|  |
| --- |
| IALA Recommendation |

Rnnnn

Cyber security for the IALA domains

Edition 1.0

Date (of approval by Council)

urn:mrn:iala:pub:rnnnn

Revisions to this document are to be noted in the table prior to the issue of a revised document.

|  |  |  |
| --- | --- | --- |
| Date | Details | Approval |
| March 2022 | First draft – joint task group on cybersecurity (ARM15 TG1.2.6) |  |
| September 2022 | Revised version for consideration by the ARM committee (ENAV30-5.2.4) |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

THE COUNCIL

**RECALLING**:

1. the function of IALA with respect to Safety of Navigation, the efficiency of maritime transport and the protection of the environment.
2. Article 8 of the IALA Constitution regarding the authority, duties and functions of the Council.

**RECOGNIZING**:

1. that the maritime sector is increasingly depending on digital and (inter)connected technologies and systems.
2. that technologies applied for Maritime Services in the context of E-navigation and AtoN, including VTS, may be susceptible to accidental and deliberate disruption.

**CONSIDERING** the proposals reported by the participants of the IALA workshop on cyber security that was held from 15 to 19 November 2021 as a virtual workshop and several input documents on cyber security in various committees,

**NOTING:**

1. that awareness of cyber risk within the IALA domains and among the IALA members may be improved, especially for non-IT personnel
2. that existing risk management processes often do not include cyber risks
3. that the risk of unavailability or unreliability of systems due to cyber incidents is often not included in business continuity plans
4. that there often is insufficient insight into used technology, especially legacy systems, within members environments
5. that there are many tools, publications, standards, and best practices available to address cyber security vulnerabilities, risky processes and human behaviours
6. that specific technologies are used within the IALA domains for which there are no ready-to-use standards or best practices regarding cyber security, and
7. that the process of modernisation is often lengthy and resource intensive.

**RECOMMENDS:**

1. to improve cyber security awareness
   1. within IALA by providing practical technical examples and how such examples can be valuable for members, both in identifying their own cyber risks and in applying mitigation methods
   2. within the members organisations by supporting the performance of cyber security functions by all personnel, including management, through appropriate means which may include policy development, training or exercises
2. that IALA members amend their risk management processes and perform risk assessments where necessary, with prioritization of:
   1. physical safety risks stemming from vulnerabilities in digital systems and data handling
   2. the estimation of impact, corruption or (accidental/deliberate) loss of critical systems or (corruption of) data following a cyber incident
   3. equipment receptive to vulnerabilities and cyber attacks
3. to amend business continuity plans with cyber incident scenarios and mitigations as well as to develop incident response and - recovery plans
4. that regular inventories are performed, including a risk assessment per (type of) system or used technology, with due consideration to the interconnections with other systems and data sources. Suggested methods are identified in Annex A
5. to adopt an appropriate industry standard for managing cyber risk and/or apply best practices. In particular, the concept of “security by design” should be practiced.   
   Suggestions for appropriate standards and best practices are summarised in Annex A
6. to implement protective measures or processes for technology specific to Maritime Services in the context of E-navigation and AtoN including VTS
7. that IALA members work towards the goal of ensuring all data in the IALA domain is provided with a means to authenticate the data, thereby allowing the user to determine if data originates from a legitimate source.

**INVITES** Members and marine aids to navigation authorities worldwide to implement the provisions of the Recommendation,

**REQUESTS** the ARM committee to keep the Recommendation under review and to propose amendments, as necessary.

Annex Contents

[1. Introduction 6](#_Toc115284467)

[2. available standards and BEST PRACTICES 6](#_Toc115284468)

[2.1. Generic / IT 6](#_Toc115284469)

[2.2. Operational technology (OT) 6](#_Toc115284470)

[2.3. for the maritime domain 6](#_Toc115284471)

# Introduction

Cyber security is a relevant topic for all uses of digital technology, not only within IALA but everywhere around us. It is not an add-on technology, nor can it be handled separately from any work on digital technologies; it should be incorporated in all technology, process, and human behaviour.

Because of the broad spectrum of cyber security, many industry standards and best practices are available to address technical weaknesses, processes, and awareness in the IALA domains Maritime Services in the Context of e-Navigation and AtoN including VTS.

# available standards and BEST PRACTICES

The IALA workshop on cyber security, held virtually in November 2021, produced a list of available standards for adoption by IALA members. The workshop report elaborates on these standards, and they are summarized below.

## Generic / IT

* ISO 27001 series
* NIST Cybersecurity Framework
* NIST SP800-53

## Operational technology (OT)

* IEC 62443: Cyber security for Industrial Automation and Control Systems

## for the maritime domain

* IMO MSC-FAL.1/Circ.3: Guidelines on Maritime Cyber Risk Management
* IEC 63173: Maritime navigation and radiocommunication equipment and systems
* Resolution MSC.428(98): MSC Maritime Cyber Risk Management in Safety Management Systems
* NISTIR 8323: Foundational PNT Profile: Applying the Cybersecurity Framework for the Responsible Use of Positioning, Navigation, and Timing (PNT) Services
* ISO 23806: Maritime Cyber safety standard
* BIMCO et al.: The Guidelines on Cyber Security Onboard Ships