efficiency

Gatwick implemented in 2013 the first permanent flight plannable Performance Based Navigation (PBN) RNAV1 SIDs in the UK, utilising the navigation capabilities of aircraft to improve track keeping on the airport's existing departure routes.

A joint NATS, airlines and airports Departure Enhancement Programme (DEP) is conducting trials of new PBN departure routes for Heathrow and Gatwick. The objective is to gather data about track keeping behaviour in the TMA environment with a view to informing the rules for route spacing standards.

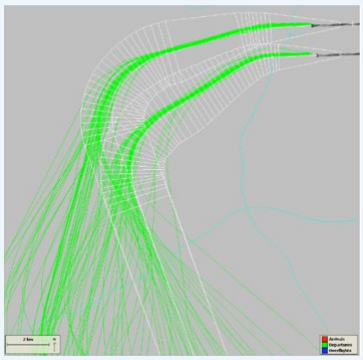
Today, controllers routinely intervene during an aircraft's Standard Instrument Departure (SID) to avoid other traffic. DEP aims to take advantage of PBN capability to recreate what controllers do now, reducing tactical intervention by design and thereby providing a predictable and efficient departure environment. The project provides a stepping stone towards a systemised PBN TMA environment in which aircraft are able to fly continuous climb operations with minimal controller intervention.

The first trial at Heathrow (DOKEN SID) went live in December 2013, systemising the trajectory that aircraft currently follow tactically. Gatwick's first trial (ADNID SID) commenced in February 2014 and will operate until August 2014.

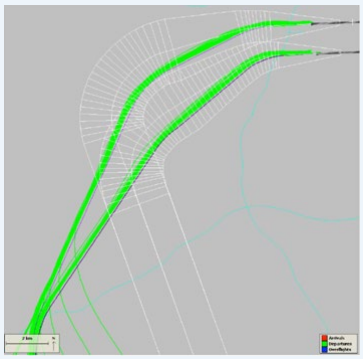
Further trials in 2014 will focus on take-off departure separation to enable more departure capacity for runways, gathering data about the minimum angle of divergence between SIDs to reduce departure separations from 2 minutes to 1 minute. It will also allow critical track-keeping and environmental data to be captured (see Noise Respite p29).

DEP is supported by a group of 'lead operators' who work as an integrated team with NATS and airports in the design and validation of the departure routes.

MID departures, 15 December 2013
(with NPRs shown)



MID departures, 16 December 2013
(with NPRs and DOKEN routes shown)



3 2013/14 Delivery Report Cont'd

> The Lead Operator concept provides an excellent framework for airlines to work alongside NATS airspace design teams. Engagement throughout the design process – from early concepts through to flight trials – ensures that airline requirements are considered at every stage.
>
> Alistair Wilson,
> Flight Operations Regulatory Affairs Captain, easyJet

TMA Resilience

While delays caused by NATS are at an all-time low, we recognise that other ATFM delays – notably weather and airport related delay – continue to have a significant impact on airlines' punctuality, particularly Heathrow and Gatwick operations.

The main driver of these delays are mostly outside NATS' control and include the level to which the airports are scheduled, their operating rules and the supporting arrival / departure route infrastructure. All of these require a combined effort by all stakeholders to resolve.

Nevertheless, we have taken action on several fronts to help reduce weather and airport related delay, for example:

- Better connecting and integrating airport operations with critical components at Swanwick Terminal Control and in the wider ATM network to minimise the impact of disruptive events and expedite recovery, through highly effective Airport Collaborative Decision Making (A-CDM) processes and the Heathrow Operational Efficiency Cell (HOEC)
- Improving resilience to bad weather in the London TMA, in particular better processes for managing traffic during thunderstorms (see Hotspot Projects in 2013/14 Delivery Report) and a technology solution on the horizon for countering the impact of strong winds (see Time Based Separation in 2014/15 Forward Plan).

Lead Operator

The Lead Operator concept brings airlines directly into the technical design team for future airspace design to provide expert guidance, take part in simulations, advise on the feasibility of procedures and other operational factors, undertake flight trials for evaluation purposes and potentially be part of the consultation process with the CAA and public. This means that airspace designs will more closely match customer requirements and will help achieve early validation of concepts and designs, leading to evidence-based decisions, quicker delivery and less risk.

The idea was introduced by the FAA for some of their major airspace programmes in the US, and proved very successful albeit with a single operator for each change. NATS has some even bigger airspace change programmes with the LAMP, DEP and the Northern Terminal Control Area (NTCA) and NATS is unique in setting up a framework for multiple airlines to engage in the design process. Having airline expertise, which encompasses a range of airline business models, built into the programmes means we are validating design and the benefits with our customers at every step we take.

The concept complements existing airspace design development arrangements for consultation with all stakeholders, including airports.

3 2013/14 Delivery Report Cont'd

Airports & Runways

Mike Stoller, Director of Operations (Airports)

Improving airport performance is one of the key solutions we offer our customers. For example last year at Gatwick, by working closely with the airport, we were able to increase the number of movements to 55 during the peak hours. That's in the context of what is already the busiest single runway operation anywhere in the world. At Heathrow airport and at other busy airports we have been working hard with our customers to trials things such as noise respite routes, to improve the fuel efficiency of departure routes, to support our customers' implementations of Collaborative Decision Making and to smooth the arrivals flow into busy airports. These solutions are all part of how we work with our customers to help them improve their performance and reduce their operating costs.

Watch the video here >

Gatwick Airport Collaborative Decision Making (A-CDM)

NATS has been working in partnership with Gatwick Airport and airlines to fully implement Gatwick's A-CDM55 project where information is shared right across the airport's operation to improve safety and efficiency. The principle of A-CDM is that everyone involved in airport operations is in the right place at the right time, working precisely to plan, in unison and sharing information.

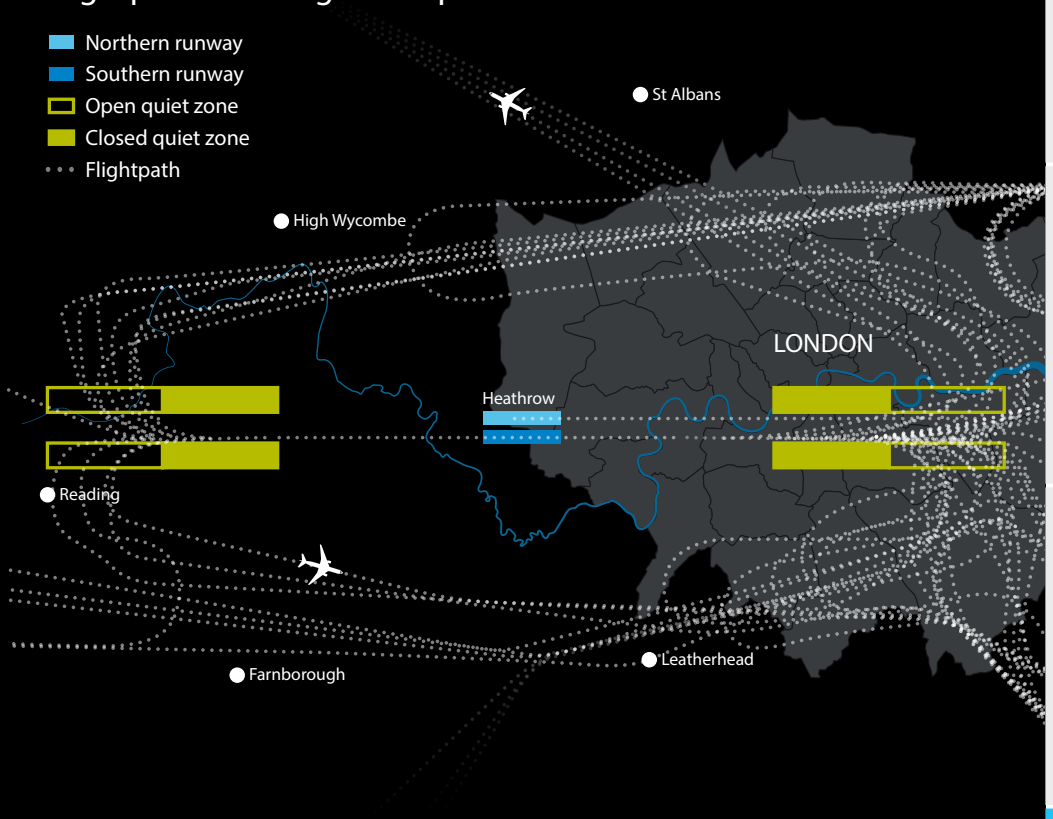
A-CDM55 had two main air traffic control components:

- Enhancing runway capacity by reducing spacing variations to reach a declared capacity level of 55 aircraft movements an hour
- Introducing a system to monitor how well the entire operation is performing on a real time basis.

Regarding spacing variations, an approach stabilisation trial operated between March-September 2013 to improve spacing consistency between arriving aircraft in order to maximise throughput. The 25% reduction in spacing variation achieved has flowed through into airport capacity declarations, with 55 movements per hour being a worldwide benchmark for single runway ATC operations.

3 2013/14 Delivery Report Cont'd

Flightpath avoiding inner quiet zones



Find out more from our infographic about the Heathrow Noise Respite Trial

Heathrow Noise Respite Trial

NATS is working with Heathrow, BA and community group HACAN on noise respite trials for people living under the airport flight paths. Linked to PBN and airspace changes being developed for LAMP, the aim is to exploit technology to create 'noise relief zones' for communities under the arrival and departure flight paths.

The first early morning arrival trial was concluded in March 2013. It demonstrated that routing flights to avoid specified areas before 6am benefits thousands of people living under Heathrow's flight path, providing predictable noise respite.

The departure trials – part of DEP above – include the concept of noise dispersion for Heathrow departures to provide predictable noise respite underneath departure routes.

The first trial started in December 2013 on Midhurst SIDs where, in addition to the existing noise preferential route up to 4,000 feet, new 'left' and 'right' routes that rotate on a weekly basis were introduced to see whether noise respite can be successfully achieved.

This trial of a single westerly (DOKEN1A/B) and easterly (MID1N-Q) departure routes concludes in June 2015. Further arrival and departure trials are planned by Heathrow.

3 2013/14 Delivery Report Cont'd

Taxi Time Monitoring

We have introduced a new Taxi Time Monitoring Tool which indicates the amount of fuel being used by flights between the stand and runway. Its purpose is to help improve environmental efficiency on the ground.

The tool uses Electronic Flight Progress Strips (EFPS) data – the information controllers use to keep track of the aircraft under their guidance – to measure the time that elapses between a flight being cleared to taxi and take-off. It is being rolled-out to all the EFPS equipped airports, including Aberdeen, Edinburgh, Gatwick, Glasgow, Heathrow, London City, Luton, Manchester and Stansted.

We will share the data with airports and airlines to get a better handle on the trends and areas for potential improvement in ground movement efficiency. For example, the data provides unique insights into the finer detail of taxiing operations like taxiway stop/starts and aircraft speeds to determine where opportunities for fuel savings might arise.

We will also see how the tool can be adapted to work with data from other types of aircraft, such as helicopters in Aberdeen's operation.

Capacity Management Tools

We have developed an enhanced capacity analysis capability that is being deployed first at Heathrow. A joint project with McLaren F1, we are providing a near real-time modelling capability to analyse airport performance against a wide set of variables.

Inspired by McLaren's F1 race day simulation that enables pit crews to use racetrack data to predict performance and make informed split-second decisions, the capacity management tool applies similar logic to an airport's operation.

The new tools allow airport planning and operations teams to assess the impact of various factors on performance in near real-time, such as taxiway closures, apron and stand restrictions, and ATC/ground movement procedures. The impact of other problems such as schedule delays and weather conditions can also be evaluated.

Tailored to Heathrow's particular specifications in this instance, the combination of robust analysis and speed of delivering information makes this an innovative and ground breaking tool. The core system can be tailored for other airport customers in future.

3 2013/14 Delivery Report Cont'd

3.4 Service Resilience

2013 was a year in which our resilience to unexpected events has been severely tested.

ATM System Failure

Swanwick Area Control Voice Control System (VCS) Failure

During the night of 6/7 December, while routine changes were being made to the VCS, the system's control and monitoring servers failed including the spare. This failure severely limited the ground-ground communications within Swanwick and with other ATC centres. The Swanwick Area Control operation remained restricted to its night time configuration of 5 sectors, unable to open the additional 15-20 sectors that would be used on a typical day until the software fault was finally resolved at 1835.

NATS implemented alternative routeings and level capping to enable flights to avoid affected airspace, with ATICCC managing communication with airports, airlines and ATM network managers to minimise the impact of disruption and expedite recovery to normal operations once the problem was fixed.

Over 90% of traffic operated, but airlines suffered extensive delays (33 mins average delay per flight) and with c.300 cancellations.

Actions stemming from lessons learned include:

- Changes to VCS and spares/backups to prevent any reoccurrence
- Work by the OPA on pre-planned re-route/level cap scenarios which are easier to deploy in any future incident and maximise uptake of available capacity by airlines when operating in a non-standard manner
- A strategic review of the level of NATS' operational and technical contingency.

Storms and Floods

Challenging weather conditions and airport disruption also tested our resilience during 2014 and in each instance we deployed capabilities and resources to keep airports and airspace safely operating no matter what the circumstances.

Gatwick Airport

Floods on 24 December affected runway lighting and ILS which, together with low visibility and strong winds, severely affected airport operations.

NATS' team at Gatwick worked hard in challenging conditions to restore critical systems and manage significant disruption / failures to keep the airport operating safely and to minimise ATC disruption.

We are working with Gatwick Airport to ensure lessons learned from the McMillan Report into disruption at Gatwick during Christmas 2013 are applied.

Infrastructure Damage

Stansted ILS

On 10 December a business jet damaged the Instrument Landing System (ILS) on landing at 0330. This affected the ILS for both runway directions during a morning with low visibility at the airport.

NATS' engineering team made temporary repairs by 1330 that enabled increased inbound flows, with full CAT3 capability on both runways restored by 1930.

Lowther Hill Radar

Severe winds of 140mph on the night of 4/5 December caused extensive structural damage to the Lowther Hill Radar, destroying the radome and damaging other equipment.

NATS' en-route radar network has overlapping coverage, hence full radar coverage can continue to be provided by adjacent radar sites. The extent of the damage means that repairs are not likely to be complete until summer 2014.

Airport Disruption

Heathrow Runway Closures

Incidents occurred on 24 May (aircraft emergency) and 13 July (aircraft fire) resulted in temporary runway closures, requiring NATS to manage the large number of inbound flights.

NATS' well-rehearsed plans and processes to manage such disruption resulted in co-ordinated prioritisation and diversion of flights, involving controllers at Heathrow, Swanwick and other airports in the south east as well as traffic managers at Swanwick and Eurocontrol. ATICCC managed communications with those affected and we worked with Heathrow and airlines to clear the backlog of flights once the runways returned to full operation.

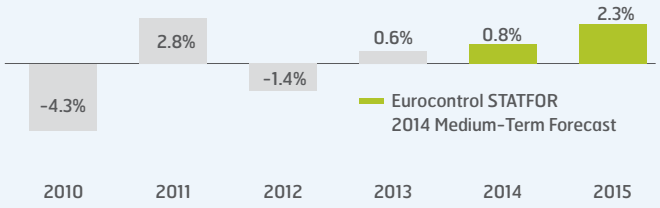
4
2014/15 Forward Plan

4.1 Context

Traffic Outlook

Economic difficulties of the past several years are being replaced by a cautious sense that economies are stabilising and recovering. Returning air traffic growth is forecast in 2014/15 by leading aviation barometers, including Eurocontrol's latest STATFOR February 2014 forecast which NATS uses for planning purposes. The STATFOR forecast reflects economic recovery in the UK, Europe and across world regions together with fuel price moderation, indicating a cautious 0.8% growth in UK IFR flights in 2014 rising to 2.3% in 2015.

UK Flights:
Recent Trend and Near-Term Forecast



Data: Eurocontrol Seven Year Forecast, February 2014

ATM Industry and Regulatory Environment

The European Commission's 'Single European Sky' (SES) project is driving the evolution of Europe's air traffic management industry. Key elements are the UK-Ireland Functional Airspace Block (FAB) and the SES ATM Research (SESAR) industry collaborative programme to deploy new technology and concepts. The UK's Future Airspace Strategy (FAS) industry-wide deployment plan represents the UK and FAB approach to deploying high priority SESAR outputs.

Additionally, the Airports Commission has short-listed 3 proposals for an additional runway in the southeast by 2030 and recommended immediate actions to improve the use of existing runway capacity, most of which are included in FAS deployment.

Our en-route business (NERL) is in its third regulatory control period (CP3/RP1) to the end of 2014 with the next reference period (RP2) starting on 1 January 2015. The European Commission (EC) has set EU-wide performance targets for RP2 designed to secure significant reductions in ATM costs at the same time as improving performance across all other areas (safety, capacity and environment). Additionally, the RP2 performance scheme is being extended to include targets for ATC at the UK's major airports.

4
2014/15 Forward Plan
Cont'd

4.2 Performance Targets

Safety

NATS has an internal safety target to reduce the Weighted SSE Index by 10% between 2011 and 2015, the Weighted SSE Index being a measure of collision risk based on a weighted sum of all SSEs that occur in NATS' controlled airspace.

Metric		2014 Target
Safety Risk Index	% reduction in the NATS Weighted Safety Significant Event Index (against 2011 base)	10%

Regulatory Service Performance Targets

The service performance metrics for 2014 are shown in the table. These metrics are incentivised such that NATS can earn a financial bonus or incur a penalty according to performance, each metric including a par value "range" (rather than a single point) within which no penalty or bonus would apply. Delay targets are modulated each year where traffic varies from the forecast, so they became tighter with reduced traffic. These modulated targets are not finalised until year end (see p11).

CP3 Metric		2014 Target
T1	Average Delay Secs per flight	12.5
T2	Delay Impact Score	35
T3	Delay Variability Score	1,500
3Di	CO_2 3D Inefficiency 12 month moving average (units)	23

4
2014/15 Forward Plan
Cont'd

OPA Customer Priority Targets

OPA performance targets will now be set for calendar years (as per regulatory targets), with just two performance targets for 2014 that focus on customer priorities; the 'Stretch' target reflects the OPA's view of an 'excellent' service performance standard.

OPA Priority		2014 Target	
		Target	Stretch
OPA1	Fuel Savings Enabled (tonnes fuel) through Flight Efficiency Partnership	10,000	15,000
OPA2	STAM Regulations (% applied of ≤ 45 mins duration)	95%	96%

Notes:

STAM = Short Term ATFCM Measure

4
2014/15 Forward Plan
Cont'd

4.3 Main Lines of Action

2014/15 Plan – at a glance...

	En Route Airspace UK – FAB – Network – Oceanic	Terminal Airspace Interface	Airports & Runways
	Glasgow 2014 Commonwealth Games - Airspace Management		
	2014 OPA Hotspot Projects		
	New Safety Projects		
	Flight Efficiency Partnership & 4% CO_2 Action Plan		
	SPA Working Groups		
Significant Projects	Oceanic COAST Data Network Modernisation DVOR Replacement	XMAN Cross Border Arrival Management LAMP & NTCA Early Deliverables	Time Based Separation (TBS) Runway Safety Nets

4
2014/15 Forward Plan
Cont'd

4.3.1 Customer Priorities – 2014 OPA Hotspots

2014 Hotspot	Action and Expected Outcome
Enhanced Resilience and Recovery	Developing a range of pre-planned re-route/level cap scenarios which are easier to deploy in any future ATM system failure incident, in order to maximise uptake of available capacity by airlines when operating in a non-standard manner. Improving tactical communications between airlines, airports, ATC and the wider ATM network during disruption and recovery.
En Route and Oceanic Airspace	
Oceanic Flight Efficiency	Improving information exchange, collaborative planning and efficient utilisation of capacity on Oceanic planned and random routes – to achieve higher correlation between flight planned and actual flight profile together with improved level allocation for traffic in the 'SE corner' of Shanwick airspace.
Conditional Route Usage	Following-on from the 2013 Hotspot, improve the uptake by airlines of flight planned CDRs that enable them to fly shorter routes through deploying an updated version of Local and Regional Airspace (LARA) tool in UK Airspace Management Cell and development of reporting requirements on CDR availability and usage to identify specific opportunities.
Sector Capacity	Daventry South and London Upper Sectors have been identified as potential delay generating sectors. The Hotspot is working with customers to reduce the need to apply particular re-route scenarios and improve the way that sector monitor values are reviewed.
Terminal Airspace Interface	
Speed Adherence	Raising pilot awareness of adhering to ATC speed restrictions to maximise airspace / runway capacity, particularly speed during approach. Developing with airlines and the CAA a range of speed compliance to be achieved by airlines.
Airports & Runways	
Bristol RNAV Procedures	Completion of the 2013 Hotspot to deliver more efficient flight profiles and a safer ATC operation with less ATC intervention, based on a streamlined airspace change process for replicating conventional procedures for PBN.
SID Fuel Uplift	Developing the framework for a commercial offering to provide airlines with information on variances between the 'planned for' SIDs and the actual climb profiles being achieved – ultimately to reduce planned fuel uplift and hence a fuel-burn saving for each flight.

4
2014/15 Forward Plan
Cont'd

4.3.2 Main Deliverables – 2014/15 Checklist

Deliverable	Action and Expected Outcome
Glasgow Commonwealth Games ATC	Deliver our ATC Service Delivery Plan to facilitate the Games air traffic and required security measures during July-August 2014 – plan based on lessons from London 2012 Olympics.
En Route and Oceanic Airspace	
Prestwick Upper Airspace	On-going dynamic sectorisation trial with IAA (FAB Project) to enable flexible and efficient management of FAB airspace between ANSPs Implementation of new iTEC Flight Data Processing system and associated Controller Tools together with early introduction of Free Route Airspace – planned to be fully operational mid-2016, enabling greater flight efficiency.
Oceanic COAST	Collaboration on Oceanic Airspace & System Tools (COAST) > Deployment of collaborative development of NAV CANADA GAATS+ system into Shanwick airspace to replace end-of-life SAATS system > Planned to be operational in November 2014 – includes enhanced tools to optimise trajectories, enhanced safety through electronic data coordination > COAST is future proof for planned Oceanic developments.
Data Network Modernisation	Deploys a replacement data network infrastructure that interconnects ATC centres, radar sites, communication sites and major airports – accommodates higher data flows in SESAR concepts while containing operating costs: > Based on Internet Protocol (IP) technology which is the SESAR standard for data communications > Design and testing of new network over last 2 years with supplier > Phased transition into service between April-December 2014 – with no expected impact on operations
Data Network Modernisation	PBN arrival / departure and airspace designs enable a reduction in ground-based navaids, allowing c.27 DVORs to be withdrawn and reducing the scale of the planned replacement programme to c.19 DVORs: > Phased programme to 2018 > 4 replacements in 2014: Ottringham, Berry Head, Talla and Lands End > 1st tranche for withdrawal (timescales subject to consultation): Benbecula, Cranfield, Dean Cross, Dover, Gamston, Inverness, Lydd & Machrihanish. Phased operation into service during 2014 with no expected impact on operations.

4
2014/15 Forward Plan
Cont'd

4.3.2 Main Deliverables – 2014/15 Checklist Cont'd

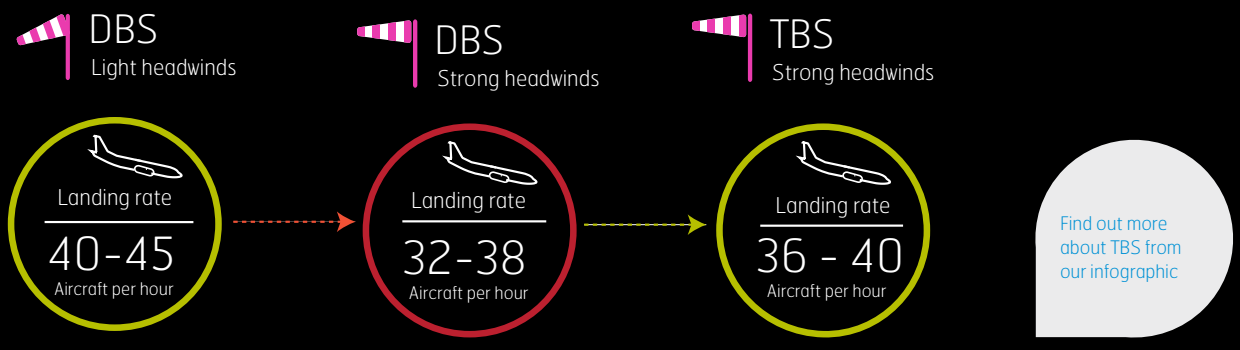
Deliverable	Action and Expected Outcome
Terminal Airspace Interface	
XMAN Cross Border Arrival Management	Heathrow XMAN trial between March-December 2014, the first cross border arrival management trial of its kind anywhere in the world: > Expands scope of 'Extended AMAN' to include absorbing airport arrival delay during the en-route phase of flight through speed control (queue position is maintained by AMAN system) > Heathrow delay information sent to adjacent ATC Centres – speed reduction of M0.03 applied 350nm from Heathrow when predicted arrival delay >9 mins > Participating ATC Centres – Prestwick, Shannon, Reims and Maastricht.
London Airspace Management Programme (LAMP)	Further planned arrival and departure trials to inform LAMP: > Heathrow easterly departures and 2nd phase early morning arrivals – to assess noise respite and departure efficiency > Gatwick departure divergence – 1 minute intervals on adjacent SIDs > New arrival routes (Point Merge) for Gatwick and London City – improving safety and enabling fuel savings > Airspace change consultation completed, DfT decision due February 2015 with planned delivery winter 2015/16 Lead Operator programme to enable airlines affected by the major changes in LAMP to be more directly involved in airspace design.
Northern Terminal Control Airspace (NTCA)	Major redevelopment of terminal airspace in northern England in line with FAS (PBN design) to improve flight efficiency and capacity Early deliverables in 2014/15: > Changes to enable fuel savings ahead of the full network design – e.g. SIDs to Flight Levels, SID truncation. > Sector and procedure re-design to improve airspace efficiency – e.g. changes to standing agreements, removal of North Upper sector.

4 2014/15 Forward Plan Cont'd

> We look forward to the introduction of Time Based Separation at Heathrow in 2015 as strong headwinds on final approach are the single biggest cause of inbound delays. The deployment of TBS will see delays significantly reduced in these conditions and British Airways is working very closely with NATS to ensure that the full potential of TBS is realised.
>
> Dave Wood,
> Manager ATC Services and Punctuality, British Airways

4.3.2 Main Deliverables – 2014/15 Checklist Cont'd

Deliverable	Action and Expected Outcome
Airports & Runways	
Runway Safety Nets	Working in partnership with airport operators as appropriate: > Further deploy H24 Stopbars and associated runway incursion alerting technologies (e.g. RIAS) > Optimise current surveillance-based Runway Incursion Monitoring Controller Alerting System (RIMCAS) to improve its effectiveness
Time Based Separation	Introduce Time Based Separation (TBS) for Heathrow Final Approach in Spring 2015 to maintain landing rates in strong headwinds – increasing airport resilience in challenging weather conditions and reducing weather related delays > World first TBS deployment, based on extensive analysis of wake vortices in strong winds and simulation of safe operating procedures > Heathrow Final Approach controllers (in Swanwick Terminal Control) provided with on-screen guidance to visualise required time separation
Airport Integration into ATM Network	Real-Time Departure Planning Information (DPI) project (a FAS project) to improve accuracy of traffic demand information provided by airports to enable ATM network performance to be optimised, with consequential benefits to airlines and airports > Funded by Transport Systems Catapult Ltd – a Government innovation centre set up with the Technology Strategy Board > Involves connecting UK regional airports to the European Network Manager to improve quality / coverage of real-time departure information.



4
2014/15 Forward Plan
Cont'd

4.4 UK Ireland Functional Airspace Block (FAB)

We are a partner in the UK-Ireland FAB along with the IAA and airspace users (civil and military). The first FAB to be created under SES in 2008, it has been operating successfully to deliver significant flight efficiencies for our customers, with airline representation on the FAB Management Board. Sustainable savings to customers since 2008, enabled by optimisation of FAB airspace, are estimated at over €70m including 232,000 tonnes of CO_2 and 73,000 tonnes of fuel.

Current key FAB projects in 2014/15 include:

- Dynamic Sectorisation Operational Trial – tactical swapping of airspace between NATS and IAA ATC Centres to share workload, ease bottlenecks and improve efficiency (see DSOT, p24)
- FAB Queue Management – working with adjacent FABs to optimise arrivals and departures for congested TMAs and airports, with cross-border optimisation for flight efficiency and reduced delay (see XMAN, p25).

In common with all other FABs, there is a perception that the SES requirements in EU regulations may not be met. We have developed jointly with the CAA and IAA a UK-Ireland FAB implementation plan and milestones to demonstrate our commitment to the SES and to ensure our full compliance with EC regulations. There has been positive feedback from the European Commission on this implementation plan.

We are now focused on FAB planning for RP2 and contributing to the delivery of SES performance targets through joint FAB projects. However, until the regulatory framework and targets are fully in place at the end of 2014, it is difficult to commit to firm actions and targets.

5 Longer-Term Plans

The European Commission's Single European Sky ATM Research (SESAR) technology programme aims to modernise airspace, introduce new concepts that exploit aircraft capabilities and technology, and ensure that the various ATM systems talk to each other to provide the most efficient service possible.

Progress to date in meeting the objectives of Single European Sky has not been as quick as it should. The return to traffic growth is increasing the aviation industry's focus on accelerating delivery of SESAR to ensure that recent ATM improvements are not undermined.

NATS is taking action on several fronts to deliver SESAR as quickly and efficiently as possible:

- The UK's Future Airspace Strategy deployment initiative which is implementing SESAR priorities in the UK
- Our collaborative approach with other ANSPs to deploy SESAR
- The European Commission's proposals to base SESAR deployment on Pilot Common Projects (PCPs).

Deploying SESAR

Simon Hocquard, Director Operations Strategy

We all know that SESAR is the key to unleashing efficiency in the European ATM system – what NATS is now doing is making that happen far more quickly. Our Deploying SESAR programme is a huge part of our investment programme, but we are fast forwarding it to deliver all the benefits of greater capacity and fuel efficiency, much faster than originally planned. It will allow us to accelerate deployment of SESAR concepts as they mature, on a single operational and technical platform without the constraints of legacy systems. It is the most exciting operational transformation in our history – and it is already under way.

Watch the video here >

5 Longer-Term Plans
Cont'd

5.1 Ten Key FAS Deployment Initiatives linked to SESAR

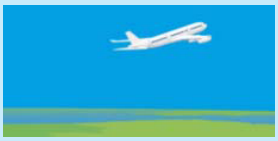
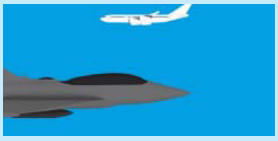
FAS Initiative	Scope & NATS input
Runway Safety Nets 	Increase electronic integration of UK airports into the ATM network, improving the quality of traffic flow information > Transport Systems Catapult sponsored DPI project
A-CDM 	A-CDM systems at capacity constrained airports to improve efficient sequencing and on-time performance > A-CDM in operation at Gatwick and Heathrow > Departure Management (DMAN)
UK Wide PBN Implementation 	Aligning investments in PBN routes across UK airports with improvements in fleet capability and the development of advanced airspace design concepts > Bristol PBN arrivals > Gatwick and Heathrow departure trials > LAMP, NTCA and Airspace alignment programmes
PBN Departure Enhancement 	Replicating or fully re-designing SIDs at key airports for PBN and collecting track keeping data to inform noise mitigation and enhanced route spacing standards > Gatwick and Heathrow departure trials through DEP > CAA PBN mandate
Terminal Airspace Re-Design 	Implementing a more efficient route structure in the TMA to systemise arrival and departure routes > LAMP and NTCA programmes

5 Longer-Term Plans
Cont'd

Airports Commission

The Airports Commission is making recommendations on how to maintain the UK's position as a hub for international air traffic. Its interim report short-listed 3 proposals for an additional runway in the southeast by 2030. It also recommended immediate actions to improve the use of existing runway capacity, these actions mostly being included in FAS. In addition to our leading role in delivering FAS, our key priority is to address operational deliverability of short-listed new runway options ahead of the Commission's preferred option being announced in 2015.

5.1 Ten Key FAS Deployment Initiatives linked to SESAR Cont'd

FAS Initiative	Scope & NATS input
Harmonising Transition Altitude 	Raising the TA across the UK-Ireland FAB, harmonised with neighbouring FABs > CAA consultation on UK TA > NATS TA implementation project > Harmonised European TA
Arrival Management 	Using AMAN tools to absorb some arrival delays through speed control in the en-route and descent phases of flight, and streaming traffic to arrive in an efficient order for landing > Extended AMAN at Heathrow and Gatwick > Time Based Separation (TBS)
Queue Management 	Expanding the AMAN capability across FAB boundaries (XMAN) and integrating Departure Management (DMAN) capabilities to de-conflict outbound traffic flows > Heathrow XMAN trial
Enhanced Flexible Use of Airspace 	Strengthening the toolsets and processes used for reserving temporary airspace and increasing use for civil use > Improved electronic interfaces (LARA tool) and advanced FUA processes
Network Management 	Supporting development of European Network Manager's capability to optimise network operations, including scheduling, flight planning and punctuality

5 Longer-Term Plans
Cont'd

5.2 Collaboration with Other ANSPs to Deliver SESAR

A6 Group of ANSPs

The A6 Alliance is formed of the six ANSP members of the SESAR Joint Undertaking – Aena (Spain), DFS (Germany), DSNA (France), ENAV (Italy), NATS (UK) and NORACON – a consortium including Austro Control (Austria), AVINOR (Norway), EANS (Estonia), Finavia (Finland), IAA (Ireland), LFV (Sweden) and Naviair (Denmark).

A6 creates synergies between these key ANSPs who collectively represent 8 of Europe's 9 FABs, control over 70% of European air traffic and 72% of the investment in the European ATM infrastructure of the future.

A6 is currently focused on SESAR deployment execution (planning, governance, funding), in particular swiftly establishing the SESAR Deployment Manager to take ownership of the programme, ensuring that ANSPs' requirements are included and that the programme is delivered collaboratively across the whole aviation community on an agreed business case basis.

Borealis ANSP Alliance

Borealis is a commercial alliance of 9 ANSPs (Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Norway, Sweden and the UK) which aims to drive better performance by 'doing things differently' through business collaboration for the benefit of customers.

Its focus on delivering Single European Sky currently covers 3 key collaboration areas:

- Extended free route airspace
- Optimised datalink services
- Regional aeronautical information management (AIM) services.

5.3 Deploying SESAR across Europe

SESAR is one of the most ambitious integrated programmes ever launched in Europe, and the European Commission (EC) is currently deciding how it will be deployed.

They are proposing a Pilot Common Projects (PCP) concept for synchronised cross-industry implementation of key programmes, orchestrated by the SESAR Deployment Manager. PCPs will be the formal legal instrument that enables EU funding for SESAR deployment.

The 4 core ATM functionalities currently proposed in the PCP are consistent with our FAS Deployment:

- Extended AMAN and PBN in high density TMA.
- Airport Integration and Throughput
- Flexible Airspace Management & Free Route
- Network Collaborative Management.

6 Customer Engagement

Involving customers in what we do

Andy Shand, General Manager Customer Affairs

NATS works very hard to keep customers at the heart of our thinking... and I like to think we do pretty well. We have built relationships where we can talk freely and challenge each other's thinking to deliver the best outcomes. A good example of this is the Flight Efficiency Partnership where with air traffic controllers and airline staff working together we delivered over 19,000 tonnes of fuel savings last year. We also now have airlines the heart of our airspace design teams delivering the Future Airspace Strategy. These are just two examples of where we work together. We see huge benefit in maintaining a close working relationship with you, our customers, and we look forward to continuing that this year.

Watch the video here >

We have a number of different forums for engaging with customers including the Operational Partnership Agreement, Flight Efficiency Partnership and Annual Service and Investment Plan Consultation. Additionally we have a website dedicated to our customers (**www.customer.nats.co.uk**).

If you would like to further information on these or to discuss anything in this report or any elements of our service delivery, please contact our Customer Affairs team at the contacts below:

Andy Shand
General Manager, Customer Affairs
andy.shand@nats.co.uk

Alex Culley
Customer Affairs
alex.culley@nats.co.uk

Daniel Nelson
Customer Affairs
daniel.nelson@nats.co.uk

Nicola Jordan
Customer Affairs
nicola.jordan@nats.co.uk

Acronyms

3Di	3 Dimensional Inefficiency
A-CDM	Airport Collaborative Decision Making
AIM	Aeronautical Information Management
AMAN	Arrival Management
APV	Approach Procedures with Vertical Guidance
ATFCM	Air Traffic Flow and Capacity Management
ATICCC	Air Traffic Incident Communication and Coordination Cell
BAT	Barometric Setting Advisory Tool
CAA	Civil Aviation Authority
CAIT	Controlled Airspace Infringement Tool
CCD	Continuous Climb Departure
CDA	Continuous Descent Arrival
CDR	Conditional Route
CP3	Control Period 3
CPDLC	Controller Pilot Datalink Communications
COAST	Collaboration an Oceanic Airspace ξ System Tools
DEP	Departure Enhancement Programme
DMAN	Departure Management
DPI	Departure Planning Information
DRA	Direct Route Airspace
DSOT	Dynamic Sectorisation
DVOR	Doppler Very High Frequency Omni-directional Radio Range
EC	European Commission
EFD	Electronic Flight Data
FAB	Functional Airspace Block
FASIIG	Future Airspace Strategy Industry Implementation Group
FEP	Flight Efficiency Partnership
FPM	Flight Profile Monitoring
FUA	Flexible Use of Airspace
GA	General Aviation
GHOST	Ground Handling Operations Safety Team
HACAN	Heathrow Association for the Control of Aircraft Noise
HOEC	Heathrow Operational Efficiency Cell
IAA	Irish Aviation Authority
iFACTS	Interim Future Area Control Tools Support
ILS	Instrument Landing System
LAMP	London Airspace Management Programme
LARA	Local And Regional Airspace
LOFT	Line-Orientated Flight Training
MCRM	Multi Crew Resource Management
MOD	Ministry of Defence
MSAW	Minimum Safe Altitude Warning
NPS	Net Promoter Score
NTCA	Northern Terminal Control Area
OPA	Operational Partnership Agreement
OTG	Operational Techniques Group
OTS	Organised Track Structure
PCP	Pilot Common Project
PENS	Pan-European Network Service
RIAS	Runway Incursion Alerting System
RIMCAS	Runway Incursion Monitoring Controller Alerting System
RNAV	Area Navigation
RP2	Reference Period 2
SES	Single European Sky
SID	Standard Instrument Departure
SIP	Service and Investment Plan
SPA	Safety Partnership Agreement
SSE	Safety Significant Event
STAM	Short Term ATFCM Measure
SWIM	System Wide Information Management
TA	Transition Altitude
TBS	Time Based Separation
TMA	Terminal Manoeuvring Area
VCS	Voice Communications System
XMAN	Extended Arrival Management

Appendix

2013 Airline Customer Survey Results

Category	Question	Importance score	Delivery score
Safety			
	Proactive management of safety	9.24	8.59
	Provision of timely and effective responses to safety events	7.03	8.24
	Provision of relevant quarterly safety statistics	8.94	8.54
	Working with customers to drive safety improvements	8.43	8.17
Operational Performance			
Swanwick	LTC Service Delivery	9.01	8.25
	LAC Service Delivery	8.75	7.99
	Daily tactical operational support	8.21	8.14
	Provision of relevant and timely responses to queries	8.17	8.17
	Effective management of interfaces with adjacent En-Route ANSPs	8.26	7.99
Prestwick	En-route Service Delivery	8.86	8.46
	Oceanic Service Delivery	8.41	8.13
	Daily tactical operational support	8.38	8.44
	Provision of relevant and timely responses to queries	7.99	8.38
	Effective management of interfaces with adjacent En-Route ANSPs	8.13	8.24
Airports	Airports Service Delivery	9.24	7.80
	Provision of predictably high standard of ATS	9.12	8.21
	Daily tactical operational support	8.70	7.69
	Provision of relevant and timely responses to queries	8.15	7.84
	Airline involvement in procedure change	9.27	7.75
	Airports/En-route interface	8.82	7.81
Unusual Events	NATS technical systems' resilience	9.41	7.63
	Management of any periods of disruption	9.42	8.16
	Provision of relevant information via ATICCC during an incident	9.10	8.50
	Feedback to customers following any periods of disruption	8.26	8.24

Appendix
Cont'd

2013 Airline Customer Survey Results Cont'd

Category	Question	Importance score	Delivery score
Environment			
	Delivery of fuel and emissions savings opportunities	9.28	7.24
	The Flight Efficiency Partnership as a mechanism for identifying fuel and emissions savings opportunities	8.81	7.55
	Development of cross-border fuel and emissions savings opportunities	8.92	7.15
	Collaborating with industry partners to drive fuel and emissions saving opportunities	8.77	7.71
	Centres' Awareness of Environmental Issues	8.45	7.43
	Airports' Awareness of Environmental Issues	8.51	7.62
	Communication of NATS' environmental programme	7.68	7.04
Meeting my Business Needs			
	Recognition of and Innovation according to my Business Needs	8.87	7.54
	Focus of customer bi-lateral meetings	8.21	8.06
Projects			
	Regular Project Updates	8.38	8.00
	Delivery of projects to time and budget	8.63	7.83
	Minimal impact of project delivery	8.95	8.11
Customer Engagement & Consultation			
Consultation	Management of RP2 consultation	7.78	7.47
	Management of SIP13 consultation	7.41	7.59
	Provision of relevant information through the SIP13 document	7.53	8.00
	Responsiveness to my company's feedback on the SIP13 consultation	8.38	7.77
Multilateral meetings	Effectiveness of customer engagement within UK/Ireland FAB	8.03	7.25
	Effectiveness of FASIIG	8.08	8.28
	Effectiveness of annual Flight Ops Director meeting	8.03	7.73
	Effectiveness of Operational Partnership Agreement (OPA) meetings	8.43	7.88
	Effectiveness of Safety Partnership Agreement (SPA) meetings	8.47	7.95

Appendix
Cont'd

2013 Airline Customer Survey Results Cont'd

Category	Question	Importance score	Delivery score
Information & Documentation			
	Provision of materials in advance of customer meetings	8.33	8.10
	Provision of salient performance information through NATS customer website	7.49	7.83
	Provision of salient operational information through NATS customer website	8.18	8.31
	Usefulness and format of NATS customer website	7.67	7.49
Other			
	Issues raised in 2012 Survey addressed	N/A	7.20
	Cost Efficiency	N/A	6.93
	How likely are you to speak positively about NATS**	N/A	+50

**Net Promoter Score has a different calculation mechanism