

ON A PATHWAY

TO DIGITAL TRANSFORMATION

Digital apron solutions leverage real-time data, connectivity and automation to improve airport efficiency, safety and security. While airport digitization has gained momentum in recent years, back in the early 2000's the technology was in its infancy. As is always the case, there were trailblazers who took a leap of faith, developing and perfecting intelligent video solutions – paving the way for the digital transformation we're seeing rolled out today. One such pioneer is Malta Air Traffic Services (MATS). In 2009, this ANSP trusted in our ground-breaking innovative technology to create a remote apron management system, becoming one of the world's first ANSPs to invest in a permanent digitalized apron solution.

MATS definitely holds a special place not only in the history of digitalization, but also in our own story at Searidge Technologies. Our relationship dates back to 2009, when conversations began and MATS started investigating the feasibility of our ground-breaking innovative system for their apron control needs. "MATS' belief in Searidge was critical in the evolution and growth of the company," stated Moodie Cheikh, CEO and Co-founder of Searidge. "They trusted in a small technology company from Canada that was pushing the envelope on how things were done within the aviation sector. They trusted in the vision, got on board and took a chance, putting in the work to make the remote apron management system happen."

The ANSP has been on a journey of evolution with us ever since. From a 4 camera installation covering one location, overlooking Apron 9, to the 62 camera system that covers 10 locations today, our bespoke technology solution has placed the ANSP on a trajectory to full digitization. According to MATS CEO Claude Mallia, "Early adoption of Searidge's Digital Tower video technology has proven successful in providing the desired enhancements and benefits to our day-to-day operation over the past 13 years. Digital Tower technology remains one of the key pillars in our digitization strategy and technology roadmap; reinforcing our commitment to ensuring MATS is providing the most cost effective, safe and resilient service to our stakeholders."

To understand more about the positive impact the digitized apron services have made at MATS, as well as their future plans, we spoke with Daniel Chircop, Senior Head of Systems for MATS. Daniel is in a unique position to speak about our platform, having used the platform as a Controller until 2016, before becoming Manager of Tower Operations in 2017 and then moving into his current role overseeing the digital apron that's in place today.

"Early adoption of Searidge's Digital Tower video technology has proven successful in providing the desired enhancements and benefits to our day-to-day operation over the past 13 years. Digital Tower technology remains one of the key pillars in our digitization strategy and technology roadmap; reinforcing our commitment to ensuring MATS is providing the most cost effective, safe and resilient service to our stakeholders."

Claude Mallia, MATS CEO



CHALLENGES FACED BY MATS

Malta may be one of the smallest countries in the European Union, but this member state is one of the most densely populated, and it only has one international airport. Located 5 km from the nation's capital, Valletta, Malta International Airport can accept any class of aircraft and handles over 97% of inbound traffic for the Maltese Archipelago.

The airport is therefore a key gateway, connecting Malta and the surrounding Maltese Islands with the rest of the world. The nation's reliance on aviation is stressed by Aaron Farrugia, Malta's Minister for Transport, Infrastructure and Capital Projects. "As an island nation on the periphery of the EU, our dependency on aviation cannot be understated. The aviation industry is a fundamental pillar of our economy, contributing some €600 million annually and directly sustaining over 5,000 jobs. Malta International Airport is not only vital for our economy, but also integral to the nation's sovereignty and connectivity."

Over the years, the airport has garnered a number of accolades, including the ACI Europe: Best Airport in the size category 5 to 10 million passengers category, in 2020. The airport has two runways that align at right angles – main runway 13/31 and the shorter runway 05/23. On a monthly basis, the airport operates around 2,000 international movements and is estimated to reach 6.3 million passenger movements by the end of 2023.

Back in the late 90s, however, the ANSP started facing a number of efficiency and safety challenges, following construction of a new international terminal alongside Apron 9. As Daniel explained, "The tower is located between the two runways, at the end of the main runway and far from Apron 9, which had then become the main apron. As a result, the tower had poor visibility of this apron, and a number of blind spots, including zero visibility of certain stands."

To resolve this issue, in 2001 an apron controller position was established separate from the main tower, in a building extension located at the main terminal. From this position, apron controllers were responsible for aircraft movements on Apron 9, whilst all other aerodrome traffic was handled by a single tower controller. As traffic at the airport increased, MATS knew this set-up wouldn't adequately support operations and eventually identified the need for a Ground Movement Controller (GMC). In 2010, a GMC position was established in the main tower, simultaneously absorbing the role of the apron controller. In order to do this, though, Daniel stressed that visibility of Apron 9 needed to be maintained; thus, MATS began the search for a solution to help resolve this issue.



“As an island nation on the periphery of the EU, our dependency on aviation cannot be understated. The aviation industry is a fundamental pillar of our economy, contributing some €600 million annually and directly sustaining over 5,000 jobs. Malta International Airport is not only vital for our economy, but also integral to the nation's sovereignty and connectivity.”

Aaron Farrugia, Malta's Minister for Transport, Infrastructure and Capital Projects



THE SOLUTION – OUR REMOTE APRON MANAGEMENT SYSTEM

After meeting at a trade event in 2009, the MATS team traveled to Searidge’s headquarters in Canada where we provided demonstrations of our technology, discussed future plans and began working on a proof of concept remote apron management system for MATS. In early 2010, the system obtained safety and transportation approval from the Civil Aviation Directorate and by that summer the system was operational. This was the moment that digitalized apron technology truly became a reality.

As Moodie explained, this was a pivotal moment for both MATS and Searidge, “That first contract with MATS was instrumental in establishing our place in this industry and is the foundation of where we are today. Digital apron management may be exponentially moving from the visual field to a data domain, with AI and machine learning streamlining processes and enhancing efficiency. But back in 2009, the use of video imagery for situational awareness and remote management was revolutionary.”

Phase 1 – Remote Apron Management System Installed

This first installation in 2010 provided real-time video feeds from four digital camera sensors to two workstations within the tower. The video feed was stitched together to provide a 180 degree panoramic view of Apron 9, replacing the controller’s previous reliance on out-the-window view. According to Daniel, the benefits were immediate, “With the improved visibility from the four cameras, we could confidently relocate the ramp controllers into the tower. The improved communication between the controllers definitely had the added benefit of improving teamwork and morale.”

Phase 2 – Expanded Coverage

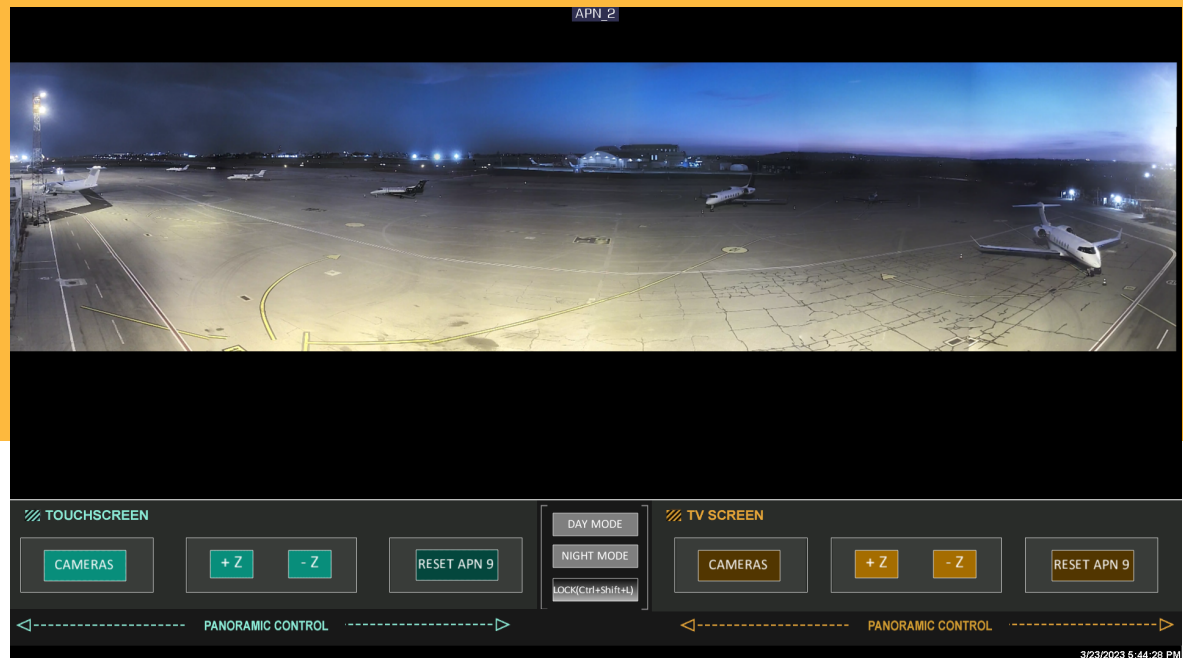
Over the next 5 years, the system was expanded and went from one location to 10 locations with 38 cameras, providing visibility of all taxiways, runways, runway thresholds and hold lines.

Phase 3 – System expansion and refresh

Within the field of airport digitalization, technology has advanced exponentially over the past decade. So in order to offer a complete overview of the airfield, using the latest hardware and software, a

“With the improved visibility from the four cameras, we could confidently relocate the ramp controllers into the tower. The improved communication between the controllers definitely had the added benefit of improving teamwork and morale.”

Daniel Chircop, Senior Head of Systems for MATS





complete system refresh was planned for 2020. However, as we all know, that year the pandemic hit. Borders closed, nations went into lockdown and – for a while at least – the world seemingly stood still.

“We had completed the factory acceptance test in January of 2020, and planned to conduct a pre-installation site acceptance test in April or May of that year, but obviously that had to be canceled,” Daniel explained. “Searidge successfully supported us remotely with the installation and the project was recently finalized with a Searidge system engineer on site to ensure that the system launched smoothly.”

The Digital Apron Management System used today has significantly improved situational awareness and provided total visibility of the airfield. The system has undergone a complete hardware refresh, software refresh and benefits from a number of system enhancements. These include: boosting the number of cameras from 38 to 62; installing 6 thermal cameras to improve visibility of dark locations; upgrading the workstations with

new graphics cards and touchscreens; new HMI layouts; multiple stitched view inputs, allowing controllers to independently select views from 10 locations across the airport; and upgraded video archiving.

THE BENEFITS OF A DIGITAL APRON

When it comes to the benefits of using the digital apron management system, Daniel stated, “With the blind spots eliminated, the controllers now have clear views of the apron, taxiways and runways. They no longer rely on pilot confirmation that the runway is clear. Likewise, we know when vehicles have finished safety inspections. This has resulted in increased situational awareness, improved safety and quicker reaction times, all of which can positively impact capacity.

“That first contract with MATS was instrumental in establishing our place in this industry and is the foundation of where we are today. Digital apron management may be exponentially moving from the visual field to a data domain, with AI and machine learning streamlining processes and enhancing efficiency. But back in 2009, the use of video imagery for situational awareness and remote management was revolutionary.”

Moodie Cheikh, CEO and Co-founder of Searidge

“We trusted in the apron management system and were confident that by adding new camera locations we would obtain complete coverage of the new taxiways. With the cameras, we solved the issue of limited visibility from the tower, enabling us to safely and efficiently manage the flow of traffic.”

Daniel Chircop, Senior Head of Systems for MATS

In particular, as we don't have a parallel taxiway serving our main runway, Rwy 13/31, most aircraft take an intersection departure. But there are times when aircraft have to backtrack and this increases runway occupancy, which obviously impacts efficiency. The fact that the video feed reduces reaction time has definitely helped us depart aircraft earlier. In airport operations, every second counts, so these improvements have made a significant impact.”

In terms of additional training, Daniel stated that the controllers quickly adapted to and trusted the new technology; and being co-located within the tower improved communication efficiency. Indeed, the only additional training required has been for the latest refresh, to demonstrate the new HMI touchscreen features. According to Daniel, “Getting the controllers up to speed was smooth sailing, compared with other systems.”

One other important aspect of improved safety is offered during incident investigations. “The video feed from every location is recorded, so during investigations we have a recording of the event. This has helped with investigations and has been a significant benefit for us,” Daniel confirmed.

However, the benefits have gone beyond improving visibility, operations and safety. In addition, the technology has aided expansion and growth. Following the construction of a new hangar for aircraft maintenance and spraying, along with two new taxiways, MATS had to find a solution for the limited visibility at the site, which was located in an area obscured by terrain and buildings. The system refresh provided the ANSP with the solution. By simply adding a new camera site and increasing the number of cameras at an existing site, full coverage of the area was achieved. “We trusted in the apron management system and were confident that by adding new camera locations we would obtain complete coverage of the new taxiways. With the cameras, we solved the issue of limited visibility from the tower, enabling us to safely and efficiently manage the flow of traffic,” Daniel stated.

TEAMWORK AND A TRUE PARTNERSHIP

“Over the years, we've developed an excellent working relationship with Searidge,” Daniel stated “When it's needed, support is always there, and the company has always been very responsive. In terms of innovation, the two businesses have developed a rapport, sharing new ideas and excitement for ground-breaking innovation.”

This is a sentiment shared by Ryan Kampman, Searidge's Engineering Support Manager who has been the technical lead on the MATS project since very early on in the relationship. “I've been working with MATS since 2009 and I am always welcomed with unmatched hospitality. It's a true partnership and we celebrate our successes together.”

FUTURE PLANS FOR DIGITIZATION

MATS is continuing this journey to digitalization with plans for a new tower – either hybrid or fully digital. In addition, the ANSP is considering installation of a fully digital contingency tower. “The pre-market consultation with suppliers and developers has already taken place”, Daniel confirmed. “We're definitely on a digital transformation pathway,” he concluded, “It's the only way we'll handle the forecasted increase in complex mixed-mode traffic operations, given the infrastructure and operational limitations.”

Here at Searidge, we truly value our partnership with MATS. “The many years of experience using video for digitization of the apron sets MATS up well for the next phase of their journey to full digitization,” quoted Moodie. “It should be a natural progression, as opposed to other ANSPs who are building a system from the ground up.”