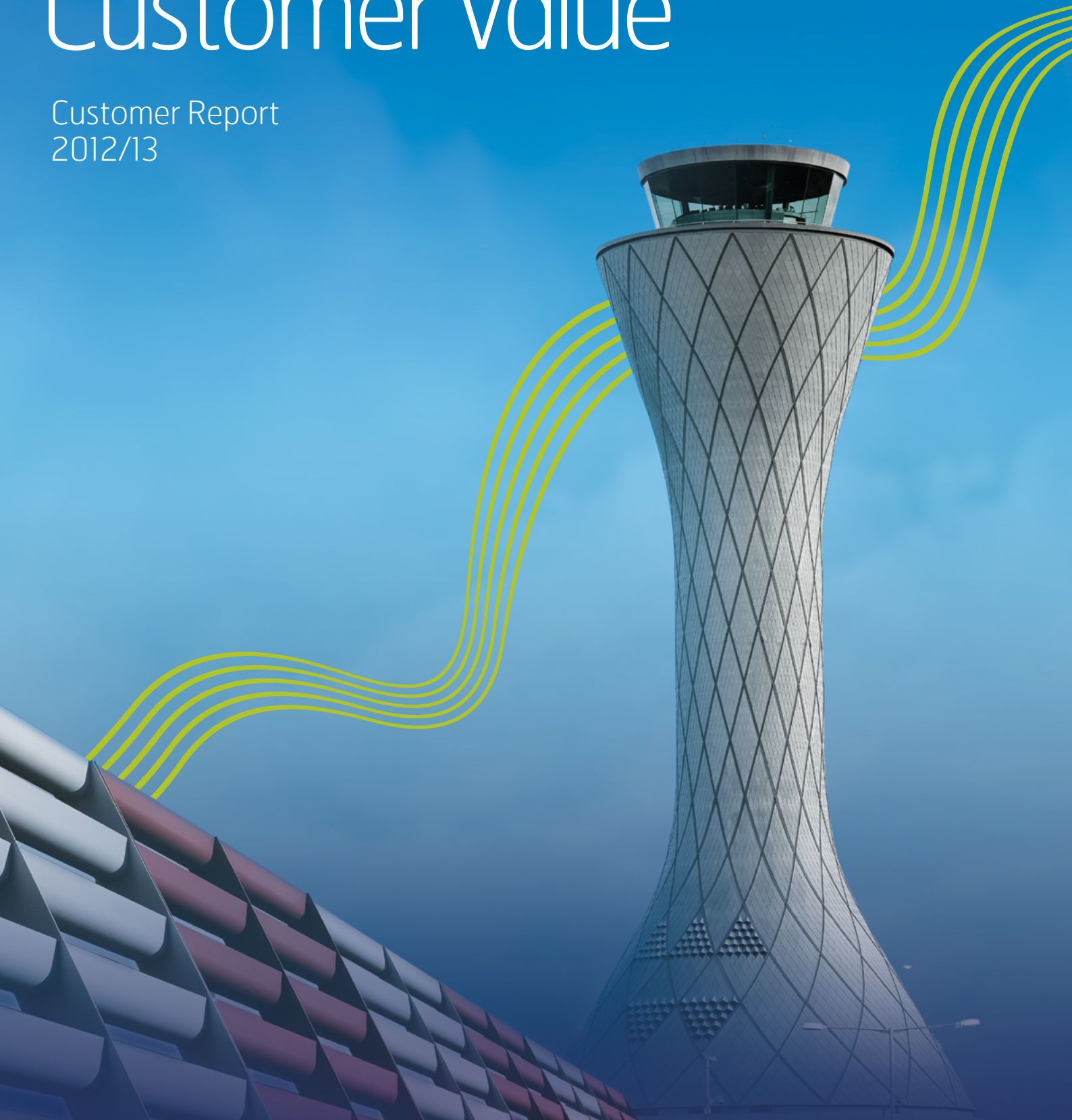# Delivering Customer Value

Customer Report
2012/13

Contents

Click on the pages below to access each section.

You may return to the contents page at any time by clicking on the arrow located in the bottom-left corner of each page.

1
Introduction

The next two years will set the context for our industry for many years to come. The CAA's Future Airspace Strategy, and the NATS airspace programmes which will deliver it, are already under way and will also deliver SESAR into the UK in the way we manage and move traffic around our network. By 2015 we will know the Airports Commission's recommendations on hub connectivity. Together these promise to change the shape of our industry.

We are also in the planning stages for RP2, the next regulatory period which starts in 2015, and our consultation with customers on our investment plan to 2020 will take place over this summer. It includes unit cost reduction which is at the top end of the PRB targets for SES and significant investment in the technologies that will allow you to make best use of your fleet with increasing efficiency.

It has never been more important for us to be tuned in to our customers, to your needs and priorities and I am pleased that this year's survey of your opinions shows a continuing improvement with an overall score of 8.2 out of 10 which is very positive. Many thanks for your feedback including areas for improvement which we will work on this year.

We were particularly pleased with the really positive feedback on operational performance during the Olympics where our joint planning and preparation really paid off.

The survey reflects the importance we attribute to maintaining really effective communication with you, and the benefits of working together to enable cumulative fuel savings of over 250,000 tonnes over the last 5 years together with specific service improvement projects and hotspots.

This year's report gives you a progress update on some of the key initiatives that will deliver future efficiencies. Many of these feature in the submission we have made to the Airports Commission. We have been asked to act as expert advisers to the Commission, and I am delighted that the importance of airspace is finally being recognised. We sit at the heart of future development and future efficiencies, and working in partnership with airlines and airports is the key to unlocking both.

Richard Deakin
CEO NATS

2
Customer Priorities

Tuned-in to customers…
…is one of NATS' core business values –
it means that we put our customers at the heart
of our decision making, understanding their
needs and priorities so that we can deliver value
to their businesses.

Traffic in our airspace fell by 1.9% in 2012/13, reflecting the difficulties our customers are facing in the current weak economic environment. Therefore, we are continuing to help reduce customers' overall operating costs through focusing on fuel savings and punctuality, and through sustainable reductions in our operating costs.

Through 2012/13 we have continued to deliver an excellent performance. Safety has continued to improve from an already excellent level. Further fuel savings have been enabled through more efficient flight profiles. NATS attributable flight delays have come down to levels where they are no longer of real concern for customers. We also delivered safe, secure and efficient air traffic management (ATM) throughout the London 2012 Olympic Games, enabling London's skies to remain fully functional and avoiding any significant delays to flights. And in 2013/14 we are pricing below the cap established by the regulator.

2.1
Customer Survey Feedback

Our 2012 airline customer survey showed a continued improvement in customer satisfaction score. The survey across a broadly standard set of criteria – which also included first-time questions on priorities, value and specific actions (London Olympics air traffic) – achieved an average score of 8.2 out of 10. Thank you to everyone who responded.

Positives

> Service delivery – the strong performance and tactical support by Centres / Units

> Outstanding ATC performance during the London 2012 Olympics

> Communications – our customer bi-lateral meetings, website, ATICCC and the pre-tactical brief

> Progress against customer priorities and Hotspot projects

> Performance monitoring – in particular the reporting of tactical flow regulations.

Negatives

> Value for money – reflecting customers' requirements for lower charges

> Maintain focus on environment and fuel efficiency

> Project delivery to time and budget – reflecting the late delivery of EFD against the original plan.

NATS Customer Satisfaction Score

2009	2010	2011	2012
7.1	8.0	8.1	8.2

2.2
Priorities and Hotspots

Our primary means of ensuring we understand our customers' near-term operational needs is through engagement in the Operational and Safety Partnership Agreements (OPA and SPA) where we work together towards delivering operational improvements and collaboratively agreeing priorities and 'hotspots' for joint action.

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 are working jointly in the CAA's Future Airspace Strategy (FAS).

Safety: SPA Focus

Through the SPA we work in partnership with customers and other industry stakeholders to identify and resolve safety issues whilst maximising the use of airspace and airport capacity. The SPA has a number of on-going activities by working groups looking at specific issues, in particular:

> Pilot-Controller Interface – focusing on human performance issues

> Speed – examining risks associated with speed limitation points and final approach speeds, and looking at the expectations of pilots and controllers

> Airspace Safety –focusing on current issues (level busts, infringements) and new areas such as controller-pilot datalink communication (CPDLC).

Service Quality: OPA Priorities

The OPA's focus for 2012/13 was on particular types of delay of concern to customers and on fuel savings. The table below shows that we outperformed the stretch targets agreed by the OPA.

OPA Hotspot Projects

Each year NATS works jointly with customers (via the OPA) on a set of "Hotspot" projects focusing 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.

The outcomes of the five Hotspot projects completed in 2012 are summarised in the 2012/13 Delivery Report.

The objectives of the seven 2013 Hotspot projects (two of which are a follow-on from 2012) are summarised in the 2013/14 Forward Plan.

Performance v OPA Targets

OPA Priority	2012/13 Target		Performance
	Target	Stretch	
OPA1: Early morning delays >15 mins (flights)	2,200	1,600	199
OPA2: STAM regulations (% applied ≤ 45 mins duration)	94%	96%	96%
OPA3: Fuel savings enabled (metric tonnes)	4,250	5,500	5,844

Notes on OPA Targets:

OPA1 – Reducing early morning (1st rotation) delays greater than 15 minutes

OPA2 – Avoiding the prolonged application of short-term ATFCM measures (STAM) beyond a 'best practice' 45 minute maximum

OPA3 – Generating fuel savings through additional airspace efficiencies (i.e. not repeat savings from existing measures), the lower target in 2012/13 compared with previous years due to London 2012 airspace preparations.

3
2012/13 Delivery Report

First year of the 3Di flight efficiency metric

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

The 3Di score for 2012, the first full year of operation, was 23.9. This performance is in line with the Civil Aviation Authority's estimated savings of 600,000 tonnes of CO_2 and £120 million of fuel by 2015 – the equivalent to 2,000 flights from London to New York.

2.125m

Number of flights in UK airspace in 2012/13

3.1
Key Indicators
NATS-wide performance indicators
Financial Year 2012/13

		2012/13	2011/12	Change v. 11/12
Traffic	UK Flights (000s)	2,125	2,167	-42
	Oceanic Flights (000s)	395	404	-9
Safety	Risk Bearing Airprox (Cat A & B) NATS Attributable	0*	0	0
	Risk Bearing Airprox (Cat A & B) Any Culpability	3*	7	-4
	Safety Significant Event Risk Index	292.2	315.2	-23
Fuel / CO_2	Fuel Savings Enabled	5,844	25,250	N/A**
Delays	% of Flights With No NATS Delay	99.9%	99.3%	+0.6

* The risk category is estimated by NATS for a number of encounters and is subject to assessment by the independent UK Airprox Board.

** Target is set anually as a project delivery target and varies year on year.
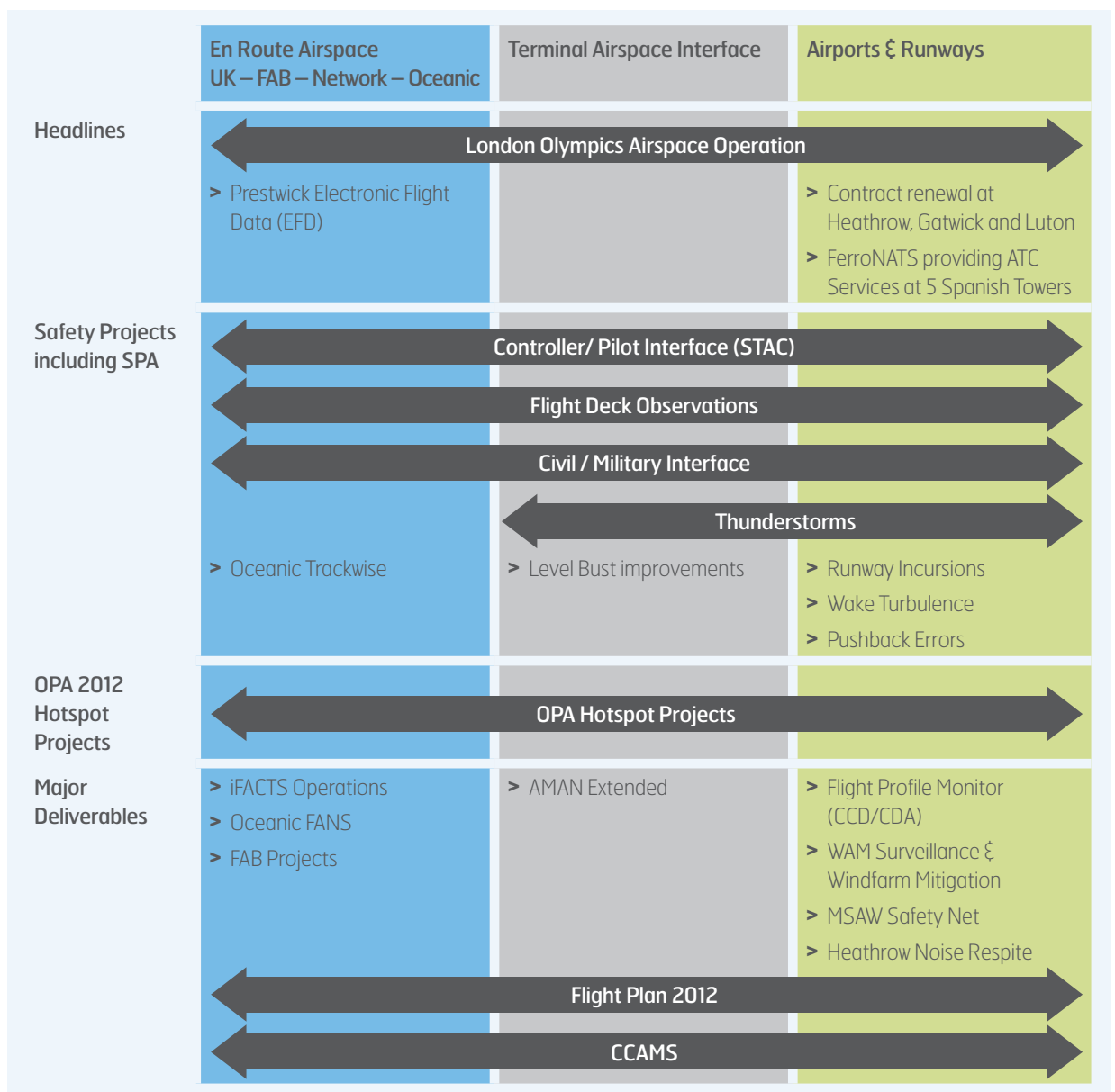
Performance v. CP3 Metrics
Calendar Year 2012

CP3 Metrics	2012 Targets (Set By CAA)		Performance	
	Olympic Period	Rest of 2012	Olympic Period	Rest of 2012
T1 Average Delay Seconds Per Flight	26.1	9.8	1.45	1.51
T2 Impact Score	74.4	27.6	2.95	3.23
T3 Variability Score	312.5	1,187.5	0	1.0
CO_2 3D Inefficiency 12 Month Moving Average (points)	Excluded	24	Excluded	23.9

3.2
Our Main Achievements

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
Headlines	London Olympics Airspace Operation		
	> Prestwick Electronic Flight Data (EFD)		> Contract renewal at Heathrow, Gatwick and Luton > FerroNATS providing ATC Services at 5 Spanish Towers
Safety Projects including SPA	Controller/ Pilot Interface (STAC)		
	Flight Deck Observations		
	Civil / Military Interface		
		Thunderstorms	
	> Oceanic Trackwise	> Level Bust improvements	> Runway Incursions > Wake Turbulence > Pushback Errors
OPA 2012 Hotspot Projects	OPA Hotspot Projects		
Major Deliverables	> iFACTS Operations > Oceanic FANS > FAB Projects	> AMAN Extended	> Flight Profile Monitor (CCD/CDA) > WAM Surveillance & Windfarm Mitigation > MSAW Safety Net > Heathrow Noise Respite
	Flight Plan 2012		
	CCAMS		

3
2012/13 Delivery Report
Cont'd

A unique and challenging project, delivered through a significant effort by many stakeholders...

3.2.1
London 2012 Olympics – Airspace Operation

With the world's attention focused on London, last summer saw the culmination of our years of planning, consultation and liaison to deliver a solution fit to tackle one of the biggest challenges in NATS' history...

...how to manage the predicted surge of extra air traffic while maintaining 'business as usual' for five of the busiest airports in the world in a safe and efficient manner, at the same time supporting the rigorous security arrangements in place for UK airspace.

We had to be prepared for every eventuality on a job of the highest visibility.

Outcomes

> **Traffic:** Swanwick handled an average of 3.5% extra daily flights, with peaks at 4.5%
> **Safety:** No risk bearing losses of separation attributed to the Olympics and no systems issues. There were just 11 infringements of temporary controlled airspace by general aviation (GA) aircraft

> **Service:** Just 593 minutes of delay attributable to NATS throughout the whole Olympics period, compared with 13,300 over the same month in 2011 – a 95% reduction. Including the Paralympics period, delay stood at just 1,900 minutes.

Our task

> Maintain and maximise capacity of London's core TMA airports that would be operating at maximum capacity at times
> Create extra capacity to satisfy demands on our airspace to continue to meet core demands without significant disruption
> Manage a significant expected increase in IFR movements to London's second and third tier airports
> Accommodate military requirements with multiple aircraft types in the biggest peacetime military operation the UK has ever seen in its airspace.

593
The number of minutes of delay attributable to NATS throughout the whole Olympics period

9,708
Total general and business aviation slot bookings over the Olympics period

How did we do it?

Airspace

We took a holistic approach to airspace change, working with many stakeholders to identify the temporary changes needed, including the Government's two security zones in the skies above London.

The proposed new temporary controlled airspaces would accommodate the increase in GA flights without affecting the service to commercial airlines.

Our controllers and equipment were made ready to bring this airspace to life through major training and equipment re-configuration tasks over 3 months.

Airports

The airports in London and the South East at which NATS provides tower ATC services were also at the forefront of our Olympics programme. We ensured resilient operations at London's main airports to help provide a good experience for athletes, officials, media and the many thousands of spectators. We also adapted our operations at surrounding airports to handle increases in traffic and to support the whole London TMA network.

Network Management

There was close cooperation with Europe's central network management unit, where NATS seconded staff to help manage the delivery of air traffic into UK airspace and ensure a quick turn-round of any route adjustments needed on-the-day.

Route scenarios were created in conjunction with European Network Managers, adjacent ANSPs and airlines to ensure an optimum presentation of traffic into London's airspace.

Military Coordination

We also facilitated the major airborne security operation, working with MOD at every stage of our planning and implementation. Monitoring of the airspace security zones was carried out by military controllers in ATLAS Control at Swanwick, in a special operations room designed, built, configured and connected to ATC and defence infrastructure by NATS' engineers. NATS' controllers facilitated the integration of the military operations over London to ensure the minimum delay to civil aviation.

Outreach

We ran an outreach programme from 18 months before the Olympics, in conjunction with the CAA and MOD, to ensure that anyone flying during the summer of 2012 was aware of airspace changes and restrictions.

Our Air Traffic Incident Communications Coordination Cell (ATICCC) was active throughout the Olympics period to keep stakeholders up to date with all operational factors, facilitating operational planning on a daily basis.

Conclusion

This was a unique challenge which was delivered successfully through a joint effort by many stakeholders. We especially appreciate the support given by our customers.

We now have a Hotspot Project to review lessons learned and understand what actions are repeatable for future summer season traffic. Additionally, we have been asked to share our experience with Brazil's aviation community to help them prepare for a similar challenge in hosting the 2014 World Cup and 2016 Olympics. And a delegation from Russian air traffic control observed our operation ahead of the Sochi Winter Olympics in 2014.

3
2012/13 Delivery Report
Cont'd

Full transition to electronic platform at Prestwick Centre achieved in November.

0

The number of minutes of delay attributable to the transition to Electronic Flight Data at Prestwick Centre

3.2.2
Prestwick Electronic Flight Data (EFD)

Following issues in the initial EFD operation in winter 2010/11, additional functionality was introduced to automate a number of the required ATM actions to mitigate controller workload. These changes, along with improvements in ATC training and over 17,000 hours of liver service enabled NATS to remove paper strips from the Prestwick Centre operation at the end of 2012.

The introduction of EFD provides safety benefits through initial conformance monitoring, supports air/ground datalink operations, and reduces the number of support staff needed in the operation.

> **"**
>
> We are very pleased to have had this opportunity to pioneer FLOSS with our partners from NATS which highlights the close working relationship and high level of co-operation between us. The ability of FLOSS to provide us with a greater level of understanding of actual operating procedures has huge potential in negating and addressing areas of possible concern and to pro-actively improving the already high safety standards employed throughout the airline industry.
>
> **"**

Captain Ian Baston
Director of Flight Operations, Flybe

3.2.3
Safety Improvement Projects

In the air

Level Bust Improvements: Our work to address level busts is on-going, in particular sharing experiences on the causes of incidents and focusing on incidents caused by altimeter setting errors, non-standard radio phraseology and non-standard procedures.

Oceanic Airspace Safety: We released a new DVD entitled 'Trackwise' to help educate airlines, flight crew and operators on the potential issues, risks and solutions when flying within Oceanic airspace. **[https://www.customer.nats.co.uk/shanwick/trackwise/]**

Thunderstorms: Pilot awareness information was created to highlight the effects that thunderstorms can have on controllers' workload, and how pilots can mitigate this.

Wake Turbulence: Work is on-going with airlines (especially British Airways) to address an increase in wake turbulence reports. In particular, Swanwick's Safety Plan now includes specific elements on wake turbulence, and controllers have new guidance on information required when pilots report incidents to help us build a full picture and better understand the risk to aircraft.

Sharing our airspace

Controller / Pilot Interfaces: We have introduced Scenario Training for Aircrew and Controllers (STAC) which looks at communication between both parties during an emergency. And controllers are attending pilot Line-Oriented Flight Training (LOFT) sessions to increase knowledge of how pilots deal with unusual events, all as part of NATS Training in Unusual Circumstances and Emergencies (TRUCE).

Civil / Military Interfaces: Deploying LARA (Local And Regional Airspace management system) into the UK Airspace Management Cell at Swanwick has improved our understanding of military and Danger Area activity. We have also introduced Multi Crew Resource Management (MCRM) courses to improve understanding of each other's environment.

Flight Deck Observations: The FLOSS (Flybe Line Orientated Safety Survey) initiative with NATS has identified, through observational surveys, safety improvements from fine-tuning of the interface between pilots and controllers. The initiative confirms those activities that are completed correctly and successfully by crews and ATC operational staff, and also highlights activities or situations that could become a safety concern.

On the ground

Runway Incursions: We continue to work with stakeholders on technology, procedures and analysis in support of the European Action Plan for the Prevention of Runway Incursions (EAPPRI). The runway safety elements of FLOSS are a key input.

Pushback Errors: Based on analysis at Gatwick that identified some common factors, we have worked with airlines and handling agents to provide advice and embed new standard operating procedures to reduce occurrences.

3
2012/13 Delivery Report
Cont'd

3.2.4
2012 OPA Hotspot Projects

Hotspot	Benefit delivered
En Route Airspace UK — FAB — Network — Oceanic	
Data Quality in Network Tools	Improved traffic load predictability within UK airspace through airports supplying accurate start-up and take-off times to NATS Network Management and Eurocontrol
Dynamic Route Availability Document (RAD) Process	Agreed process with customers for managing the RAD
	Increased use of time-banded RAD restrictions to enhance flexibility
Flexible Use of Airspace (FUA)	Improved access to routes through the North Wales Military Training Area
	Processes for managing the large Danger Area to the west of Scotland (D701) that will enable fuel savings to airlines
Oceanic Service Delivery	New direct routing (GAPLI-MERLI) was added for flights to/from northern Britain . This has enabled fuel savings of approximately 250kg per flight and has improved the availability of optimum flight levels on the 'Tango Routes' within the south east corner of Shanwick Oceanic airspace
Terminal Airspace Interface	
London TMA Weather Resilience	5 day outlook forecast of thunderstorm risk for pre-tactical planning and a more detailed forecast on the day of operation
	New pre-tactical and tactical procedures for managing traffic during thunderstorms, together with supporting communications plans
	Briefing for pilots on the effect of weather avoidance requests on TMA airspace capacity (published by the SPA)
	Agreed recovery plan to manage traffic flows until normal operations resume
	And continuing into 2013...
	The project now continues into 2103 in order to develop and implement further resilience measures, including:
	> Further network management options, as well as measuring their effectiveness in mitigating delays during thunderstorm activity
	> Awareness of different pilot behaviour when encountering weather
	> A study of other major TMAs to learn how they manage traffic during thunderstorms and consider how best to apply the learning in the London TMA
Airports & Runways	
RNAV Procedures	Bristol Airport identified as a candidate for this project
	Airspace change in December 2012 (EXMOR airspace) raised the controlled airspace ceiling to facilitate better flight profiles for Bristol traffic
	And continuing into 2013...
	The project will now deliver a set of RNAV approach and APV final approach procedures for Bristol Airport. It will include a standardised approach to airspace change consultation and the local safety case (so that they are re-usable at other airports), and evaluation of procedures as part of SESAR's release of capabilities

3.2.5
Our Main Deliverables
En Route Airspace UK – FAB – Network – Oceanic

iFACTS Operational Experience in 2012

iFACTS (interim Future Area Control Tools Support) was introduced into full operation at Swanwick Area Control (AC) in November 2011. It is a 'world first' system that predicts aircraft flight trajectories and enables tactical controllers to check for conflicting flights up to 18 minutes ahead, as well as testing 'what if' options for optimising flight profiles.

Key features of the tools include Trajectory Prediction and Medium Term Conflict Detection which facilitate the early detection of conflicts in and around the sector, and a Flight Path Monitoring function which detects if an aircraft deviates from its expected trajectory.

iFACTS has dramatically altered the way controllers interact with the ATC system, helping their decision making process, requiring fewer interactions with pilots, reducing their workload per flight, and enabling them to safely handle more flights while reducing aircraft fuel burn and emissions.

With the benefit of a year's operational experience, has iFACTS met expectations?

An initial analysis (done by NATS for the OPA) concluded that the expected benefits of IFACTS were being delivered into Swanwick AC operations:

> **Safety:** the 12 month rolling total of loss of separation (LOS) events has fallen from a rate of 0.28 losses per 100,000 movements in November 2011 to 0.11 in November 2012 (a c.60% reduction)

> **Flight efficiency:** comparing the 3Di flight inefficiency environmental score within Swanwick AC airspace for the mid-year point (June 2012 v. June 2011) showed a 6% improvement in the score in June 2012

> **Capacity:** sector monitor values (as a measure of the capacity of a sector) have increased by an average of 15% compared to an original prediction of 12%

> **Cost efficiency:** the predicted reduction in ATC support staff was achieved, reducing our cost base by c. £4 million per annum.

iFACTS has also received the Jane's ATC 2013 industry award for enabling technology.

15%

Average increase in sector monitor values following introduction of iFACTS

3
2012/13 Delivery Report
Cont'd

Flight Plan 2012

We completed a smooth transition to Flight Plan 2012 in November 2012. The changes, introduced by ICAO and Eurocontrol, updated the global standard for flight plans and associated messages, which required many NATS systems to be updated simultaneously across our Centres and Airport ATC operations.

CCAMS

CCAMS (Centralised SSR Code Assignment & Management System) was successfully deployed in November 2012, a complex transition requiring changes to a number of NATS systems. CCAMS provides an interim solution to mitigate SSR code shortages until the European mandate for States to move to using Mode S Elementary Surveillance.

The Eurocontrol system manages SSR code assignment on a centralised basis and its implementation (managed in a phased approach across States) will eliminate code shortages through making more efficient use of codes than the current system permits.

FAB Projects: Irish Sea Airspace

Changes to Irish Sea airspace were completed in December 2012, the culmination of an airspace change project which NATS managed alongside the IAA as a UK/Ireland FAB project.

The UK (NATS) element introduced changes to the lower levels of controlled airspace between Manchester and Dublin and new air routes to support improved traffic segregation over the Irish Sea.

This included improved FUA arrangements between NATS and MOD to improve high level routing for aircraft above North Wales when the military training and danger areas are not in use.

The key benefits are extra routes for traffic to/from Dublin and better connectivity for more early morning routes towards London, the reduction in track miles enabling fuel savings of around 1,200 tonnes per annum.

Oceanic FANS

The NAT Datalink mandate (requiring use of ADS-C/CPDLC) is being introduced in a phased approach, the first phase of which was introduced in February 2013,

Initially applied to selected core tracks within the OTS which are the most popular and therefore more densely populated routes, it enables reduced longitudinal separation with equipped flights operating with 5 minutes time separation in-trail between them rather than the standard 10 minutes. This will allow more flights to climb as they burn off fuel in order to stay at the most fuel efficient flight level.

Extending the AMAN horizon is anticipated to deliver a 1-2 minute reduction in average holding time for aircraft that hold.

Terminal Airspace Interface

Queue Management – Extended Arrival Manager and Speed Trial

We have extended the horizon of our Arrival Manager (AMAN) system for inbound Heathrow and Gatwick traffic out to 550 miles from the UK (1 hour before approach to the runway). This has enabled controllers to manage queues and absorb arrival delay during the en-route and descent phases of flight, reducing fuel burn and airborne holding.

Following an initial period of operation for Heathrow from November 2012 to build experience of optimising arrival flows, Gatwick was added in January 2013.

Based on a 1-2 minute reduction in holding for flights that hold, extended AMAN and speed control would enable annual fuel savings in the range 5,000-10,000 tonnes per annum.

FAB Project: Dublin TMA

We also worked with the IAA to support their introduction of a new westerly approach procedure 'Point Merge' for Dublin Airport from December 2012. Point Merge is an approach sequencing technique that places arrival streams on arcs rather than utilising holds, enabling more efficient traffic handling and increasing continuous climb/descent operations. It is a building block for SESAR developments such as 4D trajectory management.

Extended AMAN Horizon

3
2012/13
Delivery
Report
Cont'd

Airports & Runways

Flight Profile Monitoring

We led a trial at Edinburgh Airport to monitor environmental performance using our new Flight Profile Monitor (FPM) tool. FPM enables airports and airlines to gain information about the environmental performance of arriving and departing aircraft, thereby saving fuel, cutting CO_2 emissions and reducing noise in communities under the arrival flight paths.

FPM revealed that while 95% of departures achieved continuous climb, only 55% of arrivals achieved a continuous descent approach (CDA). Using FPM data to focus on improvements, alongside a radar upgrade, by February 2013 the average CDA performance into Edinburgh had risen to over 70%.

The system – which received a 2012 Best Environmental Initiative award from the Airport Operators' Association – will be rolled out to other airports in the UK as part of our ATM environmental programme.

New Airport Surveillance Technology

The UK's first Wide Area Multilateration (WAM) airport approach surveillance system became operational at Edinburgh Airport in July 2012.

WAM has replaced secondary radar as the surveillance source for approach radar separation at Edinburgh. It provides controllers with precise aircraft position and identification information regardless of weather conditions, helping to increase the safety, capacity and efficiency of airspace.

WAM is a more flexible long-term solution that is capable of supporting future technologies and provides greater resilience than the previous secondary radar system, for example mitigation against windfarms that affect traditional radar systems.

Minimum Safe Altitude Warning Safety Net

Following extensive trials, a new safety enhancement developed by NATS became operational at Glasgow Airport in June 2012 to provide altitude warnings in airspace surrounding the airport.

NATS Contour Mapping Solution is a new Minimum Safe Altitude Warning (MSAW) safety net that uses NASA satellite data to create a 3D map of the terrain around Glasgow Airport, providing a highly accurate model for ensuring aircraft maintain a minimum safe distance from the ground. It is the most accurate MSAW system in the world.

As controllers can now check flight paths to an even higher level of precision, it mitigates the risk of controlled flight into terrain over the Campsie Hills, which are located to the north east of Glasgow Airport on the approach path to Runway 23.

The system has since been installed at Aberdeen Airport to provide similar safety benefits and will be introduced at Bristol in 2013.

Heathrow Noise Respite Trials

Early Morning Arrivals

We have been working in partnership with Heathrow, British Airways and community group HACAN on a new trial to test whether creating 'noise respite zones' for communities under the flight path could ease disturbance for residents in the early morning. The aim is to provide communities with defined periods of relief from early morning aircraft noise.

On average, around 15 flights arrive at Heathrow each morning between 04.30 and 06.00. The trial is exploring whether routeing these flights in a more defined way – particularly at the beginning of their approach into Heathrow – can offer more predictability for residents living below.

The trial has defined zones in the approach area above London that are 'active' sequentially week by week. Pilots are directed by controllers to avoid flying through the zone that is active for that particular week.

And continuing into 2013...

Departure Offset Trial

Work is underway to develop and deliver an Offset Standard Instrument Departure (SID) trial in Autumn/Winter 2013/14. This innovative trial will use aircraft precision navigation (RNAV) techniques to fly a precise track 1km from the centreline of the current SID, this lateral 'side step' reducing concentrations of noise beneath existing departure routes.

The trial will involve British Airways Boeing 777 and Airbus A320 family aircraft, operating on Midhurst SIDs during easterly and westerly departures from Heathrow's runways.

NATS Airports UK ATC Services

FerroNATS Airport ATC in Spain

Commercial Airport ATC Contracts

In 2012/13 we have renewed contracts at airports:

> Heathrow

> Gatwick

> Luton.

International ATC Tower Contract in Spain

Liberalisation of Europe's airport ATC market is a reality. NATS Airports now has a successful joint venture (FerroNATS) that has brought competition to the airport ATC market in Spain.

It is providing tower ATC services at 5 ATC towers (Sabadell, Madrid Cuatro Vientos, Vigo, Jerez and A Coruña) which transferred to ferroNATS between November 2012 and March 2013, where our ATC operations have subsequently been working without incident and to the satisfaction of our airport customer AENA Aeropuertos.

The remaining towers will transfer through 2013:

> Valencia, Seville and Melilla in Spring 2013

> Alicante and Ibiza will be the biggest challenges and are planned to transfer by October 2013.

We continue to work to embed our ferroNATS operational, safety and customer service culture into our new operations in order to deliver benefits to the airport operator and user community. The expected benefits come from:

> A safety culture with improved recognition and reporting of risks

> Improved operational efficiency in terms of ATC coordination and movement rates

> Increased productivity to handle traffic with fewer staff

> Customer engagement modelled on the UK OPA.

4
2013/14 Forward Plan

2.6%

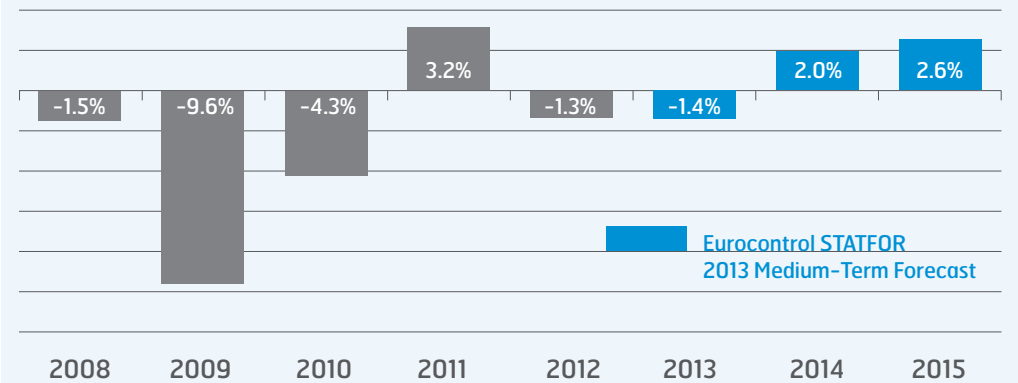Eurocontrol STATFOR's 2013 Medium-Term Forecast for 2015

4.1
Traffic Outlook

Traffic levels continue to be affected by a combination of the fragile economic situation in the UK and Eurozone, high fuel prices and strong capacity discipline being exercised by airline operators (fuller and bigger aircraft).

In its outlook for 2013, Eurocontrol's latest STATFOR Forecast indicates a further dip in UK flights, reversing the 3.2% growth of 2011. Beyond 2013, there is some guarded optimism

with the traffic forecast returning to moderate growth in 2014-15 with airlines maintaining a cautious approach to network expansion. However, significant headwinds remain due to continued economic uncertainty and high fuel prices.

UK Flights:
Recent Trend and Near-Term Forecast

2008	2009	2010	2011	2012	2013	2014	2015
-1.5%	-9.6%	-4.3%	3.2%	-1.3%	-1.4%	2.0%	2.6%

Eurocontrol STATFOR
2013 Medium-Term Forecast

4.2
2013/14 Targets

Safety

Our overall strategic safety target is to deliver a 10% reduction in the weighted SSE index over the 4 years 2011-15. This 'base target' recognises that the improvement we have achieved in recent years means our low contribution to safety risk makes further improvement more challenging. Nevertheless, we have a 'stretch' 40% reduction target over the same period to reinforce our continued focus on the risk generated by non NATS sources.

The contribution in 2013/14 to the overall strategic safety target is shown in the table, expressed as a 3 year accumulation over the period 2011/12 to 2013/14.

Regulatory Service Performance Targets

The service performance metrics for 2013 are shown in the table. Delays targets are modulated each year where traffic varies from the forecast so they become tighter with reduced traffic.

OPA Targets

A separate set of performance targets for 2013/14 have been agreed with the OPA that focus on specific customer priorities, the 'Stretch' target reflecting the OPA's view of an 'excellent' service performance standard.

Metric		2013/14 Target	
		Base	Stretch
Safety Risk Index	% reduction in the NATS Regulated Weighted Safety Significant Event Index (against 2011 base)	7.5%	30%

CP3 Metrics	2013 Targets
T1 Average Delay Seconds per flight	12.5
T2 Impact Score	35
T3 Variability Score	1500
CO_2 3D Inefficiency 12 Month Moving Average (points)	24

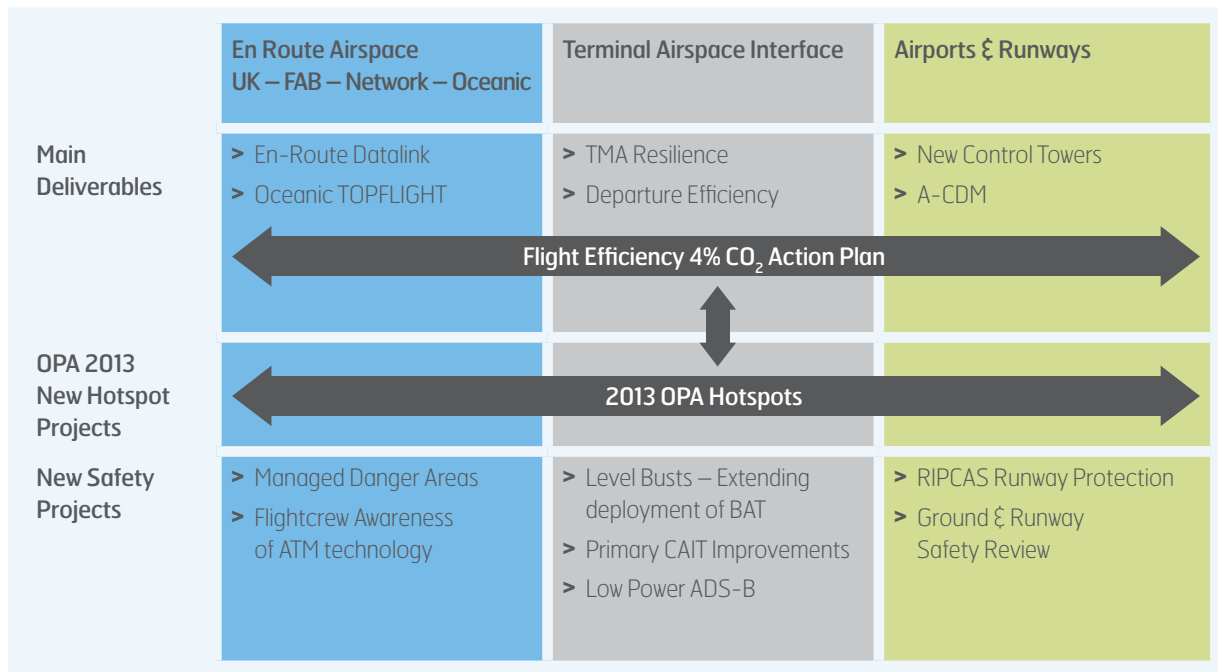| OPA Metrics	2013/14 Targets	
	Target	Stretch
Average En-Route Delay Per Flight (secs) including en-route weather related delay	8.5	7
STAM Regulations (% applied of ≤ 45 mins duration)	95%	96%
Fuel Savings Enabled (tonnes fuel)		
> Flight Efficiency Partnership	12,000	18,000
> London Arrival Metering (Extended AMAN)	5,000	10,000

4
2013/14
Forward
Plan
Cont'd

4.3
Main Lines of Action

At a glance...

	En Route Airspace UK – FAB – Network – Oceanic	Terminal Airspace Interface	Airports & Runways
Main Deliverables	> En-Route Datalink > Oceanic TOPFLIGHT	> TMA Resilience > Departure Efficiency	> New Control Towers > A-CDM
	← Flight Efficiency 4% CO_2 Action Plan →		
OPA 2013 New Hotspot Projects	← 2013 OPA Hotspots →		
New Safety Projects	> Managed Danger Areas > Flightcrew Awareness of ATM technology	> Level Busts – Extending deployment of BAT > Primary CAIT Improvements > Low Power ADS-B	> RIPCAS Runway Protection > Ground & Runway Safety Review

The Flight Efficiency Partnership has provided a unique and powerful forum for NATS to work alongside airline customers to jointly identify, agree and progress fuel saving opportunities.

Ash Bennett
Swanwick Airspace Efficiency Manager

4.3.1
Flight Efficiency

Reducing aviation's environmental impact and saving fuel are high on our agenda. Flight efficiency improvements come from two main lines of action:

> Our strategic ATM CO_2 Plan to reduce air traffic related CO_2 by an average 10% per flight by 2020 (from a 2006 baseline)

> Our joint work with customers in the newly formed Flight Efficiency Partnership to meet near-term fuel saving targets set by the OPA.

Flight Efficiency Partnership

Reflecting the increasing importance of reducing fuel burn and CO_2 emissions, a new Flight Efficiency Partnership (FEP) has been set up as an OPA sub-group to provide a forum for NATS and Airlines to work together to develop and deliver short-term improvements to flight efficiency.

The FEP builds upon the significant fuel savings enabled to date by near-term improvements (shown in the chart below).
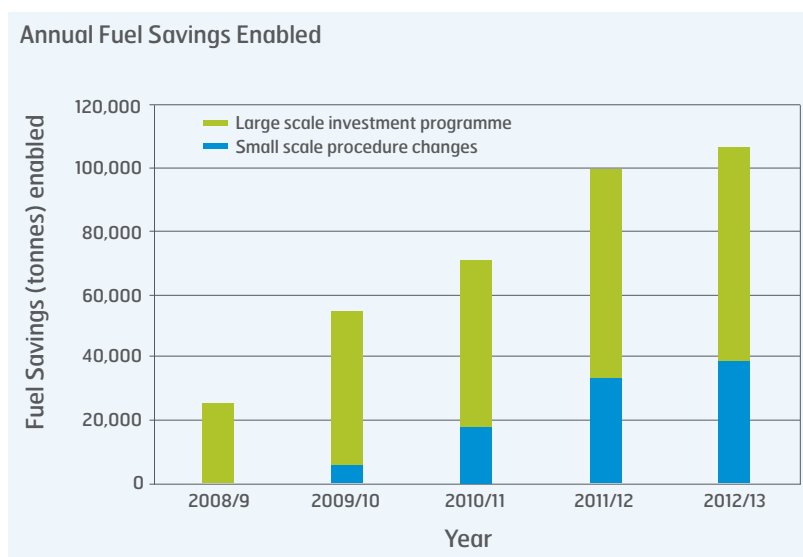
The group's focus is on agreeing the shorter term improvements that can be made to vertical and lateral route profiles in and around UK airspace, as well as exploring opportunities for NATS and the airlines to work together to ensure the most effective Flexible Use of Airspace (FUA).

ATM CO_2 Plan – 4% Action Project

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

However, because some of our strategic programmes are now being delivered later, this 4% target is extremely challenging. A '4% Action' project has been established to focus our ideas and resources on meeting the 4% target. The aim is to deliver additional short-term flight efficiency benefits, including prioritising current projects at Swanwick, Prestwick and our Airport units.

N.B. 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.

Annual Fuel Savings Enabled

Cumulatively these add up to over 250,000 tonnes of fuel savings enabled corresponding to almost 800,000 tonnes of CO_2, saving £160m in fuel burn since the programme began.

4
2013/14
Forward
Plan
Cont'd

4.3.2
2013 Hotspot Projects
En Route Airspace UK – FAB – Network – Oceanic

Flexible Use of Airspace (FUA) – Conditional Route (CDR) Usage

Conditional routes through airspace used by the military supplement the permanent route network. The project is focused on improving the notification process to increase the scope for operator planning/use of CDRs, thereby flying fewer track miles and carrying less fuel.

It includes joint work by NATS, the UK Airspace Management Cell, Eurocontrol and airlines to propose improvements to the current CDR process and reporting, and will also develop a web-based education package to increase operator awareness of the CDR process.

Swanwick AC: Sector 17 Lydd

Located at the boundary of the London FIR, Sector 17 Lydd is a key interface with adjacent busy airspace for traffic arriving into the London TMA. Despite structural changes in 2011 and capacity increases following the introduction of iFACTS, the sector has demand well beyond its capacity and is currently the biggest single cause of delay in UK airspace due to the constantly high traffic demand.

This project will work jointly with airlines, Eurocontrol and the French ANSP (DNSA) to develop re-route scenarios that make maximum use of network capacity to reduce overall delay, including implementing joint NATS/DNSA ATC techniques that improve the presentation of traffic into this airspace.

Swanwick AC: Compton/West End Airspace

This airspace includes a major crossroads for East-West and North-South traffic flows as well as large areas of military airspace. A major joint civil/military development of this airspace in 2006 increased structural capacity by around 30%, but high traffic demand on these key traffic flows creates delays for flights departing from the London TMA.

This project will examine 3 areas with potential to minimise delay:

> The end-to-end interface between airports, Swanwick area control sectors and network managers to identify scope for improvement

> A departure speed trial into area control airspace to improve consistency of traffic delivery and reduce departure route congestion

> The potential for improvements to Standard Instrument Departures (SIDs) and further strategic airspace change.

Olympics Lessons Learned

4.3.3
New Safety Projects

In the air

Level Busts: The barometric pressure setting advisory tool (BAT) provides an alert to London TMA controllers when there is a large difference between the downlinked pressure set on the flight deck and the London QNH. We are looking to extend BAT to cover all arriving aircraft in Terminal Control sectors and all departing aircraft below the Transition Altitude.

Flight Crew Awareness of ATM Technology: We will be providing new educational materials on how new technologies affect the pilot/controller interface, in particular iFACTS, EFD and CPDLC. Such improved understanding should help ensure that increased automation does not adversely affect the safety of the operations.

Sharing our airspace

Managed Danger Areas: Building upon work done at Prestwick in 2012, new information will be provided for pilots and controllers on the activities taking place in Danger Areas, and on the criteria for de-conflicting and co-ordinating both civil and military flights.

Primary CAIT Improvements: Our Controlled Airspace Infringement Tool (CAIT) warns controllers that an infringement has occurred using the primary radar return of the intruding aircraft. Based on our experience of CAIT, enhancements are to be incorporated to improve detection of intruders.

Low Power ADS-B Transceiver: We will also carry out an initial trial of a light weight, low cost ADS-B transceiver for the GA community to augment radar data in providing a technology enhancement to further improve detection of intruders.

On the ground

RIPCAS Runway Protection: A trial of this high intensity lighting system at runway entrances is planned at Aberdeen Airport.

Ground and Runway Safety Review: A new Airport Safety Improvement Team has been formed to focus on solutions to trends in safety significant events (SSEs) at NATS' airport ATC units.

4
2013/14 Forward Plan
Cont'd

4.3.4
Our Main Deliverables
En Route Airspace
UK – FAB – Network – Oceanic

En-Route Datalink Services

Datalink services are being deployed in a co-ordinated UK-Ireland FAB project in line with EC Implementing Rules for 'core area' ACCs to provide CPDLC services in en-route airspace (above FL285) in early 2013.

NATS will be implementing CPDLC in UK airspace in two phases through 2013:

> An initial set of non-profile changing messages (e.g. direct to, contact frequency, requests)

> An extended message set that includes flight profile changes (e.g. level changes, heading and speed instructions, route clearance).

UK-Ireland FAB datalink service coverage will be provided through ARINC and SITA networks to FANS and ATN datalink standards.

Our roll-out in 2013 will complete 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.

TOPFLIGHT 'perfect' transatlantic flights

TOPFLIGHT is a SESAR trial project led by NATS to demonstrate environmentally 'perfect' flights over the North Atlantic. The trial will optimise flights to achieve minimal emissions and delay, taking into account many factors from pushback from the stand and taxiing to an optimised flight profile and continuous descent approach. It is expected that each optimised trip could save approximately 500kg in fuel – the equivalent to 1.6 tonnes of CO_2 emissions.

The aim is to prove that the concept is scalable and can be implemented for many flights at the same time without penalising those in the surrounding airspace.

Terminal Airspace Interface

TMA and Airport 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 are taking action on several fronts to help reduce weather and airport related delay, for example:

> A focus on Heathrow delays where we have already reduced arrival, holding point and start-up delays during most times of the day over the last few years

> Extended AMAN and speed control to reduce airborne holding delay (see page 13)

> Improving resilience to thunderstorms in the London TMA (see page 10).

In the longer-term, we have a number of strategic programmes – in line with the CAA's Future Airspace Strategy – that would support a reduction in airport and weather delays (See Chapter 5: Longer-Term Plans – Future Airspace Strategy).

Departure Efficiency

A Departure Enhancement Project (DEP) has been launched to improve departure profiles. In today's operation, controllers routinely intervene during an aircraft's Standard Instrument Departure (SID) to avoid other traffic, especially in arrival holds. DEP aims to recreate what controllers do now, reducing tactical intervention by design and thereby providing a predictable and efficient departure environment for flights.

The programme to follows a similar approach to that adopted in Atlanta's terminal airspace, following a joint visit by NATS, British Airways and Heathrow Airport to learn from the experiences of the FAA.

Starting at Gatwick in 2013, we will stage trials of single SIDs – using Performance Based Navigation (PBN) – to gather data while progressing to other departure routes at both Heathrow and Gatwick through 2013/14. Each trial will have a 'lead operator' to work as an integrated team with NATS in the design and validation of the trial departure routes.

Following this principle of small, iterative and collaborative steps, the next stages of DEP will focus on take-off departure separation to enable more departure capacity for runways.

Airports & Runways

Airport Collaborative Decision Making (A-CDM)

Heathrow
A-CDM is planned to be re-introduced at Heathrow in late spring 2013. A-CDM requires close collaboration between Airlines and Heathrow. NATS supplies the Target Start-up Approval Time (TSAT) generator which calculates the start times of aircraft at Heathrow which are at the heart of the A-CDM system.

After trials in 2012, improvements have been made to the system including the ability of ATC to better control the generator to make data more timely and accurate in adverse conditions. Procedures have also been developed to ensure, where possible, aircraft that are absorbing delay on stand can remote hold to free-up stand capacity.

Trials have shown that CDM has the potential to reduce taxi times, improve recovery from delay and provide improved data to the airport and ATC network.

Gatwick
NATS is participating in Gatwick's A-CDM55 project in partnership with the airport community to deliver a number of objectives in 2013 including:

> Declared capacity of 55 movements per hour over 7 hours of the day (currently 53 per hour for 3 hours)

> On-time performance above 85%

> Lower environmental impact – emissions and noise

> Operational cost reductions for airlines through improved predictability.

Specifically, we are implementing several key deliverables including:

> Full A-CDM processes and connectivity with the Eurocontrol Network Manager (by end Dec 2013)

> RNAV-1 SIDs (summer 2013)

> Arrival and departure management improvements

> Operational performance management activities to support the increased runway scheduling.

New Control Towers at Birmingham and Manchester

New control towers are being introduced into operational service at Birmingham (which transitioned in April 2013) and Manchester (May 2013).

This marks the culmination of major projects by NATS to equip and transition into operations these new and iconic control towers, designed to improve each airport's operational efficiency.

The seamless transition to new tower operations reflects the major change management task by NATS in implementing new ATC systems and carrying out ATC training in the new tower environment while maintaining each airport's 'business as usual'.

At Birmingham, the airport's runway extension project will see new Standard Instrument Departures (SIDs) introduced for Runway 15 when completed in early 2014.

5
Longer-Term Plans

RP2 Context

NATS will be consulting customers during 2013 on the services provided by our en-route business (NERL), and prices to be applied, during the Single European Sky (SES) Reference Period 2015-2019 – known as RP2.

We very much understand that price reduction is now the key concern for our customers. Therefore, our RP2 Business Plan for Consultation proposes significant price reductions in RP2 against different service offerings that provide a degree of choice for customers.

We look forward to hearing your views in the consultation between May and September 2013.

Safety Strategy

We have a published Strategic Plan for Safety which describes our approach to reducing safety risk. This strategic plan describes the safety improvement areas which will address the main risks to our operation including underlying causal factors. The key elements of our safety strategy are:

Tactical Safety Improvement: on-going unit-led safety improvement projects to focus directly on tackling specific sources of our safety events.

Strategic Safety Improvement: safety improvement projects to increase the overall resilience and safety margins in our operation, including developing human performance, airspace and procedure design, and enhancing technology.

Safety Management Improvement: we will work to influence the European safety regulations, work with international partners to enhance our Safety Management System (SMS) capability and continue to develop our understanding of safety performance and risk.

Working with Others: we will continue to be engaged with industry through the SPA which maintains a joint Safety Plan detailing how NATS and airlines collaboratively tackle key risk areas.

Future Airspace Strategy (FAS)

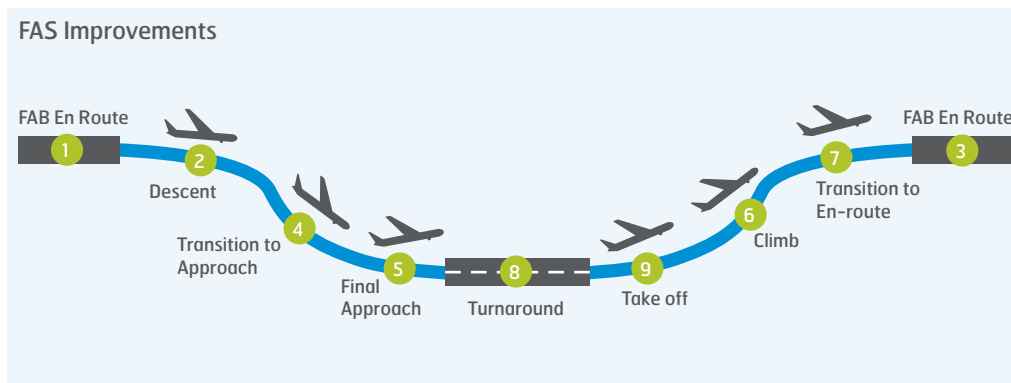We only get one chance to completely modernise our airspace system.

A FAS Deployment Plan to modernise the UK and Ireland airspace system has been produced by the FAS Industry Implementation Group (FASIIG) – a consortium of airports, operators, ANSPs, the CAA, IAA and MOD.

Aligned to SES, FAS contributes to achievement of SES objectives in our airspace by improving the way traffic is managed and moves around the network. The deployment plan affects every phase of flight across the en-route, terminal and runway environments as illustrated below.

It will require multiple initiatives by FAS stakeholders in the period 2013-2020 to deliver a modernised system and generate significant benefits for the aviation industry.

Our planned contribution to FAS is summarised on the next page.

FAS Improvements

1
More direct and free routeing in FAB airspace (High Level Sectors)
FAB En Route

2
Streaming traffic to arrive at the terminal in an optimal order
FAB En Route

3
Strengthen the Civil/ Military processes for reserving FUA
FAB En Route

4
More efficient – systemised – route network with no stack holding
Terminal

5
Refine the schedule and improve arrival punctuality
Terminal

6
Continuous Climb Operations to Cruise
Terminal

7
Airspace capacity to meet demand and increase resilience
Terminal

8
Optimise the efficiency of limited runway capacity (ACDM & TBS)
Runway

9
Optimise SIDs and STARs at low-levels for PBN
Runway

5
Longer-Term Plans
Cont'd

NATS Contribution to FAS

Existing NATS programmes form a significant part of FAS deployment:

Phase of Flight	NATS Programme	FAS Improvement
En-Route	Prestwick Upper Airspace	Advanced flight data processing (iTEC) and new workstation to support trajectory operations
		Facilitate removal of fixed airspace structures and create more direct and free route opportunities
	Queue Management	Stream arrival traffic (using AMAN) into an efficient order for landing
		Expand across FAB boundaries (through an XMAN tool) to extend the scope for absorbing arrival delay and accurately streaming traffic
	Enhanced Flexible Use of Airspace (FUA)	Strengthen civil/military airspace processes to maximise opportunities to flight plan more direct routes
Terminal	London Airspace Management Plan (LAMP) and Northern Terminal Control Area (NTCA) (with Transition Altitude as enabler)	An efficient terminal airspace route network to PBN standards to enable more continuous climbs and descents, and to free up valuable airspace capacity
		Design TMA airports' SIDs and STARs to PBN standards, to optimise their environmental and operational performance and connect them to the PBN terminal route network
Airport	Network Management Tools	Integrate airports electronically into the network to share planning information in order to better manage arrival and departure streams
	Airport Collaborative Decision Making (A-CDM)	Work with airports to deploy A-CDM to improve the turnaround process and maximise runway efficiency
	Time Based Separation (TBS)	Introduce TBS to maintain runway throughput in strong wind conditions and reduce weather related delays

Oceanic Strategy

Our Oceanic service covers the Shanwick Oceanic Control Area in partnership with the Irish Aviation Authority (IAA) who provide communications services.

Our strategy is to continue service improvements within our current method of operation, in line with the ICAO's North Atlantic Systems Planning Group's (NATSPG) plans for the region.

This will enable us to manage costs whilst delivering improved performance to our customers through:

> Deploying new, consistent methods of operation that leverage aircraft equipage and reduce safety risk, leading to conservative reductions in Oceanic separation standards

> Investing in new ground-based flight data processing systems

> Delivering sustainable improvements in service quality, fuel and CO_2 reductions.

We will also continue to align our longer-term improvement and investment activities to the NAT 2025 Task Force strategy (to be agreed in 2013) which aims to ensure alignment between the North Atlantic Oceanic operation, North American and European airspace in light of NextGen and SESAR ATM programmes.

We expect to consult customers during RP2 on the costs and benefits of deploying new technology and capabilities into our Oceanic operation to support enhanced trajectories over the North Atlantic and efficient sequencing of traffic into domestic airspace.

NATS Airports Strategy

NATS Airports provides ATC services to UK and international airport customers. We continue to help our airport customers find better solutions, working with them to drive airport efficiencies and capacity in a cost effective manner. Our strategy is centred on:

> A leading role in airport and runway safety initiatives, providing a high level of safety assurance to airports

> Contributing to the NATS-wide approach to reducing fuel and CO_2 emissions, including continuous climbs and descents

> Systemisation of airport ATC and leveraging technology solutions to improve the ATC service at airports without the need for more people

> Better integrating airports with the wider ATC network to improve airline/airport customer value

> Maximising operation of existing runway and taxiway systems in order to sustainably meet airport growth, especially in high intensity operations.

6
Customer
Affairs

We have a number of different forums for engaging with customers including the Operational Partnership Agreement, Flight Ops Directors Meeting 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

Contact us

NATS Head Office
4000 Parkway
Whiteley
Fareham
Hants
PO15 7FL

E: customerhelp@nats.co.uk

Download our Reports
Corporate Annual Report
nats.co.uk/about-us

Responsibility Report
nats.co.uk/environment

Want to view this report online?
Customer Report 2012/13
nats.co.uk/customerreport2013

Acronyms

3Di	3 Dimensional Inefficiency
A-CDM	Airport Collaborative Decision Making
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
CCAMS	Centralised SSR Code Assignment & Management System
CCD	Continuous Climb Departure
CDA	Continuous Descent Arrival
CDR	Conditional Route
CPDLC	Controller Pilot Datalink Communications
EAPPRI	European Action Plan for the Prevention of Runway Incursions
EFD	Electronic Flight Data
FAB	Functional Airspace Block
FASIIG	Future Airspace Strategy Industry Implementation Group
FEP	Flight Efficiency Partnership
FLOSS	Flybe Line Orientated Safety Survey
FPM	Flight Profile Monitoring
FUA	Flexible Use of Airspace
GA	General Aviation
HACAN	Heathrow Association for the Control of Aircraft Noise

IAA	Irish Aviation Authority
iFACTS	Interim Future Area Control Tools Support
LAMP	London Airspace Management Programme
LOFT	Line-Orientated Flight Training
MSAW	Minimum Safe Altitude Warning
MCRM	Multi Crew Resource Management
NASA	National Aeronautics and Space Administration
NATSPG	North Atlantic Systems Planning Group
NTCA	Northern Terminal Control Area
OPA	Operational Partnership Agreement
OTS	Organised Track Structure
RIPCAS	Runway Incursion Prevention and Crew Alerting System
RNAV	Area Navigation
RP2	Reference Period 2
SES	Single European Sky
SIP	Service and Investment Plan
SPA	Safety Partnership Agreement
SSE	Safety Significant Event
STAC	Scenario Training for Aircrew and Controllers
STAM	Short Term ATFCM Measure
TA	Transition Altitude
TBS	Time Based Separation
TMA	Terminal Manoeuvring Area
TRUCE	Training for Unusual Circumstances and Emergencies
TSAT	Target Start Approved Time
WAM	Wide Area Multilateration