Input paper: [[1]](#footnote-1) ENAV20-13.9

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

**□** ARM **□** ENG **□** PAP **x** Input

x ENAV  **□** VTS **□** Information

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Workplan Task Number / Technical Domain 2 3.1.16

Working Group WG5

Author(s) / Submitter(s) Michael Hoppe (WG5 Vice Chair)

MF R-Mode 2-Channel Receiver and Skywave Report

# Summary

In 2013 the German Federal Waterways and Shipping Administration contracted for a feasibility study of R-Mode using medium frequency (MF) differential GNSS (DGNSS) and very high frequency (VHF) AIS signals as well as those signals in combination and in combination with eLoran [2]. This study was part of the European Accessibility for Shipping, Efficiency Advantages and Sustainability (ACCSEAS) project. To further study propagation and skywave effects, the R-Mode modulator was relocated to a more powerful transmitter at Heligoland in the North Sea and the receiver moved to a location near the Kiel Canal (east of the transmitter). A second receiver was installed to the west of the transmitter to enable simultaneous comparison of two different propagation paths 8terschellin, NL with a basline of 213 km). A third receiver site nearly along the signal propagation path to the Kiel Canal, was added most recently. The report contains also a description of a two channel MF receiver which enable first positioning measurements.

The final report is being shared to help progress R-Mode development and to seek any comments or questions on the approach taken

# Action requested of the Committee

The Committee is requested to:

1. Consider report, ENAV21-13.4.1, when developing a Guideline on R-Mode (MF).
2. Provide any comments on the report to WG5 .

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Input papers should be assigned to a work task as listed in the Committee work plan which is available in input papers. Leave open if uncertain but consider how the paper is to be processed if not relevant to a work task [↑](#footnote-ref-2)