Input paper: [[1]](#footnote-1) ENG9-2.1.10

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

**□** ARM X ENG **□** PAP X Input

X ENAV **□** VTS **□** Information

Agenda item [[2]](#footnote-2) (from agenda) 2.1

Workplan Task Number / Technical Domain 2 Radio Navigation Services Task 3.2.3

Working Group WG3-PNT

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R-Mode – working arrangement for VDES implementation

# Summary

## Purpose of the document

This document aims to consider a working arrangement between ENAV/WG2 on and ENG/WG3 to support the required modification of the VDES ITU-R standard to support a future R-Mode implementation.

## Related documents

* R-Mode roadmap (ENAV18-14.2.18)
* LIAISON NOTE from ENAV22 to ENG8 on R-Mode using VDES (ENAV22-9.3.6)
* LIAISON NOTE from ENG8 to ENAV 23 and ARM8 on VDES R-Mode Requirements (ENG-08-12.1.25)
* Results of discussion on VDES R-Mode (ENG8-11.13.2)
* Proposal for R-Mode workshop 2019 (ENG8-12.1.23)

# Background

The concept of R-Mode, or ranging mode, was first introduced to the IALA ENAV Committee many years ago. It is an idea of using timing information on existing maritime radio systems to provide GNSS independent PNT. Most promising candidates in this respect are the marine radio beacons using MF transmissions and AIS/VDES networks using VHF transmissions.

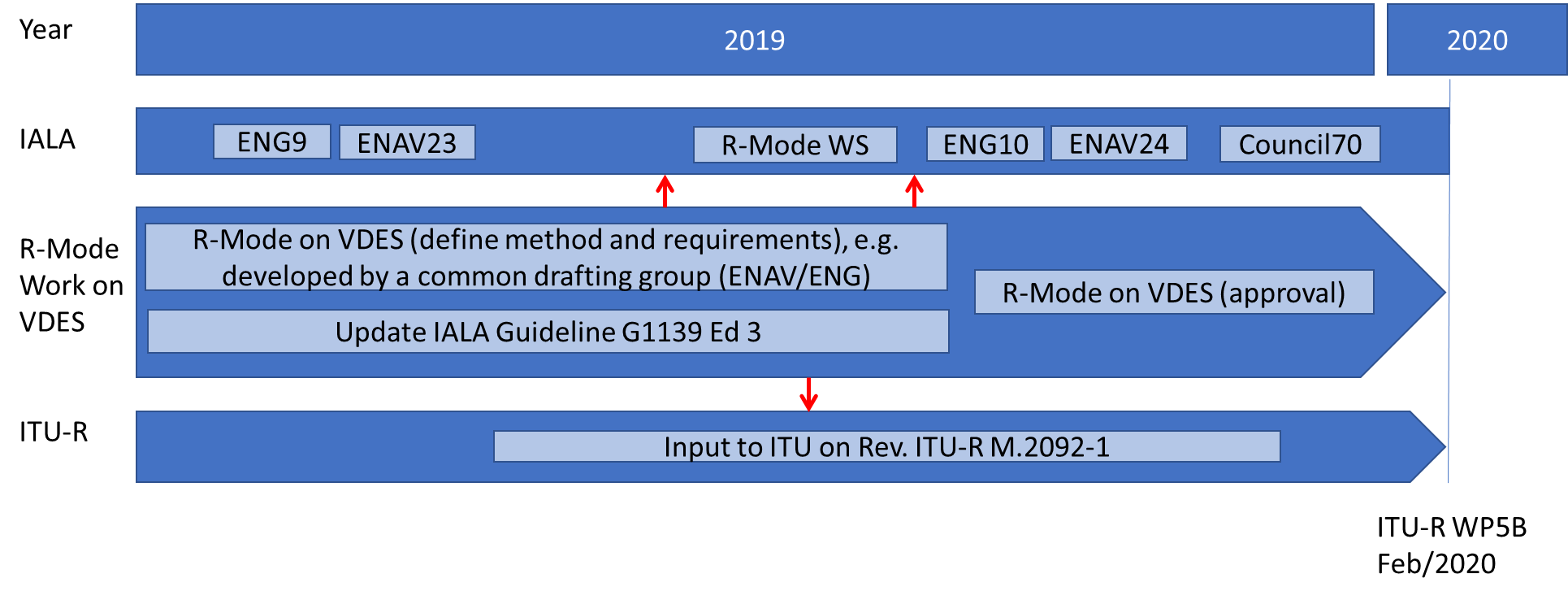
During the last year, some discussions have taken place on the possible implementation of the R-Mode on VDES. Various methods on how to implement R-Mode VDES were proposed in different research projects and study papers.

At the same time ENAV-WG2 intends to produce a new revision of IALA Guideline 1139 (The Technical Specification of VDES), which is intended to become the basis for the revision of Recommendation ITU-R M.2092-0 on the technical characteristics of VDES. In this context ENAV WG2 has developed a roadmap which indicates that required modifications (resulting from on the R-Mode implementation) are requested by ENAV24, so that the required changes to the VDES specification can be appropriately assessed and reflected in the revision process for Recommendation ITU-R M.2092-0. The ENAV-WG2 proposed a joint ENG PNT-WG3/ENAV-WG2 inter-sessional meeting / workshop to progress further work on VDES R-Mode.

Furthermore, the ENG committee proposed a workshop on the technical concepts of R-Mode implementation and the way forward to an operating system (ENG8-12.1.23). This workshop was approved at Council-68 meeting and is planned to take place in September (9th-12th) 2019 (to be confirmed) at the IALA HQ.

# Discussion

R-Mode using VDES transmissions is a promising candidate for a back-up positioning system for coastal and harbour areas. The appropriate standard documents (provided from IALA and ITU-R) are currently under development and will be the baseline for the VDES equipment manufactured in the next few years. To enable the R-Mode transmission on VDES, it is essential that modifications in the standard documents (resulting from R-Mode implementation) are performed in accordance with the international timelines and milestones. The revision of existing ITU-R M.2092-0 has to be finished by end of 2019. Thus, the initial key aspects that will enable the implementation of R-Mode at an international level have to be finished and approved at ENG10/ENAV24”. **Figure 1** provides a proposed roadmap which indicates appropriate timelines at IALA and ITU-R. The roadmap further indicates required work for an R-Mode implementation on VDES.



**Figure 1: Proposed Roadmap for R-Mode implementation on VDES**

To enable the incorporation of R-Mode requirements into the appropriate standards it would be essential that:

* an implementation method, how to implement ranging information on VDES will be defined and agreed in the international domain and that;
* resulting requirements and necessary modifications for VDES will be specified to enable the finalisation of appropriate standard documents at IALA and ITU level.

Therefore, it is proposed that:

* ENAV-WG2 and ENG-WG3 agree on an implementation roadmap which will enable the timely provision of required information for the standards under development within IALA and ITU
* ENAV-WG2 and ENG-WG3 agree on an R-Mode implementation method and derive appropriate requirements for VDES preferably before the R-Mode workshop in September 2019. This would enable a discussion and agreement in a larger international level at the R-Mode workshop. The output of the R-Mode workshop should be used as inputs to ENAV24 and ENG10 where it should be approved at Committee level. This would also allow approval at Council70 and a timely submission to ITUR WP-5B, in February 2020.
* ENAV-WG2 and ENG-WG3 members discuss technical matters using a common communication platform

It is also proposed that

* ENAV-WG2 and ENG-WG3 members and experts consider a common drafting group at their first committee meetings in 2019
* ENAV-WG2 and ENG-WG3 consider a common R-Mode VDES intersessional meeting to provide required and mature input documents to the planned R-Mode workshop or for ENAV24/ENG10 meeting period.

# References

# Action requested of the Committee

The ENAV/ENG Committees are requested to:

1. Consider and comment to the proposed roadmap for R-Mode implementation on VDES (Figure 1)
2. Consider and comment the proposals in Chapter 3
3. Note the planned R-Mode workshop in September 2019 at IALA HQ
4. Plan for intersessional work if required

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)