



**SECOND E- REPORTING AND E-MONITORING INTERSESSIONAL WORKING GROUP  
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**UPDATE ON THE IMPLEMENTATION OF ELECTRONIC MONITORING (EM) AND  
ELECTRONIC REPORTING (ER) TECHNOLOGIES IN THE WCPO**

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**WCPFC-2016-ERandEMWG2-IP01**

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Malo Hosken<sup>1</sup>, Peter Williams<sup>1</sup> and Neville Smith<sup>1</sup>

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<sup>1</sup> Oceanic Fisheries Programme (OFP), Pacific Community (SPC), Noumea, New Caledonia.

## **Update on the implementation of Electronic Monitoring (EM) and Electronic Reporting (ER) technologies in the WCPO**

Since 2013 the Oceanic Fisheries Programme (OFP) of the Pacific Community (SPC) has been collaborating with fisheries authorities from member countries, international and regional organisations, non-governmental organisations, technology service providers and the fishing industry towards the implementation of Electronic Monitoring (EM) and Electronic Reporting (ER) technologies in the Western and Central Pacific Ocean (WCPO) Convention Area.

This paper provides an update on past, current and future EM and ER projects. It also describes how member countries are building capacity to adopt and manage these emerging technologies. Finally the paper presents the processes of how EM and ER regional operational standards are planned to be implemented.

### **Report on the 2014 Solomon Islands Tuna Longline Electronic Monitoring trial**

This report summarises the results of a video camera based Electronic Monitoring project conducted on tuna longline fishing vessels operating in Solomon Islands waters during 2014.

- The main objective of the project was to investigate the extent which video Electronic Monitoring systems (E-Monitoring) can record the data normally collected by observers on-board tuna longline vessels based on the required minimum data fields specified under the Western and Central Pacific Fisheries Commission (WCPFC) Regional Observer Programme (ROP).
- The project partners were Tri Marine, National Fisheries Developments (NFD), Yi Man Fishing Company, Satlink (the service provider), Pacific Islands Forum Fisheries Agency (FFA), Oceanic Fisheries Programme of the Secretariat of the Pacific Community (SPC-OFP) and the Solomon Islands Ministry of Fisheries and Marine Resources (MFMR). The International Seafood Sustainability Foundation (ISSF) is also a major contributor through support of the Regional Electronic Reporting Coordinator position contracted by SPC.
- Two CT-4 freezer longline tuna vessels were equipped with a video E-Monitoring system and each undertook two trips under this project. The E-Monitoring system (Satlink Sea Tube) installed on-board consisted of high-definition video cameras, GPS and a central computer to record all events and video footage.
- The E-Monitoring records collected from these trips were analysed by experienced longline fisheries observers using the Satlink View Manager (SVM) analysis software. These office observers recorded all aspects of the fishing activity, including setting and hauling parameters, identifying fishing locations, the catch and size composition, and the fate of any bycatch taken. An independent fisheries observer was also assigned to each vessel to carry out the regular on-board task of observing and recording the catch.
- A comparative analysis between the on-board observer data and the E-Monitoring data is presented in this report and shows which of the required Regional Observer Programme (ROP) minimum standard data fields are adequately collected using E-Monitoring. Substantive recommendations for additional work are also identified in then report.
- In the scope of implementing E-Monitoring technology in all or parts of the Western and Central Pacific Ocean fisheries, logistical and legal frameworks will be required at national and regional levels. The Pacific Community's (SPC) knowledge and experience in managing observer data and the Pacific Islands Forum Fisheries Agency's (FFA) expertise in fisheries legislative mechanisms mean that an SPC/FFA partnership will be paramount if the decision is made to advance and implement E-Monitoring in the region.

The complete report from the Solomon Islands trial is available for download on the SPC's Digital Library: [http://www.spc.int/DigitalLibrary/Doc/FAME/Reports/Hosken\\_2016\\_SI\\_EReport.pdf](http://www.spc.int/DigitalLibrary/Doc/FAME/Reports/Hosken_2016_SI_EReport.pdf)

## **Current Electronic Monitoring projects**

### **New Caledonia**

In June 2015, the fisheries authority for New Caledonia and SPC began EM trials on a tuna longline vessel based in the port of Koumac. The International Sustainability Seafood Foundation (ISSF) is providing the major financial support for this project. The EM equipment was provided and installed by Satlink. Three high definition video cameras were placed at strategic locations around the vessel to record setting and hauling operations. One Satlink View Manager (SVM) unit is installed at the fisheries authority in Noumea allowing the analysis of the EM records (raw video footage and associated data). Hard drives containing the EM records are removed from the vessel and brought back to the fisheries authority on a regular basis for an office observer to conduct the analysis of the fishing trips. During one trip only, an on-board observer was present on the vessel and was able to monitor the vessel's setting and hauling activities. The office observer has analysed the EM records for this trip. The same EM records were also analysed by a service provider (Digital Observer Services). In order to ascertain the usefulness of this EM system, a three level comparative analysis is planned for this trip. Three main challenges have been identified for this project. Firstly, the vessel is based in Koumac which is located 400km from where the fisheries authority office is in Noumea. This means that fisheries staff cannot be present each time the vessel returns to port. Had fisheries staff been available to meet the returning vessel and crew each time, it would have allowed allow monitoring the project more closely, including exchanging feedback and maintaining good relationships. Secondly, the quality of the video footage was not ideal for mainly two reasons: two of three cameras were placed in locations where they were heavily exposed to sea spray and the vessel's crew were not cleaning the cameras lenses as often as required and agreed. Finally, the office observer tasked with analysing the EM records also works as an on-board observer on other vessels and is unable to analyse EM records before the next ones arrive. A complete report will be available during Quarter 4 2016.

### **Fiji**

In September 2015, the Fiji Ministry of Fisheries and Forest (MFF) began a five year EM pilot project with the support from the United Nations Food and Agriculture Organisation (UN FAO). Currently, five domestic tuna longline vessels are equipped with EM systems provided by Satlink. Six SVM units are installed at the MFF offices in Suva allowing the analysis of the EM records. Fourteen office observers have been trained in using the SVM. EM records are collected from the vessels each time they return to Suva port. Office observers also continue to embark as on board observers on a regular basis on either the vessels equipped with EM or other fishing vessels. Each longline vessel equipped with EM also embarks an on board observer. MFF, SPC and Satlink are collaborating to ensure that analysed EM data can be readily uploaded to the national Tuna Observer Database System (TUBs) database in Fiji as well as the regional TUBs database in Noumea. Comparative analyses between on board observer data and EM data analysed by office observers are also planned.

### **The Nature Conservancy**

In June 2016, The Nature Conservancy (TNC) has launched an EM pilot project for up to 24 tuna longline vessels with Satlink as the service provider. Planning discussions with four member countries are currently taking place, including the number and types of vessels and how to set up national and/or regional EM analysis centres. SPC is collaborating in this project to ensure EM analysed data can be readily uploaded to national TUBs databases and the regional TUBs database in Noumea.

### **Luen Thai Fishing Venture**

Since October 2015, the fishing company Luen Thai Fishing Venture (LTFV) has installed their own EM system on 33 tuna longline vessels. SPC is currently collaborating with one member country where LTFV vessels with EM systems are licenced to provide an initial assessment of this 'in house' developed EM system.

## **eTUNALOG: Tonga, Samoa, Fiji, New Caledonia**

In 2013, SPC developed the Electronic Reporting (ER) software eTUNALOG. Originally designed for Purse Seine vessels to submit the SPC/FFA Regional Purse Seine Logsheet, a module was added allowing longline vessels to submit the SPC/FFA Regional Longline Expanded Logsheet. Trials on Purse Seine vessels were stopped in 2015 as the PNA Fisheries Information Management System (FIMS) was providing an integrated solution for submitting Purse Seine logsheet data and providing catch certification or traceability. Nevertheless, the longline module for eTUNALOG is a cost-free solution for tuna longline vessels operating in the Southern Albacore Fisheries. Trials in New Caledonia, Fiji, Tonga and Samoa are on-going. eTUNALOG logsheet data can be directly imported to the TUFMAN2 database system developed by SPC and used by member countries.

### **National ER and EM officers**

Through support funding from the ISSF, SPC has been collaborating with the Republic of the Marshall Islands, the Federated States of Micronesia, the Cook Islands and the Solomon Islands to establish national ER and EM positions within the fisheries authorities. These staff oversee the day to day coordination of ER and EM trials and provide a link between the fisheries authorities, the fishing industry, the service providers and SPC. Two ER and EM officers are also present in Papua New Guinea. Investing in these positions is absolutely necessary to ensure member countries can build the capacity to adopt and manage ER and EM technologies efficiently.

### **Report of the first strategy meeting of the Tuna Fishery Data Collection Committee (DCC)**

In April 2016, SPC and FFA organised the first strategy meeting of the DCC.

The future role of the DCC was this Strategy Meeting's main theme. Initially, its future role was considered diminished by the efforts of the WCPFC, as the scope and range of influence in regards to data are similar for both groups, albeit more extensive for the WCPFC. However, a significant difference between the work of the WCPFC and the DCC is that the DCC can and does provide a mechanism for its members to set data standards above and beyond those of the Commission. It was also recognised that while the DCC has no direct mandate to set data standards in certain areas (the high seas for instance), information from such areas are critical to regional stock assessment outputs and therefore of interest to the DCC. Other noted points of difference were the DCC mechanisms to remove data fields, its efforts to ensure that data standards are practical and its documented explanations on the inclusion, or otherwise, for each data field.

Electronic data collection is now a reality in the region. Often instigated by the demands of catch certification or traceability, the number of e-providers and their areas of involvement continue to grow.

The DCC came to the agreement that its area of focus should be in creating standards to facilitate the development of products capable of delivering appropriate outputs for the regional management and data repository structures.

The full report is available in WCPFC-2016-ERandEMWG2-IP03.

### **EM Technical Standards Workshop**

In June 2016, SPC organised a three day workshop in Noumea to begin the process of establishing EM technical standards. This workshop was attend by SPC and FFA technical staff, representatives from three member countries and representatives from six EM service providers. Funding support from the ISSF was available for this event. The workshop consisted of determining how the WCPFC Regional Observer Programme minimum data fields for longline observers could be collected using EM technology currently and in the future. The panel of experts present was also an opportunity to briefly list key issues regarding the implementation of EM in the region with an aim to develop and discuss these issues in further detail at a next workshop. Such a future workshop would need to include member countries in the objective of developing a

regional strategy for the implementation of EM. A brief report of the meeting is attached at Appendix I. A full report of the draft standard arising from this workshop is paper WCPFC-2016-ERandEMWG2-04.

### **Future work**

- Regional EM strategy (SPC/FFA)

SPC and FFA plan to convene a regional strategy meeting in 2016 to answer the following key questions.

What is the broad vision and objectives for fishery monitoring in the WCPO tuna fisheries?

What advice do SPC and FFA provide members implementing ER and EM?

What resources and support can SPC and FFA offer?

- EM Purse Seine Technical Standards

SPC plans to convene another technical standards workshop aiming at drafting the standards for EM on Purse Seine fishing vessels.

- Purse Seine EM trials

EM trials on Purse Seine vessels are envisaged in collaboration with member countries and service providers. While there is 100% observer coverage on Purse Seine vessels operating in the WCPO, EM could be used to validate claims regarding set type, thus alleviating any un-due pressure on the observers. EM could also be used to obtain more precise species and size composition data.

**APPENDIX I –**

**BRIEF REPORT OF AN ELECTRONIC MONITORING (LONGLINE)  
PROCESS STANDARDS WORKSHOP**



## **ELECTRONIC MONITORING (LONGLINE) PROCESS STANDARDS WORKSHOP**



Funded by the International Seafood Sustainability Foundation (ISSF) and organised by the Pacific Community (SPC), a three-day workshop on 'Electronic Monitoring Longline Process Standards' took place at the SPC headquarters in Noumea between the 27th and 29th of June 2016. The workshop brought together experts currently involved in the use of electronic monitoring systems from regional fishery management organisations, Pacific Island national fisheries offices, a non-government agency and electronic monitoring service providers (the full participant list is below).

Electronic Monitoring (EM) has been defined as a closed monitoring system that enhances existing vessel monitoring systems (VMS) through the use of cameras, GPS capacity and gear sensors to monitor fishing activity. In the Western and Central Pacific Fisheries Commission's (WCPFC) Convention Area, EM is now, after a number of years of testing, an established method of collecting data from tuna fishing activities (e.g., VMS is approved). The capture of fisheries data through electronic tools has the powerful potential to enhance existing data collection systems and improve data deficiencies — the loss of data through mis-information or under-reporting. Such data loss from licensed vessels was identified as the major contributor to IUU fishing in the region<sup>1</sup>. Additionally, EM along with electronic reporting (ER) has the capacity to deliver real-time data and significantly improve the reliability of logbook data, thus enhancing the value of stock assessments and various other technical analyses. The ability to monitor the security of personnel on board is another valued feature.

The workshop's main aim was to list the detailed data standards for EM for longline fleets by defining the data fields and describing the business requirements in relation to those data fields. These are increasingly sought by EM service providers in the region. The longline fleet was identified as having the more immediate needs in terms of EM data specifications as full observer coverage is already a requirement for the WCPFC purse-seine fishery. In contrast the longline fleet has substantively more vessels, many of which remain at sea for extended periods, and offers a more challenging environment for observer placements. At-sea transshipments are routine for longline

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<sup>1</sup> MRAG Asia Pacific (2016). Towards the Quantification of Illegal, Unreported and Unregulated (IUU) Fishing in the Pacific Islands Region. 101pp.

vessels fishing on the high seas and the physical challenges of getting observers to the vessels and providing them with appropriate accommodation can be disruptive and are the main reason why observer coverage in this sector of the longline fishery has historically been very low.

In essence the workshop was a technical meeting. As a starting point, the *e-reporting* standards drafted for the WCPFC<sup>2</sup> provided the framework for a step-by-step approach to crafting the new EM data standards. The positive response to the workshop invitation from a diverse and knowledgeable group provided a solid environment to investigate both the validity of each data field with respect to the capabilities of EM technologies and the current technical capacity. The other reference tool that proved helpful to the workshop was the report on the trial of electronic monitoring carried out in the Solomon Islands<sup>3</sup>.

The workshop acknowledged the requirements for new policy and legislation around EM, at both the national and regional level, but noted that this area was beyond the mandate of the workshop. The associated over-arching issues were, however, documented as they arose and considered during a session at the end. This discussion will be included in the paper sent to the WCPFC ER and EM WG 2.

In developing the EM data standards, the working group systematically reviewed all the data fields currently collected by on-board observers (which cover both the WCPFC Regional Observer Programme (ROP) minimum data standards and additional fields required by the SPC/FFA Data Collection Committee) and assessed if the data could be collected through current versions of EM. The draft EM data standards recognise and detail the preferred source for each data field noting some data can't be collected through electronic imagery. It was acknowledged that some data could be collected by a technician before or after the trip (e.g. vessel details, equipment details or species lengths) and an onboard observer or port sampler will be needed to collect some biological data (e.g. otoliths and gonad stage), for example. Additionally, the large quantity of generated imagery will normally require further interpretation by an office-based observer before it becomes 'data'. Data derived from calculations is another possible source of information. Automatically generated data, often captured by sensors, is the currently preferred source of EM data; and while not always feasible with current technology, future developments are likely to increase the amount of data that

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<sup>2</sup> Western and Central Pacific Fisheries Commission (WCPFC) E-reporting standard data fields operational observer data. Version 2.00, 22 Feb 2016, Draft – yet to be approved.

<sup>3</sup> Hosken 2016 Solomon Islands E-Monitoring Project Report

can be automatically derived. The limiting factor may be cost and not technology. The workshop also documented data fields for further consideration by the appropriate data groups either for inclusion, retirement or as potential new data fields once the technological issues are resolved.

The full draft technical standard arising from the workshop will be prepared and submitted to the 2<sup>nd</sup> meeting of the WCPFC Electronic Reporting and Electronic Monitoring Intersessional Workgroup in early August, 2016. It is acknowledged that these EM data standards are a substantive start to the work that needs to be achieved, but on-going work will be required, most especially in the early years and in maintaining the standards as data needs evolve. The data standards were generated mostly from a science perspective and define how the EM data can align with existing on-board observer data and how EM can be used to verify reporting of real catch, discards and effort. Verifying real catch and effort is extremely important for stock assessments and is an important part of fisheries compliance. However, it was noted further work is needed to assess compliance needs and standards for monitoring activities like transshipment. The standards do not include advice on vessel coverage levels, the limitations around cost or the legal requirements and these will have to be explored before enhanced EM is a successful source of data in the region. They do, however, fulfil the immediate need of supplying service providers with the data standards they require to achieve the common goal of enhancing data collection from tuna longline vessels in the Western and Central Pacific Fisheries Commission's (WCPFC) Convention Area.

## Workshop Participant List

|          | <b>Name</b> | <b>AFFILIATION</b>                                     |                       |
|----------|-------------|--|-----------------------|
| Ian      | Knuckey     | Fishwell Consulting                                    | FACILIATOR            |
| Peter    | Williams    | Pacific Community                                      | CHAIR                 |
| Malo     | Hosken      | Pacific Community                                      | ORGANISER             |
| Deirdre  | Brogan      | Pacific Community                                      |                       |
| Siosifa  | Fukofuka    | Pacific Community                                      |                       |
| Tim      | Park        | Pacific Community                                      |                       |
| Emmanuel | Schneiter   | Pacific Community                                      |                       |
| Kerry    | Smith       | AFMA, Australia  | Chair of WCPFC EREMWG |
| Victor   | Restrepo    | ISSF - International Seafood Sustainability Foundation |                       |
| David    | Power       | Forum Fisheries Agency                                 |                       |
| Yvonne   | Ueda        | The Nature Conservatory                                | Palau                 |
| Netani   | Tavaga      | Ministry of Fisheries & Forestry, Fiji                 |                       |
| Jale     | Qereiwasa   | Ministry of Fisheries & Forestry, Fiji                 |                       |
| Thomas   | Auger       | Direction des Affaires Maritimes, New Caledonia        |                       |
| Brian    | Kumasi      | National Fisheries Agency, PNG                         |                       |
| Bob      | Stanley     | Archipelago Asia Pacific                               | Service Provider      |
| Gonzalo  | Legorburu   | Digital Observer Services                              | Service Provider      |
| Oscar    | Gonzalez    | Marine Instruments                                     | Service Provider      |
| Jared    | Fuller      | Saltwater Inc  | Service Provider      |
| Jens     | Heinsdorf   | Satlink  | Service Provider      |
| Garland  | Shen        | Luen Thai Fishing Venture                              | Service Provider      |

## Workshop website

<http://www.spc.int/oceanfish/en/meetingsworkshops/e-reporting-a-e-monitoring>