Input paper: [[1]](#footnote-2) ENAV26-8.2.2

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

**□** ARM **□** ENG **□** PAP X Input

**X** ENAV **□** VTS **□** Information

Agenda item [[2]](#footnote-3) 10.2

Technical Domain / Task Number 2 2

Author(s) / Submitter(s) CIRM

CIRM report to IALA ENAV25

on vocoders for digital voice channels over VHF

# Summary

This paper is a response to an action item from ENAV 24. It provides a response on issues that should be considered when selecting an appropriate vocoder for maritime use and includes some other considerations that in CIRM’s view should be considered in relation to the digitization of VHF voice channels.

## Purpose of the document

This is an information paper in response to a request for information from ENAV24.

# Background

At ENAV24, during the discussion on digitization of VHF voice channels, Working Group 2 identified an issue that a suitable vocoder needs to be identified as a standard for maritime use to ensure interoperability if this technology is implemented in the maritime mobile band.

CIRM was asked to investigate existing use of vocoders for maritime use and provide a report to ENAV25 with recommendations and justifications on suitable vocoders for consideration in a further review by Working Group 3.

# Discussion

It is CIRM’s view that licensing and patents are important considerations when selecting an appropriate vocoder. Use of technology should not involve patents unless a patent owner was prepared to donate or sell the patent.

CIRM notes that two of the most used vocoders for mobile radio at present are AMBE+2 and ACELP. AMBE+2 is used by DMR and dPMR, and ACELP is used by TETRA. CIRM notes that both AMBE+2 and ACELP are covered by patents.

CIRM suggest that the Opus audio codec (<http://opus-codec.org/>) may be worthy of further consideration by Working Group 3, as it is open and royalty-free.

On the wider issue of digitization of VHF voice channels, CIRM notes in the Provisional Final Acts of World Radiocommunication Conference 2019 (WRC-19), that Resolution COM6/28 (WRC-19): ‘Considerations to improve the utilization of the VHF maritime frequencies in Appendix 18’ invites relevant international organizations to actively participate in the studies by providing requirements and information that should be taken into account in ITU-R studies. It is CIRM’s view that the following issues need to be considered in the ENAV Committee’s ongoing work on this subject:

* A cost benefit analysis covering the entire maritime community, i.e. VHF coast stations, commercial shipping, recreational boating, ports, harbours and marinas etc.
* The relative merits of TDMA vs. FDMA (e.g. in terms of frequency spectrum efficiency)
* Management of co-existence of digital and analogue channels
* Should there be an allocation of a separate channel for digital distress, safety and calling (or should Channel 16 or Channel 70 take on this role)?
* What will be the future relationship between Digital Voice and DSC (e.g. could the same technology be used for DSC)?
* Could digitisation create an opportunity for SMS on VHF channels and position information with low overhead?
* What ITU alignment issues are involved?
* An implementation plan that clearly sets out how digitization would be introduced and the impact of each stage on the maritime community

CIRM will consider the above issues further and will report back with recommendations.

# Action requested of the Committee

The Committee is requested to:

1. Note the above.
2. Continue the discussion with CIRM on this issue.

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-2)
2. Leave open if uncertain [↑](#footnote-ref-3)