

Input paper for the following body:

- | | | |
|-------------------------------|------------------------------|---|
| <input type="checkbox"/> ARM | <input type="checkbox"/> ENG | <input type="checkbox"/> PAP |
| <input type="checkbox"/> ENAV | <input type="checkbox"/> VTS | <input checked="" type="checkbox"/> LAP |

Purpose of paper:

- | |
|---|
| <input checked="" type="checkbox"/> Input |
| <input type="checkbox"/> Information |

Agenda item

11 – Liabilities with regard to satellite based augmentation systems (SBAS)

Author(s) / Submitter(s)

European GNSS Agency in cooperation with Secretariat

Consideration of SBAS as AtoN and the IALA / Competent Authority Role

1 SUMMARY

Recent developments in relation to EGNOS have raised issues in relation to whether such Satellite Based Augmentation Services (SBAS) are AtoN. This input paper sets out some of the issues to be considered and invites the advice of the Legal Advisory Panel on the way forward.

A related question is whether GNSS, which are the systems to which SBAS provide augmentation, should also be considered as AtoN.

If SBAS and/or GNSS are AtoN then advice is sought on the role of IALA and competent Authorities in relation to their management.

1.1 Purpose of the document

This document seeks the advice of the LAP on the applicability of the definition of AtoN to GNSS and SBAS and on the role, responsibilities and interfaces of Competent Authorities and IALA in relation to such services.

2 BACKGROUND

This issue was raised at joint meeting of the European Marine Radionavigation Forum (EMRF) and the European GNSS Agency (GSA) which were discussing the development of a maritime EGNOS service. IALA is actively involved in this work through the ENG Committee. The IALA secretariat were asked to advise on the matter and would welcome the advice of the LAP.

3 DISCUSSION

Space Based Augmentation Services (SBAS) offer a wide area means of providing augmentation data to the mariner in relation to GNSS. This will facilitate improvements in integrity and accuracy.

The GSA and the EGNOS Service provider (ESSP) presently provide EGNOS, which is a SBAS developed to provide services to the aviation sector in Europe. However, EGNOS is able to support applications in a wide range of other domains such as maritime and the GSA is now developing a maritime EGNOS service using the existing system and tailoring the Service provision aspects to the Maritime community requirements.

It was originally the intention to have the Maritime EGNOS Service recognised by IMO as part of the World Wide Radio Navigation Service (WWRNS). However, IMO concluded at MSC98 in June 2017 that IMO recognition of augmentation services was not required and that the WWRNS was intended for standalone systems, not augmentations.

The GSA considers that some formal recognition of SBAS would be appropriate and have asked IALA for advice, as this declaration may have some legal implications, taking into account that Maritime Authorities, as signatory of the SOLAS Convention, are responsible for the provision of maritime services in their waters (SOLAS Chapter V Regulation 13) and that the maritime Authorities can delegate the maritime services, but not the responsibility (IALA Guideline 1005).

The IALA definition of an AtoN is 'a device, system or service, external to vessels, designed and operated to enhance safe and efficient navigation of individual vessels and/or vessel traffic'.

This definition could be applied to SBAS and the service considered an AtoN. However, if this course is followed it raises issues as to how individual Competent Authorities should oversee the service in their areas as it is provided from outside their territory. For example, in the UK and Ireland, AtoN require statutory consent from the GLA. However, the EGNOS service will be broadcast from space and will cover all of Europe and its adjacent seas. Effective Superintendence and Management of such extra territorial AtoN is not possible. Regarding this point, the GSA and ESSP (EGNOS Service Provider) with the advice of different Authorities within the EMRF, have defined a Service Provision Scheme for the provision of this dedicated EGNOS Maritime Service, indicating the actors involved and their roles and responsibilities (see Annex to this input paper).

The same issues arise in relation to GNSS systems which can also be considered to fall within the definition of AtoN but are not subject to individual Competent Authority approvals. However, the main difference is that GNSS are recognised by IMO under the WWRNS, and Augmentations are not.

The GSA will of course cooperate with individual Competent Authorities in relation to the EGNOS service and have set out detailed procedures for the service itself and the promulgation of relevant MSI. Further details are provided in Annex 1 to this input paper.

4 ACTION REQUESTED

The LAP are requested to consider whether GNSS and SBAS should be considered AtoN and the issues involved in recognition of extra territorial AtoN, whether space based or terrestrial, and to provide advice on the role of Competent Authorities and IALA in relation to such AtoN.

The LAP are also requested to consider in this analysis the proposed EGNOS Service provision scheme included in Annex 1.

ANNEX 1 EGNOS MARITIME SERVICE PROVISION SCHEME

The high-level definition of the EGNOS L1 Maritime Service Provision scheme, with the different stakeholders involved, including the interfaces and the provision of EGNOS related Maritime Safety Information (MSI) to the users, has already been developed in the frame of the EMRF EGNOS Service Provision Working Group.

The picture below presents schematically the High level Service provision model for the EGNOS L1 Maritime Service:

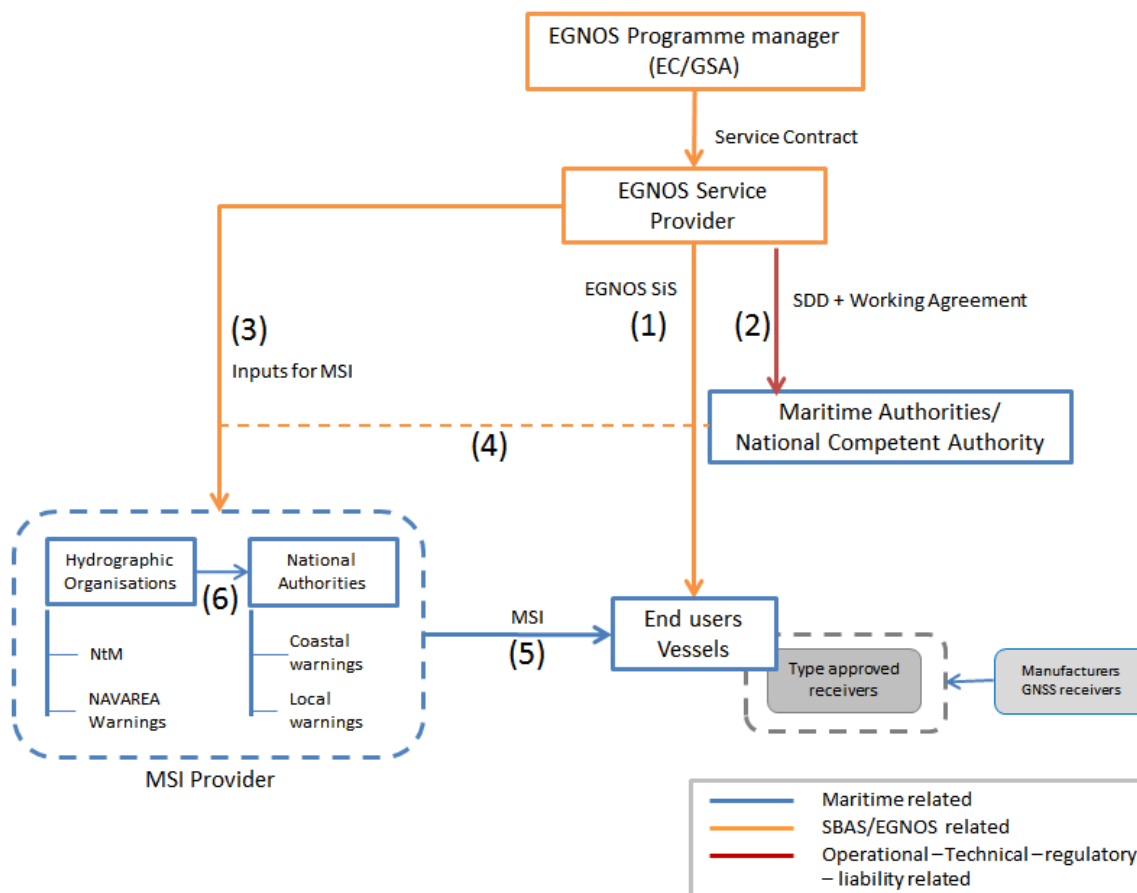


Figure 1 High-level Service Provision Model

This model considers the reception of the of the EGNOS L1 Signal in Space (SiS) directly on-board the vessels equipped with type approved receivers, thus allowing the end users (mariners vessels) to benefit from EGNOS L1 Maritime Service enhanced performance.

The EGNOS L1 Maritime Service is guaranteed at the user level by the following channels:

1. Reception of the EGNOS (SiS) on-board the vessels with type approved receivers (see (1) in figure 1).
2. On the basis of the Service terms and conditions, the establishment of specific working agreements between the ESP and the national competent authority laying down the technical modalities and required operational interfaces, for the delivery of this service (see (2) in figure 1).
3. Provision of EGNOS Maritime Safety Information (MSI¹) to the end users of the EGNOS L1 maritime service (see (3) in figure 1).

The actors involved in this high level service provision model, including their expected roles and responsibilities at operational, technical and regulatory levels, are described below:

¹ EGNOS Safety Information is used in this document following the maritime community convention for information (among other) on the availability of a certain AtoN (MSI – Maritime Safety Information). Detailed information can be found in the related documents.

- The EGNOS Service Provider (ESP)

The EGNOS Service Provider will be the entity which provides the EGNOS L1 Maritime Service (see (1) in figure 1). The ESP will be responsible for the transmission of EGNOS L1 SiS to the final users and to deliver the service under the terms, conditions and performance commitment included in the Service Definition Document. The ESP will be responsible for establishing and supporting all required operational interfaces, as per the corresponding maritime operational chain, including the generation the EGNOS MSI proposals (see (3) in figure 1) to be distributed by the Hydrographic organisation to the end users of the service.

Based on the requirements and best practices already in place the ESP responsibilities may be structured in four main blocks, as follows:

1. **Operation and Maintenance:** The EGNOS service provider should continuously monitor the service to detect and manage service disruptions and degradations and inform users. The information on the EGNOS service degradations and unavailability's is to be delivered to the MSI provider. An unscheduled outage or degradation of the EGNOS service should be communicated to the users as soon as practicable to the MSI provider
2. **Performance Verification:** The EGNOS service provider should verify that the service is performing according to specifications committed.
3. **Publication of information:** The EGNOS service provider should provide a description of the service (service characteristics, performances, coverage area, etc.) via the SDD , provide information of scheduled maintenance activities & planned unavailability, and service performance reporting and support to the users (e.g. EGNOS helpdesk)
4. **SDD + Working agreements:** With reference to the Service Definition Document (SDD) and in line with the liabilities, operational aspects and best practices already in place in the maritime domain, the working agreements or MoU between the ESP and National Authorities should contain at least:
 - Liability² scheme
 - Commitment about the long term operation of the EGNOS service
 - Service offered as per SDD
 - Reliability/continuity/quality of the service
 - EGNOS MSI proposals
 - Costs of the service – (i.e. free of charge)
 - Legal data recording

- Maritime Authorities/ National Competent Authorities

The EGNOS Service Provider will consider the National Competent Authority requirements for the final validation of the Service, so that the EGNOS Service is safely used in the waters under their remit, always considering a harmonised and equitable approach for all European states.

ESP will engage with National Competent Authorities (see (2) in Figure1). The body designed as Competent Authority may vary for each individual State (for example: Coast Guard, Aids to Navigation Authority, etc.).

For the different matters related to the EGNOS Maritime Service the National Competent Authority role and relationship will be one of mutual cooperation and support and will not entail any additional responsibility or liability for the Authority involved, beyond the existing ones. On the basis of the EGNOS Service Definition Document, this relationship may be formalized through a Working Agreement or MoU with the ESP, including the operational and technical modalities⁷. The National Competent Authority may also monitor that the ESP working committed conditions are met.

² Including technical, operational and legal aspects

For MSI, existing internationally agreed procedures will be followed (see (3) and (4) in Figure 1). As schematically shown in Figure 1 (see (4)) the Maritime Authorities may be involved in the MSI process, according to the common existing practices³.

- End Users

The end users are the mariners/vessels actually using the EGNOS L1 Maritime Service SiS with a type approved receiver (see (1) in figure 1). The end users are also the recipient of the Maritime Safety information (MSI) related to EGNOS (see (5) in figure 1).

- MSI provider (Hydrographic organisations):

The Hydrographic organisations (in particular de NAVAREA coordinators) are the bodies responsible for the transmission of Maritime Safety Information to the final users. Depending on the specific characteristics of the EGNOS MSI, the National Hydrographic Office (NHO) will distribute the information as NAVAREA warning⁴ or Notices to Mariners (NtM)⁵, or will forward it to the National Authorities (see (6) in figure 1) to be distributed as coastal or local warnings⁶ by the established mechanism.

³Some states may also monitor the MSI at point of delivery to the mariner.

⁴ NAVAREA warning is the MSI of temporary nature applicable to one of the 21 navigational areas in the world.

⁵ Notices to Mariners (NtM) is the MSI permanent information published by the National Hydrographic Office.

⁶ Coastal or local warnings are the MSI of temporary nature applicable to a coastal or local area.