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RFMO VESSEL MONITORING SYSTEMS: A Comparative Analysis to Identify Best Practices

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Abstract

Regional Fisheries Management Organizations (RFMOs) for highly migratory species, straddling stocks and discrete high-seas stocks, have established either centralized RFMO satellite vessel monitoring systems (VMS) for the high seas of their areas of competence or prescribed requirements for national VMS systems to apply to vessels that operate in the RFMO areas of competence.

This Technical Report examines and compares these existing RFMO VMS programs and the prescribed operational and technical specifications. In the final section of the Report, the results of the survey of RFMO VMS programs are used to identify a set of Best Practices for VMS.

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Executive Summary

Regional Fisheries Management Organizations (RFMOs) for highly migratory species, straddling stocks and discrete high-seas stocks, have established either centralized RFMO satellite vessel monitoring systems (VMS) for the high seas of their areas of competence or prescribed requirements for national VMS systems to apply to vessels that operate in the RFMO areas of competence.

This Technical Report compares the satellite vessel monitoring systems (VMS) that are in place in regional fisheries management organizations (RFMO), or requirements for national VMS systems for vessels that operate in RFMO convention areas, and identifies a set of Best Practices that could be used by States and RFMOs in the development or strengthening of national, regional or sub-regional VMS programs for fishing vessels.

A discussion of Automatic Identification System (AIS) is also included in this Report. AIS has begun to be required by some States and fleets to track fishing vessel movements and monitor their activities, and some RFMOs are also considering the utility of AIS as part of their suite of monitoring, control and surveillance options. In addition, AIS is being advocated by some non-governmental organizations as an important tool to enhance the transparency and public accountability of fishing operations; combat illegal, unreported and unregulated fishing; and strengthen compliance.[1]

Publicly available sources of information and documents or technical specifications provided by RFMO Secretariats were consulted and used for this Report. This Report also utilized the conventions, resolutions, conservation and management measures, rules and procedures, and other reports, memoranda of understanding, and standards-setting documents that are posted on the websites for the five tuna RFMOs (ICCAT, IOTC, CCSBT, IATTC and WCPFC) and five non-tuna RFMOs (NAFO, NEAFC, SPRFMO, SEAFO and CCAMLR), which were posted online or released by a national government authority or by private services providers.

Key Findings:

1. **All of the tuna RFMOs surveyed have measures requiring VMS for fishing vessels and carrier vessels.**
2. **Only the WCPFC and the SPRFMO VMS are "centralized" and provide for simultaneous transmission of reports to the Secretariat and flag State.**
3. **Applicable vessel size, type and transmission frequencies vary among RFMOs.**
4. **Use of VMS data for science or compliance purposes within the RFMO governance system also varies among RFMOs.**

[1] Personal communications with Pew Charitable Trusts, the World Wildlife Fund and SkyTruth.

Research Questions

These research questions are for readers to begin to examine how aspects of our best-practice recommendations for support vessels may help them in their work. The questions are not intended to be comprehensive or represent every recommendation in the Report, but are designed to assist users in identifying how to use these best practices. We have organized these questions around the key themes covered in the Report.

- **Do RFMOs require VMS on fishing and other vessel types?**
- **How are these VMS programs designed?**
- **What data are reported, on what frequency and to whom?**
- **How are these VMS data used by flag States and RFMOs?**

Introduction

This Technical Report is a comprehensive survey of the current operational requirements and designs of regional fisheries management organizations (RFMO) satellite vessel monitoring systems (VMS) programs. The purpose of this Technical Report is to survey the centralized VMS programs in place in RFMOs, or requirements for national VMS systems for vessels that operate in RFMO convention areas, and to identify best practices that could be used by States and RFMOs in the development or strengthening of national, regional or sub-regional VMS programs.

To identify a set of best practices, 10 VMS programs in use in regional fisheries management organizations responsible for the conservation and management of either highly migratory fish stocks — or straddling or discrete high-seas fish stocks — in the Atlantic, Pacific, Indian and Southern Oceans were reviewed.

Table 1 summarizes specific core requirements and programmatic elements for the Western and Central Pacific Fisheries Commission (WCPFC), the Indian Ocean Tuna Commission (IOTC), the Inter-American Tropical Tuna Commission (IATTC), the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), the International Commission for the Conservation of Atlantic Tunas (ICCAT), the Northwest Atlantic Fisheries Organization (NAFO), the North East Atlantic Fisheries Commission (NEAFC), the South East Atlantic Fisheries Organization (SEAFO), and the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).

This Technical Report is composed of two sections:

- Section I surveys the existing VMS programs or requirements in WCPFC, IOTC, IATTC, CCSBT, ICCAT, NAFO, NEAFC, SEAFO, SPRFMO, CCAMLR.[2] This section also surveys AIS and compares its operational and technical specifications to VMS programs.
- Section II recommends a set of best practices.

VMS is primarily a surveillance tool used by national authorities, and some RFMOs, for compliance and enforcement purposes, managing sensitive areas, monitoring arrivals in port and movements in and out of EEZs, tracking and monitoring fishing effort and location, managing observer programs, cross-checking and validating data from other sources, identifying fishing vessels, and other safety and security purposes.

[2] CCAMLR is not generally considered a RFMO in the same context as the other organisations profiled here. CCAMLR operates within a broader institutional framework -- the Antarctic Treaty System -- and its membership is divided among active fishing States and other States whose interest is confined to research and conservation.

Vessel Monitoring Systems

Vessel monitoring systems are programs that use on-board transceiver units (automatic location communicators [ALCs]) that transmit reports, at fixed or variable intervals, to satellites, which are then received by land-based fisheries monitoring centers (FMCs).

The on-board transceivers typically transmit position, the vessel identifier, time, and date. Some ALCs can transmit catch (weekly and upon entry/exit from a specific area) and transshipment reports, port of landing, speed over ground, heading and other data. The information transmitted through a VMS in real time is considered commercially sensitive; as a result, the data from these programs are not usually publicly available (except under certain circumstances and in line with confidentiality rules or national legislation). Data from VMS reports are often mapped and displayed on a computer.

VMS is primarily a surveillance tool used by national regulatory authorities, and some RFMOs, for compliance and enforcement purposes, management of sensitive areas (such as marine sanctuaries or marine protected areas), monitoring arrivals in port and movements in and out of exclusive economic zones (EEZs), tracking and monitoring fishing effort and location, managing observer programs, cross-checking and validating data from other sources, identifying fishing vessels, and other safety and security purposes.[3] ALC units are designed to be highly resistant to tampering, which could result in false or fake position or other data reports. The low earth orbit or geosynchronous satellite systems that are typically used to report data to the FMCs include Inmarsat, Iridium, and Argos, among others.

RFMO VMS Requirements

Tables 1 and 2 provide a summary of the following core operational elements of existing and operational RFMO VMS Programs and AIS:

- Applicable vessel sizes and types
- Required minimum data to be transmitted and recipients
- Data collection and frequency of reporting
- Polling
- Procedures in the event of ALC malfunction
- Requirements for ALC set types
- Requirements for tamper-proof ALCs
- Use of data by RFMOs
- Rules for use of data

WCPFC

The Western and Central Pacific Fisheries Commission (WCPFC) operates a centralized VMS for all vessels that are authorized to fish for highly migratory fish stocks on the high seas in the Convention Area. The WCPFC has also adopted

[3] http://www.nmfs.noaa.gov/ole/about/our_programs/vessel_monitoring.html

a set of VMS Standards, Specifications and Procedures (SSPs) and a set of Standard Operating Procedures (SOPs).[4] These SSP and SOPs set out detailed standards for the operation of the Commission VMS. The WCPFC VMS came into operation on April 1, 2009, and VMS services are delivered through a service level agreement with the Pacific Islands Forum Fisheries Agency (FFA). The approved structure of the WCPFC VMS system allows vessels to report to the WCPFC through two ways: (i) directly to the WCPFC VMS, or (ii) to the WCPFC VMS through the FFA VMS." The WCPFC has adopted reporting guidelines that set out the responsibilities and requirements for the WCPFC VMS.[5]

The WCPFC VMS was applied to the high seas areas in phases, primarily due to reported operational difficulties of some small vessels in complying with the VMS requirements. For example, until 2012, the WCPFC VMS covered only the high seas waters of the Convention Area south of 20N and east of 175E in the area north of 20N[6]. However, vessels moving from southern and eastern quadrants into the northern quadrant had to keep their ALC/MTU activated and continue to report to the WCPFC VMS[7]. The WCPFC has procedures for the application of the Commission VMS to waters under the jurisdiction of members, upon the request of the member, and the provision of those data (called "in-zone VMS data") for vessels reporting to the Commission VMS who enter these waters under national jurisdiction[8]. These in-zone VMS data are to be used only for the same purposes as high seas Commission VMS data (monitoring, control and surveillance (MCS) and scientific purposes[9]. The WCPFC has also adopted special provisions for VMS reporting relating to some of its conservation measures for tunas. For example, during FAD closure periods, purse seine vessels are not to operate under the manual reporting provisions of the WCPFC VMS SSPs and the VMS polling frequency is increased to every 30 minutes.

IOTC

The Indian Ocean Tuna Commission (IOTC) has a Vessel Monitoring System Programme, which is implemented through national programs. Each Contracting Party and Cooperating Non-Contracting Party (CPC) is to adopt a satellite-based vessel monitoring system for all vessels flying its flag 24 meters in length overall or above, or in case of vessels less than 24 meters, those operating in waters outside the Economic Exclusive Zone of the Flag State fishing for species covered by the IOTC Agreement within the IOTC area of competence.

IOTC is empowered to establish guidelines for the registration, implementation and operation of VMS in the IOTC Area with a view to standardizing VMSs implemented by each CPC. However, the IOTC has not yet adopted these guidelines. IOTC has a VMS report template for providing reports on the implementation of the VMS requirements to the Secretariat. IOTC established a VMS Working Group to provide advice and options for the model of a future IOTC Commission VMS,

[4] Standards, specifications and procedures (SSP) for the fishing vessel monitoring system (VMS) of the Western and Central Pacific Fisheries Commission and Commission VMS Standard Operating Procedures (versions as of December, 2021)

[5] https://www.wcpfc.int/doc/tcc-05/vms-reporting-requirements-draft-guidelines

[6] See WCPFC9 Summary Report: WCPFC, paragraph 285: WCPFC9 endorsed the NC members commitment to implement VMS in the area north of 20N and west of 175E by 31 December 2013."

[7] Annual Report for the Commission VMS (WCPFC-TCC9-2013-RP01, 13 September 2013)

[8] This policy is known informally as "Flick the Switch." WCPFC9 Annual Meeting Summary Report (paragraph 234-239)

[9] Commission Rules and Procedures for the Protection of, Access to and Dissemination of High Seas Non-Public Domain Data and Information Compiled by the Commission for the Purpose of Monitoring, Control or Surveillance (MCS) Activities and the Access to and Dissemination of High Seas VMS Data for Scientific Purposes (Commission's 2009 Rules and Procedures), paragraph 35.

including scope, application, hosting options, methods for real-time or near-real-time position reporting, funding models, rules and procedures for data sharing, use and protection and improvements to its VMS Resolution.[10]

IATTC

The Inter-American Tropical Tuna Commission (IATTC) has a Vessel Monitoring System, which is implemented through national programs. IATTC requires CPCs to ensure that all their commercial fishing vessels 24 meters or more in length, operating in the Eastern Pacific Ocean (EPO) and harvesting tuna or tuna-like species, are equipped with a satellite-based VMS. Resolution C-14-02 outlines specific operational details, including the data to be collected by the VMS for each vessel and the reporting frequency.**[11]** These data were not required to be sent to the IATTC Secretariat, however.[12] In 2021, IATTC agreed that, starting in 2023, CPCs shall report, or require their vessels to report to the IATTC, complete VMS data for all vessels required to carry VMS. The information reported to the Secretariat shall include, at a minimum, the information specified in Paragraphs 2(a) of and 2(b) of C-14-2021. Also, where the flag CPC requires more frequent polling rates, they are encouraged to submit higher-frequency VMS data. These VMS data are to be reported every two months and with a time delay no longer than 90 days and treated in accordance with Resolution C-15-07 on data confidentiality policy and procedures. The IATTC Secretariat is also to develop a format for approval by the Commission for reporting of these VMS data.

ICCAT

The International Commission for the Conservation of Atlantic Tunas (ICCAT) has minimum standards for VMS systems operated by CPCs for vessels flying their flags in the ICCAT Convention Area (Recommendation 18-10). ICCAT requires VMS on all commercial fishing vessels exceeding 20 meters between perpendiculars or 24 meters length overall, and on all vessels above 15 meters length overall that are authorised to fish beyond national jurisdiction. ICCAT also requires vessels authorized for transshipment to install and continuously operate a VMS in accordance with all applicable ICCAT recommendations.[13] ICCAT requires polling every two hours, except for purse seine vessels that are required to poll every hour.

ICCAT has also adopted data exchange formats and additional specific VMS requirements for the Eastern Atlantic and Mediterranean bluefin tuna fishery[14] that built on the minimum standards.[15] In particular, for this fishery, transmission of

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[10] https://www.iotc.org/meetings/4th-meeting-vessel-monitoring-system-working-group-vmswg04

[11] Resolution C-14-02, paragraph 2: "While specific operational details of CPCs' VMS requirements may vary, CPCs shall ensure that: (a) The information collected by the VMS for each vessel shall include: i) the vessel's identification; ii) the vessel's geographical position (latitude and longitude), with an error of less than 100 meters at a confidence level of 98%; iii) the date and time (UTC) of the fixing of the vessel's position, and; iv) the vessel's speed and course; (b) The information in paragraph 2.a) above shall be collected at least every four hours for longliners and two hours for other vessels by the land-based Fisheries Monitoring Centre (FMC) of the flag CPC; and (c) VMS equipment installed on vessels will, at a minimum, be tamper evident, fully automatic for regular position data reporting, operational at all times regardless of environmental conditions, and, if possible, capable of manual transmission of reports and messages.

[12] Resolution C-14-02. paragraph 4: "If practicable, the VMS equipment should be usable to transmit to the Director the data required in the relevant IATTC Resolutions, including C-03-04 and C-03-05."

[13] ICCAT Recommendation 2021-15.

[14] ICCAT Recommendations 10-04, 12-03 13-07 and 14-04.

[15] ICCAT Recommendation 03-14 (concerning minimum standards for the establishment of a VMS in the ICCAT Convention area), Recommendation 07-08 (concerning data exchange format and protocol in relation to the VMS for the Bluefin tuna fishery in the ICCAT Convention area) and Recommendation 14-09 (amending Recommendation 03-14) concerning minimum standards for the establishment of a vessel monitoring system in the ICCAT Convention area.

VMS data is required for fishing vessels over 15m in length included in the ICCAT Bluefin tuna record of "catching" and "other" vessels, prescribes specific data that is to be transmitted in VMS reports, requires that VMS data be sent to the ICCAT Secretariat, sets stricter manual reporting rules in case of a ALC breakdown, provides that VMS data can be made available by the ICCAT Secretariat to Party inspection vessels operating under the ICCAT Scheme of Joint International Inspection and stipulated that 3-year old VMS data be sent to the ICCAT scientific committee on research and statistics. Recommendations establishing a multi-annual recovery plan for bluefin tuna in the eastern Atlantic and Mediterranean provide specific rules for the transmission of VMS data by fishing vessels included in the ICCAT bluefin tuna record (see Table 1).

CCSBT

The Commission for the Conservation of Southern Bluefin Tuna (CCSBT) VMS requires CPCs to adopt and implement satellite-linked VMS for vessels fishing for southern bluefin tuna as specified by the relevant VMS requirements of the RFMO in which the fishing for southern bluefin tuna[16] is being conducted (i.e., IOTC, WCPFC, CCAMLR or ICCAT)[17]. The CCSBT VMS Resolution[18] requires that when CPCs are fishing for southern bluefin tuna outside of these RFMO convention areas, the IOTC VMS requirements must be followed. The CCSBT has adopted: (1) reporting requirements for when an ALC unit is not functioning, (2) procedures for the confidentiality, use and security of VMS data, and (3) reporting requirements that the specified data are to be transmitted to relevant national and regional authorities at least once every 4 hours. [19]

NAFO

The Northwest Atlantic Fisheries Organization (NAFO) VMS regulations [20] require that NAFO CPCs implement a satellite-based VMS for all fishing vessels operating in the NAFO Regulatory Area. Flag States establish and operate the VMS for vessels flying their flag and fishing in the NAFO Regulatory Area. The NAFO regulations also prescribe minimum operational requirements for these national programs.

NEAFC

The Northeast Atlantic Fisheries Commission (NEAFC) Scheme of Control and Enforcement[21] contains its VMS requirements. NEAFC's VMS regulations require that NEAFC Parties implement a satellite-based VMS for its fishing vessels exceeding 20 meters between perpendiculars or 24 meters overall length that fish, or plan to fish, in the NEAFC Regulatory Area. Flag States establish and operate the VMS for vessels flying their flag and fishing in the NEAFC Regulatory Area. The NEAFC regulations also prescribe minimum operational requirements for these national programs.

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[16] These other tuna RFMOs have the competence to manage tropical tuna species and certain other highly migratory tuna species, such as albacore. CCSBT is recognized by these RFMOs as having the primary responsibility for the conservation and management of southern bluefin tuna stocks.

[17] Resolution on the CCSBT Vessel Monitoring System (VMS), – 12 October 2017.

[18] ibid.

[19] Ibid.

[20] Serial No. N7254, NAFO/COM Doc. 22-01; Article 29.

[21] https://www.neafc.org/scheme/Chapter3/article11

SPRFMO

The South Pacific Regional Fisheries Management Organization (SPRFMO) established its VMS via CMM 06-2018. This CMM was replaced in 2020 by CMM 06-2020. The SPRFMO VMS will continuously monitor the movements and activity of all fishing vessels that are on the SPRFMO Record of Vessels and authorized by CPCs to fish for fisheries resources in the SPRFMO Convention Area, and have a buffer zone of 100 nautical miles outside the Convention Area. The buffer zone shall not apply to vessels flagged to adjacent coastal States fishing in waters under their jurisdiction. The SPRFMO VMS applies to all vessels as defined in the SPRFMO Convention, and reports will be sent to the Secretariat via the flag State or sent simultaneously to both. Like the WCPFC VMS, at the request of a CPC, the waters under its national jurisdiction may be included within the area covered by the Commission VMS. CMM 06-2020 explicitly provides that VMS data can be used by the Members and CNCPs, in accordance with the provisions of the CMM, for compliance purposes. These VMS data may also be used by the SPRFMO Scientific Committee for analysis to support specific scientific advice requested by the Commission

These data may be provided, without the consent of a member, only for planning of or active surveillance operations or inspections at-sea and supporting search and rescue operations or inspections at sea. CMM 06-2020 provides rules to prevent ALC tampering and procedures for manual reporting in the vent of ALC failure. The SPRFMO has also developed minimum standards for ALC, security and confidentiality requirements, and rules and procedures for the access, use and release of VMS data.

CCAMLR[22]

The Commission for the Conservation of Antarctic Living Resources (CCAMLR) VMS regulations[23] require that CCAMLR Parties implement a satellite-based VMS for all fishing vessels licensed to operate in the CCAMLR Convention Area that allows for the continuous reporting (at least every 15 minutes) of their position in the Convention Area for the duration of the license. Flag States establish and operate the VMS for vessels flying their flag, but CCAMLR measures prescribe detailed operational requirements, including transmission frequencies for different fisheries (see Table 2), minimum standards for ALCs, procedures for ALC transmission failure, etc.

SEAFO

The South East Atlantic Fisheries Organization (SEAFO) VMS requirements are part of its System of Observation, Inspection, Compliance and Enforcement.[24] SEAFO VMS regulations require that CPCs implement a satellite-based VMS for all fishing vessels and fishing research vessels operating or intending to operate in the SEAFO Convention Area. Flag States establish and operate the VMS for vessels flying their flag and fishing or conducting research in the SEAFO Area. The SEAFO regulations also prescribe minimum operational requirements for these national programs, including manual reporting in the event of a unit breakdown, reporting frequencies, etc.

[22] CCAMLR is not generally considered an RFMO in the same context as the other organisations profiled here. CCAMLR operates within a broader institutional framework -- the Antarctic Treaty System -- and its membership is divided among active fishing States and other States whose interest is confined to research and conservation.

[23] https://cm.ccamlr.org/sites/default/files/10-04_43.pdf

[24] http://www.seafo.org/Management/System_docs; Article 13.

Automatic Identification System (AIS)

Automatic Identification System (AIS) is a system used on ships and by vessel traffic services for tracking, identifying and locating vessels by automatically and electronically broadcasting position, course, speed and other data to ships that are nearby, AIS land-based stations and aircraft. AIS is a supplement to other systems, such as marine radar, for collision avoidance. AIS is composed of a radio transceiver and a positioning system, and can be integrated with other navigation equipment on board a ship. Vessels with AIS can be tracked by land-based AIS stations when within range of the coast, and farther out at sea by satellites that are fitted with special AIS receivers. Unlike VMS units, AIS units can be individually programmed by vessel operators to transmit additional data attributes (e.g., vessel name, vessel type, ship dimensions (length and breadth), size, flag State identification) and thus are not tamper-proof. There are currently several civilian satellites that receive AIS transmissions, and satellite AIS data are sold to clients. The limited number of civilian satellites in orbit capable of receiving and processing AIS signals may result in gaps in global coverage of transmissions (i.e., 2-3 hours between data reports). As new satellites are deployed with AIS receivers, these gaps should be reduced in the future.[25]

The International Maritime Organization International Convention for the Safety of Life at Sea (SOLAS)[26] requires that international voyaging ships of 300 GT or greater, cargo ships of 500GT or greater not engaged in international voyages, and all passenger ships (regardless of size) carry AIS.[27] Regulation 19 requires that AIS automatically transmit information on the ship's identity, type, position course, speed, and other safety related information, automatically receive such data from other ships and exchange data with shore based stations. At present, thousands of fishing vessels are carrying and reporting position data through AIS across the world's oceans.[28] AIS can serve to complement VMS and provide for public oversight of vessel movements at sea that is not possible with current RFMO VMS programs that are closed systems where data are not publicly accessible.

[25] SkyTruth, personal communication.

[26] Regulation 19 of SOLAS Chapter V – Carriage requirements for ship borne navigational systems and equipment; Resolution A.917(22) – Guidelines for the onboard operational use of ship borne automatic identification systems (AIS); MSC.74(69) - Recommendation on Performance Standards for Universal Automatic Identification System (AIS)

[27] http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-(SOLAS),-1974.aspx

[28] SkyTruth, personal communication.

Recommendations

Best Practices for RFMO VMS were identified through the review in Section I and are those that promote transparency, ensure the availability and utility of VMS data to monitor the implementation of conservation measures and combat IUU fishing, support scientific analyses or research programs, and minimize the risk of false reports, gaps in position reporting, or tampering with the ALC units. These Best Practices are recommended to assist RFMOs and States in improving and harmonizing VMS programs.

These identified Best Practices are consistent with and build on the operational performance requirements outlined in the VMS Supplement of the Food and Agriculture Organization Technical Guidelines for Responsible Fisheries No. 1 (Fishing Operations),[29] which also made specific recommendations on common data exchange formats and protocols for VMS.

Recommendation 1: Scope

- RFMOs should:
  - Define the size of vessel to which the VMS program applies as at least 20m LOA (or any vessel with the capacity to operate outside of the EEZ of its flag State) that operates on the high seas.
  - Define the geographical area where the VMS applies (e.g. high seas, or in EEZs if coastal States request it).
  - Ensure that the VMS covers includes reefers, carrier and support/tender vessels and any other vessel type authorized to engage in fishing-related operations, such as transshipment.

Recommendation 2: Data to be Transmitted

- RFMO VMS programs should, at a minimum, require the following are transmitted from each fishing vessel:

  a) Vessel name
  b) Vessel identifier (registration number, IMO and IRCS if applicable)
  c) Vessel position (latitude and longitude), either current or most recent, with minimum accuracy requirements of a margin of error of less than 100m
  d) Date and time expressed as UTC

- It is also recommended that States and RFMOs also require:

  a) Course
  b) Speed
  c) Activity (fishing, transshipping, searching, transit, etc.)
  d) Estimate of catch (such as via an electronic logbook or e-form integrated with the VMS[30])[31]

[29] ftp://ftp.fao.org/docrep/fao/003/w9633e/w9633e00.pdf (1998)

[30] The Secretariat of the Pacific Community's Oceanic Fisheries Program (SPC-OFP) has developed an electronic catch reporting form ("e-TUNALOG"), which allows catch data to be transmitted by email to multiple recipients in a format that can be integrated into coastal State or SPC-OFP catch and effort database. It also uses the same form currently required regionally and the data is integrated with a vessel's VMS data once in the databases.

[31] IATTC encourages the use of VMS to transmit the weekly data report required in the Resolution on At-Sea Reporting (C-03-04). In 1999, NEAFC began to require some vessels to submit catch data using VMS; however, now most vessels use electronic logbooks (Electronic Reporting System). In 2011, NAFO began to require fishing vessels to transmit daily catch notifications of catch quantities by species and location while fishing in the Regulatory Area. SEAFO also requires catch reports be submitted electronically every five days.

- In developing requirements and tools for electronic catch reporting using VMS, RFMOs should ensure that formats and communications protocols are standardized so that:
    - When vessels move between jurisdictions (such as between waters under the national jurisdiction of two or more coastal States or between waters of a coastal State and the high seas) confusion among vessel operators is reduced
    - There is no need for vessels to carry more than one type of software or tool
    - Inoperability between existing coastal State, RFMO, regional or sub-regional arrangement catch and effort or VMS databases is avoided

Recommendation 3: Data Exchange Formats

- In order to ensure usability of VMS data and the transmission of data between flag States and/or RFMOs, if they have not yet been established,[32] RFMOS should establish standard reporting formats for VMS messages and protocols and exchanging such data.

Recommendation 4: Reporting Frequency

- RFMOs should require that ALCs be continuously operating while in the applicable RFMO area or competence, and be capable of transmitting data at least hourly even when in port.
- RFMOs should require that data be transmitted at least every 2 hours. The precise frequency of the transmission of the VMS data to the RFMO Secretariat and/or the flag State and, where appropriate, coastal States can vary depending on the types of fishing operations and conservation measures being monitored or other MCS needs. One to two hourly transmissions have been recommended for scientific purposes[33] to estimate fishing effort and a because a typical purse seine set takes approximately 3 hours.

Recommendation 5: Recipients of VMS Reports

- RFMO VMS programs should define which entities VMS data are reported to, and these should include:
    a) The flag State Fisheries Management Centre;
    b) Either simultaneous or immediate and automated re-reporting from the FMC to coastal States when the vessel is operating in waters under coastal State national jurisdiction; and
    c) Simultaneous or immediate and automated re-reporting in "near real time" to the RFMO where the vessel is operating. The best practice for ensuring comprehensive data sharing, and to ensure VMS data can be used for scientific or compliance purposes, is for RFMO VMS to be designed as centralized or partly centralized programs.
- RFMO VMS programs should mandate that coastal States receive, and be able to use for prescribed purposes, VMS reports for foreign-flagged vessels when they are present in their EEZs, or within a prescribed distance from waters under their national jurisdiction, when those vessels are reporting to an RFMO VMS and those VMS reports do not automatically go to the coastal State.
- If VMS reports are sent first to flag State FMCs, then the RFMO Secretariat should receive the individual reports on a "near-real time" basis (e.g., within at least the same frequency as the VMS reporting requirement and via an automated process that does not involve human intervention).

[32] For instance, ICCAT, NEAFC, NAFO and SEAFO use the North Atlantic Format (NAF).

[33] ISSF Technical Report 2012-10: Report of the 2012 ISSF Stock Assessment Workshop: Understanding Purse Seine CPUE (Rome, Italy, July 16-19, 2012)

Recommendation 6: Use of VMS Data

- RFMO VMS programs should establish procedures for the transmission and use of VMS reports by the RFMO Secretariat and RFMO subsidiary bodies for scientific and compliance purposes, such as for monitoring the implementation of conservation and management measures and verifying catch or transshipment documentation.

- These procedures should also facilitate the use of near-real time VMS data for authorized enforcement and inspection purposes that are in accordance with an RFMO MCS or joint inspection schemes.

Recommendation 7: Confidentiality Rules

- RFMOs should establish rules to protect the confidentiality and security of VMS data transmitted to the RFMO Secretariat or CPCs or coastal States. However, these rules should not be overly restrictive such that those data are of limited use for scientific or compliance purposes.
- Each release of VMS data to other CPCs for specific purposes as agreed between the CPCs in RFMO measures should not first require the consent of the flag State of the vessel providing the VMS reports.
- RFMOs should develop different confidentiality rules for "near-real time" VMS data and "historical" VMS data (e.g., data that are 2 years old or more) that provide more flexibility in the use of reported VMS data, such as for scientific purposes.[34] In addition, VMS data for vessels flying their flag should be kept by the flag State, in a computerized readable form, for at least 3 years.

Recommendation 8: Minimum Standards for ALC

- RFMOs should define minimum technical standards for ALC units for operational performance, design specifications and security features to ensure consistency between existing national VMS programs.
- At minimum, these standards should include requirements for ALCs units to be sealed, and include official seals or other "tamper evident" mechanisms that will indicate whether the unit has been accessed or tampered, and allow for two-way communication and polling on demand.

Recommendation 9: Procedures for Defective or Inoperable ALC Units and Alternative Reporting

- RFMOs should establish clear procedures for when an ALC unit malfunctions.
- These procedures should define the procedures a vessel must follow in the event of an ALC unit breakdown, and should include, at a minimum:
    a) That the unit must be fixed or replaced within 30 days or the vessel must return to port
    b) That there is no fishing after the 30-day period until the unit is working; and that the vessel must report manually at prescribed intervals all required data that would be provided by the ALC

[34] For example, both the WCPFC and ICCAT allow access to VMS data by their scientific experts or service providers. The WCPFC Rules and Procedures for the Protection, Access to, and Dissemination of High Seas Non-Public Domain Data and Information Compiled by the Commission for the Purpose of MCS Activities and the Access to and Dissemination of High Seas VMS Data for Scientific Purposes (2009) prescribes a two-year time lag for access to high seas VMS data by the Authorized Management Entities and Personnel of Members. For near-real time high seas VMS data, the WCPFC allows these data to be made available for planning tagging programs, in accordance with those rules and procedures, and only with the consent of the Member(s) who provided the data to the Commission. The ICCAT Rules and Procedures for the Protection, Access to, and Dissemination of Data Compiled by ICCAT (2010) authorize the Standing Committee on Research and Statistics (SCRS) to use VMS data for scientific purposes, after signing the Commission's confidentiality protocol.

Recommendation 10: Two-way Systems and Polling

- RFMOs should establish a requirement that VMS programs be designed to allow remote polling of the vessel by an operator (such as in the management authorities of the flag State, coastal State or RFMO Secretariat).
- Such two-way systems that provide for remote polling allow an operator to vary the frequency of the position information it receives in response to changes in the behavior and geographic location of a vessel. This can be of value to fisheries managers and enforcement authorities. For instance, single daily reports may be sufficient verification when a vessel is in port. However, while the vessel is underway and engaged in fishing activities at sea, higher frequency reports can be helpful for monitoring compliance with certain measures, such as closed areas.[35]

[35] ftp://ftp.fao.org/docrep/fao/003/w9633e/w9633e00.pdf (1998)

Table 1: Summary of Core Operational Elements of Existing Highly Migratory RFMO VMS Programs

	WCPFC	IATTC	IOTC	CCSBT	ICCAT
Applicable vessel size	Any fishing vessel operating on the high seas of the Convention Area (and within EEZs under specific circumstances)	24m or greater LOA	Vessels >24m fishing on the high seas for species covered by the IOTC and vessels <24m operating outside of its EEZ and fishing for species covered by the IOTC Agreement	Varies with RFMO Convention Area where SBT vessels are fishing	All vessels >15m
Applicable vessel type	All fishing vessels (as defined by the Convention) authorized to operate in the Convention Area that must be on the Record of Fishing Vessels and that are covered by the VMS CMM.	All commercial fishing vessels operating in the EPO and harvesting tuna or tuna-like species. All carrier vessels authorized for at-sea transshipment under Resolution C-12-07	Fishing vessel All carrier vessels authorized for at-sea transshipment under Resolution 12/05	Varies with RFMO Convention Area where SBT vessels are fishing	Commercial fishing vessels For bluefin tuna, VMS requirements apply also to vessels other than fishing vessels (supply, tugs, towing, etc.). All carrier vessels authorized for at-sea transshipment.
Required data transmitted & required recipients (flag State, coastal State and/or RFMO)	Vessel ID (WIN); vessel name, position (latitude/ longitude); date and time; activity To flag State & Commission simultaneously. Coastal States also have access to high seas and "in-zone" VMS data via specific measures and data rules (e.g.,100 nm buffers and special high seas management area,, etc.).	Vessel ID; position (latitude/ longitude) with margin of error less than 100m; date and time, and speed and course. Flag State FMCs receive the data. If practicable, the VMS equipment may be used to transmit to the Director the data for weekly at-sea reports (C-03-04 *Resolution on At-Sea Reporting)*	Vessel ID; position (latitude/ longitude) with margin of error less than 500 m; date and time Flag State FMCs receive the data	Vessel ID; geographic position; date and time. Other data requirements vary with RFMO Convention Area where SBT vessels are fishing. Flag State FMCs receive the data.	Vessel ID; most recent position (latitude/ longitude) with margin of error less than 500m; date and time. For the bluefin fishery, also must report: radio call sign; trip number; vessel name, Contracting Party vessel registration details; and IMO or vessel side number. Flag State FMCs receive the data.

	WCPFC	IATTC	IOTC	CCSBT	ICCAT
CONTINUED: **Required data transmitted & required recipients (flag State, coastal State and/or RFMO)**					Flag States are to cooperate with coastal States, to ensure that the position messages transmitted by its vessels while fishing in waters under the jurisdiction of that coastal State are transmitted automatically and in real time to the FMC of the coastal State that has authorized the fishing activity.
Data collection frequency and polling	Polling: Any request by the WCPFC monitoring authority for a vessel's current position must receive a response within 90 minutes Reporting frequencies**:** ALCs must be capable of transmitting data hourly. This standard can vary depending upon the fishery, national laws for vessels fishing in an EEZ, applicable measures or for MCS purposes. The default reporting rate is 4 hours while in the Convention Area. During FAD closures, purse seine vessels must report at 30-minute intervals while in the Convention Area (20N/20S).	Data are to be collected every 4 hours for longliners and 2 hours for other vessels.	Data are to be collected at least once every 4 hours.	Varies with RFMO Convention Area where SBT vessels are fishing, but must be at least once every 4 hours.	Collected and transmitted at least every 2 hours. For purse seine vessels, every hour. For the bluefin fishery, messages are also sent to the Secretariat by the FMC

	WCPFC	IATTC	IOTC	CCSBT	ICCAT
Requirements in case of VMS/ALC break-down (including manual reporting)	Report to the Secretariat every 6 hours. If automatic reporting to the Commission VMS has not been re-established within 30 days, the flag State shall order the vessel to cease fishing, stow all fishing gear and return to port. The vessel cannot start fishing on the high seas until the ALC/MTU is confirmed as operational. In exceptional circumstances, the flag State may extend the time before returning to port by an additional consecutive 15 days. During this time the vessel will report its position manually every 4 hours to the Secretariat while on the high seas.	VMS device must be repaired or replaced within 1 month; vessel cannot start new trip until unit is operational. When a device stops functioning or has a technical failure during a fishing trip lasting more than 1 month, the repair or replacement has to take place as soon as the vessel enters a port; the vessel cannot start new trip until unit is operational.	VMS unit must be repaired or replaced within 1 month; vessel cannot start new trip until unit is operational. Manual reporting via alternative means (radio, email, fax) every 4 hours The master or the owner of the vessel communicate immediately to the FMC of the flag State, and if the Flag State so desires also to the Secretariat, giving the time they detected the failure or non-functioning of the VMS. If the flag State has not received for 12 hours VMS data transmissions or has reasons to doubt the correctness of the data, it shall as soon as possible notify the master or the owner or the representative of the vessel. If this occurs more than 2 times within 1 year, the flag State must investigate the matter, including having an authorized official check of the ALC, so to establish whether it has been tampered with. The results of the investigation to be sent to the IOTC Secretariat within 30 days of completion. Parties must, as soon as possible but no later than 2 working days following detection or notification of technical failure or non-	Manual reporting to the flag State, at a frequency that allows the fishing activity of a vessel to be identified, the vessel's identification, its geographical position, and the date and time. Other requirements vary with RFMO Convention Area where SBT vessels are fishing.	VMS unit must be repaired or replaced within 1 month; vessel cannot start new trip until unit is operational. Manual reporting via alternative means (radio, fax) at least daily. For the bluefin fishery, manual reports are to be sent within 24 hours. For time/area closures for bigeye and yellowfin tuna, if the VMS stops functioning or has a technical failure when the vessel is inside the area/time closure area the flag State is to require the vessel to exit immediately and it is not to be authorized to re-enter the area again without the VMS being repaired or replaced.

	WCPFC	IATTC	IOTC	CCSBT	ICCAT
CONTINUED: **Requirements in case of VMS/ALC break-down (including manual reporting)**			functioning of the VMS, forward the geo-graphical positions to the Secretariat, or ensure that these positions are forwarded to the Secretariat by the master or the owner of the vessel, or their representative.		
Requirement for specific ALC set types	Yes, minimum standards for ALCs and a list of approved ALCs. The Secretariat may recommend the removal of ALC models from the list if they don't meet the standard, or do not have the ability to successfully report to the Commission VMS. CCMs then have 3 years to ensure that its flagged vessels replace non-type approved ALCs with and approved ALC.	No.	No.	Varies with RFMO Convention Area where SBT vessels are fishing.	No.
Tamper-proof and operational at all times	Yes. VMS must include an automated alert to report when vessels enter or exit the high seas of the Convention Area. Approved ALCs must be fitted with a physical security mechanism to prevent access to the processing unit.	Yes.	Yes. Unless in port for more than one week, (with prior notification and approval of the flag State), and first position report following the re-powering shows the vessel has not changed position compared to the last report. Must be in a sealed unit with official seals that indicate whether the unit has been accessed or tampered with.	Yes. Must be in a sealed unit with official seals that indicate whether the unit has been accessed or tampered with. Other requirements vary with RFMO Convention Area where SBT vessels are fishing.	Yes. Requires an autonomous, tamper evident system able to continuously, automatically and independently transmit a message to the FMC of the flag CPC allowing for continuous tracking of position course, and speed of the vessel.

	WCPFC	IATTC	IOTC	CCSBT	ICCAT
Use of data: Science Committee	May be used by the Commission and Members for scientific purposes. VMS data shall be made available to Authorized Management Entities of members for scientific purposes with a two-year time lag. Near-real time high seas VMS data will be made available to Authorized Management Entities of members for planning tagging programs only with the consent of the member(s) who provided the VMS data to the Commission.	Article XVIII provides scope for provision of data to the Secretariat, but currently no explicit provisions providing for the use by the Scientific Committee. Starting in 2023, complete VMS data for all vessels required to carry VMS are to be reported for use by the IATTC scientific staff. The information reported shall include, at a minimum, the information specified in Paragraphs 2(a) of and 2(b) of C-14-2021. These VMS data are to be reported every two months and with a time delay no longer than 90 days.	Currently no explicit provisions providing for the use by the Scientific Committee.	No.	The Secretariat may provide VMS data provided by CPCs to the SCRS, at its request.
Use of data: Compliance Committee	Maybe used by the Commission and Members for compliance purposes.	Not currently reviewed in the IATTC Review Committee.	Compliance Committee reviews implementation of VMS Resolution.	VMS summary reports are provided to the CCSBT Compliance Committee.	Executive Secretary reports to the Compliance Committee annually on any issue related to the implementation of the VMS, and the results of relevant investigations made by the flag CPCs concerned.

	WCPFC	IATTC	IOTC	CCSBT	ICCAT
Use of data: Secretariat and/or States	Members may get access to near-real time high seas VMS reports for conducting high seas MSC activities when they have an MCS presence or capability on the high seas. Coastal State may also have access to high seas VMS reports for a 100nm buffer outside their EEZ, and "in zone" VMS data in accordance with specific rules and provisions.	Starting in 2023, complete VMS data for all vessels required to carry VMS are to be reported for use by the IATTC scientific staff. The information reported shall include, at a minimum, the information specified in Paragraphs 2(a) of and 2(b) of C-14-2021. These VMS data are to be reported every two months and with a time delay no longer than 90 days.	For Flag States only.	Members and CNMs can request another member or CNM to provide VMS data on certain vessels if there is a suspected infraction of CCSBT measures.	Generally for flag States only. For the bluefin fishery, reports can be made available by the Secretariat to Parties engaged in at-sea operations under the ICCAT Scheme of Joint International inspection.
Rules for the use of VMS data	Yes. Specified in the WCPFC MCS Data Rules and Procedures (see footnote 31).	Yes. Any VMS information provided to IATTC must be maintained in line with the IATTC rules on data confidentiality.	No.	Yes. Specified in Annex I of the applicable CCSBT Resolution	Yes. For Joint International inspections. Data 3 years old or more are provided to the science committee (SCRS) for scientific purposes only for eastern Bluefin.

Table 2: Summary of Core Operational Elements of Existing Straddling Stocks RFMO VMS Programs and AIS

	NAFO	SEAFO	NEAFC	CCAMLR	SPRFMO	AIS
Applicable vessel size	Any fishing vessel operating in the NAFO Regulatory Area.	Any fishing vessel operating in the SEAFO Regulatory Area	Fishing vessels > 20m between perpendiculars or 24 m LOA which fish, or plan to fish, in the Regulatory Area	All fishing vessels licensed in accordance with Conservation Measure 10-02	All fishing vessels that are on the SPRFMO Record of Vessels and authorized by CPCs to fish for fisheries resources in the SPRFMO Convention Area	Required by IMO on vessels >300GT (exempts most fishing vessels)
Applicable vessel type	Any vessel equipped for or engaged in fishing activities, including fish processing, trans-shipment or any other activity in preparation for or related to fishing, including exploratory fishing.	Fishing vessels, include all support/reefer/cargo vessels involved in trans-shipments.	Fishing vessels, including all support/ reefer/cargo vessels involved in trans-shipments or factory/processing vessels. Some NEAFC Contracting Parties apply the VMS regulation to commercial fishing vessels of all sizes; others apply it to vessels from 12m.	Fishing vessels only that are licensed in accordance with CCAMLR Conservation Measures	All fishing vessels that are on the SPRFMO Record of Vessels and authorized by CPCs to fish for fisheries resources in the SPRFMO Convention Area	Depends on the size of the vessel or ship.
Required data transmitted & required recipients (flag State, coastal State and/or RFMO)	Vessel ID; most recent position (latitude/longitude) with margin of error less than 500 m; date and time; vessel course and speed Flag State FMCs receive the data. Secretariat receives reports from Parties in near-real time (no	Vessel ID; most recent position (latitude/longitude) with margin of error less than 500 m; date and time; vessel course and speed Flag State FMCs receive the data. Secretariat receives reports from Parties in near-real time (no later than 24 hours	Vessel ID; (longitude, latitude) with a position error which shall be less than 500 m; date and time; and, where applicable, data relating to the catch on board and data relating to trans-shipment Flag States FMCs receive data. Flag States may	Vessel ID; position (latitude/ longitude) with margin of error less than 500m; date and time. Flag States FMCs receive data. Each Party must forward VMS reports and messages received to the CCAMLR Secretariat as soon as possible, but not later than 4 hours after receipt for	Vessel registration; position (latitude/ longitude) with accuracy of within 100m; date; time Vessels must report VMS data automatically either to the Secretariat via their Member or CNCP's FMC or simultaneously to both the	14 standard attributes: Vessel ID (MMSI or IMO number), position, heading, course, speed Can be programmed to transmit other data types (vessel type, size, length, flag State, etc.)

	NAFO	SEAFO	NEAFC	CCAMLR	SPRFMO	AIS
CONTINUED: **Required data transmitted & required recipients (flag State, coastal State and/or RFMO)**	later than 24 hours after FMC receives them). Flag States may authorize its vessels to transmit VMS data directly to the Secretariat.	after FMC receives them).	authorize vessels to transmit VMS data directly to the Secretariat. Parties must communicate VMS reports and messages to the NEAFC Secretariat without delay. If there is a technical malfunction, VMS reports must be transmitted to the Secretary within 24 hours of receipt.	certain exploratory longline fisheries; or not later than 10 working days after departure from the Convention Area for all other fisheries. Flag State also notify by email or other means the CCAMLR Secretariat within 24 hours of each entry to, exit from and movement between subareas and divisions by each of its fishing vessels. When a vessel intends to enter a closed area, or an area for which it is not licensed to fish, the Flag State shall provide prior notification to the Secretariat of the vessel's intentions. The flag State may permit or direct that notifications be provided by the vessel directly to the Secretariat.	Secretariat and its FMC.	Radio frequency broadcasts can be received by land-based receiving stations, other vessels and satellites
Data collection frequency and polling	Position reports are transmitted no less frequently than once an hour.	Position reports are transmitted at least 2 hour intervals	Position reports are transmitted at least once every 4 hours when operating in the NEAFC Regulatory Area	For finfish fisheries, the ALC must transmit VMS data every hour while the fishing vessel is operating in the Convention Area. For all other fisheries, the ALC must transmit VMS data every hour.	ALCs fitted to fishing vessels must be capable of transmitting data at least every 15 minutes. VMS position reports are to be reported: a) at least once every hour if	Broadcasts 5 times a minute with a 20-30nm range

	NAFO	SEAFO	NEAFC	CCAMLR	SPRFMO	AIS
CONTINUED: **Data collection frequency and polling**					fishing using benthic or bentho-pelagic trawling, bottom long-line gear or potting or if operating within 20 nm of an EEZ boundary; b) at least once every four hours in other circumstances.	
Requirements in case of VMS/ALC break-down (including manual reporting)	VMS unit must be repaired or replaced within 1 month; vessel cannot start new trip until unit is operational Manual reporting via alternative means (radio, email, fax) at least once every four hours When an inspector observes a fishing vessel in the Regulatory Area and has not received VMS data they shall inform the master of the vessel and the Executive Secretary. The flag State must ensure that the vessel is informed when its VMS appears defective or non-	In the event of a technical failure or non-operation of the VMS unit, the device must be repaired or replaced within 1 month. After this period, the vessel is not authorized to begin a new trip with a defective unit. If the trip is lasting more than one month, the repair or the replacement has to take place as soon as the vessel enters a port; vessel not authorized to begin a new trip without the VMS unit repaired or replaced. A vessel with a non-functioning unit must manually report to the flag State FMC at least daily.	VMS unit must be repaired or replaced within 1 month; vessel cannot start new trip until unit is operational Where a VMS stops functioning and a trip lasts more than 1 month, the repair or the replacement has to take place as soon as the vessel enters a port; cannot start new trip until unit is operational Vessels with a defective transponder have to report manually at least every 4 hours.	VMS unit must be repaired or replaced within 2 months; vessel cannot start new trip until unit is operational Manual reporting via alternative means (radio, email, fax) every 4 hours. If a Flag State finds that an ALC has failed to transmit VMS data for twelve hours, the Flag State will notify the fishing vessel master, owner or authorised representative of this. If this situation occurs more than two times within a period of one year, the Flag State of the fishing vessel shall investigate the matter, including having an authorised official examine the ALC in question, in order to	VMS unit must be repaired or replaced within 60 days of commencement of manual reporting; vessel cannot start new trip until unit is confirmed by Secretariat as operational. Four consecutive, programmed VMS positions must be received by the Secretariat to confirm that the ALC/Mobile Transceiver Unit is fully operational. The vessel master must manually report its position every 4 hours.	Only if required by a flag State, captain or shipping insurance company, etc.

	NAFO	SEAFO	NEAFC	CCAMLR	SPRFMO	AIS
CONTINUED: **Requirements in case of VMS/ALC break-down (including manual reporting)**	functional			establish whether the ALC has been tampered with. The outcome of this investigation shall be forwarded to the Secretariat within 30 days of its completion. If the Secretariat has not received VMS data for 48 consecutive hours, it notifies the Flag State of the fishing vessel. The Flag State must provide an explanation for the VMS data transmission failure within 7 working days. The Secretariat shall advise the Commission if the missing VMS data and the Flag State's explanation are not received within 7 working days.		
Requirement for specific ALC set types	No	No	Yes	No	Yes.	No
Tamper-proof and operational at all times	Yes	Yes Require vessels to be equipped with a Vessel Locating Device able to automatically transmit VMS data to the flag State FMC; allowing continuous tracking of the position of the vessel by the flag	Yes	Yes Unless in port for more than one week, (with prior notification and approval of the flag State), and first position report following the re-powering shows the vessel has not changed position compared to the last	Yes	Not tamper-proof. Units can be individually programmed.

	NAFO	SEAFO	NEAFC	CCAMLR	SPRFMO	AIS
CONTINUED **Tamper-proof and operational at all times**		State.		report. ALC must be of a type and configuration that prevent the input or output of false positions, and that are not capable of being over-ridden, whether manually, electronically or otherwise. ALC device must be located within a sealed unit protected by official seals that indicate whether the unit has been accessed or tampered with.		
Use of data: Science Committee	Summary VMS data may be available to the Scientific Council and other NAFO constituent bodies	Summary VMS data may be available to the Scientific Committee.	Summary VMS data may be available to the Permanent Committee on Management and Science. VMS data are also sent to ICES who provides NEAFC with scientific advice.	VMS data may be used for scientific purposes, with the consent of the Party that provided the data.	VMS data may be used by the service provider and Scientific Committee.	Data are publicly available with a subscription. Such data could be voluntarily provided to an RFMO scientific committee.
Use of data: Compliance Committee	VMS position reports are examined by NAFO in their Annual Compliance Review to assess compliance with NAFO measures and reporting obligations.	SEAFO's Compliance Committee reviews implementation of the VMS measures and reporting obligations.	NEAFC Permanent Committee on Control and Enforcement reviews the implementation of the Scheme of Control and Enforcement, including VMS	CCAMLR Standing Committee on Implementation and Compliance reviews the implementation of the C-VMS conservation measure. Compliance with C-VMS measure is monitored and reported annually on	Not clearly specified that these data can be used for compliance purposes by SPRFMO. Shall be used by the Members and CNCPs to achieve compliance with	Such data could theoretically be used in an RFMO compliance committee.

	NAFO	SEAFO	NEAFC	CCAMLR	SPRFMO	AIS
CONTINUED **Use of data: Compliance Committee**				as part of the CCAMLR Compliance Evaluation Procedure. Data from individual vessels are used by States only for compliance and search and rescue purposes.	CMMs.	
Use of data: Secretariat and/or States	VMS data are provided to all Parties with an inspection presence under the Scheme of Joint Inter-national inspection, and for search and rescue and maritime safety purposes.	Generally for flag States only, but may be released under the Rules for Access and Use of SEAFO Data.	Secretariat shall make available as soon as possible VMS data to Parties with an active inspection presence in the NEAFC Regulatory Area. This requirement is fully automated and operates 24/7.	Secretariat monitors VMS data. If there is vessel in an area or subarea for which no license details have been provided by the flag State, or if the vessel is in any area or subarea for which the flag State or fishing vessel has not provided prior notification, then the Secretariat notifies the flag State. Its explanation is reviewed at the next annual meeting. The CCAMLR Secretariat also daily maintains a list of vessels submitting VMS reports and messages on a password-protected section of the CCAMLR website. This list is divided into subareas and divisions, without indicating the exact positions of vessels, and is updated when a vessel	VMS data may be used by the Secretariat. May be released to other members under the rules for use and release of VMS data. VMS data can be released by the Secretariat without the consent of members for exclusive purposes (e.g., search and rescue).	Such data could be voluntarily provided to an RFMO Secretariat, Any State could have access if they purchase a subscription.

	NAFO	SEAFO	NEAFC	CCAMLR	SPRFMO	AIS
CONTINUED: **Use of data: Secretariat and/or States**				changes subarea or division. States may have access to VMS data (without the permission of the flag State) for planning or engaging in active surveillance presence and/or inspections in a specified subarea or division; verifying *Dissostichus* catch document (DCD); or supporting search and rescue activities.		
Rules for the use of VMS data	Yes. Specified in Annex II.B of the NAFO Conservation and Enforcement measures	Yes. Specified in the Rules for Access and Use of SEAFO Data.	Yes. Specified in Appendix I of Annex IX (Secure and confidential treatment of electronic reports and messages) and Rec.11 establishing an Information Security Management System for NEAFC.	Yes. Annex 10-04/B. The CCAMLR Secretariat and all Parties receiving VMS data must treat data received in accordance with confidentiality rules established by the Commission.	Yes. Specified in Annex 5 of CMM 06-2018	No privacy restrictions. Data are publicly available with a subscription.

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