

# Advanced digital tower

Automation and digitalisation Improved airport safety and efficiency Full situational awareness and user experience



Air Traffic Management

## Situational awareness needs efficient integration

Air traffic controllers (ATC) are frequently in use of a wide variety of independent and individual air traffic management systems. Situational awareness is negatively influenced by using different systems at the same time, which challenges the controller especially during traffic peaks and in critical situations. The seamless integration of existing and new applications into one controller working position achieves a workflow-oriented controller environment while optimising efficiency. This ensures the fastest possible reaction time, combining clear and fit-for-purpose presentation of all essential information into one specifically designed HMI.

## Key challenges for advanced digital towers and integrated controller working positions:





With annually increasing air traffic figures, several major airports are forecasted to reach their capacity limits within the next years.

As most affected airports are built in highly populated areas, the variety of growth options is limited.

Hence, optimising ATC operations using sophisticated IT technology is more likely to be pursued than adding airport infrastructure, such as runways, taxiways or ATC towers.

While certain IT systems excel at performing specific tasks, the ATCO, who has to see the big picture at all times struggles to keep the necessary focus as the variety of IT systems used in his environment increases.



Consequently, technology-driven growth in capacity and efficiency will only be achieved in the long run by integrating the IT-systems in use.

The ATCO shall be able to use his ATC equipment with a single well-designed and harmonising HMI on a reduced number of screens to regain his focus.

Given the availability of solutions, which fully integrate core ATC applications, such as voice communications, flight- and weather data management and surveillance, ATCOs can refocus on their core tasks associated with maximising safety for aircraft they guide as efficiently as possible through their areas of responsibility.

## Seamless digitalisation and integration

The Frequentis advanced digital tower solutions focus on reducing the ATCOs' workload and enhancing safety and efficiency by integrating the electronic flight strips with air- and ground surveillance as well as meteorological information. The combined knowledge base provides a wide variety of workflow- and decision support functions the ATCOs can access instantly throughout all flight phases, especially during ground movements. Our approach for the advanced digital tower is the integrated controller working position (iCWP). That optionally includes the ATCO's most critical ATC capability, voice communication.



## Data integration for an efficient and enhanced ATC solution

Frequentis

Stakeholders – Aviation and non-aviation

## Individual solutions for different airports

Advanced Digital Tower enables the integration of ATC services as well as new technologies like UTM into one HMI, using the data migration platform MosaiX to harmonise system data into one operational display. Surveillance data, vision enhancement and apron information can be integrated and displayed, in order to provide full situational awareness for the controller to safely operate an airport while increasing performance. Third party applications and existing infrastructure do not require any different HMI and can be integrated as well into the iCWP solution.

Frequentis offers individual solutions suitable to the individual requirements.

Remote digital tower Remotely controlled ATC Contingency operation Visual enhancement Multi tower operation

#### Advanced digital tower

High capacity operation Complex runway layouts Integrated surveillance Enhanced workflows

#### Compact digital tower

All essentials for air traffic control Integrated package Off-the-shelf: Turn key solution Compact platform; modular & expandable

## Enhanced air traffic management safety

Today's high density ATC tower environments are comprised of systems for surveillance, electronic flight strips, AGL, airport information management, weather data and voice communications. Due to the wide range of the Frequentis product portfolio, each of these application requirements is covered and embeddable in an iCWP tower solution. Hence, full backend integration between the components is given and provides a novel range of possibilities to make the ATCOs' jobs easier.

Besides the benefits given by backend integrating Frequentis products into an iCWP solution, a single and consistent HMI represents the high level of integration from the perspective of user experience. For legacy systems, which are required beyond deployment of an iCWP solution, Frequentis offers HMI-only integration. Consequently, existing systems can stay and the ideal mix between workspace innovation and well established operational workflow can be found.

### Selected references

### Aeroparque Jorge Newbery Tower, Argentina

EANA deployed a new ATC tower featuring ED-137-compliant VoIP voice communication and tower automation, including smartSTRIPS and smartTOOLS. The Frequentis solution is expected to enhance ATM operations and boost efficiency. In particular, the solution supports ICAO Aviation System Block Upgrades (ASBU) Block 0 and Block 1 modules in the airport operations performance area. With this deployment, EANA is leading implementation of new technologies in South America and is set up for enabling new functionalities in the near future.

## Major international airport, Asia

Frequentis smartSTRIPS flight data management solution was implemented to support faster decision-making and more efficient operations. Replacing a number of legacy systems and frontend integratig others, the Frequentis solution was awarded the IFATCA 2016 Technical Award. Operational feedback suggests that the solution provides a more user-friendly experience, helping to enhance safety and efficiency. This supported the ANSP to meet the demanding regional growth trends exposed over the last years.

### Amsterdam Airport Schiphol, the Netherlands

LVNL made a strategic decision to deploy a completely new tower system in accordance with the Pilot Common Project driving the SESAR deployment. Within a planned 25-year development partnership with Frequentis, the first step, which has already been successfully and timely implemented, was to deploy electronic flight strips to replace paper strips. The main design goals were to increase the capacity of ATC tower operations and to simplify decision-making. The next steps in the 25 year program comprise deployment of departure and surface management systems (DMAN / SMAN).

The Frequentis tower solutions roadmap is fully aligned with the SESAR 2020 wave of ATM research and ICAO Aviation System Block Upgrades. Thus allowing airports to rely on support to address future industry challenges according to standardised best-practice approaches.



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