EASA	CERTIFICATION MEMORANDUM
	**EASA CM No.: EASA CM - AS – 002** **Issue: 01 Revision: 01** **Issue Date: 25th of October 2012** **Issued by: Avionics Systems section** **Approved by: Head of Certification Experts Department** **Regulatory Requirement(s):** **CS 25.1301, 25.1302, 25.1307, 25.1309, 25.1316, 25.1321, 25.1322, 25.1325, 25.1329, 25.1431, 25.1581.** **CS 23.1301, 23.1309, 23.1311, 23.1321, 23.1322, 23.1325, 23.1329, 23.1335, 23.1431, 23.1581.** **Equivalent requirements of CS/FAR 27 and 29 if applicable.**

EASA Certification Memoranda clarify the European Aviation Safety Agency's general course of action on specific certification items. They are intended to provide guidance on a particular subject and, as non-binding material, may provide complementary information and guidance for compliance demonstration with current standards. Certification Memoranda are provided for information purposes only and must not be misconstrued as formally adopted Acceptable Means of Compliance (AMC) or as Guidance Material (GM). Certification Memoranda are not intended to introduce new certification requirements or to modify existing certification requirements and do not constitute any legal obligation.

EASA Certification Memoranda are living documents into which either additional criteria or additional issues can be incorporated as soon as a need is identified by EASA.

Subject

Clarifications to AMC 20-27

Log of Issues

Issue/Revision	Issue date	Change description
Issue 01 Revision 00	06.08.2012	First issue.
Issue 01 Revision 01	25.10.2012	First issue. First revision. Correction of: 1. Reference to ICAO PANS-OPS in section 7.3. § 2: - the document is 8168 (not 8186), - the volume reference is Volume II (not III). 2. p.15 § 1 "As can be seen from the table, nominal obstacle clearance margin is already slightly exceeded, above 10.000 feet, …" (not 5.000 feet) To allow readers to see the detailed changes the following format has been used: 1. text not affected by the revision remains the same: unchanged 2. deleted text is shown with a strike through: ~~deleted~~ 3. new text is highlighted with grey shading: new.

Table of Contents

1. INTRODUCTION

1.1. PURPOSE AND SCOPE

The purpose of this Certification Memorandum is to provide specific guidance, within the context of AMC 20-27, on:

- General applicability and intended use of AMC 20-27;
- The use of SBAS/GNSS geometric altitude as a source of altitude for approaches to LNAV/VNAV minima;
- Provisioning of steering and monitoring signals with angular vertical deviations as opposed to the linear deviations assumed in AMC 20-27;
- Acceptance of previous demonstration of compliance with FAA AC 20-129 for credit for AMC 20-27 airworthiness and operational approval.

This Certification Memorandum describes how the additional clarifications and interpretations may be applied by an applicant for airworthiness or operational approval.

1.2. REFERENCES

It is intended that the following reference materials be used in conjunction with this Certification Memorandum:

Reference	Title	Code	Issue	Date
EASA AMC 20-27	Airworthiness Approval and Operational Criteria for RNP APPROACH (RNP APCH) Operations Including APV BAROVNAV Operations	--	--	23/12/2009
EASA NPA 2009-04 (AMC 20-28)	Airworthiness Approval and Operational Criteria for on-board equipment related to Area Navigation for Global Navigation Satellite System approach operation to Localiser Precision with Vertical guidance minima using Satellite Based Augmentation System	--	--	19/03/2009
FAA AC 20-129	Airworthiness Approval of Vertical Navigation (VNAV) Systems for Use in the U.S. national Airspace System (NAS) and Alaska	--	--	12/09/1988
FAA AC 20-130A	Airworthiness Approval of Navigation or Flight Management Systems Integrating Multiple Navigation Sensors	--	--	14/06/1995
FAA AC 20-138B	Airworthiness Approval of Positioning and Navigation Systems	--	--	27/09/2010
ETSO C115b	Airborne Area Navigation Equipment Using Multi-sensor Inputs	--	--	24/10/2003

Reference	Title	Code	Issue	Date
ETSO C145c	Airborne Navigation Sensors Using the Global Positioning System Augmented by the Satellite Based Augmentation System	--	--	14/12/2010
ETSO C146c	Stand Alone Airborne Navigation Equipment Using the Global Positioning System Augmented by the Satellite Based Augmentation System	--	--	14/12/2010
RTCA DO-229C	Minimum Operational Performance Standards for Global Positioning System/Wide Area Augmentation System Airborne Equipment	--	--	28/11/2008
RTCA DO-229D	Minimum Operational Performance Standards for Global Positioning System/Wide Area Augmentation System Airborne Equipment	--	--	13/12/2006

1.3. ABBREVIATIONS

The following abbreviations are used in this Certification Memorandum:

Abbreviation	Meaning
AC	**A**dvisory **C**ircular
AMC	**A**cceptable **M**eans of **C**ompliance
AFM	**A**ircraft **F**light **M**anual
APCH	**Ap**proa**ch**
APV	**Ap**proach with **V**ertical guidance
ARINC	**A**eronautical **R**adio, **Inc**orporated
BARO	**Baro**metric
CDI	**C**ourse **D**eviation **I**ndicator
CM	**C**ertification **M**emorandum
CRI	**C**ertification **R**eview **I**tem
EASA	**E**uropean **A**viation **S**afety **S**ystem
EGNOS	**E**uropean **G**eostationary **N**avigation **O**verlay **S**ervice
EHSI	**E**lectronic **H**orizontal **S**ituation **I**ndicator
ETSO	**E**uropean **T**echnical **S**tandard **O**rder
FAA	**F**ederal **A**viation **A**dministration

Abbreviation	Meaning
FSD	**F**ull **S**cale **D**eflection
FTEz	**F**light **T**echnical **E**rror (Vertical)
GNSS	**G**lobal **N**avigation **S**atellite **S**ystem
GPS	**G**lobal **P**ositioning **S**ystem
HSI	**H**orizontal **S**ituation **I**ndicator
ICAO	**I**nternational **C**ivil **A**viation **O**rganisation
LNAV	**L**ateral **Nav**igation
LPV	**L**ocaliser **P**erformance with **V**ertical guidance
MAPt	**M**issed **A**pproach **P**oin**t**
MOC	**M**inimum **O**bstacle **C**learance
MSL	**M**ean **S**ea **L**evel
NAA	**N**ational **A**viation **A**uthority
NAS	[US] **N**ational **A**irspace **S**ystem
NPA	**N**otice of **P**roposed **A**mendment
PANS-OPS	**P**rocedures for **A**ir **N**avigation **S**ervices – Aircraft **Op**eration**s**
PBN	**P**erformance **B**ased **N**avigation
POH	**P**ilot **O**perating **H**andbook
RNP	**R**equired **N**avigation **P**erformance
RTCA	**R**adio **T**echnical **C**ommission for **A**eronautics
SBAS	**S**pace **B**ased **A**ugmentation **S**ystem
STC	**S**upplemental **T**ype **C**ertificate
TC	**T**ype **C**ertificate
TSEz	**T**otal **S**ystem **E**rror (Vertical)
VNAV	**V**ertical **Nav**igation
VDI	**V**ertical **D**eviation **I**ndicator
WAAS	**W**ide **A**rea **A**ugmentation **S**ystem
WGS-84	**W**orld **G**eodetic **S**urvey 1984

1.4. DEFINITIONS

The following definitions are used in this Certification Memorandum:

Definition	Meaning
---	---

2. BACKGROUND

At the time of writing of AMC 20-27, certain assumptions were made, which either did not reflect the latest technological advances, or appeared too restrictive for TC holders and operators of existing aircraft. Following various meetings with manufacturers, national aviation authorities (NAAs), aircraft operators and their representative bodies, EASA has agreed to provide further guidance and clarifications on the subjects identified in the introduction. Each of the subjects will be discussed in a separate chapter in this Certification Memorandum.

3. EASA CERTIFICATION POLICY

3.1. EASA POLICY

The clarifications and guidance provided in this Certification Memorandum relate to the acceptable means of compliance documented in AMC 20-27, which was published in December 2009.

3.2. WHO THIS CERTIFICATION MEMORANDUM AFFECTS

This Certification Memorandum affects applicants for airworthiness approval (TC, STC, Major Change), aircraft operators, National Aviation Authorities and EASA experts when working on projects where the additional guidance of this Certification Memorandum may be applicable.

4. GENERAL APPLICABILITY AND INTENDED USE OF AMC 20-27

4.1. IDENTIFICATION OF ISSUE

From discussions with applicants for airworthiness approval, aircraft operators and NAAs, it became clear that the applicability of specific sections of the AMC and in particular the division between airworthiness requirements and operational requirements was not always understood. Consequently, requirements were not always applied as intended, resulting in discussions with the applicants for airworthiness approval and sometimes additional burden to the operators.

4.2. APPLICABILITY

The criteria and clarifications in this section apply to aircraft operators, applicants for airworthiness approval and aviation authorities.

4.3. INTENDED APPLICATION OF AMC 20-27

AMC 20-27 contains 11 sections and 5 appendices. The intended application of the guidance and means of compliance provided in AMC 20-27 is as follows:

- Sections 1 through 5, Section 11 and Appendix 1 provide general and background information, assumptions and reference documents. These sections provide information which may be useful to all.
- Sections 6 through 9 contain airworthiness requirements. Demonstration of compliance with the requirements of these sections is typically expected from applicants seeking airworthiness approval of; a Type Certificate (TC), a Supplemental Type Certificate (STC) or a Major Change to a TC. The Aircraft Flight Manual (AFM) or Pilot Operating Handbook (POH) or a supplement thereto generally contain statements indicating the types of operation for which compliance has been demonstrated, with reference to EASA AMCs.
- Section 10 and associated Appendices 2, 3, 4 and 5 contain operational requirements. Demonstration of compliance with these requirements is typically expected from an aircraft operator and should be provided to the authority responsible for oversight of the operator's operations for approval.

5. THE USE OF GNSS/SBAS GEOMETRIC ALTITUDE AS A SOURCE OF ALTITUDE FOR APPROACHES TO LNAV/VNAV MINIMA

5.1. IDENTIFICATION OF ISSUE

When AMC 20-27 was drafted, it was assumed that vertical navigation (VNAV) would be based on barometric altitude. With the introduction of Space Based Augmentation Systems (SBAS), such as the US Federal Aviation Administration's (FAA) Wide Area Augmentation System (WAAS) and more recently the European Geostationary Navigation Overlay Service (EGNOS), GNSS geometric altitude augmented by SBAS corrections, became available to aircraft operators as a viable second source of altitude, provided that they had the required SBAS capable GNSS receivers installed.

This second source of altitude was considered, but it was assumed that those systems would primarily be used to support Approaches with Vertical Guidance (APV) to Localiser Performance with Vertical guidance (LPV) minima, which would be covered in a separate AMC, namely AMC 20-28 (NPA 2009-04). Industry standards, like RTCA DO-229C (and later revisions), however contained provisions which would enable SBAS capable GNSS receivers to provide steering commands and guidance data on selected approaches to LNAV/VNAV minima. Industry appeared keen to bring such systems to the market, but certification of aircraft equipped with those systems to the strict requirements of AMC 20-27 proved to be difficult.

5.2. APPLICABILITY

The criteria and clarifications provided in this section of the Certification Memorandum are provided to applicants for airworthiness approval, except for those in paragraph 5.3.6, which could be useful for operators of aircraft equipped with systems using SBAS/GNSS geometric altitude as a source of altitude for approaches to LNAV/VNAV minima, and their NAA.

5.3. CONDITIONS FOR ACCEPTANCE OF SBAS/GNSS GEOMETRIC ALTITUDE

After consultation with internal and external experts, EASA decided that SBAS/GNSS may be used as a source of altitude on approaches to LNAV/VNAV minima, provided that the aircraft installation complies with the following criteria:

5.3.1. Equipment Qualification

The requirements of AMC 20-27 paragraphs 6.2.1 and 6.2.2 do not apply to equipment providing VNAV based on SBAS/GNSS geometric altitude and should be substituted by the following:

5.3.1.1. GNSS SBAS Stand-alone Navigation system

GNSS SBAS stand-alone equipment should be approved in accordance with ETSO-C146c class Gamma, operational class 2 or class 3.

5.3.1.2. Integrated Navigation System Incorporating a GNSS SBAS sensor

The equipment should incorporate a GNSS SBAS sensor approved in accordance with ETSO-C145c class Beta, operational class 2 or class 3.

5.3.2. Installation Requirements

5.3.2.1. Vertical Accuracy

The requirements of AMC 20-27 paragraph 6.3.2 do not apply to equipment providing VNAV based on SBAS/GNSS geometric altitude and should be substituted by the following:

Systems compliant with the requirements of paragraph 5.2 above are considered to provide equal or better vertical accuracy than the requirements of AMC 20-27 paragraph 6.3.2 prescribe, provided that the guidance is adequately displayed on a vertical deviation display (Reference is made to paragraph 5.3.3.1).

5.3.3. Functional Requirements

5.3.3.1. Display

The requirements of AMC 20-27 paragraph 7.1 item 1 and paragraph 7.2, item 1 do not apply to equipment providing VNAV based on SBAS/GNSS geometric altitude and should be substituted by the following:

Approach guidance must be continuously displayed on a lateral and vertical deviation display (HSI, EHSI, CDI/VDI) including a failure indicator and must meet the following requirements:

1. This display must be used as primary means of guidance during the approach.
2. The display must be visible to the flight crew and located in the primary field of view (± 15 degrees from the normal line of sight) when looking forward along the flight path.
3. The deviation display must have a suitable full-scale deflection based on the required lateral and vertical track keeping accuracy.

5.3.3.2. Database

The requirements of AMC 20-27 paragraph 7.1 item 3 remain applicable, with the additional requirement that for systems that provide VNAV based on SBAS/GNSS geometric altitude, the flight crew should be able to retrieve an approach to LNAV/VNAV minima only when the approach has been appropriately coded, i.e. a GNSS/FMS indicator of 'A' in the ARINC 424 coded Navigation Database (see note below).

Note:

In order for an approach to LNAV/VNAV minima to be flown with VNAV guidance based on SBAS/GNSS geometric altitude, the angular nature of the guidance should have been taken into account in the procedure design. States publishing the approach should explicitly declare whether or not angular guidance has been accounted for in the approach design. Where approaches with angular guidance can be used, this is indicated by the database provider by coding an approach with the character 'A' in the ARINC 424 GNSS/FMS indicator field of the navigation database. This is not visible to the flight crew. However, if the coding of the approach indicates that the approach to LNAV/VNAV minima cannot be flown with angular guidance, the flight crew should not be able to retrieve the approach with associated LNAV/VNAV minima from the Navigation Database.

5.3.4. Integrating SBAS/GNSS VNAV

Because BARO-VNAV will be in use for most flight phases, including missed approach, there will be a need for a smooth transition from BARO-VNAV to SBAS/GNSS-VNAV and vice versa. Aspects to consider when transitioning from one source to the other include:

1. Temperature errors, particularly if operating outside the allowable BARO-VNAV temperature range.
2. MSL versus WGS-84 ellipsoid for path definition.

3. Curved BARO-VNAV path versus straight SBAS/GNSS path.
4. Linear BARO-VNAV guidance versus angular SBAS/GNSS guidance.

These issues can cause discontinuities or jumps that have the potential to destabilise the aircraft on final or missed approach, resulting in unacceptable pilot workload. The applicant for airworthiness approval should demonstrate that:

Transitions between BARO-VNAV and SBAS/GNSS VNAV and vice-versa are smooth, i.e. there should be no transients or jumps that would result in either a sudden change in aircraft position on the flight path or in commands that could contribute to destabilisation of the aircraft.

Note:

Although depicted as a straight line on the approach chart, BARO-VNAV follows the earth's surface, implying a slightly curved glide path. SBAS/GNSS VNAV on the other side calculates a straight glide path from the missed approach point (MAPt) to a point in space.

5.3.5. Operational Criteria

The operational criteria of section 10 and associated appendices 2 through 5 of AMC 20-27 have been written with the assumption that BARO-VNAV would be used as the sole means of altitude information. Consequently, the procedures contained therein will have to be modified to adapt the procedures for the use of SBAS/GNSS geometric altitude.

The applicant for airworthiness approval should provide documentation containing alternate procedures, appropriate to the use of SBAS/GNSS altitude to the operator of the aircraft, to enable the operator to obtain operational approval from the NAA. The alternate procedures should consider all the aspects addressed in section 10 of the AMC 20-27.

Aspects that may need particular attention are operational characteristics and alternate criteria for monitoring of the procedure, in order to ensure adequate obstacle clearance and a stabilised approach. Transitions from BARO-VNAV to SBAS/GNSS-VNAV and vice versa should also be addressed.

5.3.6. AFM or POH

In order to indicate the types of operation for which compliance has been demonstrated, the AFM should include the following statement:

> *"The aircraft complies with the criteria of AMC 20-27 for RNP approaches to LNAV/VNAV minima, with the exception that VNAV is based on SBAS/GNSS geometric altitude."*

5.3.7. Interpretation

AMC 20-27 was written with the assumption that VNAV would be based on barometric altimetry (BARO-VNAV). The AMC 20-27 therefore contains many references to BARO-VNAV. Although this Certification Memorandum addresses the main differences between VNAV-based on barometric altimetry and VNAV based on SBAS/GNSS geometric altimetry, it would be nearly impossible to cover all references to barometric VNAV. Where the AMC refers to BARO-VNAV and no explicit guidance is provided in this Certification Memorandum, the reader of this Certification Memorandum should replace this reference by SBAS/GNSS VNAV.

6. PROVISIONING OF STEERING AND MONITORING SIGNALS WITH BAROMETRIC ANGULAR VERTICAL DEVIATIONS AS OPPOSED TO THE LINEAR DEVIATIONS ASSUMED IN AMC 20-27

6.1. IDENTIFICATION OF ISSUE

Some applicants have approached the EASA with proposals for provisioning steering commands and monitoring data for approaches to LNAV/VNAV minima with angular deviations, where the altitude source for the VNAV is based on barometric altimetry.

6.2. APPLICABILITY

The criteria and clarifications in this section are provided to applicants for airworthiness approval of systems which provide angular steering commands and guidance data, based on barometric VNAV. Systems based on SBAS/GNSS geometric altitude are addressed in section 5 of this Certification Memorandum; this section is not applicable to those systems.

Although the contents of this section may provide useful information to aircraft operators and aviation authorities responsible for oversight of these operators, this section primarily provides criteria and guidance on airworthiness aspects. Aircraft operators are therefore not expected to demonstrate compliance with the criteria of this section.

6.3. CONDITIONS FOR ACCEPTANCE OF ANGULAR VERTICAL DEVIATION

The EASA has identified two possible options for provisioning of angular deviation:

- The angular deviation is provided within the vertical boundaries of the 'standard' linear approach to LNAV/VNAV minima.
- The angular deviation complies with a Full Scale Deflection (FSD) of ±0.25 x (glide path angle), as defined in RTCA DO-229D, section 2.2.4.4.4.

The applicable criteria for both options are discussed in the paragraphs below.

6.3.1. The angular deviation is provided within the vertical boundaries of the 'standard' linear approach to LNAV/VNAV minima.

Most of the airworthiness and operational criteria of AMC 20-27 would apply, with the notable exception of the criteria for monitoring of the approach: Obviously, the requirement to monitor that deviation above and below the vertical path must not exceed ± 75 feet cannot readily be applied with angular deviations. The applicant should therefore propose an alternate means of monitoring to the EASA for review and acceptance.

Operational procedures and flight crew training instructions should be provided to the aircraft operator in a suitable format to enable the operator to incorporate the procedures in their own operating manuals and provide adequate training.

6.3.2. The angular deviation complies with a Full Scale Deviation (FSD) of ±0.25º x (glide path angle), as defined in RTCA DO-229D.

In this case, more deviations from the airworthiness and operational criteria of AMC 20-27 are foreseen, which require detailed review and analysis. Aspects that need particular consideration include the vertical accuracy of the system and temperature compensation. The EASA would support such applications, but considers the matter too complex and application specific to address in this Certification Memorandum. A project specific Certification Review Item (CRI) will be issued in support of such an application.

7. ACCEPTANCE OF PREVIOUS DEMONSTRATION OF COMPLIANCE WITH FAA AC 20-129 FOR CREDIT FOR AMC 20-27 AIRWORTHINESS AND OPERATIONAL APPROVAL

7.1. IDENTIFICATION OF ISSUE

Paragraph 6.3.2 of AMC 20-27 contains the VNAV requirements, including vertical Flight Technical Error (FTEz) limits which the applicant should demonstrate. These are considerably more stringent than those found in FAA AC 20-129 and in the attachment to Vol. II of the ICAO PBN manual. Operators, applicants for airworthiness approval, aviation authorities and their representative bodies have objected to the more stringent requirements, because it would require re-certification of existing aircraft.

7.2. APPLICABILITY

The criteria and clarifications in this section are provided to aircraft operators, applicants for airworthiness approval and aviation authorities.

7.3. RATIONALE

The reason for the more stringent requirements in AMC 20-27 is an inconsistency between the values found in FAA AC 20-129 (cancelled by FAA AC 20-138B) and in the attachment to Vol. II of the PBN manual and PANS OPS design criteria: The allowable Vertical Total System Error (TSEz) values found in the referenced documents exceed the ICAO PANS-OPS Minimum Obstacle Clearance (MOC) buffer of 246 ft. at altitudes above 5000 ft.

The PANS-OPS (ICAO Doc ~~8186~~ 8168, Volume ~~III~~ II) nominal obstacle clearance margin, excluding the additional buffer for abnormal operation, is 246 ft. The allowable Vertical Total System Error (TSEz) values listed in § 8 (b) of FAA AC 20-129 and in the attachment to Vol. II of the PBN manual could in specific situations result in inadequate obstacle clearances, hence a potentially unsafe situation. The table below provides the differences between FAA AC 20-129 / Attachment II to the PBN and EASA AMC 20-27:

	FAA AC 20-129 / Attachment II to PBN		**EASA AMC 20-27**	
Altitude Band	**FTE_z**	**TSE_z**	**FTE_z**	**TSE_z**
≤ 5000 ft. (MSL)	**200 ft.**	**224 ft.**	**150 ft.**	**199 ft.**
5000 to 10,000 ft. (MSL)	**300 ft.**	**335 ft.***	**150 ft.**	**238 ft.**
≥ 10,000 ft. (MSL)	**300 ft.**	**372 ft.***	**150 ft.**	**296 ft.***

Note: The values marked with an star (*) exceed the PANS-OPS MOC criteria.

As can be seen from the table, nominal obstacle clearance margin is already slightly exceeded, above ~~5000~~ 10.000 feet, even with the reduced specification for FTE_z of AMC 20-27.

Note: The vertical performance limits for BARO-VNAV operations along a specified vertical profile defined in FAA AC 20-138B are more stringent and consistent with ICAO PANS-OPS requirements.

7.4. AIRWORTHINESS APPROVAL

Although the EASA recognises the additional burden put on the OEMs to recertify their aircraft to the new requirements of AMC 20-27, the EASA is taking into account the potential safety issues resulting from the inconsistency between FAA AC 20-129, Attachment II of the ICAO PBN and the ICAO PANS-OPS manual.

Considering that the number of RNP-APCH operations with BARO-VNAV (or APV BARO-VNAV) at airfields at altitudes higher than 5000 feet is limited we have adapted the following guidance with regard to acceptance of previous demonstration of compliance with FAA AC 20-129 for credit for AMC 20-27 airworthiness approval:

1. The vertical accuracy requirements of § 6.3.2 of AMC 20-27 will not be changed.
2. Aircraft which have not previously been demonstrated to comply with the requirements of FAA AC 20-129 will have to fully comply with the requirements of AMC 20-27.
3. Aircraft which have previously been demonstrated to comply with the requirements of FAA AC 20-129 may, under certain conditions, be eligible for acceptance without further demonstration of FTE values, albeit with limitations.

With reference to the conditions referred to in item 3 above, the following general guidelines are applicable:

- The applicant should provide to the EASA proof that the aircraft has previously been approved to the requirements of AC 20-129.
- The applicant should provide to the EASA a document stating how the requirements of AMC 20-27 have been complied with, with the exception of FTE_z/TSE_z requirements.
- The aircraft should be equipped with a suitably scaled indicator to enable the flight crews to comply with operational requirements of AMC 20-27 Section 10, Appendix 4, paragraph 1.3 for monitoring deviations from the intended vertical path.
- The AFM should include a limitation that BARO-VNAV approaches to airfields at elevations above 5000 ft (MSL) are not permitted.

7.5. CONSIDERATIONS FOR EXISTING OPERATIONAL APPROVALS

Operational approvals for BARO-VNAV approaches to LNAV/VNAV minima had been issued by European NAAs prior to publication of AMC 20-27. The EASA understands the implications associated with recognition of existing operational approvals, versus issuance of approvals under a new regime.

Nevertheless, the EASA would strongly recommend that aircraft operators and National Aviation Authorities consider the safety implications of possible deviations below the nominal obstacle clearance surface and apply measures consistent with those taken by the EASA in the field of airworthiness approval, i.e. limit approaches to LNAV/VNAV minima with FAA AC 20-129 compliant aircraft to airfields at elevations not exceeding 5000 feet (MSL).

Note:

The new European Regulation on Air operation will have an effect on existing operational approval. When these rules are applicable, existing approvals can only remain valid if they comply with applicable requirements. If operational approvals have been issued on an

outdated standard, the competent authority has to ensure through oversight that the operator transitions to the new standard to maintain the approval valid. The operational approval process for PBN is regulated in Annex V Part-SPA Subpart SPA.PBN.

8. REMARKS

1. Suggestions for amendment(s) to this EASA Certification Memorandum should be referred to the Certification Policy and Planning Department, Certification Directorate, EASA. E-mail CM@easa.europa.eu or fax +49 (0)221 89990 4459.
2. For any question concerning the technical content of this EASA Certification Memorandum, please contact:

   Name, First Name: HOEKEMA, Hette

   Function: Avionics Systems Expert

   Phone: +49 (0)221 89990 4302

   Facsimile: +49 (0)221 89990 4802

   E-mail: hette.hoekema@easa.europa.eu