



GAMBAS
**Galileo Advanced features for Maritime domain:
Breakthrough Applications for Safety and Security**

HORIZON 2020

Beneficiary:

GSA (European Global navigation Satellite systems Agency)

Grant Agreement:

101004292

USER NEEDS COLLECTION QUESTIONNAIRE

WP 2.4: SAR FORCES

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WP 2.4: SAR FORCES

Project partners

Thales Alenia Space		FRANCE
Thales Hellas		GREECE
ECA Aerospace		FRANCE
Pildo Labs		SPAIN
Synthetica		GREECE

Project Abstract

Galileo-based solutions for a better surveilled, safer and more secure sea.

Maritime transportation is a backbone of the worldwide economic growth, representing 80% of the worldwide merchant traffic, and a major domain of human and nature activity.

The improvement of maritime safety and security has always been a major concern for the global community, and, in the last decades, the protection of environment and the resilience to climate change effects have also appeared in the overall scope. Considering the size of the maritime domain and the potentially large distances to coasts, the GNSS is a core technology of maritime systems. Getting the best possible information from on-board GNSS receivers and more generally GNSS applications (including Search-and-Rescue payloads and short-messaging capabilities of GNSS satellites) is then beneficial to the maritime community for a minimum additional investment. Galileo system is bringing new assets and functionalities, in particular compared to other GNSS constellations, which appears to be particularly relevant for the maritime community.

The objective of the GAMBAS project is to highlight how Galileo specific features can benefit to maritime domain, to propose implementations and to support demonstrations and disseminations of associated services, for the benefit of maritime domain in terms of security, safety, detection of illegal activities, protection of environment and resilience to major catastrophic events.

The project will in particular address the modernization of SSAS Cospas-Sarsat anti-piracy beacon, with unique Galileo return-link features, and the development of solutions for rescue operators and for the vessels to use Galileo robustness to jamming and spoofing (including authentication) and the expected future Emergency Warning Service. The solution will be supported by demonstration at sea, in Europe (Greece and Spain) and eventually outside Europe.

The questionnaire below aims at collecting & understanding the needs coming from the SAR forces.

The estimated time to fill this questionnaire is approximately: 25- 30 mins

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Identification

The protection of your personal data is of high importance to GAMBAS partners; therefore, we take all reasonable care to ensure that your personal data is processed safely.

When filling this questionnaire, you may share some personal data with GAMBAS partners, and Thales Alenia Space (Toulouse) will be acting as Data Controller.

Please note that, in order to carry out the processing activities specified therein, GAMBAS partners rely on your consent, which you can withdraw at any time, without affecting the lawfulness of processing based thereon before its withdrawal.

Data collected through this questionnaire is to be used only inside GAMBAS project framework and accessible to project team members and GSA (European GNSS Agency), all inside European Economic Area.

It is not subject to any communication, transfer or disclosure to third parties, without prior written consent (extra from the present consent) of the user concerned/involved/replied.

The provision of your personal data is Optional.

The records are kept in printed and/or electronic format for the duration of the GAMBAS project (up to end of June 2023).

Please note that you have the right to access your personal data and to request that your personal data be rectified or deleted. You are also entitled to request restriction of the processing of your personal data. In addition, you have the right to ask for receiving, in a structured and standard format, your personal data that you provided to GAMBAS team.

In case of any request or complaint, please send an email to kevin.salsac@thalesaleniaspace.com. You can also contact our Data Protection Officer by sending an email to the following address: dataprotection@thalesgroup.com. In any case, you also have the right to lodge a complaint with the competent data protection authority.

By checking "yes", you confirm your agreement with above terms concerning the management of the data supplied in the present questionnaire.

YES

ID (Received through Email): _____

Entity: _____

What is your responsibility inside the entity?

Years of experience in maritime operations: _____

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1. About your entity

This section aims to gather general information about your entity (or yourself if you fill this questionnaire on your behalf).

1.1 What is your role in the SAR operation chain?

1.2 In which SAR areas do you provide service?

1.3 Where are located your operational headquarters/bases/facilities?

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2. About the current operation

This section aims to gather information about your entity's SAR operations.

- 2.1 Which types of distress alerts can you receive and manage?
Categorization to be based on the communication channel used to receive the alert (radio link, Cospas-Sarsat beacons, phone call, etc.).

- 2.2 In general terms, what is the chain of actions undertaken to process each type of alert?
Involved departments, internal/external communications, aircraft operations, etc.

- 2.3 What is the average response-time between the reception of an alert and the departure of the rescue teams for each type of alerts?

- 2.4 Do you have existing procedures you follow in case of natural disaster alert?
Tsunami alert, storm, cyclones, etc.

- 2.5 What communication means do you use during the SAR operation to collect information about the vessel in distress?

- 2.6 How is the search area defined?

- 2.7 Do you have the means to retrieve information about the vessel in distress, people on-board, navigation plans, others (please detail)? Which of this information is valuable for conducting a better rescue operation?

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2.8 Which information is received by the SAR/rescue team during the SAR operation, and through which means? (beacon position update, other rescue team positions, nearby vessels, operation status, etc.)

2.9 Which communication means are available for coordination between the SAR/rescue team and RCC?

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3. Statistics

This section aims to gather statistics related to the alerts that your entity receives/manages. Please, consider that two different types of alerts are referred to, based on the following description:

- Real alerts: The ones coming from a user in distress situation when an alert is raised and processed. This includes the alerts which do not require sending rescue teams (near vessels, re-routing...).
- False alerts: The ones coming from a user not in distress situation. An alert is raised (beacon activation because of a user manipulating their beacon at home and triggering it unwillingly, user that does not correctly report to control team...) but without real reasons to initiate a SAR operation.

3.1 Average number of real alerts received per year:

3.2 Average number of false alerts received per year:

3.3 Common causes of real alerts (*natural emergencies, piracy, etc.*):

3.4 Common causes of false alerts:

3.5 Year's period with larger number of real and false alerts:

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3.6 Real and false alert percentage by type of user:

General good maritime navigation, commercial maritime operations including customers on board, fishing vessels, etc.

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4. Improvement opportunity

This section aims to get your personal opinion about how current SAR operations could be improved by adding the GALILEO constellation features.

These features include:

- **Returning Link Message:** The Galileo Return Link Service (RLS) is a free-of-charge global service available to Cospas-Sarsat RLS compatible beacons. The new functionality, currently offered uniquely by Galileo, enables a communication link that relays Return Link Messages (RLM) back to the originating beacon through the Galileo Navigation Signal in Space. By using RLM, several services can be deployed:
 - **Automatic Acknowledgement:** Acknowledge signal is automatically sent back to the beacon when the alert is received by the system.
 - **Remote Beacon Activation (RBA):** In case of overdue vessel, a signal can be sent to the beacon to activate it. Then the system can start tracking the beacon.
 - **Distress Position Sharing (DPS):** The position of a beacon in distress is shared through the GALILEO Return Link with the other beacons in the same zone.
 - **Two-Way Communication (TWC):** Service allowing the sending of pre-coded questions with multiple choice and eventually short free text.
 - **Self-Test:** Service allowing a self-test of the complete chain of communication.
- **Emergency Warning Service (EWS):** Some of the new GNSS constellations, including GALILEO, allow the operators to send messages to all users in a specific area, using a specific service called EWS. For example, this feature will allow the operators to alert the users about a piracy activity in a region or adverse meteorological conditions.
- **Open Service Navigation Message Authentication (OSNMA):** As of today, all open civil GNSS signals are transmitted in the clear, conforming to interface specifications that are fully available in the public domain. That means that the signal can be simulated, forcing a false position to a specific receiver. GALILEO will include the OSNMA feature, which hardens the signal and ensures the received data belongs to a real GALILEO satellite. This feature would ensure the received position is not being faked by any means (e.g. during piracy attacks, for illegal activities)

4.1 Would it be useful to have any of the previous Galileo features to improve SAR operations? Order them by priority.

Galileo Features	Order (1 to 7)
Automatic Acknowledgement	
Remote Beacon Activation (RBA)	
Distress Position Sharing (DPS)	
Two-Way Communication (TWC)	
Self-Test	

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Emergency Warning Service	
Open Service Navigation Message Authentication	

4.2 Automatic Acknowledgement:

4.2.1 How this new RLS feature could impact/improve your current operation?

4.2.2 Do you think the Automatic Acknowledgement is important for all types of alerts / situations?

4.3 Remote Beacon Activation (RBA):

4.3.1 How this new RLS feature would impact/improve your current operation?

4.4 Distress Position Sharing (DPS):

4.4.1 How this new RLS feature would impact/improve your current operation?

4.5 Two-Way Communication (TWC)

4.5.1 What would be the expected benefits of TWC for rescue operations?

4.5.2 What would be the expected risks of TWC for rescue operations?

4.5.3 What would be the MAXIMAL acceptable latency (from the time the Questions are sent by the SPOC to the time the Answers are received by the SPOC)?

Below 1 minute	
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1 to 5 minutes	
5 to 10 minutes	
10 to 15 minutes	
15 to 30 minutes	
30 to 60 minutes	

4.5.4 Would you be interested in a "dialogue" mode with questions depending on previous answers?

From 1 (not interested) to 5 (extremely interested)	
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4.5.5 Would you be interested in lists of Questions and Answers depending on the type of Beacon used?

From 1 (not interested) to 5 (extremely interested)	
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4.5.6 Would you be interested in lists of Questions and Answers depending on the SAR Region in which the distress is triggered?

From 1 (not interested) to 5 (extremely interested)	
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4.6 Self-Test

4.6.1 How this new RLS feature would impact/improve your current operation?

4.6.2 Do you see important points in order this feature not to disturb your current operation?

4.7 Emergency Warning Service (EWS)

4.7.1 Does your entity use already a broadcast system? If not, would you be interested in using EWS?

4.7.2 What type of alert would you like to broadcast through EWS? For which type of events?

4.8 Open Service Navigation Message Authentication

4.8.1 What means does your entity have to confirm the position of a vessel in distress? Do you have any redundant systems?

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4.8.2 Have you ever attended a distress caused by GNSS wrong positioning (spoofing)?

4.8.3 How this new feature would improve your current operation?

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5. General feedback

This section aims to get your personal opinion about how current SAR operations are conducted, and how they could be improved.

5.1 Have you ever met a rescue situation made unnecessarily complicated and risky?

Was it due to a lack of coordination? Communication? Human errors? Device failure? Unexpected behaviors of the victims? Others?

5.2 Are you satisfied with the overall international standardization or are there specific concerns (regulation, additional interfaces or point of contacts, latency to get data...) when the person in distress and the rescue teams are not from the same country?

5.3 What would you change to improve SAR operations?

Unified information system, new communication protocols between actors, standardization of tools, automation of tasks, information and training of the users to use SAR beacons, number of rescue operators/vessels, geographical distribution of bases, etc.

5.4 What is your opinion on the potential outcome of the GAMBAS project, and how could this outcome be improved?

5.5 Do you have any further comments or suggestions?

**Thank you for your time and for your contribution
to this project, which is highly appreciated!**