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**COMMISSION STAFF WORKING DOCUMENT**

**Union submission to the 9th session of the International Maritime Organization's Sub-Committee on Navigation, Communications and Search and Rescue on two-way communication service demonstration for Cospas-Sarsat distress beacons using the SAR/Galileo Return Link Service**

## **Union submission to the 9<sup>th</sup> session of the International Maritime Organization's Sub-Committee on Navigation, Communications and Search and Rescue on two-way communication service demonstration for Cospas-Sarsat distress beacons using the SAR/Galileo Return Link Service**

### **PURPOSE**

This Staff Working Document contains a draft Union submission to the International Maritime Organization's (IMO) 9<sup>th</sup> Sub-Committee on Navigation, Communications and Search and Rescue (NCSR 9). The IMO has indicatively scheduled NCSR 9 from 21 to 30 June 2022.

The draft submission presents the preliminary results of the demonstration of a two-way communication service on Cospas-Sarsat distress beacons to be provided by the Galileo system by using the SAR Return link. It also presents for discussion the preliminary list of predefined questions and answers issued following the stakeholders consultation. The Committee is invited to take note of the suggestions to allow SAR forces to receive additional information on the distress situation. The document builds on previous Union submissions on the topic, namely for NCSR 8, MSC 104 and MSC 105.

### **EU COMPETENCE**

Regulation (EU) 2021/696<sup>1</sup> establishes the Union Space Programme and the European Union Agency for the Space Programme (Article 1). The programme includes the European satellite navigation policy that provides the Union with two satellite navigation systems: the system established under the Galileo programme (Article 3(1)(a) of the Regulation (EU) 2021/696) and the European Geostationary Navigation Overlay Service (EGNOS) system (Article 3(1)(b) thereof).

According to Art. 28(1) of the Regulation (EU) 2021/696, the Commission has overall responsibility for implementing the European Space Programme, including Galileo and EGNOS. The aim of the Galileo programme is to establish and operate the global satellite navigation and positioning infrastructure specifically designed for civilian purposes, which can be used by a variety of public and private actors in Europe and worldwide. Furthermore, Galileo provides the Search and Rescue service to detect and locate distress worldwide and to provide feedback via the Return Link Service to distress beacons. The proposed two way communication/messaging is based on the unique feature of Return Link Service provided by Galileo.

In light of all of the above, the present draft Union submission falls under EU exclusive competence.<sup>2</sup> This Staff Working Document is presented to establish an EU position on the matter and to transmit the document to the IMO prior to the required deadline of 15 April 2022.<sup>3</sup>

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<sup>1</sup> Regulation (EU) 2021/696 of the European Parliament and of the Council of 28 April 2021 establishing the Union Space Programme and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013 and (EU) No 377/2014 and Decision No 541/2014/EU; OJ L 170, 12.5.2021, p. 69.

<sup>2</sup> An EU position under Article 218(9) TFEU is to be established in due time should the IMO Maritime Safety Committee eventually be called upon to adopt an act having legal effects as regards the subject matter of the said draft Union submission. The concept of '*acts having legal effects*' includes acts that have legal effects by virtue of the rules of international law governing the body in question. It also includes instruments that do not have a binding effect under international law, but that are '*capable of decisively influencing the content of the legislation adopted by the EU legislature*' (Case C-399/12 Germany v Council (OIV), ECLI:EU:C:2014:2258, paragraphs 61-64). The present submission, however, does not produce legal effects and thus the procedure for Article 218(9) TFEU is not applied.

<sup>3</sup> The submission of proposals or information papers to the IMO, on issues falling under external exclusive EU competence, are acts of external representation. Such submissions are to be made by an EU actor who can represent the Union externally under the Treaty, which for non-CFSP (Common Foreign and Security Policy) issues is the Commission or the EU Delegation in accordance with Article 17(1) TEU and Article 221 TFEU. IMO internal rules make such an arrangement absolutely possible as regards existing agenda and work programme items. This way of proceeding is in line with the General Arrangements for EU statements in multilateral organisations endorsed by COREPER on 24 October 2011.

**AGENDA ITEM 13: DEVELOPMENT OF GLOBAL MARITIME SAR SERVICES,  
INCLUDING HARMONIZATION OF MARITIME AND AERONAUTICAL PROCEDURES**

**Two-way communication service demonstration for Cospas-Sarsat distress beacons  
using the SAR/Galileo Return Link Service**

**Submitted by the European Commission on behalf of the European Union**

**SUMMARY**

*Executive summary:* This document presents the preliminary results of the demonstration of a two-way communication service on Cospas-Sarsat distress beacons to be provided by the Galileo system by using the SAR Return link. It also presents for discussion the preliminary list of predefined questions and answers issued following the stakeholders consultation. The Committee is invited to take note of the suggestions to allow SAR forces to receive additional information on the distress situation.

*Output:* TBC

*Action to be taken:* Paragraph 26-30

*Related documents:* NCSR 8/10/2, MSC 104/inf.4, MSC 105/inf.5

**Introduction**

1 At the eighth session of the Sub-Committee on Navigation, Communications and Search and Rescue (NCSR 8) in 2021, the European Union presented a submission (NCSR 8/10/2), highlighting the plans to perform a demonstration of the two-way communication Service with the Galileo Return Link capability on the second generation of Cospas-Sarsat distress beacons.

2 Following that paper, action was taken to report at subsequent meetings the progress of the demonstration of the two-way communication service by the European Commission's Galileo SAR services.

3 The European Union therefore presented further information papers at the MSC 104 and MSC 105 (MSC 104/INF.4, MSC 105/INF.5) describing the outcomes of the stakeholders consultation and the advantages that might be provided by the Two Way Communication functionality to collect information from a distress area.

4 This paper presents to the Committee the concept developed after the stakeholders' survey, which is based on an initial set of questions, a Q&A session between the person in distress and the SAR forces<sup>4</sup> and instruction phases.

<sup>4</sup> With the generic term of SAR forces (not strictly referring to military forces) the Serenity project indicates the members of Rescue Coordination Centres, SAR Points Of Contacts and the Search and Rescue Units which were interviewed or participated to the survey.

5 SAR forces have expressed the highest interest in the possibility to have a direct confirmation of a false alert from the beacon user. Due to the high level of false alerts of the Cospas-Sarsat system (~90%), this possibility has been identified as a real benefit.

6 The list of questions (initial set, Q&A session) with suggested answers and the list of instructions suggested for Maritime rescue are presented.

### **SERENITY project highlights**

7 SERENITY is an 18-month project funded by the European Union, which started in January 2021, and is being carried out by Telespazio France, CNES, Thales Alenia Space France, Orolia and Pildo Labs.

8 SERENITY aims at refining the requirements of the Two-Way Communication service (TWC) and performing a Service Demonstration using the SAR/Galileo Return Link Service (operational since January 2020) with the development of a prototype of a Second Generation C/S beacon.

9 The TWC service demonstration will allow completing the service definition by inviting SAR forces to prepare and execute the demonstration, and to provide feedbacks on the designed and demonstrated service.

### **Stakeholder consultation**

10 The Stakeholder consultation was launched in March 2021. It is conducted with online questionnaire, interviews and workshops widely shared in SAR community. The questionnaire is accessible until the end of the project at: <https://tinyurl.com/EU-TWC-User-consultation-2021>.

11 In February 2022, more than 180 stakeholders had been consulted, composed of 70% of beacon users and 30% of SAR forces members. The non-exhaustive list of activities of the respondents spans around: heads of RCC, RCC operators, SAR helicopter teams, SAR aircraft teams, paramedics, rescue swimmers, military pilots, skippers, trekkers, trailers, hikers, kayakers, skiers, mountaineers, leisure pilots, commercial pilots, commercial flight crews, merchant navy officers, airline flight test engineers, beacon manufacturers.

12 The responding SAR forces are for 73% from EU Member State and for 27% from non-EU countries.

### **Main outcomes of the consultation**

13 The responding SAR forces confirmed the importance to receive an initial set of answers to corresponding to the initial SAR checklist. The initial questions could be automatically triggered at beacon activation and the answers sent with the alert message (using rotating fields of SGB). These answers should be made available as soon as possible and before SRU take-off:

- i. Nature of distress (including false alert confirmation);
- ii. Number of person involved in distress;
- iii. Need for medical assistance;

14 It would be appropriate to collect these answers after the activation of the beacon or, to a certain extent, pre-coded by the user before each use ("go fishing, 3 persons in the boat..."). Such information might be embedded in the first Forward Links Alert Messages

(FLAMs) sent by the beacon in distress following the activation of the alert.

15 The responding SAR forces confirmed that the possibility to exchange pre-defined questions and answers with the persons in distress via the alert beacon will greatly improve their operations. The questions will be sent to the activated beacon using the Return Link Service. A preliminary list of questions with multiple-choice answers relevant to the maritime case is provided in annex (list to be expanded).

16 The responding SAR forces considered that having a pre-defined instructions “how-to-act” to be sent to the beacon in distress relevant to the maritime case will greatly improve their operations. The pre-defined instructions “how-to-act” will be channeled to the activated beacon using the Return Link Service. A preliminary list is provided in annex (list to be expanded).

17 The project highlighted that the list of questions and instructions available at RCC side should be expanded to provide more flexibility to the rescue coordinators. A consolidated list will be produced at the end of the project to be the baseline for the first implementation of the service.

### Service specification

18 The TWC service will allow the exchange of information between the SPOC and the beacon users through pre-defined questions and answers with the following features:

- 3 initial questions triggered automatically by the beacon at activation
- Specific questions selected by SAR forces in charge of the rescue (with up to 7 possible answers per question) on the RCC Graphic User Interface.
- The answers will be selectable via a Graphic User Interface on the Beacon.



Figure 2: Mechanical design of a SGB TWC beacon prototype

19 The TWC service shall allow sending “1-way” instructions ‘how-to-act’ from SAR forces to beacon users.

20 The TWC service latency, compatible with SAR forces’ needs, shall be:

- 1-3 minutes for the beacon user to receive questions and “1-way” messages;
- 15 minutes for SAR forces to receive answers (Cospas-Sarsat performances).

This proved to be in line with the average time between alert receptions by the SRU and take-off (between 15 and 30 minutes) as stated by the responding SAR forces.

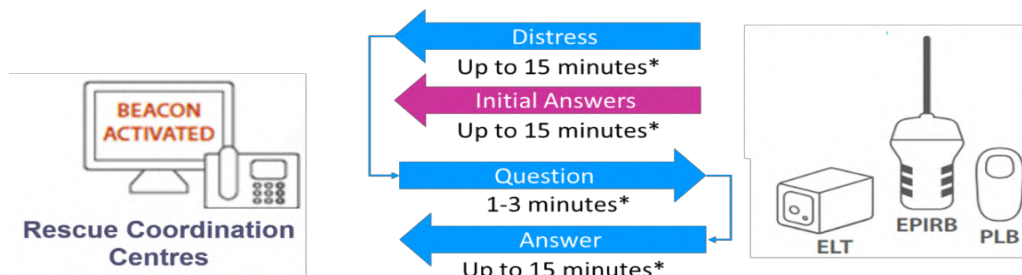


Figure 3: TWC service latency

21 The TWC service can be used in any language by setting up independently the SPOC and the beacon user interfaces. This will remove the language barrier to communicate TWC questions, answers and “1-way” messages. (common database for the service developed in several languages).

22 The TWC service would need to provide mechanisms to control the battery consumption.

### Project forward plan for the TWC demonstration

23 The Project has developed a prototype of Personal Locator Beacon (PLB) for the demonstration but the requirements baseline could be tailored to all types of beacons (ELT, EPIRB).

24 The project is proceeding with the preparation of the Service ‘live’ demonstration to be held in September 2022 with the support of operational SAR forces. Since October 2021, a close coordination has been setup with the French MRCC Gris-Nez, allowing identifying a preliminary demonstration area fitting operational constraints and the potential support of the French MRCC Jobourg.

25 The demonstration will be designed to maximise the opportunity to get technical and operational feedbacks from the SAR community (workshops, interviews and more) in view of consolidation of the TWC service specification. The demonstration will be available on a pinned post @SARGalileo Twitter account.

### Actions requested of the Sub-Committee

26 The Sub-Committee is invited to note the interest of the TWC service for a direct confirmation of false alert with the beacon via the Return Link Service.

27 The Sub-Committee is invited to note the interest expressed for a functionality to include preliminary information in the alert as described in paragraph 13 and to invite interested participants to investigate the potential implementation of this functionality.

28 The Sub-Committee is invited to note the interest expressed for the Two Communication Service with pre-defined questions and answers as described in paragraph 15 and to invite interested participants to investigate the potential implementation of this functionality.

29 The Sub-Committee is invited to note the interest expressed for the Two Communication Service with pre-defined instructions “*how-to-reat*” to be sent to the beacon in distress as described in paragraph 16 and to invite interested participants to investigate the potential benefits of the implementation of such functionality.

30 The Committee is invited to confirm its interest in exploring further the suggestions in paragraphs 26 to 29 in technical working group as appropriate.

## Annex 1

### Initial set of questions

1. Nature of distress; a. False Alert b. MOB c. Fire on board d. Flooding e. Injured people on board f. Engine/Mechanical damage	2. Number of persons involved in distress; a. 1-3 b. 4-10 c. >10	3. Need for medical assistance; a. Yes b. No
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### Q&A session: exchanges between SAR Forces and the person in distress (list to be expanded / complemented)

1. Distress situation ? <input type="radio"/> Person in the water <input type="radio"/> Life raft <input type="radio"/> On-board <input type="radio"/> Grounded <input type="radio"/> Other	2. Person in the water ? <input type="radio"/> 1-3 <input type="radio"/> 4-10 <input type="radio"/> > 10	3. Length of the boat/craft ? <input type="radio"/> <5m <input type="radio"/> 5-10m <input type="radio"/> 10-20m <input type="radio"/> >20m
4. Color of the boat/craft ? <input type="radio"/> White <input type="radio"/> Grey <input type="radio"/> Black <input type="radio"/> Yellow/Orange <input type="radio"/> Red <input type="radio"/> Blue/Green <input type="radio"/> other	5. Is the boat dismasted? <input type="radio"/> Yes <input type="radio"/> No	6. Visible height of the mast? <input type="radio"/> No Mast <input type="radio"/> <5m <input type="radio"/> 5-15m <input type="radio"/> >15m
7. Visibility on scene ? <input type="radio"/> Dense fog <input type="radio"/> Thin fog <input type="radio"/> Cloudy <input type="radio"/> Clear sky	8. Do you have a boat tender ? <input type="radio"/> Yes <input type="radio"/> No	9. Survival equipment on-board? <input type="radio"/> First Aid Kit <input type="radio"/> Life raft <input type="radio"/> Life jacket <input type="radio"/> Flares <input type="radio"/> None
10. Drinking Water available? <input type="radio"/> Yes <input type="radio"/> No	11. Food available? <input type="radio"/> Yes <input type="radio"/> No	12. Age of the person in distress? <input type="radio"/> youngest age <input type="radio"/> oldest age <input type="radio"/> all ages
13. Weather on scene ? <input type="radio"/> Rough <input type="radio"/> Bad <input type="radio"/> Moderate <input type="radio"/> Good	14. Do you have defibrillator on-board ? <input type="radio"/> Yes <input type="radio"/> No	15. Do you hear/see the rescue ? <input type="radio"/> Yes <input type="radio"/> No

### "How to react" instructions to be sent by SAR forces to the activated beacon via the Return Link.

Switch on any light;	Go into the boat tender;
Switch on hand-held flare	Go in front of the boat;
Switch on smoke flare	Go at the rear of the boat.
Catch and keep the rope with your hand only;	Save battery power until xx:h
Signal your presence when hearing rescue;	Save battery power until zz:h
Switch on VHF on channel 16	Hold tight until complete rescue;
Switch on MOB AIS	