

## Progress on the development of the e-MARIS application and the online Record of Authorised Vessels

PREPARED BY: IOTC SECRETARIAT<sup>1</sup>, 28 JANUARY 2023

### PURPOSE

To provide participants at the Working Party on the Implementation of Conservation and Management Measures (WPICMM) an update of the development of an Electronic Monitoring and Reporting Information System (e-MARIS) application and online Record of Authorised Vessels (RAV) to support the compliance process of the IOTC.

### BACKGROUND

In 2013 the Indian Ocean Tuna Commission (IOTC) Performance Review made two major recommendations related to compliance with data collection, reporting and following up on infringements ([IOTC-2016-PRIOTC02-R](#)).

#### Compliance with data collection and reporting requirements

Para 102. The Commission, through its Compliance Committee, needs to strengthen its compliance monitoring in relation to the timeliness and accuracy of data submissions. To this end, the performance review recommended: *“b) to facilitate thorough reviews of compliance, the Commission should invest in the development and implementation of an integrated electronic reporting program. This should include automatic integration of data from CPCs into the IOTC Secretariat’s databases and automatic cross-referencing obligations and reports for the various obligations, in particular related to the provision of scientific data.”*

#### Follow-up on infringements

Para 153. The performance review recommended that: *“b) The IOTC **further develop an online reporting tool to facilitate reporting by CPCs** and to support the IOTC Secretariat through the automation of identification of non-compliance.”*

These recommendations were the basis for the development of the e-MARIS initiative. This document reports on the progress of work on the development of the e-MARIS application.

### DISCUSSION

The e-MARIS initiative started with the [Consultation/Validation workshop on the development of e-MARIS](#) held in South Africa, from 25 to 27 October 2017, with the financial assistance of the FAO Common Oceans/ABNJ Tuna Project.

The e-MARIS project was designed in 3 phases:

#### Phase 1 – ToR technical specifications

Development of a draft Terms of Reference to be used for the design & implementation of an integrated monitoring and reporting information system for IOTC CPCs, web based system accessible through the IOTC web site, to support the reporting of data & information required by the IOTC Resolutions and the Agreement. Noting the design of e-MARIS should follow a thorough assessment of the current state of the art in close consultations with CPCs.

<sup>1</sup> IOTC-Secretariat@fao.org

**Phase 2 – Development of the system**

The development of the system includes the development of user manuals, both for internal users (installation, administration, maintenance) and the training of the IOTC CPCs. This would include the organisation of regional training courses and national training courses.

**Phase 3 – System performance assessment**

Technical assistance to the IT Section of the IOTC Secretariat, including training and assessment of the performance of the system and debugging.

The workshop participants made a series of recommendations related to the development of the application, and at its 15<sup>th</sup> Session the Compliance Committee ([IOTC–2018–CoC15–R](#)) made the following recommendation which was endorsed by the Commission (S22):

105. The CoC **ACKNOWLEDGED** the funds secured by the IOTC Secretariat for e-MARIS and **RECOMMENDED** the Commission endorsed the IOTC Secretariat pursuit of the development of the e-MARIS application.

Following the endorsement of the Commission (S22), the IOTC Secretariat updated and finalised the Terms of Reference, detailed requirements, functional and technical specifications of the e-MARIS application incorporating the recommendations of the workshop, and the Phase 2 “Development of the system” started on 15 May 2019 with the financial assistance of the World Bank (SWIOFISH 2 project) and the recruitment of four IT consultants, expert in applications development.

At its Nineteenth Session the Compliance Committee ([IOTC–2022–CoC19–R](#)) made the following recommendation that was endorsed by the Commission (S26):

CoC19 (Para.153) The CoC19 **RECOMMENDED** that the Commission (S26) endorse WPICMM05’s recommendations that the e-MARIS application enter into implementation for the next compliance assessment of the 2023 Compliance Committee meeting (CoC20) and that those CPCs encountering problems be allowed to continue using the paper system for Compliance Committee 20.

Importantly, the e-MARISe-MARIS facility was rolled out to all CPCs in late December 2022 and early January 2023, with a view to it being used for the submission of the Compliance Questionnaire, the Implementation Report and other reporting obligations by CPCs. The e-MARISe-MARIS will therefore be used by the Secretariat for assessing compliance and by CPCs for commenting on the Secretariat’s assessment. It is also intended that the Compliance Reports for CoC20 be made available via e-MARISe-MARIS.

The online Record of Authorised Vessels (RAV), technically distinct but an element that will be linked to the e-MARISe-MARIS, is integrated in the Work Plan. Work on the RAV is advanced, but priority for roll-out has been given to the e-MARISe-MARIS to date. By February 2023 there will be a candidate Release of the system, ready as a basis for a rollout process expected by the end of June 2023. The online RAV shall therefore feed into the compliance process leading up to CoC21 in 2024.

The work plan of the 2<sup>nd</sup> development phase is presented below in chronological order, by Work Package (WP).

<b>WP1: Inception</b>		<b>(IMPLEMENTED)</b>
September 2021		
The technical and development infrastructure of e-Maris is revised and improved based on the feedback collected throughout Phase I, with a particular emphasis to the shift required from a development and staging regime to target production regimes. The activity subsumes onboarding of new team members.		
A Kick-Off Meeting with IOTC Secretariat scheduled to overview, organize, and validate activities in the WPs that follow, particularly in relation to the organisation of the Workshops in the Pilot WPs.		
Deliverable	WP Report: Summary and Assessment of Activities, Events and Outcomes.	

**WP2: Pilot 1****(IMPLEMENTED)**

October 2021 – December 2021

A pilot test of the e-Maris system provides the first round of feedback from its target users. The pilot focuses on the use of the system during a yearly cycle of data collection and compliance assessment.

The pilot targets two user groups.

- First and foremost the IOTC Compliance section, with the design of the data collection campaign but also its day-to-day operations. The emphasis is on small-to-medium-scale testing of both system functionality and usability, while the use cases, the workflows, and the data are real-world.
- Second, a few users from select volunteer CPCs (3-4) interact with the system as configured and run by the IOTC users, submit their information, receive feedback etc.

The pilot takes place during a Workshop which blends training, task simulation, and retrospective activities. The mode of delivery, the duration, and the overall structure of the Workshop follow a plan defined and agreed upon during the Kick-Off Meeting of WP1 (it could be split in two sessions, a first one for IOTC Secretariat and a second one for participating CPCs).

Preparation activities include workflow design, data staging, training materials, and the provision of a dedicated runtime environment in the e-Maris staging Cloud.

This Pilot 1 allows to collect valuable feedback on the application from both sides (IOTC Secretariat and CPCs). Based on this, the Release Candidate of the system that was delivered at the end of Phase 1 undergoes a development iteration to ensure coverage and correctness of all the functionality exercised by the targeted workflows. This yields an Incremental Release of the system.

Deliverable	Pilot 1 Test & Workshop (e-Maris is open to IOTC and select CPCs)
Deliverable	Incremental e-Maris System Release
Deliverable	Documentation Incremental Update
Deliverable	WP Report: Summary and Assessment of Activities, Events and Outcomes.

**WP4: e-MARIS Upgrade****(IMPLEMENTED)**

December 2021 – January 2022

Based on the feedback collected from the Pilot 1, the e-Maris system is further refined through a continuous cycle of development iterations that include backend integration, frontend development, and Quality Assurance activities.

The outcome of this is an Incremental Release of the system. User-level documentation is also updated to match the latest release.

Deliverable	Incremental e-Maris System Release
Deliverable	User Documentation Incremental Update
Deliverable	WP Report: Summary and Assessment of Activities, Events and Outcomes

**Onboarding of Software Expert 1****(IMPLEMENTED)**

January-February 2022

The newly recruited Software Expert 1 is onboarded to work on the Record of Authorized Vessels (RAV) and e-Maris systems.

The process covers toolchain installation, development workflows, deployment and operation procedures.

It also includes domain knowledge, system requirements and objectives, current features and future roadmap. The emphasis here is on the RAV, though an overall understanding of e-Maris ensures support in rollout phases to follow.

Deliverable	WP Report: Summary and Assessment of Activities, Events and Outcomes
-------------	--

**WP3: RAV Construction I 1****(IMPLEMENTED)****February 2022– May 2022**

The RAV Minimum Viable Product (MVP) delivered at the end of Phase 1 is fleshed out and expanded in a continuous cycle of development iterations. Iterations include backend integration and frontend development, and lightweight Quality Assurance activities. Deployments and QA tests target a dedicated staging environment in the Cloud, and rely on principles and mechanisms already adopted for the e-Maris system.

The main outcome of this package is a Beta Release of the system, where the functionality of the MVP is expanded and supported with backend components. Testing remains small-scale and lightweight, focusing on the design individual functionalities rather than complete user-level workflows.

Deliverable	RAV Beta Release
Deliverable	WP Report: Summary and Assessment of Activities, Events and Outcomes.

**WP5: Pilot 2 1****(IMPLEMENTED)****March 2022 – May 2022**

A second pilot test of the e-Maris system provides an additional round of feedback from its target users. The pilot continues to revolve on the use of the system during a yearly cycle of data collection and compliance assessment, but the goal now is to onboard as many volunteer CPCs as possible.

For this, all CPCs are invited to join the Pilot, alongside a representative subset of IOTC users. Again, the focus pragmatically remains on small-to-medium-scale, with use cases, workflows, and data from the real-world.

Like the previous pilot in WP2, this pilot takes places during a Workshop which blends training, task simulation, and retrospective activities. Mode of delivery, duration, and overall structure are modified only to the extent suggested by feedback on the previous pilot.

Again, preparation activities include workflow design, data staging, training materials, and the provision of a dedicated runtime environment in the e-Maris staging Cloud.

This Pilot 2 allows to further collect valuable feedback on the application from both sides (IOTC Secretariat and CPCs), as well as on a larger scale. Based on this, the e-Maris system undergoes a development iteration to ensure coverage and correctness of all the functionality exercised by the targeted workflows. This yields another Incremental Release of the system. User-level documentation is also updated to match the latest release.

Deliverable	Pilot 2 Test & Workshop (e-MARIS is open to all interested CPCs)
Deliverable	Incremental e-Maris System Release
Deliverable	User Documentation Incremental Update
Deliverable	WP Report: Summary and Assessment of Activities, Events and Outcomes

**WP7: e-Maris Rollout 1****(IMPLEMENTED)****June 2022 – November 2022**

Based on feedback collected during Pilot 2, e-Maris is further refined through a continuous cycle of development iterations that include Backend Integration, Frontend Development, and Quality Assurance activities.

A first outcome of this package is an Incremental Release of e-Maris. This release is deployed onto a new runtime environment in the Cloud entirely dedicated to Production. As a second outcome of this package, user-level documentation is updated to remain in sync with the latest release.

e-Maris is staged in the Production environment. This includes various forms of application-level configuration, a seeding of the full range of CPCs, an initial staging of their initial users, and mostly the design of the upcoming

data collection campaign based on the 2022-2023 reporting requirements, with all its report layout definitions and temporal aspects.

At the end of this WP, the application is fully functional and open for the real-life 2022-2023 Compliance Assessment cycle.

Deliverable	e-Maris Incremental Release
Deliverable	User Documentation Incremental Update
Deliverable	Midway meeting
Deliverable	WP Report: Summary and Assessment of Activities, Events and Outcomes

#### WP6: RAV Construction II

**(ONGOING)**

September 2022 – February 2023

The RAV Beta Release delivered at the end of WP3 is fleshed out and expanded in a continuous cycle of development iterations that include Backend Integration, Frontend Development, and QA activities. The main outcome of this phase is a Candidate Release of the system, ready as a basis for a rollout process.

Deliverable	RAV Candidate Release.
Deliverable	WP Report: Summary and Assessment of Activities, Events and Outcomes.

#### WP8: e-Maris Support & Operations

**(ONGOING)**

December 2022 – August 2023

The e-Maris system enters a regime of observation and on-demand support, with an expectation of intensive activity for the first three months, as well as at peak reporting times in the data collection campaign.

Besides incident resolution and ticket processing, the system undergoes as many short-lived iterations as required for bug fixing and unanticipated, high-priority enhancements. These activities result in Incremental Releases of the system.

User-level documentation is updated as required so as to remain in sync with the latest release.

This WP is divided in three phases: Active maintenance 1 (September 2022-November 2022) & Active maintenance 2 (December 2022-February 2023) where most of the effort takes place, and Passive maintenance (March 2023-August 2023), where work only happens when an issue is identified.

Deliverable	e-Maris Incremental Releases (as required)
Deliverable	User Documentation Incremental Updates (as required)

#### WP9: RAV Construction III & RAV Rollout

**(ONGOING)**

March 2023 – June 2023

The Candidate Release delivered in WP6 is further refined into a Stable Release, which is deployed onto a new runtime environment in the Cloud entirely dedicated to Production.

The historical record of data accumulated in the legacy generation of the system is transformed and ingested in the new system.

The system is staged in Production, a task that includes various forms of application-level configuration, as well as a seeding of the full range of CPCs, an initial staging of their initial users.

Deliverable	RAV Stable Release
Deliverable	RAV rollout

Deliverable	RAV Data Migration
Deliverable	RAV User Documentation
Deliverable	WP Report: Summary and Assessment of Activities, Events and Outcomes

### WP10: RAV Support & Operations

July 2023 – August 2023

The RAV system enters a regime of observation and on-demand support, with an expectation of intensive activity for the first three months after the rollout in WP9.

Besides incident resolution and ticket processing, the system undergoes as many short-lived iterations as required for bug fixing and for unanticipated, high-priority enhancements. These activities result in Incremental Releases of the system.

User-level documentation is updated as required so as to remain in sync with the latest release.

Deliverable	RAV Incremental Releases (as required)
Deliverable	User Documentation Incremental Updates (as required)

### RECOMMENDATION/S

That the WPICMM06:

- 1) **NOTE** paper IOTC–2023–WPICMM06–10 on the progress on the development of the e-MARIS application and the online Record of Authorised Vessels application.
- 2) **NOTE** the progress made for the development of the e-MARIS application and the online Record of Authorised Vessels application and the work plan for 2023.
- 3) **NOTE** that the SWIOFISH 2 project support for-MARIS and the online Record of Authorised Vessels applications will terminate in September 2023.
- 4) Consider to **RECOMMEND** that Compliance Committee requests the IOTC Secretariat to identify, propose and secure financing for the operation and maintenance of the e-MARIS application and the online Record of Authorised Vessels application, and to keep future sessions of the Compliance Committee informed of progress.
- 5) **NOTE** that e-MARIS has been fully operational since the beginning of January 2023 and to **FURTHER NOTE** that the Commission (S26) endorsed WPICMM05's recommendation that those CPCs encountering problems to utilise e-Maris to be allowed to continue using the paper system for Compliance Committee 20.
- 6) Consider to **RECOMMEND** to the Compliance Committee that the use of e-MARIS be made mandatory for all CPCs after Compliance Committee 20, henceforth.