The next steps for remote digital tower – think BIG

Aerosense Managing Directors, Christian Weiss and Katrin Scheidigen, talk about digital towers at larger airports, multi remote tower and Artificial Intelligence

Digital and Remote Digital Towers (RDT) are dominating Air Traffic Control (ATC). Operational and cost efficiency are attractive motives for switching to this type of ATC tower, however, although primarily targeted at smaller, regional airports, with low traffic volumes, major benefits can also be leveraged by larger airports. As global air traffic growth continues, and with it controller workload, changes are required to the traffic management experience in consulting, validation, transition and training, as well as deep and ongoing investment in human resources. Therefore, remote towers are gaining momentum and are a key component of the future of ATC management. Katrin Scheidigen and Christian Weiss, the Managing Directors of Aerosense, talk about digital towers and the future of ATC management.

Aerosense Managing Director Katrin Scheidigen.

Managing Director Katrin Scheidigen explains: “Digital towers provide a way to increase efficiency and maintain safety and tools which support controllers in their daily work. Many current and ongoing projects in New Zealand and Argentina are additional proof points of the technology’s ability. The ANSP of Denmark, Naviair, has also most recently selected FREQUENTIS DFS AEROSENSE to provide a bespoke digital tower system, integrated digital tower and approach system, for its second largest airport, to increase service provision and efficiency.”

Other operational references for the Frequentis technology are; Jersey airport in the UK Channel Islands, in place as a contingency system, fast to test the technology in extreme weather, Vienna airport for vision enhancement at a large airport, and Brazil as the first remote tower in Latin America. Further ongoing projects in New Zealand and Argentina are additional proof points of the technology’s ability. The ANSP of Denmark, Naviair, has also most recently selected FREQUENTIS DFS AEROSENSE to provide a bespoke digital tower system, integrated digital tower and approach system, for its second largest airport, to increase service provision and efficiency.

ADVANCING ARTIFICIAL INTELLIGENCE

Frequentis has been stepping up the introduction of artificial intelligence (AI) functions for its remote towers, including object detection. Christian Weiss, Managing Director of Aerosense, explains: “We developed the first generation of this [object detection] function for Saarbrücken airport in Germany. Saarbrücken uses this functionality operationally and we are now working on the second generation of this function, using the detected object to provide virtual safety nets.”

Virtual safety nets will enhance safety by automatically alerting the controller about safety-relevant situations, e.g. an aircraft occupying the runway. On top of this, digital towers provide the ability for new and advanced algorithms based on AI to connect all relevant data, including voice, to provide controllers with a much broader range of information in an intuitive and efficient way. This will allow more efficient airport operations.

“Voice Communication is still the most important tool in ATC. Despite all the data processing we are developing, we must not forget to seamlessly integrate voice communication as it is an essential element of every controller workstation,” says Christian Weiss. “This is especially important for multi remote tower scenarios, where up to three airports can be simultaneously controlled by a single controller. SESAR validations on this concept have been successful and received positive feedback from controllers involved in the trials. Research in the industry is now focusing on this development.” Christian adds.

It has already become clear that seamless integration of all systems from voice communication up to the data and visualisation components is required, to successfully provide multi remote tower services, while maintaining the same safety standards as a conventional tower. In 2020, Aerosense is planning to introduce the “MosaiX” platform, developed by Frequentis, for all of its system components, from voice communication up to video processing and the air traffic management display, in order to provide a seamless interface between all systems used by the air traffic controller. The unified platform will also enable the development of a multitude of unique AI and safety features.

MORE TO COME

RDT and digital tower tools have come some way to offering a solution to the increasing controller workload by enhancing visibility and automating functions and workflows. Most importantly, RDT provides location independence for ATC services, something which didn’t exist in a traditional tower.

As more and more airports around the world start to notice the benefits that RDT can bring, and trust in the technology grows, the obvious question is: what’s next? Both Christian and Katrin agree that we will see the first multi remote tower centres within the next three to five years. “The ability to provide centralised ATC at a multi remote facility will allow for controller working environment and flexibility to be improved and increase service provision. If capacity demands of the future are going to be met, while maintaining safety levels, automation, AI and seamless integration are key,” says Christian Weiss. With customers on all continents, the Frequentis Remote Digital Tower solution is already widely deployed and used operationally, providing advanced visual surveillance to controllers. This combination also allows the user to handle multiple airports from one centralised system, allowing automatic and instant coordination between towers and approach systems. The change and transition process and stakeholder management are vital to a successful remote tower project and with the extensive experience DFS gained when implementing its own remote tower, the pair become the perfect partnership for a complete remote tower delivery project.

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