Western and Central Pacific Fisheries Commission

TO ALL COMMISSION MEMBERS, COOPERATING NON-MEMBERS, PARTICIPATING TERRITORIES AND OBSERVERS

Circular No.: 2024/23
Date: 3 May 2024
No. pages: 32

Proposed Meeting of the Electronic Reporting and Electronic Monitoring Intersessional Working Group (ERandEM-IWG)

Dear ERandEM Working Group participants,

First, I would just like to thank people for the extremely detailed and constructive feedback received on the material which was sent out for comment on 5 March 2024 directly to IWG members as well as more widely in Circular 2024/12.

Secondly, the following outlines my proposed next steps for continuing the work of this IWG including consideration of the feedback.

In accord with the original workplan, **I am proposing to hold a virtual session on 31 May 2024.** I expect the meeting to take 4 hours.

The purpose of the session would be to:

1. Walk through the draft SSPs that were provided – considering all the various points raised in feedback.

2. Discuss some of the other matters related to the operation of an EM programme within the WCPFC context, i.e.,
    - Monitoring objectives
    - Assurance processes
    - Any additional SSPs that may be required; and
    - Harmonisation.

The agenda and additional workshop material are still being finalised however, to support the virtual session, I have attached a consolidated version of the draft SSPs incorporating the feedback received. A WORD version of this document has been emailed directly to IWG participants and is also posted on the IWG webpage: (https://www.wcpfc.int/ERandEM-IWG).

I will provide a specific discussion paper to support No. 2, above. The paper will draw on the original material provided, and the feedback received both in writing and via conversations.

These matters are both important and complex and I want to take the time to reflect on the variety of responses received. **I expect to circulate the agenda and a further paper by 15 May**.

As always, if there are any working group members who would like the opportunity to share their thoughts via a call – please don't hesitate to reach out to me.

Kind regards,

Shelton

Shelton Harley | Acting Director Digital Monitoring
Fisheries New Zealand – Tini a Tangora | Charles Fergusson Building
34-38 Bowen Street | PO Box 2526 | Wellington 6011 | New Zealand
Email: Shelton.Harley@mpi.govt.nz
Telephone: +64 4 894 0857 Mobile: 021 506 568 | Web: www.mpi.govt.nz

Western and Central Pacific Fisheries Commission

TO ALL ERandEM IWG Participants

Date: 4 March 2024
Version 2.0 2 May 2024
No. pages: 29

Progressing Interim Electronic Monitoring Standards – ANNOTATED WITH FEEDBACK

Dear ER/ EM Intersessional Working Group members,

With today being 4 March 2024, the year seems to be racing along and the Commission has set clear direction for what it expects of us this year!

Before I get to the real work, New Zealand now has 127 of our small-medium inshore vessels fitted with cameras – including 22 vessels that operate as part of our domestic (within-EEZ) tuna longline fleet. We now have three different fishing methods covered by cameras and the vessels are operating throughout our EEZ!

You will recall that for WCPFC20 I provided an update on activities and proposed a plan for the next 24 months (WCPFC20-2023-ERandEM IWG-01). The Commission, while liking my plan (my words), felt that it was not ambitious enough and instead decided the following (which is available in the draft WCPFC20 Summary Report):

> *618. The Commission noted the Report of the ER&EM WG (WCPFC20-2023-ERandEM-IWG-02) and agreed to adopt the Schedule of Work set out in Appendix 1 of the report (**Attachment 5 – see below**).*
>
> *619. The Commission tasked the ER&EM WG to develop a set of interim EM standards for adoption at WCPFC21 in 2024.*
>
> *620. The Commission noted the need for cooperation with IATTC in the development of EM procedures for WCPFC.*

ERandEM Proposed Schedule of Work

ER and EM Work Plan Priority Tasks	Timing	Mode of working	Outputs
a. Identification of priority Standards, Specifications and Procedures (SSPs)	Dec 23 – Feb 24	Via email	Key materials and priority SSPs identified
	Apr-May 24	Virtual meeting	Review of priority SSPs for inclusion in SC and TCC paper
	Aug-Sep 24	SC and TCC consideration	Recommendation and advice from these two subsidiary bodies
b. Confirm information needs for longline and longline transhipment c. Develop proposed assurance and associated SSPs	Dec 24	WCPFC-21	Agreement and/or feedback on SSPs
d. Develop an initial draft CMM for a WCPFC EMP	TCC	In-person session	Outline of draft CMM
	Oct- Nov 24	Via email	Draft CMM and key questions identified
	Dec 24	WCPFC-21	Feedback on draft CMM
e. Finalise SSPs and propose changes to other WCPFC documents	Dec 24 – Feb 25	Via email	Key activities and timelines for 2025 identified, including any consequential amendments required
	Apr-May 25	Virtual meeting	*To be confirmed*
	Aug-Sep 25	SC and TCC consideration	*To be confirmed*
	TCC	In-person session	*To be confirmed*
	Dec 25	WCPFC-22	Adoption of CMM on a WCPFC EMP

Further, in adopting an updated Tropical Tuna CMM (CMM 2023-01) EM was specifically called out in Table 3 of Attachment 1:

> ***For the United States and those who maintain a 5% observer coverage level, no catch increase is allowed.*
> *Any increase in BET tuna catch limit, up to 10%, by a CCM in table 3 shall correspond with a proportional increase of observer coverage, (eg observer + Electronic Monitoring (EM) coverage increases from 5% to 10%; and for example, a 2.5 percentage point increase in observer + EM coverage corresponds with a 5% increase in the catch limit; and a 5 percentage point increase in observer + EM coverage corresponds with a 10% increase in the catch limit.) A minimum level of 5% ROP coverage shall be maintained. Any CCM who wants such an increase shall notify the Secretariat by the end of February of the year of fishing operations. If such CCM fails to achieve the required observer coverage level assessed for the year of increase of catch limits, then it will be subject to a payback penalty of 110% of the increased portion of the catch limit that can be repaid in either of the next two years, and will be assigned a status of priority non-compliant through the CMR process for this obligation.*
> ****Any observer coverage above 5% can be achieved by human observer and/or EM coverage*

The purpose of this email is to initiate our work around three areas called out in the workplan:

1. Identifying monitoring objectives / data needs for EM on longline vessels;
2. Identification of priority Standards, Specifications and Procedures (SSPs) and relevant materials; and
3. Outlining the key features of the assurance process that WCPFC might consider for an EM program being undertaken to meet Commission requirements.

Monitoring objectives

A critical aspect of any EM program will be 'what it is seeking to achieve', i.e., the monitoring objectives. These determine 'everything' for an EM program, e.g. from the number and position of cameras, the quality of the EM records collected, the timeliness for submission, through to the level and nature of footage review.

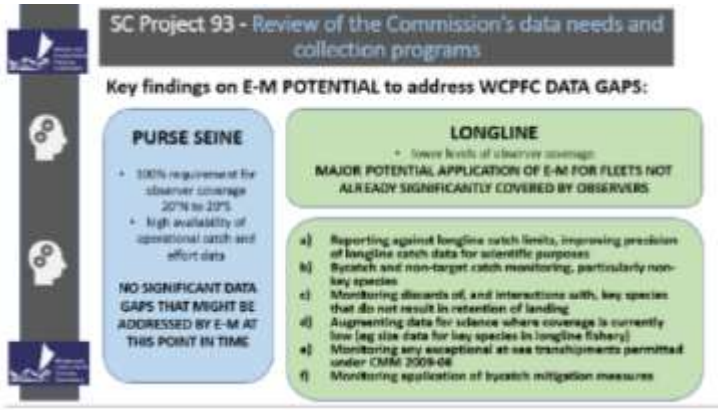
The SC Project 93 info-graphic below provides some potential monitoring objectives for EM on longline vessels. Through the Tropical Tuna CMM, the Commission has already emphasized that (a) below is particularly important.

Ultimately it will be the Commission that determines these objectives, but we need to be mindful of these potential objectives when developing SSPs. In particular, we should seek to avoid SSPs that might require significant change in response to new or changing objectives.

Also, I propose that there is value in taking information needs as a whole, and considering a range of tools that can be used to achieve it. For example, information collection and verification could occur through:

- On-board observers
- EM data (e.g., the review of EM records)
- Verified (through EM) Fisher reporting
- Port sampling / inspections
- At-sea inspections
- Sampling in processing facilities
- Dedicated research programmes

I propose that this flexibility be provided for EM programs in WCPFC, but this is something I would appreciate feedback on.



GENERAL COMMENTS – MONITORING OBJECTIVES		
	Section of Chair proposal	**Submission**
CCMs	**Objectives related:** *The purpose of this email is to initiate our work around three areas called out in the workplan:* *1. Identifying monitoring objectives / data needs for EM on longline vessels;* *"The SC Project 93 info-graphic below provides some potential monitoring objectives.."* **SSP related:** *"Ultimately it will be the Commission that determines these objectives, but we need to be mindful of these potential objectives when developing SSPs. In particular, we should seek to avoid SSPs that might require significant change in response to new or changing objectives."* **Information needs related:** *"I proposed that there is value in taking information needs as a whole, and considering a range of tools that can be used to achieve it. For example, information and collection and verification could occur through:* "*I propose that this flexibility be provided for EM programs in WCPFC....."*	**Objectives related comment:** **AU** - Supports SC Project 93 objectives. **JP** - Suggest having high-level and general objectives, rather than specific or focused ones. **US** - Gaining agreement on monitoring objectives/data needs should be a priority. Potential monitoring objectives require further discussion. **PEW -** Based on our experience with other RFMO EM processes, we would strongly recommend that the group re-confirm agreement on the objectives for the EM program that the standards will support, which were agreed to by the EM/ER WG in 2020 ""The objectives of the Commission Electronic Monitoring Programme (EMP) shall be to verify catch data, other scientific data, and additional information related to the fishery from the Convention Area and to monitor the implementation of the conservation and management measures adopted by the Commission." Reconfirming agreement on basic objectives will avoid situations where discussion is stalled because there is disagreement on "why" EM standards are being developed, and objectives can be pointed to when justifying decision making. If possible, if would be good to frame the development of EM standards and an EM program as building a tool that can be used as part of a holistic monitoring program. While the main driver currently might be to ensure standards are in place given some fleets may be able to increase their BET catch limit with an increase in observer coverage, it would be beneficial to think longer-term and in a broader context, designing standards and a program that could support a wide range of gear types and catch profiles in the future. **SSP related comments:** **TW** - Despite understanding its influence on the SSPs, we agree with your comment that this decision lies not with this working group but with the Commission. Considering that numerous CCMs, including New Zealand and Taiwan, have either developed or already implemented an ongoing EM programme, we support the idea of deferring this discussion and shifting the focus of our work to developing the SSPs as a workable **minimum standard** for every CCM's EM programme. **US** - It would be useful to have SSPs that can be responsive to changing objectives. Recommend focusing on current collection methods i.e. EM and on-board observers **Information needs related comments:** **AU** - Agree and supports proposed approach and framing. **JP** - Fully support the idea. **US** - Recommend focusing on current collection methods i.e. EM and on-board observers. Notes there is a lot of validity in comparing observer and EM data fields in the same fishery. Both tools have their pros and cons, and the data comparisons should not be given full weight relative to looking at all the possible data streams.

		AU - We support this position and consider that it aligns to an approach that holistically considers the Commission's data needs and potential collection programs to support those. **PEW** - It will be important to specifically discuss and try to reach agreement what form the data collected by EM will be in when submitted to the Commission. Our strong view is that it should be follow the model of the ROP program, where individual trip data, and not just summarized CCM data, is submitted to both the Secretariat and the SPC.

Priority SSPs

As I noted in the paper to WCPFC20, many fishing vessels operate in one or more EEZs and on the high seas. Further, there will be vessels that participate in fisheries in different RFMOs – sometimes within the same trip. It will be important for the IWG to identify those SSPs for which harmonization should be sought.

In early January I reviewed available material from IATTC, IOTC, ICCAT, and the FFA and I also caught up with key folks at the IATTC to start a conversation on how we can work together throughout the year.

For the work in front of us I propose that we use the FFA material as a starting point. These extensive SSPs were provided to WCPFC in 2022 (WCPFC19-2022-DP-08).

As I am recommending a staged approach to consideration of WCPFC SSPs I have focused on only two of the eight SSPs covered in this paper (**Appendix 1** attached)– focusing on those where I propose that harmonization is most important.

In reviewing these SSPs I have proposed a priority for each requirement:

- MUST – these are things that an EM System or EM Program must have. Evidence for these 'musts' would need to be provided and could be subject to an assurance process;
- SHOULD – features that could be very useful to have, but not strictly required; and
- COULD – features that are much less critical.

In addition to whether all relevant information is included in the SSPs, I am especially interested in feedback on what should be a MUST.

GENERAL COMMENTS FROM CCMs FEEDBACK – PRIORITY SSPS/SSPS		
1.	*General comment*	**TW** - We expect that the SSP can provide flexibility or options to facilitate CCMs in promoting EM.
2.	*"..important for the IWG to identify those SSPs for which harmonization should be sought."*	**AU** - We agree that this is an area for IWG input. Our preference is to consider harmonization for SSP definitions (e.g. EM data/ EM records) to facilitate any inter-organisational discussions and implementation. Noting that some WCPFC members are IOTC members, it would be useful

		to ensure WCPFC SSPs do not conflict with IOTC EM standards.
3.	*"In early January I reviewed available material from IATTC, IOTC, ICCAT, and the FFA and I also caught up with key folks at the IATTC to start a conversation on how we can work together throughout the year."*	**JP** - Among EM standards developed by other RFMOs cited in your paper, Japan prefers to use IOTC's standards (Resolution 23/08 on Electronic Monitoring Standards for IOTC Fisheries) as a basis for the development of EM standards at WCPFC. It is because IOTC's standards have clear but concise technical minimum standards, while giving a certain level of flexibility to the CPCs on how to implement EM programs in accordance with the minimum standards. The flexibility in the standard is expected to encourage and facilitate the development and introduction of EM devices in this region. **US** - While the FFA SSPs may be a good starting point, the US strongly encourages harmonization with SSPs from other RFMOs (e.g. ICCAT) as we continue through this process
4.	*"As I am recommending a staged approach to consideration of WCPFC SSPs I have focused on only two of the eight SSPs covered in this paper (**Appendix 1** attached) – focusing on those where I propose that harmonization is most important."*	**AU** - We agree with this staged approach. Following CCM input into these SSPs it would be useful to see a broader workplan leading into WCPFC21, and also into 2025. **JP** - We support your idea to take a staged approach, with a focus on high priority elements of the SSPs. While we respect your attempt to use FFA's SSPs as a basis of development of WCPFC SSP, we are afraid that FFA's SSPs are quite technical and detailed, and it would be difficult to agree on such specifics in a short term.

Assurance processes

I propose that determining how an EM Program is integrated into the Commission process (and the associated assurance processes) be handled in a slightly different way to other SSPs. I have provided (Appendix 2) an outline of the potential things to be considered in the process. The aim is to present a more developed framework – with options – to TCC later this year, but I am keen to take any early feedback and would aim to discuss it at the virtual meeting.

Next steps

- I would be grateful for any written feedback – either to myself (Shelton.Harley@mpi.govt.nz) and Eidre Sharp (Eidre.Sharp@wvpfc.int) or to the entire group by Friday 29 March.
- I am on leave until the 18 March, but after that date could be able to take a zoom call with any WG member who would like to discuss any of the material provided.
- Before the 29 March, we will aim to finalise the date of the virtual meeting proposed for late April/May.

Kind regards

Shelton

Shelton Harley | Acting Director Digital Monitoring
Fisheries New Zealand – Tini a Tangora | Charles Fergusson Building
34-38 Bowen Street | PO Box 2526 | Wellington 6011 | New Zealand
Email: Shelton.Harley@mpi.govt.nz
Telephone: +64 4 894 0857 Mobile: 021 506 568 | Web: www.mpi.govt.nz

APPENDIX 1

Proposed Interim Standards, Specifications, and Procedures (SSPs)

This document addresses the following Standards, Specifications, and Procedures (SSPs):

SSP1a: On-board EM systems

SSP1b: EM hardware and software in Data Review Centres (DRCs)

Terms and Definitions[1]

Note: In some cases, the original drafts of the SSPs used slightly different terms across the consultant groups. Where appropriate, this version addresses some of the inconsistencies without changing the meaning of the original drafts.

GENEARL COMMENTS FROM CCMs FEEDBACK - TERMS AND DEFINITIONS	
Several CCMs	1. Need relevant WCPFC references and remove FFA references throughout 2. Terms not appearing in presented SSPs so potentially delete. Unclear if used in other SSPs not discussed at this time: a. **Authorised Agent -** A person designated by the appropriate authority to carry out a specific function. b. **IUU** - Illegal, Unreported and Unregulated Fishing (defined in IUU CMM) c. **Privacy Impact Assessment** - A systematic process for evaluating the potential effects on privacy of a project, initiative or proposed system or scheme 3. Clarify what /who is an 'appropriate authority' for terms Authorised agent, EM Certifier
JP	Reserve position to make further comments on "Terms and Definitions" since this section may need reviewed based on discussion of SSP Different terms are being used for data requirement such as "data field to be required by WCPFC", "the regional minimum data field standards" or "EM minimum data field standard". These should be consistent throughout
US	Suggest clarifying what regional minimum data field standards are. For example, would expect at least vessel name, flag, IMO number, WCPFC number, possibly others. Term used in text in multiple places.

Ancillary Logs - Data records from the EM system that are supplemental to the EM Records, such as a record of changes in system configurations and settings and a summary of system health checks performed.

Artificial Intelligence (AI) – ~~The theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.~~ [A machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments. Artificial intelligence systems use machine and human-based inputs to (A) perceive real and virtual environments; (B) abstract such perceptions into models through analysis in an automated manner; and (C) use model inference to formulate options for information or action.]

Commented [ES1]: US - Suggest using a more broadly accepted version such as the one input here which is the US definition in 15 USC 9401

~~**Authorised Agent** - A person designated by the appropriate authority to carry out a specific function.~~

Cold Data Storage - The storage of inactive data that is rarely used or accessed. Cold data storage takes longer to access but is generally much cheaper to store.

[1] For consistency, when available, relevant terms and definitions have been sourced from FFA, 2020. "Regional Longline Fisheries Electronic Monitoring Policy."

Control Centre - The EM control centre is a computer and software system that records and stores information from EM System components (e.g., video, sensor data, GPS data, system log data) and also controls the operation of onboard EM system components.

Custodian - A person or organisation designated by the EM records and EM data owner to manage authorization and storage of EM records and EM data. There may be a different custodian for records and data.

Data Lake - A storage repository that holds raw data in its native format until it is needed for analytics applications.

Data Records - Actual records or entries in a data file or database.

Data Review Centre (DRC) - A facility with supporting software platform(s) used to analyse e-monitoring records and record e-monitoring data.

Designated Installer or Service Technician - A person or entity authorised by an EM Service Provider to install or service an EM System.

EM Analyst - A person qualified [by the appropriate EM Programme provider] to analyse e-monitoring records and record e-monitoring data in accordance with the EM standard and analysis procedures.

EM Analysis - See EM Records Analysis/Interpretation.

EM Analysis Rate - The proportion of e-monitored records that are analysed.

EM Certifier - An individual or organisation which has been ~~accredited~~ [approved] by the appropriate authority to inspect and approve e-monitoring systems for use.

EM Data - Data produced through analysis of e-monitoring records that conforms with the data standards specified in the SSPs.

EM Data Quality Reviewer – A ~~qualified~~ EM Analyst who reviews EM Data to verify and validate information produced by the EM Analyst.

EM Programme - A process administered by a national fisheries regulator(s) [of the flag state] that includes the use of EM systems on vessels to independently collect and verify fisheries data and information.

EM Records - Footage (still images and video) and sensor data recorded by an EM System that can be analysed to produce EM Data. Sensors may include any number of sensors (e.g., hydraulic sensors) that are part of the EM equipment and whose data is recorded on the vessel as part of the EM system.

EM Records Analysis/Interpretation - The process of an EM Analyst reviewing EM records and converting them into EM Data.

EM Service Provider - A ~~third-party~~ provider of EM technical and logistical services. An EM Programme may have multiple EM Service Providers and they may provide different services within the programme (e.g., onboard hardware, DRC software, DRC review services).

EM System - All the vessel and shore-based components supporting the generation, storage, transmissions, analysis and reporting of EM Records.

Commented [ES2]: US

Commented [ES3]: AU

Commented [ES4]: AU - Not needed as definition of EM Analyst already requires " a person qualified.."

US – if needed, propose combining with - **Review for Data Quality** - The verification process of re-analysing/interpreting a portion of previously analysed EM records to determine completeness, adherence to protocols, and accuracy of the EM Data produced by the EM Analyst.]

Commented [ES5]: JP - As a WCPFC standard, we need more clarity on the meaning of “national fisheries regulators”.

Commented [ES6]: AU - Some of these technical and logistic services may be provided for in-house by a national authority, so we suggest this option still be kept available to CCMs

Event - An occurrence in the EM Records that is enumerated into EM data.

FFA Observer - FFA member personnel who are trained under a common framework (PIRFO) to observe, collect, record and report on fishing activities both at sea and in port.

FFA VMS - systems employed by FFA members and coordinated by the FFA to monitor the position and activities of fishing vessels for the purpose of effective management of fisheries.

Fishing - [as defined in WCPFC Convention Article 2(d)] ~~(i) Searching for, catching, taking or harvesting fish; (ii) attempting to search for, catch, take or harvest fish; (iii) engaging in any other activity which can reasonably be expected to result in the locating, catching, taking or harvesting of fish for any purpose; (iv) placing, searching for or recovering electronic equipment such as radio beacons; (v) any operations at sea directly in support of, or in preparation for, any activity described above; or (vi) use of any other vessel, vehicle, aircraft or hovercraft, for any activity described in items (i) to (v) above, except for emergencies involving the health and safety of the crew or the safety of a vessel.~~[2]

Comment from ERandEM IWG Chair: This does not explicitly cover the sorting of the catch, including returning animals back to the sea. Do we need to ensure that footage is collected for these activities?
Submission responses: **AU** - In our national program, we identify the fate of catch items in the longline fleet and whether they are discarded (i.e., returned to the water), escaped, retained or cut off. We also have a bycatch mishandling treatment condition that requires all bycatch to be returned to the water in a timely manner to increase its chances of survival – this also helps the reviewer to identify the fate of the catch item. **US** – Yes, we need to ensure that footage is collected for these activities, also possibly for target species. This could be important when there are discards. The US also suggests it could be best addressed in an SSP as there isn't an obvious place for it in the definitions. **ISSF**: Discards and estimated fate are important

Fishing Trip - The collection of [EM Data] ~~activities~~ from the time of a vessel's departure from port until the return to port.

Geolocation device - A device that is used to capture information on vessel position, speed, and heading.

Independent - with respect to audits - no financial or current employment interest with the DRC

~~**IUU** - Illegal, Unreported and Unregulated Fishing.~~[3]

Commented [ES7]: US - generalise to "observer" or "ROP Observer" and remove "FFA"

ISSF - SSPs and should be broadened to cover WCPFC ROP and other observer programmes (accredited national programmes etc),, not just FFA. Same for VMS (should be WCPFC and FFA VMS)

Commented [ES8]: US - remove FFA and generalise to VMS broadly

ISSF - VMS (should be WCPFC and FFA VMS)

Commented [ES9]: US

Commented [ES10]: US

SPC - 'from port' - In some cases a fishing trip may start and end at sea

~~[2] Forum Fisheries Agency, 2019. "THE HARMONISED MINIMUM TERMS AND CONDITIONS FOR ACCESS BY FISHING VESSELS:As amended by FFC110 (May 2019)."~~

~~[3] See FAO for a complete definition of IUU.~~

Machine Learning (ML) - A subset of AI that refers to the use and development of computer systems that are able to learn and adapt without following explicit instructions, by using algorithms and statistical models to analyse and draw inferences from patterns in data.

Owner - The CCM Member that owns the EM Records and EM Data.

~~**Privacy Impact Assessment** - A systematic process for evaluating the potential effects on privacy of a project, initiative or proposed system or scheme.~~[4]

Regional Agency - A regional or sub-regional organisation that supports CCM national EM Programmes and EM Systems.

Review for Data Quality - The verification process of re-analysing/interpreting a portion of previously analysed EM records to determine completeness, adherence to protocols, and accuracy of the EM Data produced by the EM Analyst.

Sensors - EM systems may be equipped with a variety of integrated sensors that can provide additional information on fishing activity, trigger activation or adjustment of configurations of cameras, and identify points of interest to expedite EM video review. This may include "synthetic sensors" that ~~process raw sensor information to identify objects or events~~ [use camera imagery used to capture imagery of fishing activitys].

Uninterruptible power supply (UPS) - Provides power to the system and enables controlled shutdown in the event of a power loss.

User interface - A display that communicates EM system status messages and provides views of onboard cameras.

Vessel Monitoring Plan (VMP) - A document describing how an electronic monitoring system is specifically positioned and configured on a vessel [(e.g. camera placement with images of camera views and types and locations of sensors)] ~~and how fishing operations on that vessel will be conducted~~ to allow effective monitoring of fishing activity and accurate generation of EM Data specified by the EM Programmes.

Vessel Operator - any person who is in charge of, directs or controls a vessel~~, including the owner~~, charterer and master.

Commented [ES11]: US - A CCM Member may not own the data but a 3rd party could. Consider a different definition here since the business model has not been determined yet.

Commented [ES12]: US - Suggest combining with EM Data Quality reviewer definition above, if that one is needed

Commented [ES13]: US

Commented [ES14]: US - confirm this aligns with any comparable VMS SSPs

Commented [ES15]: US - Language additions. If magnetic sensors are used, would be good to know in VMS if more than one reel and if sensors are placed on all reels.
Note that this plan ideally would include elements that are easily checked by HSBI teams so the plan should clearly describe the units, their locations, etc.

Commented [ES16]: US - Suggest removing this term "owner". The owner is not the operator. The vessel operator is the person in charge of or who directs the vessel such as the Captain or Master.

[4] ~~Clarke, Roger, 2009. "Privacy impact assessment: Its origins and development."~~

SSP: Onboard EM Systems

Onboard EM Systems comprise all vessel components supporting the acquisition of and reporting of EM Records. Onboard EM Systems shall be configured such that they collect the information set out in a relevant WCPFC agreed minimum data standards [5]. The core EM System components covered in these SSPs are: control centre, user interface, cameras, geolocation device, uninterruptible power supply, sensors, and communication system. Together, these components ensure that required information is collected, including system health status, to support fisheries management and enforcement objectives.

On-board EM System component	SSP	ERandEM IWG Chair comments
1. Control centre	The EM system control centre: a. MUST Control all onboard EM hardware components. b. ~~MUST Be powered on and remain on while the vessel is underway and during all fishing activity, including during any at sea vessel rendezvous activity~~. [MUST be able to connect to the vessel's power source and sustain this power source throughout the duration of the fishing trip.] c. ~~MUST~~ [SHOULD or COULD] Store and transmit system health status information (See System Health Status). d. MUST Have sufficient storage capacity for all EM Records generated during a fishing trip [to meet all WCPFC data requirements] until EM Records are transmitted to a DRC for review. e. [MUST] ~~SHOULD~~ Have sufficient backup storage to prevent data loss. f. ~~SHOULD [MUST] Have the ability to encrypt stored EM Records. (See SSPs on EM Records and EM Data Security and Confidentiality)~~ g. SHOULD Have unambiguous and unique identification of storage devices (e.g., barcode on hard drives).	Deleted "Store EM Records on a fishing trip necessary for a DRC to extract EM Data for all of the fields in the latest version of the agreed upon regional minimum data field standards." It is the camera placement, specifications and footage collection which determine the ability to create the necessary EM data and storing them is covered under (d) Deleted:

[5] For example, such as in the current draft of the Data Collection Committee (DCC) Longline EM Minimum Data Fields Standards (NOV-2020), which may be revised in the future.

Commented [ES17]: AU - As a general comment, we note that hard drives are included under 'control centre' SSPs. We are ok with that approach, but perhaps some clarity could be provided in case questions are asked as to treatment of hard drives (or alternatives).

Commented [ES18]: US - related to a comment above about including other RFMO SSPs - if any are incorporated, consider there could be additional components not listed here that could be useful. (Refer to comment under "Priority SSPs" heading and comment on use of FFA material as a starting point).

Commented [ES19]: AU - This is a vessel operator requirement, not a system requirement (i.e., the vessel operator controls the power source on board the vessel). We suggest it be redrafted.

US - consider if there are any extenuating circumstances where cameras would be shut off? Clarify if this is "underway" AND "during all fishing activity" versus just on while the vessel is underway

ISSF - Cross reference with Table 2 General Requirements for onboard EM Components, 6: System Health Status - a. The system SHOULD execute a system health test on power up and MUST provide a visual signal that the system is operational. Consider how these two work together.

Commented [ES20]: AU

Commented [ES21]: ISSF - for extended trips and where records potentially for compliance purposes

Commented [ES22]: AU - This contradicts h – MUST transmit EM records securely.
If there is an alternative method to transmit data securely that is not encryption, then maybe f and h should be merged somehow or f is deleted in its entirety.

Commented [ES23]: SPC - Should there be another element in this list for when EM records are transmitted wirelessly e.g. the serial or ID number of the transmitting device?

On-board EM System component	SSP	ERandEM IWG Chair comments
	h. ~~MUST [COULD] Allow for the recovery and secure transmission of EM Records at the end of each trip.~~ [MUST allow EM records to be transmitted, stored or accessed surely (see SSPs on EM Records and EM Data Security and Confidentiality). To secure EM records, the system should be equipped with applications such as user logins, EM record encryption and firewalls.] i. ~~COULD~~ [SHOULD] Store all EM Records on storage devices and in formats that are compatible or can be readily translated into formats that are compatible with DRC hardware and EM review software.	"Allow the export of EM Records (and related sensor and annotated data) into the regional standard EM Records transfer format (for subsequent use by EM review software of another EM Service Provider)" This could be considered later.
2. User interface	The onboard user interface: a. MUST Include a display. b. MUST Include software that shows EM system health status (System Health Status) and real time images from installed cameras on the display. c. MUST Allow [only] authorised users (e.g., EM Service Providers, EM service technicians) to adjust system configurations. The onboard user interface: d. COULD Include a keyboard, mouse, touchscreen, or other device to allow user inputs to the system.	
3. Cameras	a. An EM system MUST be outfitted with cameras to capture imagery of fishing activity. b. The number and position of cameras MUST be sufficient to capture necessary imagery to collect [, to the extent practicable,] all data fields [to be] required by the WCPFC[6].	

Commented [ES24]: AU - As an additional query, depending on any revised language for (h), we are not clear what is meant by "recovery" here?

Commented [ES25]: CA - considering the importance for compatibility, we recommend this be changed to 'should'

SPC - This requirement caters for provide A's EM records to be analysed by provider A's review system. It does not allow for true interoperability between vendors and review systems.

Commented [ES26]: ISSF - clarify this is on the vessel

Commented [ES27]: JP - Without "only", it is a matter of course

Commented [ES28]: CA - Does the Commission need to agree on what 'other mechanisms'? Could we get more clarity on the footnote

Commented [ES29]: AU - Camera position and number is an installation requirement.
For the system to support the number of cameras required to collect the data is a hardware requirement.
Suggest adding in 1. Control center: "*MUST be able to support the functionality and capacity of the number of cameras and sensors needed to capture all required WCPFC data fields, including adequate camera and sensor expansion.*"

JP - EM data fields are not yet established, and it is not practicable to collect all data fields.

[6] Unless the CCM has identified other mechanisms for the collection of those data

On-board EM System component	SSP	ERandEM IWG Chair comments
	c. Cameras MUST, capture imagery that meets image quality standards under typical fishing conditions that allow for an EM Analyst to extract all required data fields (subject to any conditions with respect to footnote ~~6~~ [6]). As a minimum standard 1. Frame rate ~~MUST~~ [SHOULD] be no lower than 5fps for any imagery requiring identification of catch or bycatch; and 2. Resolution ~~MUST~~ [SHOULD] be no lower than 720p for any imagery requiring identification of catch or bycatch b. See also (Vessel Monitoring Plan) c. SHOULD Be capable of accommodating remote or onboard configuration of parameters to optimise camera functionality throughout a typical fishing trip; *Other camera configurations (e.g. shutter speed, bitrate etc) may vary in order to balance collection of adequate footage versus storage needs* Recorded imagery: d. ~~SHOULD~~ [MUST] be recorded in a widely used and accessible video or image file format, such as MP4 or JPEG, ~~and~~ [or other] compression standards that are able to be viewed. e. ~~SHOULD~~ [MUST] include a timestamp, GPS location, and ~~FFA Vessel Register ID~~ [WCPFC VID] [vessel identification information] ~~watermark~~ on the video [or image].	
4. Geolocation device	a. A geolocation device[7] MUST ~~be present to~~ record vessel location coordinates and the associated date and time ~~in a format specified by the most recent version of the regional minimum data field standards~~ [in a format capable of integration with EM Records].	For point c. I am assuming that the vessel will already have a requirement to transmit geolocation data so it would not be necessary (i.e. a MUST) for the location data

[7] The EM system may use an existing geolocation device on type-approved hardware on the vessel (e.g., VMS) or have its own geolocation device.

Commented [ES30]: Footnote reference requires updating depending on finally agreed specifications

Commented [ES31]: JP - The EM does not need such high specification. In fact, Other RFMO, such as IOTC, does not require such high specification. Some of the EM devices being developed by Japanese companies does not satisfy these levels yet.

Commented [ES32]: AU

Commented [ES33]: US - WCPFC VIN or WCPFC WIN, IMO number, or registration number instead of FFA Vessel Register ID? Also, It would be good to future proof this in the event the data needs to be shared, such as a redaction process or limiting what is on the video/image file. The data listed in the requirement may be able to be added to an image using metadata, rather than the default being on screen.

KR - time/location information is important for the sake of verification and credibility, no matter whether the data is used for scientific data collection or compliance monitoring purpose. Also, we suggest "WCPFC VID" as we believe there are vessels that are not registered to FFA.

SPC - We suggest as a minimum that 'compression standards' needs to reflect the ISO standard - e.g. https://www.iso.org/standard/35424.html

Commented [ES34]: AU

Commented [ES35]: AU - suggested alternative language

JP - The date and time does not need to be recorded in a specified format, because this type of information can be easily converted to an appropriate format later stage

On-board EM System component	SSP	ERandEM IWG Chair comments
	b. The geolocation ~~receiver~~ [device] MUST be installed and remain in a location in accordance with the manufacturer's guidelines such that the device can reliably function. c. The EM system ~~COULD~~ [SHOULD or MUST] transmit geolocation data and associated date and time, and vessel identification information to DRCs on a regular basis, as defined by the relevant programme requirements, throughout the duration of a fishing trip in a format compatible with DRC software. d. The EM system ~~SHOULD~~ [COULD] [MUST] be able to verify whether transmissions of geolocation data and associated date and time, and vessel identification information to DRCs are successful. e. ~~If the EM system is unable to transmit geolocation data due to a communication error, it~~ ~~MUST~~ [SHOULD] ~~store geolocation data and automatically send it as soon as practically possible after communication is restored.~~ f. The vessel location and timestamp data from the geolocation system ~~MUST~~ [SHOULD] be ~~capable of integration with~~ [incorporated in] the EM ~~video data~~ [images].	from the EM system to be transmitted during a trip.
5. Uninterruptible power supply	~~The EM system MUST [SHOULD] be powered by an uninterruptible power supply capable of controlled shutdown in the event of power loss.~~ [The EM system SHOULD include a UPS in the event that the main source of power is interrupted.]	
6. Sensors	a. EM systems SHOULD [COULD] [MUST] be outfitted with sensors, which may include the use of camera imagery as a synthetic sensor, to capture information about fishing activity. These may include, but are not limited to: i. Pressure sensors ii. Hydraulic or drum rotation sensors iii. Temperature sensors iv. Door open/closed sensors	

Commented [ES36]: JP - "Geolocation receiver" is not defined in this document, but seemingly it constitutes a part of geolocation device. Suggest use "device".

Commented [ES37]: SPC - This para doesn't cater for near real time or real time transmission of EM records. So suggest replacing COULD with SHOULD or MUST

Commented [ES38]: JP - Since item c, transmission of the data, is under COULD provision, its verification should be under COULD, too

ISSF - should be MUST as e. is MUST

Commented [ES39]: JP - Suggest deletion of e., for the same reason provided under d (i.e. Since item c, transmission of the data, is under COULD provision, its verification should be under COULD, too)

US - Suggest SHOULD

Commented [ES40]: AU - Query whether d) and e) are better suited in the Control Centre section.
d) s more of a control box / communication system requirement to allow the user to identify if data upload/transmission was successful or not.
e) is a control box requirement to be able to store the data. It is also a communication system requirement that transmits health statement, geolocation and sensor information.

Commented [ES41]: JP - Some of the currently available devices do not have location and timestamp on the images

Commented [ES42]: AU - We suggest this language as it better relates to the functionality of an UPS (i.e. a backup power supply that is only used during power loss situations)

JP - SHOULD - Some of the currently available devices do not have this function yet

On-board EM System component	SSP	ERandEM IWG Chair comments
	v. Proximity sensors vi. RFID readers b. If t~~T~~he EM system is outfitted with sensors, then it ~~MUST~~ [COULD] be capable of generating and recording a log file of readings from system sensors with all sensor readings linked to/integrated with the vessel identification, location and timestamp data from the geolocation system.	
7. Communication system	a. The EM System ~~MUST~~ [SHOULD] have or integrate with at least one network communication system that enables the reliable and regular transmission (e.g., daily or weekly, hourly) of near-real-time data on system health (including still images for EM system status verification when prescribed by the programme requirements), sensors (if applicable), and geolocation to DRCs during all fishing activity, and supports remote access to the EM system by the EM Service Provider or their designated service technicians. b. The network communication system(s) SHOULD be a widely used and globally recognized technology, such as i. 3G, 4G, or 5G cellular networks. ii. Wi-Fi iii. Satellite communications. c. The EM system ~~MUST~~ [SHOULD] be able to verify whether transmissions of data on system health (including still images), sensors, and geolocation to DRCs are successful. d. ~~In the event that the EM system is unable to transmit data due to a communication error, it must~~ [MUST] ~~store that data and automatically send it as soon as practically possible after communication is restored~~. e. The EM System ~~must~~ [MUST] [SHOULD] have ethernet or any other communication system allowing data transfer and remote access to the system via the onboard ~~Internet~~ connection.	

Commented [ES43]: AU - suggested new language

JP - The use of the sensors in connection with EM system should be optional, because there should be other ways to ensure proper operation of EM system

Commented [ES44]: JP - We suggest SHOULD for this item. We cannot support the real-time transmission of the system health etc. since, as we mentioned earlier, transmission of such information is not necessarily needed. It can be recorded to HD device

US - Suggest "MUST" to "SHOULD" for now. Could be worth further discussion to determine if there would be use in setting a deadline to implement a "MUST".
It is important to specify what is being set (text vs imagery) and how often, as that will dictate requirements of the transmission technology.

Commented [ES45]: JP - We cannot support the real-time transmission of the system health etc. since, as we mentioned earlier, transmission of such information is not necessarily needed. It can be recorded to HD device.

Commented [ES46]: CA - what constitutes a communication error

JP - For the same reason as above.

Commented [ES47]: JP - To have consistency with provisions regarding data transfer and remote access

SPC - suggest removing 'internet'

General Requirements for onboard EM Components	
1. Weather Resistance	~~On-board EM hardware components~~ [EM hardware components that are utilized on deck and are exposed to the elements (e.g., sensors and cameras)] MUST be sufficiently dust and water resistant (e.g., IP66) and durable (e.g., corrosion, impact, and vibration resistant) to operate reliably under the range of conditions expected in their location on longline fishing vessels. IP67 or IP68 SHOULD be used for those locations where significant water contact is expected.
2. Tamper Resistant and Tamper Evident	a. The onboard hardware MUST be robust and tamper evident to mitigate the risk of intentional sabotage or malfunctions. This shall include both physical and software features. b. The EM System ~~MUST~~ [SHOULD] feature a login history tool which allows the tracking of information on when and by whom system configuration settings have been accessed offering insights into possible tampering attempts.
3. Compatibility with Other On Board Equipment	The EM System ~~MUST~~ [SHOULD] be capable of functioning in close physical proximity to other onboard electrical and hydraulic equipment (i.e., EM System operations MUST not be materially impacted by the presence of other onboard electrical equipment and MUST not materially impact the proper functioning of other onboard electrical equipment).
4. Compatibility with DRC Review Software ***NOTE: Requires further discussion on Interoperability*	~~All EM Records (e.g., video files, system log files, sensor log files) generated by the EM system must [MUST] [SHOULD] be compatible with EM analysis software being used by the DRC(s) where EM Records from the EM System will be sent to generate EM Data per the EM programme definitions.~~ [All EM Records generated by the EM system MUST be in a compatible format, or be able to be converted into a compatible format, to allow the ingestion of the EM Records into an analysis software being used by the appointment DRC(s).]
5. Capable of Spatial Calibration	An EM system ~~COULD~~ [SHOULD] have capability for spatial calibration for accurate image and fish length measurements ~~[using EM analysis software as required by the EM programme]~~.

Commented [ES48]: AU

Commented [ES49]: JP - It is important to have tamper evident feature, but it can be implemented through physical or software feature.

Commented [ES50]: JP - Having tamper evident functionality is sufficent

Commented [ES51]: US - Change "MUST" to "SHOULD". This may be near or impossible depending on the vessels' current technology.

Commented [ES52]: JP - We would like to know the meaning of "compatible" here. Does it mean the data should be useable whatever software DRCs use?

AU - suggest alternative wording

Commented [ES53]: AU - suggest deletion

SPC - SHOULD suggested to promote the usage of EM for scientific purposes

6. System Health Status	a. The system SHOULD execute a system health test ~~on power up~~ [either automatically or when initiated by user] and MUST provide a visual signal that the system is operational. b. The EM system MUST [SHOULD] be able to generate a log file including, but not limited to, the following EM processes to capture the operational health status of the system: i. System power up ii. System shutdown planned iii. System shutdown unplanned (e.g., power cut) iv. Camera connectivity v. Camera recording start and stop times (planned) vi. Camera recording error[8] vii. Available hard drive space viii. Sensor connectivity[, if applicable] ix. Sensor recording start and stop times (planned) [, if applicable] x. Sensor recording error [, if applicable] xi. Activation and deactivation of recording triggers (e.g., vessel speed, drum rotation sensors, geofencing~~s~~, and time scheduled) c. System MUST undertake regular system health checks throughout the duration of the fishing trip at a frequency defined by the EM Programme and MUST show ~~health status~~ [malfunction] ALERTS (errors and warnings) on the display of the user interface (Onboard User Interface) of the control centre. d. The EM system COULD be able to capture and store single frame images from each onboard camera on a regular basis (e.g., timed intervals, such as hourly, or on event triggers such as geofences) to show that cameras are operational, not obstructed, obscured, or displaced.

Commented [ES54]: AU - Suggested edit noting that there are different tests that can be carried out (e.g., testing camera views, gear sensor inputs that require activation etc).

JP - We would like to know what "visual signal" means

ISSF - Cross reference with Table 1 On-board EM System component, 1: Control Centre - b. MUST be powered on and remain on while the vessel is underway and during all fishing activity including during any at sea vessel rendezvous activity. Consider how these two work together.

Commented [ES55]: JP

Commented [ES56]: JP - Considering that use of Sensor is optional

Commented [ES57]: JP - Since it is an alert, it should be linked with malfunction (not a general health status)

[8] The appropriate time interval may require regular review and updating.

Installation, Operation, and Service of onboard EM Systems		ERandEM IWG Chair comments
Requirement	SSP	
1. *EM system installation*	The EM Service Provider or their designated installer: a. SHOULD [MUST] coordinate installation with the vessel owner or their designated representative. b. ~~MUST~~ [SHOULD] install an onboard EM system that meets the performance standards described in onboard EM System Component and General Requirements. c. ~~MUST~~ [SHOULD] ensure the onboard EM system meets the performance standards described in onboard EM System Component and General Requirements through system tests. d. ~~MUST~~ [SHOULD] provide the necessary information for the vessel owner/operator or their designated representative to complete a Vessel Monitoring Plan (Vessel Monitoring Plans) or complete the Vessel Monitoring Plan on behalf of the owner/operator. e. ~~MUST~~ [SHOULD] brief the vessel operator and crew member(s) and provide documentation on EM system operation, maintenance, and procedures to follow during regular operation and in the event of a system malfunction (Vessel Monitoring Plans). f. ~~MUST~~ [SHOULD] submit notification to the relevant EM Programme of system installation in the agreed form that attests to the system functionality and its conformance with the performance standards described in onboard EM System Component and General Requirements. (See SSPs on EM Records and EM Data Security and Confidentiality)[9] The vessel owner or their designated representative:	General comment on Installation, Operation, and Service of onboard EM Systems

Commented [ES58]: US - Change from "SHOULD" to "MUST" due to practical requirements of coordination to install on vessels.

Commented [ES60]: TW - the installation and maintenance of EM can be regulated by contracts between CCMs and their service providers, so the SSP only needs to handle simple provisions, while the operation can be further discussed by CCMs.

Commented [ES59]: AU - Does this refer to performance standards, technical standards or both.

JP - It is not implementable to require EM service provider or their designated installer to mandatory obligation. Japan suggests deleting a-f above, or at least, change "must" to "should"

[9] Note: A standardised regional form could be useful for this purpose

Installation, Operation, and Service of onboard EM Systems		ERandEM IWG Chair comments
Requirement	SSP	
	a. MUST provide information[10] describing the vessel configuration and systems to facilitate EM system installation. b. MUST make the vessel and appropriate personnel (such as engineers, fishing master, multilingual staff, etc.) available and provide the EM Service Provider unfettered access, including to the ship's power supply, to complete EM system installation.	
2. Vessel Monitoring Plan	a. Vessel owner or EM Service Provider MUST complete a Vessel Monitoring Plan, and submit it to the EM Programme for approval ~~[after installation of an EM hardware system on a longline vessel and prior to departure from port]~~. (See section EI4 of SSPs 3&4)[11] b. Vessel Monitoring Plans MUST be updated and submitted to the EM Programme at a frequency determined by the EM Programme and anytime changes are made to information or requirements outlined in the VMP (e.g., new vessel contact information, change in EM System configuration, change in catch handling guidelines). c. The Vessel Monitoring Plan [MUST include the following elements]: i. ~~MUST include~~ contact information for the EM Service Provider~~,~~ [and] vessel owner(s)~~, and vessel operator(s), and base manager(s) (if applicable)~~. This should include information for a primary contact that can be used to communicate with the vessel while at sea~~, if available~~. ii. General vessel information as specified in the vessel identification section of the latest version of the regional minimum data field standards.	

Commented [ES61]: US - Suggest adding that the vessel should keep a copy (paper or electronic) on board as well.

Commented [ES62]: JP - We would like to have some flexibility on the timing of approval, because in some cases the EM hardware becomes available and is installed just before the departure

Commented [ES63]: US - with consequential suggested deletions for parts of c.

AU - suggested deletions in i.

Commented [ES64]: US - Suggest remove "if available" since it is already labelled as a MUST

[10] Note: A standardised regional form could be useful for this purpose

[11] Note: A standardised regional form could be useful for this purpose

Installation, Operation, and Service of onboard EM Systems		ERandEM IWG Chair comments
Requirement	SSP	
	iii. ~~MUST include~~ a diagram, description, and photo(s) of the vessel layout that identifies where key fishing activities will occur on the vessel (e.g., hauling, sorting, discarding) and ~~COULD~~ [SHOULD] include measurements of all items, tools, or areas on the vessel that EM Analysts may use to estimate lengths of catch which require length measurement in the latest version of the regional minimum data field standards. iv. A description of the EM setup: ● ~~MUST include~~ the number and location of cameras including images of their installation location and an image from each camera's perspective, and ~~COULD~~ include at-night images to demonstrate sufficient lighting. ● ~~MUST include~~ a description and image of the location of all other components of the installed EM system (e.g., geolocations system, EM control system, sensors, power supply). ● ~~MUST include,~~ ~~[as appropriate,]~~ a list of system configuration settings, including [but not limited to]: ○ Camera configuration settings (e.g., frame rates, resolution, bitrate) ○ Sensor units and threshold values[, if applicable] ○ Data recording frequencies and/or sensor triggers for recording ○ Software and Firmware versions ○ Spatial calibration settings[, if applicable] v. ~~MUST include any required~~ catch handling procedures to ensure that EM Records collected allow for an EM Analyst to generate EM Data for all the required fields of the latest version of the regional longline EM minimum data field standards (e.g., handling in view of cameras, allowable discard locations).	

Commented [ES65]: US - Suggest removal of word "COULD" as this is already a "MUST" statement. If night fishing is occurring, there must be enough light.

SPC - suggest MUST since most LL hauling activities occur at night

Commented [ES66]: CA

Commented [ES67]: JP - "if applicable" added considering that the use of sensors is optional

US - Further discussion on these metrics should occur either at the WG or in the next draft document.

Commented [ES68]: JP - Considering that such setting is necessary only if the EM is supposed to measure the length of fish

Installation, Operation, and Service of onboard EM Systems		ERandEM IWG Chair comments
Requirement	SSP	
	vi. ~~MUST include~~ vessel duty of care responsibilities to prevent system malfunctions, such as: ● Verifying system functionality at the beginning and throughout the duration of each trip ● [~~Required frequency for checking camera lenses and cleaning obligations~~] vii. ~~MUST include~~ vessel responsibilities in the event of system malfunctions that describe the steps that must be taken.	
3. Field and Technical Support Services	The EM Service Provider, in a timely manner, ~~must~~ [MUST] [SHOULD]: a. Communicate with vessel operators and the relevant EM Programme to coordinate service needs, resolve specific programme issues, and provide feedback on programme services. b. Provide maintenance and support services, including software and firmware updates, such that all installed EM systems perform according to the performance specifications described in onboard EM System Component and General Requirements and that field services are scheduled and completed with minimal delays to minimise disruption to fishing operations. c. Provide technical assistance to vessels upon request on EM system operations, diagnosing causes of system malfunctions, and providing assistance for resolving malfunctions. This assistance ~~must~~ [should] be available 24 hours a day, seven days a week, year-round. This service must be provided in English or another language spoken by the vessel point of contact as defined in the programme specifications. d. Submit to the relevant EM Programme, and the EM Certifier, where appropriate, reports of all requests for technical assistance from vessels and service calls that include: i. The name and designation of the vessel point of contact ii. The date(s) and time a request for service was made.	Whilst very important not sure if WCPFC should prescribe how a CCM manages their EM Service Provider

Commented [ES69]: JP - It is too much to establish the required frequency. Proper frequency depends on weather condition. Having cleaning obligation is sufficient

Commented [ES70]: JP - 'should' be available 24 hours - It is not implementable to require EM service provider mandatory obligations. Japan suggests deleting a-d above, or at least, change "must" to "should"

US - Needs further internal and WG discussion on how to incorporate and implement.

Installation, Operation, and Service of onboard EM Systems		ERandEM IWG Chair comments
Requirement	SSP	
	iii. The date(s) and time(s) when the EM Service Provider called or visited the vessel to provide technical assistance. iv. A description of the issue. v. A description of how the issue was resolved, including actions completed during all service calls or visits in response to the request for service. vi. The date and time the issue was resolved. The vessel owner/operator: a. MUST follow duty of care responsibilities described in the Vessel Monitoring Plan. b. MUST report EM system malfunctions to the ~~EM service provider~~ [flag state] as soon as is practicable, including the date, time, and, if possible, the geolocation when the malfunction was first detected. c. MUST follow vessel responsibilities outlined in the Vessel Monitoring Plan in the event of system malfunctions. The EM Programme: a. MUST define vessel responsibilities in the event of system malfunctions that describe the steps that must be taken under different failure scenarios. b. ~~MUST~~ [SHOULD] respond to EM Service Providers or vessel owners/operators in a timely manner.	

Commented [ES71]: JP

SSP: Data Review Centres

A data review centre (DRC) is an entity with access to supporting software platform(s) used to analyse EM Records and generate EM Data. DRCs may serve individual CCMs, subregional groupings, or the entire WCPFC membership. They may also be administered by individual CCMs members, a sub-regional or regional body, or a third-party (commercial) provider. This SSP is not specific to any DRC structure and covers the required infrastructure (hardware and software) to analyse EM Records

A DRC ~~must~~ [MUST] include the following components:

1. EM analysis software (which could be cloud-based [or hardware])
2. EM analysis workstation(s)
3. ~~Qualified~~ EM Analysts

The EM programme ~~must~~ [MUST] [should] have:

4. A system to monitor EM system health on vessels, which may be part of or separate from the DRC

DRC Component	SSP	ERandEM IWG Chair comments
1. EM Analysis Software ***NOTE: This section requires further discussion on Interoperability.*	The DRC must use EM analysis software to facilitate the generation of EM Data from EM Records. The EM analysis software: a. MUST be compatible with the file types, data structures, syntax, and semantics of EM Records that will be analysed with the software. b. SHOULD be the latest version of analysis software, including security patches c. ~~SHOULD~~ [MUST] be able to display EM analysed output: i. Display the vessel track on a map based on geolocation data integrated in the EM Records, with an option to display the geolocation data of each vessel. ii. Display synchronised imagery from all cameras simultaneously with zoom capability and other relevant imagery features.	

Commented [ES72]: CA

Commented [ES73]: TW - the standard of DRC should focus on whether data can be produced, rather than the means of production

Commented [ES74]: US - More internal discussion needed on specifics for components.

Commented [ES75]: SPC - suggest MUST. Without the key features, it's not likely to be a good review system

DRC Component	SSP	ERandEM IWG Chair comments
	iii. Display a visual timeline with sensor readings or status[, if applicable]. iv. Display synchronised sensor data (including vessel heading and speed) and video imagery simultaneously[, if applicable]. d. ~~COULD~~ [SHOULD] be able to spatially calibrate an image and measure the length of species brought onboard as required by the EM Programme (e.g. through a digital measuring tool which must be available in the EM analysis software). e. ~~MUST~~ [SHOULD] allow [the] EM Analyst [to create annotations to mark events where fishing activity occurred within the EM records]. f. ~~COULD~~ [SHOULD] be able to bookmark specific video segments or events that can be used to navigate quickly to those points in the video and data feed. g. SHOULD be able to extract and save segments of video and sensor data, including extraction and saving of still images and the ability to automatically extract short duration video clips of catch. h. ~~EM data SHOULD~~ [MUST] be [able to extract EM Data] in[to] a form[at] compatible with relevant databases used in regional fisheries management organisations to store information on longline tuna fishing activity. i. COULD be able to import EM records (and related sensor and annotated data) from systems of other EM Service Providers that have been exported into the regional standard EM Records transfer format. j. [SHOULD have the ability to change the playback speed of the footage (e.g., 0.5x, 1x, 2x, 6x, 8x, 10x).]	
2. EM Analysis Workstations	The DRC ~~must~~ [MUST] have EM analysis workstation(s) where EM Analysts will use EM analysis software to generate EM Data from EM Records. The EM analysis workstation:	

Commented [ES73]: TW - the standard of DRC should focus on whether data can be produced, rather than the means of production

Commented [ES76]: JP - Considering that the use of sensor is optional

Commented [ES77]: SPC - Suggest SHOULD to promote the use of EM for measuring specimens

Commented [ES78]: AU - additions proposed

JP - Would be useful functionality, but could be recorded in a different way

Commented [ES79]: AU - Are the bookmarks different to the annotations? If not, then we suggest that the above item is sufficient to cover this one as well and can be removed.

Commented [ES80]: AU - suggested edits

SPC - suggest MUST to foster a regional standard. reference to agreed upon regional minimum data standards.

Commented [ES81]: SPC - COULD here does not promote true interoperability

Commented [ES82]: AU

DRC Component	SSP	ERandEM IWG Chair comments
	a. MUST have hardware and software, or cloud-based platforms that enable effective EM analysis b. ~~SHOULD~~ [MUST] have reliable data transmission capabilities sufficient for efficient streaming or download/upload of data required for EM Records analysis, reporting of EM Data, and storage of EM Records. c. SHOULD have proper ergonomics that support analyst well-being, quality, and efficiency.	
3. ~~Qualified~~ EM Analysts	The use of EM software to generate EM Data from EM Records ~~must~~ [MUST] be conducted by ~~qualified~~ EM Analysts. The ~~qualified~~ EM Analysts ~~must~~: a. ~~SHOULD~~ [SHOULD] complete an ~~FFA-recognized~~ EM Analyst qualification and training programme [from the relevant programme provider]. b. ~~MUST~~ [MUST] meet a minimum standard on an examination(s) to demonstrate necessary knowledge and skills to complete EM Analysis (e.g., species ID, EM review processes, etc.). c. Have an absence of fisheries-related convictions. d. Be independent from fishing-related parties including, but not limited to, vessels [owners and operators], dealers, processors, canners, traders, shipping companies, fishers, ~~fisheries managers~~, or advocacy groups, ~~or research institutions~~ to prevent conflicts of interest, whether it be a direct or indirect interest that could ~~substantially~~ affect the performance or non-performance of the official duties of the EM Analyst. Any potential conflicts of interest must be declared to their employer and EM Certifier.	On point c. If this is MUST then it would be incorporated into the 'assurance' process On point d. If this is MUST then it would be incorporated into the 'assurance' process

Commented [ES73]: TW - the standard of DRC should focus on whether data can be produced, rather than the means of production

Commented [ES83]: ISSF - very specific. Reason to include noting all countries should have Work Health and Safety legislation that covers off things like this.

Commented [ES84]: AU

Commented [ES85]: JP - delete a. as this is not FFA SSPs

ISSF - WCPFC recognized

Commented [ES86]: US - Unclear if this is considered a "MUST'. Need further discussion on this, if a "MUST" then may need to consider changing this to a "SHOULD" or "COULD".

SPC - could refer to Observer ROP standard in c. and d.

Commented [ES87]: JP - Suggest deleting fisheries managers and research institution, because at some stage, we need to involve fisheries managers and/or scientists of flag states

US - Suggest changes including deletions based on the practicality of this aspect.

DRC Component	SSP	ERandEM IWG Chair comments
4. A system to monitor EM System health on vessels	a. The EM Programme ~~MUST~~ [SHOULD] have a health monitoring system to receive and display near real-time information of onboard EM System health status (System Health Status), this ~~COULD~~ [SHOULD] include still images to verify functionality of onboard cameras (System Health Status) and geolocation data (Geolocation device). This system may be part of the DRC. b. The on-shore health monitoring system MUST receive any alerts (errors and warnings) that have been generated from the onboard health monitoring system. c. The health monitoring system ~~COULD~~ [SHOULD] be able to display the latest geolocation of all covered EM Systems on a map.	

Commented [ES73]: TW - the standard of DRC should focus on whether data can be produced, rather than the means of production

Commented [ES88]: health status does not need to be transmitted to the on-shore system

APPENDIX 2

Potential elements for an assurance process for a WCPFC-approved EM program

GENERAL COMMENTS – ASSURANCE PROCESS	
AU	We suggest that the CMM places obligation on CPC to align the with standards and provide vessel monitoring plans and a national report; and that the At some point, WCPFC may also want to consider accrediting a WCPFC EM auditor who travels to different DRC's and conducts secondary reviews on EM records to see if they match up with the EM data that the reviewers are collecting. This will require establishing an EM record holding period (e.g., 6 months).
JP	Keep minimum standards simple ones. Support the idea to start with notification (or reporting) process to be followed by discussion at the TCC. It is premature to establish an approval and/or audit process.
TW	At this stage, we believe that CCMs should notify the Secretariat, rather than seek approval, in line with the non-mandatory nature of the footnote adopted in CMM2023-01. Before the Commission approves EM standards and Objectives, it is premature and challenging to comment on audit procedures. We suggest waiting until EM standards are approved and CCMs operate under these standards for some time. This will provide CCMs and the Commission with more information to further develop audit standards and methods
US	In general, this is a very important topic and would like further discussion on this process.
PEW	On verification of domestic or subregional EM programs, we suggest that the group consider following the model laid out for the Commission's ROP authorization and auditing process. It is our view that an EM program must be authorized before a member's EM observer coverage can be counted towards meeting observer coverage requirements or other quota related requirements.

What is needed to apply or notify the Commission / Secretariat?

- Is it simply a notification process or is there an approval given
  - Attestation against the MUST SSPs?
  - How monitoring / data requirements will be met
    - Observers
    - Video annotations
    - Verified fisher reporting
    - Port / processing facility sampling
    - Port inspections
    - At-sea inspections
  - Manuals for processes
    - Footage review
    - Equipment malfunctions
- Vessel Monitoring Plans
- Review rates

Assurance – how will the Commission know that you are meeting the requirements?

Commented [ES89]: US - Suggest we have something akin to the authorization process that the WCPFC ROP program has. According to https://cmm.wcpfc.int/supplementary-info/supplcmm-2018-05-1, there is an interim authorization until an audit can happen and that is when full authorization may occur after.

Commented [ES90]: US - How would this be verified? Need more discussion on this point.

Commented [ES91]: SPC - best chance of inspecting equipment on vessels

Commented [ES92]: SPC - would be interested in leading this work

Commented [ES93]: SPC - Reference SC18 paper: Designing EM Reviewing Rates for WCPFC Fisheries - https://meetings.wcpfc.int/node/16237

Commented [ES94]: US - Need more internal and WG discussion on this process.

- Independent audit?
  - By whom
  - Frequency
  - Who pays?
  - Scope
- VMP are accessible for any High-Seas boarding and inspections
- Submission of data

What reporting is required back to the Commission?

- Modifications to the Part 1 and Part 2 reports

Commented [ES95]: SPC - similar to ROP

Commented [ES96]: SPC - every two years?

Commented [ES97]: SPC - Auditing of whom? All domestic vessels with EM in the, or the entire fleet with EM. Auditing the EM service provider?