

Global Urban & Advanced Air Summit Asia 2023

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CHECK AGAINST DELIVERY

Keynote: Enabling the Next Revolution in Aviation

Thanks for the introduction; delighted to have the opportunity to deliver this keynote address to this Global Urban and Advanced Air Summit.

The right summit to have at the right time, as we look to address our common challenges.

Pleasure to be back in Singapore, thank you to our hosts; underlines the international nature of the challenges, and that the solutions must ultimately be international in nature.

Summit – personal learning and engagement opportunity.

The theme of my speech is ‘enabling the next revolution in aviation’.

120 years ago, the Wright Brothers made history with the first flight by a powered aircraft.

It didn’t travel far, but it was monumental – it marked an aviation revolution that would change the world.

The pace of technological advance from that point has been astonishing and never-ending: day-to-day changes may often have been small, but incremental change – and the hard-won lessons from experience - have transformed aviation.

Then a second revolution – the jet engine - marked a significant leap forward in the history of aviation, bringing transformative changes in global connectivity.

That never-ending pace of change is accelerating – the last decade has seen rapid growth in new types of aircraft, new investors, and high expectations from new entrants to the aviation market.

Aviation now stands on the cusp of its next – and potentially biggest - revolution since the invention of the jet engine: radically different types of platforms; uncrewed systems; artificial intelligence; novel propulsion systems; the drive towards sustainability.

Systems with impacts which span a far wider range of sectors, users and novel applications, challenging us to change the way we think about aviation.

They have the potential to revolutionise the way people move around cities, improve transportation options, and contribute to a more sustainable aviation ecosystem.

Systems which are also proliferating in numbers to a scale which we have not seen before.

And unlike many revolutions, this one is not replacing what came before: the new systems are additional and complementary to previous generations in aviation: current and new technologies will exist together, so integration and inter-operability are essential.

Finally, I would also define this new revolution as being about pace – however fast we thought innovation and technology was advancing previously, it's far faster than that now and we all have to respond accordingly.

Against this backdrop, what then is our role?

Everyone in this room has a part to play, whether that be:

- Governments making policy.
- Regulators enabling new technology safely.
- Investors financing new technology.
- Innovators turning ideas and concepts into reality.
- Current airspace users supporting integration.
- Looking after the interests of consumers.
- Explaining and reassuring those that will fly in these new platforms, and those who will be overflowed by them.

It's a long list, but as you would expect I'm going to focus on one – the role of the regulator.

And as you would also expect, I'm going to focus on the UK approach. Not because we think we've cracked the challenge in all respects, but simply to offer what we've been doing, to help stimulate our discussions.

Because as I said at the beginning, that there's no solution which doesn't involve cooperation between nations – be that bi-laterally, multi-laterally or globally.

That doesn't mean though that there shouldn't be competition at some level between nations on these new technologies – that's part of how we make advances and what we've done throughout the history of aerospace.

The UK Civil Aviation Authority has a dual role. At our core, we are a safety regulator, relentlessly focused on assuring the safety of those who fly and those on the ground below – that will always be our priority, whatever the technological advances.

However, we also have a role in helping enable innovation and those technological advances – enabling the success of a thriving aerospace sector. We do not lead the sector in this respect, but we know that we have a vital, leading role to play.

Now, experience suggests that it's pretty easy to point to the regulator when things are not going as well or as fast as innovators might wish. My response is to say that we understand your ambitions and the need to raise money and give your investors confidence.

And to offer that the solution is engagement, in both directions. We need to understand what you're trying to achieve; we need to describe the regulatory environment and what evidence we're looking for – an especially important need for those innovators who might be new to aerospace.

Not though to tell you what to do though to deliver safety – it's a fundamental part of our regulatory principles that safety is delivered by those developing the technology and delivering the activity, not by the regulator – our role is assurance.

And remember of course that regulators are learning too – we don't have a playbook for these technologies either. We will certainly have clearly in mind the regulation of the existing sector – it's the product of over a century of hard-won experience, generally based on what's gone wrong.

But we will evolve and adapt regulation to match the requirements of the new technologies. Our primary interest is safety. The safety of those that fly, and those that are overflowed. That is our starting point, and when we enable new technologies, it has been and always will be within that context.

And the sector needs us to have that safety focus – there is a collective task here to build public trust in new aviation technologies, and as the safety regulator we provide a significant amount of reassurance to society.

The Civil Aviation Authority is of course not the only actor here. As well as the sector, there is principally Government, owning the really big levers – whether that's national planning, setting ambitions and owning funding decisions.

That's why we've welcomed the UK Government's Future Flight Challenge – led by UK Research & Innovation – which has helped galvanise and focus effort on the RPAS and eVTOL sector, backed by substantial amounts of industry and Government money. This has helped all parties – industry, Govt and regulator focus on what we need to do to realise these ambitions.

As well as the inevitable focus on the technology, this programme is also working through the litmus test for any new product and service – its social licence. Will the public accept the benefits case and will any impacts be tolerable? In some cases there are use cases which improve human connectivity and safety, as well as possible noise benefits of eVTOL aircraft compared to helicopters.

There may be some risks too though, such as more visual pollution. The key point is that ultimately the public need to be bought along the journey and ultimately buy into the net benefit case.

As a forward-thinking regulator, what are goals? It's about regulating for the future. It's to enable and integrate new vehicles and new fuels with current infrastructure.

Ultimately, it's about creating an environment that's safe, robust and sustainable.

One that encourages innovative companies to develop and test their solutions, with us supporting them in an open and clear way.

And one that continues to foster innovation when things go wrong – the Wright Brothers did bicycles before aviation and they didn't always get it right – they had failures, but they learned from those experiences.

A number of new entrants into the eVTOL industry have had incidents. It's not a desired outcome, but it's important to create conditions in which new platform types can safely innovate and failures in development are part of the process in making sure failures in operation are reduced to minimum level.

How then is the UK Civil Aviation Authority reconfiguring itself to support future flight and innovation?

In 2019 we launched our innovation hub in response to the growing pace of change.

- This made expertise and guidance, viewpoints more accessible and provided a key point of contact for innovators.
- It helps innovators maximise regulatory preparation for the demonstration of their aviation systems, by testing them in safe environments and learning how they address regulatory challenges (so called sand boxes).
- It also accelerates the development of new policies and regulations by predicting regulatory challenges in areas of innovation and then considering the requirements for new policies and regulations.

Since then we've continued to evolve our organisational design and capacity to support innovation, including separating more clearly the regulatory and enabling functions and moving to paid-for services in response to the constantly growing demand, run through our subsidiary CAA International.

Earlier this year we moved to the next stage – establishing a Future Safety & Innovation directorate within our Safety and Airspace Regulation Group, sitting alongside the Current Safety function. The aim has been not only to expand the size of our regulatory engine room, but to underline the constantly growing importance of Future Safety & Innovation in our core regulatory activities.

The Future Safety and Innovation Team draws together existing areas of the organisation - Remotely Piloted Aircraft System (RPAS), Innovation Challenge

Leads, Aircraft Design and Certification, Rapid Capabilities Office, and General Aviation – to provide coherence within the CAA and in our engagement with the sector; and to build capacity to better allow the sector to demonstrate, scale and sustain new capabilities.

Our sandbox approach in particular helps applicants maximise the regulatory readiness of their innovation, and also helps the regulator develop better, more efficient ways to develop new regulations.

Sandbox services are offered prior to commencing applications, and it's about creating an environment where innovation and aviation can be explored in line with our core principles of safety, security and consumer protection.

We've launched sandbox trials across a variety of areas since 2019, including BVLOS in controlled and uncontrolled airspace, Unmanned Traffic Management (UTM) and Airspace Integration.

We are currently working with three eVTOL operators – including Vertical, Joby and Volocopter - as they develop and move through the certification and validation process, and others are coming on stream.

Our thinking on eVTOL operations goes beyond just operational readiness – we recently published guidance on our consumer principles on eVTOL – making sure considerations are made for consumer access, value, choice and fair treatment.

And we're providing guidance for airports and vertiports on how to accommodate eVTOL aircraft, in advance of the publication of technical and operational standards.

We're also enabling other kinds of aviation – we recently supported Apian and Skyports in their trials, where they make time-sensitive, sustainable medical deliveries for our health service via drone.

And we oversee over half a million drone users in the UK, of which 3,500 are commercial users, including Royal Mail, which is exploring rural drone deliveries.

We know that our responsiveness and readiness to accept applications is important – that's why we're currently investing in a system that will launch next year for specific drone operations that will allow over 95% of the risk assessments currently submitted to be authorised within 24 hours, down from the 1 month previously taken.

And we're helping pave the way in sustainable aviation, giving ZeroAvia and Cranfield Aerospace the green light for a successful test flight of the world's largest hydrogen-powered aircraft in January this year.

There is a need also to look beyond the physical – systems are needed to facilitate these new technologies – from us improving the way we process applications and risk assessments, through to a significant amount of consideration on airspace.

And for the operation of these vehicles, wider systems around connectivity, understanding what is happening around them, the way they interact with other airspace users – it is critical that we all understand the importance that systems play in the safety of future flight.

This future isn't just about having certified vehicles – they have to be able to fly in the same airspace structure alongside the well established commercial air transport, military and general aviation industries. Regulators need to be there for the entire sector, not just for new technologies.

In places like the UK with a large and established aviation sector and compact geography, we need a strategy to integrate these different forms of traffic rather than segregate them. That isn't what users want and in many cases there isn't space to do that.

That's why we set out in our Airspace Modernisation Strategy our approach to how this can be achieved. This strategy involves upgrading much of our existing airspace infrastructure as well as accommodating new users. There is still much to do on the detail and delivery plans – but we have a relevant and exciting strategy points that will set a credible way forward.

Wider innovation is also important for future flight – enabling new technologies must include consideration of AI – how can we as an industry use it to improve systems? And how can we use it to delivery our regulatory duties? Next year we will be publishing our strategy for AI which explores this.

I've covered a lot of ground there in rapid time. The key point I want to leave with industry and innovators is that the UK Civil Aviation Authority is open for business and we want to engage with you.

What then of the future? We will continue to improve the way we communicate and engage with industry, as highlighted in the recent UK Government review of the Civil Aviation Authority which highlighted our strengths as a regulator and our global reputation along with some areas where, like any organisation, we can continue to improve.

We will continue to engage with other member states and regulators, including ICAO – we know there are different paces of change when it comes to innovation and nations are at different points in their journey, but all shared learning is important.

We are all trying to address the regulatory issues, to take on the enormous challenge of regulating for the future, albeit sometimes in a slightly different way. But there is more common ground than what separates us.

Our shared learning with the Civil Aviation Authority of Singapore is one such example – earlier this year we announced that we would step up collaboration between our two organisations, exchanging details on aspects such as vertiport standards and regulatory roadmaps for Advanced Air Mobility and Beyond Visual

Line of Sight. This deeper relationship builds on many years of CAA and CAA International collaboration with CAAS.”

We also have bilateral arrangements and constructive working relationships with Eurocontrol, EASA, ECAC, EuroCAI

And if I can offer one overarching theme for all of this activity – indeed all that I have said today – is that we need to be able to do this at the right pace.

To conclude, our mission as a regulator is to assure safety but also to enable that next revolution in aviation – one that changes the way we think about aviation, that opens up new opportunities for the future, and does so in a sustainable manner.

Engagement and collaboration is how we all enable it – I believe that the UK Civil Aviation Authority has a strong track record on both counts.

Our door is open for conversations – I and the rest of the Civil Aviation Authority are playing our vital part in helping bring about that revolution.