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IOTC-2019-CoC16-05a [E]

REPORT OF THE VMS STEERING GROUP

Prepared by: VMS Steering Group, 03 May, 2019

This document provides the assessment by the VMS Steering Group of the Consultant's report that considered options to strengthen the IOTC VMS. It is presented as fulfilment of Recommendation CoC 15.21 (paragraph 99 of the CoC15 Report).

1. Background

In 2016 the Indian Ocean Tuna Commission (IOTC) endorsed the Terms of Reference for an IOTC options Paper for Strengthening the VMS (paragraph 61, 62 and Appendix IXb of the Report of the 22nd Session of the IOTC). The Steering Group was established following a call for interested members and accredited observers via IOTC Circular 2017-070. The Steering Group was comprised of representation from the EU, Kenya, Seychelles, Somalia, UK, the FAO ABNJ Tuna Project, ISSF, and The Pew Charitable Trusts (Circular 2017-076).

In preparation and in support of the work of the Consultant, two members of the Steering Group together with the IOTC Secretariat undertook to collect baseline information on the national VMS programs already in place by IOTC members (Circular 2017-088). The responses to this questionnaire was collated and used by the Consultants in the consideration and preparation of the advice for strengthening the IOTC VMS.

In August 2018, with funding from WWF Mozambique, Pontus Consulting was awarded the contract to undertake the work as outlined in the Commission's endorsed TOR (Circular 2018-40). The consultant was asked to:

To provide the Commission with options for strengthening the IOTC VMS, such that the VMS provides an effective platform for the monitoring and controlling IOTC fisheries, consistent with the Commission's management regime. Specifically, in monitoring and controlling the activities of vessels authorised to operate in the IOTC Area of Competence. The establishment of a regional or Commission VMS should also be considered, taking into account the costs and benefits, the existing national VMS approaches as well as regulatory framework, technical, confidentiality and Secretariat staffing requirements.

Noting the delays on completing this work, the Commission endorsed the CoC15 recommendation that "the Steering Group review the report of the VMS study and provide recommendations to CoC16, including a workplan, budget and if necessary a revision of Resolution 15/03 (paragraph 99 of the CoC15 Report)". This enabled this important work to continue in a timely manner. The Consultant's report was provided to the IOTC Secretariat in February 2019 and presented to the Working Party on the Implementation of Conservation and Management Measures (WPICMM) in February 2019 (IOTC-2019-WPICMM02-VMS Study). The WPICMM made the following recommendation (Recommendation 02.04) in relation to the VMS report:

*The WPICMM02 **RECOMMENDED** that the VMS Steering Group consider options 2 and 3, (in document IOTC-2019-WPICMM02-VMS Study) and possible variation of option 3 to take into account paragraph 15, as the basis for strengthening the IOTC VMS and continue its work, including a work plan and budget, and if necessary, a revision of the Resolution 15/03 for the consideration of the CoC16.*

The objective of this paper is to outline the Steering Group's review of the Consultant's report, and to make an assessment of option 2, 3, and possible variations to option 3 as per the WPICMM's recommendation. This paper is presented for the consideration of the CoC16.

2. Context from the Consultant's Report

This section provides a brief overview of the key points and recommendations from the Consultant's report and are provided as context for the recommendations made by the Steering Group in the remainder of this paper.

2.1. Key Points and Conclusions

- 28 CPCs completed the baseline survey which highlighted that:
  - overall, CPCs have implemented a VMS program that provides *relatively* high VMS coverage of their flag vessels in basic terms. However, there is also a high degree of variability in the way that the VMS has been implemented resulting in widely different VMS standards across CPCs.
  - The different VMS standards relate to scope, coverage of different vessel type and sizes, reporting rates, manual reporting requirements, data reporting and sharing. Resolution 15/03 only provides general standards, specifications and procedures, including general guidance on issues such as MTU capability and actions in the event of an MTU failure.
  - The incomplete implementation of Resolution 15/03 needs to be addressed to facilitate a strengthened VMS for the IOTC.
- The IOTC, through Resolution 15/03, has currently established a 'completely decentralised VMS' which is limited to CPCs monitoring their own vessels and having sole access to the associated VMS data.
  - It does not mandate, facilitate, require or encourage any degree of routine VMS data sharing amongst CPCs or with the IOTC Secretariat.
  - The current IOTC VMS has likely driven improvements in flag State monitoring but does not have a strong framework as an RFMO-wide management or monitoring, control and surveillance (MCS) tool
- The key conclusion from the Consultant is that *the lack of data sharing, consistency and transparency represent significant weaknesses and mean that the current VMS cannot contribute to wider MCS programs, does not facilitate coastal State monitoring nor does it support the collection and reporting of data for scientific purposes*.
- Immediate opportunities to strengthen the IOTC VMS, with little to no costs for the Commission, include:
  - implementing a more consistent practice by CPCs through the instigation of agreed standards, specifications and procedures at the Commission level.
  - Enhancing the scope of the current VMS Resolution 15/03 to ensure that CPCs are applying the application of VMS requirements to the same types and sizes of vessels.

2.2. Key Recommendations

- To implement a "partially centralised system" consisting of flag State implementation where VMS data is sent automatically to the Commission's Secretariat by VMS service providers (not through the CPCs Fisheries Monitoring Centre (FMC)).
- Form an intersessional Working Group to develop specific rules for the sharing, protection and use of the VMS data, cost recovery and other policies to support the IOTC VMS.
- Implement changes to Resolution 15/03 (Appendix 3) to foster greater consistency and strengthen the current IOTC VMS
- Enhance the scope of the VMS by including additional vessel types (non-fishing vessels such as carrier, support/supply and bunker vessels) and some types of vessels smaller than 24 m LOA.
- Strengthen the manual reporting requirements by reducing the allowable time for manual reporting and developing IT solutions to facilitate the capturing of manually reported data in the same format as automatically generated VMS data.

3. Assessment of the Pros and Cons of Different Options

The following pros and cons summaries and are derived from the Consultant's report and touch on key aspects of an effective VMS program. For a full account of these strengths and weaknesses please refer to Table 2 in the Consultant's report.

Option/ Criteria	Shared Decentralised	Partially Centralised
Consistency with national privacy laws	Pros: • Can be overcome • Builds trust and cooperation between States parties • Enhances MCS capability Cons: • May be, at least in part, inconsistent with national privacy laws	Pros: • Proven possible including by States who thought it impossible • Builds, strengthens and enhances cooperation between State parties • Enhances stakeholder trust in the management framework Cons: • nil
Transparency	Pros: • Data provided automatically from the FMC to the Secretariat (or third-party) • Increases the likelihood that it is accessed by relevant CPCs without complex bilateral negotiations Cons: • Need for the Secretariat or third party) to audit and review FMCs access and data transmission	Pros: • Greatest level of transparency • Data is sent automatically from the satellite service provider to the third-party provider or Secretariat (rather than via the FMC). • Data provided in near real-time to other non-flag CPCs without possibly data tampering. Cons: • nil
Effectiveness in promoting vessel compliance	Pros: • Promotes greater access by non-flag CPCs thereby increasing the likelihood of the data being used to promote vessel compliance Cons: • Time delays in data transmission may pose greater risk that the data has been tampered with • Time delays in data transmission may facilitate IUU fishing activities	Pros: • Greatest Contribution to Vessel Compliance • No time-lags in data submission between the FMC and other non-flag CPCs • Verification of the vessel's activities, position, etc Cons: • Need to manipulate the database by the Secretariat to achieve a single consistency. The current status of VMS' in the IOTC would require time and resourcing to provide the necessary database consistency to realise the benefits associated with a partially centralised system.
Usefulness for other MCS programs (e.g. CDS, PSM, etc)	Pros: • Improvement in the capability including for MCS, but not as much as for the partially centralised system due to the time delays in having access to and using the VMS information for MCS purposes. Cons: • Any time delay in transmission between the FMC and other non-flag CPCs reduces the MCS capability of the Commission, including related to the identification of, and response to, IUU fishing	Pros: • Follows as above – improved information provision and timeliness greatly enhances the MCS capability of the Commission Cons: • nil

Option/ Criteria	**Shared Decentralised**	**Partially Centralised**
Usefulness for science	Pros: • Enhances the ability to collect and use information for scientific purposes Cons: • Need the development of established rules and guidelines,	Pros: • Enhances the ability to collect and use information for scientific purposes • Improves the data that is 'owned' by the Commission and therefore the availability of the data for scientific purposes. Cons: • nil
Costs – CPCs	• Actual costs unlikely to change for CPCs, except those that are yet to establish a VMS • Some minimal additional costs are likely which would be linked to the need to acquire capacity and skills to comply with any agreed Standards, Specifications and Procedures agreed by the Commission relating to the sharing of VMS information.	• Actual costs unlikely to change for CPCs, except those that are yet to establish a VMS • Some minimal additional costs are likely which would be linked to the need to acquire capacity and skills to comply with any agreed Standards, Specifications and Procedures agreed by the Commission relating to the sharing of VMS information.
Costs – Secretariat staff	• Likely result in some increased staff-time at the Secretariat as there is a requirement for auditing the CPC VMS systems, processes and to check that all data is being provided from the FMC according to the pre-agreed rules, that it is not being filtered, delayed or altered	• Likely result in additional staffing complement for both the IT and the operational management of the information. Substantial information and data would be being transferred through the Secretariat. Staff would be required to collate, store, protect the data while providing CPC access
Costs – Secretariat running costs	• Nil – there is minimal running costs associated with this option	• There would be two forms of running costs associated with this option: reporting costs and system provision costs. • For the reporting costs – the Commission would need to decide who is responsible for these costs: borne solely by the CPC or by the Commission, or a split cost. Either way, given the large number of vessels that could potentially be covered by the IOTC VMS this could be a substantial cost • For the system provision – this would likely be a cost borne by the Commission for using a commercially available system. The Commission would need to negotiate the system provision cost with possible providers through a tender (or similar) process
Costs – Secretariat infrastructure	• Minimal IT infrastructure is required for this option; a database for internal usage by the Secretariat. • NB there may be considerable work to develop and agree formal standards that would enable the transmission of the data from the FMC to the Secretariat	• Additional infrastructure is potentially significant (depending on if the VMS is housed within the Secretariat or with a third-party provider) due to the magnitude of the data being received and transmitted • Infrastructure required would be hardware: additional servers and associated back up servers, software: to receive and disseminate data according to the pre-agreed rules, geofencing, auto-notifications in accordance with the pre-agreed rules

3.1. Variation on Option 3

There are of course many options and ways that the IOTC can customise its VMS to ensure that it is fit for purpose. For example, below sets out some of the alterative adjustments that could be made to option 3:

- Implement a centralised system only on the high seas, leaving coastal States with the option to opt into any centralised system. If this approach was taken it would help build the capacity of the coastal States in the implementation of their own VMS while building understanding of the benefits of a centralised system.
- Outsource the VMS to a third-party provider. This has been the approach taken in the South Pacific RFMO which operates from Australia to Chile in the south Pacific Ocean. Outsourcing the VMS service provider (rather than housing it at the SPRFMO Secretariat) was chosen as a cost-effective option for this Commission's members.
- Implement a partially centralised system but retain reporting via flag State FMCs, with either auto-reporting to the centralised system or with very minimal time lags for this data to be reported.

3.2. Risks

There are a number of critical risks that the IOTC Parties and VMS Working Group needs to consider. This is a non-exhaustive list of key risks.

- The biggest risk of any non-decentralised system is the latency of the reporting from the vessel to the flag State and on to the centralised VMS provider (the IOTC Secretariat or a third-party service provider). It is essential that, if simultaneous VMS data transmission is not agreed, that there is very minimal time between when the flag FMC received the VMS data and its transmission to the centralised system, i.e. it is transmitted in near real-time based upon agreed minimum transmission standards.
- Address confidentiality concerns. It is essential that the IOTC develops and implements a rigorous confidentiality policy pertaining to the collection, storage, use and sharing of VMS data. It is imperative that all parties can trust that the information they share is held with the upmost care. In this regard, it is suggested that the WPCFC procedures are used as a starting point.
- Failure of the IOTC fisheries management systems. There is a real risk that retaining the status quo for the IOTC VMS will indirectly support the failure of the IOTC's management system, including those related to harvest strategies, combatting IUU fishing, catch and/or effort limits, and spatial and temporal management arrangement. As the consultant notes, the current IOTC VMS may have driven improvements in flag State monitoring of their vessels, but it is not strong as an RFMO-wide management or MCS tool.

4. Considerations

There are a range of other considerations that a VMS Working Group would need to consider when continuing to develop the strengthened VMS arrangements in the IOTC. For example:

- Objective: the Commission needs to agree the fundamental objective of the VMS. If it is to support regional management and MCS then the appropriate policies and framework should be developed to support that end point, even if the implementation of the partially centralised system takes some years to be released.
    - Directly related to the objective is for the Commission to consider the risks and consequences for the sustainability of IOTC fisheries without improvements to the VMS, including related to risk and consequence associated with IUU fishing. The IOTC may wish to consider this in light of neighbouring regions taking measures to strengthen their ability to detect and respond to IUU fishing, which may leave the Indian Ocean vulnerable to unscrupulous operators who are displaced to the region as it is easier to conduct illegal fishing and avoid detection.

- Scope: the number of vessels operating in the IOTC Area– there are thousands of vessels operating in the IOTC Area which may make the VMS too complex to operate. It is essential that the IOTC agrees and clearly articulates the objective of the IOTC VMS and then considers the scope of any strengthen VMS in relation to that.
- Data sharing and exchange: the approach taken in relation to the data sharing should be driven by the agreed VMS objective. Elements to consider including data sharing between the FMCs of parties and other groups like the Secretariat. Key considerations here include agreeing the type of format and its method of transmission.
    - The Fisheries Language for Universal eXchange (FLUX) – this has been developed by the UN and is currently being used in many fisheries globally, for example in Thailand.
- Funding: see the budget elements under 6. There may be interest from external donors to support the development of the IOTC's VMS, but fundamentally the long-term running costs need to be considered. Options for funding the VMS include through CPC contributions in the ordinary budget, being borne solely by the CPCs for their flag vessels, a combination of CPC and IOTC budget including proportional costs based on the number of vessels and their location of operation (i.e. higher costs for vessels operating on the high seas or in the EEZ of a coastal State).
- E-reporting linked to VMS. Technology is changing very rapidly particularly in relation to fisheries data collection, reporting and integration. The IOTC may like to consider concurrently the benefits of integrating its VMS data with e-reporting (e-logbook) standards and a service provide that can offer technology to address both.
- Maritime boundaries: it is important to note that if there are any outstanding maritime boundaries under dispute, that this may cause some issues for policy discussions.

5. Steps, Timing and Suggested Workplan

Appendix 1 provides a suggested 12-month workplan for a VMS Working Group to progress the work of strengthening the IOTC VMS. This workplan is based on the Consultants suggested workplan but has been modified by the Steering Group. It only provides suggested actions for the forthcoming intersessional period as the Steering Group considered that the VMS Working Group would refine the workplan based on the progress made between Session 23 and 24 and present this to the IOTC CoC in 2020.

Appendix 2 outlines initial suggested amendments to Resolution 15/03 to improve the IOTC VMS in the short term.

6. Budget

It is difficult for the Steering Group to provide an estimate of the likely budgetary consequences of the different VMS options, as there needs to be decisions about the objective and scope of the VMS before any realistic cost estimates could be provided. That said, some overarching principles can provide some estimates of component costs:

- System acquisition: somewhere between USD136,000 – 230,000/annum
- Airtime costs: depends on the number of vessels covered by the VMS and the polling rate but anywhere between
    - 3000 vessels @ 2 hr polling – USD131,400/annum
    - 4000 vessels @ 2 hr polling – USD175,400/annum
    - 5000 vessels @ 2 hr polling – USD219,000/annum
- Staffing: VMS specific staff USD100,000 – 130,000/annum, IT staff/consultants USD100,000/annum

Overall, the Consultant highlights that it is impossible to accurately estimate the costs until fundamental policy questions are answered, but that it could cost anywhere between USD380,000 – 810,000/annum

7. Recommendations

That the CoC16:

1. Note the review and assessment of the VMS Steering Group on the Consultant's report as outlined in IOTC-2019-CoC16-05a.
2. Provide a recommendation to the Commission on the preferred option(s) or way forward for strengthening the IOTC VMS based on the recommendations in this paper, or a variation of them.
3. Recommend the establishment of a VMS Working Group to progress the work associated with strengthening the IOTC VMS as per the proposed workplan in Appendix 1.
4. Endorse the proposed amendments to Resolution 15/03 and recommend to the Commission that these amendments be adopted at IOTC Session 23 (Appendix 2).

APPENDIX 1: PROPOSED WORKPLAN FOR THE VMS WORKING PARTY

Actions for the Commission and CPCs prior to IOTC Session 24 in 2020.

1. Establish an expertise-based intersessional working group to develop rules and procedures for the sharing, use and protection of VMS data. The VMS Working Group will consider issues such as, for example:
   - Preferred model for a future IOTC Commission VMS (centralized or decentralized), including where a VMS system could be hosted (within the Secretariat or outsourced)
   - Scope and application of the VMS (vessel types and size, geographic scope)
   - Method for position reporting (direct, indirect or simultaneous)
   - Possible funding models and options.
   - Development of a tender process for choosing a VMS provider
   - Consider improvements that can be made to Resolution 15/03 to improve consistency in CPCs' VMS that meet the policy discussions.
   - Develop rules and procedures for the confidentiality, sharing, use and protection of VMS data.
2. Develop a new draft Resolution, or amendments to Resolution 15/03, to enhance consistency in CPCs' VMS, based on proposals at Appendix 2 of IOTC-2019-CoC16-05a, including related to the scope (inclusivity of additional vessel types and sizes (possibly using phased-in implementation if necessary).

APPENDIX 2: PROPOSED AMENDMENTS TO RESOLTUION 15/03

Below sets out the proposed amendments to Resolution 15/03 as suggested by the VMS Consultant. The Steering Group endorses these proposed amendments but note that there are some decisions remaining for the COC16 to advise on, for example paragraph 7 as highlighted.

The Consultant notes that *'the amendments below only respond to the specific issues including the scope of the VMS and enhancing consistency in the application of VMS amongst CPCs. They do not seek to address longer term amendments that will be needed to cover other elements of the recommendations as they will need to be developed over time as policy decisions are taken by the Secretariat. This attachment only shows paragraphs where specific changes should be considered.'*

Preamble [No change proposed]

1. Each Contracting Party and Cooperating Non-Contracting Party (CPC) shall adopt a satellite- based vessel monitoring system (VMS) for ~~all~~ vessels flying its flag ~~24 metres in length overall or above or in case of vessels less than 24 meters, those operating in waters outside the Economic Exclusive Zone of the Flag State fishing for species covered by the IOTC Agreement within the IOTC area of competence.~~as follows:

   a) All vessels[1] greater than 24m;
   b) All vessels[2] operating outside of the flag CPC's EEZ; and
   c) All domestic only15 longline, purse seine, pole and line, carrier and bunker vessels greater than 15m.

~~3.~~2. [No change proposed]

~~4.~~3. [No change proposed]

~~5.~~4. The Commission may establish guidelines for the registration, implementation and operation of VMS in the IOTC area of competence with a view to standardising VMS adopted by CPCs.

~~6.~~5. Information collected in respect of each vessel covered under paragraph 1 shall include:

   a) the vessel identification;
   b) the current geographical position of the vessel (longitude, latitude) with a position error which shall be less than 500 metres, at a confidence level of 99%; and
   c) the date and time (expressed in UTC) of the fixing of the said position of the vessel.

~~7.~~6. [No change proposed]

~~8.~~7. Each CPC shall ensure that the information in paragraph 5 is transmitted to the FMC at least once every 4 hours for [insert vessel types where low reporting rate is acceptable] and every [X] hours for [inset vessel types where more regular reporting is required]. Each CPC shall ensure the masters of fishing vessels flying its flag ensure that the satellite tracking device(s) are at all times fully operational.

~~9.~~8. Each CPC as a Flag State shall ensure that the vessel monitoring device(s) on board its vessels are tamper resistant, that is, are of a type and configuration that prevent the input or output of false positions, and that they are not capable of being over-ridden, whether manually, electronically or otherwise. To this end, the on-board satellite monitoring device must:

   a) be located within a sealed unit; and
   b) be protected by official seals (or mechanisms) of a type that will indicate whether the

[1] "All vessels" means fishing vessels and any vessel operating in support of fishing vessels including, but not limited to carriers, bunkers and purse seine tender/supply vessels.
[2] "domestic only" means vessels that are only authorised to operate in the flag CPC's EEZ.

unit has been accessed or tampered with;
c) be capable of providing specific automated reports when powered off or on; and
~~b)~~ d) be capable to providing automated reports when the antenna is blocked.

9bis. In addition, each CPC as a flag State shall ensure that the vessel monitoring device(s) on board its vessels have the following capabilities:

a) Able to be programmed to provide automatic reports when the vessel enters or exits designated areas;
b) Able to be remotely prompted to provide position reports outside of regular reporting intervals [note - may be low priority if short reporting intervals are agreed]; and
c) Able to provide location data described in paragraph 5 directly to multiple (at least two) recipients.

~~10.~~9. The responsibilities concerning the satellite-tracking devices and requirements in case of technical failure or non-functioning of the satellite-tracking devices are established in Annex I.

~~11.~~10. [No change proposed]

~~12.~~11. [No change proposed]

~~13.~~12. [No change proposed]

~~14.~~13. [No change proposed]

~~15.~~14. Resolution ~~06~~15/03 *On establishing a Vessel Monitoring System Programme* is superseded by this Resolution.

ANNEX I - RESPONSIBILITIES CONCERNING THE SATELLITE-TRACKING DEVICES AND REQUIREMENTS IN CASE OF TECHNICAL FAILURE OR NON-FUNCTIONING OF THE SATELLITE-TRACKING DEVICES

A) [No change proposed]

B) [No change proposed]

C) [No change proposed – although port State consent should be considered in approval to turn VMS off]

D) In the event of a technical failure or non-operation of the satellite tracking device fitted on board a fishing vessel, the device shall be repaired or replaced within ~~one month~~30 days. CPCs shall ensure that the vessel returns to port before the conclusion of this period and does not commence a fishing trip until the CPCs FMC has confirmed that the satellite tracking device is functioning correctly. ~~After this period, the master of a fishing vessel is not authorised to commence a fishing trip with a defective satellite tracking device. Furthermore, when a device stops functioning or has a technical failure during a fishing trip lasting more than one month, the repair or the replacement has to take place as soon as the vessel enters a port; the fishing vessel shall not be authorised to commence a fishing trip without the satellite tracking device having been repaired or replaced.~~

E) In the event of a technical failure or non-functioning of the vessel monitoring device on board the fishing vessel, the master or the owner of the vessel, or their representative, shall communicate immediately to the FMC of the Flag State, and if the Flag State so desires also to the IOTC Secretariat, stating the time that the failure or the non-functioning was detected or notified in accordance with paragraph F of this Annex. In the event of a technical failure or non-functioning of the vessel monitoring device on board the fishing vessel, the master or the owner of the vessel, or their representative, shall also communicate to the FMC of the Flag State the information required in paragraph 5 of the Resolution every four hours, by email, facsimile, telex, telephone message or radio.

F) When the Flag State has not received for 12 hours data transmissions referred to in paragraphs 7 of the Resolution and E of this Annex, or has reasons to doubt the correctness of the data transmissions under paragraphs 7 of the Resolution and E of this Annex, it shall as soon as possible notify the master or the owner or the representative thereof, and the manual reporting provisions in paragraph E shall commence immediately. If this situation occurs more than two times within a period of one year in respect of a particular vessel, the Flag State of the vessel shall investigate the matter, including having an authorised official check the device in question, in order to establish whether the equipment has been tampered with. The outcome of this investigation shall be forwarded to the IOTC Secretariat within 30 days of its completion.

G) [No change proposed – but more real-time arrangements will be required for the provision of manual reports to the Secretariat once option 3 is implemented]