

**TO ALL ERandEM IWG Participants**

 **Date: 4 March 2024**

 **No. pages: 29**

**Progressing Interim Electronic Monitoring Standards**

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](https://meetings.wcpfc.int/node/21015)). 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](https://meetings.wcpfc.int/node/21655)):

1. *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****).*
2. *The Commission tasked the ER&EM WG to develop a set of interim EM standards for adoption at WCPFC21 in 2024.*
3. *The Commission noted the need for cooperation with IATTC in the development of EM procedures for WCPFC.*

Attachment 5 to the draft WCPFC20 Summary Report

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Further, in adopting an updated [Tropical Tuna CMM](https://cmm.wcpfc.int/measure/cmm-2023-01) ([CMM 2023-01](https://cmm.wcpfc.int/measure/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.



**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](https://meetings.wcpfc.int/node/17866)).

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.

**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

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APPENDIX 1

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# Proposed Interim Standards, Specifications, and Procedures (SSPs)

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

[SSP1a:](#_heading=h.1fob9te) On-board EM systems

[SSP1b](#_heading=h.1pxezwc): EM hardware and software in Data Review Centres (DRCs)

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Proposed Interim SSPs - draft for comment by ERandEM IWG participants

# Terms and Definitions[[1]](#footnote-2)

*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.*

**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.

Proposed Interim SSPs - draft for comment by ERandEM IWG participants

**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.

**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 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 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) 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.

**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.

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**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 -** (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]](#footnote-3)

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| 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? |

**Fishing Trip** - The collection of 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]](#footnote-4)

**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]](#footnote-5)

**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.

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

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**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 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.

## 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]](#footnote-6). 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.

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| On-board EM System component | SSP | ERandEM IWG Chair comments |
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| 1. Control centre | The EM system control centre:1. MUST Control all onboard EM hardware components.
2. 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.
3. MUST Store and transmit system health status information (See [System Health Status](#_heading=h.4i7ojhp)).
4. MUST Have sufficient storage capacity for all EM Records generated during a fishing trip until EM Records are transmitted to a DRC for review.
5. SHOULD Have sufficient backup storage to prevent data loss.
6. SHOULD Have the ability to encrypt stored EM Records. (See SSPs on ​​EM Records and EM Data Security and Confidentiality)
7. SHOULD Have unambiguous and unique identification of storage devices (e.g., barcode on hard drives).
8. MUST Allow for the recovery and secure transmission of EM Records at the end of each trip.
9. COULD 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.

Proposed Interim SSPs - draft for comment by ERandEM IWG participants | 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:"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:1. MUST Include a display.
2. MUST Include software that shows EM system health status ([System Health Status](#_heading=h.4i7ojhp)) and real time images from installed cameras on the display.
3. MUST Allow authorised users (e.g., EM Service Providers, EM service technicians) to adjust system configurations.

The onboard user interface:1. COULD Include a keyboard, mouse, touchscreen, or other device to allow user inputs to the system.
 |  |
| 3. Cameras | 1. An EM system MUST be outfitted with cameras to capture imagery of fishing activity.
2. The number and position of cameras MUST be sufficient to capture necessary imagery to collect all data fields required by the WCPFC [[6]](#footnote-7).
3. 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 7). As a minimum standard
	* 1. Frame rate MUST be no lower than 5fps for any imagery requiring identification of catch or bycatch; and
		2. Resolution MUST be no lower than 720p for any imagery requiring identification of catch or bycatch
4. See also ([Vessel Monitoring Plan](#_heading=h.qsh70q))
5. SHOULD Be capable of accommodating remote or onboard configuration of parameters to optimise camera functionality throughout a typical fishing trip;

Proposed Interim SSPs - draft for comment by ERandEM IWG participants*Other camera configurations (e.g. shutter speed, bitrate etc) may vary in order to balance collection of adequate footage versus storage needs* Recorded imagery:1. SHOULD be recorded in a widely used and accessible video or image file format, such as MP4 or JPEG, and compression standards that are able to be viewed.
2. SHOULD include a timestamp, GPS location, and FFA Vessel Register ID watermark on the video.
 |  |
| 4. Geolocation device | 1. A geolocation device[[7]](#footnote-8) 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.
2. The geolocation receiver MUST be installed and remain in a location in accordance with the manufacturer’s guidelines such that the device can reliably function.
3. The EM system COULD 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.
4. The EM system SHOULD be able to verify whether transmissions of geolocation data and associated date and time, and vessel identification information to DRCs are successful.
5. If the EM system is unable to transmit geolocation data due to a communication error, it MUST store geolocation data and automatically send it as soon as practically possible after communication is restored.
6. The vessel location and timestamp data from the geolocation system MUST be capable of integration with the EM video data.

Proposed Interim SSPs - draft for comment by ERandEM IWG participants | 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 from the EM system to be transmitted during a trip. |
| 5. Uninterruptible power supply | 1. The EM system MUST be powered by an uninterruptible power supply capable of controlled shutdown in the event of power loss.
 |  |
| 6. Sensors | 1. EM systems SHOULD 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:
	1. Pressure sensors
	2. Hydraulic or drum rotation sensors
	3. Temperature sensors
	4. Door open/closed sensors
	5. Proximity sensors
	6. RFID readers
2. The EM system MUST 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 | 1. The EM System MUST 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.
2. The network communication system(s) SHOULD be a widely used and globally recognized technology, such as
	1. 3G, 4G, or 5G cellular networks.
	2. Wi-Fi

Proposed Interim SSPs - draft for comment by ERandEM IWG participants* 1. Satellite communications.
1. The EM system MUST be able to verify whether transmissions of data on system health (including still images), sensors, and geolocation to DRCs are successful.
2. In the event that the EM system is unable to transmit data due to a communication error, it must store that data and automatically send it as soon as practically possible after communication is restored.
3. The EM System must have ethernet or any other communication system allowing data transfer and remote access to the system via the onboard Internet connection.

Proposed Interim SSPs - draft for comment by ERandEM IWG participants |  |

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| General Requirements for onboard EM Components |
| Weather Resistance | On-board EM hardware components 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 | 1. 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.
2. The EM System MUST 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 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 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.Proposed Interim SSPs - draft for comment by ERandEM IWG participants |
| 5. Capable of Spatial Calibration | An EM system COULD have capability for spatial calibration for accurate image and fish length measurements using EM analysis software as required by the EM programme. |
| 6. System Health Status | 1. The system SHOULD execute a system health test on power up and MUST provide a visual signal that the system is operational.
2. The EM system MUST 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:
3. System power up
4. System shutdown planned
5. System shutdown unplanned (e.g., power cut)
6. Camera connectivity
7. Camera recording start and stop times (planned)
8. Camera recording error[[8]](#footnote-9)
9. Available hard drive space
10. Sensor connectivity
11. Sensor recording start and stop times (planned)
12. Sensor recording error
13. Activation and deactivation of recording triggers (e.g., vessel speed, drum rotation sensors, geofencings, and time scheduled)
14. 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 ALERTS (errors and warnings) on the display of the user interface (Onboard User Interface) of the control centre.
15. 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.
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Proposed Interim SSPs - draft for comment by ERandEM IWG participants

| Installation, Operation, and Service of onboard EM Systems | ERandEM IWG Chair comments |
| --- | --- |
| Requirement | SSPProposed Interim SSPs - draft for comment by ERandEM IWG participants |  |
| EM system installation  | The EM Service Provider or their designated installer:1. SHOULD coordinate installation with the vessel owner or their designated representative.
2. MUST install an onboard EM system that meets the performance standards described in [onboard EM System Component](#_heading=h.1fob9te) and [General Requirements](#_heading=h.35nkun2).
3. MUST ensure the onboard EM system meets the performance standards described in [onboard EM System Component](#_heading=h.1fob9te) and [General Requirements](#_heading=h.35nkun2) through system tests.
4. MUST provide the necessary information for the vessel owner/operator or their designated representative to complete a Vessel Monitoring Plan ([Vessel Monitoring Plans](#_heading=h.qsh70q)) or complete the Vessel Monitoring Plan on behalf of the owner/operator.
5. MUST 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)](#_heading=h.qsh70q).
6. MUST 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](#_heading=h.1fob9te) and [General Requirements](#_heading=h.35nkun2). (See SSPs on ​​EM Records and EM Data Security and Confidentiality)[[9]](#footnote-10)

The vessel owner or their designated representative:1. MUST provide information[[10]](#footnote-11) describing the vessel configuration and systems to facilitate EM system installation.
2. 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 | 1. 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]](#footnote-12)
2. 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).
3. The Vessel Monitoring Plan :
	1. MUST include contact information for the EM Service Provider, 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.
	2. General vessel information as specified in the vessel identification section of the latest version of the regional minimum data field standards.
	3. 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 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.
	4. 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:
			+ Camera configuration settings (e.g., frame rates, resolution, bitrate)
			+ Sensor units and threshold values
			+ Data recording frequencies and/or sensor triggers for recording
			+ Software and Firmware versions
			+ Spatial calibration settings
	5. 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).
	6. 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
	7. 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:1. Communicate with vessel operators and the relevant EM Programme to coordinate service needs, resolve specific programme issues, and provide feedback on programme services.
2. 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](#_heading=h.1fob9te) and [General Requirements](#_heading=h.35nkun2) and that field services are scheduled and completed with minimal delays to minimise disruption to fishing operations.
3. 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 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.
4. 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:
5. The name and designation of the vessel point of contact
6. The date(s) and time a request for service was made.
7. The date(s) and time(s) when the EM Service Provider called or visited the vessel to provide technical assistance.
8. A description of the issue.
9. A description of how the issue was resolved, including actions completed during all service calls or visits in response to the request for service.
10. The date and time the issue was resolved.

The vessel owner/operator:1. MUST follow duty of care responsibilities described in the [Vessel Monitoring Plan](#_heading=h.qsh70q).
2. MUST report EM system malfunctions to the EM service provider as soon as is practicable, including the date, time, and, if possible, the geolocation when the malfunction was first detected.
3. MUST follow vessel responsibilities outlined in the [Vessel Monitoring Plan](#_heading=h.qsh70q) in the event of system malfunctions.

The EM Programme:1. MUST define vessel responsibilities in the event of system malfunctions that describe the steps that must be taken under different failure scenarios.
2. MUST respond to EM Service Providers or vessel owners/operators in a timely manner.
 | Whilst very important not sure if WCPFC should prescribe how a CCM manages their EM Service Provider |

##

## 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 include the following components:

1. EM analysis software (which could be cloud-based)
2. EM analysis workstation(s)
3. Qualified EM Analysts

The EM programme must have:

1. 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:1. MUST be compatible with the file types, data structures, syntax, and semantics of EM Records that will be analysed with the software.
2. SHOULD be the latest version of analysis software, including security patches
3. SHOULD be able to display EM analysed output:
	1. 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.
	2. Display synchronised imagery from all cameras simultaneously with zoom capability and other relevant imagery features.
	3. Display a visual timeline with sensor readings or status.
	4. Display synchronised sensor data (including vessel heading and speed) and video imagery simultaneously.
4. COULD 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).
5. MUST allow EM Analyst notations.
6. COULD 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.
7. 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.
8. EM data SHOULD be in a form compatible with relevant databases used in regional fisheries management organisations to store information on longline tuna fishing activity.
9. 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.
 |  |
| 2. EM Analysis Workstations | The DRC 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:1. MUST have hardware and software, or cloud-based platforms that enable effective EM analysis
2. SHOULD 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.
3. 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 be conducted by qualified EM Analysts. The qualified EM Analysts must:1. SHOULD complete an FFA-recognized EM Analyst qualification and training programme.
2. 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.).
3. Have an absence of fisheries-related convictions.
4. Be independent from fishing-related parties including, but not limited to, vessels, dealers, processors, canners, traders, shipping companies, fishers, fisheries managers, 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' processOn point d. If this is MUST then it would be incorporated into the 'assurance' process |
| 4. A system to monitor EM System health on vessels | 1. The EM Programme MUST have a health monitoring system to receive and display near real-time information of onboard EM System health status ([System Health Status](#_heading=h.4i7ojhp)), this COULD include still images to verify functionality of onboard cameras ([System Health Status](#_heading=h.4i7ojhp)) and geolocation data ([Geolocation device](#_heading=h.4d34og8)). This system may be part of the DRC.
2. The on-shore health monitoring system MUST receive any alerts (errors and warnings) that have been generated from the onboard health monitoring system.
3. The health monitoring system COULD be able to display the latest geolocation of all covered EM Systems on a map.
 |  |

##

APPENDIX 2

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

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?

* 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
1. For consistency, when available, relevant terms and definitions have been sourced from FFA, 2020. “Regional Longline Fisheries Electronic Monitoring Policy.” [↑](#footnote-ref-2)
2. Forum Fisheries Agency, 2019. “THE HARMONISED MINIMUM TERMS AND CONDITIONS FOR ACCESS BY FISHING VESSELS:As amended by FFC110 (May 2019).” [↑](#footnote-ref-3)
3. See FAO for a complete [definition of IUU](https://www.fao.org/3/a0126e/a0126e04.htm). [↑](#footnote-ref-4)
4. Clarke, Roger, 2009. “Privacy impact assessment: Its origins and development.” [↑](#footnote-ref-5)
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. [↑](#footnote-ref-6)
6. Unless the CCM has identified other mechanisms for the collection of those data [↑](#footnote-ref-7)
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. [↑](#footnote-ref-8)
8. The appropriate time interval may require regular review and updating. [↑](#footnote-ref-9)
9. Note: A standardised regional form could be useful for this purpose [↑](#footnote-ref-10)
10. Note: A standardised regional form could be useful for this purpose [↑](#footnote-ref-11)
11. Note: A standardised regional form could be useful for this purpose [↑](#footnote-ref-12)