Remote tower evolution

The current uptake and evolution of the remote tower is gaining momentum. Expanding from its initial use case as a cost-saving solution for regional airports, the remote tower can now be utilised in many additional ways. Frequentis was involved in the early stages of design for this technology in 2010, resulting in winning the first international tender outside of a company's own country. By now adding more pieces of the surveillance puzzle to the offer, this sets them ahead of the rest.

Early days

It all started with the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) starting the RapTOr project in 2005, to create an experimental remote tower system at Germany's Braunschweig research airport.

Frequentis then began working with DLR on first customer concepts and a feasibility study, with the design and testing in 2012 of a demonstrator in Dresden. In 2014 Frequentis installed a remote tower test system in Braunschweig to evaluate visual and IR camera technology under operational conditions and was the first to evaluate advanced functions such as video tracking and surveillance integration. In 2015 DLR and Frequentis signed a cooperation agreement that permitted Frequentis' use of key remote tower technologies. Frequentis then developed its smartVISION solution consisting of video sensor-based airport traffic surveillance, bandwidth compression and flexible presentation in its solution. Frequentis continued further development and implementation with key partners, including DFS and Rheinmetall.

Location, location, location

The Frequentis Remote Virtual Tower (RVT) not only replaces the out-of-the-window view with a set of cameras, but also integrates existing airport equipment such weather sensors, airfield lighting and local radios, as well as surveillance solutions based on multilateration or ADS-B, in order to provide enhanced situational awareness for the controller. In addition to its tower portfolio with smartStrips, smartVISION and smartTools, Frequentis RVT encompasses high definition video technology from Rheinmetall, the Frequentis market-leading voice communication system VCS3020X, DIVOS recording, as well as Quadrant ADS-B and multilateration from Frequentis Comsoft, among a number of other essential tools for data handling, display and control.

The Frequentis RVT comes in three options to improve airport operations. First is the remote tower for small and medium capacity airports which replicates the airports view at a remote location, with additional new enhancement tools such as aircraft and object detection and tracking, and information augmentation.

Secondly, the virtual tower is for enhanced tower operations and contingency to add new functionalities to high capacity airports to provide backup services and safety enhancements.

And thirdly, airport operations whereby the RVT provides an additional set of eyes, allowing video-based airport apron control, providing a large-scale video panorama, blind spot coverage, position information, augmented information about aircraft status, airport security and perimeter security.

Today

Frequentis has equipped Saarbrucken Airport with remote tower technology, managing approximately 15,000 traffic movements per year for Deutsche Flugsicherung (DFS), with Erfurt and Dresden to follow. A contingency solution is currently being installed at Jersey Airport in the Channel Islands to provide seamless ATC services for all occasions, including continuity of service in the event of a technical failure or evacuation. Airways New Zealand is also using the Frequentis solution to demonstrate how the safety and efficiency of airport operations could be enhanced with a remote tower, including improved visualisation in persistent bad weather and extended hours of service at regional locations. Furthermore, the Frequentis VCS3020X IP voice communication system is currently part of every digital tower solution in use, including those for LFV in Sweden and HungaroControl in Hungary.

Moving ahead

The most critical enabler for efficiency increases is the provision of ATC services to multiple remote towers and Frequentis is working on procedures and support tools together with selected ANSPs to make this happen in a safe manner. In November 2017, Frequentis, DLR, HungaroControl and Leonardo conducted the first successful validation campaign on 'Remote Tower for Multiple Airports' in Braunschweig. The remote tower project for DFS will result in the Saarbrucken, Dresden and Erfurt airports all being controlled from one remote tower centre in Leipzig.

The current remote tower deployments illustrate the first step in the use of a single remote tower being utilised to support one airport. In the future, Frequentis' multi remote tower will be the next generation of digital tower facilities where multiple airports are centrally managed from a single location. ∎

REMOTE VIRTUAL TOWER PRODUCT PORTFOLIO

- smartVISION visualisation and surveillance
- smartTOOLS information display and control
- smartSTRIPS flight data handling
- VCS3020X voice communication system
- QUADRANT ADS-B and multilateration
- DIVOS 3 log recording and replay
- Consulting services

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