INTER-AMERICAN TROPICAL TUNA COMMISSION

WORKSHOP OF AN ELECTRONIC MONITORING SYSTEM (EMS) IN THE EPO: EMS MANAGEMENT CONSIDERATIONS

3RD MEETING

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EMS MANAGEMENT CONSIDERATIONS

CONTENTS

1. INTRODUCTION AND BACKGROUND

The Inter-American Tropical Tuna Commission 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; Gilman *et al*., 2019). Accordingly, per request of the Scientific Advisory Committee during its 10th meeting in 2019, and pursuant to paragraphs 9 and 10 of Resolution C-19-08, the IATTC staff prepared for consideration by the Commission document SAC-11-10 "*An electronic monitoring system for the tuna fisheries in the eastern Pacific Ocean: objectives and standards*". This document, which received positive feedback from several global experts on the matter, was presented at the 11th meeting of the SAC in 2020. However, because the meeting was held by videoconference and with time constraints, it was not possible for Members to provide in depth comments and suggestions. Thus, it was proposed that a workshop be held in 2021 to further discuss some of the elements contained in document SAC-11-10, as well the presentation of a workplan for the implementation of an EM system (EMS) in the eastern Pacific Ocean (EPO), which was provided in EMS-01-02-Rev. The Commission endorsed this concept during its 96th meeting (extraordinary) and agreed that the *1st Workshop on Implementation of an Electronic Monitoring System (EMS)* should be held in April 2021, before the SAC 12th meeting.

Prepared for the 1st Workshop, EMS-01-01 recommended a number of actions for endorsement by the Commission. Among these was a workplan formulated by IATTC staff (EMS-01-02), which proposed a series of workshops to consider and analyze the EMS components and subcomponents in a hierarchical and chronological order. To provide structure for these workshops and other activities related to the EMS implementation process, the staff also recommended the adoption of Terms of Reference for the EM

workshops and a set of working definitions. The associated TORs and a set of definitions were adopted through the Resolutions C-21-02 and C-21-03, respectively, during the 98th Meeting of the IATTC. The workplan was also adopted with a minor modification to show flexibility on a potential starting date for the EMS in the EPO (EMS-01-02-Rev).

Subsequently, during the *2nd Workshop of an Electronic Monitoring System (EMS) in the EPO: Institutional Structure, Goals and Scope of the EMS,* held virtually in December 2021, the IATTC staff addressed a number of organizational issues, rules and procedures relating to the institutional structure (document EMS-02-01) as well as to the goals and the scope of an EMS (document EMS-02-02) for tuna fisheries in the EPO which are subject for adoption by the Commission. A summary of the discussions from the 2nd Workshop are available here.

This document was prepared for the 3rd workshop of the series planned under the adopted EMS workplan (EMS-02-02), focusing on the management considerations of the EMS (Fig 1).This workshop will consider the following subcomponents: i) Coordination and Compatibility, ii) Confidentiality, iii) Compliance, iv) EM equipment, and v) EM coverage and review rate. Because of their nature and dependence with other components to be discussed, the goals and scope subcomponent were previously discussed in December 2021, whereas the financial considerations subcomponent will be addressed in spring 2023. Throughout the remainder of this paper, the IATTC staff presents, within a series of outlined text boxes, a number of preliminary recommendations on topics to be considered by the workshop. The preliminary nature of these recommendations deserves special emphasis. One of the primary purposes of this series of workshops on EMS is to facilitate discussions and generate ideas that will inform the formulations of future IATTC staff recommendations on EMS, recommendations from CPCs, and recommendation from other IATTC bodies like the SAC. That is, these preliminary recommendations are intended to serve as starting points for stimulating discussion, and they are not intended to preempt or limit meaningful discussion or alternate approaches. This document also includes a series of focus questions to stimulate participant engagement during the workshop.

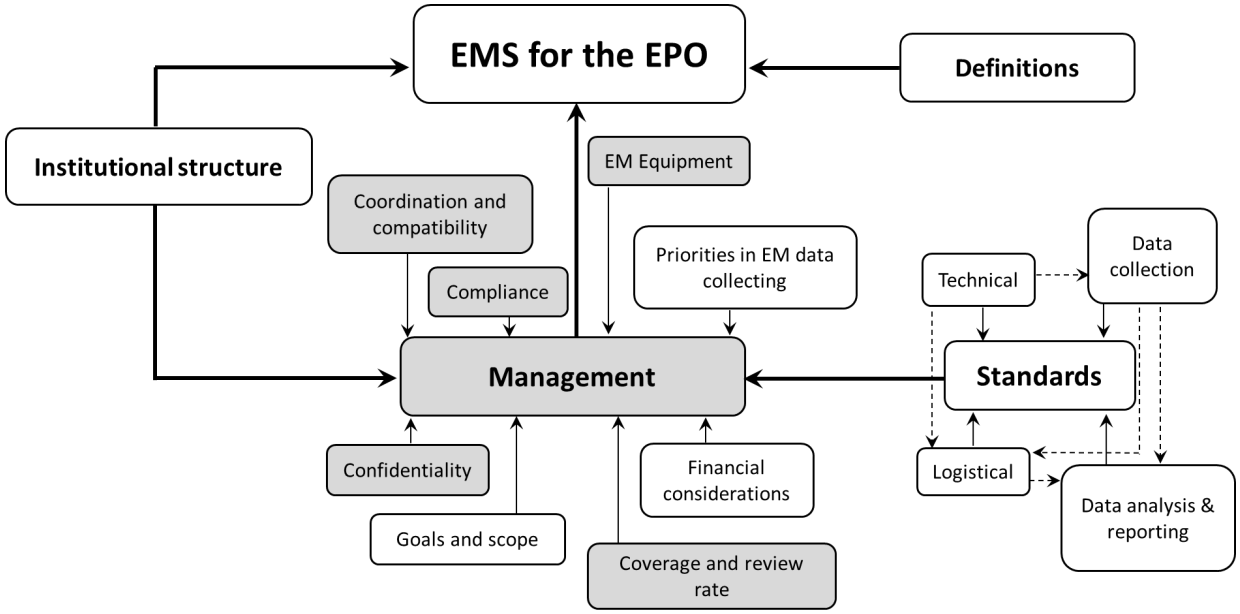

FIGURE 1. Structure of the EMS for the tuna fisheries in the EPO, emphasizing (in gray) the five EMS management considerations' subcomponents discussed in this workshop.

2. OVERVIEW OF MANAGEMENT CONSIDERATIONS

Coordination and compatibility

The IATTC collects and receives information from several different sources, but in particular, from a number of purse-seine and longline observer programs (e.g. national programs, cross-endorsed observer trips). Although the Commission still needs to decide the application of EM for different fisheries (i.e. use EMS to replace or complement current observer rates and duties), it is necessary to design the procedures to efficiently coordinate data collection as well as ensure compatibility matters to integrate the IATTC EMS within the existing data collection programs. Hence, the recommendation that was included in Document EMS-01-01, as follows:

> 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.

Focus questions

Participants are encouraged to consider the following aspects:

- Which body/entity should be in charge of coordinating the type of coverage a particular fishing trip should receive?
- Should the current capabilities of EM on the collecting of data fields for both purse-seine and longline fisheries, presented in Appendices 2 and 3 of document SAC-11-10, be considered as a starting point for allocating data fields to be covered by EM to complement observers' duties?

Confidentiality

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 need to be compatible with the IATTC and AIDCP rules of confidentiality, specific and adjusted to the nature and scope of the data to be collected, and some provisions of Resolutions C-13-05 and C-15-07 may need to be revised. Hence, the recommendation that was included in Document EMS-01-01, as follows:

> 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.

Focus questions

Participants are encouraged to consider the following aspects:

- What are the data aspects that are of most concern for participants in terms of confidentiality (e.g., disclosure of sensitive information, ethics of confidentiality: protection of individual, professional, commercial or personal information and privacy)?
- Are current IATTC and AIDCP rules of confidentiality, and the provisions of Resolutions C-13-05 and C-15-07 broad enough to consider EMS data and records or do they need to be revised?

Compliance

a) Presumably, the usual procedure to assess compliance and non-compliance with the measures adopted by the IATTC (the implementation of the EMS scheme and of IATTC resolutions) and all applicable rules and obligations would be followed, including the relevant reporting to the Review

Committee[1], which would then refer them to the vessel's flag CPC for investigation and possible sanction. Each CPC would have to establish regulations to implement the provisions and requirements of the EMS to ensure uniformity. Hence, the recommendation that was included in Document EMS-01-01, as follows:

> 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.

It is important to remind participants that, in addition to the regulations established by each CPC to implement the provisions an requirements of the EMS, these may require the support and cooperation from the fleet management and the crew to ensure that the integrity, and the functioning of the EM equipment, as well as the data collection and transferring are done as stipulated by the standards (e.g., maintenance at sea of some technical aspects, timely and secure provision of data storage units), aspects that would presumably be monitored by the Review Committee.

Although the Commission still needs to take a final and formal decision whether EMS data would be used for compliance, it is important to remind participants on the current capabilities of EMS to monitor vessels' operations with regard to compliance in a reliable way. For example, Ruiz *et al.* (2017) identified that EMS could be used to monitor spatiotemporal fishing closures, full retention of commercial tuna species and non-target species, and landings and transshipments of tuna or tuna products that have been identified as originating from fishing activities that contravene the conservation measures for tropical tunas in the EPO, and are included in the current Resolution C-21-04. Similarly, the EM pilot project for purse-seiners in the EPO, carried out by the IATTC staff (Project D.2.a, SAC-11-10-ppt), also identified activities linked to compliance that could be covered by EMS, such as the retention and transshipments of tuna or tuna products and non-target species, including sharks, and the prompt and safe release of vulnerable species associated to the purse-seine fishery, provisions included in Resolutions C-21-06, C-11-10, C-16-05, and C-19-06. On the other hand, and although EM may also be useful to monitor vessel activities in relation to IATTC and AIDCP procedures and requirements (e.g. the conditions indicated in the guidelines for transit waiver, approved by the Parties to the AIDCP, 2005), EMS may be of limited capacity, in the current state, to accurately account for dolphin mortalities, in general and by species. A summary of current capabilities of EM in the purse-seine fishery is shown in Appendix 2 of the document SAC-11-10. It is also expected that results of the ongoing EM pilot project for longliners in the EPO, also being conducted by the IATTC staff (Project C.2.b), could identify EMS capabilities with regard to compliance, such as retention and catch limits for sharks accidentally caught in the longline fishery (Res. C-21-06), the prohibition of using fishing gears used to target sharks (Res. C-16-05; C-21-06), the use of gears and methods to reduce seabird bycatch (Res. C-11-02), among others.

Focus questions

Participants are encouraged to consider the following aspects:

- Should current EMS capabilities for monitoring vessels' activities shape the potential use of EMS for defining research priorities as well as for compliance purposes?

[1] Formally the *Committee for the Review of Implementation of Measures adopted by the Commission*

b) In occasions, adapting to new regulations and measures may take time and can be a confusing and time-consuming process. Although CPCs are the final responsible for the application and enforcement of IATTC regulations, periodic capacity building activities are a good tool for promoting and improving compliance. Hence, the recommendation that was included in Document EMS-01-01, as follows:

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

Another aspect to be considered by participants is the possibility of developing mechanisms that would create incentives to encourage compliance. Such incentives could be economic, for example, in correlation with reductions in costs (e.g., lower EM data review rates associated with historic compliant behavior).

Focus questions

Participants are encouraged to consider the following aspects:

- Are capacity building activities with stakeholders a useful tool to improve compliance with the EMS implementation? What kind of additional mechanisms could be explored for this purpose?
- Should incentives be created to promote and improve compliance with EMS requirements and standards? If so, what kind of incentives would be desirable?

EM equipment

a) Procedures and requirements for cases of equipment failure will be needed as part of an EMS program established by the Commission (Note: the technical specifications of EM equipment will be covered in fall 2022). A damaged camera, hard-disk or a failed sensor could be replaced by the vessel crew (although it may be necessary to define procedures as to define the type of repairs the vessel would be allowed and capable to do), but the storage devices would need to be tamper-proof, and the EM equipment would have to record and report any malfunctions and/or repairs. The recommendations below, which were also included in EMS-01-01, suggest actions and procedures to prevent tampering, minimize malfunctions so as to ensure the functioning of the EM equipment and thus, the collecting of EM records, according to the desired standards. Of course, responsibility for implementing such protocols by vessel crew will also require some training and education efforts, though, for example, capacity building workshops, the development of guidelines by the IATTC and training by official and authorized EM service providers, among others.

In order to prevent potential or systematic EM equipment malfunctions either due to poor maintenance, or by stretching its life-span time limits, it may be necessary to establish requirements for its servicing, maintenance and replacement. These issues should be addressed with EM providers and other stakeholders while discussing the technical aspects of EM equipment, and could also inform policies, periodicity of audits, etc., to ensure the EM equipment are consistent with the technical standards.

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.

EM records storage devices should be tamper-proof. Cameras and other sensors should be tamper-resistant as well, but also capable of allowing repair by vessel crew when at sea in coordination with EM service providers, as needed.

It is also worth noting that 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.

b) The quality and integrity of EM records depends upon the reliability of the EM equipment at sea, and thus, it may be necessary to establish 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 provision should be made for cases of equipment malfunction at sea. If the EM equipment ceases to record useful or sufficient data, the vessel could be required to return to port. Hence, the recommendations that were included in Document EMS-01-01, as follows:

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.

Focus questions

Participants are encouraged to consider the following aspects:

- What kind of repairs or maintenance activities should the fishing crew be allowed to do in land/at-sea, assuming training has been received and that it is conducted in coordination with official EM service providers?
- How long should a vessel be allowed at-sea with a malfunction EM equipment?

EM coverage and review rate

EM coverage is the proportion of the vessels or effort by a fishery that is subject to EM, while EM review rate is the proportion of EM records that are analyzed to produce EM data. As for EMS, the IATTC staff's preliminary conclusion is that EM coverage should comprise all vessels on the Regional Vessel Register that are greater than a minimum vessel size to be discussed and agreed at a later time[2]. That is, 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 record review rates, on the other hand, would vary according to the purpose of the review, to the characteristics of the fleets and vessels concerned as well as of the nature of the fishing activity to be subject to that review. Coverage and review rates will have to be determined for the different fleets and fisheries, which will be dependent on several factors, chiefly the desired objective of the sampling. Assuming that the purpose of the EMS will be for both data collection for scientific research and monitoring for compliance, 100% review rate is probably not necessary for scientific or management purposes but could vary in accordance with the objective of the specific activities to be monitored. Twenty percent is generally considered the minimum necessary to obtain a statistically reliable representative sample for target species (Lennert-Cody, 2001; McCracken, 2006, 2012; Skillman *et al.,* 1996; SAC-12-16), but the percentage would be much higher if the objective were to quantify bycatches of species caught only occasionally (Lawson, 2004; BYC-10-INF-D), or for

[2] Current IATTC staff's recommendation on the scope of the EMS reads as follows "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".

relevant compliance matters (e.g., closures, retention of vulnerable species), for example. Scientific studies will be required to determine the appropriate review rate for a given fishery or fleet under different scientific and management goals. In this regard, the data collected in the IATTC EM pilot projects (i.e. purse-seine (Project D.2.a), and longline (Project C.2.b)) could be analyzed to estimate different EM review rates that reflect different sampling options.

It is worth noting, for participants information, that decisions on EM coverage and review rates are some of the elements, along with the technical standards and data collection priorities, that are expected to directly affect the financial implications of a Commission EMS. As part of the hierarchical and chronological EMS workplan (EMS-01-02), workshops on technical standards and data collection priorities, and financial considerations will be organized in fall 2022 and spring 2023, respectively.

Hence, the staff recommendations, also included in EMS-01-01, as follows:

> 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.

It is important to remind participants that regardless the EM review rate further established, as for the reasons explained above, cameras should be collecting EM records for the entire trip. This recommendation, 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.

> 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.

Results of EM review rate analysis for purse-seine vessels are expected later this year (fall 2022 EM workshop), and subject to discussions by the SAC in 2023 for further EM data review rates for the Commission adoption.

Although EM review rate analysis for longline vessels with data provided by Project C.2.b is tentatively expected by Spring 2023, the rates established for science purposes should be no less than 20%, as repeatedly recommended by the IATTC staff, the Working Group on Bycatch, and the SAC itself (SAC-10-04 REV, BYC-10-INF-D). Furthermore, studies for the western and central Pacific Ocean using longline observer data presented during the 17th Meeting of the Standing Committee on Tuna and Billfish (Lawson, 2004), demonstrated that species with higher levels of CPUE like tuna or other target species, as well as some sharks would require no more than 20% human observer coverage, assuming that observer coverage is representative of the various fleet components. However, when observer coverage is not representative or for species with very low catch rates, the desired observer coverage may be higher, at almost 100% in certain occasions.

The tuna fishery in the EPO, its regulations, the environment and the status of the populations are constantly evolving. In such a changing environment, 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. Several factors like the economy, population dynamics and the development of regulations to both ensure the long-term sustainability of target species and mitigate species vulnerability and environmental issues may cause fisheries behaviors and strategies to change. As a result, EM review rates should be periodically revised to reflect these dynamics and meet management and conservation goals. Consequently, the implementation of the EMS in the EPO should be planned to be adaptable to these changes without causing major logistical and financial effects. In this regard, it is important to be mindful of the development of new EM analysis tools and advanced technologies (e.g., AI) that would allow not only to optimize and expedite the time of EM analysis but also reduce its costs.

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

Focus questions

Participants are encouraged to consider the following aspects:

- Considering the full human observer coverage in large purse-seiners and the low or non-existent coverage in small purse-seiners and longliners, what type of observer data is most urgently needed by the Commission? Could these data be collected through EMS?
- Should data collection for both science/compliance using EMS be guaranteed/promoted, regardless of the financial considerations? Should some components (e.g., data collection, economic) be favored over others?

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