

2007 Shore-based Hake Fishery

At-Sea Electronic Monitoring Program

March 2007

Introduction

In order to stay within rebuilding plans and establish a standardized bycatch reporting method, an at-sea monitoring program is being established for the shore-based hake fishery. After considering various options, NOAA Fisheries has decided to apply electronic monitoring (EM) technology to monitor on the shore-based hake fleet.

Electronic monitoring has been tested over the last three years and many of the vessels are familiar with the technology and program. For those new to the program this document is intended to provide a brief overview of the project, the technology, explain where your involvement is needed and identify contact persons for further information.

Project Goal

NOAA's overall goal is to ensure high quality catch information in the shore-based component of the hake fishery. As well, NOAA seeks to ensure that the fleet complies with maximized catch retention to the greatest extent practical.

Why Are We Doing This?

NOAA is charged with ensuring that we stay within rebuilding plans for over fished species and with ensuring that bycatch reporting for the groundfish fishery meets certain standards. Fishery catch data come from sampling activities at shore side plants. An effective at-sea monitoring program is needed for the fishery to demonstrate with certainty that bycatch data from the plants accurately represents true catch levels at sea.

The at-sea monitoring program will be in place primarily to verify that fishing vessels comply with maximized catch retention requirements as outlined in Section F of the Exempted Fishing Permit (EFP) permit. If there is to be discard in the fishery, it should be minimal, non-selective and unsorted. At-sea monitoring will be also be in place to ensure that all instances of discarding are accurately recorded in fishing logbooks.

The most cost-effective at-sea monitoring method is with the use of EM System. At-sea monitoring with observers is less preferred due to greater cost and logistical difficulties with deploying observers for short trips on short notice.

What Is The Impetus For Fishing Vessels To Participate In This Program?

The terms of the 2007 Exempted Fishing Permit (EFP) includes the requirement for vessels to have electronic monitoring equipment supplied by a NMFS-specified EM system provider. Currently, NMFS has only specified Archipelago Marine Research Ltd. as providing EM systems

capable of providing the full complement of data necessary to attain the goals of this EFP. In seasons past, NOAA Fisheries has funded the entire EM program and this year NOAA plans to cost share the program with industry. The industry (EFP holders) will fund EM system rental as well as the EM system installation, maintenance and removal project components while NOAA Fisheries will continue to fund overall project administration, analysis and release of the data collected by EM systems. In 2005, NOAA Fisheries awarded a multi-year contract to Archipelago Marine Research Ltd. as a result of an open bid process. Despite the change to a co-funded program, Archipelago will continue to provide the EM program service to the fleet, adhering to the cost framework as specified in their contract with NOAA. As a condition of the EFP, vessels will be required to make arrangements with Archipelago for securing EM services.

Project Overview

The EM project for the shore-based hake fishery has seven components:

Outreach – Issues that will be presented include the goal of the project, why the project is taking place, the equipment being installed (including a demonstration), what is needed/expected of the fishers, what information is being collected, the data analysis, minimizing the disturbance to the vessel's operations, and data confidentiality concerns. As well, a summary of the past performance of the fleet targets will be discussed. This process includes public meetings and preparation of resource materials, such as this document.

EM System Provision – Archipelago will provide all EM Systems for all the vessels participating in the shore-based hake fishery, including the early season fishery in California.

Installation of EM System on Fleet – Archipelago staff will provide technical assistance to install EM Systems on all vessels participating in the fishery.

EM System Service – When promptly informed by the fleet, Archipelago staff will be available to repair (and maintain) any malfunctioning systems.

EM System Data Analysis and Reporting – All EM System data will be analyzed according to a structured routine. Summary data from the EM System will be compiled and reported to NOAA.

EM System Removal – All EM Systems will be removed from fishing vessels upon completion of the fishery.

Project Report – Upon completion of the fishing season, a report will be prepared to summarize the project results and highlighting the functionality of this technology for monitoring maximized retention in this fleet, and comments and feedback from stakeholders involved in the program.

Plan Of Action

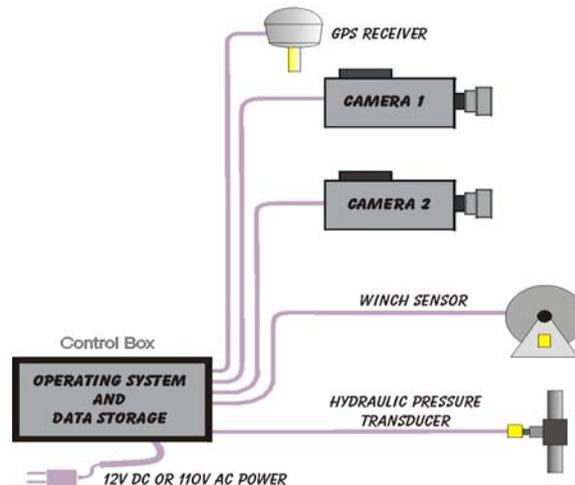
California – The EM project will be outlined at the March 15 meeting with fishing industry stakeholders. Installation of EM Systems is expected to commence late March.

Oregon and Washington – The EM project will be outlined at industry meetings in Newport and Astoria with EM System installations starting late in May.

Archipelago's project operations will be based from its head office in Victoria, BC. NOAA's project operations will be based from the Northwest Fisheries Office in Seattle, Washington.

Overview of EM Systems

The EM System is shown in the schematic diagram and components are described in the following sections.



Control Box - The heart of the EM System is a metal tamper-proof control box (approx. 15x10x8" = 0.7 cubic feet) that houses data storage and computer circuitry. Data from the EM System is recorded on a removable drive, mounted within the control box. An array of lights mounted externally on the control box will display the system operational status to the operator at all times. A laminated handout will describe the status lights and other EM System operation issues.

Cameras – Each vessel will be equipped with as many as three closed circuit television cameras to provide imagery of the trawl deck and the area astern of the vessel. The cameras are lightweight, compact and quickly attach to the vessel's standing structure with a universal stainless steel mount and band straps. These cameras have been successfully used in Canadian and American fisheries programs along the Pacific coast and in the Bering Sea.

GPS Receiver - An independent GPS receiver will be installed with each EM System. The GPS receiver and antenna are packaged together in a plastic dome that is easily mounted in the vessel rigging. The GPS delivers an accurate time base as well as vessel position, speed, heading, and position fix quality. The GPS antenna mounts on the cabin top away from any from other GPS or radio antennas.

Hydraulic Pressure Transducer – A pressure transducer mounts on the supply side of the warp winch hydraulic system to measure pressure and hence, work performed by winches.

Drum Rotation Sensor - A photoelectric drum rotation sensor mounts on the warp winch or net drum of each vessel. The small waterproof sensor can be mounted in an out of the way location on the winch frame where it will neither impact nor be impacted by regular hauling and setting operations.

EM System Data Capture Specifications

Sensor data is recorded and stored in the control box several times per minute. The operating system is designed to start automatically and reset itself after power interruptions or system lockups.

The stored data includes date, time, position, GPS positional error, vessel speed, vessel heading, winch rotation status, and hydraulic pressure. In addition to storing these data, the control box operating system interprets the sensor signals on the fly to initiate video recording on one or more cameras. Cameras are triggered by winch activity; therefore, they will not record imagery until fishing operations commence. Image capture begins during fishing operations and continues until the vessel lands to offload the catch. Whenever video is actively being captured the data logger sends a GPS caption sentence to the video computer to provide a geo-reference title for each frame of imagery.

EM System Installation

Prior to the EM installation the technician will meet with the vessel master to go over the EM System components, and discuss the best strategy for EM System installation on the vessel. The EM System installation process will usually be carried out two technicians and will take four to six hours. We will require crewmember assistance periodically for the installation of certain components and for system power up and testing. The installation process is greatly increased with consideration to the following:

Control Box Location - The control box must be mounted in a dry interior cabin location near a source of electrical power and where wires can be easily routed to the outside.

Control Box Electrical Supply - Crewmember assistance will be needed for setting up and testing the electrical supply. The control box must be continuously powered with 120 volts AC, or 12 volts DC. Inverted AC power is preferable but AC generator power is acceptable as long as the vessel computers have been proven to operate reliably from that source. If the control box is to be powered with a 12 volt DC source, it should be on a separately fused 15-ampere circuit. The maximum AC power draw of the control box is about the same as a desktop PC - 300 watts or less.

Wire Routing - Wire runs between the control box sensors should be accessible and located where they are out of the way, free from damage. There should be a minimum 1½ inch hole to feed wires between the cabin space and outside, preferably in a weather protected location. These modifications should be done by a crewmember.

Hydraulic Pressure Transducer – The sensor requires a ¼” National Pipe Thread female port, identical to what is required for mounting a pressure gauge. The transducer can be installed along with an existing pressure gauge or by installing a “T” fitting into a flexible hydraulic line. The transducer should be mounted anywhere on the supply side that powers the warp winches and clear of areas where the wire or transducer could be damaged. We will require crewmember assistance for the installation of this component.

System Run Up and Testing – Upon completion of the installation we will require crewmember assistance to enable us to run up and test the EM system. This involves starting the engine, powering the hydraulics and operating the winches.

EM System Operation

The EM System will operate automatically without any operator involvement. We will provide a single laminated page of EM System operation instructions. Included on the page are simple steps to ensure the EM System is operating properly and contact information if the equipment needs service. The following are basic requirements for EM System operation:

- While EM equipment is aboard the vessel, the system must not be interfered with, damaged, or the power source turned off. If the EM system is interfered with, damaged, or the power source turned off, it will be a violation of the terms and conditions of the EFP.
- The vessel operator must check status lights located on the EM system control box at least once per day to confirm that the EM system is functioning properly. If status lights indicate an EM system malfunction, the vessel must contact Archipelago immediately.
- Changes to the location of an EM System on or between fishing vessels is not permitted without the prior consent of Archipelago;
- During night time fishing operations, the camera field of view should be sufficiently illuminated to enable clear and accurate recording of imagery;
- Vessel personnel should take reasonable precautions to keep the EM System secure and free from damage while it is on the Vessel; and
- Vessel personnel are required to contact Archipelago as soon as possible if there is loss or damage to the EM System, or if the EM System does not appear to be operating properly.

EM System Service Schedule

EM data in the 2007 fishery will be collected once to twice during the fishery. Archipelago staff will arrange service times while vessels are in port.

Data Analysis Procedures

Archipelago has an important role of balancing the privacy concerns of fishing vessel crews and ensuring that EM System data are used effectively to addressing the following monitoring issues:

- Ensuring compliance with maximized catch retention;
- Ensuring that fishing logbooks accurately reflect fishing activities;
- Ensuring fishing activities occur in permitted fishing areas; and
- Ensuring that fishing vessels comply with EM System operation requirements.

For General Questions about the EFP Please Contact:

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For Questions Specific to the Electronic Monitoring Systems, Please Contact:

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