COMMISSION IMPLEMENTING DECISION (EU) 2015/1183

of 17 July 2015

setting out the necessary technical and operational specifications for implementing version 3 of the EGNOS system

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) No 1285/2013 of the European Parliament and of the Council of 11 December 2013 on the implementation and exploitation of European satellite navigation systems and repealing Council Regulation (EC) No 876/2002 and Regulation (EC) No 683/2008 of the European Parliament and of the Council [1], and in particular Article 12(3)(d) thereof,

Whereas:

(1) Article 12 of Regulation (EU) No 1285/2013 provides that the Commission shall have overall responsibility for the EGNOS programme and confers on it implementing powers to determine the technical and operational specifications necessary for EGNOS system evolution.

(2) The EGNOS system has already evolved, as version 1 was introduced in the 2000s, followed by version 2 in 2009. The three services offered by the system, namely the open service, the commercial data dissemination service ('EDAS') and the safety-of-life service ('SoL') defined in Article 2(5) of Regulation (EU) No 1285/2013 became operational on 30 October 2009, 26 July 2012 and 12 March 2011 respectively.

(3) In order to comply with the characteristics and meet the specific objectives of the EGNOS programme referred to in Article 2 of Regulation (EU) No 1285/2013, it is now important to determine the technical and operational specifications of a version 3 of the system. This version 3, which should be brought into service in the 2020s, would be an improvement on version 2 because, in technical terms, it would include on the one hand the monitoring and correction of the signals of the open service offered by the system established under the Galileo programme, and on the other hand the use of double frequency, both for the GPS system and for that of the Galileo programme.

(4) The technical evolution of version 2 to version 3 would improve the geographic coverage of the three services offered by the system and enhance their performance.

(5) With regard to geographic coverage, system evolution would aim, first of all, to guarantee coverage of all territories of the EU Member States geographically located in Europe, including the Azores, the Canary Islands and Madeira. An extension of this coverage beyond the borders of the EU Member States to include the EU candidate countries and the countries involved in the EU neighbourhood policy would also be possible, subject to technical feasibility and on the basis of international agreements, under the conditions set out in the last subparagraph of Article 2(5) of Regulation (EU) No 1285/2013.

(6) Performance, mainly that of the 'SoL' service, should be improved in version 3 of the system, compared to version 2.

(7) For the open service, an improvement in performance would involve providing precise data in terms of time measurement, such as differences between the time used by EGNOS on the one hand, and the UTC time and the GPS system time on the other hand.

(8) For the 'EDAS' service, this improvement would above all serve to reduce the data-transmission time to two seconds and reduce the lapse of time during which the service is not available.

(9) However, the performance enhancement achieved by version 3 of the EGNOS system should concern mainly the 'SoL' service, particularly for the sectors of civil aviation and maritime transport.

[1] OJ L 347, 20.12.2013, p. 1.

(10) For civil aviation and in order to adequately meet air navigation needs, in particular with respect to the optimisation of traffic flow between various geographical areas, version 3 should provide a new 'Cat I Precision Approach' service in addition to the three services already on offer in version 2, i.e. the 'En-Route — Non-precision Approach', 'Approach with Vertical Guidance APV-I' and 'LPV 200 Approach'. Furthermore, the availability of the 'LPV 200 Approach' service would be significantly increased because the time period during which this service is available should fall within the range of 0,99 to 0,999.

(11) In civil aviation, it is also important to ensure that the SoL service continues to comply with Commission Implementing Regulation (EU) No 1035/2011 ([1]). Indeed, as set out in recital 14 of this Regulation, air navigation service providers should operate in compliance with the relevant standards of the International Civil Aviation Organisation, pending the complete transposition of the standards of that international organisation into EU law.

(12) For maritime transport, version 3 of the EGNOS system should introduce the 'SoL' service in accordance with the international standards laid down by the International Maritime Organisation, allowing new EGNOS applications which, thanks to their greater precision, would benefit this sector in terms of effectiveness and safety. To this end and bearing in mind the constraints inherent to navigation close to the coast, on the approach to and when entering ports, the extension of the 'SoL' service to the maritime sector should in particular provide for a very high degree of availability, over 0,998 on a scale ranging from 0 to 1, guaranteeing the integrity of the service in an interval of less than ten seconds and lateral precision of less than 10 metres.

(13) In addition to this, in order not to affect EGNOS users or compromise the current commercial applications, the technical and operational specifications of version 3 of the EGNOS system should be compatible with those of version 2 so as not to jeopardise what has been achieved so far, or result in degrading current possible uses, to the detriment of users.

(14) In order to complete the technical evolution of version 2 to version 3 of the system, the technical and operational specifications set out in the Annex must be established.

(15) The measures provided for in this Decision comply with the opinion of the committee established pursuant to Article 36(1) of Regulation (EU) No 1285/2013,

HAS ADOPTED THIS DECISION:

Article 1

The technical and operational specifications of version 3 of the EGNOS system are set out in the Annex.

Article 2

This Decision shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

Done at Brussels, 17 July 2015.

For the Commission
The President
Jean-Claude JUNCKER

([1]) Commission Implementing Regulation (EU) No 1035/2011 of 17 October 2011 laying down common requirements for the provision of air navigation services and amending Regulations (EC) No 482/2008 and (EU) No 691/2010 (OJ L 271, 18.10.2011, p. 23).

ANNEX

TECHNICAL AND OPERATIONAL SPECIFICATIONS

1. **Main characteristics of EGNOS v3 which are maintained or improved from, or added to EGNOS v2**

	EGNOS v2	EGNOS v3
Receivers modes	— Mono-frequency mono-constellation: GPS L1	— Mono-frequency mono-constellation: GPS L1 — Dual-frequency mono-constellation: GPS L1/L5 or Galileo E1/E5a — Dual-frequency dual-constellation: GPS L1/L5 + Galileo E1/E5a
Specific services for Aviation	— En-route/non-precision approach — Approach with vertical guidance APV-I — LPV-200 approach	— En-route/non-precision approach — Approach with vertical guidance APV-I — LPV-200 approach — CAT-I precision approach
Specific services for Maritime	n.a.	— Oceanic areas — Navigation in harbour entrance, harbour approaches and coastal waters
Capability of the system to be replicated	yes	yes
Compatibility of service performance at user level vs. previous version	n.a.	yes
Limitation of services (1)	— Safety of Life area limited to [40W, 40E], [20N, 70N] — Maximum number of stations limited to 60	None (2)

(1) User access for open service and safety of life services limited to visibility area of the geostationary satellites.
(2) Absence of limitation to allow the design of EGNOS v3 to include additional stations in order to extend, in a continuous manner, the EGNOS service area in accordance with Article 2(5) of Regulation (EU) No 1285/2013.

2. **Open service technical and operational specifications**

	Open service
Lateral accuracy (95 %)	3 m
Vertical accuracy (95 %)	4 m
OS availability	0,99
Service Area	EU-MS + Norway and Switzerland
Guarantee of service	No
Accessibility	— Through compatible receivers within the EGNOS service area — No specific authorisation/certification required

	Timing service
EGNOS Network time to UTC system time accuracy	20 ns 3sigma
EGNOS Network time to GPS system time accuracy	Maximum 50 ns
Availability of timing service	99 %
Guarantee of service	no
Accessibility	— Through compatible receivers within the EGNOS service area — No specific authorisation/certification required

3. **EGNOS Data Access service (EDAS) technical and operational specifications**

	EDAS	
Service specifications	Products provided directly by the system	RIMS raw data
		EGNOS broadcast message data
		EGNOS health status data
	Latency [1]	2 sec
	Availability	0,999
	Accessibility	Products provided to end users through specific service providers connected to the EGNOS server
Server specifications	Secured architecture for worldwide access Sufficient bandwidth connectivity	

[1] Latency is the time elapsed since the transmission of the last bit of the navigation message from the space segment (EGNOS and GPS/Galileo satellites) until the data leave the EGNOS server.

4. **Safety-of-Life service technical and operational specifications**

4.1. Aviation service [1]

	En-route — Non-Precision Approach	Approach with Vertical Guidance APV-I (legacy service)	LPV 200 Approach	Cat I Precision Approach
Standards	Annexe V, point 3(a) of Implementing Regulation (EU) No 1035/2011, as applicable			
Lateral accuracy	220 m	16 m	16 m	16 m
Vertical accuracy	Not applicable	20 m	4 m	4 m
VNSE — fault-free conditions	N/A	N/A	10 m with probability of 10^{-7}/150 s	N/A

	En-route — Non-Precision Approach	Approach with Vertical Guidance APV-I (legacy service)	LPV 200 Approach	Cat I Precision Approach
VNSE — system failure conditions	N/A	N/A	15 m with probability of 10^{-5}/150 s	N/A
Integrity risk	$1{,}10^{-7}$/hour	$2{,}10^{-7}$/150 s	$2{,}10^{-7}$/150 s	$2{,}10^{-7}$/150 s
Time To Alarm	10 s	10 s	6 s	6 s
HAL	556 m	40 m	40 m	40 m
VAL	Not applicable	50 m	35 m	10 m
Continuity risk	$1{,}10^{-5}$/hour	$8{,}10^{-6}$/15 s	$8{,}10^{-6}$/15 s	$8{,}10^{-6}$/15 s
SoL Service (2) availability	0,999	0,99	0,99 to 0,999	0,99
Service area	Flight information regions (FIRs) of EU-MS + Norway and Switzerland	Landmasses (3) of EU-MS + Norway and Switzerland	Landmasses of EU-MS + Norway and Switzerland	Landmasses of EU-MS + Norway and Switzerland
Target service area extension	Article 2(5) of Regulation (EU) No 1285/2013			
Performance of reversion modes	EGNOS V3 shall deliver LPV 200 (4) service level over its Service Area with 99 % availability when reverting to the use of the Galileo constellation only. EGNOS V3 shall deliver LPV 200 service level in the land masses of the Service Area with 99 % availability upon complete loss of L5/E5a frequency at user level.			
Guarantee of service	Yes			
Accessibility	Through SBAS-compatible receivers			

(1) The performance specifications included in this table address only signal-in-space contributions.
(2) A range is given for service availability for approach procedure. The bottom of the range shall correspond to the availability expected for the GPS L1-only service. The top of the range shall be available for users equipped with a dual frequency GPS L1-L5 receiver or a combined GPS/Galileo dual-frequency receiver.
(3) 'Land masses of an area' means any land territory, including islands, in the FIR of that area except for the Cat I service for which coverage of Azores, Madeira and Canary Islands are excluded.
(4) Until sufficient Galileo performance is demonstrated, APV-I service level is accepted.

4.2. Maritime service (1)

	Navigation in harbour entrances, Harbour approaches and coastal waters
Standards	IMO Resolution A.915(22) and A.1046(27)
Lateral accuracy	10 m
Vertical accuracy	Not applicable
Integrity risk	$1{,}10^{-5}$/3 hours

	Navigation in harbour entrances, Harbour approaches and coastal waters
Time To Alarm	10 s
HAL	25 m
VAL	Not applicable
Continuity risk	$3{,}10^{-4}$/15 minutes
SoL Service availability	0,998
Service Area	National Waters (2) of EU-MS + Norway and Switzerland
Guarantee of service	Yes
Accessibility	Through SBAS-compatible receivers

(1) The performance specifications included in this table address only signal-in-space contributions.
(2) National (or territorial) waters are defined in the 1982 United Nations Convention on the Law of the Sea as waters extending at most 12 nautical miles from the coast line.

Appendix

ACRONYMS

APV	Approach Procedure with Vertical Guidance
CAT	Category
EDAS	EGNOS Data Access Service
EGNOS	European Geostationary Navigation Overlay Service
EU-MS	European Union Member States
FIR	Flight Information Region
Galileo E1	E1 frequency of Galileo system, corresponding to 1 575,42 MHz
Galileo E5a	E5a frequency of Galileo system, corresponding to 1 176,45 MHz
GPS	Global Positioning System
GPS L1	L1 frequency of GPS system, corresponding to 1 575,42 MHz
GPS L5	L5 frequency of GPS system, corresponding to 1 176,45 MHz
HAL	Horizontal Alert Limit
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
LPV	Localizer Performance with Vertical guidance
OS	Open Service
RIMS	Ranging and Integrity Monitoring Station
SARPs	Standard and Recommended Practices
SBAS	Satellite-Based Augmentation System
SoL	Safety of Life
UTC	Coordinated Universal Time
VAL	Vertical Alert Limit
VNSE	Vertical Navigation System Error