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| From: DTEC Committee | ARM21-6.2.6  (DTEC5-15.3.1) |
| To: ARM, ENG, VTS Committee(s) | 03 October 2025 |

LIAISON NOTE

Update of Emerging Technology Review

# INTRODUCTION

As an ongoing task, the DTEC Committee continues to review emerging technologies, using IALA G1153 – Template for the Review of Emerging Technologies for Possible use by IALA Members.

The review of three (3) emerging technologies was completed or updated at DTEC 5.

# DISCUSSION

## Emerging Technology Reviews Completed

The DTEC Committee welcomed the comments previously provided on the use of an ‘Emerging Technologies – Candidate Technologies Tracker’ and updated the format of the document at DTEC2. DTEC continues to review and update the summary table.

At DTEC 5 three (3) ongoing reviews were completed or updated:

* QUALCOMM 5G-NR Positioning (may have specific interest for ENG)
* SADRMT (Ship Air Draft Remote Measurement Technology) (may have specific interest for VTS)
* Metal Wave Radio Free communication technology (MS@MS) (may have specific interest for ARM).

To facilitate access to the summary of technology reviews, a folder is located to the parent folder of the Committee File Share. Within the folder there are sub-folders for each technology, including the detailed review and related documents. In addition, ‘parent’ of the folder contains the Candidate Technology Tracker Summary tables, as updated at each DTEC meeting. (Figures 1 and 2 refer)

A screenshot of a computer

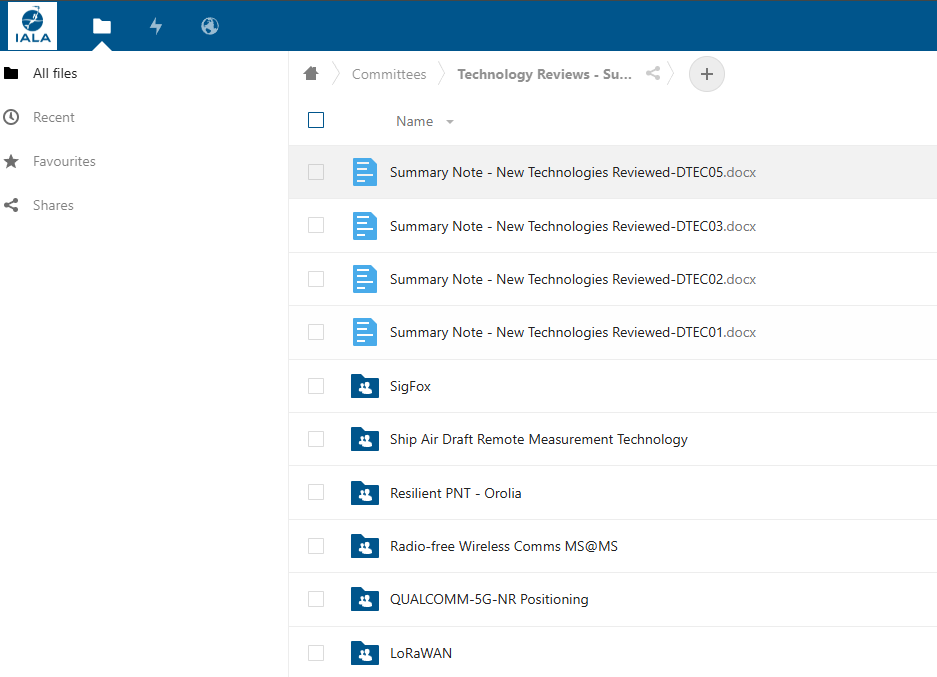
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Figure 1 – Location of the Technology Reviews Figure 2 – Contents of the Technology Review Summary folder

For ease of access, the updated ‘Technology Tracker’ is provided as an Annex to this liaison note. This is the same document that is found in the *Technology Reviews - Summary and Folders* / *Summary Note – New Technologies Reviewed-DTEC05*.

## Review of G1153 – Template for assessing emerging technologies

As an ongoing activity, DTEC is reviewing and updating G1153 – *Template for the review of emerging technologies for possible use by IALA members*. Input to enhance the guideline and ensure a relevant, consistent and timely review process for emerging technologies. This review is expected to be undertaken at DTEC6, and proposals for amending G1153 are requested for DTEC6.

# ACTION REQUESTED

The IALA ENG, ARM, and VTS Committees are invited to:

* Note the update of the Emerging Technologies – Candidate Technology Tracker
* Review and, if appropriate, provide input to support the review and update of IALA G1153 to DTEC 6
* Identify any emerging technologies that may be suitable for DTEC’s reviewto DTEC6

# ANNEXES

1. Revised version of the Emerging Technology Candidate Technology Review Summary.

Emerging Technologies – Candidate Technology Tracker

# Introduction and Purpose

The development of digital technologies continues to be rapid, and it impacts on almost all aspects of the maritime industry, including maritime communications, aids to navigation and VTS. Digital technologies deal with the creation and practical use of digital or computerised information using devices, methods, or systems. (Source <http://www.dictionary.com>)

In the 2018-2023 work programme, the IALA ENAV Committee was tasked with monitoring developments in technology in the maritime industry, including the use of existing technology, and provide feedback on how these technologies may be of potential use for IALA members. This work continues in the 2023-2027 work programme as a task within the DTEC Committee.

The Emerging Technologies – Candidate Technology Tracker provides a high-level summary of the results of the review by the DTEC Committee, with the details of the reviews available in the subfolders provided on the IALA fileshare.

# Review of technologies

It is important to evaluate emerging digital technologies in consideration of user requirements and the needs of IALA membership. These evaluations are a preliminary, high level, desktop study. The reviews identify the key features and capabilities, advantages/disadvantages, limitations, and application to aids to navigation, VTS and other services and systems within the remit of IALA.

The simplified set of assessment criteria has been established to provide a consistent review approach, as provided in IALA G1153. The review process is an initial step in determining further steps that may be taken to confirm that technology is appropriate and feasible for the use of IALA members. When providing information on a new technology the organisation which provides the information should also identify how the technology may be adopted or adapted for use by IALA members.

IALA is an international association that deals with Marine Aids to Navigation. The association aims to provide information and support to its members and the maritime community through its standards, recommendations, guidelines and other documents as accurately as possible. However, the planning, implementation and operation of Marine Aids to Navigation remains the sole responsibility of the respective national members, authorities, administrations or other entities according to their respective national law including the decision to use IALA’s standards, recommendations, guidelines and other documents.  IALA shall in no event be held responsible for any claim, damages or other liability, whether in an action of contract, tort or otherwise, arising from, or out of or in connection with the above-mentioned documents, the use of or other dealings with them.

# Summary of Technologies

When a review is completed, a rating of red, amber or green is identified. Technologies rated as:

* red are not considered suitable for use within a given context;
* amber could be considered for use with possible changes or developments;
* green could be considered suitable for use within a given context.

The Technology Tracker is updated following the completion of a technology review. The Technology tracker and supporting review document (completed G1153 review table) is provided on the IALA FileShare, under ***Committees / Technology Reviews – Summary and Folders***.

# Reviews against G1153

These technology reviews have been reviewed against G1153 Ed 1.0 (December 2019).

Candidate Technology Tracker

| **No.** | **Candidate Technology** | **Rating** | **ENAV / DTEC Start Session** | **ENAV / DTEC Planned End Session** | **Revised End Session** | **Review  (% complete)** | **Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 3GPP – 4G (including LTE) | Green | ENAV22  Oct 2018 | ENAV24 Oct 2019 | ENAV 24 Oct 2019 | 100% | Note - This technology has been evolved in the development of IMT (IMT-2030) |
|  | LoRa (Lorawan) | Green (some amber) | ENAV 25 March 2020 | ENAV 26 Oct 2020 | ENAV 27 March 2021 | 100% | Some issues identified as Amber related to costs (unknown / ongoing fees) and risks associated with licensed and unlicensed services. NB-IoT – licenced – guarantee of service; ISM bands by nature unlicensed with no guarantee of service. |
|  | Digital VHF - dPMR | Green (some amber) | ENAV 23 March 2019 | ENAV 25 March 2020 | ENAV 31 (ENAV EM1) Feb 2023 | 100% | Digital VHF voice technology is proven and could be suitable for use by IALA members. Amber elements relate to issues with IPR for the CODEC, and the ongoing work at ITU for the digitalisation of the maritime mobile VHF Channels. Further work on the development and implement of digital VHF voice for use in the maritime domain is required. |
|  | Leo Constellation Developments – including Virgin/OneWeb; SpaceX/Starlink; Amazon/Kuiper, (2026); Telsat Lightspeed, (2026); ESA | Green | ENAV 25 March 2020 | --- | ENAV 31 (ENAV EM1) Feb 2023 | 100% | Developments in solid state antenna suitable for the maritime environment, along with increasing number of satellites in the constellations, could provide significant capability. Upfront costs for users related to the terminal, antenna and monthly data plan subscription. |
|  | NAVDAT – development in progress, updates provided to IMO. | On hold | ENAV 25 March 2020 | --- | --- | 10% | Noting the work at IMO on NAVDAT, deemed not suitable for full template review. May be reviewed if further input is received. |
|  | LiFi (Light Fidelity) | On hold | ENAV 25 March 2020 | --- | --- | 10% | No input or expertise available in WG2. Will review when more input is received. |
|  | Resilience in PNT: GPS/GNSS (presented by Orolia, technology called M SecureSync) | Amber (some green) | ENAV 28 Oct 2021 | ENAV 29 March 2022 | ENAV 29 March 2022 | 100% | Review template for Orolia covers both M SecureSync and GNSS Antenna. For M SecureSync, the systems is not yet mature, awaiting feedback from trials. There are patens on the technology. |
|  | Resilience in PNT: GPS/GNSS (presented by Orolia, GNSS antenna systems) | Green (some amber) | ENAV 28 Oct 2021 | ENAV 29 March 2022 | ENAV 29 March 2022 | 100% | Review template for Orolia covers both M SecureSync and GNSS Antenna. The GNSS antenna is a mature technology, appears to have ease of implementation. |
|  | 5G Private Network and Positioning in a port environment (presented by Qualcomm) | Green (some amber) | ENAV 28 Oct 2021 | ENAV31 (ENAV EM1) Feb 2023 | DTEC5 (Sept 2025) | 100% | Final review completed. |
|  | AI detection of ships in ports / Synthetic images (Presented by SeerBI) | Review not completed | ENAV30 Oct 2022 |  |  | --- | Overtaken by events (no further action planned) |
|  | IMT 2020 on buoys (Presented by Jet Engineering) | Review not completed | ENAV30 Oct 2022 |  |  | --- | Overtaken by events (no further action planned) |
|  | Metal Surface Wave communication (Presented by KRISO/ SWT, technology called MS@MS) | Green | ENAV30 Oct 2022 | DTEC01 Oct 2023 | DTEC04  March 2025 | 100% | Noting the provision of IPR (Intellectual Property Rights) for a non-discriminatory nature, all aspects of the review have been noted as ‘Green’  Update provided at DTEC3 regarding trials. Final review at DTEC4, video demonstration at DTEC5 |
|  | Ships Air draft remote measurement (Presented by China MSA) | Green (some amber) | ENAV30 Oct 2022 | DTEC01 Oct 2023 | DTEC05 Sept 2025 | 100% | Updated information reviewed, including remote air draft measurement approach in Melbourne, Australia (OMC International presentation) and Singapore MPA. |
|  | SigFox (Irish Lights) | Green (some amber) | ENAV30 Oct 2022 | DTEC01 Oct 2023 | DTEC02 March 2024 | 100% | Overall, the technology is noted as ‘Green’ with some amber areas related to cycbersecurity, potential longevity of the technology and bandwidth requirements. It is noted that the technology would require encryption before being used to control AtoN. Use may be suitable to monitor AtoN without additional encryption. |