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IMPLEMENTATION OF AN ELECTRONIC MONITORING SYSTEM (EMS)

UPDATED STAFF CONSIDERATIONS AND DRAFT RECOMMENDATIONS – PROGRESS REPORT

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SUMMARY

In accordance with the Commission-approved workplan for the implementation of an Electronic Monitoring System (EMS) for the tuna fisheries of the EPO, the purpose of this document is to present a report on the progress made during the 2nd and 3rd EMS workshops on the Institutional structure, goals and scope of the EMS, and on the EMS Management considerations, in that order. The feedback of the workshop participants is summarized and reflects their thoughts on topic-based discussions that were stimulated by a series of preliminary recommendations made by the staff, with the understanding that these recommendations may evolve over time, after each successive workshop, as a result of the feedback resulting from the discussion.

1. INTRODUCTION

As a general background, it should be recalled that the IATTC has acknowledged and endorsed that electronic monitoring (EM) is a promising tool for monitoring, addressing data gaps, and improving data collection for both purse-seine and longline vessels that do not carry onboard observers, as well as for vessels with observers onboard as a mean to complement the observer's data-collection (Resolution C-19-08; Document SAC-07-07f.i). Consequently, as requested by the Scientific Advisory Committee (SAC) at its 10th meeting (2019) in its Recommendation 3.1, which was endorsed by the Commission, and in compliance with Resolution C-19-08, paragraphs 9 and 10, the staff prepared, and subsequently presented at the 11th meeting of the SAC, Document SAC-11-10 "*An electronic monitoring system for the tuna fisheries in the eastern Pacific Ocean: objectives and standards*". This document contained information on the potential of an Electronic Monitoring System (EMS), a description of its potential components, a comprehensive evaluation of the minimum standards for these components, and the actions that would be required for its implementation. On that basis, the IATTC staff proposed that the *1st Workshop on Implementation of an Electronic Monitoring System* further discuss some of the elements contained in document SAC-11-10 and the recommendations compiled in the document EMS-01-01.

As complement to these recommendations, Document EMS-01-02 (Rev.) proposed a workplan (Table 1; Figure 1), consisting in the holding of several workshops that would focus on the various EMS components and subcomponents and analyze them in a logical and chronological order. The purpose of these workshops is to educate participants and foster communication, facilitate discussions and generate ideas to working towards a common understanding among stakeholders on EM matters, and to highlight where

participants seemed to be in broad agreement, as well as those where future challenges lie in as a result of strongly held differences. As a result, at its 98th meeting, held in August 2021, the Commission adopted Resolution C-21-02, which established the Terms of Reference for these workshops, and adopted on a provisional basis, the definitions recommended in the document EMS-01-01 to facilitate the discussion in the EMS workshops (Resolution C-21-03).

This document presents a compilation of the background and the rationale of the recommendations indicated in the documents EMS-02-01, EMS-02-02 and EMS-03-01, and presented during the 2nd and the 3rd EM workshops in the EPO on the Institutional structure, goals and scope of the EMS, and on the EMS Management considerations, in that order; in accordance with the implementation of an EMS for the tuna fisheries of the EPO. In addition, this document addresses the discussions on the topics discussed during the 2nd and 3rd EMS workshops and revised the recommendations when considered appropriate. A summary of the recommendations covered are compiled in the Appendix 1.

Finally, it should be noted that the adopted work plan anticipates that the current series of EMS workshops would generate a corresponding series of actionable recommendations to be considered by the Commission for adoption. However, with the benefit of experience from the first three workshops, this seems like an unrealistic expectation, given the informal and open format of the workshops instead of that of delegations negotiating towards consensus recommendations. Additionally, the workshops are convened and facilitated by IATTC staff rather than a Member-appointed Chair, as would be expected for the holding of negotiations leading to the adoption of formal recommendations. This has demonstrated that the Commission should most probably consider now the establishment of an Ad Hoc Working Group which would complement the process of the workshops, as set in the approved workplan, without duplicating it; offering to Members a forum to discuss issues and reach conclusions and eventual recommendations that cannot be resulting from technical and informal workshops.

2. WORKPLAN ON THE IMPLEMENTATION OF THE EMS IN THE EPO

2.1. Institutional Structure, Goals and Scope of the EMS

The *2nd Workshop of an Electronic Monitoring System (EMS) in the EPO: Institutional Structure, Goals and Scope of the EMS* was held to address a number of organizational issues relating to the institutional structure (document EMS-02-01) as well as to the goals and the scope of an EMS for tuna fisheries in the EPO (document EMS-02-02). It was also noted that the conclusions and recommendations reached at this workshop will necessarily impact and guide the exploration of other objectives and actions to be considered for the other EMS components and subcomponents to be discussed in the future workshops (e.g. EM data to be generated, EM review rate, EM coverage).

2.1.1. Institutional Structure

Structure of the EMS program

Document EMS-02-01 describes the options for an institutional framework of an EMS program under the umbrella of a single institution or a combination of institutions and the way they operate, their relationships and interactions. For the EMS scheme, the overarching institutional framework would be the IATTC itself.

Workshop discussion on this topic**.** As indicated in the document WSEMS-02 Discussion Summary, there were a range of different opinions on the best framework for an EMS Program for the EPO. Some participants expressed a preference for a highly decentralized system comprised exclusively of national programs, which would be harmonized, and that would provide summarized data to the IATTC according to a set of agreed minimum standards and fields, while others expressed concerns about a model that would mandate exclusively the use of national programs, noting that some CPCs might not have the

capacity or desire to establish and maintain a national EMS program. Thus, they would prefer a centralized or hybrid EMS program that allowed for the possibility for IATTC to provide the required EMS coverage and process the resulting data. Other opinions also pointed out that some aspects of EMS institutional structure might vary according to the vessel type and activity (e.g purse-seine, longline, or carrier vessel).

IATTC staff considers that for the EMS scheme, the overarching institutional framework would be the IATTC itself. Therefore, the staff suggests the recommendation would remain as originally proposed*:*

> *Establish a single, unified EMS Program for the EPO following the International Dolphin Conservation Program (IDCP) model, in which databases, standards, procedures and protocols are standardized across all components/individual programs and are compatible with existing IDCP and IATTC practices*.

Rules and procedures: standardization and compatibility

As expressed in the document EMS-02-01, within the institutional structure, the staff suggested the establishment of a central body that would interact with the different national bodies/agencies, as a hybrid approach similar to that of the AIDCP Onboard Observer Program. In addition, the set of rules and procedures that would govern the functioning of the scheme would be defined so as to ensure, as a principle, a general standardization and compatibility between themselves and the regional and national level as well as with the existing IATTC rules, standards and practices. The need of such standardization and compatibility would be most acute if some institutional components of the whole scheme at the national level would choose in turn to delegate its implementation to a third party.

Workshop discussion on this topic. Several participants agreed that the use of third-party vendors (and also decentralized national programs) would require oversight through a process of accreditation or certification, confirming that the programs meet all IATTC established standards.

The staff, once analyzed these opinions and by the rationale provided, maintains its recommendation as originally proposed*:*

> *Agree that national EMS programs that may be set up to complement the IATTC EMS Program, can be fully or partially contracted out to third parties, but only if they apply the common standards, protocols, procedures, and databases of the overarching EPO EMS Program.*

Harmonization and compatibility of EPO EMS with WCPFC EMS

The question of compatibility or harmonization with the EM schemes of other RFMOs and RFBs is closely linked to the question of the need for some kind of priority or hierarchy between these other RFMOs and RFBs when considering which of their EMS schemes should be considered for this purpose. It is clear that priority should be given to those of the region and subregion, such as WCPFC and SPRFMO. In addition, a common ground should be found between IATTC and these other organizations for sharing the data generated by EM, but also to optimize the use of the EM equipment installed on board, and allow its utilization when these vessels would operate during the lifetime of that equipment under the jurisdiction of various RFMOs or entities.

Workshop discussion on this topic. A general support for coordination and harmonization of EMS standards with WCPFC was expressed, and some concern that the amount of coordination to date was too little. Also, it was recommended that the IATTC-WCPFC coordination should happen as a matter of priority given the more advanced stage of the WPCFC process. One opinion referred that any cross-RFMO coordination should exclude matters related to the possible use of EMS for monitoring, control and surveillance (MCS) matters.

Overall, the staff considers that the opinions gathered were oriented to the intention of the recommendation. Therefore, it remains as originally proposed:

> *To the extent practical, seek to ensure harmonization and compatibility of EPO EMS with WCPFC EMS procedures and standards among others to facilitate cooperation and exchange of information as appropriate and necessary between the two organizations*.

Data: integration, access and sharing

The integration, access and exchange of the data are key points of an EMS program structure. EM analysis must be performed by human personnel (perhaps eventually supplemented by AI) to generate EM data in pursuit of the agreed goals. This will require special training similar to that of onboard observers. These analysts could be employed by the Commission, by the CPCs according to national or regional programs, by a third-party service provider or a combination thereof.

Ensuring the single and unified character of the EMS to be established in the EPO calls for recognition as a fundamental principle that all EMS data will be fully shared with the IATTC and its staff and stored as well as integrated and utilized by it as appropriate.

Workshop discussion on these topics. Some opinions indicated that national legislation might foresee difficulties in sharing original EM records or complete EM datasets because of limitations related to confidential, commercial data. Instead, what they could supply to IATTC would be a subset of data, according to pre-agreed minimum fields and formats, similar to the minimum data fields currently prescribed for longline observer data under C-19-08, while the original EM records would remain with the flag government.

The staff is mindful that some of these aspects will be further defined and discussed to ensure confidentiality of the EM records and EM data provided, and understands the reasons why the sharing of unedited video date could raise privacy and other domestic legal concerns. At the same time, IATTC staff also believes that periodic, centralized review of a subset of EM records collected by various national programs could be an important way of assessing whether EM records are being reviewed and interpreted in a consistent manner across all participating programs. This would help ensure that the IATTC scientific staff would have the robust, accurate and detailed data needed for scientific investigation. Therefore, the staff considers leaving these recommendations as originally proposed:

> *Agree that all EM data resulting from national EMS programs (and, if required for research purposes, the underlying EM records) be shared with the IATTC staff.*

> *Task the IATTC staff with coordinating the EPO EMS and integrating all derived EM data for their future utilization and analysis, as appropriate.*

2.1.2. Goals and scope

Goals

As reflected in the document EMS-02-02, EMS can provide relevant and useful benefits for the conservation and management of target and non-target species in the EPO. The primary benefit of an EMS in the EPO would be the collection of information related to fisheries activities covered by the Antigua Convention which would not be otherwise available to the Commission, its Members, and its staff. This information would be supplemented by data that could be collected on vessels with on-board observers (e.g., biological sampling), if observers are relieved of their most immediate duties. EMS-02-02 also indicates that EMS data would be used to further scientific research, and such data would constitute an

additional and efficient monitoring, control and surveillance (MCS) tool that could help CPCs implement their obligations under the Antigua Convention, and as elaborated in the resolutions adopted by the Commission.

Workshop discussion on this topic. Although, as referred in the document "WSEMS-02 Discussion Summary", there was consensus on that EM data would need to be used for scientific endeavors. However, opinions were divided regarding the use of the EMS in the EPO for monitoring, control and surveillance (MCS) purposes. While there appeared that most participants were comfortable with EM data being used for both science and compliance purposes in the purse-seine fishery and on carrier vessels, some participants indicated that EM data should not be used for compliance purposes in longline fisheries, and that like longline observer data, its use should be limited to scientific purposes.

While fully respecting these divergent views, the staff wishes to recall that the objective of the Antigua Convention is *"to ensure the long-term conservation and sustainable use of the fish stocks covered by this Convention, in accordance with the relevant rules of international law."* and that, for this purpose, Article XVIII on implementation, compliance and enforcement by Parties states that each Party shall, *"authorize the use and release, subject to any applicable rules of confidentiality, of pertinent information recorded by on-board observers of the Commission or a national program"* and ensure that vessel owners and captains allow for the collection and analysis of *"information necessary for carrying out the functions of the Committee for the Review of Implementation of Measures Adopted by the Commission."* In application of the Antigua Convention, including these specific provisions, IATTC staff analyzes all available data sources, including observer data to monitor compliance with active resolutions, and considers that, as broadly recognized, EMS data constitutes a valuable MCS tool that could help the CPCs implement their obligations under the Convention. Therefore, despite the clearly stated concerns of some participants, for now, the staff maintains its recommendation as originally proposed:

> *The EPO EMS should generate data to be made available for use in both scientific and compliance related activities, as defined by the Members.*

Scope

When presenting the list of all the recommendations of document EMS-01-01 during the 1st workshop on EMS, some Members and participants suggested that in addition to the purse seine fleet, and the longline fleet, the EMS should cover also all transshipments at sea by authorized carriers under resolution C-12-07. As far as it is concerned, the IATTC staff agrees that this would be of great benefit, for which reason it was included in document EMS-02-02.

Document EMS-02-02 explains the staff's rationale on the need for EMS in small purse-seine vessels, with an emphasis on catch and bycatch information for these vessels, which is currently lacking. IATTC staff also see potential usefulness for EM systems on class 6 purse-seine vessels to complement the work of human observers in data collection and perhaps allowing them to undertake additional tasks such as the collection of biological samples, which are not currently possible in view of the extent of their current responsibilities regarding the recollection of data. Finally, the deployment of EM on longline vessels in general could allow large longline vessels to be sampled at a rate greater than the 5% currently mandated by C-19-08, and also to collect information on longline vessels smaller than 20m LOA, which are not subject to any IATTC observation requirement.

Workshop discussion on this topic. As described in document "WSEMS-02 Discussion Summary", different views were expressed. For example, some suggested EMS should not replace or substitute for the 100% human observer coverage on Class-6 purse-seine vessels nor the 5% minimum observer coverage currently mandated for longline vessels greater than 20m LOA. At the same time, some participants stated

that EM coverage should not cover purse-seine or longline vessels with human observers onboard, in view of the difficulty to justify the costs of additional EM coverage on these vessels. These participants expressed that the EMS should cover exclusively the currently unobserved or under observed fleets and vessels. With regards to the carrier vessels engaged in transshipment, some participants mentioned that EMS could potentially replace onboard human observers.

While fully taking into account the various points of view that were expressed during the workshop, the IATTC staff is convinced of the benefits of some overlap between human and EM observation platforms for several reasons. Aside from freeing up human observers to take biological samples, the opportunity to compare data collected by onboard human observers with EM records and data resulting for the same fishing trips could allow to identify any potential disparities or biases that might exist between the two sources and methods. Another benefit that should not be disregarded is the increase in the observed level of compliance as a result of the presence of EM systems on a vessel, in addition to the potential decrease of pressure on observers. Therefore, at least for now, the staff maintains its original recommendation from document EMS-02-02 regarding the scope of the EPO EMS:

> *The EPO EMS should include the following types of vessels operating in the IATTC Convention Area: tuna purse-seine vessels of all sizes; all longline vessels of 12 meters in length or more and motherships of longline vessels less than 12 meters in length, and all authorized transshipment carriers.*

2.2. EMS Management considerations[1]

During the *3rd Workshop of an Electronic Monitoring System (EMS) in the EPO: EMS Management considerations*, the scientific staff presented a number of the EMS Management considerations subcomponents that were described in the document EMS-03-01. Because of their nature and dependence with other components to be discussed, other EMS Management considerations subcomponents were not addressed in this workshop: the goals and scope subcomponent were previously discussed in the 2nd Workshop of an EMS in the EPO, whereas the data collection priorities, and the financial considerations subcomponents will be addressed in the EMS workshops of Fall 2022 and spring 2023, respectively. The EMS Management considerations subcomponents presented in the 3rd EMS workshop, as follows:

2.2.1. Coordination and compatibility

As per document EMS-03-01, The IATTC collects and receives information from several different sources, including a number of purse-seine and longline observer programs (e.g., national programs, cross-endorsed observer trips). Although the application of EM for different fisheries needs to be decided (i.e., use EMS to replace or complement observer rates and duties, as well as corresponding coverage rates), it is necessary to design the procedures to coordinate data collection as well as ensure compatibility so that IATTC EMS integrates seamlessly with the existing data collection programs.

Workshop discussion on this topic. Several points were expressed during the 3rd EMS workshop. One participant advocated for compatibility through the concept that any data standards adopted for EM to be applied to longline vessels should be limited to a subset of the longline observer data minimum standards that are in place through Annex B of Resolution C-19-08, with the expectation that EM and human observer programs would be implemented by the same entity. Others remarked that while it is reasonable to expect that there would necessarily be a great deal of overlap between the data standards for EM and human observers, EM data standards should more appropriately focus on the scope of EM capabilities and the potential usefulness of the data to the work of the Commission, including the

[1] Coordination and compatibility, Confidentiality, Compliance, EM equipment, and EM coverage and review rate.

possibility of the usefulness of EM data for MCS purposes. Others remarked the objectives are set on the vital and useful data for the Commission to be collected. It was also mentioned that there could be some data fields that could be collected through EM that might exceed the capacity of human observers (e.g., the activities of the vessel while the observer is sleeping or otherwise off-duty, activities that happen below deck when observers are up top, or using AI to count the number of hooks deployed in a longline set).

The staff considers that EM data priorities and type of EM data to be collected are part of future workshops, and this recommendation addresses the framework under the EMS and the existing observer programs may interact. Therefore, the staff maintains the recommendation as originally proposed:

> *The EPO EMS should, to the extent practicable, be designed to operate as part of, or in close coordination with, the existing observer programs and other relevant data-collection programs, to maximize efficiency and avoid unnecessary duplication of effort and/or data collected.*

2.2.2. Confidentiality

As referred in document EMS-03-01, additional rules may be required that ensure that EM records and data are handled in a manner that maintains personal and commercial privacy and confidentiality, in accordance with IATTC policy. Their handling would be compatible with the IATTC and AIDCP rules of confidentiality.

Workshop discussion on this topic. During the 3rd EMS workshop, some participants anticipated that the rules of confidentiality applied to the EM data resulting from the analysis of EM records could be in large part the same as those that currently apply to the Commission's data. But it was also clear that because of the nature of EM records, which include sensitive data of a new nature in the form of video recordings, new rules would be needed to govern instances where such records were collected or held by the Secretariat and also the circumstances and conditions under which such data might be shared with third parties (e.g., for research or investigations). Similarly, confidentiality rules would be adjusted or added as needed and each CPC would use the EM data according to its national legislation. Some participants expressed concerns regarding the possibility of the EM records being made available to a third-party given the confidentiality-driven sensitive issues.

The staff considers that comments on whether the EMS would be used for certain type of fishery are under the goals and scope EMS subcomponent, and others address the intention of this recommendation which is the amendment (if necessary) of IATTC and AIDCP data confidentiality rules to guarantee confidentiality. Therefore, the staff maintains its advisory recommendation as originally proposed:

> *The Commission should consider whether it is necessary to clarify or amend IATTC and AIDCP data confidentiality rules to ensure that they are adapted to the circumstances and requirements related to the implementation of an EMS, in particular to guarantee the personal and commercial privacy and confidentiality of EM records and EM data.*

2.2.3. Compliance

Non-compliance with measures adopted by the IATTC

There are two different issues when considering EMS and compliance.

First, the question of compliance with the EMS itself and its related obligations and requirements. In this respect, Document EMS-03-01 indicates clearly that the usual procedure to assess compliance and non-compliance with the measures adopted by the IATTC and all applicable rules and obligations would be followed; that is, the reporting to the Review Committee, and the reporting to the vessel's flag CPC for investigation and possible sanction. This would guarantee a uniform degree of compliance by CPCs

regarding their EMS obligations and requirements.

Second, the issue of the use of EMS as an MCS tool for compliance by CPCs and their vessels of all applicable measures adopted by the Commission.

Workshop discussion on this topic. Interestingly, the discussion that took place during the workshop focused on the second issue, since after all the first seems evident and shall not raise any specific concern. Participants expressed a range of views on the use of the EMS in the context of general compliance with the measures adopted by the Commission. Many participants, and particular those that are more familiar with the current purse-seine observer programs, expressed general support for the idea that Commission EMS data should be used for the collection of data for both scientific and compliance purposes. Their statements made it clear also that the coverage rate for vessels should be 100%, not only in order to maintain fairness across all of them and for practical reasons, but also as an essential requisite should it be agreed to use the EMS for compliance purposes. Other participants, in addition to referring to restrictions under their national legislations, reiterated that the use of EM data in the context of longline vessels should be limited to scientific purposes, as currently under Resolution C-19-08, but did not object to that use for purse seine vessels, since it would be consistent with the current practice regarding the data collected by human observers on these vessels. An intermediate view was also voiced, consisting in stating that the EMS should primarily focus on the collection of scientific data, but that this data could also be used for compliance.

The IATTC staff is mindful of the complex and sensitive nature of this topic, which is also one of the most difficult. Reaching consensus on these issues is likely the linchpin of the further elaboration and agreement on many of the other elements of EMS. However, without ignoring the divergence of the views that have been expressed, and although fully understanding the concerns that some of them reflect, the IATTC staff, taking into account the benefits of EMS as a recognized unique MCS tool as well as the relevant provisions of the Antigua Convention, considers more prudent and appropriate to maintain its recommendation as originally drafted, without prejudice to its possible revision:

> *Non-compliance with EM standards and requirements established pursuant to other IATTC decisions (e.g., IATTC Resolutions) should be referred to the relevant Members for investigation and further consideration, and also reported to the Review Committee for recommended improvements to increase compliance, or other actions, as appropriate.*

Regulation-adapting process

As stated in document EMS-03-01, adapting to new regulations and measures may take time and can be a confusing and time-consuming process. Periodic capacity building activities are a good tool for promoting and improving compliance. Also, mechanisms creating incentives to encourage compliance may be developed. Such incentives could be economic, correlated with reductions in costs.

The staff asked the participants whether capacity building activities with stakeholders are considered a useful tool for improving compliance with the EMS implementation, or any other mechanisms that could be explored for this purpose. Also, in addition to the economic-incentive example provided, what kind of incentives would be desirable, should incentives be created to incentivize and improve compliance?

No substantive comments were provided in this particular. As a result, the staff the recommendation remains as originally proposed*:*

> *The Commission will take all appropriate measures to promote and improve compliance, including through the appropriate capacity building activities.*

2.2.4. EM equipment

EM equipment installation, malfunction and manipulation

Recommendations on EM equipment as referred in EMS-03-01 are based on the design of actions and procedures to prevent tampering, minimize malfunctions so as to ensure the functioning and integrity of the EM equipment and thus, the collecting of EM records, according to the desired standards. Also, it is necessary to establish requirements for its servicing, maintenance, and replacement to prevent systematic malfunctions of the EM equipment either due to poor maintenance, or by stretching its life-span time limits.

EM equipment capabilities

It is important that the EM service provider presents the pertinent information of the EM equipment. Among the features provided, it should have the capability of logging all the activities that the different EM equipment components were subject (e.g., malfunctions, instances of possible tampering).

Workshop discussion on these topics. The comments on the 3rd EMS workshop offered views on these two topics. Some expressing that vessels should have backup units in case malfunctions; however this would elevate costs significantly and crew would need to be trained to uninstall and install equipment, which other participants expressed doubts about. Others were concerned that an excessive number of cameras and the uninterrupted time they are recording would elevate costs because of the large amount of data storage that would be required. Some participants also expressed their agreement with these recommendations on EM equipment capabilities.

Although, mindful of these observations, the staff remarks that these aspects would be discussed in the EMS workshop on technical and logistical standards, providing more details on the EM equipment requirements (e.g., fishing activities activated by sensors, cameras' capabilities), as well as for reaching logistical agreements, and this would bring the cost of maintenance and other variables of interest. It is also expected the participation of EM service providers to share cost estimates. Therefore, the staff considers leaving these recommendations as originally proposed*:*

> *The Commission should establish policies and procedures for installation, use, and repair of EM equipment malfunctions, and prevention of tampering.*

> *The EM equipment should be capable of detecting, recording and reporting malfunctions, and instances of possible tampering.*

Robustness of the equipment

It is worth to note that the advances on the EM equipment technology and improvement of its components should be expected and hence, some degree of flexibility granted so as to minimize risks of malfunction, tampering and to improve robustness against severe at-sea conditions.

Workshop discussion on this topic. One participant with extensive knowledge of EM systems indicated that the concept of "tamper proof" or "tamper resistant" did not really apply to EM equipment, and that instead it would be more appropriate to think in terms of the ability to detect tampering or manipulation (i.e., tamper-evident). The action for ensuring proper functioning, is that the equipment must be well tested by the supplier before installation and inspected for functionality before the start of each trip.

The staff, mindful of this feedback, considered that it was necessary to clarify the points concerning the security and robustness of the EM equipment, hence this recommendation was revised and edited as follows*:*

EM records storage devices should be capable of securely storing, and preventing external data input or manipulation. Cameras and other sensors should be weather and tamper-evident as well, but also capable of allowing repair by vessel crew when at sea in coordination with EM service providers, as needed.

Provisions when EM equipment is nonfunctional

Document EMS-03-01 underlined the need of provisions to ensure that the EM equipment is functioning to the required standards, and the vessels' activities are recorded as mandated. To this end, vessels could be prohibited from leaving port unless their EM equipment is working, and provisions should be made for cases of equipment malfunction at sea.

In addition, provisions are needed in cases when EM equipment ceases to record useful or sufficient data the vessel could be required to return to port.

Workshop discussion on these topics. The comments expressed during the 3rd EMS workshop reflected the need for these recommendations to first estimate the time required for the EM equipment until it needs maintenance. This is key for longline vessels, that spend a very long time at sea. Other comments expressed the need of feedback from EM providers in terms of repairs and maintenance.

On these remarks, the staff is mindful that it would be necessary to establish a reference time-period indicating for how long a vessel should be allowed at-sea with a nonfunctional EM equipment. These aspects would be covered in further workshops on EMS technical standards. Consequently, the recommendations are suggested to remain as originally proposed*:*

Vessels should be prohibited from leaving port unless their EM equipment is functioning properly.

If the EM equipment ceases to record useful or sufficient data, the vessel should be required to return to port in a reasonable timeframe when at-sea repair is not feasible.

2.2.5. EM coverage and review rate

EM coverage

As for EM coverage (the proportion of the vessels or effort by a fishery that is subject to EM) the document EMS-03-01 indicates that, if a specific vessel size and type falls within the scope of an IATTC EMS, all vessels within the qualifying categories should carry EM equipment for all their trips.

EM review rate

Regardless the EM review rate (the proportion of EM records that are analyzed to produce EM data) further established, cameras should be collecting EM records for the entire trip.

The recommendation above, based on the experiences provided by the pilot EM project on purse-seiners and longline vessels (Projects D.2.a and C.2.b) and conversations with experts in the field, does not add budgetary issues to the EMS in the EPO, whereas the EM analysis, directly related to the review rate, especially for longline fishing activities, could increase the costs.

Assuming that the purpose of the EMS will be for science and compliance, document EMS-03-01 describes the variability in EM review rates estimated in different scientific studies depending on the catch and bycatch CPUE as wells as for compliance matters. However, scientific studies will be required to determine the appropriate review rate for a given fishery or fleet under different scientific and management goals. For example, the data collected in the IATTC EM pilot projects (D.2.a, and C.2.b) could be analyzed to estimate different EM review rates that reflect different sampling options.

Document EMS-03-01 underlined that the regulations, the environment, and the status of the populations involved in the EPO tuna fishery are constantly evolving, and non-flexible requirements for EM review rates may not be able to deliver to the specific needs and goals of the Commission in an effective way. Therefore, EM review rates should be periodically revised to reflect these dynamics, and the implementation of the EMS in the EPO should be planned to be adaptable to these changes without major logistical and financial effects.

Workshop discussion on these topics. Comments expressed during the 3rd EMS workshop presented different views on these five EM coverage and review rate subcomponents. Several of these, with contrasting opinions on the consideration whether or not it is appropriate to require 100% EM coverage for all the vessels falling within the goals of the EMS. As mentioned above, this topic is closely related to the question of whether or not the scope of purpose will include compliance as well as science. Both external presenters and participants noted that if EMS is to be used to monitor and promote compliance, anything less than 100% coverage can result in inequities. At the same time, it was noted that a 100% coverage does not exclude the adoption of much lower review rates, while still resulting in improvements in the level of compliance, in particular due to the strong disincentive created by the mere presence of operational EM equipment on the vessel, because of the awareness that the recorded data might fall within the smaller percentage of data effectively reviewed. In addition, even those participants who wish to restrict the use of the EM data to a scientific purpose may recognize that a 100% coverage would ensure the best availability of data even if for science only 20 or 30% of that data would have to be effectively reviewed.

For all the above-mentioned reasons and taking into account the ongoing discussion, the IATTC staff considers that, for now, and without prejudice to future considerations, it should maintain its recommendations as originally drafted:

The objective of EM coverage should be 100% coverage for all longline and purse-seine vessels and trips, with an interim objective of making sure that programmatic coverage at less than 100% must be representative of all fleets and fishing strategies.

When a vessel has operational EM equipment, it should be used to monitor all fishing activities conducted by that vessel for the entire trip.

Separate EM review rates should be established for compliance and for science, taking into account costs and feasibility.

For those EM data fields that do not require an EM review rate of 100%, the review rate should be established on a scientific basis (e.g., through the analysis of EM data provided by the Projects D.2.a, C.2.b). Results should be discussed in a workshop (possibly in fall 2022) involving stakeholders with experience in fisheries EM programs and presented to the SAC, before being transmitted to the Commission.

EM review rates should be reviewed periodically so that they are revised, if necessary, following results of analysis of EM data.

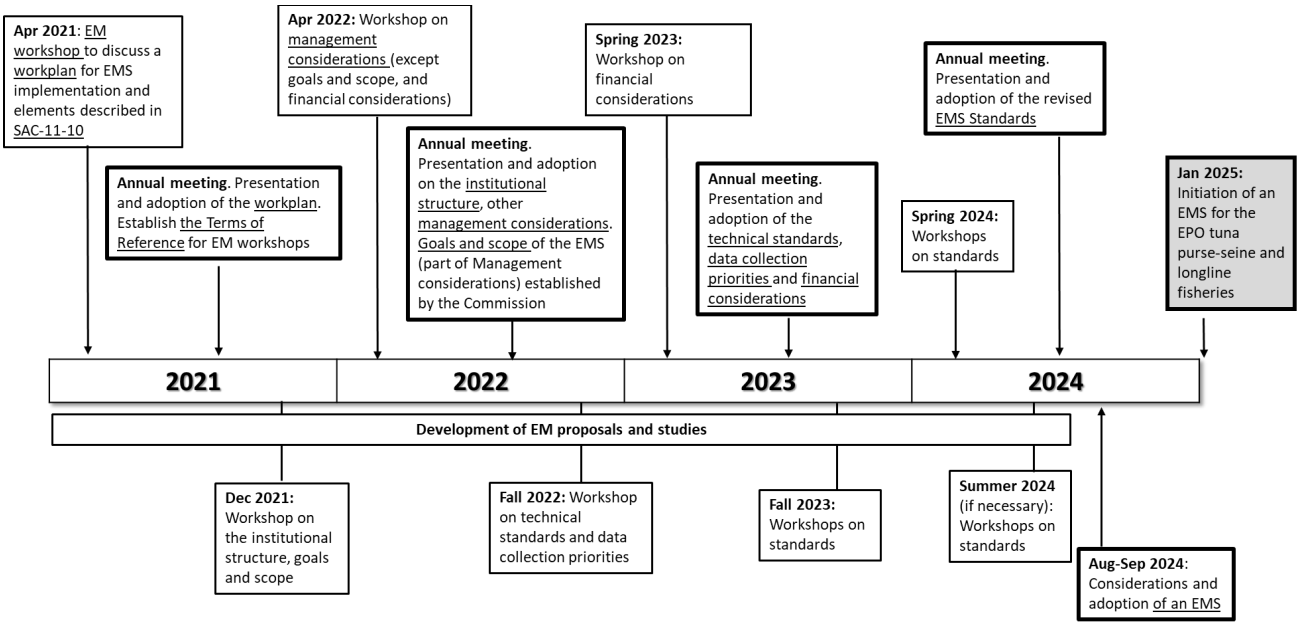

FIGURE 1. Commission's adopted workplan on the implementation of an EMS for the tuna fisheries in the EPO.
FIGURA 1. Plan de trabajo adoptado por la Comisión para la implementación de un SME para las pesquerías de atún en el OPO.

TABLE 1. Timetable of activities in the workplan adopted by the Commission.
TABLA 1. Calendario de actividades del plan de trabajo adoptado por la Comisión.

2021											
Semester 1						**Semester 2**					
Month 1	2	3	4	5	6	7	8	9	10	11	12
Jan 1, 2021. Cont. Pilot project of EM in the purse-seine fishery (D.2.a).											
	Feb. Pilot project of EM in the longline fishery (C.2.b).										
		Mar. Exploring technologies for remote FAD identification (C.1.a).									
					Jun: Cost-benefit analysis of EM for tuna fisheries in the EPO.						
			Spring. EM workshop to discuss a work plan for EMS implementation and elements described in SAC-11-10.			Annual meeting. Presentation and adoption of the workplan. Establish the Terms of Reference for EM workshops.		Fall. Workshop on the institutional structure and EMS objectives and scope.			
Development of new EM proposals and studies											
2022											
Semester 3						**Semester 4**					
Month 13	14	15	16	17	18	19		20	21	22	23	24
Jan 1, 2022. Cont. Pilot project of EM in the longline fishery (C.2.b).											
Jan. Cont. Exploring technologies for remote FAD identification (C.1.a).											
Jan. Analysis to define EM sampling coverage and EM data review rates (purse-seine fishery). *(subject to/pending decisions on EMS objectives)*											
			Spring. Workshop on management considerations (except Goals and scope, and financial considerations)			Jul/Aug, Annual meeting. Presentation and adoption on the institutional structure, other management considerations. Goals and scope of the EMS (part of Management considerations) established by the Commission			Fall. Workshop on technical standards and data collection priorities.		
Development of new EM proposals and studies											
2023											
Semester 5							**Semester 6**					
Month 25	26	27	28	29	30	31	32	33	34	35	36

Jan 1, 2023. Cont. Pilot project of EM in the longline fishery (C.2.b).												
Jan. Analysis to define EM sampling coverage and EM data review rates (longline fishery). *(subject to/pending decisions on EMS objectives)*												
						Spring. Workshop on financial considerations		Jul/Aug, annual meeting. Presentation and adoption of the technical standards, data collection priorities and financial considerations.		Fall. Workshop on standards (1)		
Development of new EM proposals and studies												
2024												
Semester 7						**Semester 8**						
Month 37	38	39	40	41	42	43	44		45	46	47	48
			Spring. Workshop on standards (2)		Jun. Workshop on standards (3) *if necessary	Jul/Aug, Annual meeting. Presentation and adoption of the revised EMS Standards.						
									Aug/Sep. Final consideration and adoption by the Commission of the whole set of EMS components for the purse-seine and longline fishery on the basis of the conclusions and recommendations of the EMS workshops as well as the discussion and decisions of the Commission during its intervening meetings as described in the workplan and in this timetable**.** The EM equipment should be installed and the EMS operative before Jan 1, 2025, or on a date to be agreed upon by the Commission based on the conclusions and recommendations of the EM workshops described in the workplan and in this timetable.		
Development of new EM proposals and studies												
2025												
Semester 9									**Semester 10**			
Month 49			50	51	52	53	54		55	56	57	58	59	60
Jan 1, 2025, or on a date agreed upon by the Commission, initiation of an EMS for the tuna fisheries in the EPO												
Development of new EM proposals and studies												

APPENDIX 1

List of the recommendations as presented in the EMS workshop documents EMS-02-01, EMS-02-02 and EMS-03-01.

Institutional structure

Structure of the EMS program

Establish a single, unified EMS Program for the EPO following the International Dolphin Conservation Program (IDCP) model, in which databases, standards, procedures and protocols are standardized across all components/individual programs and are compatible with existing IDCP and IATTC practices.

Rules and procedures: standardization and compatibility

Agree that national EMS programs that may be set up to complement the IATTC EMS Program, can be fully or partially contracted out to third parties, but only if they apply the common standards, protocols, procedures, and databases of the overarching EPO EMS Program.

Harmonization and compatibility of EPO EMS with WCPFC EMS

To the extent practical, seek to ensure harmonization and compatibility of EPO EMS with WCPFC EMS procedures and standards among others to facilitate cooperation and exchange of information as appropriate and necessary between the two organizations.

Data: integration, access and sharing

Agree that all EM data resulting from national EMS programs (and, if required for research purposes, the underlying EM records) be shared with the IATTC staff.

Task the IATTC staff with coordinating the EPO EMS and integrating all derived EM data for their future utilization and analysis, as appropriate.

Goals and scope

Goals

The EPO EMS should generate data to be made available for use in both scientific and compliance related activities, as defined by the Members.

Scope

The EPO EMS should include the following types of vessels operating in the IATTC Convention Area: tuna purse-seine vessels of all sizes; all longline vessels of 12 meters in length or more and motherships of longline vessels less than 12 meters in length, and transshipment authorized carriers.

EMS Management considerations

Coordination and compatibility

The EPO EMS should, to the extent practicable, be designed to operate as part of, or in close coordination with, the existing observer programs and other relevant data-collection programs, to maximize efficiency and avoid unnecessary duplication of effort and/or data collected.

Confidentiality

The Commission should consider whether it is necessary to clarify or amend IATTC and AIDCP data confidentiality rules to ensure that they are adapted to the circumstances and requirements related to the implementation of an EMS, in particular to guarantee the personal and commercial privacy and confidentiality of EM records and EM data.

Compliance

Non-compliance with measures adopted by the IATTC

Non-compliance with EM standards and requirements established pursuant to other IATTC decisions (e.g., IATTC Resolutions) should be referred to the relevant Members for investigation and further consideration, and also reported to the Review Committee for recommended improvements to increase compliance, or other actions, as appropriate.

Regulation-adapting process

The Commission will take all appropriate measures to promote and improve compliance, including through the appropriate capacity building activities.

EM equipment

EM equipment installation, malfunction and manipulation

The Commission should establish policies and procedures for installation, use, and repair of EM equipment malfunctions, and prevention of tampering.

The EM equipment should be capable of detecting, recording and reporting malfunctions, and instances of possible tampering.

Robustness of the equipment

EM records storage devices should be capable of securely storing, and preventing external data input or manipulation. Cameras and other sensors should be weather and tamper-evident as well, but also capable of allowing repair by vessel crew when at sea in coordination with EM service providers, as needed.

Provisions when EM equipment is nonfunctional

Vessels should be prohibited from leaving port unless their EM equipment is functioning properly.

If the EM equipment ceases to record useful or sufficient data, the vessel should be required to return to port in a reasonable timeframe when at-sea repair is not feasible.

EM coverage and review rate

EM coverage

The objective of EM coverage should be 100% coverage for all longline and purse-seine vessels and trips, with an interim objective of making sure that programmatic coverage at less than 100% must be representative of all fleets and fishing strategies.

EM review rate

When a vessel has operational EM equipment, it should be used to monitor all fishing activities conducted by that vessel for the entire trip.

Separate EM review rates should be established for compliance and for science, taking into account costs and feasibility.

For those EM data fields that do not require an EM review rate of 100%, the review rate should be established on a scientific basis (e.g., through the analysis of EM data provided by the Projects D.2.a, C.2.b). Results should be discussed in a workshop (possibly in fall 2022) involving stakeholders with experience in fisheries EM programs and presented to the SAC, before being transmitted to the Commission.

EM review rates should be reviewed periodically so that they are revised, if necessary, following results of analysis of EM data.