NAV11.1 — Implement precision approach procedures using GBAS CAT II based on GAST C

In current ILS Cat II 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 GAST C for CAT II 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 in Low Visibility Conditions include improved resilience of airport capacity with fewer flight cancellations due to LVP in force. GBAS GAST C for CAT II will enable runway ends which are not ILS CATII equipped to be used for CATII operations as long as the runway is CATII qualified. This will have positive effects on gaseous emissions, i.e. less CO_2.

NOTE: The benefits mentioned are only gained if a sufficient number of aircraft are qualified; therefore, an action should be included to verify upgradeability of existing aircraft equipage, promote further airborne equipage, monitor aircraft equipage rate and qualification 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
Type	SESAR
Scope	Local
Status	Active

Context

Related Elements

OBJ
NAV11.1

Applicability Area(s) and Timescales

Applicability Area: *(Subject lo local need)*

Timescales	From	By	Applicable to
IOC used for Analytics functioning only - not for implementation planning	01-07-2022	-	
FOC used for Analytics functioning only - not for implementation planning	-	31-12-2030	

Links to ATM Master Plan Level 2

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SOL Links to SESAR Solutions

Code	Title	Program	Related Elements
No record found			

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
-

Expected Performance Benefits

Safety	Safety of approach, landing and guided-take-off operations based on GBAS GAST C CAT II are as safe as operations based on ILS CAT II 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 weather conditions. Many fielded avionics and ground systems are upgradeable with limited effort
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 CO_2 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	-

Stakeholder Lines of Action

Code	Title	From	By	Related Enablers
REG01	Apply EASA and ICAO material to local national regulatory activities			
ASP01	Install GBAS GAST C CAT II ground equipment			
ASP02	Design and Publish GBAS CAT II precision approach procedures			
ASP03	Ensure the conformity assessment of GBAS GAST C CAT II ground equipment			
USE01	Equip aircraft with systems approved for GBAS GAST C CAT II			
USE02	Get airworthiness certification and operational approval			

Supporting Material

Title
EASA - CRI F-27 issue 2 for CAT II operations -
EUROCAE - ED-114B - MOPS For Global Navigation Satellite Ground Based Augmentation System Ground Equipment to support Precision Approach and Landing 09/2019 https://eshop.eurocae.net/eurocae-documents-and-reports/ed-114b/
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
ICAO - NSP JWG7 WP19 - Concept for GBAS Cat II Operations using ICAO GAST-C 04/2021 -

Consultation & Approval

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