



HERE TO STAY

Digitalization is a vital part of ATC's growth, but reliable and accurate nav aids and methods of surveillance will be part of the industry for decades to come

Ben Sampson



Kais Mnif is the director for the nav aids and non-radar surveillance part of the Airspace Mobility Solutions business within the Thales Group. Before joining Thales, Mnif spent most of his career in the railway industry, working for Alstom across Asia. When he joined Thales in 2014 he started within the Thales Group's rail business. He became the head of the Group's Nav aids and Surveillance business five years ago.

Massimiliano Ferla is the product line manager for nav aids and non-radar surveillance products at Thales and was formerly product manager for Instrument Landing Systems (ILS).

Both engineers are based in the Milan area where the Thales Group's center of competence for nav aid system design, development and production is. In this interview they discuss the current trends in the ATM sector related to nav aids and surveillance as well as the future for the technology in the industry.

Q: CAN YOU DESCRIBE YOUR BUSINESS?



Kais Mnif (KM): Aviation is one of Thales' core businesses and we take a holistic view to the industry – we are present onboard the aircraft, whether it's civil or military as well as on the ground infrastructure side. We are a systems provider and a systems integrator. We supply all around the systems that we install and integrate to make the platform work efficiently and safely in its environment.

We are one of only a few players in this sector that has this holistic view and one-stop shop approach. We can offer customers the whole portfolio of products needed to safely manage an airspace and a turnkey approach to integrating it all.

Our nav aids and surveillance business is a strategic one for us because it's one of the major building blocks of aviation ground infrastructure. When we enter a new country, where we are not so well-known,

nav aids and surveillance might be the first ground systems and infrastructure we supply.

Q: WHICH REGIONS DO YOU WORK IN?

KM: We are the most international business in the Thales Group – we serve customers in 180 countries, because you need to safely land an aircraft everywhere. All our solutions are fully compliant with regulations as set by ICAO / EUROCONTROL. You need radar, ADS-B infrastructure, ILS (instrument landing system), or DME (distance measuring equipment) to efficiently manage your airspace. And you need them to be working reliably at your airport and connected safely to the aircraft everywhere.

Q: DO YOU WORK IN CIVIL OR MILITARY?

KM: Both, we have a balanced portfolio of customers, around 60% civil and 40% military. The US Air Force is one of our top three customers.

Most of our nav aids are dual use. If we take the example of ILS. An ILS is an ILS



Above: The company has installed navaids in Africa; this DVOR can be seen with Mt Kilimanjaro in the distance in Tanzania
Left: A Thales-supplied VOR navaid in South Africa

same – a sharp decrease compared to 2019. In 2019 we were on a dynamic growth curve, with new airports being built everywhere, large numbers of aircraft being bought and air traffic on target to have doubled globally by 2030. That dynamic has completely changed with the pandemic. COVID-19 has been a great equalizer and I see it as an opportunity. It's a fight only the fittest will survive – the company that adapts better and faster will be the winner.

Our focus is on being smarter and anticipating our customers' needs. We are protected to a degree because we supply the infrastructure and are less affected by a reduction in passengers in the system. But we need to be able to read and anticipate how our customers are adjusting and how these changes translate to their infrastructure needs.

In the short term, we are helping our customers through the pandemic with new flexible procurement models and new product policies in order to help them in their aviation recovery and / or in their digital transformation.

Q: CAN YOU DESCRIBE YOUR PRODUCT PORTFOLIO IN DETAIL?



Massimiliano Ferla (MF): We cover the full portfolio and offer turnkey solutions for managing operational tasks like navigation and landing.

Within the Navaids portfolio we are supplying a new generation of equipment with technology such as ILS and DME for automatic landing, VOR for azimuth direction both in conventional and doppler configurations (CVOR and DVOR) as well as TACAN as Kais mentioned. We also supply and offer NDB (non-directional beacon), which is now being decommissioned by ICAO. This complete portfolio of navigation aids will ensure a safe and accurate navigation. New technologies include cybersecurity features which are essential.

whether you are landing a commercial aircraft or a fighter jet. It's the same signal and the same onboard interrogator or transceiver to guide the pilots.

There is a military navaid called TACAN (Tactical Navigation System) which uses specific frequencies and signal forms for more accurate positioning. It's most used in NATO and NATO-friendly countries. We combine our new generation of products and technologies to achieve the performance needed for navigation with our VOR / TACAN for military use or DVOR/DME for civil use.

Regarding the non-radar surveillance technologies we are also providing a new generation of ADS-B sensors for airports and at a country-wide level.

Q: HOW HAS THE COVID-19 PANDEMIC IMPACTED BUSINESS?

KM: 2020 and 2021 have been complicated years but we have adjusted. In terms of market size, the last two years have been the

Our global portfolio includes surveillance systems like primary and secondary radars, as well as non-radar surveillance systems like ADS-B and multilateration, allowing air surveillance both in local areas around airports and up to country-wide areas for accurate navigation in the airspace.

Q: HOW HAVE NAVAIDS AND SURVEILLANCE DEVELOPED RECENTLY?

MF: We are continuously evolving and redesigning systems to be on the cutting edge of the market and to cover the new needs of customers.

To support customers in recovery after the pandemic we have redesigned our product portfolio. Our fourth and fifth generations of navaids have been digitized to enable remote connections and remote maintenance, while remaining very reliable and accurate.

The other force driving the redesign has been to keep the total cost of ownership to a minimum. This is being enabled by the digitalization of our products and systems. But the focus with recent developments hasn't been digitalization or finance specifically, but to support customers in doing remote operations during COVID-19 provoked travel restrictions.

Digitalization is now a must, not just something nice to have. It's a key part of future aviation systems because it serves the increasing need for flexibility and efficiency from ANSPs and we are fully supportive of that within our portfolio.

Q: WHAT ARE THE BENEFITS OF DIGITALIZATION?

MF: You can see navaids a bit like a nationwide IoT network, with ground stations spread across a territory, up to hundreds of miles away from each other. A software upgrade used to mean technicians had to travel to many different locations. That is the 2010 way of doing things. If you have dozens of locations it is laborious and restricts upgrades.

The new way of downloading and upgrading is to do it remotely. You need a smart system and the communications infrastructure to do that, but most importantly you need to do it in a cyber secure way. That's where Thales has the reputation to offer a legitimate service, because cybersecurity is one of our core businesses as well.

Q: ARE THERE ANY OTHER CONSIDERATIONS?

MF: In addition to digitalization we are developing security and artificial intelligence

©THALES, GREGOIRE BERRY



into our products. They are two key pillars and are important aspects in managing industrial digitalization.

We have people dedicated to these aspects. Securing communications and operations is always our top priority because we know we are working in safety-critical environments.

Q: HOW DO YOU DEVELOP YOUR PRODUCTS?

MF: We participate in many international groups, events and have direct contact with customers, as well as run internal processes to assess customer feedback with surveys, workshops and user groups. This helps us understand and develop the products in line with the customer expectations.

KM: We have a significant self-funded R&D budget. We can see what's coming on the horizon, whether it's hardware components, mechatronics and software to innovate new products or product features. So, there's a lot of push from our end.

Q: WHAT NEW INITIATIVES AND INDUSTRY TRENDS INTEREST YOU?

KM: Thales has an initiative to address digital transformation within the aviation space to address the integration of small, unmanned aircraft as well as urban air mobility or advanced air mobility. The goal is to ensure a smooth integration into the airspace for unmanned aircraft so they do not disrupt global air traffic systems.

Drone services have already started in some places around the world. At sites in North Dakota, USA and in France we are deploying several technologies supporting the integration of drone platforms and enabling operators to conduct missions in a safe environment.

We think drones will eventually represent a major growth area in aviation and the challenge will be to identify, monitor and manage the airspace in which they operate.

Above: A Tactical Air Navigation System (TACAN) is used to provide geographical navigation for military applications

Below: Localizers generate signals to provide final approach azimuth navigation information to aircraft landing at airports



We are working with several airspace regulators and air navigation services providers to address operations and the infrastructure needed to support operations, particularly at low altitude airspace. We are looking at not only the management of airspace but also at providing data and tools to operators for situational awareness and post-mission analytics.

MF: We are embracing the challenges of integrating the new operator community with traditional operators to enrich the global airspace system. We are well positioned to fulfil the role of systems integrator to enable several technology solutions to come together to address the safety challenges that our end customers are committed to. We are already moving in the right direction with new propositions and new technologies for this purpose.

For example, we are exploring applications and benefits of sUAS for on-airport use in navigation aid calibration, radio frequency interference detection and pavement condition, VOR and radome inspections.

Q: WHEN WILL WE SEE MORE DRONES?

KM: We have some very innovative customers who are anticipating changes in

aviation with far-ahead policies and R&D programs. For example Germany, Italy, France and Singapore. In these places convergence between traditional aviation and digital aviation is already happening and we are supporting them. In Singapore we have a joint laboratory with CIS developing and testing digital products.

The US market has a lot of ongoing activity that is helping to shape the global UAS integration market. As a systems integrator, Thales is bringing together various surveillance sensors for short range and long-range surveillance, command and communications solutions to control and communicate the drone platforms. We are also developing mission and network operations capabilities to monitor the airspace so drone operators don't get in the way of manned aviators and so operations staff can oversee the health and performance of the infrastructure. This is setting the stage for a much larger integration, perhaps even for urban air mobility. More to come!

Q: WOULD YOU DESCRIBE THALES AS A MULTINATIONAL COMPANY?

KM: No. Our approach is to be a multidomestic group, as opposed to multinational, because if you are multinational you're nowhere, everywhere.

In the countries in which we operate, we are there with a strong industrial and engineering footprint. We talk to governments on a local basis and have people from that country manage the business in that country. With the countries I just mentioned, that's the way we operate.

Q: WHAT IS THE FUTURE FOR NAVAIDS AND SURVEILLANCE?

KM: The fundamental technologies in navaids and surveillance have been the same since WW2. Many people will tell you that it is an obsolete technology. They were predicting the same thing 20 years ago, yet this technology and infrastructure still exists.

There are a few reasons why navaids are still relevant: They are reliable and cannot be easily spoofed; they are a sovereign capability that enables you to have full control of your airspace without depending on external installations, and finally for technical reasons they are the safest – we have yet to find anything more accurate and more reliable than ILS Cat 3 for a safe landing.

We are confident that both the industry and our customers will continue to request our products for many years to come. It is this conviction which guides how we manage our business. ❖