



SAFETY OF NAVIGATION SEMINAR
First General Assembly
17 February - Singapore



1ST GENERAL ASSEMBLY OF THE INTERNATIONAL ORGANIZATION FOR MARINE AIDS TO NAVIGATION

18 - 21 FEBRUARY 2025
SINGAPORE



Report of the IALA Seminar Safety of Navigation

Executive Summary

Under the auspices of the First General Assembly of IALA held in Singapore, the Singapore Maritime Port Authority hosted a seminar on the Safety of Navigation on the 17 February 2025.

The seminar was attended by 149 delegates, representing 49 countries. It featured presentations on relevant topics, with conclusions agreed upon on the same day.

The seminar resulted in the following remarks:

1. Significant need for training on digital services;
2. Developing nations can benefit from digital services to fill the gap of development;
3. It is not too late to meet the timeline for S100/S200 implementation;
4. Virtual Marine Aids to Navigation should be utilized with care and in accordance with IALA publications;
5. International conventions cascading down into a national legal framework form the basis for AtoN provisions;
6. Risk assessment is fundamental and the IALA Risk Management Toolbox provides a complementary set of tools; the toolbox can expand.

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IALA Seminar on Safety of Navigation

1. INTRODUCTION

First General Assembly of IALA held in Singapore, the Singapore Maritime Port Authority hosted a seminar on the Safety of Navigation on the 17 February 2025.

The purpose of the Seminar for IALA members who provide maritime services worldwide was to exchange information and develop views on:

- Explain the role of the IALA World-Wide Academy (WWA) in global Marine Aids to Navigation (AtoN) harmonization and knowledge sharing.
- Explain coastal States' AtoN responsibilities under international conventions and IALA standards.
- Explain the principles and application of current best practice maritime digitalization and data exchange tools.
- Describe the IALA training courses that can help coastal States implement AtoN responsibilities, including using digital tools.
- Discuss barriers and solutions for coastal State implementation of international conventions and IALA standards.

The seminar also includes real-time polling sequences, to gather the view and concerns of the audience

2. OVERALL PROGRAMME

The overall programme is shown in the following table:

Time	Topic	Facilitator / Speaker
13:00 – 13:15	Registration and welcome coffee	All
13:15 – 13:30	Session 1 - Opening	Captain Segar, Singapore MPA
	Opening Address	Vincent Denamur, IALA
	Opening Address	Captain Segar, S'pore MPA
	Objectives of the Seminar	Vincent Denamur, IALA
13:30 – 14:25	Session 2 - Setting the scene	Facilitator: Rear Admiral Vincent Denamur, IALA
	Introduction to the IALA World-Wide Academy	Vincent Denamur, IALA
	Introduction to the International Foundation for Aids to Navigation (IFAN)	Francesca Pradelli, IFAN
	Coastal State AtoN Obligations	Mary Dean, AMSA
14:25 – 15:15	Session 3 – Digitalization	Facilitator: Lu Yongqiang, China MSA
	AtoN data exchange and harmonization - S200 Product Specifications	Minsu Jeon, IALA
	VHF Data Exchange System (VDES) - Principles and applications	Stephan Pielmeier, Sternula
15:15 – 15:30	Group photo and coffee break	All
15:30 – 17:05	Maritime Connectivity Platform - Facilitating seamless maritime communication	Axel Hahn, DLR
	Session 4 – Implementation: Opportunities and challenges	Facilitator: Latifa Oumouzoune, IALA
	Navigational Risk Management - Obligations, resources and the IALA Risk Management Toolbox	Gerardine Delanoye, IALA
	Panel discussion/Q&A on opportunities and challenges in AtoN provision	Latifa Oumouzoune, IALA
17:05 – 17:15	Conclusions and close	Vincent Denamur, IALA

3. TECHNICAL DISCUSSIONS

3.1 Session 1 – Welcome and introductions

3.1.1 Opening remarks / Captain M. Segar – MPA

Captain Segar, Chief Marine Officer and Assistant Chief Executive to the MPA, welcomed all participants and congratulated Mr. Denamur on his appointment as Dean of the Academy. He emphasized that this new chapter for IALA as an IGO will further contribute to safety of navigation and harmonized standards. He referred to the Academy as training and education is a key instrument.

3.1.2 Welcome from IALA / Rear Admiral Vincent Denamur– IALA

Vincent Denamur, Dean of the IALA World-Wide Academy, welcomed all participants and explained that the Academy addresses particularly goal 2 of IALA that: *all coastal states have contributed to a sustainable and efficient global network of Marine Aids to Navigation through capacity building and the sharing of expertise*. He emphasized the importance of cooperation with the technical division to achieve this.

3.1.3 Objectives of the Seminar / Vincent Denamur

Vincent Denamur explained the objectives of the seminar as a complementary one to the morning seminar on VDES. After an in depth morning session, this second seminar is aimed at giving an encompassing overview of all the issues – legal, technological and implementation - at stake when it comes to safety of navigation, under the coastal states perspective.

3.2 Session 2 – Setting the Scene

The session was chaired by Vincent Denamur and addressed the following topics:

3.2.1 Introduction to the IALA World/Wide Academy / Vincent Denamur – IALA WW

Summary

The Dean explained the Triple-E principle on how the Academy operates, being *Enlighten, Educate and Engage*. He advised that the Academy focusses mainly on training and capacity building, but that research may increase in the future. The training framework,

which includes many accredited training organizations for AtoN training, resulted in 1400 AtoN Alumni over a period of 12 years' operation. He continued explaining the capacity building work, emphasizing that this will benefit most from the IGO status, especially as IALA will now be an equal partner working with sister organizations under the UN principle to "Deliver as one". He ended his presentation pointing out that all this could only be possible because of the contributions of the Academy's sponsors, where the International Foundation for Aids to Navigation (IFAN) is the main sponsor.

3.2.2 Introduction to the International Foundation for Aids to Navigation / Catherine Mulvihill and Francesca Pradelli - IFAN

Summary

IFAN provided a brief overview of its history and its charitable and operational objectives, namely the enhancement of safety of life at sea and the protection of the marine environment, directly or indirectly through AtoN, notably through its subsidiary MENAS (Middle East Navigation Aids Service), and its longstanding relationship with the IALA WWA.

IFAN also presented the initiatives current being funded globally and encouraged the audience to reach out to them to discuss partnerships.

3.2.3 Coastal State AtoN Obligations / Mary Dean - AMSA

Summary

Mary Dean started by explaining the main obligations for establishing AtoN under international conventions. She referred to UNCLOS articles in order to highlight specific obligations and explained using examples how this cascades down into national laws and other arrangements. Finally, she informed how the IALA Standards and other publications fit into these legal frameworks.

She recapped with important and inspiring advice:

For SOLAS contracting governments:

- Review SOLAS requirements
- Do a risk assessment
- Check IALA documentation
- Remember AtoN maintenance
- Regularly review all arrangements
- Train your staff

For governments not party to SOLAS:

See above – this is best practice

3.3 Session 3 – Digitalization

The session was chaired by Liu Yongqiang and addressed the following topics:

3.3.1 AtoN Data Exchange and harmonization – S200 Product Specifications / Minsu Jeon - IALA

Summary

Minsu Jeon set the scene by referring to the conclusions of the 20th IALA Conference to point out the importance of the subject. He explained how to achieve digital transformation in the S-100 domain. He used the example of chart updates in the past and now to explain the process of digitalization. Looking at the roadmap for S-100 and S-200 implementation he encouraged the participants that it is not too late! He ended his presentation with S-200 validation and sea trials and, very importantly, training on this subject developed by the WWA.

3.3.2 VHF Data Exchange System (VDES) – Principles and applications / Stefan Pielmeier - Sternula

Summary

For AtoN, several use cases were highlighted, and Stefan Pielmeier provided examples how the new ASM and VDE channels can offload traffic from existing channels, add more capacity for applications like firmware updates, monitoring, and use of S-100 ship-AtoN, and above all other, provide cybersecurity through authentication of AtoN information.

Today, AIS-only AtoN is vulnerable to spoofing, i.e. maliciously transmitting AtoN information that is not true, to misguide ships. With VDE, it is possible to authenticate the existing AIS transmissions, such that new ship and shore equipment, that can read the VDE signals, can check the identity of the sender of AtoN data, and the integrity of the data sent.

3.3.3 Maritime Connectivity Platform – Facilitating seamless maritime communication / Professor Axel Hahn - German Aerospace Center (DLR)

Summary

Axel Hahn opened the subject of his presentation looking at voyage planning for shipowners over history. He also questioned how safe a virtual AtoN is. This revealed the need for digitalization to achieve reliable provision of maritime services. He emphasized the importance of separating the application from the technical communication mode. He concluded that digital platforms may support the implementation of e-navigation maritime services for safer and efficient navigation.

3.4 Session 3 - Implementation

The session was chaired by Latifa Oumouzoune and addressed the following topics:

3.4.1 Navigational Risk Management – Obligations, Resources and the IALA Risk Management Toolbox / Gerardine Delanoye - IALA

Summary

Gerardine Delanoye started by explaining the need to conduct risk assessments, not only from the perspective of international obligations, but also to ringfence resources. Using the example of the new IMO VTS guidelines, she explained how a risk assessment can support justifying your decisions, for example when downgrading a VTS to Local Port Service. She described the different risk management tools within the IALA toolbox and used some specific cases from around the world. She encouraged active participation in the IALA ARM Committee to further develop the IALA Risk Management Toolbox.

3.4.2 Panel discussion and polling result session

During the panel discussion participants addressed the following topics:

- **Implications for Liabilities of the New Status of IALA:** A discussion on the implications of IALA's new status triggered many comments. Since IALA will not be a normative body but rather a technical and standardization entity, member states will review its recommendations and guidelines with a view to implementing them on a voluntary basis. Furthermore, the change of status doesn't induce, in itself, changes to the way aids to navigation including VTS may be governed and managed. The point is that IALA is now at the same level as the other intergovernmental organization (for example, IALA on its own may give inputs to IMO when necessary) ; and the WWA is given more legitimacy when carrying out technical missions.
- **Budget :** Echoing the main concern expressed through the polling, some participants wondered how to solve the lack of sufficient resources (budget mainly) dedicated to Aids to Navigation in many countries. This recurring question highlights the importance of raising awareness among high level management and even political. To this purpose, regional seminar but also capacity building and technical mission in countries by the WWA are instrumental.
- **Risk Assessment Tools:** As regards navigational risk management as a part of their organization's activities, the polling showed a disparate audience (35 answers) with two main blocks : one third considers it as frequent, and another third finds it rare. And as regards the IALA risk management tools, it must be pointed out that the first answer is "others", before SIRA and IWRAP. During the panel discussion advice was requested on the complementary use of different risk assessment tools. The response indicated that it is observed that the choice depends on the preferred approach of the person entitled to perform it—qualitative (SIRA/PAWSA) or quantitative (IWRAP)—and the assets owned by the organization. i.e., for an IWRAP analysis, AIS data and ENC/raster charts are required to be uploaded into the purchased IWRAP software. It was also noted that IWRAP calculates only the probability component of the risk function ($R = P \times C$), while SIRA and PAWSA address the overall risk result. A good starting point could be to conduct a SIRA. Other organizations, including EMSA in the EU and authorities in Malaysia, have their own risk assessment tools, which may be of interest to personnel involved in safety.
The participants asked which risk assessment tool they would be advised to use. The panel advised that it could be a good idea to start with SIRA as AIS data is not necessarily needed for that. When terrestrial data is available, then IWRAP could also be an option. In order to manage a larger group of stakeholders, PAWSA would be the preferred tool.
- **Digitalization :** under the result of the polling, embracing digitalization requires first training and knowledge, but also standardisation and collaboration.
- **Maritime Connectivity Platform:** The MCP is a decentralized framework designed to facilitate secure and reliable information exchange within the maritime domain and beyond. It enables efficient digital service provision and seamless communication among authorized maritime stakeholders across various communication systems. A question was raised regarding its operational status in the future. The speaker stated that in 2/3 years the full operational status can be envisaged.
- **Communications and VDES:** as showed by the polling , the audience considers the three main benefits from VDES :
- AIS Vessel and AtoN message authentication, traffic management and provision of improved navigational aids (vessels). Meanwhile, some doubts were raised regarding shore-based VDES stations and their coverage (up/downlink). Various IALA documents and future work on VDES shore stations will cover this topic in greater depth. It was advised to stay connected with the DTEC committee. To become more familiar with VDES, a useful reference document is IALA G1117, which provides an overview of VDES and lists its use cases.
- **Safety of Navigation and S-100/S-200 Implementation:** Finally, it was noted that some Competent Authorities—well represented in the IALA committees (ARM, DTEC, VTS, and ENG) and working on product specifications for S-100/S-200—are implementing safety of navigation tools based on S-100. For instance, Denmark, Norway, the Republic of Korea, and Australia are delivering S-124 navigational warnings through the MCP. However, the majority of participants made clear, through the polling, that their countries are not ready to implement S100/S-200 ; mainly due to budget issues but also because of insufficient knowledge.

3.5 Seminar Report

The technical officer for the Seminar, noted that the workshop presentations, documents, and photographs would be available on the page of the seminar file-sharing link <https://shorturl.at/QoW3s>

The seminar report will be posted on the file-sharing server within one week and will be permanently available on the IALA website. It will be forwarded to the IALA Council and all IALA Committees.

3.6 Closing of the seminar

The Dean of the WWA thanked everyone for attending the seminar and the good discussions.

He wished everyone a successful IALA General Assembly and declared the seminar closed.

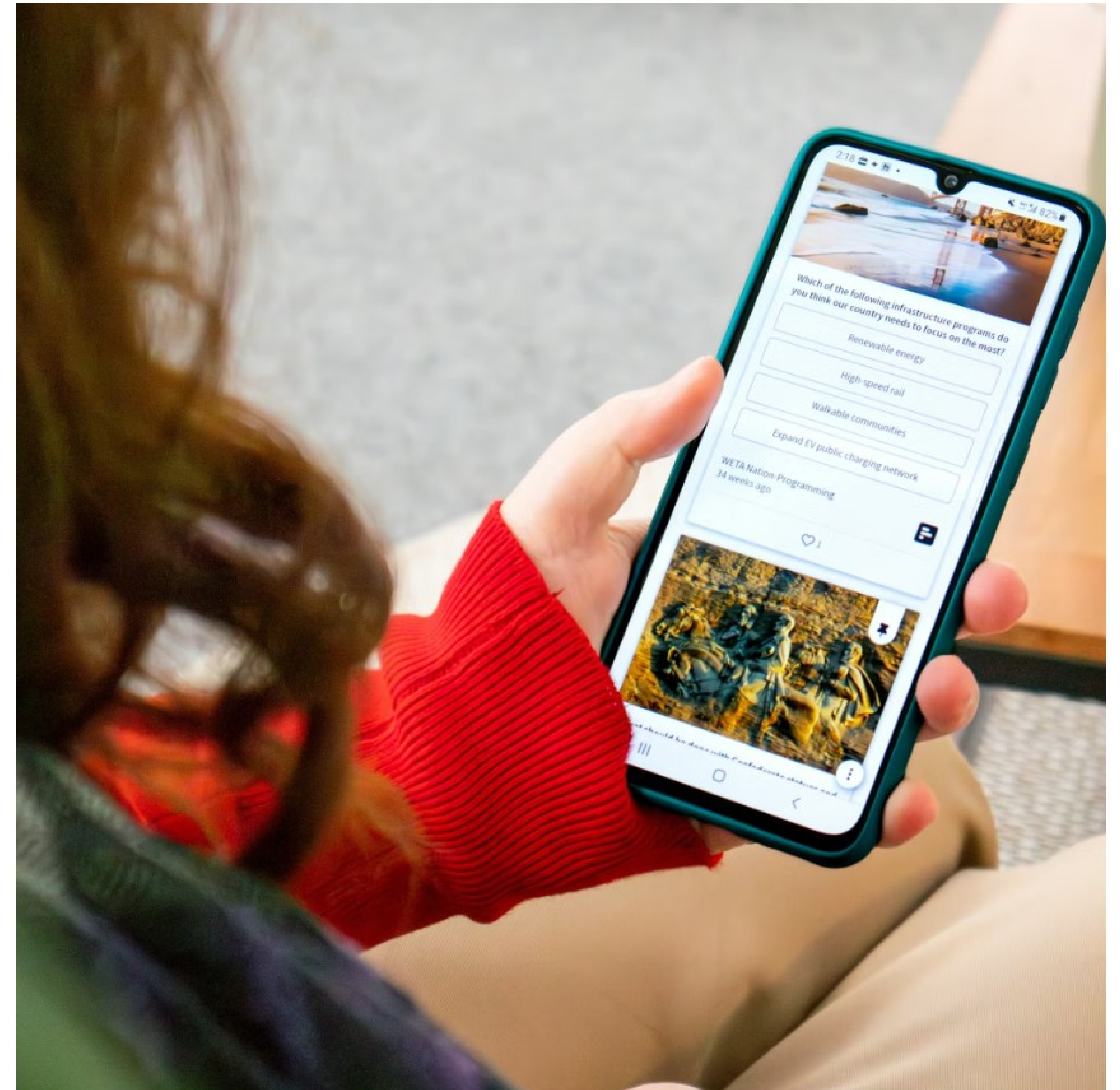
Annexe 01 : Poll Result

Safety of Navigation Seminar - Tell us your views

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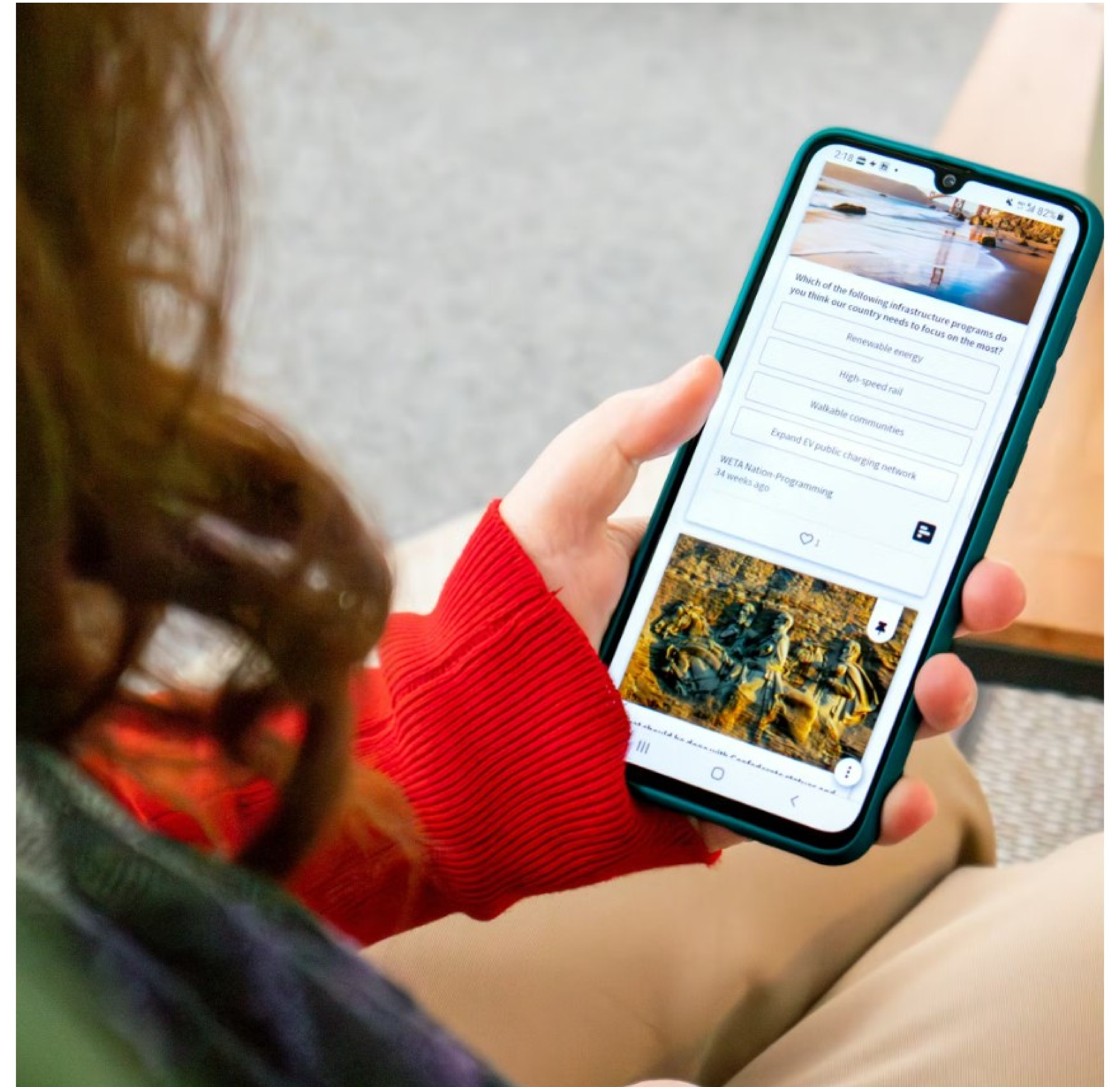
Participant Poll - Practice question



What Chapter of SOLAS includes obligations on Marine Aids to Navigation and vessel traffic services? Select one



Participant Poll - Coastal State AtoN obligations

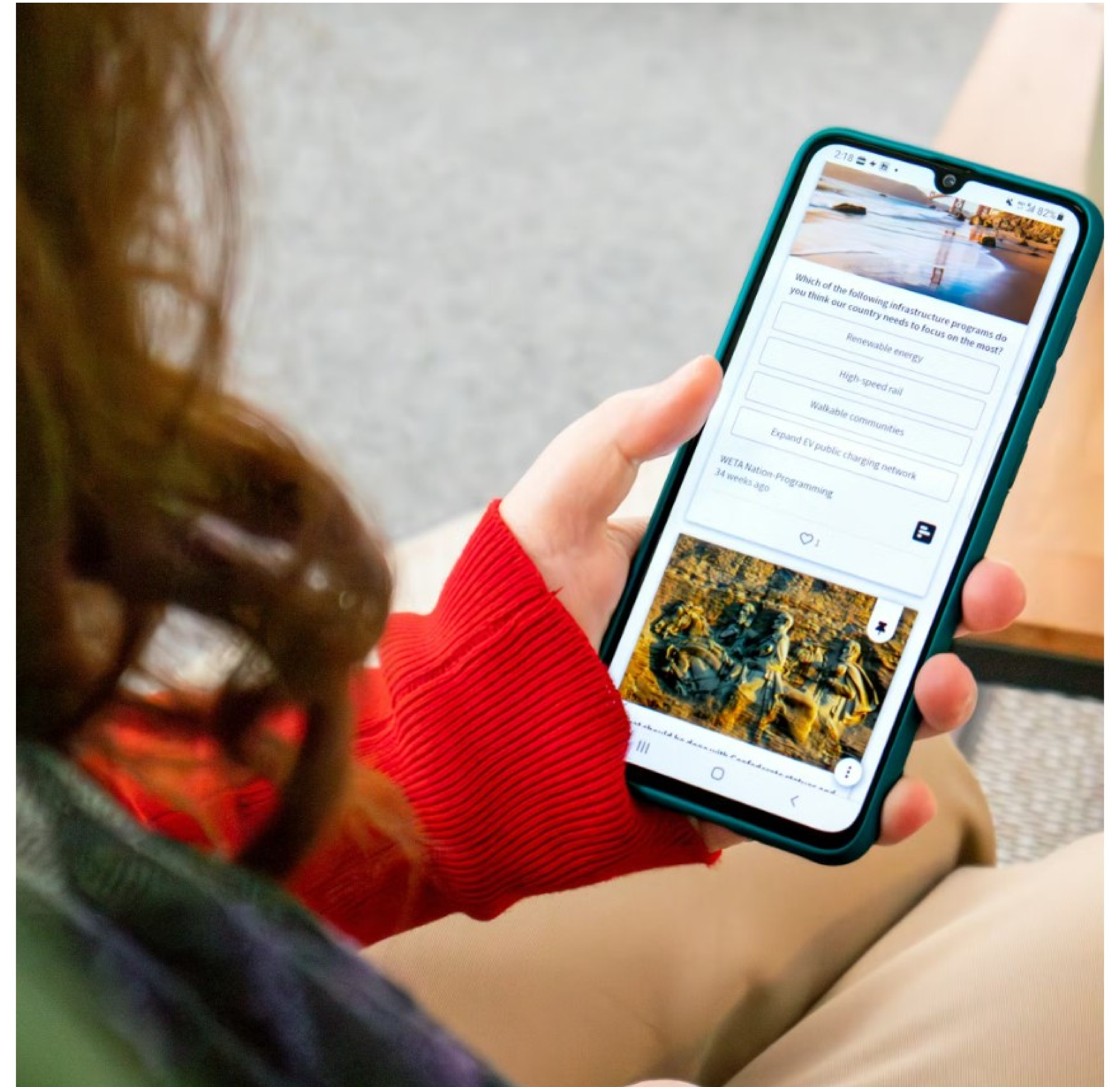


Question 1? What are the main challenges for your organization in complying with the international AtoN responsibilities?

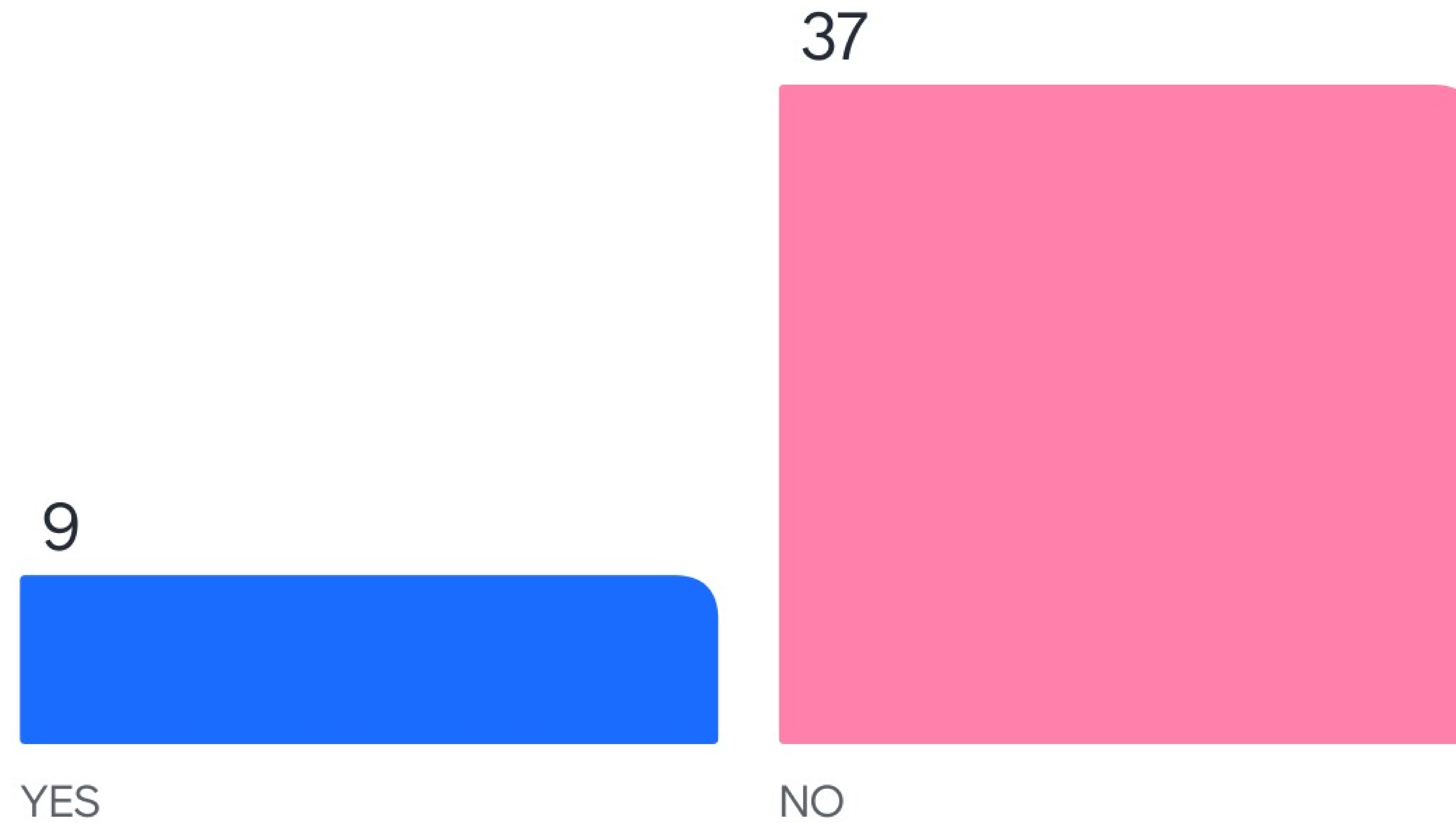
95 responses



Participant Poll - Implementation of S-200



Question 2? Is your organization ready to implement S-100/S-200? Yes or no

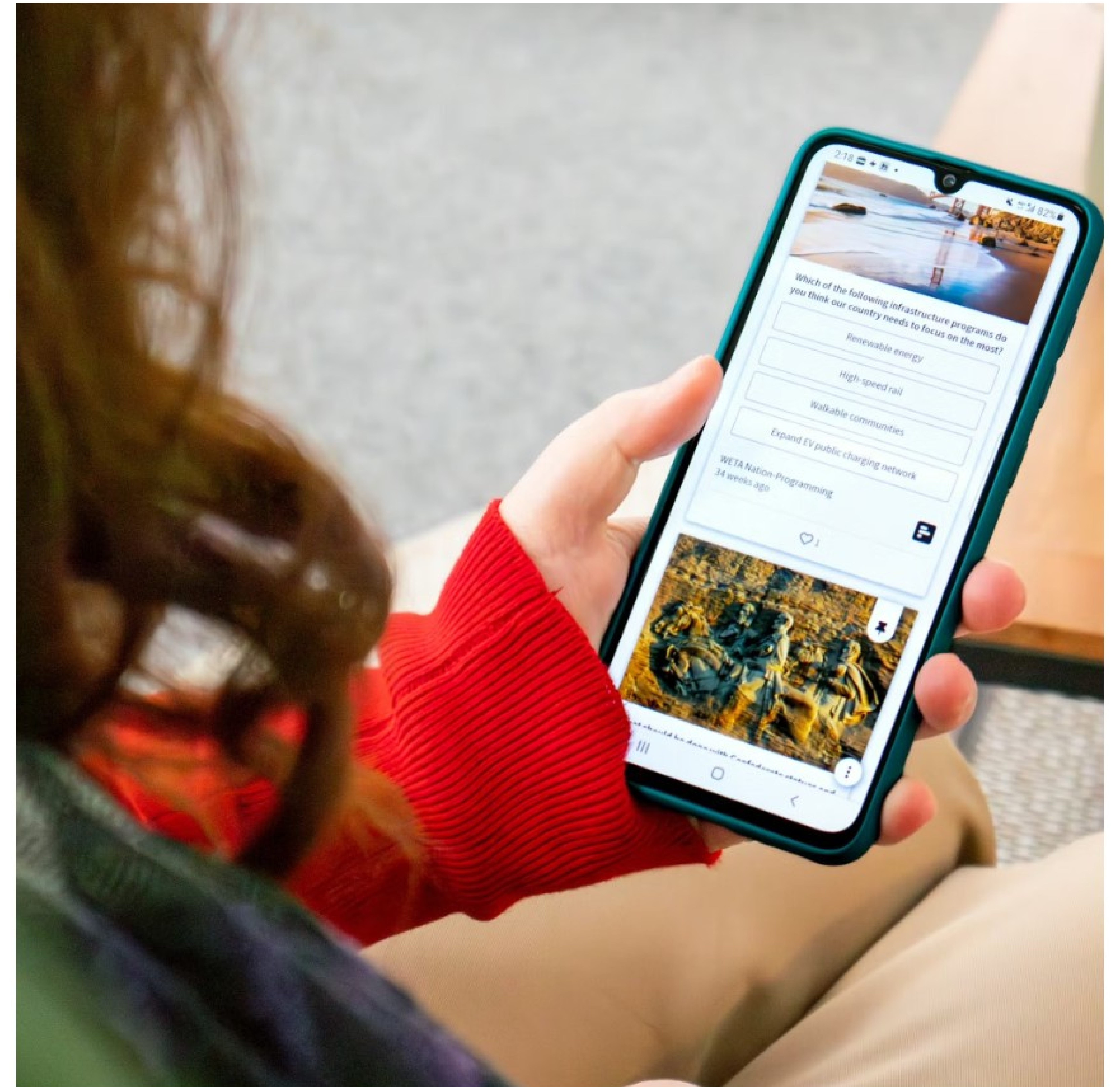


Q3? What are your biggest challenges in implementing S-100/S-200?

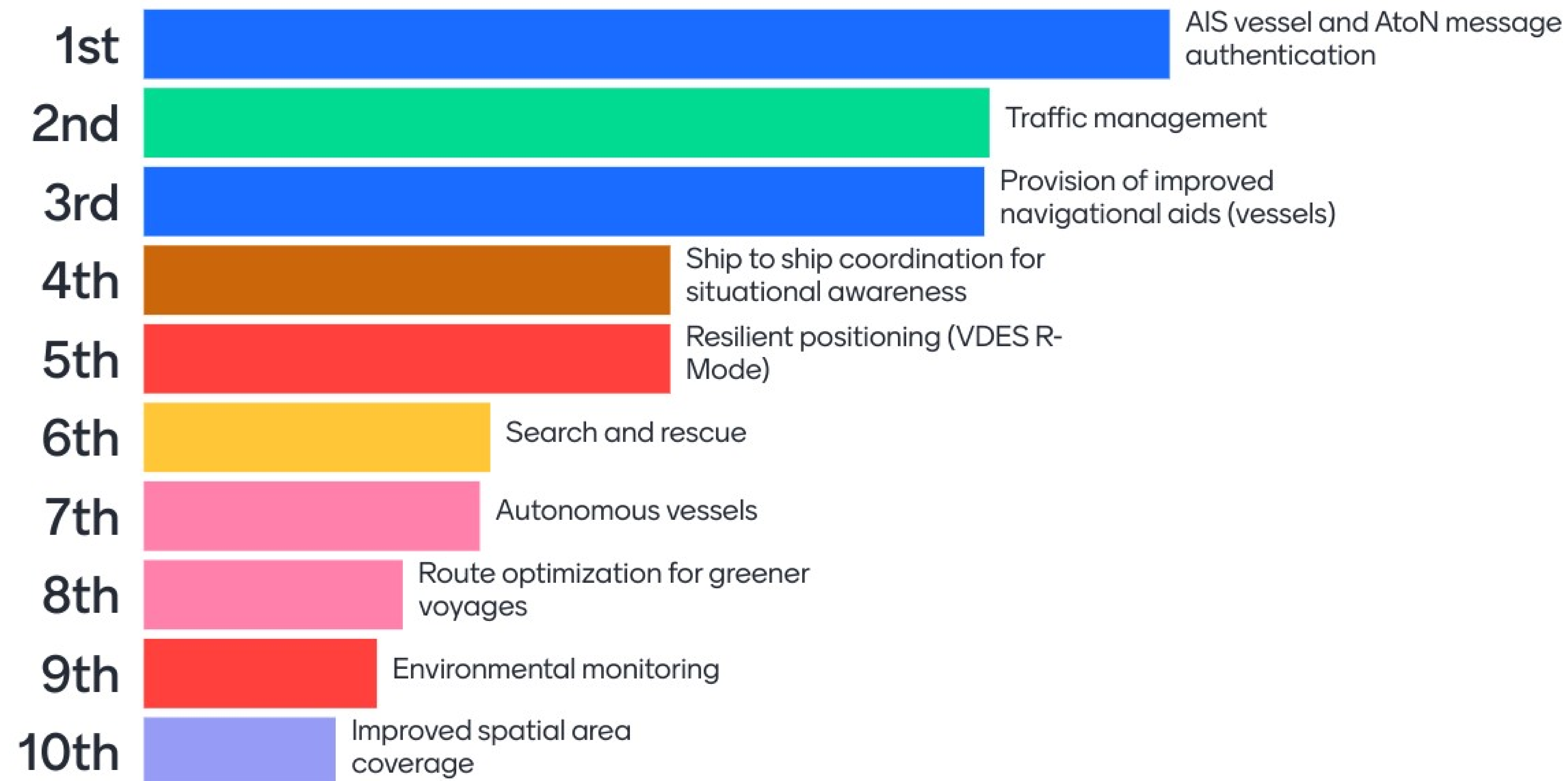
76 responses



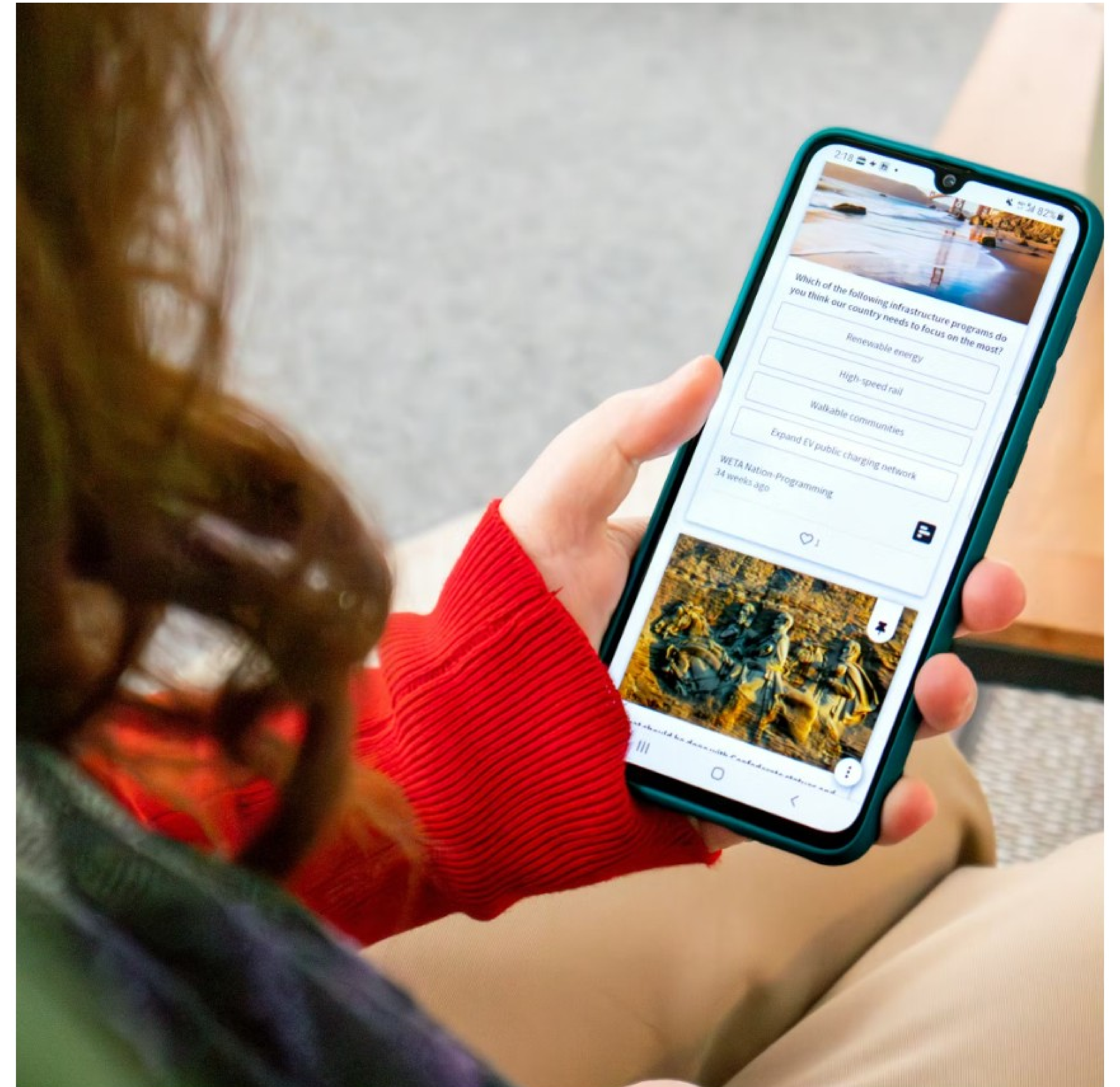
Participant Poll - Implementation of VDES



Question 4? What specific benefits will VDES bring to your organization? Choose your top three.



Participant Poll - Embracing digitalization

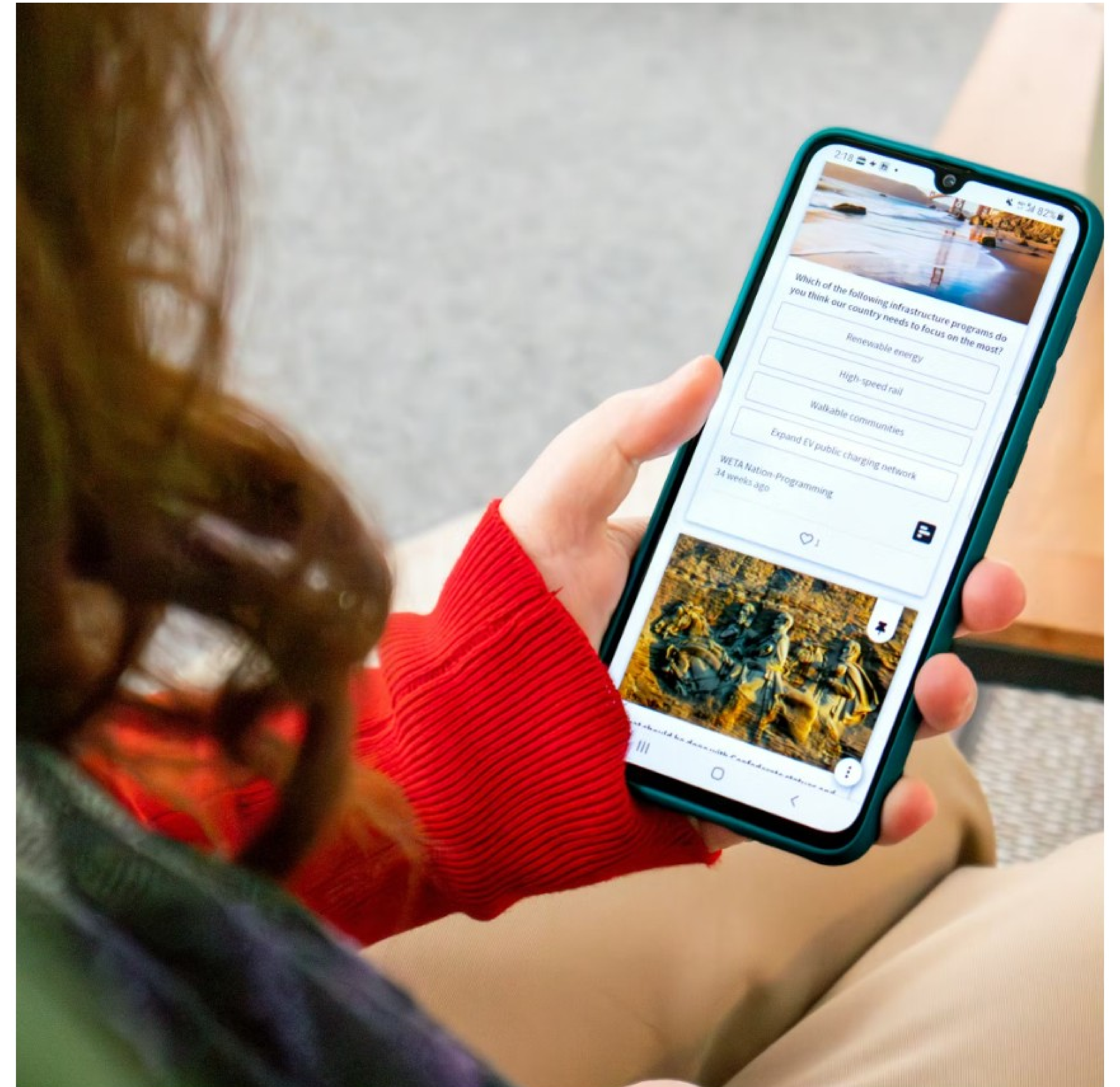


Question 5? What can we do to foster digitalization in the Marine Aids to Navigation sector?

60 responses



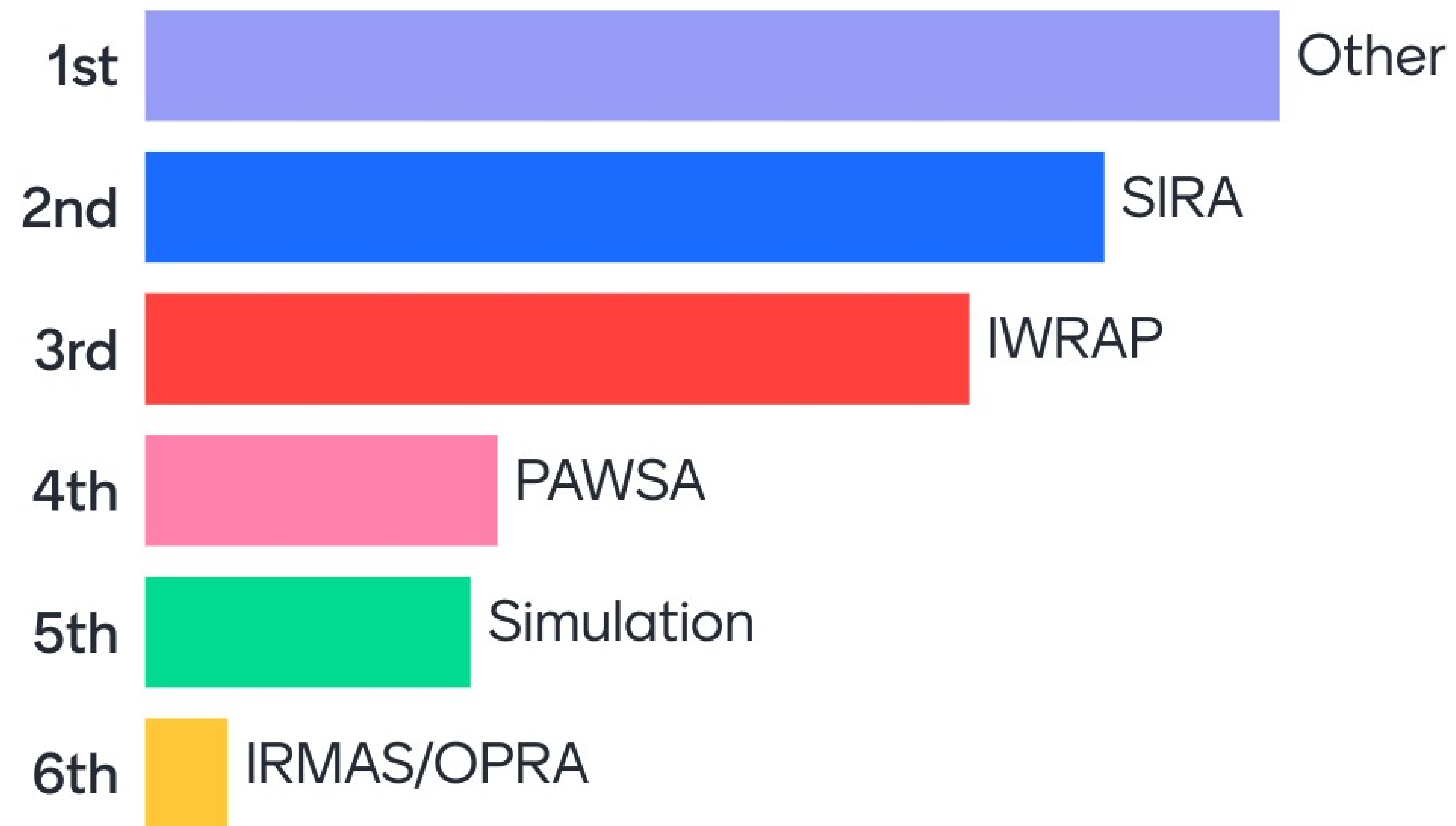
Participant Poll - Navigational risk management



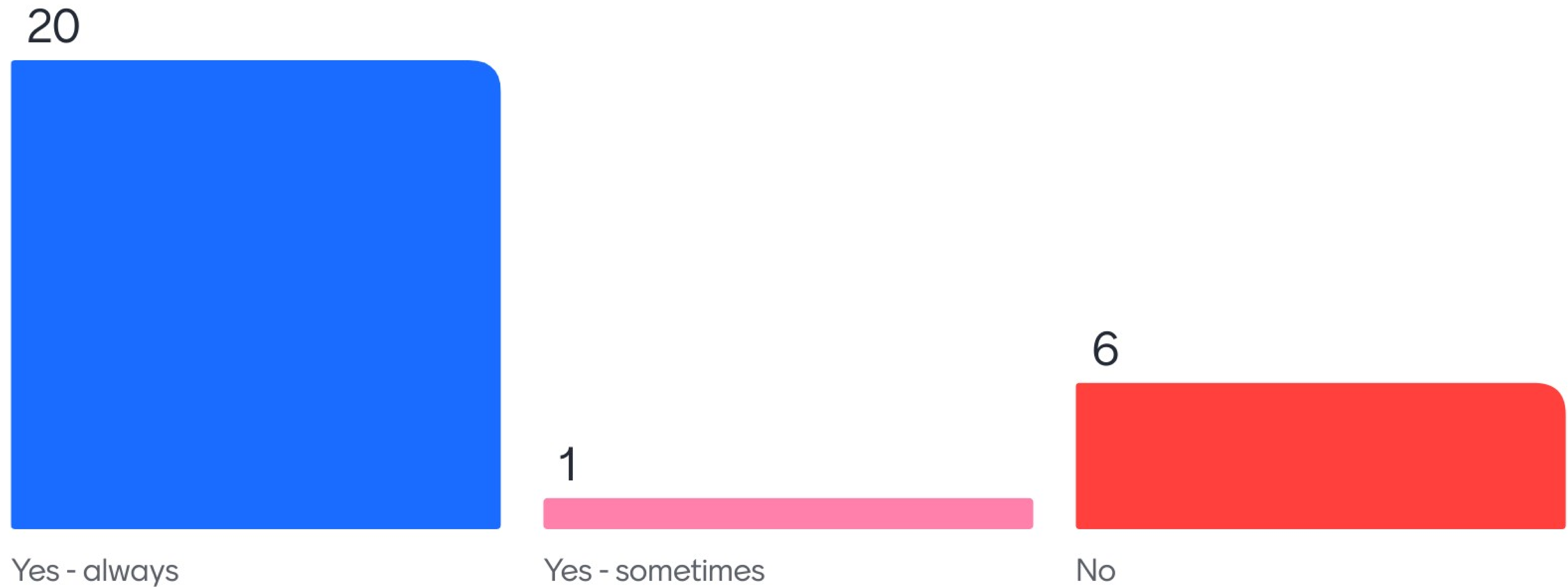
Question 6? Is navigational risk management part of your organization's regular activities? Select one



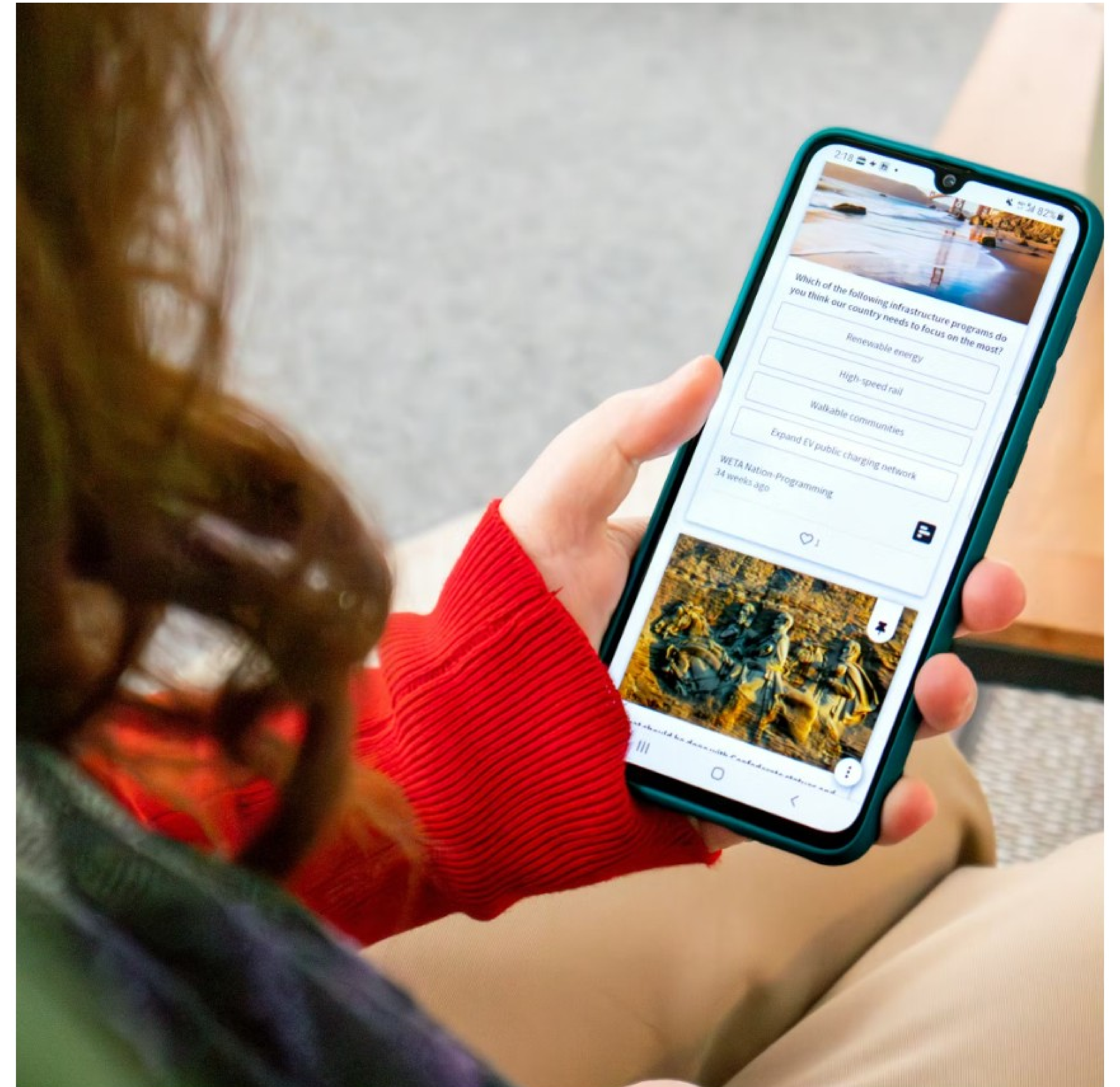
Question 7? Do you use IALA Risk Management toolbox or other tools to carry out your navigational risk assessments (Select all that apply)



Question 8? Do you keep records of your navigational risk assessments? Select one



Participants Poll - Most likely area of improvement



Question 9? In one or two words, what is the main thing that you have learned this afternoon?

26 responses



Question 10? In a few words, what will you do next to improve navigational safety in your State?

23 responses



Safety of Navigation Seminar - Thank you for your participation!

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