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PJ.14 W2 I-CNSS

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Integrated Communication Navigation and Surveillance System

Delivering an integrated communication navigation and surveillance system for Europe

The European aviation infrastructure has traditionally relied on separate communications, navigation and surveillance (CNS) solutions so that one domain could back up another at an operational level. This legacy structure, however, fails to take advantage of cross-domain synergies between technologies, or the significant benefits arising from global navigation satellite systems (GNSS). To modernise this infrastructure, the SESAR Joint Undertaking is developing an integrated CNS concept to provide operational and efficiency improvements to airspace users and air navigation service providers, taking advantage of satellite-based systems and digital technology.

This is where the project PJ14-W2 I-CNSS comes in - the project aims to develop an integrated suite of CNS solutions to meet the operational requirements of air traffic management in the short, medium and long term. Added to that is the goal to ensure that these solutions are interoperable globally, as outlined in the ICAO Global Air Navigation Plan (GANP).

Performance requirements for CNS systems are becoming increasingly complex and demanding and need to be considered as part of an integrated common infrastructure, which includes air and ground systems and a unified concept of operations. The successful implementation of the new technologies developed in the project will also provide sure improvement in the secure and safe data communications; in particular, improvements in navigationwill enhance environmental sustainability.

The project will pave the way to European harmonisation, cooperation between ANSPs, industry and international organisations, as well as interoperability between the civil and military aviation.

Coordinated by Leonardo, the project brings together 17 beneficiaries from different European countries. It is one of several projects of the SESAR Joint Undertaking (Europe's programme to modernise air traffic management) and is funded within the framework of the European Union's Horizon 2020 research and innovation programme under grant agreement No 874478.

PJ14-W2 I-CNSS will ensure the availability of the required Communication Navigation and Surveillance (CNS) by developing a suite of solutions in the three areas.

Communications bringing together safety critical Terrestrial, Satellite and Aerodrome technologies

- A network infrastructure common for all previous data links and based on "multilink" using modern network technologies integrating digital technologies for
- A new ground-based line-of-sight data link called LDACS
- The evolution of satellite-based COM system SATCOM ATN/OSI into ATN/IPS
- Hyper connected ATM
- SWIM TI Purple Profile for Air/Ground Safety Critical Information Sharing
- SWIM TI Green Profile for Ground/Ground Civil-Military Information Sharing

Navigation fully incorporating GNSS technologies and Alternatives for robust efficient new systems

- New GNSS landing systems for low visibility using GBAS approach service type F (GAST-F) and Service Type D (GAST D) in complex airports and extended latitudes
- Innovative solutions for Alternative Positioning, Navigation and Timing system including LDACS (NAV), Multi-DME, Enhanced DME, Terrain Vision
- Using the Aircraft as an AIM/MET sensor and consumer

Surveillance extending the monitoring to cover both Space Based and Ground Based systems

The solution will investigate new use and evolution of Cooperative and Non-Cooperative Surveillance

- Multi-sensor data fusion;
- Future ADS-B Communication Link
- Multi-Tower Remote Surveillance
- Secured surveillance systems (single and composite)
- Performance Monitoring
- End to end Surveillance monitoring (including sensors)

PJ14 aims to develop innovative technological solutions for the future ATM

- Surface Data Sharing to support huge data exchange for effective and efficient airport operations and awareness
- New Common Integrated Communications infrastructure to reduce the ATCo workload avoiding misunderstandings and improving the efficiency
- Collaborative Air Traffic Management to support the ATCos, pilots, airport operators to improve situation awareness with smoother data integration and increase of data accuracy
- Optimization of Capacity, Flexible Use of Airspace and Turn-around operations to avoid congestion in ATM domain
- Provision of a common integrated communication infrastructure to improve performance (faster, safer and more dynamic), allowing any airport to select dynamically the comms technology among those available
- Provision of safer services for navigation accessing alternative systems in case of non-availability or loss of accuracy for nominal services (e.g GPS)
- Interoperability between the civil and military aviation

Key Figures

Project acronym: PJ14-W2 I-CNSS
Project full title: Integrated Communication Navigation and Surveillance System
Type of project: Industrial Research
Duration: 37 months
Start: 1.12.2019
Beneficiaries: 17 partners
Coordinator: Leonardo S.p.A
Volume: EUR 38 846 094,78 €

Partners:

AIRTEL ATN
FREQUENTIS
AT-One
Honeywell
COOPANS
indra
DFS Deutsche Flugsicherung
LEONARDO
dgac DSNA
LPS SR
DLR
NATMIG
ENAIRE
NATS
enav
SINTEF
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*This project has received funding from the **SESAR Joint Undertaking** under the **European Union's Horizon 2020** research and innovation programme under grant agreement no **874478***

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