FIFTH E-REPORTING AND E-MONITORING WORKING GROUP MEETING (ERandEMWG5)

Electronic Meeting

19 – 20 July 2022 from 10.00am to 2.00pm Pohnpei time

E-MONITORING IMPLEMENTATION: NATIONAL EXPERIENCE

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Paper submitted by the Federated States of Micronesia & Australia

E-monitoring Implementation: National Experience

The Federated States of Micronesia & Australia

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1. Introduction

The Federated States of Micronesia (FSM) and Australia have developed Electronic Monitoring (EM) programs for their national tuna fisheries.

The FSM seeks to promote the integration of EM as a monitoring tool in longline fisheries across the Pacific through championing the "T3 Challenge[1]", which aims to improve transparency in tuna fisheries management in the FSM through the use of technological tools. Australia has implemented EM within a range of its national fisheries since 2015, including in its Eastern Tuna and Billfish Fishery that are authorised to operate in the WCPFC Area of Competence.

This paper outlines key elements of the FSM and Australian EM programs, including how each national program aligns with, and can support the development and implementation of the *FFA Electronic Monitoring Longline Policy (2021)* (FFA EM Policy).

Key points for consideration

a) Note the national approaches taken by FSM and Australia regarding their national EM programs.
b) Consider how the approaches in the national programs could support addressing the program challenges in developing national and/or regional EM programs.
c) Provide feedback on additional program design approaches or challenges that could be canvassed in any future information sharing paper or discussion.
d) Invite any partners to contribute their experiences on the program design elements outlined in this paper.

2. Objective of Electronic Monitoring

The FSM and Australia have both clearly defined the objective for their respective national EM programs. These objectives were developed based on critical review of national priorities and of the data collection and verification needs of each country's relevant fisheries. Each national objective is consistent with the FFA LL EM Policy objective.

a. FSM EM Program Objectives

The objectives of the FSM EM Program are to ensure transparency in fisheries monitoring and activities in the FSM EEZ, to fill existing data gaps in the longline fishery and to complement and supplement, but not replace, existing data collection tools. The objectives are:

[1] Technology for Tuna Transparency (T3) Challenge, issued in 2017.

- Compliance - To collect fishery information to independently monitor and ensure compliance with FSM laws by longline vessels operating in FSM waters and by FSM flagged longline vessels wherever they operate.
- Science – To collect fishery information to support science assessment, particularly for species of special interest.
- Sustainability – To collect fishery information to support FSM's goals of being a responsible steward in resource management.

b. Australian EM Program Objective

The objective of Australia's EM program is to provide both an efficient and cost-effective data collection and a monitoring tool for fisheries management, which will assist AFMA in meeting its legislative objectives[2]. Australia's program focuses on verifying operational logbook data and interactions with protected species.

c. Analysis and consideration of FFA EM Objective

The objectives for the EM Programs of the FSM and Australia are largely aligned although expressed differently. There are some notable differences in priorities as a reflection of the current management and nature of the fisheries to which EM is applied. To support the common principle of sustainability for their respective fisheries, both EM programs seek to independently verify data that is currently collected with other monitoring tools, e.g., logbook data. They do not seek to replace existing monitoring tools, but rather to integrate EM into the established fisheries' monitoring platforms. In the case of FSM, the EM program seeks to address known gaps in data collection in the longline fishery by supplementing or complementing operations such as observer placement. The FSM prioritises monitoring to ensure compliance with FSM laws by longline vessels fishing in FSM waters as well as FSM-flagged LL vessels wherever they operate.

Australia's EM program objective directly supports AFMA's ability to meet broader legislation, which cover areas relating to efficiency, cost effectiveness and sustainable management of marine resources. It confirms that EM is both a data collection and monitoring tool, and intentionally allows Australia's fisheries management needs to specify the use and application of the EM program within a particular fishery.

The FFA Regional LL EM Policy has the following broad objective:

> *With an overarching objective to strengthen fisheries management, the Regional Longline Fisheries EM Policy aims to:*
> - *improve the availability and accessibility of quality-assured information for scientific and compliance purposes; and*
> - *contribute to improving economic viability of longline fisheries.*

FSM's national EM objective reflects the importance of compliance by FSM-flagged longline vessels operating throughout the western and central Pacific Ocean (WCPO). It also captures the importance of compliance with FSM national laws by all vessels operating in the FSM EEZ. EM represents a useful tool that, when integrated with other monitoring tools, can yield necessary and beneficial information to support strong fisheries management. This is especially critical in the longline fishery which has extremely low observer coverage rates (~5%-20%) compared to the purse seine fishery,

[2] See Section 3 of the *Fisheries Management Act 1991*.

and for which a majority of activities take place on the high seas. The importance of scientific data goes hand-in-hand with compliance data, particularly in verifying logbook reporting and ensuring that all catch is recorded accurately to support scientific assessments. In addition, as EM technologies continue to evolve, its utility as a reliable tool for species identification and verification will support continued stock assessments. FSM is also concerned with sustainability initiatives to support market demand requirements and ensuring that as custodians of key tuna species, catch originating in the FSM or by FSM-flagged vessels, can be trusted as emanating from a traceable and well-monitored fishery.

The FSM considers EM to be complementary to its existing fishery observer program with the potential for EM analysts/reviewers and on-board fisheries observers to be interchangeable. This will ensure continued employment opportunities for FSM nationals, consistent with national and regional objectives of supporting an economically viable longline fishery.

3. Program Design

Program Design Element	FSM	Australia	FFA EM Policy
Jurisdiction	Applies to FSM longline vessels operating in FSM waters and FSM flagged longline vessels wherever they operate.	AFMA regulates Australia's EM program for specific Commonwealth fisheries throughout the location of the fishery, i.e., EEZ and high seas. All Australian flagged vessels operating port-to-port	Vessels operating in areas under the national jurisdiction of FFA member countries and the adjacent high seas.
Application (fishery)	Longline	Longline Midwater trawl (small pelagic) Gillnet, Hook and Trap	Longline
Approach to review	NORMA Data Review Center (DRC); In-house review. - Optional 3rd party review may be considered under specific circumstances	Moving from independent provider to in-house review by government agency (AFMA).	Internalise EM Records analysis through the establishment of Data Review Centres or contract a third party.
Coverage Rate *% of fishery with EM system installed*	100%	100%	Default will be 100%
Analysis *% of footage reviewed*	20% of trip sets are randomly selected using random.org.	Minimum 10% of shots per boat and a minimum of one shot per drive for each boat. Demonstrated excellent congruence between the EM data and the logbook data over the eight-year program.	Target Rate: 20% - for vessels operating in national waters but not landing catch into domestic ports.

			10% - for domestic vessels landing catch into domestic ports.
Cost recovery	Under consideration but likely to be on cost-recovery basis with industry (users).	Program Administration staff 50% cost-recovered from industry (through levies) and 50% Government funded. Program proper is 100% cost recovered from Industry. This includes routine servicing of EM systems, non-warranty service repairs, routine costs for shipping data drives, and routine footage review and processing.	Member decision.
Feedback to industry	Trip summary report compiled after the review stage.	Report provided regarding EM System functioning. Potential engagement if any compliance issue /investigation.	EM Records and EM Data may be shared with the vessel owner subject to data exchange and sharing arrangements.
Confidentiality and privacy	Confidentiality and privacy of EM records and data are reflected in the FSM draft EM regulations, in accordance with FSM national laws.	AFMA is required to comply with national privacy and freedom of information laws. These laws, and others (including Fisheries legislation) include safeguards on the disclosure of personal or commercial information. As with any other information it collects, AFMA must be able to use and disclose e-monitoring data (including video footage) where this is necessary to carry out its functions under Fisheries legislation.	The confidentiality of EM Records will be subject to the same procedures, systems and protocols as apply to other fisheries data and information generated from FFA member country fisheries including logsheets, VMS and observer data.
Records (Footage) and Data Storage	NORMA stores all EM records in-house and annotated data in a regional repository. Timeframe for EM records storage is yet to be finalized; Pending development of EM draft regulations.	AFMA is required to store all EM footage for 6 months. All annotated EM data is held in perpetuity like all other AFMA datasets (e.g., logbook data).	FFA member countries will adopt standards for the storage of EM Records and EM Data.

4. Key program challenges

The below section summarises some of the FSM's and Australia's key program challenges in the implementation of their national EM Programs. The sections following this, explore key technical challenges with each EM program, including approaches to addressing those challenges.

a. FSM

FSM has been the beneficiary of strong support from a key NGO partner throughout the development of its national EM program. Support for EM trials as well as both financial and in-kind assistance, has enabled the FSM to make steady progress since issuing the T3 Challenge in 2017. FSM has also been fortunate to receive excellent cooperation by industry partners during the EM trials. The locally-based foreign longline fleet in the FSM has been particularly interested in advancing use of EM in the FSM fishery, to support its own sustainability goals.

Even with strong support, challenges will arise and that has been the case for FSM throughout program development. Some of those challenges include:

- Program Design: In the absence of a regional model or approach in place, FSM navigated a fairly open playing field of options for designing its national program, including whether to establish a national data review center, what role NORMA would play, and what standards would be required.
- Cost recovery: FSM views industry as a partner and industry success is an important part of this partnership, particularly on sustainability goals driven by market interests. The appropriate cost-recovery approach is still under consideration, including what level of industry payment for EM services is required versus support from government.
- Multi-zone trips: FSM's locally-based longline fleet also operates in neighboring RMI, which will require strong coordination and a data sharing agreement between the FSM and RMI. Discussions are already underway and the PNA Fisheries Information and Management System (FIMS) apparatus will be an important tool to support cooperation.
- Interoperability: This is an area that FSM has minimal control over and is relying on the regional organizations to ensure that interoperability is supported by EM Service Providers operating in the region.
- Integration with other datasets: This work is ongoing especially with integrating EM information with SPC-managed databases, and soon, PNA FIMS. NORMA has started development of an in-house EM data platform to house analysed EM Records in an electronic format.

b. Australia

Australia has engaged in widespread consultation with all relevant stakeholders regarding the design, development, implementation and continuous review of its EM Program. Australia engaged in many years of trials and testing with industry prior to the mandatory adoption of EM in the four Commonwealth fisheries. This ongoing consultation has provided a meaningful way for AFMA and the Australian fishing industry to implement a new technology into Australia's fisheries. However, during the last decade of the trials and implementation of EM, Australia has encountered a number of key program challenges:

- Costs: The EM program's costs are not insignificant and there are ongoing conversations with industry regarding this. The EM program is a cost-effective data collection and monitoring tool, but some of the benefits are difficult to quantify. For example, AFMA has demonstrated the increased accuracy of logbook data. Increasing the accuracy of logbook data increases the

confidence in the data used to support stock assessments, harvest strategies and minimises uncertainty in management arrangements. This has, in turn, supported the implementation of more discrete spatial and temporal management arrangements, rather than fishery wide management arrangements.

- Regulating an evolving technology: EM systems and their components continue to evolve with ongoing improvements to develop greater efficacies, capability and lower costs. However, providing regulation that allows for ongoing technological evolution is challenging. Australia has addressed this by using a standards-based approach, focusing on required outputs of any system or technology to meet the fisheries' needs, while allowing for flexibility in systems to achieve these. In the past year, Australia has reviewed its EM program design to further utilise standards and an outcomes-based approach to the EM program. This will include the development of technical standards, fishery specific performance (outcomes) standards to support the installation of the EM system, footage analysis and data standards. Alongside this will be audit protocols and processes.
- Increasing the efficiency of the footage analysis: Australia has had limited success in reducing the footage analysis/review times and therefore costs. This component of the program costs ~50-60% of the total program costs, so efficiency gains here equate directly to savings for the program. AFMA has been investing and supporting the development of Artificial Development and Machine Learning for the EM program. This includes working to establish a publicly available image library (fishnet.ai) and collaborating with CSIRO to develop software for species identification.
- Interoperability: Australia has undertaken trials to confirm that the geolocation data from the EM system provide equivalent data to the traditional VMS system. This supports streamlining management requirements and burdens placed on industry.

5. Technical Issues

a. Confidentiality and data ownership

FSM

FSM's position is that all fishery information collected within the FSM EEZ and by FSM-flagged vessels is owned by the FSM. More relevant, however, is accessibility of that information and for this, the FSM considers the WCPFC data rules to be an appropriate process for ensuring relevant parties have access to information to serve multiple purposes. FSM's legal framework is still under development and specific EM regulations are in final draft form. A comprehensive review of FSM's fishery laws is also underway. The draft EM regulations cover some key data confidentiality issues and FSM expects the regional EM standards, specifications, and procedures (SSPs) that are currently under development to also assist.

Australia

The collection of personal information (individual's faces, boat names etc.) through the implementation of the EM program has required Australia to address a range of ancillary issues previously not triggered by other data collection programs. This has included privacy legislation, confidentiality, as well as system and footage ownership. These issues have required AFMA to address the Australian Government agencies' legislative requirements that fall outside of specific fisheries legislation (e.g., privacy laws and freedom of information laws).

Australia has undertaken a Privacy Impact Statement together with Regulatory Impact Statement processes. Further, Australia secured an exemption from the Commonwealth Archives Act to hold EM

footage/EM records for six months (reduced from the mandatory requirements). These processes have ensured that Australia adheres to all privacy laws and requirements, as well as establishes appropriate retention requirements.

For system ownership, Australia requires that industry purchase and install EM systems at their own cost, with the maintenance and EM analysis are paid through industry levies. With respect to fisheries legislation, amendments to the *Fisheries Management Regulations* in 2019 authorised Australia to provide the licence holder access to their own EM footage and data, though this clause is yet to be utilised.

6. Storage

a. FSM – challenges and approach

FSM continues to use hard disk drives (HDDs) to record, store, and transfer data to the HDD. Each vessel is fitted with 2 HDDs per trip (4 terabytes total), ensuring that there is adequate storage to store videos up to 3 months, given that is usually the duration of trips. The onboard EM system is set up to collect, store footage and associated metadata, all of which are securely encrypted.

The issues FSM is facing includes:

- HDDs crash, resulting in trip data loss.
- Logistics: When a vessel calls into a different port, someone has to board, remove the HDD, and ship it back to FSM (Pohnpei) for review. In such cases, FSM had to ship spare HDDs prior to the vessel's arrival, so it may be swapped with the one containing the data.
- Exploring other means, FSM trialled the use of solid state drives (SSDs) onboard 3 longliners based out of Guam. The trial concluded with no issues relating to the storage mediums failing, suggesting that a shift from using HDDs to SSDs should be considered. As technology evolves, cloud storage would be the cost-efficient option to explore, given it will eliminate the logistical issue of physical data transfer.

b. Australia – challenges and approach

To ensure that EM footage for all fishing activities are captured during a fishing trip, Australia's EM program relies on the use of encrypted hard drives. Australian EM standards set out that the EM system must record, store and transfer all EM records to AFMA through the submission of data drives (e.g., HDDs, SDDs) but is future proofed to enable transmission of EM records via Global System for Mobile Communication (GSM) or satellite transmission and in accordance with data standards when this option becomes cost effective.

The EM system must consist of data drives (e.g., HDDs and SSDs) with a storage capacity of at least 2 TB (per trip), to ensure:

- Storage of EM footage for all fishing activities during the fishing trip;
- Storage of sensor component data;
- Encryption of EM footage and sensor component data; and
- Storage of continuously collected geolocation data.

7. Data Transfer

a. FSM – Challenges and approach

The biggest issue with data transfer has been the logistics of moving physical hard drives between ports, i.e. Majuro to Pohnpei, or from other FSM ports to Pohnpei. The costs and logistics associated

with moving a physical hard drive between different ports has resulted in delays in review of EM records or in some cases, loss of continued recording because hard drives are full. FSM is monitoring experiences in other areas (Chile, French Polynesia) that are trialling in-port electronic data transfer via cellular network and cloud-based data transfer to learn any relevant lessons and consider alternatives.

b. Australia – challenges and approach

Australia's EM standards currently allow for the transfer of EM records to AFMA via Australia Post, but have been future proofed to permit transmission by GSM module or satellite transmission as long as done so in accordance with the specified data standards. In time, this will allow operators to choose a data transfer method that best meets their needs as well as meeting the data standards and cost elements. However, the majority of Australian operators chose to utilise data drives that can be securely posted to the review centre. This flexibility also future proofs the EM standards to allow for greater uptake of GSM or satellite transmission as the technology evolves.

Data drives are required to be carefully removed and packaged to ensure that they are not damaged or corrupted during transit. Data drives must be submitted to AFMA by postal service:

- within 24 hours of returning to port;
- when the data drive 80% full (i.e., only has 20% storage capacity remaining);
- if the data drive has failed a system test and a replacement drive have been issued; or
- if instructed to so by AFMA or the EM system vendor.

8. Conclusion

The FSM and Australia have prepared this paper to share their respective experiences regarding EM program design and implementation. Consideration of these two national EM programs, overlayed with the recent FFA EM Policy, provides an example of national approaches to implementing EM programs in a manner consistent with FFA's agreed regional policy.

Both national programs, while at different levels of implementation and application, are subject to continuous review and improvement. Through these processes, in close collaboration with industry and EM providers, the FSM and Australia are able to ensure that their respective EM programs meet their data collection and monitoring needs, necessary for effective and sustainable fisheries management.

<u>Key points for consideration:</u>

a) **Note the national approaches taken by FSM and Australia regarding their national EM programs.**
b) **Consider how the approaches in the national programs could support addressing the program challenges in developing national and/or regional EM programs.**
c) **Provide feedback on additional program design approaches or challenges that could be canvassed in any future information sharing paper or discussion.**
d) **Invite any partners to contribute their experiences on the program design elements outlined in this paper.**