DRAFT Pacific Islands Region Longline Electronic Monitoring Program; Vessel Monitoring Plan Guidance Document

Vessel Monitoring Plan

A vessel monitoring plan (VMP) describes how an electronic monitoring (EM) system is configured on individual vessels and how fishing operations must be conducted to effectively monitor catch and discards including bycatch of fish and protected species. The VMP provides clear objectives and outlines EM program requirements and documents specifics of EM installation on individual vessels. Specifically the VMP would include information on the hardware that makes up the system, the EM system operations, and the operators responsibilities for operation, maintenance, reporting, and data retrieval.

The EM equipment identified in the VMP would be reviewed by NMFS for adherence to minimal standards and the VMP would be reviewed and approved by NMFS as part of the vessel's EM approval process. A vessel electing or required to use EM as part of the Pacific Islands longline EM program may work with a selected or approved service provider to develop a VMP for NMFS approval. This document includes guidance for selected EM service providers on what needs to be included in an individual vessel VMP in the region and the NMFS approval process and timeline.

Example VMP Template

GOAL of Workshop: Council directed staff to work with NMFS and the Hawaii and American Samoa longline fisheries to conduct a workshop on Vessel Monitoring Plans to **ensure they are appropriate and practical for these fisheries in order to improve efficiency of an EM program and reduce burdens to vessel operations.**

VMPs would include information similar to the information outlined below. Outlined are the basic components of a Pacific Islands longline VMP and are likely necessary for the successful operation of the EM Program. The information in below **bold** is an example of information that would likely be included in a Pacific Islands longline VMP.

I. General Information

Information on the VMP submission date and version number must be included.

Table 2. VMP Date and Version

VMP Submission Date:	
VMP version number:	

The following vessel identification items would likely be included: vessel name, vessel ID, home port, primary landing port(s), gear type(s) to be used (e.g. shallow and/or deep), name of vessel owner and their contact information, and primary point of contact if different from owner.

Table 3. Vessel Summary

Vessel Name:	
Vessel ID:	
Home port:	
Primary landing port(s):	
Gear type(s) to be used:	
Vessel Owner name:	
Owner Address:	
Owner Email:	
Owner Phone number(s):	
Vessel Primary Point of Contact: **(if different from owner)**	

Vessel contact Address:	
Vessel contact Email:	
Vessel contact Phone number(s):	

II. Provider Support and NMFS Contact Information

All VMPs would include a list of EM provider and agency contact information for vessel operators. Vessels participating in the Pacific Islands longline EM program must maintain current federal permits and continue to meet standard vessel reporting requirements including trip notification requirements at 50 CFR 665.803 (Notify RA of trip departure date and trip type 72 hrs before departing). If the vessel is longer than 50 ft (15.2 m), it must also carry an operational NOAA Enforcement-owned and installed VMS unit onboard whenever the vessel is at sea. Contact numbers for trip notification and for the NOAA Office of Law Enforcement would also be included as seen in Table 5. below.

Table 4. EM Provider Contacts

TITLE (NAME)	CONTACT #	EMAIL
EM Provider 24-hr Technical Support		
Technician Assigned to Vessel		
EM Program Manager		
Provider Weekend or Alternate Contact		
Software Support Staff Contact		

Table 5. NMFS EM Contacts

TITLE (NAME)	CONTACT #	EMAIL

VMS Support		
Trip Notification		
Data Request Information		
PIRO EM Lead		
PIFSC EM Lead		
American Samoa		
NOAA Office of Law Enforcement		

III. EM System Overview

The VMP should include the following overview of EM equipment:

- **Your vessel is equipped with an electronic monitoring system consisting of cameras, GPS, gear sensors, user interface, and a control center.**
- **The system will continuously record GPS coordinates, hydraulic pressure, and rotation sensor data while powered.**
- **High-definition video will be recorded from rail and deck view cameras during hauling activity as measured using hydraulic system pressure changes and drum rotation data.**
- **More specific information about your EM system is provided in *Section V – System Specifications and Installation Summary.***
- **Specifies when cameras are recording and any impacts to privacy**

Discussion Topics (Privacy Concerns/ Use of data):
This section is for vessel operator awareness regarding the system and notifies that there could be periods of reduced privacy when vessels are operating with EM systems. Captain and crew will identify blind spots on deck via viewfinder monitor prior to operation; captain and crew are aware they will not otherwise have privacy on the deck when the system is operating.
Could the EM data in NMFS' possession be FOIA'd? Yes, however, these records would likely be confidential for MSA purposes and as such not subject to public release.
Could the data be used by OLE for an investigation and enforcement action? Yes.
PSMFC maintains data on record retention schedule (1 year for video) (all footage of PS interactions will be clipped and maintained ~4-5 min), raw footage will be kept for 1 year. Could be released if required by a judge. Video clips submitted to NMFS (e.g. protected species interactions) would be subject to the record retention schedule all other video held for one year.

IV. Vessel Owner/Operator Responsibilities

This section would outline the likely vessel owner/operator responsibilities in the EM program. The VMP, at a minimum, would likely include the following vessel requirements:

Please turn your EM system on and confirm function 3 business days prior to leaving the dock. The EM system shall remain powered on for the duration of each trip, even if an observer is present. Click end trip and turn the system off when you return to the dock. System operation details are included in this section.

EM Requirements

- **Carry on board the vessel's approved VMP and make the VMP available for review at all times. The vessel is prohibited from fishing in an EM program without a NMFS-approved VMP.**
- **Comply with requirements outlined in the VMP.**
- **The EM system must be operated continuously for all fishing trips after installation (see exceptions for equipment malfunctions)**
- **Ensure that no person tampers with, disconnects, or destroys any part of the electronic monitoring system, associated equipment, or recorded data.**
- **When requested, provide NMFS or a NMFS service provider access to your vessel to collect data and service the EM system.**
- **Contact the EM service provider if there has been a lapse of 30 days or more between trips, to review protocols and verify the system is functioning before departing on the next trip.**

Each Trip

- **The EM system must operate on all trips from the vessel's time of departure from a port until its return to a port.**
- **Power: Maintain electrical power to the EM unit for the duration of the trip - the system will have some sort of battery backup to address fluctuating power supply, but must be connected to vessel power (installed with an uninterruptible power supply).**
- **Function Test: Prior (72h) to leaving port, the vessel operator should call into service provider to notify leaving within 72 business hours (week days), then function test will be done remotely by service provider or by captain guided by service provider over the phone conduct a system function test following the instructions provided in *Section VI – System Testing and Troubleshooting. (However this may be completed by the service provider)* If the function test identifies a malfunction, the vessel operator should follow the troubleshooting guidelines listed in *Section VI – System Testing and Troubleshooting.***

Discussion Topics:

1) Are pre-trip tasks for vessel operators reasonable and feasible?
2) What if the system has failed after 72 hours?
    a) They can proceed on trip without functioning EM but can not do a subsequent trip without resolving the issue (the vessel operator should follow the troubleshooting guidelines listed in Section VI – System Testing and Troubleshooting)
    b) Could a PSMFC staff determine how much hard drive space is available or is this a simple means to determine by vessel operator?
        i) This is unlikely to be an issue because these hard drives will be specified d to have enough space
3) Will operators be provided a new hard drive, back-up, or a set of spares? (see below for Post-Trip requirements)
    a) e.g. American Samoa
4) Issues with loss of power?

a) System should be able to operate continuously even with fluctuations in power

5) Need to make sure there is a seamless process between vessel operators and PSMFC staff to swap out hard drives and provide new hard drives for the next trip. Could there be a drop box for vessel operators to leave hard drives?
    a) Service provider will meet vessel dockside to drop off hard drives prior to trip/retrieve the hard drives after each trip
    b) How do we ensure timely access to vessels for the service provider?
6) How easy and simple is it to remove the hard drives and insert them? Would there be a need for a PSMFC staff to remove the hard drives and insert new hard drives?
7) Under what situations would there be a need to mail hard drives? If ingress/egress from California? In those situations in which there is a return to Honolulu or Pago Pago, could those hard drives be provided then?

Each Haul

- **Prior to each haul, the vessel operator should:**
    - **Verify that all cameras are operational, and all sensors and other EM system components are functioning as instructed in *Section VI – System Testing and Troubleshooting.*** Note: this requirement may not apply, contingent on EM hardware and service provider.
    - **Check the viewfinder monitor and verify that the camera views are clear, unobstructed, and consistent with the images provided in *Section V – System Specifications and Installation Summary*. Ensure lighting is sufficient to illuminate catch, so that catch and discards are visible to the video cameras and may be identified and quantified as required. Vessel operators are not expected to modify camera angles or focus.**
    - **Clean camera lenses to maintain video quality and monitor through the haul. Video quality will be reported in the trip summary report.**

Discussion Topics:

1) Are pre-haul tasks for operators practical and feasible? Operators should not be moving cameras and just checking viewfinder monitor
2) Should cleaning frequency contain a minimal requirement?
3) What kind of materials can be used to wipe down EM camera lens (i.e. rags or applications of RainEx)? Do the cameras need to be at arms length of the crew? What is sufficient to ensure clean cameras?
4) Would needing to deploy a boom arm in instances where another area is not available be too onerous?

- **Catch Handling**
    - **To effectively meet the goals of the program (the three main goals are identification, post release mortality estimates, and measurements for impact and stock assessment), we require the following catch handling procedures:**
        - **The vessel operator is responsible for ensuring all catch is handled within view of the cameras as defined in the camera descriptions and images in *Section V – System Specifications and Installation Summary.***
    - **Two areas specific areas will be defined on your vessel: a Discard Control Point [the**

primary point at which discards will be released from the vessel (a section of rail and area in the water by the side of vessel where animals will be released) as well as a radius of X ft] and a Deck Control Point [a square area on the vessel that is marked and through which all catch and bycatch brought on board will pass prior to moving to the hold or discard point]. These areas will be illustrated in Section XX and figures (YY & ZZ).

- **Retained catch should be brought aboard through the deck control point before being moved for processing (EM specific).**
- **All animals brought on board should be discarded within the discard control point (EM specific).**
- **All animals too large to bring on board should be brought fully to the surface and hauled alongside the vessel within the discard control point before further handling (EM specific e.g. blue sharks).**

- **For catch & protected species brought on board:**
  - **All catch that are brought on board (including protected species and non-target catch) should be placed in view of the deck camera in the deck control point before being discarded from the vessel's designated Discard Control Point or moved for processing (EM specific).**
  - **Board all small turtles and birds into the 'Deck Control Point' for identification and measurements (EM specific).**
- **For catch & protected species not brought on board:**
  - **For large turtles, marine mammals, and protected sharks and rays, bring these animals as close to the vessel as possible.**
  - **For marine mammals: follow the whale handline and release guidelines: If hook will not straighten, or if the marine mammal has swallowed the hook, bring the marine mammal close to the vessel and cut line as close to the hook (or mouth) as possible, using the long-handled line cutter.**
  - **For sharks: Use a line clipper meeting the minimum design standards in paragraph (m) of this section to cut the branchline so that less than 1 meter (or 3.3 ft) of line remains on the animal. If this is not possible without compromising the safety of any persons, cut the branchline as close to the hook as possible.**
  - **For entangled protected species: fishermen must disentangle and remove the gear, or cut the line as close as possible to the hook or entanglement to remove as much gear as possible from the turtle.**
- **If the line is cut, crew to identify this with a signal on camera (EM specific)**
- **Any gear removed from a protected species, including if line breaks or a hook straightens, it should be placed in the deck control point for estimates of gear remaining. (EM specific)**
- **Follow all protected species handling requirements at Appendix to this VMP.**

Discussion Topics:

1) Do you see any issues with handling animals within one of the two control points
2) Means to simplify define a deck control point on each vessel. This can include placing a pre-measured mat or tape on deck as predetermined location on deck. Which would industry prefer? Any ideas on how this could be defined?
3) Gear handling/measurements:
    a) Is signalling to cut line on camera reasonable? hold line or hook in camera view?
    b) Is putting the animal over a pre-measured mat or box in the deck control point reasonable?
4) Define pre existing requirements

Discard (& Possibly Retention) Control Point Location

*Define and describe the location of the vessel's discard control point(s) where catch may be discarded here. Maybe require image grabs of each camera view from the vessel with marked discard and deck control points.

Trip End

- **On return to port, report any known malfunctions of your EM system to the EM service provider (timeline tbd) and make the vessel available for servicing.**
- **After each trip and before returning to sea, make vessel available for service provider to swap hard drives and make any system adjustments or repairs. (timeline tbd)**
- **The procedure for dealing with hard drives for fishermen fishing from ports outside of Honolulu or Pago Pago are not yet determined**

Discussion Topics:

1) Do we need a process between vessel operators and PSMFC staff to swap out hard drives and provide new hard drives for the next trip? What timeline is reasonable.
2) How easy and simple is it to remove the hard drives and insert them? Would there be a need for a PSMFC staff to remove the hard drives and insert new hard drives?
3) How are hard drives dealt with for trips from California? In those situations in which there is a return to Honolulu or Pago Pago, could those hard drives be provided then?

Equipment Malfunctions

The EM provider would outline a comprehensive action plan to address system errors or malfunctions pre and mid-trip and include 24-hour technical support contact information for the vessel operator. An operational EM system is defined as the following: the EM system must be functional and in use, meaning that the system is recording fishing operations, including the video, images, and other sensor

data, as well as the metadata that provides information (e.g., trip departure date, vessel information) onto a hard drive or other suitable video storage device.

Pre-trip malfunctions

If the system function test identifies a malfunction, the vessel operator should follow the troubleshooting guidelines listed in *Section VI – System Testing and Troubleshooting.* If this does not resolve the issue, the vessel operator should contact the EM service provider immediately. The EM service provider will determine if the malfunction is critical or non-critical:

- **<u>Non-Critical Malfunction</u>: If the malfunction cannot be repaired in a timely fashion, the vessel operator may depart on the scheduled trip, but should follow the service provider's instructions. Please call the service provider and make arrangements for them to service the vessel upon return from this trip.**
- **<u>Critical Malfunction</u>: A critical malfunction prevents the data collection objectives from being achieved. A service provider technician should be available to service and repair the vessel EM within 3 business days of notification of the malfunction. The system must be repaired prior to the vessel leaving on a trip. If the system cannot be repaired in a timely manner (e.g., 72 hours) then the vessel may receive permission from NMFS to leave on their trip without a functioning EM system.**

Mid-trip malfunctions

- **If the system passed the function test prior to leaving port, and remains continuously powered during the trip, follow the instructions provided in *Section VI – System Testing and Troubleshooting*.**
- **If the malfunction cannot be resolved following the troubleshooting guide and/or with remote support, the vessel operator should continue the trip, run the system with all functional parts, and contact the service provider immediately (from sea if possible) to assist with scheduling service at the time of landing.**
- **The vessel should be made available upon return to port for the service provider to make repairs.**

Discussion Topics

1) Is 72 hours enough time to reconcile most malfunctions? And is that a fair duration for longline vessels between subsequent trips?
    - Exemptions to operate without operational EM system could include when there has been 72 hour notice and time period to reconcile malfunctions with permission from NMFS or if an observer is placed onboard; or if a vessel is not fishing with longline gear
    - See Council recommendations and draft regulations
2) What other exemptions or exceptions could be noted to keep vessels operating under reasonable situations where there is a malfunction? (See Council recommendations and draft regulations)
3) Troubleshooting guide must be simple and clear, easy to follow

V. System Specifications and Installation Summary

This section of the VMP would describe and illustrate each component of the system. A vessel diagram featuring the layout and location of all components (cameras, sensors, GPS, power source, control box, keyboard, and all monitors) would be included (Figure 1). The diagram would illustrate the work deck

during fishing activity and include the following items: gear bins, fish doors, deck houses, designated discard and retention control points, fish hold, mainline reels, catch processing area, float storage including radio buoys, and mechanical equipment such as winches, hauling devices, or cranes (Figure 2). These items could be on a single diagram or separate diagrams. If the vessel would use EM with multiple gear categories (shallow-set or deep-set gear), the service provider could create gear specific diagrams that illustrate the layout of the work deck if deemed necessary.

Camera specifications would be provided, and could include, the location and materials used to mount the camera, frame rate settings, advanced video coding capabilities, if the camera records in color or will record in greyscale under low light conditions, lens size, manufacturer, general description of focal point, and its primary purpose (i.e., rail camera, deck camera, etc.) (Tables 8a and b). Additionally, sensor specifications could be listed, including the sensor type and frequency or ping rate that data is broadcasted. Still images of each camera in the system would be included. Still images selected for a VMP would be representative of how the work deck would appear when the vessel is fishing, and could include the locations of the discard and retention control points within the camera views. Camera images would come from either a data drive or the EM review platform and cannot include images taken with handheld cameras.

NMFS staff would assess the proposed location and evaluate images based on concerns such as camera blocking and the crew's ability to clean camera lenses in advance of approving a VMP. If primary views are reliant on cameras installed in rigging or on top of the wheelhouse, the service provider should develop a camera maintenance plan and offer alternate solutions to vessels to keep cameras clean that are not readily accessible or pose safety concerns to the crew.

Data Collection Process

Video recording is triggered during the haul by use of the hydraulic system or rotation of the reel. All cameras will record from the trigger point to one hour after the haul. Video is captured at 30 frames per second.

Table 7. Hardware and Equipment Installed

GPS Model:	
GPS Location:	
Rotation Sensor:	
Rotation Sensor Location:	
Hydraulic Sensor:	

Hydraulic Sensor Location:	
Sensor Processing Unit Location:	
Control Box Location:	
Monitor and Keyboard Location:	
Software Version:	
Power Type:	
Power Location:	
Power Configuration:	
Power Hardware:	

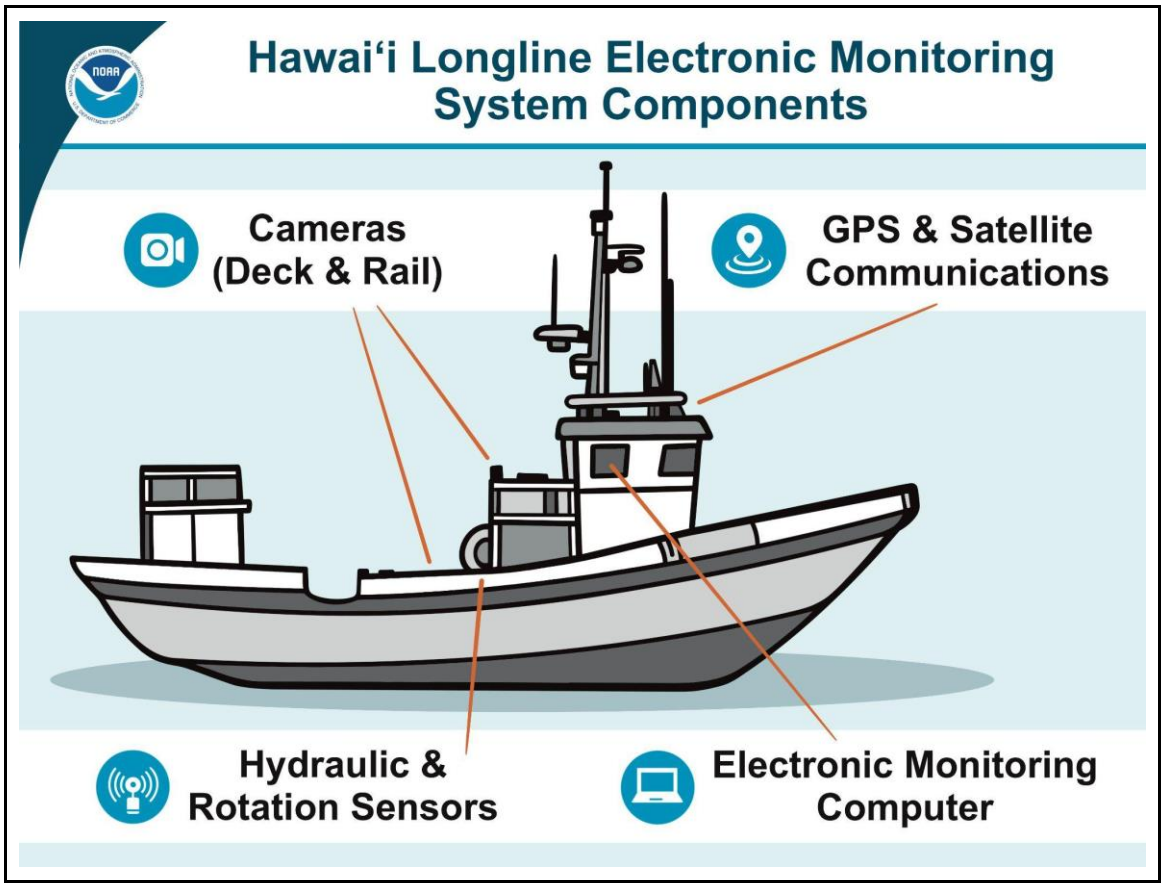


Figure 1. Vessel diagram example of system component placement

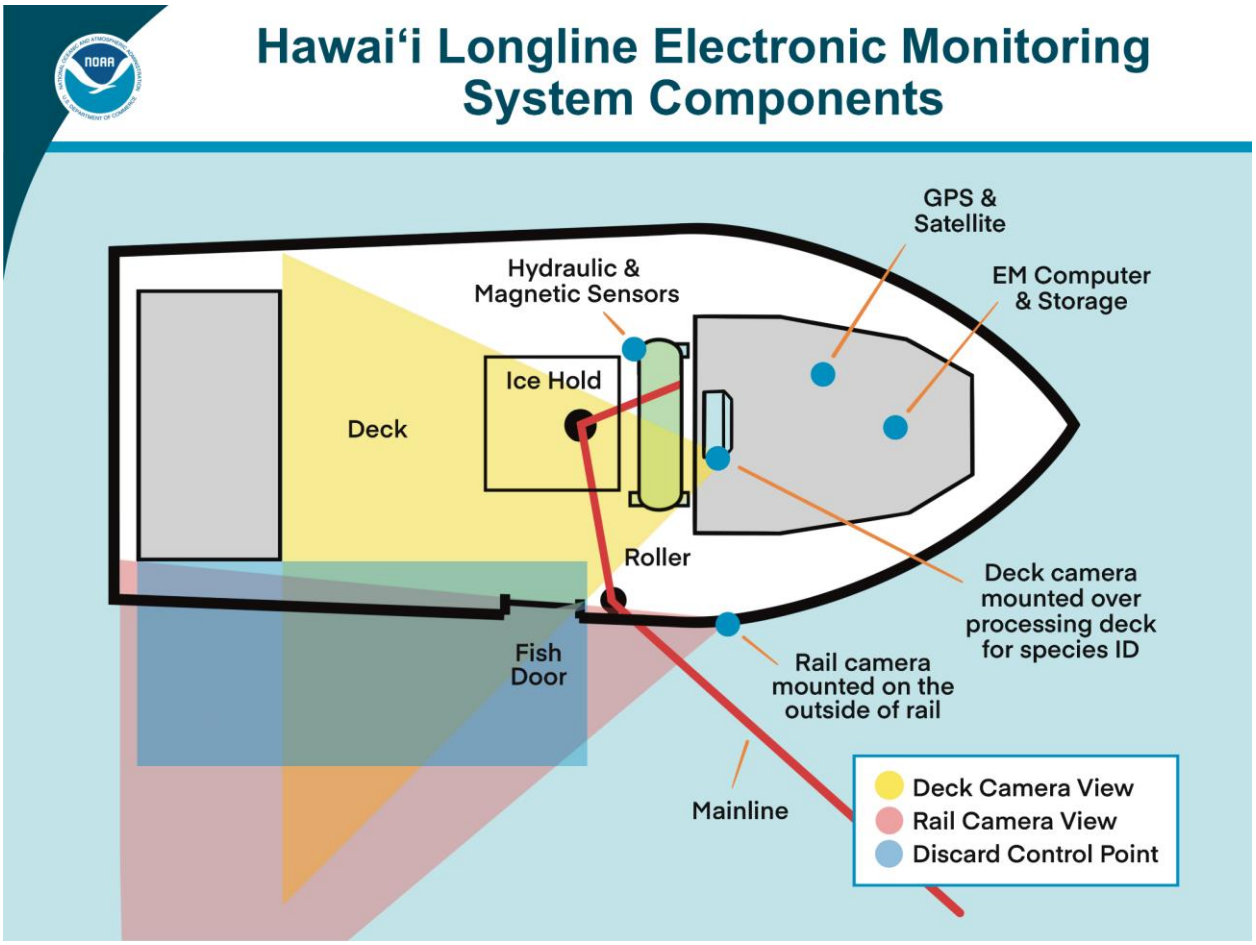


Figure 2. Vessel diagram example of working deck during fishing activities

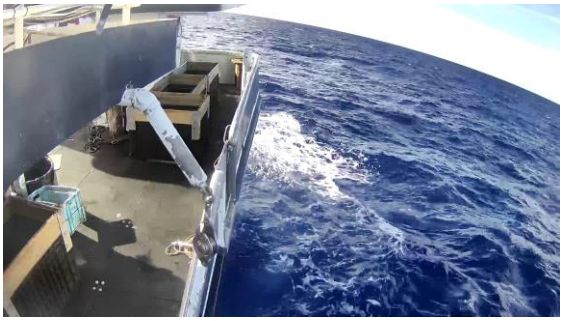
Table 8a. Camera Installation

Camera Name:		SCREENSHOT OF CAMERA VIEW
Location:		
View:		
Aim:		
Hardware:		
Resolution/FPS:		
Recording Trigger:		

Run On Time (if applicable)		
Recording Exceptions (if applicable):		

*complete this table for each camera

Table 8b. Camera Installation (example from HI PIFSC R&D EM)

Camera Name:	Rail	
Location:	Mounted on boom arm above hauling station; port side	
View:	View of fish door to stern of vessel. Water view ou	
Aim:	Downward and aft facing	
Hardware:	Geovision model EX1	
Resolution/FPS:	1080p@30fps	
Recording Trigger:	Pressure trigger: 200 PSI Magnetic sensor: 5 rotations of drum in hauling direction	
Run On Time (if applicable)	1 hour	
Recording Exceptions (if applicable):	Recording only during gear hauling	

*complete this table for each camera

VI. System Testing and Troubleshooting

TBD - Troubleshooting guide must be simple and clear, easy to follow

VII. Signature Page

The signature page acknowledges the intent to be bound to the terms of the VMP and would be signed by the EM provider, the vessel owner, the vessel operators that have been fully briefed/trained to operate the vessel, and a NOAA Fisheries representative upon plan approval. The signatures certify that the vessel owner and the vessel operator have been briefed/trained on EM operations and catch handling, and program requirements and understand the requirement to comply with the components of the VMP. In addition, the signatures document that NOAA Fisheries has approved the Service Provides VMP. A signed copy (hand written or digital signature) of the VMP must be onboard at all times**.** Each time a VMP is modified and sent to the agency for approval, the VMP would require a new signature and date.

The list below demonstrates a vessel's understanding of the EM system and Pacific Islands longline EM program. It also documents the system has been fully installed and is operational. The technician and vessel representative(s) should place their initials next to each bullet point and sign/date the bottom of this page. A copy of this document will be scanned and provided to the vessel.

- **I know how to complete the pre-trip check (if applicable) during the 72-hour notification. I know how to view the status of my cameras, GPS, and pressure sensor.**
- **I know how to control the EM system.**
- **I understand I will need to make the vessel available to the service provider between trips for hard drive collection and equipment maintenance. (Question: what is reasonable for fishermen, will also depend on what is reasonable for service provider)**
- **I understand the catch handling requirements to ensure the necessary program data are collected.**
- **I understand the trouble shooting required of me and when to call the support line.**
- **I have been shown where all EM system components are mounted. I understand the field of view and purpose of each camera as well when it will be recording.**
- **I have been given an example VMP. I understand I will need to keep an approved, signed, and current copy onboard.**
- **I am aware of the support line and know who to contact if there are EM system issues or if I have questions.**
- **I will clean the camera before and during EM trips. I will keep the deck well-lit during fishing operations.**
- **I understand the program requirements and will call the support line if I have any questions.**

This certifies that the vessel owner/operator has been trained in the function and operation of the EM system installed on the vessel and that the vessel owner/operator must comply with the components of this Vessel Monitoring Plan. A signed copy of this VMP must be aboard at all times when the vessel is participating in this Electronic Monitoring Program. Digital signatures are acceptable.

Vessel permit holder signature: _____ Date: _____

Vessel Operator signature: _____ Date: _____

Service provider representative signature: _____ Date: _____

NOAA fisheries VMP approval signature: _____ Date: _____

Discussion:

1) Is the vessel operator signature necessary? This is because of frequent turnover of captains and crew.
2) How to ensure captains are aware of the EM system and requirements if they've never been trained or briefed? Could this be the responsibility of the permit holder?