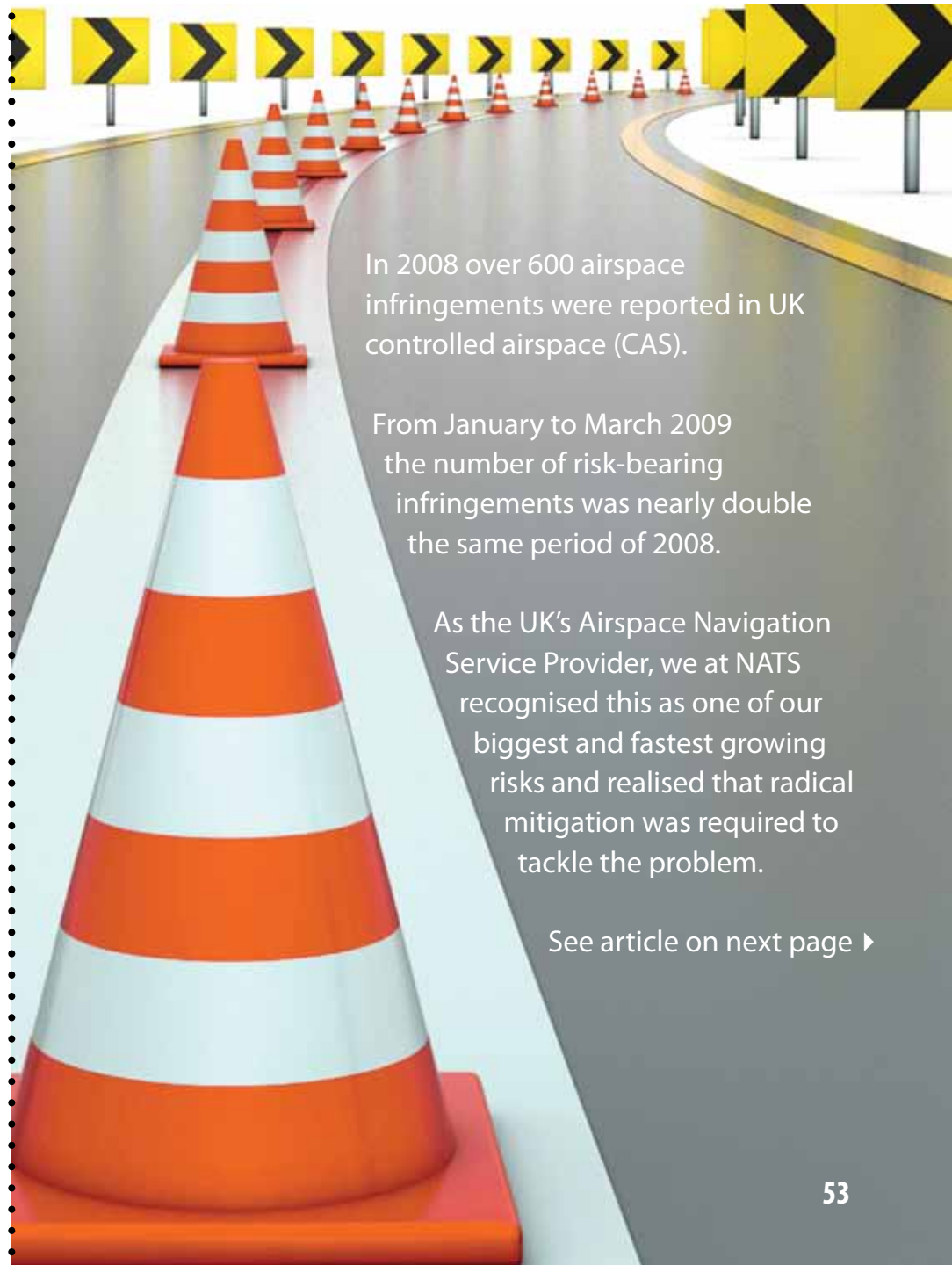
'Aware' - Preventing infringements before they happen



In 2008 over 600 airspace infringements were reported in UK controlled airspace (CAS).

From January to March 2009 the number of risk-bearing infringements was nearly double the same period of 2008.

As the UK's Airspace Navigation Service Provider, we at NATS recognised this as one of our biggest and fastest growing risks and realised that radical mitigation was required to tackle the problem.

See article on next page ▸

'Aware' – preventing infringements before they happen (cont'd)

The Controlled Airspace Infringement Tool (CAIT)

NATS had already taken several measures to reduce the risk from infringements. Our Operations Analysts looked within the operation and beyond into the GA community to gain a picture of the needs and opinions of GA pilots. Our incident investigators focused on discovering some of the reasons behind infringements in UK airspace.

In the Terminal Control room, our researchers developed the Controlled Airspace Infringement Tool (CAIT) to assist controllers in detecting infringements by transponding aircraft. CAIT highlights an aircraft as soon as it infringes controlled airspace, and can display Mode-S data available for the aircraft. Our researchers worked together with operational controllers and specialists in human factors and safety to develop this simple yet effective tool that requires minimal training in its use. We have now developed this further by creating a primary radar multi-radar tracking version of CAIT.

Out in the community, we raised awareness of the issue of infringements within the UK CAA Airspace Infringements Working Group and within the Airspace Safety Initiative, which brings together representatives from NATS, the UK CAA, the UK Ministry of Defence (MoD) and GA organisations. We toured flying schools and attended instructor seminars and flying exhibitions, promoting an understanding of the safety implications of airspace infringements. In addition, we complemented these activities with a media campaign to communicate the issue, producing DVDs demonstrating the way to conduct VFR flights around the London TMA (which records the highest number of infringements in the UK) and best practice for GPS en route navigation.

Our research suggested that the two main causes of unauthorised airspace infringement were a loss of positional awareness and a lack of knowledge regarding controlled airspace boundaries and airspace changes. By March 2009, key people at NATS began to discuss a simple, low-cost yet potentially extremely effective tool to reduce airspace infringements; we could create a simple, affordable airspace alerting and positional awareness device for GA pilots. We believed that such a device, if used correctly, would help pilots ensure that they did not enter controlled airspace without being aware of its existence. Widespread use of such a device might prevent airspace infringements

at source, potentially averting serious breaches of safety and also reducing the need for costly mitigation in Terminal Control and at airports.

However this path would take the organisation out of its comfort zone and lead to our first endorsement of a commercial product. The partner that NATS chose for the development was Airbox Aerospace Limited, an innovative British company already making well regarded aviation GPS systems. Airbox were chosen both because of their experience and because of their shared belief in the value of improving GA flight safety.

The 'AWARE' requires minimal user input but gives a clear depiction of nearby controlled airspace relevant to the current altitude. It is a GPS moving-map device featuring clear audible and visible warnings of controlled airspace and other en-route hazards such as Glider launching sites and Parachute Drop Zones, relative to altitude and lateral proximity. The background maps used by the device are the standard ICAO 1:500,000 UK airspace charts which British pilots use when learning to fly. Airbox committed to selling the product at a modest price of £150 as a means of encouraging widespread adoption by pilots. Uniquely, NATS also committed to provide free monthly updates of the airspace definition to reflect changes to the UK Aeronautical Information Publication (AIP), ensuring pilots can keep their device up to date.

NATS and Airbox believe that by eliminating many of the perceived obstacles to buying and maintaining a GPS such as price and complexity, we have created a situation where pilots might ask not "why would I buy one?", but "why wouldn't I?" Information gleaned from customers at the point of product sale indicates that over 60% of customers were either not flying with any form of GPS or are flying with a GPS with an airspace warning more than a year out of date, prior to purchasing Aware.

Whilst NATS has pioneered this development with Airbox, and to a large extent created a whole new market segment for aviation GPS devices, it is NATS' firm intention to make the same airspace boundary information available to all equipment manufacturers in order to encourage up-to-date airspace information on all GPS devices to help reduce infringements.

NATS funded the product development but does not financially support the product manufacture or profit from any sales in the UK. We believe that the potential safety benefits delivered to us far outweigh the commercial opportunities to pricing the AWARE higher or charging for monthly updates. Ultimately, our core motivation is to improve safety by reducing infringements.

After approximately six months in development, 'AWARE' has been on sale since February 2010. It has achieved significant early sales success and created unprecedented interest within the UK general aviation community. Reviews in the aviation press and on-line forums have universally praised the product as a break-through for general aviation safety. The early signs are that our infringement numbers are down on last year's figures, and this is attributable to all of our initiatives. We believe that the AWARE has contributed significantly to this, both by maintaining the awareness of infringement avoidance with pilots but also by creating something new and innovative that is affordable and useful to them in actively avoiding controlled airspace. More information can be found at www.airspaceaware.com

Mark Watson

is head of CNS/ATM & Safety Research at NATS and has managed the development of several of NATS infringement initiatives. Mark is a Chartered Engineer and holds an MBA in Entrepreneurship & Innovation and has been with NATS since 1992, of which the last 12 years has been spent in R&D.

Kathy McColl

has been working in Safety Research for the last 4 years and is NATS projectmanager for the AWARE device, where she works in close collaboration with Airbox. Kathy has a background in software development at NATS and holds a Masters degree in Geographical Information Systems.

Jonathan Smith is an operational London TMA controller and is NATS Infringements lead, involved in all aspects of NATS infringement prevention initiatives. Jonathan is also a private pilot, owning a Piper Cub, and it is his passion, breadth of experience and understanding of infringements, both from a controller's perspective and from a pilot's perspective, that helped shape the design of the AWARE device.