OBJ NAV11 — Implement precision approach procedures using GBAS CAT II/III based on GPS L1

In current ILS Cat II/III operations there is a need to protect the ILS critical and sensitive areas which result in restricted ground movements and extra spacing margins between aircraft in order to accommodate the longer runway occupancy times (ROT) through the need to protect the larger ILS sensitive area. At capacity constrained airports this may lead to flights being diverted or even cancelled. In addition, this is typically also associated with longer flight times, i.e. more fuel being used.

This objective proposes the use of GBAS which has limited (GBAS Local Object Consideration Areas) or no protection areas, usually located outside aircraft movement areas. This allows the reduction of runway occupancy times in low visibility conditions resulting in reduced spacing between arrival aircraft. The amount of runway throughput gained depends on wake turbulence separation and any other additional spacing needs. With a proper siting of the GBAS ground equipment (compliant with the GBAS Local Object Consideration Areas), there's no need for critical/sensitive areas. Use of GBAS CAT II/III enables:
a) flexible approaches; synergistic with RNAV/RNP, PA where ILS cannot due to geography, signal stability (immune to signal bends inherent in ILS);
b) complement ILS at airports with multiple RWYs during LVP;
c) the rationalization of some ILS thus reducing operation and maintenance costs and optimizing spectrum;
d) PA at aerodromes without SBAS coverage or where PA performances cannot be achieved with SBAS.

Benefits of using GBAS CATII/II in Low Visibility Conditions include improved resilience of airport capacity with fewer flight cancellations due to LVP in force. GBAS CATII/III will enable runway ends which are not ILS CATII/III equipped to be used for CATII/III operations as long as the runway is CATII/III qualified. This will have positive effects on gaseous emissions, i.e. less CO2.

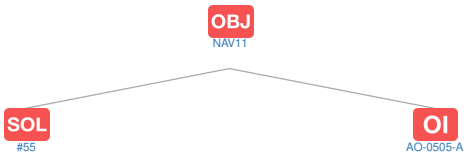
Note: The benefits mentioned are obviously only gained if a sufficient number of aircraft are equipped; therefore, an action should be included to promote airborne equipage, monitor aircraft equipage rate and assess incentives.

NOTE FOR MILITARY AUTHORITIES: It is the responsibility of each Military Authority to review this Objective IN ITS ENTIRETY and address each of the SLoAs that the Military Authority considers RELEVANT for itself. This has to be done on top and above of the review of "MIL" SLoAs which identify actions EXCLUSIVE to MIL Authorities.

Edition	2022
Stakeholders	Regulator / Air Navigation Service Provider / Airspace Users / International Organisations and Regional Bodies / Aeronautics Industry
Type	SESAR
Scope	Local
Status	Removed

Context

Related Elements



Applicability Area(s) and Timescales

Applicability Area: *(Subject to local need.)*

Timescales	From	By	Applicable to
Subject to local need.	31-05-2019	-	

Links to ATM Master Plan Level 2

OI Operational Improvment Steps

Code	Title	IOC	FOC	Related Elements
AO-0505-A	Improve Low Visibility Operation using GBAS Cat II/III based on GPS L1	31-12-2025	31-12-2035	SOL OI EN OBJ DS ICAO

SOL Links to SESAR Solutions

Code	Title	Program	Related Elements
#55	Precision approaches using GBAS CATII/III	SESAR1	OI OBJ DS EOC ICAO

PCP Links to PCP ATM Sub-Functionalities

Code	Title	Related Elements
No record found		

ICAO ICAO Block Modules: No associated data

References

Applicable legislation
None
Applicable ICAO Annexes and other references
None
Deployment Programme 2022
-
Operating Environments
Airport
Terminal Airspace

Expected Performance Benefits

Safety	Safety of approach, landing and guided-take-off operations based on GBAS CAT III L1 (GAST-D) are as safe as operations based on ILS CAT III assuming the identified safety requirements are met. GBAS improves safety in the segment of avoiding a scenario of false LOC or Glide beam capture.
Capacity	GBAS has limited (GBAS Local Object Consideration Areas) or no protection areas, usually located outside aircraft movement areas. This allows the reduction of runway occupancy times in low visibility conditions resulting in reduced spacing between arrival aircraft. The amount of runway throughput gained depends on wake turbulence separation and any other additional spacing needs.
Operational efficiency	Fewer flights will be cancelled or diverted saving the Airspace User (Main and Regional airliners) associated costs. To be noted that cancellations also affect the subsequent legs planned with those aircraft. Business Aviation see minimal benefits as they fly infrequently to capacity constrained airports during LVP. Avoiding the loss of runway capacity will reduce the level of delay and avoid the associated costs. A key issue is the impact of the primary delays on the subsequent legs to be performed by those aircraft which try to absorb the delay where possible. Higher glide slopes than those possible with ILS, 3.2° even in CAT II/III weather conditions.
Cost efficiency	One GBAS station can provide approaches for multiple runway end as well as multiple approaches per runway end. The GBAS station in the long term is much more cost efficient than the ILS in terms of less maintenance and flight inspection required.
Environment	The environmental benefits come from the saving of jet fuel due to the resilience of the system in keeping its capacity even in Low Visibility Operations. Fuel savings results in direct reductions in CO2 emissions. There is also a direct benefit in term of local air quality by having less aircraft queuing on the runway for departure conditions. Noise abatement.
Security	Not identified.

Stakeholder Lines of Action

Code	Title	From	By	Related Enablers
REG01	Apply EASA material to local national regulatory activities			
ASP01	Install GBAS CAT II/III ground equipment			EN
ASP02	Design and Publish GBAS CAT II/III precision approach procedures			
USE01	Equip aircraft with systems approved for GBAS CAT II/III			EN
USE02	Get airworthiness certification and operational approval			EN
INT01	Develop material for certification of GBAS ground facilities			
IND01	Get certification for GBAS CAT II/III ground equipment			EN

Supporting Material

Title
ICAO - Annex 10 - Aeronautical Telecommunications http://store1.icao.int/
ICAO - Doc 8168-Volume II - Aircraft Operations - Volume II - Construction of Visual and Instrument Flight Procedures - Edition 5 / 11/2011 https://store.icao.int/
ICAO - EUR-Doc 013 - Guidance Material on All Weather Operations at Aerodromes https://www.icao.int/EURNAT/Pages/EUR-and-NAT-Document.aspx? RootFolder=%2FEURNAT%2FEUR%20and%20NAT%20Documents%2FEUR%20Documents%2F013%20%2D%20EUR%20Guidance%20Material%20on%20AWO%20at%20Aerodromes&FolderCTID=0x012000DAF95319EADD9946B510C5D7B595637D00A
SJU - SESAR Solution 55: Data Pack for Precision approaches using GBAS CAT II/III based on GPS L1 https://www.sesarju.eu/sesar-solutions/precision-approaches-using-gbas-cat-iiii

Consultation & Approval

Working Arrangement in charge	Unassigned
Outline description approved in	-
Latest objective review at expert level	12/2018
Commitment Decision Body	Provisional Council (PC)
Objective approved/endorsed in	05/2019
Latest change to objective approved/endorsed in	05/2019