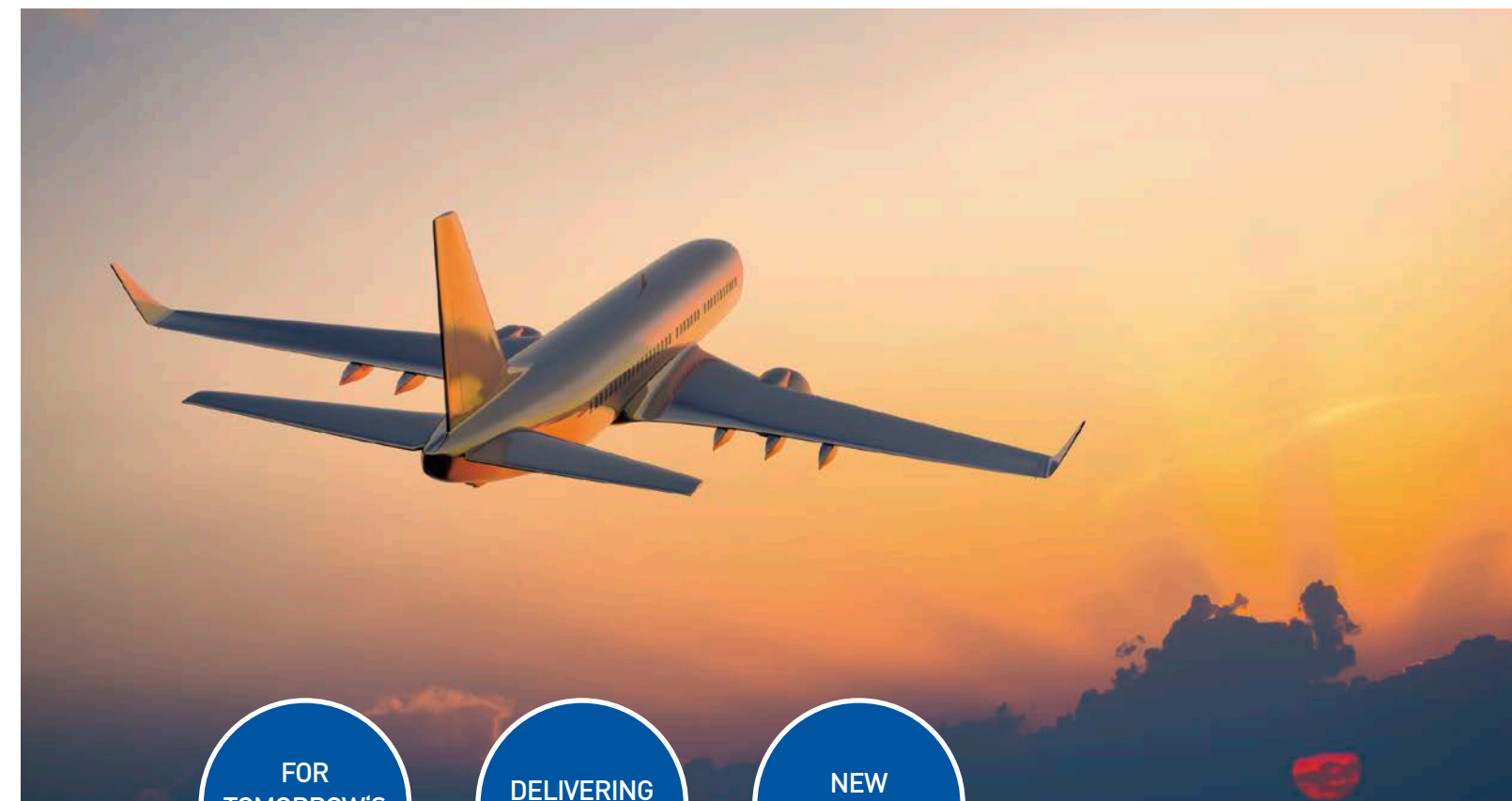


ATM MASTER PLAN

Frequentis stands for quality, innovation and a total commitment to ATM. The Single European Sky (SES) initiative is set to bring unprecedented change to the organisation of Air Traffic Management. New technologies that both follow and integrate with the state-of-the-art architecture of the overall system will enable the operational improvements required to meet the 2020 targets. Frequentis supports the service-oriented system of systems approach described in the European ATM Master Plan and therefore favours an open SES ATM interface framework. A Military Expert Group is contributing to the SESAR Concept of Operations (CONOPS), with a focus on harmonising civil and military rules and procedures. These CONOPS are broken down to individual projects. Through its contribution to various of those projects, Frequentis also ensures that military needs and requirements are reflected in all products and solutions.

THE FREQUENTIS CONTRIBUTION TO THE SINGLE EUROPEAN SKY

As a member of the SESAR Joint Undertaking, Frequentis will be one of the first organisations able to provide early SESAR deliverables that also benefit our customers. The future is a key focus at Frequentis. This means that today's Frequentis solutions are already designed to support SESAR upgrades at any point in the future. Our product development approach reflects the ATM Master Plan, so the end results are all implicitly SES 'certified'. Proactive involvement in SESAR also means Frequentis has the knowledge and expertise required to develop the new technologies needed to build the 'Future ATM System' and meet the 2020 targets.



FOR
TOMORROW'S
ATM

DELIVERING
RESULTS

NEW
CONOPS

FREQUENTIS AG HEADQUARTERS

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FREQUENTIS & SESAR

The SESAR (Single European Sky ATM Research Programme) Joint Undertaking is a unique public-private partnership in air traffic management research and development. The partnership's mission is to modernise Europe's air traffic management system. Frequentis, the global market leader for voice communication systems in air traffic control, is among sixteen organisations that are members of this EUR 2.1 billion programme, which is the first of its kind in aviation history.



INTEGRATED TOWER & AIRPORT SYSTEMS

Tower operators sit at the centre of a growing challenge. They manage an expanding logistical landscape that threatens to become a logistical nightmare. The result is inefficient work areas cluttered with multiple screens and devices. The variety and complexity of the information flows, tasks and input systems grow and so does the scope for human error, which is already the number one cause of air safety incidents. The integrated tower and airport projects within SESAR are described in the ATM Master Plan and share a common principle: open interfaces. The implementation of this principle within a fully-integrated ATC tower will help harmonise the interaction of controllers with various tools, and allow many different suppliers to hook up their components to the core system. The result will be a feature-rich and flexible set of applications. Improved system usability and a more efficient work environment will then reduce the potential for human and system errors, while high data integrity combined with intelligent algorithms will give all users access to new functions that support clear situational awareness. Operators will be able to make quick and accurate decisions using the reliable, clear and comprehensive information they can access via a harmonised user interface. They will benefit from improved workflows, more efficient operations, uncluttered workspaces and shorter learning curves for new equipment: all made possible through the constant focus on usability that stems from the Frequentis contributions. In addition, Frequentis will focus on remote tower applications and enhanced safety-net functions.

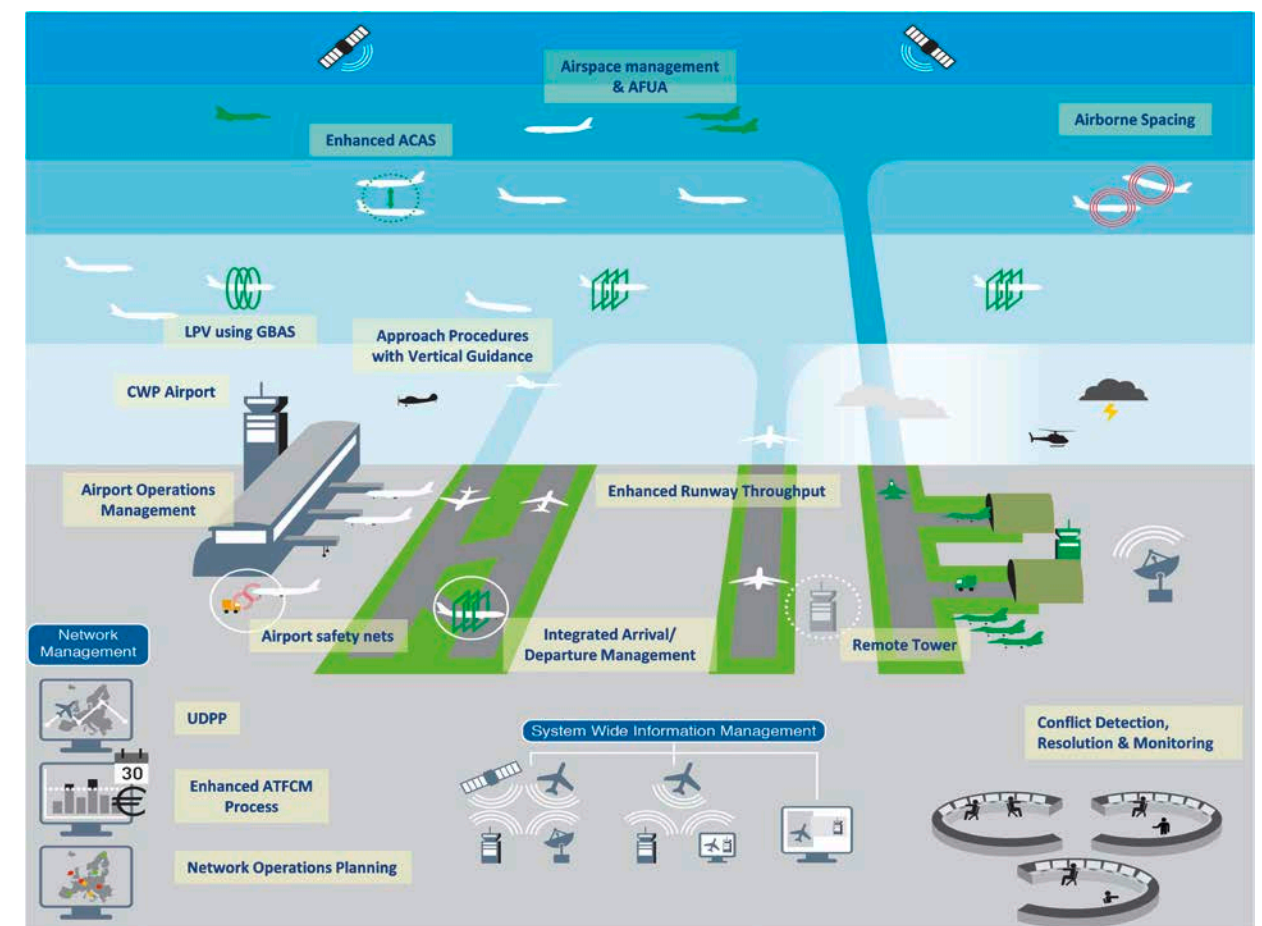
COMMUNICATIONS

Both ground-based and air-ground communications face major changes. Communications issues on the ground basically focus around the convergence of all services (including voice) through a common transport platform based on IP technology. The digital radio link is, however, fundamental to all SESAR operational concepts and also requires close attention. Frequentis already provides solutions that reflect these trends and developments. Network-centric voice services, structured according to SOA principles, will allow any workstation in the network to manage operations. This is the focus of the company's contribution to SESAR's communication projects. Frequentis understands the importance of voice communication in a changing environment and is preparing for the future. Flexibility will be a key characteristic in a world where tactical voice communication will be both a safety net and a high-priority intervention tool. Frequentis is contributing to these areas through the vast know-how and expertise we have gained over many years.

INTEGRATED CONTROLLER WORKING POSITION (iCWP)

"The ATM Target Concept remains "human-centric", i.e. that humans...will constitute the core of the future European ATM System. However, to accommodate the expected traffic increase and complexity, an advanced level of automation support for the humans will be required..." (abstract from the SESAR Master Plan).

This statement emphasises the importance of improving the human-machine symbiosis and is one of the basic requirements of SESAR. With its expertise in human factors and usability, Frequentis is leading the design of future integrated controller working positions and has taken on a coordination role for all iCWP-related issues within SESAR. The purpose of the iCWP projects is to produce a "Human Factors and User Interface Design" document. This will also involve the specification and production of several prototypes for an integrated controller working position for en-route and approach environments...one that follows a generic SESAR "style". Frequentis has been part of the SESAR programme from the very beginning. This has allowed the company to maintain and input an understanding of operational needs that will drive development all the way through to the end validation of relevant prototypes. The revision and standardisation of the iCWPs will help achieve one of SESAR's major goals: the modernisation of the pan-European air traffic management system with support for full interoperability.



→ INFORMATION MANAGEMENT

Frequentis has a long track record in the development of large scale AIM Systems and we are strongly committed to the evolution to Information Management (IM). Frequentis supports the airspace users and ANSP to gather all needs for information harmonisation and to provide all the information at appropriate time, format and quality. The interface between System Wide Information Management (SWIM) and

those services collaborating on SWIM is critical for successful information management. This is clearly one of the topics attracting the highest priority. In order to manage airspace, it is essential to manage the information that represents this airspace (and all its users) so comprehensively. Information modelling and the shaping of SWIM are important pillars of the Frequentis contribution to SESAR.

→ OVERALL ARCHITECTURE

Frequentis supports the service-oriented system of systems approach described in the European ATM Master Plan and therefore favours an open Single European Sky (SES) ATM interface framework. Open interfaces play a central role for Frequentis. They unleash the power of flexibility without compromising quality, stability or safety. Open interfaces allow best-in-breed experts to contribute on a small-

scale services basis while the overall system still operates through the same architecture: there is no need to change everything. Open interfaces thus reduce costs. Frequentis sees the SESAR overall architecture as a stable set of open service which may undergo continuous change in different implementations. A subset of these interfaces is important to Frequentis and thus addressed with vigour within the company.

→ SAFETY & SECURITY

The European ATM Master Plan proposes to increase the level of safety and security in relation to traffic growth. The majority of the operational improvements in the ATM target concept contribute positively to safety & security. Frequentis believes safety & security management is not just the business of a handful of specialists, nor is it only about specific modules which can be built into

products. Instead, an awareness of safety and also security management needs must be built into the psyche of every employee and the very fabric of the product development process. Safety & Security management is part of the Frequentis culture and an ever-present goal in all our activities. Frequentis helps to ensure SESAR delivers safety & security results at highest levels.