Remote Virtual Tower
Enhancing military air traffic control
Mature, safe and secure solution
Scalable and deployable
Designed by operators
Ensure mission success and safe air traffic control

Inefficient and insufficient air traffic control (ATC) staffing, operations with limited visibility, vulnerabilities of deployable ATC towers, as well as new challenges, such as non-cooperative drones, require modernisation of military air traffic management (ATM). In addition, air forces need to embrace innovations driven by increased automation, connectivity and data fusion at air bases.

Addressing the needs of military use cases

A remote virtual tower replicates the visual tower view to provide ATC services from remote locations, thus improving operations and enhancing safety. It adds new operational capabilities for a number of military use cases in ATM and beyond to ensure accomplishment of different types of missions.

Domestic airbase operations
- Enhanced visibility and flight safety
- Efficiency for smaller airbases
- Cost-efficient tower alternative

Domestic off-base operations
- Quick ATC support for emergency landing strips
- Safety for remote landing sites
- Enhanced situational awareness

Deployed operations
- Safe combat operations
- Fast humanitarian assistance
- Enhanced staff protection
- Cost-efficient contingency tower

Situational awareness and automation
- Information sharing and data fusion
- Additional detection capabilities e.g. UAS
- Enhanced airbase security and efficient protection
A mature solution designed by operators

Remote Virtual Tower is a flexible and scalable solution that improves efficiency, safety and ensures mission success.

Turning challenges into opportunities
Remote Virtual Tower increases flexibility and situational awareness, while keeping controllers out of harm’s way by locating them in secure environments.
The operationally proven and tested controller workplace ensures safe operation of air traffic. The sensor mix with different spectral bands increases the overall situational awareness under standard and silent operations.
Advanced sensor technology in combination with sophisticated video processing and tracking capabilities creates data feeds, which can be used beyond ATC in base and technical operations, for purpose of surveillance, general defence and airbase security.

Flexibility and efficiency gains
- Service on demand
- Several bases managed remotely from one centre
- Lower investment and expenses
- Decreased workload by automation

Enhanced vision
- Enhanced situational awareness
- Increased night vision
- Blind spot coverage

Safety and protection
- Protection of operators
- Object and threat detection

Maximum performance with minimised risk
The joint solution modernises and improves the aviation standard, while meeting regulatory requirements at a reasonable cost-benefit ratio.

<table>
<thead>
<tr>
<th>Maturity and user acceptance</th>
<th>Successful change management</th>
<th>Flexibility, scalability and integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Virtual Tower draws on extensive experience in ATM. It is operationally approved, tested and accepted by DFS (German ANSP).</td>
<td>Risk is mitigated by applying an incremental change management process supported by DFS consulting services and long-term support and maintenance commitments.</td>
<td>The solution is flexible and highly customisable to individual defence customer needs and builds upon a fully integrated solution portfolio.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High-end electro-optical daylight and infrared visualisation systems</th>
<th>Product safety and security</th>
<th>One step ahead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sophisticated visual and cooled IR technology supported by advanced object detection, bounding and tracking improves flight safety.</td>
<td>Highest standards – including secure data backbone solutions – guarantee continuous operation by using an intelligent mix of redundant technology and sensors.</td>
<td>Deployability, mobility, drone detection and additional smart airbase features complement the solution, by using advanced sensors, tracking and video processing capabilities.</td>
</tr>
</tbody>
</table>
Remote Virtual Tower success stories

The solution benefits from extensive experience in vision enhancement and commitment to mission-critical ATM and communication solutions for military users. Frequentis and Rheinmetall are actively driving the evolution of image processing- and remote tower solutions across the world through involvement in major research programs, such as Fraunhofer Institute, SESAR, and by driving standardisation, e.g. via the EUROCAE working group.

DFS, Germany
Remote Virtual Tower
The companies have equipped the airport of Saarbrücken (Germany) with a remote tower that manages roughly 15,000 traffic movements per year.

DFS selected enhanced infrared and visual sensor and tracking technology, allowing controllers to detect and mark IFR and VFR flights and vehicles. Embedded surveillance information increases the situational awareness.

The German airports of Saarbrücken, Dresden and Erfurt will be controlled from one remote tower centre in Leipzig.

ÖBH, Austria
Video-based surveillance
ÖBH (Austrian Armed Forces) Frequentis and Rheinmetall performed a validation at the military airfield in Zeltweg (Austria). ÖBH evaluated the system for the purpose ATC from a remote position and the use of this system for the protection and security of critical infrastructure. An interface to the local approach radar has been implemented.

The German airports of Saarbrucken, Dresden and Erfurt will be controlled from one remote tower centre in Leipzig.

Middle East Airbase
Video-based surveillance
Intense evaluations and testing at an Airbase in the Middle East was executed to demonstrate system performance under harsh environmental conditions. Enhanced vision for ATC controllers was ensured in heat, dust and high humidity.

Underlining the airbase protection capabilities, the system detected and alarmed for wildlife and potential threats from air, land, and sea. The sensor network enabled the airbase to generate additional airpower and to secure high-value assets. Existing infrastructure was integrated and network-enabled capability was achieved.

Remote Virtual Tower product portfolio

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

Extensions and related solutions

→ ATM-grade network performance
→ Deployable Remote Virtual Tower
→ Drone detection system
→ Airbase security solutions
→ Smart airbase data automation and fusion

The information contained in this publication is for general information purposes only. The technical specifications and requirements are correct at the time of publication. Frequentis accepts no liability for any error or omission. Typing and printing errors reserved. The information in this publication may not be used without the express written permission of the copyright holder.