

From: IALA
To: RTCM

C02-12.2.1
(ENG20-9.2.2.1)

LIAISON NOTE

Liaison Note to RTCM regarding the 10402.n Standard

1 INTRODUCTION

IALA would like to express their appreciation for the continued support from RTCM in maintaining the RTCM 10402.3 standard over many years. This standard is still used by DGNSS beacons world-wide and is important for the maritime safety.

2 DISCUSSION

IALA provided over the last years information to RTCM in two Liaison Notes:

1. Liaison Note to RTCM on SC-104 2.X (IALA22-201 (C76-12.1.1))
2. Liaison Note to RTCM regarding update of RTCM 10402.3 Standard (IALA24-132 (C80-12.2.1))

This Liaison Notes expressed the need of IALA members to extend the existing RTCM 10402.3 or to generate a new version of RTCM 10402.n and publish it.

Starting with the ACCESEAS project in the North Sea region in 2012 IALA members investigated in the extension of the maritime radio beacon service by an additional radio navigation signal component. The service, which is named medium frequency (MF) Ranging Mode (R-Mode), enables ranging and positioning in coastal waters.

Measurements in the Republic of Korean waters, Canadian waters and the Baltic Sea show feasibility of this approach to provide a positioning service as maritime backup for GNSS for navigation in coastal areas. To provide the R-Mode mobile receivers with necessary information to perform positioning, the R-Mode system has to provide R-Mode a navigation message together with the legacy DGPS /DGLONASS service (RTCM 10402.3). IALA members developed a proposal for an MF R-Mode navigation message considering the latest version of RTCM 10402.3.

The proposed extension of RTCM 10402.3 was already tested in a Republic of Korean testbed which is still in operation. In addition, the R-Mode Baltic Sea testbed will implement the proposed R-Mode navigation message for its transmitters in 2025/2026. MF R-Mode receiver prototypes, which uses the proposed RTCM 10402.3 extension, will be available at the same time. Extensive tests are foreseen to be finished by the end of 2026.

IALA would like RTCM to consider implementing support for R-Mode messages in the standard RTCM 10402.3 or newer version. The IALA Guideline on medium frequency R-Mode signal and navigation message with contains the proposal is attached as annex to this Liaison Note.

Furthermore, the current edition of RTCM 10402.n DGNSS broadcast standard is 2.3, which defines messages for DGPS and DGLONASS only. There was a plan to develop edition 2.4 to include new message types for differential

corrections for other GNSS/RNSS, e.g., Galileo, BDS, IRNSS, QZSS, but the edition 2.4 has never been published. However, the IEC testing standards for Galileo, BDS and IRNSS receiver equipment refer to the pertinent differential correction message types as supposedly specified in RTCM 10402.4, where the draft was withdrawn.

This has led to the situation where receiver manufacturers are not able to have their receiver equipment certified in accordance with the testing standards. If the GNSS/RNSS receivers used in the industry are continually incapable of applying differential corrections to Galileo, BDS, IRNSS, and QZSS, differential GNSS services may die out, which should be avoided.

IALA asked RTCM for their plan of supporting differential corrections to Galileo, BDS, IRNSS, and QZSS in the future.

3 ACTION REQUESTED

RTCM is requested to:

- Take note of provided information.
- Consider to implement the support of the proposed R-Mode navigation message in the standard, either as an amendment to the existing RTCM 10402.3, or in a new version of the standard.
- Provide information about RTCM plans, when differential corrections to Galileo, BDS, IRNSS, and QZSS will be supported.

Annex IALA G1187 Ed1.0 MF R-Mode signal structure and message