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**□** ARM **□** ENG **□** PAP **X** Input

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

Agenda item [[2]](#footnote-2) 8.4

Technical Domain / Task Number 2 WG2 – review of Candidate Technologies

Author(s) / Submitter(s) J Carson-Jackson, Chair, IALA ENAV WG2

Candidate Technologies for use by IALA members – Review at ENAV26

# Summary

This paper highlights a number of candidate technologies that may be suitable for use by IALA members, and could be reviewed by the IALA ENAV Committee. This paper presents the technologies that have been identified for discussion and possible review at ENAV26.

## Purpose of the document

This paper is provided to assist WG 2 in their activities. It invites members of the ENAV Committee to provide input on the candidate technologies identified and also identify other candidate technologies.

## Related documents

ENAV25-2.1.1 – Action items from ENAV 24

ENAV25-2.1.2 – Report of ENAV24

ENAV25-10.0 – Terms of Reference for WG2

IALA G1153 – Template for the review of emerging technologies for possible use by IALA members

IALA Maritime Radio Communications Plan, December 2017

# Background

The terms of reference for WG2 highlight the expectation of the WG to:

1. monitor the technological environment and identify possible technologies and systems to be evaluated;
2. invite representatives of candidate technologies to provide information to the working group;
3. evaluate selected emerging digital technologies at a high level, and identify their advantages, limitations and applicability in consideration of user requirements and needs of IALA membership.
4. provide internal advice on emerging digital technologies and inform other working groups and IALA Committees on matters of relevance to their work;
5. […]

To assist with the discussion, an initial review process for digital technologies was prepared and revised. As part of the monitoring process, the reports of ENAV22, ENAV23 and ENAV24 requested members of the IALA ENAV Committee to review and use the template to provide input on the identified, and other, emerging technologies that may be suitable for use by IALA members and provide input and expertise to ENAV25.

At ENAV 25 the template for the review of emerging technologies was approved and forwarded to IALA Council. IALA Council approved the document as Guideline 1153.

The current Maritime Radio Communication Plan (MRCP) includes a section that looks at different technology capabilities which may be suitable for different geographical areas – ENAV area definitions and GMDSS Sea Areas. These are presented in tables 1, 2 and 3 of that document, and may assist discussions on candidate technologies.

# Discussion

At ENAV 24 IALA ENAV WG2 completed their initial review of 4G (including LTE) and dPMR based on the Candidate Technology Review template.

At ENAV24, and between ENAV24 and ENAV 25 some technologies have been identified as possible candidate technologies for review. These include:

* LoRA / LoRaWAN – a low power-wide area network (LP-WAN) system that enables long transmission with limited power consumption. (<https://www.mdpi.com/2079-9292/8/1/15/htm> - tracking and monitoring system based on LoRa Technology for lightweight boats; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6163321/> Experimental study of LoRa transmission over seawater). This technology will be reviewed at ENAV 25 (ENAV25-2.1.1, action item 26 refers). This discussion may include a review of Sigfox if expertise is available.
* LEO constellation developments, noting the growth in digital communications capabilities from different low earth orbiting satellites. This technology will be reviewed at ENAV 25 (ENAV25-2.1.1, action item 25 refers)
* NAVDAT – noting developments as presented at IMO, including the recent input to NCSR, this technology may be reviewed if expertise and input is received for ENAV25.
* LiFi – LiFi, or light fidelity, is a communications capability based on Visual Light Communication (VLC) that uses LEDs to network a wireless system. this technology may be reviewed if expertise and input is received for ENAV25.

All listed technologies can be used for proprietary maritime communications, but may not address standardization or security aspects.

# Action requested of the Committee

The Committee is requested to:

1. Review the proposed candidate technologies and provide input, as appropriate, to assist WG2 in their deliberations;
2. Identify any additional technologies that may be suitable to address the requirements and needs of IALA members and provide information on these to WG2 during ENAV25.

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