Report of the 5th Session of the IOTC Ad-hoc Working Group on the Development of Electronic Monitoring Programme Standards (WGEMS)

Online, 5 May 2025

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ACRONYMS

AIS	Automatic Identification System
BET	Bigeye tuna
CPCs	Contracting parties and cooperating non-contracting parties of the IOTC
EM	Electronic Monitoring
EMS	Electronic Monitoring System
IOTC	Indian Ocean Tuna Commission
RAV	IOTC Record of Authorised Vessels
RFMO	Regional Fisheries Management Organization
ROS	Regional Observer Scheme
SC	IOTC Scientific Committee
VMS	Vessel Monitoring System
WPDCS	Working Party on Data Collection and Statistics of the IOTC
WWF	World Wide Fund for nature

STANDARDISATION OF IOTC WORKING PARTY AND SCIENTIFIC COMMITTEE REPORT TERMINOLOGY

SC16.07 (para. 23) The SC **ADOPTED** the reporting terminology contained in Appendix IV and **RECOMMENDED** that the Commission considers adopting the standardised IOTC Report terminology, to further improve the clarity of information sharing from, and among its subsidiary bodies.

HOW TO INTERPRET TERMINOLOGY CONTAINED IN THIS REPORT

Level 1: From a subsidiary body of the Commission to the next level in the structure of the Commission:

RECOMMENDED, RECOMMENDATION: Any conclusion or request for an action to be undertaken, from a subsidiary body of the Commission (Committee or Working Party), which is to be formally provided to the next level in the structure of the Commission for its consideration/endorsement (e.g., from a Working Party to the Scientific Committee; from a Committee to the Commission). The intention is that the higher body will consider the recommended action for endorsement under its own mandate, if the subsidiary body does not already have the required mandate. Ideally this should be task specific and contain a timeframe for completion.

Level 2: From a subsidiary body of the Commission to a CPC, the IOTC Secretariat, or other body (not the Commission) to carry out a specified task:

REQUESTED: This term should only be used by a subsidiary body of the Commission if it does not wish to have the request formally adopted/endorsed by the next level in the structure of the Commission. For example, if a Committee wishes to seek additional input from a CPC on a particular topic, but does not wish to formalise the request beyond the mandate of the Committee, it may request that a set action be undertaken. Ideally this should be task specific and contain a timeframe for the completion.

Level 3: General terms to be used for consistency:

AGREED: Any point of discussion from a meeting which the IOTC body considers to be an agreed course of action covered by its mandate, which has not already been dealt with under Level 1 or level 2 above; a general point of agreement among delegations/participants of a meeting which does not need to be considered/adopted by the next level in the Commission's structure.

NOTED/NOTING: Any point of discussion from a meeting which the IOTC body considers to be important enough to record in a meeting report for future reference.

Any other term: Any other term may be used in addition to the Level 3 terms to highlight to the reader of and IOTC report, the importance of the relevant paragraph. However, other terms used are considered for explanatory/informational purposes only and shall have no higher rating within the reporting terminology hierarchy than Level 3, described above (e.g., **CONSIDERED**; **URGED**; **ACKNOWLEDGED**).

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EXECUTIVE SUMMARY

The 5th Session of the Indian Ocean Tuna Commission's (IOTC) Ad hoc Working Group on the Development of Electronic Monitoring Programme Standards (WGEMS) was held online on Zoom on 5 May 2025. A total of 43 participants attended the Session (80 in 2024, 89 in 2023 and 104 in 2022). The list of participants is provided in Appendix I. The meeting was opened by the Chairperson, Dr Hilario Murua (ISSF) who welcomed participants.

The WGEMS **NOTED** that the ROS forms have been updated for purse seine, longline and pole and line by the Secretariat based on the revised minimum data fields endorsed by the SC. However, the WGEMS **NOTED** that the gillnet specific fields still need revision as gillnet fishery experts were not available to provide inputs into the review process.

The WGEMS **AGREED** that the same gear-specific small working groups as those who worked together last year should review the revised data forms and ensure that all of the minimum data fields have been properly incorporated. The WGEMS **ENCOURAGED** those who would like to participate in this work to contact the Chair or the Secretariat.

The WGEMS **NOTED** that no CPCs provided updates on EM pilots projects and that only Australia are currently providing EM data to the Secretariat despite Resolution 24/04 allowing CPCs to use EM to complement their onboard observers to raise their coverage levels.

The WGEMS **NOTED** two papers relating to the use of Artificial Intelligence in analysing species composition from EM footage. The WGEMS **NOTED** that both approaches seemed promising but much work is still required to improve the accuracy of the analyses.

The following is the recommendation from the WGEMS05 to the Working Party on Data Collection and Statistics.

WGEMS04.01 (para. 35) The WGEMS **RECOMMENDED** that the WPDCS consider and endorse the WGEMS Programme of Work (2026–2029), as provided in Appendix IV.

1. OPENING OF THE MEETING

1. The 5th Session of the Indian Ocean Tuna Commission's (IOTC) Ad-hoc Working Group on the Development of Electronic Monitoring Programme Standards (WGEMS) was held online on Zoom on 5 May 2025. A total of 43 participants attended the Session (80 in 2024, 89 in 2023 and 104 in 2022). The list of participants is provided in Appendix I. The meeting was opened by the Chairperson, Dr Hilario Murua (ISSF) who welcomed participants.

2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

2. The WGEMS **ADOPTED** the Agenda provided at Appendix II. The documents presented to the WGEMS are listed in Appendix III.

3. DECISIONS OF THE COMMISSION RELATED TO THE WORK OF THE WGEMS

3.1 Any Relevant Outcomes from the 29th Session of the Commission

3. The WGEMS **NOTED** that the 29th Session of the Commission did not discuss issues relating to WGEMS in any detail.

4. The WGEMS **NOTED** the adoption of Resolution 25/06 *On a Regional Observer Scheme* which will supersede Resolution 24/04. The revisions relate to the timings for submitting observer reports and harmonising this with the deadlines for submitting data for the main IOTC datasets. There were no changes in relation to Electronic Monitoring Systems.

3.2 Updates from the 27th Session of the Scientific Committee

5. The WGEMS **NOTED** the discussions held during the 2024 Session of the Scientific Committee and included in the SC27 report:

*(para. 142) The SC **NOTED** the report of the 4th ad hoc working group meeting on Electronic Monitoring Standards (IOTC -2024-WGEMS04-R), including the recommendation to convene an in-person meeting to address outstanding issues and finalise changes to the data fields for each gear type. The meeting was attended by 80 participants (cf. 89 in 2023).*

*(para. 143) The SC **ACKNOWLEDGED** that the WPDCS conducted a comprehensive review of all ROS data fields for purse seine, longline, and pole-and-line fisheries but did not address the gillnet-specific fields due to the absence of gillnet fishery experts at the meeting.*

*(para. 144) The SC **NOTED** the recommendation from the WPDCS based on this review:*

- *That the SC **ENDORSE** the following revised lists of ROS minimum data fields (including their stated collection and reporting requirement) for purse seine, longline and pole and line (include associated "general" fields) provided in IOTC-2024-SC27-DATA01.*
- *That the SC **ENDORSE** the revised collection and reporting requirement categories as follows:*

  - Mandatory – mandatory for collection and reporting

  - Optional – optional for collection and reporting
- *That the SC **ENDORSE** the revised ROS data fields (and associated collection and reporting requirements) as a living document, for which CPCs can, if necessary, in future years, bring forward proposals for amendments or improvements, to the WPDCS and SC for review.*
- *That the SC **advise** the Commission to take actions for all CPCs to ensure that the Record of Authorised Vessels (RAV) details are completely accurate and up to date.*

*(para. 145) The SC **REQUESTED** the WPDCS to undertake an online intersessional review in collaboration with the IOTC Secretariat to check and where necessary amend field definitions and reporting requirements to ensure that they appropriately recognise (where necessary) the potential use of additional ROS data collection tools (e.g., EM and port sampling) and are otherwise also clear and easy to understand for observers.*

6. The WGEMS **NOTED** that the group has not yet undertaken the intersessional review to check the field definitions as they were awaiting the endorsement of these new data fields by the Commission. The WGEMS **AGREED** that now that these have been endorsed, this work will be undertaken ahead of the WPDCS later this year.

4. THE IOTC REGIONAL OBSERVER SCHEME

4.1 Current projects related to Electronic Monitoring and Electronic Reporting

7. The WGEMS **NOTED** that no papers were submitted on this topic.

4.2 Revision of ROS minimum data standards

8. The WGEMS **NOTED** paper IOTC-2025-WGEMS05-07 which provided an update on the revised ROS data forms for review.

9. The WGEMS **NOTED** that the ROS forms have been updated for purse seine, longline and pole and line by the Secretariat based on the revised minimum data fields endorsed by the SC. However, the WGEMS **NOTED** that the gillnet specific fields still need revision as gillnet fishery experts were not available to provide inputs into the review process.

10. The WGEMS **NOTED** that the IOTC has hired two consultants to help to address some of the outstanding issues with the ROS. One will deal with technical details such as updating the ROS model and tools to allow data to be submitted to the Secretariat easily by CPCs and incorporated into the database. The other consultant will be responsible for aligning all updates to the ROS data fields with existing documentation, ensuring that all materials related to the ROS accurately reflect the revised data fields.

11. The WGEMS **NOTED** a number of comments and questions from the Secretariat regarding translating the new minimum data fields into the updated ROS forms. The WGEMS **AGREED** with all the suggestions put forward by the Secretariat on general comments.

12. The WGEMS **NOTED** that there are some non-mandatory fields, such as the tori line diagram, that would be difficult for CPCs to submit through the data forms. The WGEMS **SUGGESTED** that this information could be submitted through observer data submissions or national reports and **ENCOURAGED** the provision of both, observer data and observer report according with the paragraph 18 of the Resolution 24/04.

13. The WGEMS **NOTED** a question from the Secretariat regarding the data field that had been revised from 'Number of retrieved hooks observed' to 'Number of branchline haulings observed'. The WGEMS **NOTED** that many participants expressed surprise and concern about this proposed change, **NOTING** that it would be difficult to use this information to properly calculate the number of observed hooks which is used by the Secretariat to estimate the observer coverage. The WGEMS also **NOTED** that branchlines can have different meanings in different fleets or with different gear configurations meaning that it would be difficult to compare this or to use this information to calculate the number of hooks observed. The WGEMS **AGREED** that the original 'number of retrieved hooks observed', should be maintained and **REQUESTED** the longline working group to review this issue.

14. The WGEMS **NOTED** that in some cases, hooks may have been bitten off or otherwise lost which is important information to know so **ENCOURAGED** the revision of the data field 'Number of retrieved hooks observed' description to instruct observers to include bite offs in the total number of hooks observed.

15.

16. The WGEMS further **NOTED** that the Commission endorsed the SC's recommendation for mandatory reporting of geo-referenced effort data as a number of sets/operations for longline and surface fisheries to complement the current requirements of Resolution 15/02, which would allow the Secretariat to accurately calculate the ROS coverage in line with the requirement in Resolution 24/04 (now Resolution 25/06). The WGEMS **NOTED** that this was requested by some CPCs as an alternative to using the number of hooks observed to calculate the coverage.

17. The WGEMS **NOTED** that the record of accredited observers provided by CPCs is integrated into e-Maris, under requirement 9.5 (not accessible) to facilitate the review and update of the list of National observers for each CPC. The Secretariat will be assigning an ID and update the records according to CPCs submissions. The WGEMS **NOTED** that the Secretariat will include a data field in the ROS database to distinguish between onboard observers and observers who review EM records (i.e., EM footage).

18. The WGEMS **AGREED** that the same gear-specific small working groups as those who worked together last year should review the revised data forms and ensure that all of the minimum data fields have been properly incorporated and the definitions are clear and understandable. The WGEMS **ENCOURAGED** those who would like to participate in this work to contact the Chair or the Secretariat.

5. EMS PROGRAMMES/RESEARCH INITIATIVES IN IOTC

5.1 Update on CPCs EMS pilot projects and Programmes

19. The WGEMS **NOTED** that while no CPCs provided updates on EM pilot projects, WWF had indicated that they are starting three EM related projects. Details of these projects were summarised for the group:

- A small consultancy to assess, validate, and harmonize low-cost data collection systems used in small-scale fisheries across five SWIO countries—Mozambique, South Africa, Tanzania, Kenya, and Madagascar. This work aims to evaluate pilot tools such as MoMs, Abalobi, eCAS, SMART, and KoboToolbox based on performance, scalability, and alignment with regional fisheries frameworks (e.g., IOTC, SWIOFC).
- Implementing a pilot project in Madagascar to explore the use of low-cost electronic monitoring (EM) tools—including drones, Earth Observation technologies, and satellite tracking systems—to strengthen fisheries MCS. The project will focus on assessing the effectiveness of these technologies within the existing legal and regulatory frameworks and will deliver policy briefs, capacity-building workshops, and visual communication products. The pilot aims to inform regional MCS strategies and promote broader adoption of EM across the SWIO region by demonstrating scalable, cost-effective solutions for combating IUU fishing.
- Piloting the use of low-cost Electronic Monitoring (EM) systems on small-scale tuna vessels for data collection.

5.2 Update on EMS project/initiatives (EM data collection congruence, image recognition by artificial intelligence, EM record analysis software, etc.)

20. The WGEMS **NOTED** paper IOTC-2025-WGEMS05-05 on artificial vision, a new method to estimate the species composition of catches in tropical tuna purse seine fisheries, including the following abstract provided by the authors:

> *"Purse seine fisheries play a crucial role in global tuna fishing, accounting for approximately 66% of the world's tropical tuna catch. However, accurately estimating the specific composition of these catches per set and in real-time remains challenging. To enhance traditional data collection methods like onboard observers and port sampling, all tuna Regional Fisheries Management Organizations (RFMOs) have established minimum standards for utilizing Electronic Monitoring (EM). EM was developed to improve data collection efficiency and traceability. Despite its advantages, EM faces challenges such as the time required to review all data and the difficulties in accurately distinguishing and estimating the specific composition of purse seine catches based on visual reviews.*
>
> *In response to these challenges, we are developing a pipeline to reduce the workload involved in reviewing EM footage. This pipeline utilizes video captured by the EM, along with several computer vision models. This setup enables the estimation of species composition of the catches with minimal human interaction. The target tuna species composition is estimated using standard 2D footage from the wells deck, where the fish are recorded on the conveyor belt before being stored in wells.*
>
> *This document highlights several key points identified during the pipeline's development. Some issues to consider while collecting data aboard the vessel include ensuring adequate lighting on the fishing deck and utilizing dedicated global shutter camera hardware. Other considerations pertain to the development of AI models, such as creating custom datasets and specific model architectures. Addressing these factors will enhance the accuracy and efficiency of species composition estimation, ultimately improving the overall effectiveness of EM systems in fisheries management."*

21. The WGEMS **NOTED** that this technology has promising results with good accuracy scores but is still preliminary at this stage.

22. The WGEMS **QUERIED** when the technology would be considered practical for commercial application, **NOTING** the importance of developing experimental training datasets to ground-truth predictions. The WPEB **NOTED** that

significant work remains to ensure the validity of the results, and suggested that this working group, along with the WPDCS, could be the right forum to discuss relevant criteria. However, the WGEMS **AGREED** that extra caution is required, especially if the results may be used for compliance purposes. The WGEMS also **NOTED** the suggestion of using a 10% tolerance margin of error, as prescribed in EU regulations, as a potential threshold for the criteria.

23. The WGEMS **NOTED** that some neritic tuna species (such as frigate tuna), which are commonly caught by purse seines, are currently treated as non-target species by the system and separated from target species (i.e., SKJ, YFT, and BET) at the initial stage of the classification models. The WGEMS also **NOTED** that these species are generally easy to distinguish from other non-target species, such as sharks.

24. The WGEMS **NOTED** that although this is a controlled experiment aimed at improving accuracy, bias may still be introduced due to certain configurations. For example, some sections are unobservable—small fish may be covered by larger fish and are thus not visible to the camera. In wells close to the hatch, it is not possible to have camera coverage, and in some cases, fish can go directly into the well without passing through the conveyor belt, resulting in a significant amount of unobservable catch. The WGEMS **NOTED** that, at present, the trial is focused primarily on optimal scenarios under the best conditions.

25. The WGEMS **NOTED** that, in commercial fishing, large quantities of fish often pile up on the belt. The WGEMS **NOTED** a suggestion that using a device to spread the fish could increase camera coverage in real applications. The WGEMS **NOTED** that while spreading the pile would certainly help improve model predictions, the current project is not planning to change standard fishing practices and operations.

26. The WGEMS **NOTED** that the current confidence ratio of 0.7 used in the model prediction is subjective, and while other thresholds could be considered, it is unclear if they would produce better results. The WGEMS also **NOTED** that the validation exercise is ongoing, with comparisons to true samples having only started a few weeks ago.

27. The WGEMS **NOTED** that much of the footage has been collected from real vessels, but it has not yet been thoroughly analysed, as the project currently remains focused on ground-truthing samples in the control experiment. The WGEMS **NOTED** that there is a need to increase the sample size which is the next step in the project, and that a good approximation of reality would require around 1,000 fish.

28. The WGEMS **NOTED** paper IOTC-2025-WGEMS05-06 on Mobilizing AI and edge processing of electronic monitoring footage to advance sustainable fisheries management, including the following abstract provided by the authors:

> *"Large-scale fishing provides essential protein globally, but over one-third of the world's fish stocks are fished at unsustainable levels. Illegal, unreported, and unregulated (IUU) fishing can lead to fish stock decline, altered food web dynamics, and decreased resilience of marine species and ecosystems to climate change impacts. Effective fisheries management requires verified monitoring data.*
>
> *Electronic monitoring (EM)—the use of onboard video cameras, GPS and sensors to monitor and verify fishing activities at sea—has significant potential to improve fisheries sustainability and management when installed on industrial fishing vessels. However, the broad adoption of EM is hindered by the immense volume of footage generated by a single vessel and across fleets along with the costs associated with footage review. Currently, the average review process involves manually shipping hard drives to human review centers after vessels return to port where the footage is analyzed long after the seafood products enter the supply chain. This prevents the delivery of timely, actionable data to stakeholders.*
>
> *The Nature Conservancy's Large-Scale Fisheries (LSF) Program seeks to dismantle these barriers to scaling EM by integrating edge AI, a form of computer vision that makes processing footage faster by analyzing the video aboard fishing vessels and predicting catch count and species composition."*

29. The WGEMS **NOTED** that the model has been trained to detect fish to the species level and is therefore capable of distinguishing between tuna and non-tuna species.

30. The WGEMS **NOTED** that a reference line is used to determine the fish retained, based on the fish entering and exiting the line.

31. The WGEMS **NOTED** that the example camera footage in the test data is in good condition; however, lighting conditions can sometimes be poor in practice, which can make analysis more difficult. For example, when the sunlight is too bright, light can reflect off the skin of the fish making it difficult to detect any patterns to allow for species identification.

32. The WGEMS **NOTED** that the project has utilized additional tools to annotate the footage. At this stage, only 5% of the data has been annotated and the model needs to be further trained with more data that covers different

aspects of the fishing process to improve its performance and scalability, enabling it to be rolled out to other vessels and larger fleets.

33. The WGEMS **NOTED** that currently this is being run on only two vessels but that the team hopes to extend this onto more vessels and so they are working to make it easier to scale this process up.

6. PLAN AND FUTURE MEETINGS

6.1 Updated roadmap to implement EM Programme in IOTC

34. The WGEMS **NOTED** that to date, the Secretariat has still only received EM data from Australia despite Resolution 24/04 allowing CPCs to use EM to complement their onboard observers to raise their coverage levels.

6.2 Revision of the WG Program of Work (2026–2029)

35. The WGEMS **NOTED** paper IOTC-2025-WGEMS05-03 on the WGEMS Program of Work (2026–2030).

36. The WGEMS **RECOMMENDED** that the WPDCS consider and endorse the WGEMS Programme of Work (2026–2030), as provided in Appendix IV.

6.3 Next Meetings

37. The WGEMS **NOTED** that the small gear working groups will again work intersessionally to review and finalise the ROS data forms ahead of the WPDCS where these can be endorsed.

7. OTHER BUSINESS

7.1 Election of the Chair and the Vice-Chair of the WGEMS for the next biennium (Chairperson and IOTC Secretariat)

Chairperson

38. The WGEMS **NOTED** that the second term of the current Chairperson, Dr Hilario Murua (ISSF) expired at the close of the WGEMS05 meeting and, as per the IOTC Rules of Procedure (2014), participants are required to elect a new Chairperson of the WPEB for the next biennium. The WGEMS **EXPRESSED** their gratitude to the Chair for his dedicated leadership, **NOTING** that numerous important issues were resolved and significant progress was made during his tenure.

39. **NOTING** the Rules of Procedure (2014), the WGEMS **CALLED** for nominations for the position of Chairperson of the IOTC WGEMS for the next biennium. Dr Don Bromhead (Australia) was nominated, seconded and elected as Chairperson of the WGEMS for the next biennium.

Vice-Chairpersons

40. The WGEMS **NOTED** that the second term of the current first Vice-Chairperson, Dr Don Bromhead (Australia) expired at the close of the WGEMS05 meeting and, as per the IOTC Rules of Procedure (2014), participants are required to elect a new Vice-Chairperson of the WGEMS for the next biennium.

41. **NOTING** the Rules of Procedure (2014), the WGEMS **CALLED** for nominations for the position of first Vice-Chairperson of the IOTC WGEMS for the next biennium. Dr Hilario Murua (ISSF) was nominated, seconded and elected as Vice-Chairperson of the WGEMS for the next biennium.

7.2 Date and place of the 6th Session of the WGEMS (Chairperson and IOTC Secretariat)

42. The WGEMS **NOTED** that the Commission has provisionally scheduled next year's meeting for 13-14th April. The WGEMS **NOTED** that the dates will be finalised during the SC later this year.

43. The WGEMS **SUGGESTED** maintaining two days for the meeting for next year but **NOTED** that this can be reduced to one if few papers are submitted ahead of the meeting.

8. REVIEW OF THE DRAFT, AND ADOPTION OF THE REPORT OF THE 4TH SESSION OF THE WGEMS

44. The report of the 5th Session of the Ad-hoc Working Group on the Development of Electronic Monitoring Programme Standards (IOTC–2025–WGEMS05–R) was **ADOPTED** via correspondence.

APPENDIX I

LIST OF PARTICIPANTS

Chairpersons					
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APPENDIX II
MEETING AGENDA

Date: 5-6 May
Location: Online
Venue: Zoom
Time: 12:00 – 16:00 (Seychelles time) daily
Chairperson: Dr. Hilario Murua, **Vice-chair**: Dr. Don Bromhead

1. **OPENING OF THE MEETING** (Chairperson)
2. **ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION** (Chairperson)
3. **DECISIONS OF THE COMMISSION RELATED TO THE WORK OF THE WGEMS**
   - 3.1. Updates from the 27th Session of the Scientific Committee
   - 3.2. Any Relevant Outcomes from the 29th Session of the Commission
4. **THE IOTC REGIONAL OBSERVER SCHEME (ROS)** (IOTC Secretariat)
   - 4.1. Current projects related to Electronic Monitoring and Electronic Reporting (all)
   - 4.2. Revision of ROS minimum data standards (all)
5. **EM PROGRAMME INITIATIVES IN IOTC**
   - 5.1. Update on CPCs EMS pilot projects and Programmes
   - 5.2. Update on EMS project/initiatives (EM data collection congruence, image recognition by artificial intelligence, EM record analysis software, etc.)
6. **PLAN AND FUTURE MEETINGS** (Chairperson and Vice-chairperson)
   - 6.1. Updated roadmap to implement EM Programme in IOTC
   - 6.2. Revision of the WG Program of Work (2026–2029)
   - 6.3. Next meetings
7. **OTHER BUSINESS**
   - 7.1. Election of the Chair and the Vice-Chair of the WGEMS for the next biennium (Chairperson and IOTC Secretariat)
   - 7.2. Date and place of the 6th Session of the WGEMS (Chairperson and IOTC Secretariat)
8. **REVIEW OF THE DRAFT, AND ADOPTION OF THE REPORT OF THE 5TH SESSION OF THE WGEMS**

APPENDIX III
LIST OF DOCUMENTS

Document	Title
IOTC-2025-WGEMS05-01a	Draft Agenda for the 5th Ad-Hoc Working Group on the Development of Electronic Monitoring Programme Standards (WGEMS) (Secretariat)
IOTC-2025-WGEMS05-01b	Draft Annotated Agenda for the 5th Ad-Hoc Working Group on the Development of Electronic Monitoring Programme Standards (WGEMS) (Secretariat)
IOTC-2025-WGEMS05-02	List of Documents for the 5th Ad-Hoc Working Group on the Development of Electronic Monitoring Programme Standards (WGEMS) (Secretariat)
IOTC-2025-WGEMS05-03	WGEMS Programme of Work (2026 – 2029) (Secretariat)
IOTC-2025-WGEMS05-04	Outcomes of the 29th Session of the Commission and the 27th Session of the Scientific Committee (Secretariat)
IOTC-2025-WGEMS05-05	Artificial vision, a new method to estimate the species composition of catches in tropical tuna purse seine fisheries (Lekunberri, X., Ruiz, J., Kamal, A. and Quincoces, I.)
IOTC-2025-WGEMS05-06	Mobilizing AI and edge processing of electronic monitoring footage to advance sustainable fisheries management (Saccomanno, V., Gilmer, B., Teran, A. and Fletcher, M.)
IOTC-2025-WGEMS05-07	ROS reporting forms update (Secretariat)

APPENDIX IV

PROGRAMME OF WORK FOR THE AD HOC WORKING GROUP ON THE DEVELOPMENT OF ELECTRONIC MONITORING PROGRAMME STANDARDS (2026–2030)

The Program of Work consists of the following, noting that a timeline for implementation would be developed by the SC once it has agreed to the priority projects across all of its Working Parties:

Table 1. Priority topics for obtaining the information necessary to deliver the necessary advice to the Commission. Resolution 25/06 and 23/08 elements have been incorporated as required by the Commission.

		Timing				
Topic	**Sub-topic and project**	**2026**	**2027**	**2028**	**2029**	**2030**
Items considered to be of high priority						
1. EMS data fields	Review of the fields that are required under the ROS but are logistically difficult to collect for EMS (and /or human observers) and their utilisation for scientific and management purposes.					
2. Capacity building	Capacity building to develop and implement National EMS Programs.					
3. EMS Pilot Projects	Facilitation of EMS pilot projects in IOTC fisheries (LL, PS, PL, GN, and others) to ensure that ROP minimum data requirements are collected by EMS Cross validation of EM information with other data sources Identify needs and encourage pilots for new electronic tools and systems. Provide guide for the capabilities of EMS to collect ROS data requirements and how they may be collected in the future (include examples as to how annex II of EM System and Data Standards can be improved).					
Items considered to be of medium to low priority						

4. Develop guidelines on development of EM programmes	• An overview of the projects conducted in the Indian Ocean and other oceans with some general information (number of vessels, gears, EM provider, duration, context (e.g., FIP), funding, etc.) • A list of EM providers with the main pros and cons (like in document IOTC–2024–WGEMS04–06) • An open repository on EM scientific articles, reports, and conference proceedings (e.g., PEW) • A review of the main outcomes of the pilots to define best practices and guidance to any CPC that would be interested in developing an EM project, including information on costs of equipment, maintenance, and review, and • Collaboration with other t-RFMOs , including other RFBs such as ICES, to compare progress on implementation, commonalities between data minimum requirements, standards and exchange formats between companies, identification of unobtainable information with EM, etc., and possibly work on a global, standard terminology and glossary that could be considered in the context of the Coordinating Working Party on fishery statistics of the FAO.					
5. Review EM Minimum data Standards	Agree on or revise: • Definitions • Minimum technical specifications and equipment • Data collection (including EM capabilities to collect ROP minimum data requirements) and storage • Data transfer and logistical specifications • Data analysis specification and data submission • EM maintenance and functioning, • EM data analysis, validation and quality control specifications • Roles of EM users					

6. Review of EM Programme Standards	Agree on or revise: • Objectives and Scope of the Programme • Institutional structure and management • EMS coverage and data review coverage • Roles and responsibilities • Specifications and Procedures • Timeframe for EMS implementation • Accreditation of EMS Systems/vendors • Data confidentiality, access and use • EMS Program cost					
7. Compatibility and Interoperability	Compatibility of IOTC databases and other collection platforms (e.g. VMS) Interoperability among different vendor's EMSs					
8. Development of tools and innovative strategies	Innovative collection of data which may include Artificial Intelligence and Machine learning for EMS data analysis as well as other methods that are identified by the WG.					