Input paper: [[1]](#footnote-1) ENG18-3.2.2.5

Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□** ARM X ENG **□** PAP **□** Input

**□** DTEC **□** VTS **□** Information

Agenda item [[2]](#footnote-2) n.n

Technical Domain / Task Number 2 …………………………………

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EGNOS Safety of Life assisted service for Maritime Users (ESMAS)

and IEC 61108-7 standard publication

# Summary

EGNOS Safety of Life assisted service for Maritime Users (ESMAS) has been declared on 13th March 2024 during the EGNOS 2024 workshop, ensuring a safe navigation using EGNOS for ocean waters, coastal waters and harbour entrances/approaches according to operational requirements (IMO Res. 1046(27) [1]) over Europe.

In parallel, the IEC SBAS L1 standard (IEC 61108-7 [2]) is expected to be published within March 2024. This standard is composed by a set of minimum performance requirements, method of testing and the required test results to ensure safe navigation with SBAS L1 in harbour entrances/approaches and coastal waters according to operational requirements (IMO Res. 1046(27) [1]).

Vessels should be equipped with type approval receivers (compliant with IEC 61108-7 [2]) to ensure a safe navigation using the EGNOS maritime service over European waters.

## Purpose of the document

The purpose of the document is to inform that:

* The EGNOS Safety of Life assisted service for Maritime Users (ESMAS) [5] has been declared on 13th March 2024, the Service Definition Document will be published at <https://edas-maritime.gsc-europa.eu>.
* The standard for SBAS L1 shipborne receivers IEC 61108-7 [2] is planned to be published by March 2024, being available at <https://webstore.iec.ch>.
* Guidelines for manufacturers for the development of SBAS L1 receivers according to IEC 61108-7 standard [2] for the maritime domain will be shortly provided in the EGNOS and Maritime website in <https://edas-maritime.gsc-europa.eu>.

# Background

This input paper is an update related to the previous ones presented in IALA and listed below:

* ENG13-3.1.3.12: IEC Standardisation for SBAS maritime receivers
* ENG15-3.1.3.2: IEC Standardisation for SBAS maritime receivers
* IALA G1152 SBAS Maritime Service Ed1.1 July 2022.
* IALA Conference 2023: Standardisation Process for SBAS Maritime receiver in the International Electrotechnical Commission
* IALA Conference 2023: Status of the EGNOS Services Development for Maritime Applications
* ENG17-3.1.2.7 Upcoming IEC standard for SBAS L1 shipborne receivers

# DISCUSSION

Comments related to EGNOS Safety of Life assisted service for Maritime Users and SBAS L1 shipborne receivers’ standard IEC 61108-7 [2] are welcome.

# EGNOS Safety of Life assisted service for Maritime Users (ESMAS)

## Description

EUSPA has declared the EGNOS Safety of Life assisted service for Maritime Users to support navigation in “Harbour entrances/approaches and Coastal waters” and in “Ocean Waters” over Europe. This service aims at providing pseudo-range corrections and integrity information to GPS L1 signals to let shipborne receivers compute an enhanced navigation solution with respect to GPS standalone in line with operational requirements defined in the IMO Resolution A.1046 (27) [1].

The Service is named ESMAS (EGNOS Safety of Life assisted service for MAritime userS), which will be freely accessible through SBAS L1 signal without any direct charge.

The Service Definition Document (SDD) [5] has been published in <https://edas-maritime.gsc-europa.eu> to present the characteristics of the service offered to maritime users at the time of its publication. The publication was the 13th of March 2024. This document describes the EGNOS system architecture and Signal-In-Space (SIS) characteristics, the EGNOS SoL assisted service for maritime users service performance, and provides information on the established technical and organisational framework for the provision of this service. It is intended to be of use to Maritime authorities, Maritime Safety Information (MSI) providers, notification bodies, receiver manufacturers, equipment integrators, GNSS application developers and the final users of the EGNOS SoL assisted service for maritime users.

For the ESMAS service area defined in SDD [5], the service provides a committed performance in terms of signal availability, time to alert (integrity alerts about EGNOS system) and the Maritime Safety Information (MSI) proposal notification service in case of planned or unplanned outage events affecting the service. About the ESMAS Service Area, it is defined as the geographical area in which the ESMAS users can expect the fulfilment of the committed performed. For further information, please, refer to the Service Definition Document [5].

## Benefits

EGNOS is the SBAS (Satellite Based Augmentation System) system in Europe. SBAS services are able to provide, over a wide area, the similar GNSS augmentation offered by a DGNSS service (i.e. differential corrections and system integrity information) which can be used to improve the position estimation accuracy and to protect the user from possible system-related failures. Therefore, depending on the application requirements, SBAS can be used to effectively complement DGNSS in Maritime domain, with performances in the same order of magnitude than the DGNSS ones (e.g. accuracy <5m (95%) - IALA Guideline 1112).

The main SBAS generic benefits for maritime applications can be summarised as follows:

* SBAS provides increased accuracy and integrity information in line with IMO resolution A.1046(27) [1] supporting “Harbour entrances/approaches and Coastal waters”, not being currently possible with GNSS standalone solutions without augmentation.
* SBAS comply with common global standards and are compatible and interoperable, thus providing the user with a “seamless”, augmented, navigation solution.
* SBAS services are available for free.
* SBAS services cover large areas including locations currently not served by other navigation aids. Actually, SBAS are able to complement the coverage area of a DGNSS service to increase the availability and the continuity of the provision of correction data and integrity information.
* SBAS may support the rationalization of ground-based Navigation Aids.

## Users

The target users are mariners that have been equipped with a type-approved shipborne GPS and SBAS receiver developed according to the IEC 61108-7 standard [2] (see 5) and on-board equipment enabling Maritime Safety Information (MSI). A complete description of target users will be provided in the Service Definition Document [5].

# IEC standard for SBAS L1 shipborne receivers

## Description

The title proposal for this standard IEC 61108-7 [2] is “Maritime navigation and radiocommunication equipment and systems - Global navigation satellite systems (GNSS) – Part 7: Satellite Based Augmentation Systems (SBAS) L1 – Receiver Equipment – Performance requirements and method of testing”.

IEC 61108-7 [2] is planned to be published in March 2024 [https://webstore.iec.ch](https://webstore.iec.ch/), including the minimum performance for SBAS L1 maritime receivers to be obtained by the equipment under coverage of SBAS service in order to be compliant with the IMO Resolution A.1046(27) [1], describing operational requirements for ocean waters, coastal waters and harbour entrances/approaches.

In addition, it includes a high level procedure for SBAS L1 navigation computation to ensure that receivers correctly process and uses the SBAS data, the receiver output sentences to support SBAS L1 operation and bridge alert management compliant with IEC 62923-1 [3]and IEC 62923-2 [4].

The IEC 61108-7 [2] standard includes the tests description to be performed by the receiver manufacturers to get the type-approved certificate useful for the ESMAS Service (see section 4).

You can refer to paper ENG17-3.1.2.7 for further information about this standard.

# Guidelines for manufactures for the development of SBAS L1 receivers

## Description

Guidelines for manufacturers for the development of SBAS L1 receivers according to IEC 61108-7 standard [2] for the maritime domain will be shortly published in <https://edas-maritime.gsc-europa.eu>. The purpose of this document is to provide further details to meet the requirements of IEC 61108-7 standard [2], covering:

* Minimum facilities required for the SBAS L1 receiver equipment (i.e. antenna, receiver, position display…)
* Minimum configuration
* Signal processing requirements for GPS L1 and SBAS L1.
* Procedure for PVT SBAS solution computation, including the set of SBAS messages that shall be processed.
* Requirements related to interference conditions, equipment output and failure warnings and status indicator.

# References

1. IMO Resolution A.1046(27) (2011), Worldwide Radionavigation System.
2. Standard under development IEC 61108-7: Maritime navigation and radio-communication equipment and systems – Global navigation satellite systems (GNSS) - Part 7: Satellite Based Augmentation System (SBAS) L1 – Receiver equipment – Performance standards, methods of testing and required test results
3. IEC 62923-1: Maritime navigation and radiocommunication equipment and systems – Bridge alert management – Part 1: Operational and performance requirements, methods of testing and required results.
4. IEC 62923-2: Maritime navigation and radiocommunication equipment and systems – Bridge alert management – Part 2: Alert and cluster identifiers and other additional features.
5. EGNOS Safety of Life (SoL) assisted service for Maritime Users - Service Definition Document. Planned for 13th March 2024

# ACTION REQUESTED OF THE COMMITTEE

Following the recent EGNOS Safety of Life assisted service for Maritime Users (ESMAS) service declaration, it is invited to IALA members to kindly participate in this survey [*https://www.surveymonkey.com/r/753YX77*](https://www.surveymonkey.com/r/753YX77)

to provide their feedback about this new augmentation service. Although the survey is launched now, answers will be gathered from now to IALA ENG19 (October 2024) with the intention of receiving comments related to the EGNOS maritime service specially during the first months of service provision.

Receiver’s manufactures are invited to upgrade their receivers according to SBAS L1 receiver equipment standard (IEC 61108-7) [2]. In this regard, ESSP and EUSPA kindly offers free-of-charge technical support for this potential update. EGNOS helpdesk is available for any further information or support ([**egnos-helpdesk@essp-sas.eu**](mailto:egnos-helpdesk@essp-sas.eu)**).**

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)