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

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Candidate Technologies for use by IALA members

# 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.

## 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

ENAV23-2.1.1 – Action items from ENAV 22

ENAV23-12.1.7.1 – Digital Technologies, initial review process

ENAV24-2.1.2 – Report of ENAV23

ENAV24-10.0 – Terms of Reference for WG2;

IALA Maritime Radio Communications Plan, December 2017

# Background

The terms of reference for WG2 (ENAV24-10.0) 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 and ENAV23 requested to review and use the template to provide information on developing technologies.

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

Following ENAV23 it was agreed to include a review of the Chinese Study of LTE, and to finalise the high-level review of LTE at ENAV24. In addition, noting the presentation on dPMR, it was agreed to carry out a high-level review of dPMR at ENAV24.

Between ENAV23 and ENAV 24 some technologies have been identified as possible candidate technologies for review. These include:

* Oneweb – announced global maritime shipping services at Nor-Shipping (<https://www.oneweb.world/media-center/oneweb-announces-global-maritime-services-at-nor-shipping>)
* 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).
* GSM Connect – LTE, 4G and 3G, recently announced by Navarino to provide GSM data service of up to 100Mbps to vessels within range of shore networks. (<https://smartmaritimenetwork.com/2019/07/25/navarino-adds-100mbps-gsm-option/>)

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

For example, LoRa WAN is attractive or closed-system monitoring of AtoNs, however the frequency used may need adjusting to avoid interference. One-web may deliver high speed internet to mobile stations, but requires a dedicated, specialised antenna which could be cost prohibitive.

# 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 ENAV24.

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