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REVIEW OF VMS STANDARDS AND SPECIFICATIONS AND A SUMMARY OF OPTIONS FOR THE ESTABLISHMENT OF A VMS BY THE COMMISSION UNDER ARTICLE 24 OF THE CONVENTION

Paper prepared by the Secretariat[1]

I. Introduction

1. This background paper was prepared by MRAG Ltd in order to assist Members in considering Agenda Item 4.1 on the provisional agenda for first meeting of the Technical and Compliance Committee (TCC) of the Commission (WCPFC/TCC/2005/02).

2. This paper opens with a review of the existing state of play with respect to the development of a vessel monitoring system (VMS) for the WCPFC, covering three main areas: (i) consolidated information on VMS issues discussed previously within the context of the WCPFC Preparatory Conference process (PrepCon) and the first meeting of the Commission (WCPFC1), (ii) the results of those discussions and (iii) remaining VMS issues and needs. Following this review, the paper describes current and emerging practices with respect to VMS in other regional fishery management organizations (RFMOs), in particular those RFMOs dealing with the management of tuna and tuna-like species. Finally, the paper presents a review of VMS standards and specifications and a summary of options for the establishment of a VMS by the Commission under Article 24 of the Convention. Options are considered in the context of the existing monitoring, control and surveillance capability of the Commission and its Members and the potential for linkages with existing VMS installations.

II. Review of Working Group III in relation to VMS.

3. At its second session, the PrepCon adopted terms of reference for Working Group III of which those relating to VMS, either directly or indirectly, are listed below;

(a) identify the needs of the Commission relating to MCS;

(b) in consultation with Working Group II, identify the objectives and priorities of the regional observer programme and to develop a scheme to deliver the programme in a manner consistent with the Convention. In addressing this matter, the Working Group should consider, inter alia:

[1] Prepared by Marine Resource Assessment Group (MRAG) Ltd, 18 Queen Street, London, United Kingdom.

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(i) the rights, duties and responsibilities of observers and fishing vessel masters; and
(ii) the respective roles of the members of the Commission, including the role of the flag State, in the assignment and certification of observers;

(c) develop procedures for practical implementation of a boarding and inspection scheme consistent with the provisions of Article 26 of the Convention;

(d) develop standards, specifications and procedures, consistent with the Convention, including Article 24, for the operation of a vessel monitoring system (VMS); and

(e) provide options in relation to other monitoring, control and surveillance needs of the Commission;

4. No progress on the issue of VMS was made at the 3rd and 4th sessions of the PrepCon, although an information paper on VMS was requested at the 4th session. Although a discussion paper (WCPFC/PrepCon/WP.23)[2] was prepared by the Interim Secretariat for the 6th session, VMS and observer programme issues were deferred to later sessions. During the 7th session of the Preparatory Conference the future workplan for the Technical and Compliance Committee of the Commission was developed of which item 1 was to "Establish standards, specifications and procedures for the operation of a vessel monitoring system".

5. WCPFC/PrepCon/WP.23 describes in detail the legal basis for VMS within the WCPFC, along with the institutional structures and arrangements with regard to international cooperation. WP.23 also identifies options for VMS cooperation arrangements and issues that must be addressed in defining the VMS and a "roadmap" for development of VMS cooperation. Our aim in the current paper is to build on WP.23 by providing up to date information that will support informed discussion and decision-making leading to the development of a VMS for the Commission.

6. The First Session of the Commission noted that the Technical and Compliance Committee will consider the regional observer programme as well as the VMS programme as a matter of priority at its 2005 meeting, but did not address VMS issues further.

III. Review of current and emerging VMS practices in other RFMOs.

FAO Expert Consultation on Data Formats and Procedures for Monitoring Control and Surveillance

7. The issue of standardisation of VMS data formats and procedures was discussed by the FAO at the Expert Consultation on Data Formats and Procedures for Monitoring Control and Surveillance in 2004.[3] The Consultation noted that standardisation upon a certain make and model of equipment or "closed" systems in which only one type of communication system can be used may be contrary to national policy in some countries due to the perception that such practices may inhibit product development and innovation which has resulted in the need for the national systems to accept reports from Inmarsat, Argos, EutelSat and other satellite networks. This has particular reference to fisheries in which European Community vessels operate as it is probable that they will have a wide variety of transponders[4] installed.

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2 Discussion Paper on the Institutional Options for VMS Cooperation Among the Parties to the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. Prepared by Kieran Kelleher for the Interim Secretariat (WCPFC/PrepCon/WP.23)

3 Report of the Expert Consultation on Data Formats and Procedures for Monitoring, Control and Surveillance. Bergen, Norway, 25-27 October 2004. FAO Fisheries Report, No. 761. Rome, FAO 2005. 16p.

4 The term "transponder" is used throughout this document, although also known as a Vessel Locator Device (VLD) in FAO terminology and Automatic Location Communicator (ALC) in FFA terminology or alternatively simply as a VMS unit.

8. The Expert Consultation noted the existence of the well established standard for VMS data format , the North Atlantic Format (NAF) that is currently in use in the North Atlantic by the North Atlantic Fisheries Organisation (NAFO) and the North-East Atlantic Fisheries Commission (NEAFC). This format can be found in Annex 1. This format has also been taken up by CCAMLR and is in use currently, though in a slightly reduced form[5]. The Expert Consultation agreed that the issue of suitability of the NAF as a standard VMS data exchange format would be brought to the attention of the Coordinating Working Party on Fisheries Statistics (CWP).

Current VMS Implementations in RFMOs

9. The preferred options currently in use within RFMOs fall into three main categories:

- Direct reporting to RFMO
- Indirect near-real-time reporting to RFMO via flag State Fisheries Monitoring Centre (FMC)
- Flag state monitoring only; no reporting to RFMO.

10. The majority of RFMO VMS implementations fall into the second category. This is regarded as the most cost-effective option for the delivery of reports, especially for the vessels themselves. This is especially true for EU vessels where this is the standard delivery mechanism for VMS reports as part of fishing agreements with coastal States. Table 1 summarises the VMS options used in those RFMOs that currently have, or are likely to introduce, a regional VMS capacity.

11. VMS data when they reach flag States or the RFMO are used for a variety of purposes. These can be divided into real-time or "operational" actions and "strategic" actions based on historical analysis of VMS data. Operational actions include near-real-time tracking of vessels and related tasks to ensure that closed areas and other within-season regulations are enforced through, for example, the provision of VMS data to support the actions of at-sea patrols (e.g. in NAFO and NEAFC) and the management of effort quotas such as days at sea programmes. Strategic actions are those carried out usually after vessels have left the area covered by the VMS and are based on the analysis of large volumes of long-term data sets. These actions include patrol planning to enhance the utilisation of patrol resources, verification of logbook data against VMS positions and analysis of VMS data for evidence of transponder or data tampering.

Emerging Practices

12. As shown in Table 1, vessel monitoring systems at the RFMO level currently only exist in a few regions. For those that do exist, it is important to recognise that they are the produce of a process of evolution that may take years. The step-wise evolution of the CCAMLR VMS across successive Commission meetings is a good example. Table 2 describes the timeline over which CCAMLR has introduced its VMS and how the system has increased in complexity and centralisation. The notion of a CCAMLR VMS was first introduced in 1997. It took between then and the 2004 meeting for the VMS to evolve from a non-binding resolution, through a flag state system to a fully RFMO-centralised VMS[6].

13. In the case of CCAMLR, it was not acceptable to all Members of the Commission[7], either politically or technically to bring in a centralized VMS system more quickly. Since 1997, technical developments have made it more straightforward to establish a centralised system from an operational perspective, but clearly political considerations, although likely to be different in detail in another organisation, will still

[5] The CCAMLR system currently uses the format for entry, exit and position reports. with slightly fewer fields.
[6] To date the near-real time centralized system has been introduced only for certain exploratory fisheries for toothfish.
[7] At CCAMLR decision-making is by consensus.

have to be taken into account. A step-wise approach is perhaps a pragmatic expectation for the establishment of VMS in other multilateral organisations.

Table 1. Current VMS options in place at selected RFMOs

RFMO	VMS Used	Description
ICCAT	Flag state VMS Only	All ICCAT Contracting Parties and Cooperating Non-Contracting Parties must track all fishing vessels with VMS.
CCSBT	Flag State VMS Only	CCSBT Member States all now have vessel monitoring systems. No centralised system in place.
IOTC	Flag State VMS Only	Member States do not all currently have vessel monitoring systems. No centralised system in place though recommendations in place from NGOs to implement system similar to that proposed for WCPFC.
IATTC	Flag State VMS Only	Most IATTC Member States have VMS in operation. Latest update from June 2005 indicated that the remainder were in progress of implementing VMS. IATTC Members requested to submit progress reports at six monthly intervals.
CCAMLR	Centralised VMS	All members required to have flag state VMS with position reports forwarded to CCAMLR directly or through flag state FMC in near-real time for exploratory longline fisheries and at the end of the fishing season for all other fisheries. Standardised data format based on NAF.
IWC	None	No requirement to carry VMS for whaling fleets at the moment. VMS requirement under consideration.
NAFO	Flag State VMS and real-time sharing with other states and NAFO VMS.	Flag State VMS with data exchange with all member states when fishing in reciprocal waters. Standardised data format (NAF) used by NAFO and NEAFC.
NEAFC	Flag State VMS and real-time sharing with other states and NEAFC VMS.	Flag State VMS with data exchange with all member states when fishing in reciprocal waters. Standardised data format (NAF) used by NAFO and NEAFC.
EU	Flag State VMS and real-time sharing with other EU states and third parties.	Flag State VMS with data exchange with all member States and third party states when fishing in reciprocal waters.
FFA	Flag State VMS and Direct Reporting in Centralised System	FFA VMS covers area of all FFA Member States.
CECAF	Some flag State and coastal state VMS in operation	No requirements to carry VMS regionally, though some cooperation on MCS and VMS through the Sub-Regional Fisheries Commission.
GFCM	Currently only 4 GFCM Members have VMS, with 3 planning VMS implementations.	No regional capability at the moment.

14. One of the more recent developments is the contribution of VMS data to the prosecution of fishing vessels for violations of fisheries law. The types of offence in which VMS data has successfully been used as evidence include:

- Unlawful entry into a closed area;
- Failure to properly maintain a logbook;
- Illegal fishing in a closed area;
- Failure to properly maintain a functioning VMS transponder;

- Tampering or interfering with the transponder;
- Provision of false information to the relevant fisheries administration.

Table 2. Evolution of CCAMLR VMS Regulations 1997 / 1998 to date

Year	CCAMLR Resolution / Conservation Measure	Description of Status
1997 / 1998	Resolution 12/XVI	Members shall endeavour to establish automated satellite based VMS for flag vessels for toothfish fisheries. Vessel ID, location, date-time Real-time, tamperproofing, automatic and 500m resolution
1998 / 1999	CM 148 / XVII	As above plus; VMS required on all fisheries but krill 4 hour reporting frequency defined Entry, Exit and Area Movement Reports Required Transponder Technical Failure Reporting / Repair
1999 / 2000	CM 148 / XVIII	No changes
2000 / 2001	CM 148 / XIX	No changes
2001 / 2002	CM 148 / XX	As above plus; Two working day limit on Entry, Exit and Area Movement Reports
2002 / 2003	CM 10-04 (2002)	As above plus; Increased definition of tamperproofing to include both hardware and software components and no manual override allowed. Contracting Parties not to issue licences unless VMS on vessels comply with requirements.
2003 / 2004	CM 10-04 (2003)	No changes
2004 / 2005	CM 10-04 (2004)	Major redraft of CM 10-04. Increase in tamperproofing for sealed units (transponders). Notification of the Commission if tampering is noted. Emphasis on masters, owners and licensees of fishing vessels to ensure VMS operational. Port visit regulations (one-week switch off rule) Increase in transponder technical failure reporting and repair regulations (6 hours and not 24 hours) VMS reports to be supplied direct to CCAMLR in near real time for exploratory fisheries and at the end of the season for others. Notification of details of flag state FMC / VMS contacts to CCAMLR. Lists of compliant vessels on password protected CCAMLR website. Provision of VMS data during active surveillance (100nm buffer around patrol location). Contracting Parties may request VMS data to validate DCDs (*Dissostichus* Catch Document). Confidentiality and Security Procedures.

15. VMS data have been used successfully in proceedings relating to fisheries offences in Spain, France, England and Wales, Scotland, Sweden, the Republic of Ireland, Iceland, Norway, the United States of America and South Africa amongst others. The latest successful prosecution in UK waters that included VMS data as evidence was that of an Irish skipper who mis-declared catches while his position was tracked by the UK VMS in Edinburgh (see Annex 5).

16. Although the number of successful proceedings is quite high given the relative novelty of this type of evidence to the various courts involved (perhaps three dozen occasions to date), in many countries there are no reported cases of the use of VMS data. Its use as sole evidence in a prosecution without supporting

evidence from, for example, a patrol vessel inspection, is much less common[8]. The prosecuting authorities may not be willing to risk a prosecution without further evidence. Furthermore, there are a number of countries where, although VMS data has been successfully used in civil and administrative proceedings, its validity has yet to be considered by a criminal court.

17. The question of whether or not VMS data can be used as evidence in legal proceedings relating to fisheries offences and, if so, the weight accorded to them depends ultimately on the national rules of evidence in the jurisdiction concerned. Such rules may be contained in a variety of legal instruments including a code of criminal procedure or a special law on evidence. In general terms, the rules of evidence in common law jurisdictions (mostly English speaking) tend to be more elaborate than those of jurisdictions of the civil law tradition. This is because of the important role that juries play as the finders of fact in criminal trials in common law jurisdictions. The rules of evidence seek to prevent juries from being misled. In the civil law tradition where professional judges are responsible for making findings of fact as well as applying the law, such safeguards have been considered less necessary. Nevertheless, in both civil law and common law jurisdictions, a higher standard of proof is necessary for cases brought under criminal law than cases brought under civil or administrative law. This, in turn, has important implications for the use of VMS data as evidence.

18. An important point to note, however, is that to date VMS data have never been rejected as evidence by a court, even when data have been provided by the MCS authorities of another country. The security elements of the VMS system are critical in this respect, and in particular the ability to trace data through the VMS system and verify that they are genuine and could not have been modified. One reason for the apparent confidence in VMS data may be the widely accepted reliability of Global Positioning Systems (GPS) technology, though the acceptance of VMS evidence should not be taken for granted.

19. The definition of the various offences for which VMS data may be used as evidence vary between national legal codes. In the case of a regional VMS maintained by the Commission, the extent to which the legal codes used by Member States need to be harmonised to assist in the process of prosecuting vessels for offences within the Convention Area based on VMS evidence should be investigated.

20. Coastal States are now taking increased responsibility for the management of fishing activity in their waters. When VMS was first being introduced, it was often the flag State that was taking responsibility for monitoring the activities of vessels under its register. Coastal States used VMS often only for vessels flying their own flag and would accept feeds of data from other States operating in their EEZ. This was in part limited by the cost of communications and the technical capabilities of transponders. Satellite communications costs for VMS have dropped significantly in recent years and transponders now typically can manage reporting directly to multiple Digital Network Identifications (DNIDs). As a result there is now a move towards more direct reporting, especially with Inmarsat-C transponders that can be configured to the requirements of the coastal State and allowing polling of the vessels.

21. With the improvements in maritime satellite communications and in particular the provision of internet services on fishing vessels such as email and access to the world wide web, access to near real-time information can be considered as a realistic option. This has two distinct advantages for an FMC.

[8] VMS data have not been accepted in court proceedings as sole evidence by itself of illegal fishing in a closed area or a closed period. Indeed, it is hard to predict that it will ever be possible to use VMS data under criminal law on their own, because of the higher standard of proof that must be satisfied. The basic problem is that a VMS is only designed to show the position (plus course and speed) of a vessel. It is doubtful that, in cases brought under criminal law, such data alone would be accepted as evidence of illegal fishing without corroboration. Other factors which may impact on the extent to which VMS data can be used in proceedings relating to fisheries offences include the creation of offences relating to the correct installation and/or operation of VMS equipment, the extent to which VMS data are systematically compared with logbook data and the technical setup of the VMS transponder.

22. The first is that vessel reporting can be of both increased in frequency and in detail. Detailed electronic logbooks can now be completed daily by fishing vessels and forwarded immediately by email to the relevant authorities. This information can then be checked against VMS data in near real-time, for example if a vessel is under suspicion of misreporting.

23. The second advantage is that patrol vessels and aircraft can have near real-time VMS data forwarded to them either as a clone of the VMS (i.e. with a working system on board) or as regular email updates of vessel positions. Both of these advantages increase substantially the efficiency and efficacy of fisheries monitoring and surveillance. Secure satellite communication is also an advantage for the fishing vessels in that data are transmitted confidentially, unlike radio communications. There is therefore no problem with reporting detailed catch, effort and location information.

24. A number of FMCs have integrated catch reporting systems. Catch reporting may be integrated with the VMS, as in the case of Mozambique, or may be in the form of a separate detailed electronic logbook. An example of the latter is the CCAMLR haul-by-haul electronic logbook that is submitted monthly during the fishing season by email.

25. During the next five years it is likely that reporting via satellite communications (both linked to and separate from VMS) of haul-by-haul logbook data and data collected by fisheries observers will become more commonplace. This will enable quicker and more efficient management of catch and effort limits and allow stock assessments to be undertaken on more up to date information. A system of detailed daily electronic reporting has already been implemented for tracking product from the Marine Stewardship Council (MSC) certified South Georgia toothfish (*Dissostichus eleginoides*) fishery (known as the chain of custody system). Vessels report their catches by email daily and the data are automatically processed into an integrated catch tracking database.

26. VMS data are also used in the verification of catch certification and trade documents. The "FAO Expert Consultation of Regional Fisheries Management Bodies on Harmonization of Catch Certification" held in 2002 suggested that "The information on the catch certificate should be verified upon unloading the catch in terms of weight and species." In addition to catch weight and species, the location of the catch is an important factor in terms of assigning and verifying trade documents. For example, in the CCAMLR toothfish Catch Documentation Scheme (CDS), catches are attributed to a particular fishery. This is also a routine component of the MSC's chain of custody verification process in which each individual container of fish is attributed to a single haul that has been verified as being from within the certified fishery. VMS data in this case are used to verify the position of the vessel during each haul.

IV. Review of VMS Standards, Specifications and Procedure Options

VMS Requirements

27. As part of the future development of a VMS, the Commission needs to agree a clear definition of its purpose and the division of responsibilities between the various stakeholders, including the Commission, its Members, flag States, coastal States, port States and vessels. This is crucial in determining the requirements for the physical setup and organisation of the VMS along with its operational procedures in relation to the other MCS related commitments of the Commission. The following sets out an example set of responsibilities that are provided as a starting point for discussion by the TCC;

28. The WCPFC VMS may be required to:

- Track and store VMS position, course and speed data for registered Member State fishing vessels within the Convention Area;

- Provide vessel position information to national fisheries management authorities to enhance national monitoring control and surveillance activities such as identification of fishing activity, inspections at sea, port inspections and transhipment monitoring;
- Provide vessel position data and estimates of fishing effort for verification of catch and effort data submitted to the Commission;
- Provide vessel position data for verification of catch verification and trade documentation as required;
- Provide members of the Commission with details of operational procedures relating to VMS operations (e.g. type approval process for VMS transponders, approved transponder lists)

29. Within the context of these responsibilities there is a need to identify levels of reporting for different vessel types, according to the priorities of the Commission. An example of such a specification is "All longline vessels over 15m in length will be required to report on a 4 hourly basis (i.e. 6 position reports per day) direct to the Commission via Inmarsat-C."

VMS Specifications

30. Several different options exist for the establishment of the Commission VMS under Article 24 of the Convention, particularly when taking into account the existence of the current VMS system in operation through FFA for vessels operating within FFA Members' EEZs. Below and in Annex 1, a number of options for the basic structure of the VMS data reporting mechanism are described. These options include systems that are combined in function and closely linked with the existing FFA VMS and entirely separate from it. They essentially span a range from a system that is based entirely with the FFA and one that is based entirely with the Commission:

FFA ← **→WCPFC**

Option 1 (enhanced system at FFA)	Option 3 (system at FFA forwarding data to WCPFC) Option 4 (system at WCPFC forwarding data to FFA) Option 5 (Separate Systems at WCPFC and FFA with no data forwarding)	Option 2 (system at WCPFC)

The data flows for each of the options outlined can be found in Annex 1.

31. There are four options that represent a collaborative systems that would cover both the FFA Members' EEZ reporting and the High Seas remit of the Commission (Options 1 to 4), and one option for a separate system based at the Commission which is entirely independent of the existing FFA VMS (Option 5). All the options show the flow of data from the land earth station to the VMS (direct) and via the relevant flag State FMCs (indirect). For options 2, 4 and 5, in which the Commission is the primary recipient of the VMS data, it is recommended that all vessels report directly to the Commission and not through flag State systems. Although the data would be delivered in near-real-time by both direct and indirect reporting routes, the direct route will allow polling of the vessels when in the Convention Area and where transponder types allow remote configuration on vessels by the Commission's VMS.

32. In Option 1 (Annex 1), the Commission itself does not host the VMS, but provides FFA with the remit and financial support to extend VMS coverage over the High Seas within the Convention Area. All position reporting for vessels in Commission Member's EEZs (including FFA Members EEZs that are currently covered) and on the High Seas would be sent to the FFA VMS. The Commission would gain access to the system through secure internet protocols, providing remote access to and limited control of the system. The main advantage under this option, is that the Commission would not need to develop its own VMS, but would piggyback on an existing system, with the associated financial advantages that this would bring. The disadvantage, however, is that this option would not provide the Commission with the full control over the VMS. Functions such as being able to poll vessels' VMS units independently from the Commission itself and full, direct access to the data, would not be available.

33. Option 2 (Annex 1) is the opposite end of the spectrum from Option 1. In this option, a new VMS would be setup at the Commission, covering Commission Member's EEZs and the High Seas. Under such a scenario, the FFA VMS would become redundant. Taking it to the extreme, FFA could decommission its system and simply tap into the new Commission VMS. However, this option would raise a number of security concerns because of the level and complexity of access rights required to the system by FFA Members and the information they would have rights to view.

34. Under Option 3 (Annex 1) there would be two parallel systems in operation. All the position reporting would be through the FFA VMS which would then automatically forward all the relevant position data for the High Seas to the Commission VMS.

35. Option 4 (Annex 1) would have a similar structure to Option 3 but in this case the Commission would be the primary destination for vessel data, from where the relevant data for FFA Members would be forwarded to FFA. These options remove the issues of rights to view information as the primary VMS in each case would filter the VMS reports and only forward data to the appropriate clients. The drawback for which ever is the "secondary" VMS in each case (i.e. the one that does not receive the data directly) would be that it might not have the level of control over polling and configuration of reporting required.

36. Under Option 5, the Commission would establish an entirely independent VMS that could be based at the Secretariat in Pohnpei. Vessels would report to the Commission VMS when on High Seas inside the Convention Area and independently to the FFA VMS (where required) when within FFA members' EEZs. There would be no forwarding of data between the two systems. If this system were implemented, it would be important to draw up reciprocal agreements to alert VMS systems in adjacent areas of jurisdiction on the movement of vessels from one system's area of coverage to another. This would allow the operators to ensure the vessels have the correct reporting setup. This process can be automated by the inclusion of a provision for automatic area based reporting in the type approval process. A number of transponders can have zone charts installed on chips within the unit which can automatically trigger the unit to start or stop reporting to one or more destinations.

37. There are major benefits associated with options that give the Commission control over the system operations in terms of configuration, management of vessel polling, security and interaction with other sections of the Commission and Member State MCS staff. This would be similar to the systems currently implemented by CCAMLR and in some respects NAFO and NEAFC, which currently provide most of the elements of best practice with respect to centralised VMS.

38. Aside form the options for the technical setup of the system, the Commission has various options with regard to the operation of the VMS. The two basic scenarios would be (i) for either the Commission to setup and manage the system itself, hiring and training dedicated staff to manage the system or (ii) to set up a sub-contract with an independent organization to provide the Commission with this service either at the Secretariat or elsewhere. There are pros and cons to both these options, but the basic trade off is

between the benefits of close linkages and skill crossovers by having the staff and system in house compared to the likely cost savings of contracting out the service.

39. Terms of Reference will need to be defined for the provision of a VMS once specific requirements of the Commission have been discussed and agreed upon.

Transponder Specifications

40. There are a great many potential ways of implementing a VMS, given the wide variety of VMS solutions and transceiver and antenna units on the market. A number of these units are known to be insecure and unreliable with regard to being used as part of a VMS. It is therefore important to consider the need for a type approval and associated requirements of minimum standards for transceiver, GPS and antenna units. It would also be important to undertake a review of these standards on a regular basis to ensure they keep pace with technological advancements and any concerns that may arise from time to time. It is recommended that the following list of features is considered as a minimum specification for the type approval process. These features match quite closely those currently defined by FFA for use within FFA Member States and by other fisheries management authorities.

Recommended mandatory minimum specifications for a VMS:

- Automated position reporting (latitude, longitude, date and time)
- Course and Speed
- Power On / Off Reporting
- Blocking / Disconnection Reporting
- Tamper reporting (intrusion alarms)
- Secure power supply connection with tamper-resistant connectors and fittings and internal battery backup (24 hr reporting, 30day recording)
- Secure antennae connections [9] with tamper-resistant connectors and fittings
- Mounting of aerial and unit in secure location with tamper-resistant body and fittings
- Remote Polling
- Restriction on crews ability to transponder settings (e.g. modify reporting frequency)
- Multiple destination configuration (i.e. vessels can report both to their own flag State and regional RFMO at the same time through the same transponder but if necessary on different reporting frequencies).
- Automatic setup and configuration of reporting on entry into predefined areas, e.g. High Seas or FFA waters.

Recommended optional specifications for a VMS

- Data Reporting through terminal facility
- Ability to store very high resolution data (e.g. store position every 10 minutes).
- Ability to download data by hand
- Remote reconfiguration of automated reporting
- Standard seals and fixings with identification marks.

41. In addition there are system-wide considerations for the GPS and communications systems external to the transponders themselves that must be adhered to. These include;

- Geographical Coverage of the Area Required
- Length of time between a position reporting being sent and arriving at the FMC

[9] The requirement for secure antennae connections negates the use of a single transponder as both a GMDSS unit and VMS transponder as the requirements for GMDSS compliance require the potential to attach an external GPS, for VMS compliance it is advised that there is no potential to attach an external GPS source.

- Tolerance of position information; and
- Security of communications between the transponder and land-earth station (LES).

42. Two major satellite communication networks that are commonly used for implementation of VMS, have full coverage of the WCPFC Convention Area. These are the INMARSAT and Argos networks. Currently only the INMARSAT-C network is capable of two-way communication to the transponder to request polling and to reconfigure transponder settings. The ADEOS II satellite that is carrying the two-way Argos communications payload has now been deployed and is being configured for use. Once configuration is complete, the range of facilities available to Argos users will be rolled out gradually. It is not known at this time if the footprint from this one satellite and the range of facilities that will be available will be useful from the point of view of managing a VMS.

43. At the 6th session of PrepCon the Delegation of France recommended that the Commission's VMS be capable of using both Inmarsat-C and Argos transponders, due to the prevalence of Argos units on many European purse seine vessels and Japanese longliners.

VMS for small traditional/artisanal fleets

44. The potential for tracking traditional or artisanal vessels by VMS is difficult. The primary reason for tracking vessels if often not MCS but more of a safety issue. The safety of the fleet is being increased by providing the artisanal fleet with a VMS unit with a distress button. There are a number of difficulties in setting up such systems mainly due to the small size and low power of these vessels.

45. One of the largest trials of small vessel VMS in tropical waters (not restricted to the near coast region) was carried out by the Seychelles Fishing Authority. A number of different options for data transmission were investigated in this case with VHF, GSM mobile phone networks and satellite options all being considered. The VHF and GSM options are very useful for fisheries within 24nm of the coast but beyond this range they were not viable. The satellite options based on Inmarsat mini-M were moderately successful on larger artisanal vessels, but success was highly dependent on the vessel specifications for the size, power, availability of stable mountings which had a significant effect on the ability to get a good signal strength for both the GPS and satellite transponder. The programme to develop the artisanal VMS in the Seychelles continues.

Procedure Options

46. A series of standard operating procedures and protocols and associated documentation should be developed to support the operation of the VMS. These are described in the following paragraphs:

- **Registration and approval forms** for the forwarding of VMS data to the Commission: Working Group III developed procedures, in accordance with article 24(7) of the Convention, to enable the development of a WCPFC Record of Fishing Vessels. Those vessels that are required by the Commission to carry a VMS transponder should therefore be a subset of the WCPFC Record of Fishing Vessels. Consequently only a small amount of additional information would be required from these vessels relating directly to the VMS implementation. An example registration form is shown in Annex 4. These forms would also include an approval form from the vessel owner that the Commission may track the vessel or that the national authority may forward data to the Commission.
- **Vessel de-listing and removal**: The registration process needs to be reversible; i.e. to allow a vessel to be de-listed and removed from the Commission's VMS. This will occur when a vessel moves to another ocean or fishery, or is taken out of service. However, it is recommended that, where possible, the vessel registry should retain the information on the vessel for possible future use, for example in the event that the vessel needs to be reactivated if the vessel returns and submits new registration forms. Checks will need to be made, based on national and international vessel identifiers (e.g. National Registration Numbers and Lloyds Numbers), to avoid duplication of vessel details

- **Transponder malfunction procedure**: A set of procedures will need to be elaborated that can be implemented in the event of transponder malfunction on a vessel. As part of this procedure, a malfunction would be notified to the vessel (and/or vessel owners) by the Commission or National VMS centre. Following notification, vessels should be required to undertake secondary reporting of their position by alternative means (by fax/email). The procedure will also include a time period within which the transponder will need to be repaired, which, if exceeded, will result in the vessel having to leave the fishery. Such procedures would benefit from harmonisation between Member States.
- **Inspection protocol**: A harmonized protocol will need to be developed for the inspection of VMS units at sea and in port. This protocol defines the list of checks required during the inspection process, how these need to be conducted and actions that need to be taken if problems are detected with a vessel during the inspection. This process would be easier to implement with a clear type approval process in place regionally, as the specific inspection protocols could be developed for each approved transponder make and model. It is recommended that all inspectors are issued with a handheld GPS unit to enable independent position verification on board with the master of the vessel present. If transponder seals are used in tamper-proofing the transponders then the inspectors need to be issued with replacement seals if these are broken during the inspection.
- **Fishing vessels in transit**: The Commission will need to decide how it deals with fishing vessels in transit through the Convention Area. In theory a fishing vessel returning to its home port within the Convention Area from a fishing trip in the Atlantic or Indian Ocean will not be required to be registered with the Commission or appear on the Commission VMS. However, such a vessel is likely become a target of MCS activity in the region for the very reason that it is not registered, would not appear on the VMS and would therefore need to be investigated. It is recommended that a voluntary system of transit reporting be implemented for fishing vessels in transit that are not registered with the Commission. This should be and advertised through national authorities, national fisheries organisations and directly with large fishing companies and agents. This system should be made as simple as possible with low levels of input required.
- **Translated forms**: Although the working language of the Commission is English, translated forms for the most common vessel flags should be developed. This should apply to all forms relating to the operational procedures outlined. The forms should be based on a single format to allow ease of data entry. Where possible, electronic versions of the forms should be developed to enable direct recording of data in electronic format, which will reduce the time taken to process the data.

Relationship between VMS and the wider context of the Commission's MCS Framework

47. There will be a number of linkages between the VMS established and managed by the Commission and other components of the Commission's MCS framework, such as the observer programme, the high seas boarding and inspection and monitoring of transhipment, as discussed in the following paragraphs.

48. The 1995 UN Fish Stocks Agreement, which has been signed or ratified by all WCPFC Member States except Palau, imposes a duty on port States to take measures on a non-discriminatory basis and in accordance with International Law to promote the effectiveness of subregional, regional and global conservation and management measures. VMS can be used as a regional tool to supply relevant information to coastal State MCS Authorities for a number of MCS related tasks such as port inspections, transhipment monitoring, and deployment of observers. The information that should to be supplied will need to be standardised through consultation with Members and the Commission and standardised formats for data exchange and rules on data confidentiality agreed (See paragraph 63).

49. The provision of information on likely port visits is of particular importance in the case of vessels with malfunctioning VMS equipment which should be prioritised for inspection as described in paragraph 46.

50. It is recommended that tampering with, blocking or interfering in any manner the normal operation of the VMS be included as a serious offence as detailed in the "Revised Draft Procedures for Boarding and Inspection". It is also recommended that during an inspection, the validation process of the vessels transponder and reporting, there should be no modification of any systems that could affect the safety and navigation of the vessel.

51. Where possible, when Member States are conducting patrols either inside EEZs or on the High Seas within the Convention Area it is recommended that the patrol vessel be registered with the VMS or at least report in via secure means (phone/telex/fax/email) to the Commission FMC during the patrol. This will enable the Patrol Vessel to get lists of "candidate" vessels that are within a specified range (e.g. 30nm) that could be boarded and inspected on that day. When combined with a database of inspections maintained at the WCPFC FMC this can help to ensure that an even spread of boardings takes place. Some VMS implementations allow for Patrol Vessels to be allocated a floating zone of a defined range that would automatically identify potential "candidates" within that range. Depending on the choice of VMS software it is possible for a patrol vessel or aircraft to be fitted with a modified version of the VMS that would receive updates by email from the FMC allowing near real-time access to VMS data.

52. When a fishing vessel is targeted for inspection it is recommended that a validation of the correct working of the VMS is initiated by polling the vessel prior to physical contact being made. This is currently only possible with the Inmarsat-C network. Once this poll has been sent and a reply received, the position of the vessel can be validated against previous automatic reports and the transponder and antennae inspected on board as part of the inspection protocol detailed above. This procedure should additionally be appended to the "Revised Draft Procedures for Boarding and Inspection".

V. Other VMS Issues Under Consideration

Determination of catch and effort

53. Many vessel monitoring systems now enable catch and effort data to be submitted alongside the normal position information, although many of these are proprietary systems closely linked to the VMS. The collection of this information is critical in determining the closure dates of specific areas or of whole fisheries when catch and effort quota management are being used as management options. A more preferable solution, purely from a data collection point of view, is to use the same satellite communications system to submit more detailed electronic logbooks by email that can be completed in a database or spreadsheet on board and emailed to the Commission on exit from the zone or at regular intervals. CCAMLR has shown that a system of regular reporting on a five day basis combined with monthly reporting of haul-by-haul data in electronic logbooks enable close monitoring of the quotas for the fisheries monitored. Systems such as this are becoming increasingly complex. The chain of custody database implemented for the South Georgia fishery in the CCAMLR Area is able to track catches down to the level of individual boxes of fish, with data reported daily from vessels that are still at sea.

Promotion of cooperation and coordination

54. The most appropriate communication routes for cooperation and coordination for the setup of a centralised VMS for the Commission is through the WCPFC Member States and the relevant national fishermen's organisations in each country. It is recommended that once a programme of work has been defined posters and flyers (paper and electronic) describing the planned VMS implementation should be designed and disseminated through the region.

Compilation of Statistical Data and Facilitation of allocation measures, e.g. catch/effort

55. The compilation of statistical data is most appropriately done through logbook and other reporting systems for the various fisheries, unless catch and effort data for complex quota management procedures are required. The use of VMS data in the estimation of vessel effort (in terms of time spent fishing) and identification of locations fished can provide verification of logbook as specified in the Fish Stocks Agreement (Annex 1 (6)) "States or, as appropriate, subregional or regional fisheries management organizations or arrangements should establish mechanisms for verifying fishery data, such as: (a) position verification through vessel monitoring systems;…".

56. VMS is an efficient and effective mechanism for measurement and control of effort levels in terms of days at sea or days spent in management areas. However as discussed previously, it is extremely difficult in a legal sense to identify when a vessel is fishing based solely on VMS data. It is, however, possible to identify a "fishing footprint" or "fishing fingerprint" that can identify when a particular vessel type is fishing, e.g. when a purse seine vessel stops moving it is likely that it is fishing or when a longliner repeats the same pattern of positions at a particular speed it is likely to be setting and hauling a line. As described in WCPFC/PrepCon/WP.23 the VMS operator may be prompted to increase the reporting frequency on the receipt of an alert of potential fishing activity to investigate further. However even if VMS data cannot be used to identify fishing effort they can be used to aid in the collection, verification, and timely exchange and reporting of data such as electronic logbooks.

Standardisation for different vessel classes

57. It is recommended that an analysis of the different vessels sizes (by GRT or length) by vessel type be conducted for all relevant vessels fishing in the Convention Area. Fishing vessels should be classified according to the FAO standard of vessel classes and within this by length classes to identify VMS application. It is common within a vessel class for a number of different size classes to exist. Tuna longliners for instance often fall into three distinct classifications, those under 200 GRT, those between 200 and 600 GRT and those above 600 GRT. Once appropriate length classes have been defined within each vessel class, appropriate timetables for the deployment of VMS can be agreed and target reporting frequencies for each class can be determined along with areas of operation etc.

58. The implementation of VMS across the various vessel classes should be staggered. An implementation plan could include provisions such as the following: all fishing vessels >24m LOA to be tracked within the first year; all vessels >18m within 2 years; and all fishing vessels >12m LOA being tracked within 4 years. Such a staggered implementation would enable the operations procedures to be tested and refined with experience in the region while gradually increasing the coverage across the fleets.

59. There is a potentially major problem with the identification of what constitutes a 'traditional vessel' within the Convention Area. The type and number of 'traditional vessels' varies greatly between the different coastal States. Many of these vessels are not powered or do not have sufficient power to maintain a standard VMS installation, although low power options exist for VMS tracking by radio or mobile phone technology. These may be of particular interest to coastal States where the safety aspects of VMS compared to the more traditional MCS use of VMS are more important.

Standards to address compatibility issues

60. VMS data are in essence quite simple, making compatibility issues relatively straightforward to resolve. The main components of the data stream are a set of vessel identifiers, a date and time, position as latitude and longitude (normally decimalised) and calculated fields for course and speed. The adoption of a common VMS data format similar to that detailed in paragraph 8, the North Atlantic Format (NAF) would be appropriate. This format is currently used by NAFO and NEAFC in the North Atlantic and in a slightly reduced form by CCAMLR and provides a good candidate system for data exchange. It is well documented and could easily be adapted to work with the WCPFC Convention Area.

Standard to clarify/specify recipients/users of data

61. There should be a clear identification process during the development of the Commission VMS to categorise users of VMS data. This process will identify groups who will be given different levels of access to the VMS data. A typical outline of the different groups is given below;

Group	Rights Description
Commission VMS Administrators	Administrative rights to the VMS. Ability to add / modify vessel details and modify VMS data (with full modification tracking on underlying database).
Commission VMS Operators	Rights to view all VMS data and underlying vessel databases, rights to modify temporary reporting frequencies and other management controls but no rights to modify data.
National Fisheries Officers (MCS)	Rights to view all VMS data relating to their flag vessels or vessels operating in their EEZ.
National Fisheries Officers (Other)	Aggregated data for all vessels (aggregation levels to be agreed) or by vessel detail with vessel identifiers removed.

62. Flewelling *et al.* (2003)[10] recommend that it is essential to protect the confidentiality of data derived from VMS and to provide appropriate penalties for their misuse. They recommend the following measures:

a) Categorise sensitive information derived from VMS as confidential;
b) Require that this information be used primarily for MCS and other fisheries management purposes;
c) Clearly define the situations in which secondary use of VMS information is permitted (e.g. for search and rescue);
d) Restrict access to premises where VMS information is processed or stored , as well as access to the information itself; and
e) Make breach of confidentiality an offence punishable by severe penalties.

Standard authorisation for users of VMS data

63. The UN Fish Stocks Agreement (Article 10(f)) and Annex I) states that "States shall,… compile and disseminate accurate and complete statistical data, as described in Annex I, to ensure that the best scientific evidence is available, while maintaining confidentiality where appropriate;" VMS and related MCS data are highly confidential and should only be released under specific, clearly defined guidelines and then only in support of the Commission's or Member States' MCS or scientific programmes. Data should never be publicly released where individual vessel positions are identified except possibly in the case of legal proceedings taken against vessels acting illegally.

64. Guidelines for the provision and treatment of VMS data required for legal proceedings will need to be developed in line with the differing national requirements. The provision of expert witnesses for legal proceedings to describe the chain of evidence and any analysis conducted on VMS data must also be considered.

65. Requests to the Commission for access to and/or use of VMS data maintained by the Commission by individual Member MCS officials should be approved in writing as appropriate by that Members' Commissioner. For such requests, the Commission should ensure that each request meets the conditions

[10] Flewelling, P., Cullinan, C., Balton, D., Sautter, R.P. and Reynolds, J.E. Recent trends in monitoring, control and surveillance systems for capture fisheries. FAO Fisheries Technical Paper. No. 415. Rome, FAO. 2002. 200p.

of access developed, and, if so, release the data and inform the data vessel owner(s) and flag State originator(s). Release of data by the Commission to the requestor does not necessarily constitute permission to publish or release data into the public domain. Such permission remains a matter to be determined between the requestor and the vessel owner and flag State originator(s).

Standards for maritime boundaries in the WCPO region.

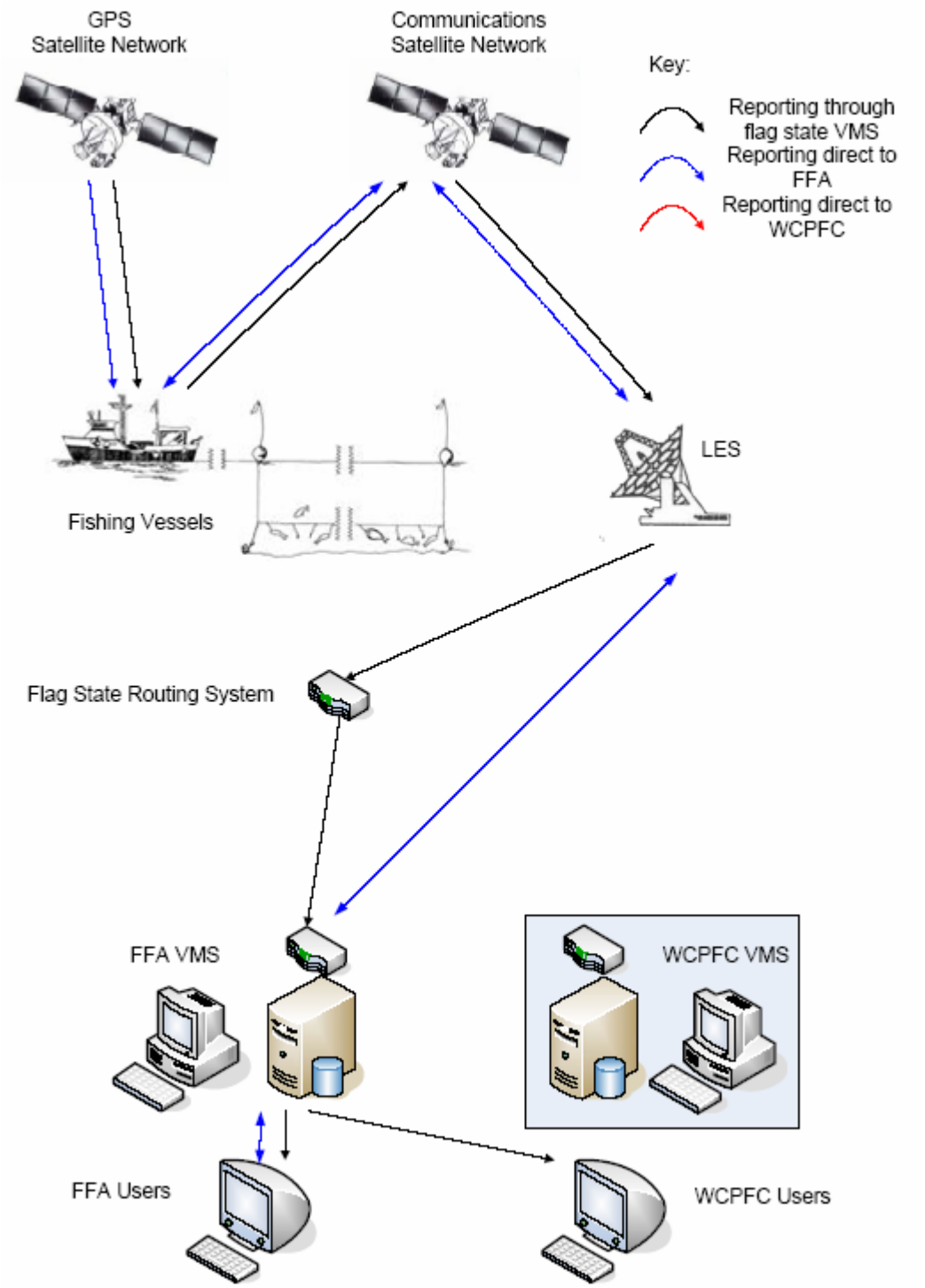
66. UNCLOS requires all coastal States to provide the United Nations with charts or lists of coordinates defining the outer limits of their maritime jurisdiction. The United Nations maintains a list of all the maritime boundary claims that are currently held, including disputed areas. A summary of these for the Convention Area of the WCPFC coastal States is provided in Annex 3. From the map shown in Figure A3-1, only four areas that bound the Convention Area are currently disputed[11].

67. These maritime boundary claims are maintained in easily usable formats by a number of third parties such as the Global Maritime Boundaries Database as commercial products which detail all current claims and are updated on a regular basis. It is important to maintain this database with all current and disputed claims which define the boundary to the WCPFC Convention Area. It should also be noted that there is currently a deadline set at 2009 for the submission of claims under UNCLOS Article 76 relating to the extension of EEZs under the jurisdiction of the International Seabed Authority.

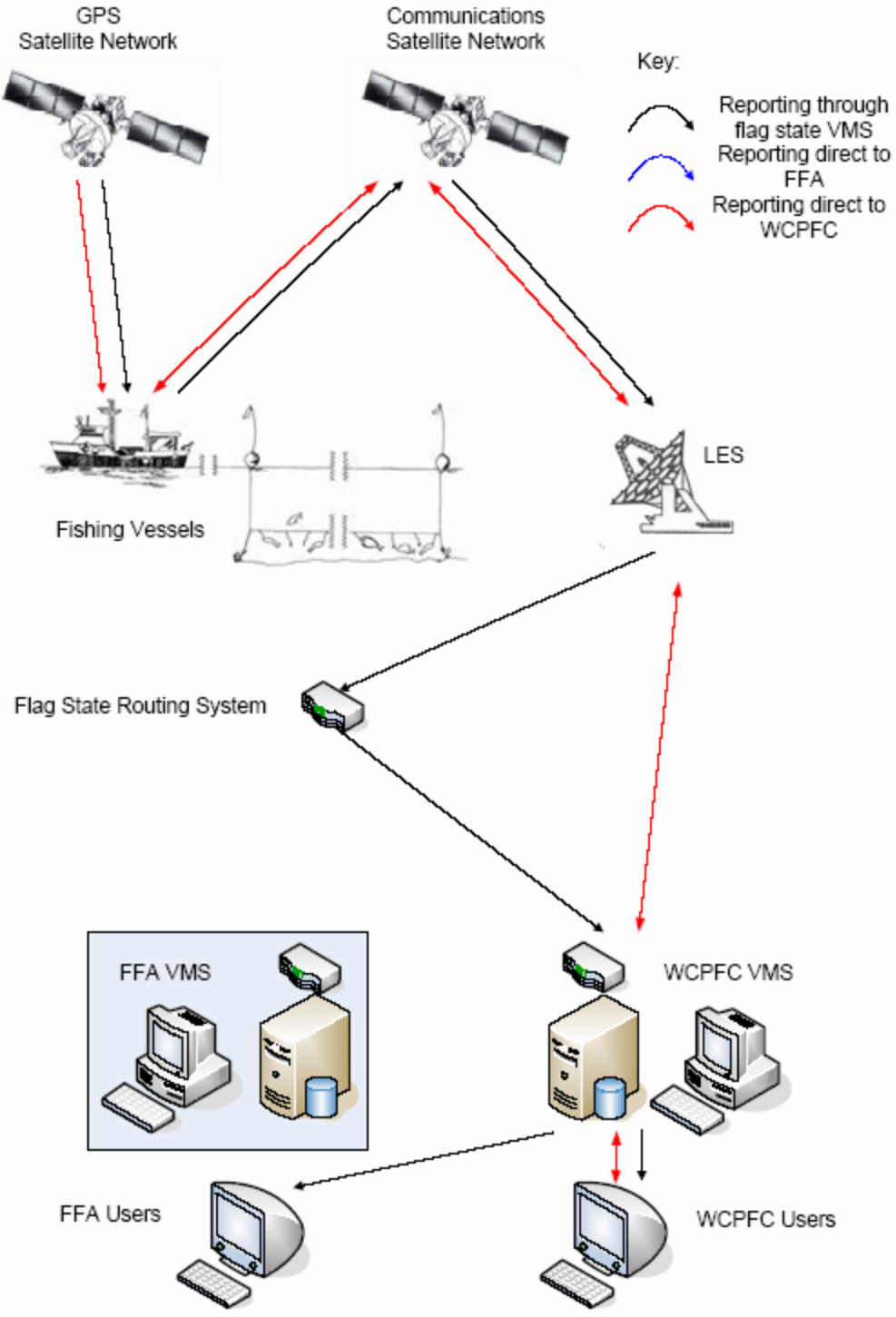
[11] These are: the archipelagic status claimed by the Philippines and the territorial sea claimed around the archipelago; the status of the zone around the southernmost of the Kuril Islands; the Matthew and Hunter islands to the east of New Caledonia and the maritime boundary between Fiji and Tonga.

Annex 1 Data Flow Diagrams for Proposed Regional VMS Options

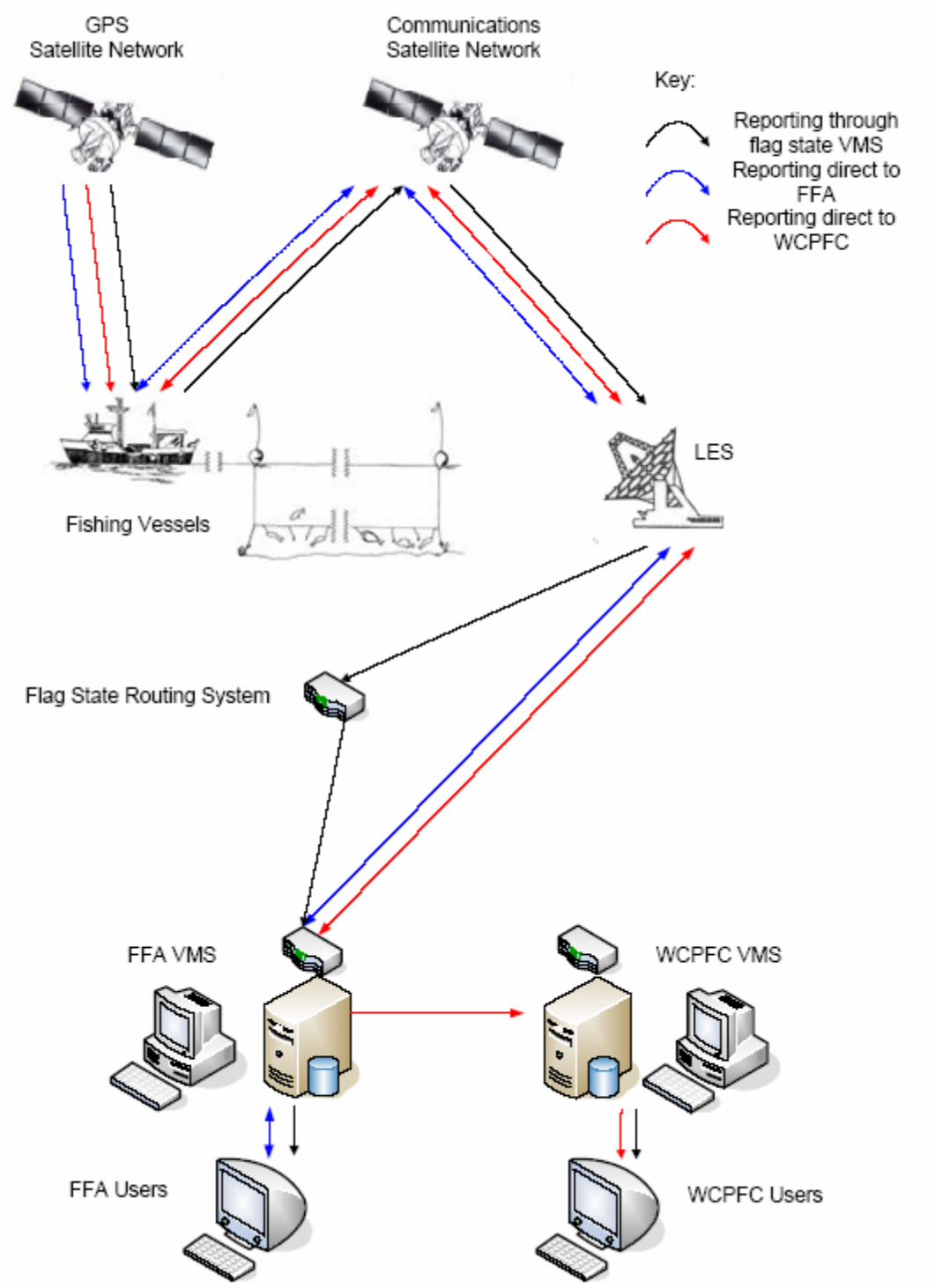
Option 1 All Regional Data to single VMS at FFA



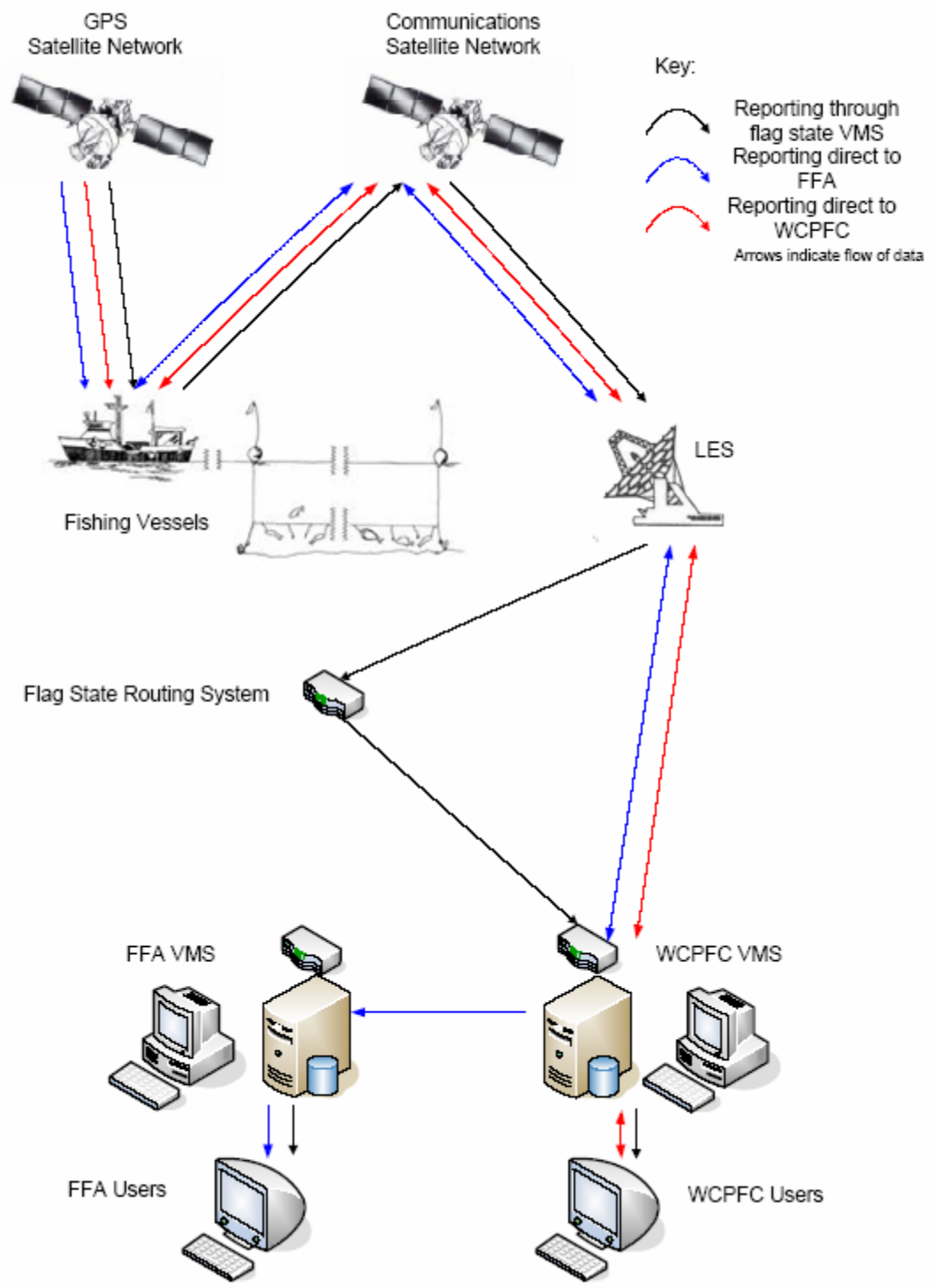
Option 2 All Regional Data to single VMS at WCPFC



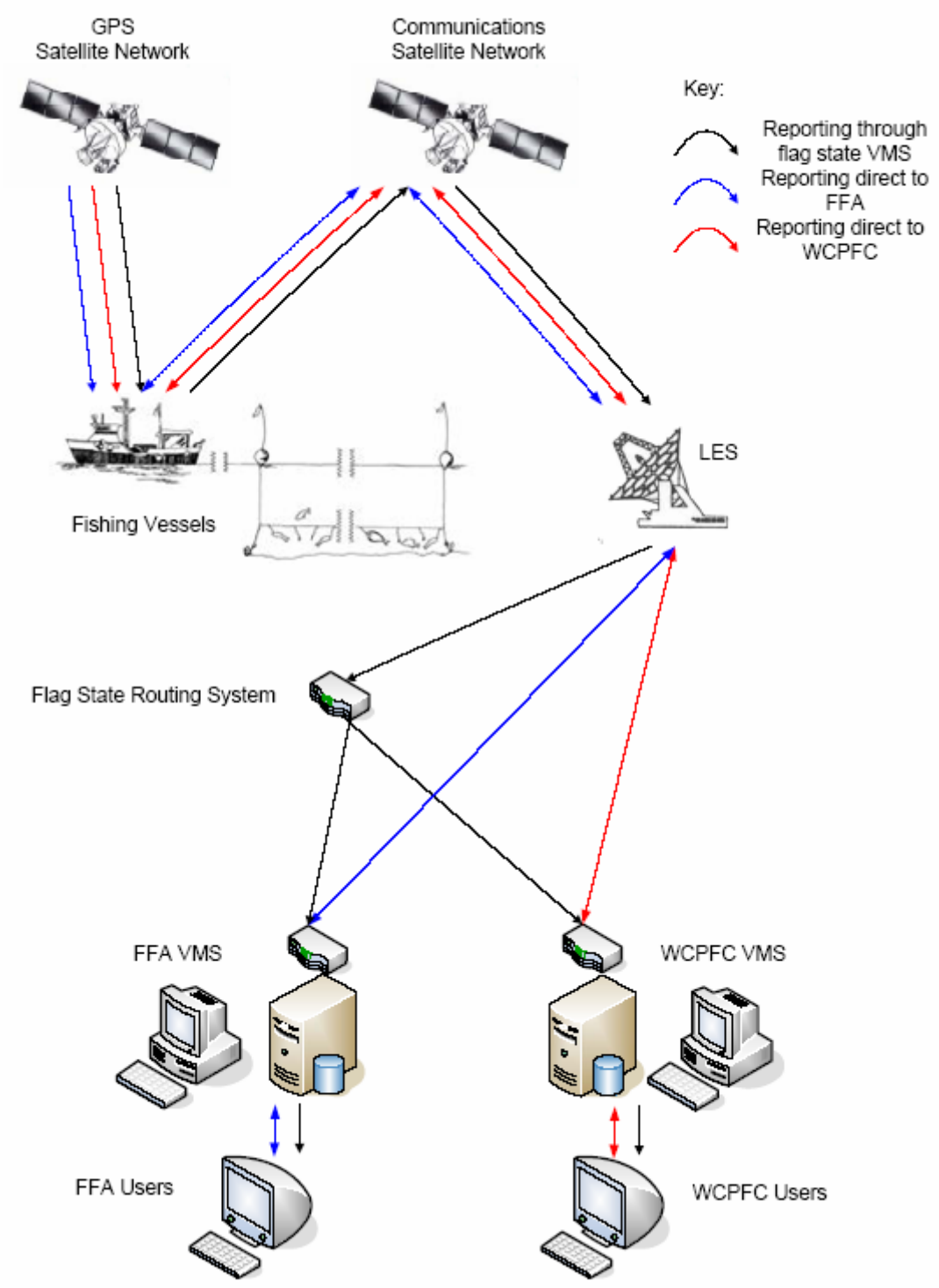
Option 3 All Regional Data to single VMS at FFA and data routed to WCPFC



Option 4 All Regional Data to single VMS at WCPFC and data routed to FFA



Option 5 Separate VMS systems at FFA and WCPFC for EEZ and High Seas Data



Annex 2 NAFO / NEAFC VMS Data Exchange Formats – The "North Atlantic Format"

The following table details the requirements for the North Atlantic Format of VMS data exchange.

Data Element	Code	Mandatory /Optional	Remarks
Start record	SR	M	System detail; indicates start of record
From	FR	M	Address of the transmitting party (Contracting Party)
Address	AD	M	Message detail; destination; "XNW" for NAFO Secretariat
Sequence Number	SQ	O	Message detail; message serial number in current year
Type of Message	TM	M	Message detail; message type, "POS" as Position report/message to be communicated by VMS or other means by vessels with a defective satellite tracking device
Radio call sign	RC	M	Vessel registration detail; international radio call sign of the vessel
Trip Number	TN	O	Activity detail; fishing trip serial number in current year
Vessel Name	NA	M	Vessel registration detail; name of the vessel
External Registration Number	XR	M	Vessel registration detail; the side number of the vessel
Latitude	LT	M	Activity detail; position at time of transmission
Longitude	LG	M	Activity detail; position at time of transmission
Date	DA	M	Message detail; date of transmission
Time	TI	M	Message detail; time of transmission
Record Date	RD	M	Year, month and date
Record Time	RT	M	Hours and minutes in UTC
Record Number	RN	M	Serial number of the record in the relevant year
End of record	ER	M	System detail; indicates end of the record

Each data transmission is structured as follows: double slash ("//") and the characters "SR" indicate the start of a message; • a double slash ("//") and field code indicate the start of a data element; a single slash ("/") separates the field code and the data; pairs of data are separated by space; the characters "ER" and a double slash ("//")indicate the end of a record."

The CCAMLR VMS data format is very similar except that the "From", "Record Date", "Record Time" and "Record Number" fields are not required and the only message types in use are "ENT "– Entry, "EXI" – Exit and "POS" – Position.

Annex 3 Table of Claims to maritime jurisdiction in the Convention Area (as at 26 August 2005) [12]

The table presented below details all claims to maritime jurisdiction within the Convention Area and represents a review of information published, *inter alia*, in the report of the Secretary General on oceans and the law of the sea. It is based on national legislation and other relevant information obtained from reliable sources with a view to ensuring the most accurate representation of the status of claims. Despite extensive research and periodic review, however, the table may not always reflect the latest developments, especially those which have not been brought to the attention of the Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs of the United Nations.

State	UNCLOS Ratification	Straight Baselines	Archipelagic Status	Zone Claims			Fisheries Zone	Continental Shelf Claim	
				Territorial Sea	Contiguous Zone	EEZ		Party to 1982 Convention	Outer Limit of Claim
Australia	05/10/1994	Yes		12 [13]	24	200		1982	CM/200
Brunei Darussalam	05/11/1996			12		200		1982	N/A
Cambodia		Yes		12	24	200			200
China	07/06/1996	Yes		12	24	200		1982	CM/200
Cook Islands	15/02/1995			12	200			1982	CM/200
Democratic People's Republic of Korea				12	See note [14]	200			N/A
Fiji	10/12/1982		Yes	12		200		1982	200m/EXPL.
France	11/04/1996	Yes		12	24	200 [15]		1982	200m/EXPL.
Indonesia	03/02/1986		Yes	12		200		1982	N/A
Japan	20/06/1996	Yes		12 [16]	24	200		1982	CM/200
Kiribati	24/02/2003	Yes	Yes	12		200		1982	N/A
Malaysia	14/10/1996			12		200		1982	200m/EXPL.
Marshall Islands	09/08/1991		Yes	12	24	200		1982	N/A
Micronesia (Federated States of)	29/04/1991			12		200		1982	N/A

[12] This material is unofficial and for informational purposes only.

[13] The territorial sea boundaries between the islands of Aubusi, Boigu and Moimi and Papua New Guinea and the islands of Dauan, Kaumag and Saibai and Papua New Guinea, together with such other portion of the outer limit of the territorial sea of Saibai are determined by a treaty with Papua New Guinea. The territorial seas of the islands known as Anchor Cay, Aubusi Island, Black Rocks, Boigu Island, Bramble Cay, Dauan Island, Deliverance Island, East Cay, Kaumag Island, Kerr Islet, Moimi Island, Pearce Cay, Saibai Island, Turnagain Island and Turu Cay do not extend beyond three miles from the baselines.

[14] 50-nautical mile military zone. Army Command Announcement of 1 August 1977.

[15] Applies to the North Sea, the English Channel and the Atlantic Ocean from the Franco-Belgian border to the Franco-Spanish border, Saint Pierre and Miquelon, French Guiana, Réunion, New Caledonia, French Polynesia, French Southern and Antarctic Lands, Wallis and Futuna, Tromelin, Glorioso, Juan de Nova, Europa and Bassad da India Islands, Clipperton Island, Mayotte, Guadaloupe and Martinique.

[16] Three-mile limit applies to the Soya Strait, the Tsugaru Strait, the eastern and western channels of the Tsushima Strait and the Osumi Straits only.

State	UNCLOS Ratification	Straight Baselines	Archipelagic Status	Zone Claims			Fisheries Zone	Continental Shelf Claim	
				Territorial Sea	Contiguous Zone	EEZ		Party to 1982 Convention	Outer Limit of Claim
Nauru	23/01/1996	Yes		12	24	200		1982	N/A
New Zealand	19/07/1996	Yes		12[17]	24	200[18]		1982	CM/200
Niue				12		200			N/A
Palau	30/09/1996			3		200		1982	N/A
Papua New Guinea	14/01/1997		Yes	12[19]		200		1982	200m/EXPL.
Philippines	08/05/1984		Yes	See Note [20]		200		1982	EXPL.
Republic of Korea	29/01/1996	Yes		12	24	200		1982	N/A
Russian Federation	12/03/1997	Yes		12	24	200		1982	CM/200
Samoa	14/08/1995	Yes		12	24	200		1982	N/A
Solomon Islands	23/06/1997	Yes		12		200		1982	200
Timor-Leste				12	24	200			CM/200
Tonga	02/08/1995	Yes		12		200		1982	N/A
Tuvalu	09/12/2002		Yes	12	24	200		1982	N/A
United Kingdom	25/07/1997	Yes		12[21]		200[22]	200 [23]	1982	Defined by coordinates
United States of America				12	24	200 [24]		1958	CM/200
Vanuatu	10/08/1999	Yes	Yes	12	24	200		1982	CM/200
Viet Nam	25/07/1994	Yes		12	24	200		1982	CM/200

Figure A3 -1 Map of WCPFC Convention Area overlaid with territorial claims.

[17] Includes Tokelau.

[18] Includes Tokelau.

[19] Three nautical miles in certain areas.

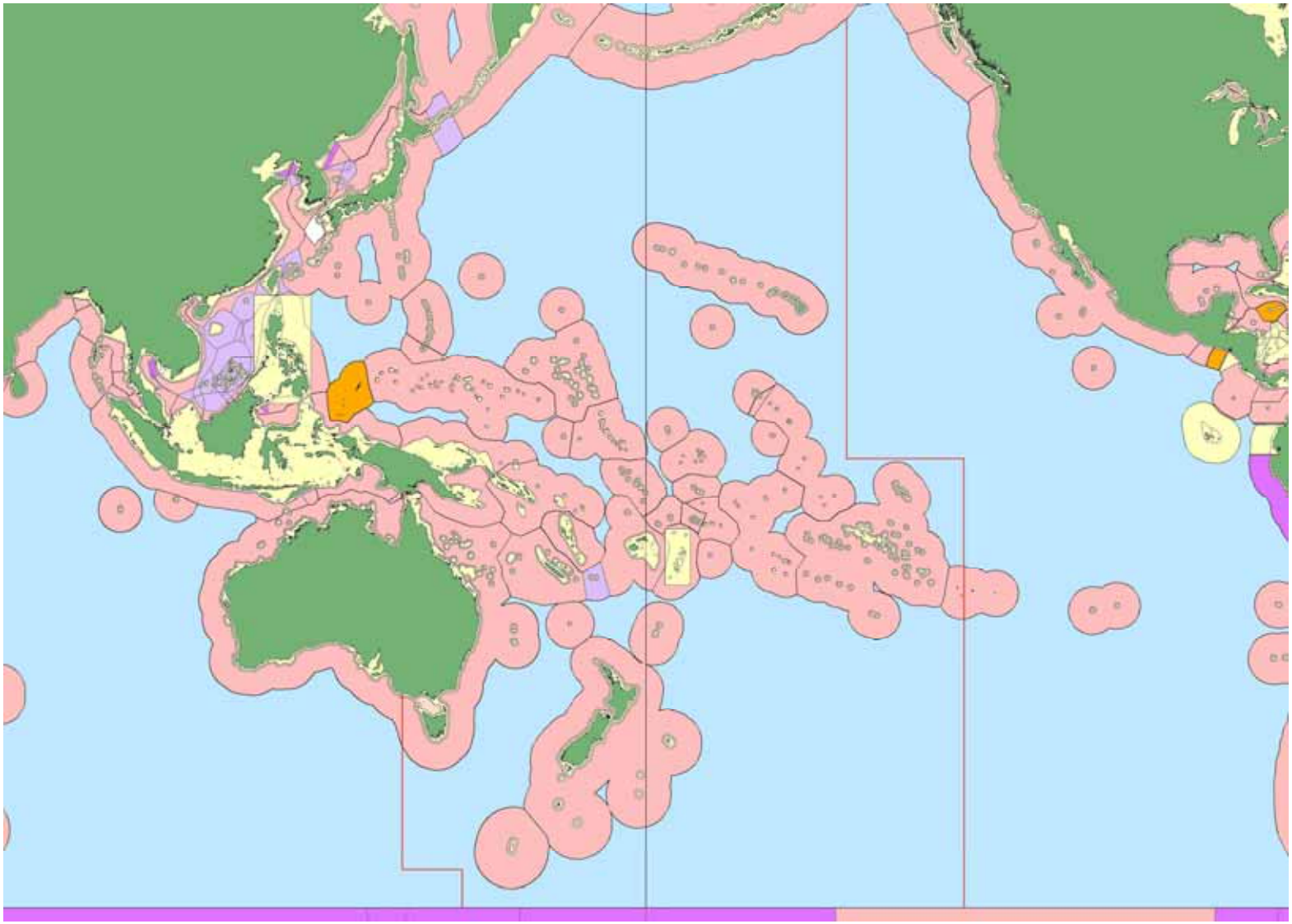
[20] Rectangle defined by coordinates. Claim extends beyond 12 nautical miles.

[21] Also three nautical miles. (Three nautical miles in Anguilla, Guernsey, British Indian Ocean Territory, British Virgin Islands, Gibraltar, Monserrat and Pitcairn; 12 nautical miles in United Kingdom, Jersey, Bermuda, Cayman Islands, Falkland Islands, Isle of Man, St. Helena and Dependencies, South Georgia, South Sandwich Islands, and Turks and Caicos Islands.)

[22] Bermuda, Pitcairn, South Georgia and South Sandwich Islands.

[23] 12 nautical miles in Guernsey; 200 nautical miles in United Kingdom, Anguilla, British Indian Ocean Territory, British Virgin Islands, Cayman Islands, Falkland Islands, Monserrat, St. Helena and Dependencies, and Turks and Caicos Islands.

[24] Includes Puerto Rico, U.S. Virgin Islands, American Samoa, Guam, Johnstoll Atoll, Palmyra Atoll, Midway Island, Wake Island, Jarvis Island, Kingman Reef, Howland Island, Baker Island, Northern Marianas, and Navassa Island.



Western Central Pacific Fisheries Commission

VMS Registration Document

Vessel Identification **Vessel Name**	
International Radio Callsign	
Nationality	
National Registration Number	
Commission use only: **WCPFC Record of Fishing Vessels Identifier**	
Transponder Details **Inmarsat-C Terminal (Make and Model)**	
Mobile Serial Number	
Commission use only: **Inspected By**	
Inspected Location	
Inspected Date	
Submitted By (Name)	**_____ (Block Capitals)**
	_____ (Signature)
Submitted On: (dd/mm/yyyy)	**____ / ____ / _____ (dd/mm/yyyy)**
Commission use only: **Approved By**	
Approved Date	

Annex 5 Latest Prosecution Utilising VMS Evidence

Irish skipper incurs heavy fine for misreported log

A Donegal skipper of an Irish fishing boat who confessed to falsifying his logbook for time and money purposes was levied a fine of GBP 17,500 (USD 31,094) at Lerwick Sheriff Court Thursday 27th October 2005.

Seamus Doherty, skipper of the Western Viking, originally reported he had been off Ireland on a fishing trip from Sunday to Tuesday last week and caught 240 tonnes of mackerel worth an estimated GBP 288,000 (USD 511,718). However when he landed his catch in Shetland, fisheries protection officers checked with their monitoring headquarters in Edinburgh who said Doherty's vessel Western Viking had never left the North Sea during the entire three day trip.

Doherty stated to the court that he falsified his records in order to have enough time to catch mackerel migrating from Ireland's eastern waters to its west, around the island – a location where fishing boats possess a three month license to harvest the fish from October to the end of the year. The skipper stated, however, that he did not wish to spend a lengthy time fishing during the winter months and opted to pre-empt the migrating schools in order to ground his boat early in the season.

Fiscal Procurator Duncan Mackenzie called the violation a "flagrant breach" of EU fishing conservation measures and added: "Fishery conservation would simply collapse in its entirety without a diligent, trustworthy completion of logsheets. The importance of that cannot be emphasised enough."

Defending barrister, Tommy Allan, stressed to the court that Doherty had yielded no additional profit from the misreported enterprise as *Western Viking's* quota allowed the crew to harvest 3,400 tonnes of North Sea mackerel with quota capacity to spare. He added that the actual value of the catch had been GBP 190,000 (USD 337,592).

Sheriff Graeme Napier said: "This is one of the most blatant cases of misrecording I have dealt with." Had Doherty profited from the violation he would have been "sorely tempted" to fine him the value of the catch.