

Deployment Scenario Title	CNS rationalisation
Deployment Scenario Description	<p>The CNS services evolution deployment scenario includes the following:</p> <p>Integrated CNS and spectrum addresses CNS cross-domain consistency in terms of robustness, spectrum use and interoperability, including civil-military aspects, through the provision of a global view of future CNS services, as well as the definition of the future integrated CNS architecture and the CNS spectrum strategy.</p> <p>FCI services address the provision of digital communication services (IP-based data and digital voice). It supports future ATS and airline operations centre (AOC) services with demanding high air-ground and air-air communication capacity and high performance. It will allow the real-time sharing of 4D trajectories and timely access to ATM data and information services and will enable network-centric SWIM architectures. It manages, in a secure way, different subnetworks. It also integrates the services provided by open networks needed for hyper-connected ATM.</p> <p>The FCI terrestrial datalink and A-PNT enabler, L-DACS (L-Band Digital Aeronautical Communication System), constitutes the future terrestrial air-ground and air-air datalink solution to support increasing ATM performance requirements. The development and standardisation of L-DACS technology will continue. The system will address both avionics and ground implementation.</p> <p>Future satellite communications datalink class A performance will enable more ATM concepts and services to emerge. It aims to provide global interoperability based on an international communications standard that ensures that aircraft equipped with a standard terminal will be able to communicate anywhere using compatible satellite systems. In addition, it is expected to ensure lower costs for aircraft equipment and communication services.</p> <p>Dual-frequency multi-constellation (DFMC) GNSS/SBAS and GBAS address the move towards resilient and performance-based navigation in all phases of flight, taking advantage of a dual GNSS constellation (GPS and Galileo). In particular, for the approach phase, this will include the development of GBAS approach service type F (GAST-F), based on multi-constellation multi-frequency GNSS. Finalisation of the development of GAST-F CAT II/III (these are ICAO categories of precision approach and landing) and DFMC SBAS is expected to maximise the benefits of satellite-based technology for achieving approach in low-visibility conditions down to CAT II/III minima for GBAS and lateral precision with vertical guidance down to 200 ft for SBAS (LPV 200).</p> <p>In the long term, the aim is to develop A-PNT systems capable of providing better performance in comparison with the short-term solution (based on DME-DME) and supporting PBN / required navigation performance (RNP) operations using alternative technologies in the event of a GNSS degradation or outage.</p>
Essential Operational Change	CNS Infrastructure and Services
Maturity	In deployment phase: Key SESAR Solution

Applicable Operating Environment			
Airport	Terminal Airspace	En-Route	Network

Timeline																					
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Deployment												Benefit									

Performance Contribution of the DS				
Capacity	Safety	Environment	Cost-efficiency	Operational efficiency

Stakeholders affected (at least one enabler to be deployed)						
ANSP		AO		AU		Network Manager
Civil	Military	Civil	Military	Civil	Military	
ENR, CNS, AIS	ENR, CNS, AIS, AMC			Scheduled, BA Fixed, BA Rotorcraft, GA	Transport, Fighter, Light	Network Manager

SESAR Solutions			
Solution Code	Solution Title	Solution Description	Related Elements
#55	Precision approaches using GBAS CATII/III	This SESAR Solution aims at improving Low Visibility Operation using GBAS Cat II/III based on...	OI DS EOC ICAO
#103	LPV approaches using SBAS as alternative to ILS CAT I	Approach Procedures with Vertical guidance, using Satellite- Based Augmentations System, pave the...	OI DS EOC ICAO
#109	Air Traffic Services datalink using SatCom Class B	SATCOM Class B offers a viable option for air traffic services (ATS) datalink using existing...	OI DS EOC
#110	ADS-B surveillance of aircraft in flight and on the surface	Automatic dependent surveillance-broadcast (ADS-B) is a technique which allows the tracking of...	DS EOC

Operational Improvement Steps			
OI Step Code	OI Step Title	OI Step Description	Related Elements
AO-0505-A	Improve Low Visibility Operation using GBAS Cat II/III based on GPS L1	Use GBAS Cat II/III based on GPS L1 for precision approaches	SOL OI EN DS ICAO A-A
AOM-0602	Enhanced terminal operations with APV using Barometric VNAV	The widespread availability of GNSS based RNAV and Baro/VNAV systems has made the implementation...	SOL OI EN DS ICAO
AOM-0604	Enhanced terminal operations with LPV using SBAS	SBAS supports RNP Approaches to LPV minima which can be as low as 200ft, equivalent to ILS Cat I...	SOL OI EN DS ICAO
POI-0018-COM	SatCOM Class B for ATM	The use of Class B Satellite Communication systems for Air/Ground datalink will support ATC and...	SOL EN DS

Enablers						
Required/Optional	New/Inherited	Develop/Use	Enabler Code	Enabler Title	Enabler Description	Related Elements
🔒			A/C-01	Enhanced positioning for LPV/RNP based on Single Frequency SBAS	Enhanced positioning for Localizer Precision with Vertical Guidance Approach based on Single...	STK OI EN DS
🔒			A/C-02a	Enhanced positioning using GBAS single frequency	Enhanced positioning using GBAS single frequency (GPS L1)	STK OI EN DS
🔒			A/C-04	Flight management and guidance for improved lateral navigation in approach via RNP	Flight management and guidance to improve lateral navigation in approach e.g. 2D RNP value down...	STK OI EN DS

Enablers						
Required/Optional	New/Inherited	Develop/Use	Enabler Code	Enabler Title	Enabler Description	Related Elements
🔒			A/C-05a	APV Barometric VNAV	Flight management and guidance to perform Approach Procedure with Vertical guidance (APV) using...	STK OI DS
🔒			A/C-06	Flight management and guidance for LPV approach based on SBAS	Flight management and guidance for Localizer Precision with Vertical guidance approach (LPV)...	STK OI EN DS
🔒			PRO-AC-06	Cockpit Procedures for LPV approach based on SBAS	Cockpit procedure to perform SBAS Localizer Precision with Vertical guidance approach	STK OI EN DS
🔒			A/C-33a	Class B SATCOM	Description: Satellite A-G datalink in multilink or in a standalone environment, based on...	STK OI DS PCP
🔒			A/C-56a	Flight management and guidance for Precision Approach GBAS CATII/III using GPS L1	Flight management and guidance for Initial Precision Approach GBAS CATII/III using e.g. GPS L1 or...	STK OI EN DS
🔒			CTE-C02f	Future Satcom for ATM: SATCOM Class B in Multilink	A new satellite A/G datalink to provide service redundancy to the existing terrestrial datalink...	STK OI EN DS ⚙️
🔒			CTE-N01	GPS L1/L5	Modernised GPS constellation broadcasts the civilian use signals in two different frequency bands...	STK OI DS PCP ⚙️
➔			CTE-N06	Space Based Augmentation System (SBAS)	Space Based Augmentation Systems (SBAS, i.e. EGNOS, WAAS) are civil aviation safety-critical...	STK OI EN DS ⚙️
➔			CTE-N06a	EGNOS V2.4.X	EGNOS (SBAS) evolutions until 2020 will gradually improve its coverage to East and North ECAC,...	OI EN DS ⚙️
🔒			CTE-N07	Ground Based Augmentation System (GBAS)	Ground Based Augmentation System (GBAS) is a civil-aviation safety-critical system that supports...	STK OI EN DS ⚙️
🔒			CTE-N07b	GBAS Cat II/III based on Single-Constellation / Single-Frequency GNSS (GPS L1)	Single-Constellation / Single-Frequency (GPS L1) GBAS Cat II/III is deployed as a precursor to...	STK OI EN DS ⚙️
🔒			MIL-STD-01	Trajectory management and improved navigation	Detailed supplementary specifications under ICAO PBN framework to support specific performance...	STK OI DS PCP
🔒			MIL-STD-02	Vertical navigation for fighter aircraft	Means of compliance for military fighter aircraft systems for compliance with vertical navigation...	STK OI DS PCP
🔒			PRO-AC-06	Cockpit Procedures for LPV approach based on SBAS	Cockpit procedure to perform SBAS Localizer Precision with Vertical guidance approach	STK OI EN DS
➔			CTE-N02	GALILEO E1/E5	GALILEO Open Service broadcasted in Dual-Frequency (E1/ E5) will be used in ...	OI EN DS ⚙️

Enablers						
Required/ Optional	New/ Inherited	Develop/ Use	Enabler Code	Enabler Title	Enabler Description	Related Elements
→			CTE-N03	GLONASS-K	Modernised GLONASS constellation (GLONASS-K) provides additional satellite navigation signals...	OI EN ⚙️
→			CTE-N04	BEIDOU B1/B5	Dual-frequency (B/B5) BEIDOU constellation (B1 + B5). provides additional satellite navigation...	OI EN ⚙️
→			CTE-N06b	EGNOS V3	Multi-Constellation / Multi-Frequency (MC/MF) EGNOS (SBAS). Will support GPS & GALILEO L1...	OI EN DS ⚙️