



GENERAL FISHERIES COMMISSION FOR THE
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COMMISSION GÉNÉRALE DES PÊCHES POUR
LA MÉDITERRANÉE



Ad hoc Working Group of the Compliance Committee of the GFCM on VMS as a MCS tool

Guidance to the revised draft recommendation concerning minimum standards for the establishment of a Vessel Monitoring System in the GFCM Area

Introduction

This guidance is meant to provide a very general overview of some primary considerations for the Ad-Hoc Working Group of the Compliance Committee on VMS as a MCS tool of the GFCM while it works to refine its draft recommendation concerning minimum standards for the establishment of a satellite based VMS in the GFCM Area. It is not to be taken as an all inclusive treatise on VMS but simply to raise a number of issues which it would be advisable to consider. Not all issues require complete resolution prior to adoption of the draft recommendation but it is useful to be aware of these issues and their potential ramifications¹.

While a number of options exist for vessel monitoring systems, the information presented in this guidance will be limited to satellite-based vessel monitoring systems and focused on the issues relevant to a determination on the Draft Recommendation Concerning Minimum Standards for the Establishment of Satellite Based Vessel Monitoring System in the GFCM Area.

A fishing vessel monitoring system (VMS) is a programme of fisheries surveillance in which equipment that is installed on fishing vessels provides information about the vessel's position. Although a VMS typically makes traditional surveillance and enforcement activities more effective, it does not replace them. Traditional MCS tools such as aerial and surface patrols and dockside inspections, continue to be essential components of effective MCS programmes. VMS is generally recognized as a cost effective tool used to improve the effectiveness of MCS.

¹ Additional suggested reading includes the Report of the Expert Consultation on the Use of Vessel Monitoring Systems and Satellites for Fisheries Monitoring, Control and Surveillance, FAO Rome 2006 and FAO technical Guidelines for Responsible Fisheries, Suppl. 1, Vessel Monitoring Systems (note this publication is in the process of being updated).

VMS programmes have expanded relatively quickly and are likely to continue to do so. At least 80 countries currently use or are planning to implement a VMS in the near future.

How It Works

In a satellite based VMS, shipboard electronic equipment is installed on board a fishing vessel and assigned a unique identifier. Most types of shipboard VMS equipment uses satellite communications systems that have an integrated Global Positioning System (GPS). The system calculates the unit's position, i.e. the vessel's position, and sends a data report to shoreside users. The standard data report includes the VMS unit's unique identifier, date, time and position in latitude and longitude.

The data report is communicated between the shipboard VMS unit and the monitoring agency's fishery monitoring centre. The preferred communications medium involves the use of satellite systems because the geographic coverage is greater.

In a satellite-based system, data reports sent from the vessel are transferred to a satellite and then on to a terrestrial, or "earth", station. The earth station validates and stores the data, and makes them available to the monitoring agency. The fishery monitoring centre retrieves the data, evaluates it and ultimately stores the data in a database.

The data provider might also be required to store data and to establish quality control protocols regarding the functioning of the system. This might be necessary for future legal proceedings.

Position Reports: Frequency and Implications

The vessel's position information (in latitude and longitude) is sent to fisheries monitoring agencies at certain predetermined intervals, e.g. every two hours, every hour, every thirty minutes or more frequently. In certain situations, such as when a vessel is approaching a closed area or has already crossed the boundary into such a restricted area, i.e. is believed to be engaging in illegal activity, monitoring agencies prefer to obtain position reports very frequently.

From the vessel's position and speed, as provided in a number of consecutive position reports, it is possible for a monitoring agency to draw conclusions about the activities of a vessel. Some MCS agencies have been able to use these conclusions to present a circumstantial case in a court of law to establish a vessel's activities, i.e. a vessel is fishing. But to date, most legal cases have concentrated on position of the vessels, as established by VMS, or on failures to properly use VMS, for example, turning it off during certain segments of a fishing trip.

The shorter the intervals between reports, the more which can be determined about a vessel's activities, especially when used in conjunction with other available information. The requirement for frequency of position reports is normally related to the intensity of a given fisheries management regime and the resources available to respond to VMS observations.

The identity and location of shipboard VMS units can be presented on a map display, comparing vessel positions with features of interest, such as EEZ boundaries and regulated fisheries areas which assist authorities in evaluating the vessel's activities and taking timely action.

Position information for a fishery can also be used to identify fishing effort and fleet location to more efficiently plan for surveillance deployment and management purposes.

Criteria and Requirements

Determining operational and performance specifications of a VMS system are important prior to selecting a VMS service provider. Security, speed, cost, functionality, accuracy, reliability are a few of the considerations.

Consideration should also be given to installation of VMS units aboard fishing vessels by certified installers. Operability of repaired units should also be certified.

As part of establishing a VMS, which vessels will be required to install and operate a VMS needs to be determined. If harmonization with the requirements of other bodies, such as RFMOs is a factor, this should be considered.

The timing of any new requirements and exactly what will be required, effective dates, and feasibility of compliance need to be determined.

Prior to committing to VMS, it is advisable to determine exactly what function VMS will serve in supporting specific fisheries management objectives. Undertaking such an analysis will assist in formulating fishery management rules where VMS can assist and maximizing the benefit from VMS systems and information.

Appropriate legal provisions supporting the use of VMS need to be in place so VMS can be appropriately utilized by authorities; modifications may be needed at the national and regional levels.

Benefits

Fisheries management authorities and fishing vessel operators make use of VMS in several ways.

A VMS can enhance the monitoring, control and surveillance (MCS) of fisheries in a cost-effective manner. Traditional MCS methods, such as aerial and surface patrols, are deployed randomly, or based on assessments of historical vessel activity, if known, and third party information. This is an expensive use of personnel and equipment, and the coverage of these traditional methods is relatively limited. A VMS continually informs the management authority of the location of each participant in a fishery at all times, at a fraction of the cost of traditional methods. Efficient patrols can be planned using the VMS. The VMS allows fishery agencies to deploy patrol assets effectively. Searching and travel times are reduced because the locations of the fishing fleet and individual vessels are known in advance of the patrols.

VMS can assist in conducting effective dockside inspections. The VMS can provide advance notice to fishery inspectors of routine arrivals into port by all fishing vessels, and also provide notification about the arrival of vessels that might be of special interest.

The VMS has proven its value in situations where vessel operators have been accused of alleged illegal activity, and the VMS provided information to the contrary.

For fishery management authorities, a VMS programme is not solely a technical solution to monitoring vessels. The additional components of the VMS are largely human, i.e. the policy makers and people who produce the legal framework, the technicians who install and maintain shipboard equipment, those who operate the communications links and staff the fishery monitoring centre, as well as the enforcement officers, investigators and legal personnel who analyze and respond to the information provided by the VMS. The VMS also includes the vessel operators and other industry contacts responsible for participation in the programme.

The VMS programme must be implemented and operated by people with an understanding of surveillance, computers and communications. In addition to the technical skills, however, the VMS staff must also have a comprehensive knowledge of the regulated fishing industry, including operations and activities. This knowledge is required to reliably interpret the information provided by the VMS, and also to plan and implement changes to the VMS and responses to provided information.

If integrated, the VMS database can also consolidate other information about vessels and operators (e.g. vessel characteristics, contact information, licenses and registries, etc.), making this information available in one convenient location.

The VMS equipment and service offers affordable and secure communications. The fishery management authority may authorize the use of the VMS unit as a communications device. If the equipment is capable of this function, it may provide relatively cost-effective and secure communications for many purposes. An example could be the arranging for sale of fish on board the vessel at sea, in advance of landing the fish in port.

VMS can also play a range of roles in vessel safety.

Limitations

A VMS is one of many tools that can be used in monitoring compliance with fisheries regulations. Traditional surveillance is also required to monitor vessels that are not part of a VMS programme, or to monitor vessels with faulty VMS equipment as some of these vessels may be fishing illegally. Traditional surveillance techniques are also required to detect illegal tampering with VMS equipment.

Tampering

On board the vessels, intentional tampering with VMS equipment exists in several forms. The simplest methods are blocking the antenna, disrupting the power source, removing the unit from the vessel, or otherwise disabling the unit's normal functionality. The blockage of normal transmissions can be difficult to prevent and identify, but some shipboard equipment has a built-in alerting function – if the antenna is disconnected or blocked, the end user is notified when it is reconnected or unblocked.

The disruption of power to shipboard electronics, including the VMS unit, is common on fishing vessels. Power failures are often accidental, but can sometimes be wilful. Like blocking the antenna, many VMS units will send a status report that power has been interrupted and restored. Physical removal or relocation of a unit is best detected by audits

and inspections. Provisions should be made for these situations, i.e. a back up or alternative system of reporting, which can be used to communicate information in a timely way to the management authorities. Frequency of alternative reports and contents of reports should be carefully considered.

More egregious and technically more difficult types of tampering include the creation of unauthorized duplicate units (cloning), and the introduction of false information into data reports (spoofing). Cloning means the creation of a duplicate VMS unit, installed in some location that is legal from a fisheries management perspective and that appears to the management authority to report normally. During this time, the original unit aboard the regulated vessel is disabled and the vessel may be engaged in unlawful activity that is not detected via the VMS.

It should be noted that tampering is sometimes difficult to distinguish from normal failures of the electronic equipment. Management authorities should conduct routine inspections of VMS equipment, and have legal provisions for penalties that are appropriate for the various forms of documented tampering.

Security of VMS information

The security of VMS data is important both to fishing vessel operators and to fishery management authorities.

Security is essential to the fishery management authorities, as they have a responsibility to ensure that the VMS information is:

- Authentic and non-repudiated, i.e. the data were provided from a verifiable source, and that source cannot deny sending the data.
- Of high integrity, i.e. the data have not been altered from vessel to FMC, false data have not entered the system, and the chain of data transfers is recorded and auditable.
- Restricted access, if appropriate, i.e. the data have been protected from unauthorized access and usage as appropriately determined.

The FMC should be housed in a physically secure location that ensures that only certain personnel can access the VMS data. These personnel should have the appropriate training and authorization to access the VMS. The FMC should also have operational and policy provisions to guarantee that the data are safe from damage or disclosure.

Sharing of VMS Information

VMS programmes may incorporate several types of information that are desirable to exchange with other agencies, including VMS position information, permit and license registries, catch certificates and trade documents, electronic fishing logbook information, customs tariff codes and fish product tracing information.

Sharing VMS data with other management agencies should be considered to support the efforts to prevent, deter and eliminate IUU fishing and related activities. Linkages among Flag States, Port States, and Coastal States should be considered as VMS data is a desirable tool for detection of illegal activities when shared on a timely basis.

Role of Secretariat

RFMOs have taken a variety of approaches in implementing a VMS to meet their needs and circumstances. Often adopting a phased approach is advisable which will allow issues to be addressed on an as needed basis. Providing reports to the Secretariat for various purposes, such as scientific and administrative, allows collective solutions to be discussed and maximizes the utility of VMS data. Expectations should be realistic as a break in period to sort out problems will likely occur.