

Digital NOTAMs: a paradigm shift

As air traffic control (ATC) moves steadily towards a digital environment, great changes are being made to the way information is managed. One key tool will be digital aeronautical information updates, **Barry Davis**, US Federal Aviation Administration (FAA), tells *Future Airport*.

Major efforts are under way to manage the complexity of tomorrow's aviation industry in a more efficient way in order to improve safety and increase capacity. In the US, this means changes on many fronts as the NextGen project brings ATC into the digital age.

An important element will be the transition to digital aeronautical information updates (digital NOTAMs), which are part of the foundation of the shift from aeronautical information services (AIS) to aeronautical information management (AIM).

Traditional vs digital

Currently, NOTAMs are filed with aviation authorities to warn of hazards en route or in a specific location, and are then disseminated by the authority to pilots. They cover many issues, from severe weather and closed runways to temporary flight restrictions and military exercises.

The traditional procedures for NOTAMs, however, have limitations that make them less than ideal for the digital age where the aviation industry is under pressure to save

time and money, as well as optimise safety. NOTAMs are based on legacy teletype systems and are in upper case, making them difficult to read. They are not consistent with international standards and recommended practices for safe international operations. Further, it is hard to integrate them into maps or other graphical aids used to help pilots and controllers achieve situational awareness.

"The question is how to move paper-based products like NOTAMs and pre-flight bulletins to the point where they provide useful information for pilots who want to sort, filter, transpose and fuse that data with other datasets to improve situational awareness?" says Barry Davis, AIM manager for the FAA. "Pilots have the least time of anyone to do this, but they have more information to sort, so the move to the digital world – the AIM world – will integrate data to help the pilot. Digital NOTAMs are one piece in a larger picture in achieving this."

The FAA aims to improve flight planning, assist situational awareness and navigation, and help pilots to make faster, better

Barry Davis, FAA

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decisions. Digital NOTAMs provide a data set about the condition of aeronautical facilities that is disseminated faster through automated equipment used by personnel concerned with flight operations. Using an AIM database, the FAA enables airports to enter NOTAMs directly into the system, where enhanced systems and user interfaces will support their distribution and make interpretation easier.

"Digital NOTAMs are like Twitter messages: bursts of information that must

be integrated with other data," says Davis. "If you are using text then you need a human to interpret the message, which can be difficult if they are complex. Pilots must integrate the data against time constraints, so we want to shorten the process for them. Using an automated system to interpret NOTAMs gives an amazing potential for pilots to do a better job."

Complex transition

The potential advantages of putting more up-to-date information in the hands of pilots are easy to demonstrate, such as the ability of airports to enter NOTAMs directly into the system, which can generate significant time savings.

"This leads to big efficiency gains," notes Davis. "For example, snow conditions constantly change, so information can quickly get stale. There is real benefit if you can get the latest runway status in just a few seconds. Using traditional NOTAMs could take five minutes or more."

The appeal of such benefits has made airports eager to engage with the project.

"The airports are really positive," Davis explains. "I now need to provide them with a system that is not susceptible to faults. We



standards for geospatial information, including Geography Markup Language, and it supports the latest ICAO and user requirements for aeronautical data including obstacles, terminal procedures and airport mapping databases.

This firm platform has enabled the coordination of all affected parties, in the US, Europe and other key locations, to be managed effectively and efficiently.

"Digital NOTAM is a transformational project," remarks Davis. "As with any transformational project, it is important to

operations as we provide digital NOTAM capabilities," says Davis. "The good news is that the steps on our roadmap have remained consistent and we have used the feedback we have received from the community to improve our planning and implementation activities."

In the year ahead there will be further demonstrations of the concept with key stakeholders, as well as a major effort to implement policy changes to improve the management of US NOTAMs and lay the foundation for future system improvements. These include the transition to international NOTAM formats and the standardisation of terminology and formats.

In summer 2010, a digital NOTAM demonstration, in coordination with Eurocontrol and other aviation partners, will take place through the Open Geospatial Consortium. The FAA will also begin transmitting special activity airspace activation information over the FAA's System Wide Information Management interfaces, which will be available only to internal FAA stakeholders at first, but could be opened up to external stakeholders in 2010 or early 2011.

As the FAA rolls out the digital NOTAM origination system, its demonstration search page (notams.aim.faa.gov) will leverage computer-readable NOTAM information to provide an interactive NOTAM search experience for the site's users.

These developments, and the prospect of more airports joining the project, are just part of what keeps Davis excited about the future.

"We will have at least ten airports online and maybe more," he says. "2010 will be an exceptional year for the project." ■

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must have the right infrastructure to support what is a relatively simple concept, and that is what is taking up my time."

Therein lies part of the complexity of the transition. Digital NOTAMs affect every airspace system user. Therefore, the infrastructure must be up to the task from day one. Fortunately, the foundation stone for digital NOTAMs and similar products is the Aeronautical Information Exchange Model version 5 (AIXM 5), developed in cooperation between Eurocontrol and the FAA, with the support of the international AIS community.

AIXM 5 takes advantages of existing and emerging information engineering standards and supports current and future aeronautical information system requirements. It includes an exhaustive temporality model, including support for the temporary information contained in NOTAMs. It is aligned with ISO

balance change with the need to maintain safe flight operations. To mitigate this challenge, we are working closely with the NOTAM community to get frequent feedback on our approach and progress. We have received positive encouragement and constructive feedback reinforcing the value and support that exists for this effort."

Milestones ahead

The challenge now facing Davis and his counterparts around the world is principally a technical one. The enormous complexity of effective transformational changes such as digital NOTAMs has meant that the original timeline has slipped a little, but only in the interest of delivering better results and maintaining the highest safety standards.

"We have been spending more time on coordination to ensure we maintain safe