Based on experience gained in a real life environment, DSNA is a key-player in all international major UTM initiatives. DSNA is committed to building U-space, together with best class solutions for U-space services through a collaborative approach.
The increasing importance of drones in everyday life in Europe is a key challenge for any Air Navigation Service Provider (ANSP). These new unmanned flight operations have very varying flight performances and sectors of activity. There are two categories of drones:
- Remotely Piloted Aircraft System (RPAS), that will eventually fly in IFR up into the upper airspace
- Other drones (UAS, eVTOL), that fly mostly in the lower airspaces

In 2018, DSNA, the French Air Navigation Service Provider, handled 3.2 million IFR flights and almost 3 million VFR flights operated in French airspace. DSNA already supports thousands of drone flights operating yearly in one of the busiest airspaces in Europe. DSNA is committed to U-space implementation to support the traffic growth in the coming years.

**OUR VISION**

To create a safe, fair and efficient U-space for both manned and unmanned operations by a customer-centric approach. Services exchanges are supported by networks (Internet, PENS….) and SWIM Services.

**OUR OBJECTIVES**

To enable efficient drone operations in a safe sky:
- Safety shall be strengthened in order to support the development of drone operations
- Restricted airspace such as urban airspace shall be opened up to drone operations according to UAS airworthiness, risk assessment and social acceptance
DSNA fully supports the drone industry by creating the best conditions to enable companies to innovate. DSNA brings its know-how including safety management as a core driver and collaborates with the Civil Drone Council, a strong industrial body.

However, the uneven maturity of drone-based services, the number of UTM players, the number of business models and the diversity of economic and operational contexts in France call for an iterative and open approach. To support the development of U-space, DSNA is carrying out live tests in Paris-CDG and Toulouse airports, among others, by means of several UTM solutions.

Moreover, in 2018, DSNA launched a call for U-space partnerships to foster and structure U-space solutions that will:
- enhance management of drones within controlled airspace
- integrate RPAS operations into General Air Traffic
- meet the needs of safety, security and the economy in all kind of airspace in France

The first step of this programme is a request for information to better understand the present and future economic fabric, the operational and technical UAS environment for the coming decade. DSNA will then establish one or more long-term structured partnerships for the integration, testing and provision of U-space services in France.

AT THE EUROPEAN LEVEL

DSNA is a very active player in the exploratory research projects of the SESAR program on U-space and UTM-related demonstrations. For instance, it participates in CORUS and USIS projects.

CORUS
(Concept of Operations for euRopean Unmanned Systems)

This project has received funding from the SESAR Joint Undertaking under the European Union’s Horizon 2020 research and innovation programme under grant agreement 763551.

The CORUS project led by EUROCONTROL aims at designing an UTM system to manage drones in European very low level (VLL) airspace. It shall enable a safe interaction with other airspace users, being viable technologically and economically, fostering their economic development and enlarging drone operations, in a way acceptable to society.

This project involves 9 partners.

USIS
(U-space Initial Services)

This project has received funding from the SESAR Joint Undertaking under the European Union’s Horizon 2020 research and innovation programme under grant agreement 783261.

The USIS project led by Thales explores UTM services with automated assistance to airspace users for operating their flights. It targets especially regulations and coordination with air traffic control units.

The main objective is to demonstrate that U1 and U2 services are capable to support all B-VLOS operations.

This project involves 7 partners.
SOFIGA DRONE  
Provision of Aeronautical Information Services (SOFIGA)  

DSNA has launched the Aeronautical Information Management (AIM) program to support the transformation of the supply of aeronautical information into digital form. The AIM program coordinates the various stakeholders to offer innovative services such as SOFIGA-drone based on the SWIM concept developed in the SESAR program.

SOFIGA-drone provides to drone operators, no-fly and restricted zones through web-services for visualization and for requesting data. In 2019, DSNA will focus on improving the quality of the digital data provided for the populated areas.

COUNTER UAV  
Detection and management of non-cooperative UAV intrusions

Airports are locations for which safety and security are of utmost importance. DSNA is therefore actively addressing the risk of non-cooperative UAV intrusions entering the airport area and which may create major issues.

DSNA is collaborating with all other actors involved in the process to put in place measures adapted for the protection of airports and similar complex environments, involving national regulator, airport operators, national security, law enforcement, armed forces. This level of protection requires also a very high performing and sensitive system.

DSNA with Groupe ADP and Thales have developed the HOLOGARDE solution: it integrates into a Command and Control System, holographic radars, direction finders, piloted cameras. The system provides high-level features for detection of drones intrusions, classification and decision-making. HOLOGARDE is in production and is being deployed at Paris-CDG airport after a successful experimental installation at the International Paris Air Show in June 2017, which saw the detection, tracking and identification of 131 test drones at a distance of 5 km during the week-long event.

In 2017, the first live trials led by DSNA and the French Air Force were conducted with a RPAS. Its performances were equivalent to those of light aircraft operating in civil aircraft operating into civil air traffic.
DSNA and the French Air Force are very much involved in the integration of medium altitude long endurance drones (MALE) in civil air traffic other than in segregated airspace. This new generation of unmanned aircraft system will become, in the short term, a real operational challenge for overall performance of air traffic management.

Both authorities led live trials with the new military REAPER drone in the upper airspace of Bordeaux ACC in July 2018. The picture above shows a crossroad with the flight KLM at FL 190. This drone has performances equivalent to those of regional aircraft.

The results obtained will be shared with the EASA, the European Agency for Safety Aviation, in charge of establishing the future regulations in this matter.

PODIUM
Proving Operation of Drones with Initial UTM Management (PODIUM)

This SESAR project includes four complementary Very Large-Scale Demonstrations in France (2 sites), Denmark, and the Netherlands in 2019.

Over 185 drone flights are planned with the objective to demonstrate UTM solutions in a broad range of realistic operational conditions. Drone operations will be VLOS and B-VLOS in Very Low Level (VLL) airspace interacting with manned traffic.

Operations will be tested:
- in controlled & uncontrolled airspace
- in urban and rural areas
- in the vicinity of airports
- in mixed environments with manned aviation.

SESAR 2020 Project
This project has received funding from the SESAR Joint Undertaking under the European Union’s Horizon 2020 research and innovation programme under grant agreement 783230.
A MID-TERM VISION OF THE USE OF AIRSPACE WITH INTEGRATED ATM AND U-SPACE SERVICES

Air traffic control is provided by ANSPs within controlled airspace. UTM services are provided by **U-Space Service Providers (USP)** in their U-subspaces. Regulatory and supervisory authorities delegate management of airspace to USPs with pre-defined common rules and ensure their certification. The required data is provided by SWIM services. By 2025, U-space will evolve through a digital, automated and interconnected infrastructure.

The U-Space vision was introduced by the European Commission. It covers the ecosystem of services and specific procedures necessary for reliable, safe and efficient drone operations. A U-space service provision regulation shall be required.

**U1 Basic services** (e-registration, e-identification)
**U2 Initial services** (flight planning, authorization and tracking)
**U3 Advanced services** (dynamic airspace management)
**U4 Full services** (digital, automatized and interconnected operations)
Emergency and rescue operations benefit greatly from drone technology. By flying with complex cameras over solar power plants, building sites, wind farms, lands and fields, engineers and farmers can monitor and optimize maintenance and production processes and thus reduce waste.

Drones, which require little infrastructure and consume little or no fuel, are also more and more used to combat environmental offenders, and thus to protect the environment. DSNA supports and promotes drone initiatives that contribute significantly to sustainable development.

At the same time, large scale drone operations may impact safety, security, privacy and generate noise. In that respect, urban-air-mobility will be an important challenge. DSNA is specifically vigilant concerning drone impact on the Environment and aims at sustainable balance in terms of social acceptance of drone applications.
ACRONYMS

**ATM**
Air Traffic Management

**AIS**
Aeronautical Information Services

**B-VLOS**
Beyond VLOS

**eVTOL**
electric Vertical Take-off and Landing

**RPAS**
Remotely Piloted Aircraft System

**SESAR**
Single European Sky ATM Research

**SWIM**
System-Wide Information Management

**UAV**
Unmanned Aerial Vehicle

**UAS**
Unmanned Aircraft System

**USP**
U-space Service Provider

**U-subspace**
UAS subspace

**U-space**
UAS space

**UTM**
UAS Traffic Management

**VLL**
Very Low Level

**VLOS**
Visual Line Of Sight