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USE OF MONITORING CONTROL AND SURVEILLANCE (MCS) IN FISHING AS AN INTEGRAL PART OF FISHERIES MANAGEMENT IN THE WECAFC REGION

SUMMARY

This document considers the impact the various international legal instruments have had on the Monitoring, Control and Surveillance of fishing vessels (MCS) and how modern equipment is changing the type and effectiveness of MCS that is implemented. The introduction of Vessel Monitoring Systems (VMS) is one of the technologies that have attracted much attention in recent years, but there are other tools that are becoming available to the MCS practitioners. These developments are reviewed and recommendations made to enable the member countries of the Commission to make informed decisions on their MCS provisions. There are also recommendations with regard to the regional cooperation that can be undertaken in MCS.

I. INTRODUCTION

1. In the past, fisheries administrators have viewed Monitoring, Control and Surveillance of fishing vessels (MCS) as little more than the policing of the various maritime zones under the national jurisdiction of the coastal State. This paper attempts to provide a broader view of MCS – a view of MCS as a vital component of fisheries management. The rapid depletion of key fish stocks in the 1980s and 1990s has made it imperative that governments achieve greater control over fishing activities. At the international level, a number of new agreements have created a stronger legal basis on which to develop greater control. At the same time, new technological developments have facilitated the remote monitoring of fishing vessels and the collection of fisheries data.

II. LEGAL REGIME

2. The 1982 United Nations Convention on the Law of the Sea (LOS), which entered into force in 1994, forms the backbone of the international legal framework for fisheries management. It sets out the rights and duties of coastal, port and flag States in respect of each of the principal maritime zones recognized by international law, namely the territorial sea, the exclusive economic zone, the continental shelf and the high seas. It also deals with a range of other important issues that are related, including the legal regimes applicable to internal waters, archipelagic waters, the contiguous zone, and the right of innocent passage and passage through international straits. The LOS also contains additional guidance relating to fish that occur in waters under the jurisdiction of more than one state, migrate between areas under national jurisdiction and that occur exclusively on the high seas.

The exclusive economic zone (EEZ)

3. The EEZ is a maritime zone which may extend to 200 nautical miles from baselines. Within its EEZ, the coastal state has “sovereign rights for the purpose of exploring and exploiting, conserving and managing the

natural resources, whether living or non-living, of the waters superjacent to the sea-bed and of the sea-bed and its subsoil” (LOSC, Art. 56, 1 (a)), as well as jurisdiction with regards to marine scientific research and the protection and preservation of the marine environment. It is thus a single multipurpose zone that balances the coastal state’s control over its marine resources with residual freedom of navigation. A coastal State is required to grant foreign fishing vessels access to any surplus in the total allowable catch (TAC) in its EEZ, but is entitled to set the terms and conditions of such access in laws and regulations that may, inter alia, require foreign vessels to provide “vessel position reports” (LOSC, Art.62, 4 (e)).

4. The EEZs have provided MCS with its greatest challenge with regard to enforcement of national laws. The fishing activities in the territorial seas or in the coastal zone are visually observable from the shore. In the outer limits of the EEZ it is necessary to employ vessels and aircraft to monitor fishing vessels.

5. The establishment of EEZs or of 200 miles fisheries zones has modified significantly the balance in rights, interests and obligations. Distant water fishing nations (e.g. Japan, Spain, Poland, and Korea) that had previously fished off the coasts of other continents in what were high seas had to negotiate access agreements with the relevant coastal States in order to pursue their operations. On the other hand, coastal States had to respond to the challenge of managing these vast areas under their national jurisdiction, sometimes of a far greater extent than their own land territory as in the case of the Pacific island countries and other SIDS.

The continental shelf

6. Under LOSC, a coastal State “exercises over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources” (LOSC, Art. 77, par.1). These rights are exclusive (*ibid.* par.2) and inherent –they “do not depend on occupation, effective or notional, or on any express proclamation” (*ibid.* par.3). As a consequence of its definition, the legal continental shelf covers most of the continental margin and may extend thus far beyond the 200 miles outer limit of the EEZ. The legal regime of the continental shelf applies to a category of living resources, those belonging to sedentary species, “that is to say, organisms which, at the harvestable stage, either are immobile on or under the sea-bed or are unable to move except in constant physical contact with the sea-bed or the subsoil” (*ibid.* par. 4).

The high seas

7. The high seas are “all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State” (LOSC, Art.86). “Freedom of high seas” includes “freedom of fishing” (LOSC, Art.87, paragraph 1), which means that “All States have the right for their nationals to engage in fishing in the high seas” (LOSC, Art. 116). However, this right is subject to a number of significant qualifications, particularly the obligation to conserve living resources of the high seas and to cooperate with other States for the conservation and management of these resources; it is also subject to the rights, duties and interests of coastal States concerning straddling stocks, highly migratory species, marine mammals, anadromous stocks and catadromous species.

8. The result of the establishment of extended zones of national jurisdiction is that only about 60% of the world’s oceans are now “high seas”. However given that they are relatively unproductive compared to the continental shelves, significantly less than 10% of the world’s marine catch is caught on the high seas. The challenge raised to MCS in the high seas derives from the fact that fishing vessels on the high seas are subject to the exclusive jurisdiction of the flag State. However, a number of recent international agreements have given States other than the flag State certain rights to take action with respect to fishing vessels on the high seas, primarily to help prevent, deter and eliminate IUU fishing. Coastal States may also exercise the right of hot pursuit of foreign fishing vessels on the high seas in certain carefully defined circumstances, when these vessels have incurred in violations in the exclusive economic zones of the laws and regulations of these States (LOSC, Art. 111, paragraph 2).

9. For the high seas and for areas under national jurisdiction, a series of multilateral regional fisheries bodies were established in the framework of FAO to provide support and assistance and to encourage cooperation and development. These FAO bodies have recently been reviewed and some of them dissolved and others revitalised. There are a number of regional fisheries bodies that were set up by interested States for the purpose of conservation and management of specific stocks of multi-lateral interest (e.g IWC, NASCO, PSC, IPHC) and for tunas and other highly migratory species (e.g. ICCAT, IOTC, IATTC, GCFM). At present, there

are around forty such bodies although only around 15 of them really deal with fisheries management *per se*. Several others are in the process of being established (SWIOFC, SEAFO)

10. It is interesting to note that these bodies, in spite of lacking the kind of jurisdiction and enforcement power that coastal States or flag States enjoy, have developed and adopted innovative schemes in particular to combat IUU Fishing, through the use of catch documentation and the recourse to port state control. They also have been generally active in getting FAO to be involved in this process.

III. POST LOSC INSTRUMENTS

11. The rules of international law relating to fisheries and reflected in the relevant provisions of LOSC, thus applicable even before the Convention itself entered into force, did not prevent the depletion of several valuable fish stocks. For this reason, the international community, especially on the occasion of the 1992 United Nations Conference on Environment and Development (UNCED), felt the need of and called for the urgent development of further instruments aimed at re-establishing and maintaining sustainable fisheries worldwide. Some of these instruments contain provisions that address specifically the issue of Monitoring Control and Surveillance of fishing vessels (MCS).

FAO Code of Conduct

12. The FAO Code of Conduct for Responsible Fisheries (CCRF) is a broad and comprehensive but non-binding document – with the exception of the 1993 FAO Compliance Agreement, which forms an integral part of the Code and is a legally binding instrument. It sets out principles and standards for the conservation and management of all fisheries, as well as for fish processing, trade in fish and fishery products, fishing operations, aquaculture, fisheries research and the integration of fisheries into coastal area management. A fundamental objective of CCRF is “to serve as an instrument of reference to help States to establish or to improve the legal and institutional framework required for the exercise of responsible fisheries and in the formulation and implementation of appropriate measures.” (Article 2 (c)).

13. In addition to its dynamic nature and the fact that it is intended to be interpreted and applied as part of a package of international instruments, the CCRF contains specific provisions that are relevant to MCS, including the following:

“States, in conformity with their national laws, should implement effective fisheries monitoring, control and surveillance and law enforcement measures including, where appropriate, observer programmes, inspection schemes and vessel monitoring systems. Such measures should be promoted and, where appropriate, implemented by sub regional or regional fisheries management organizations and arrangements in accordance with procedures agreed by such organizations or arrangements.” (Article 8.1.4)

14. Implementation of the Code is primarily the responsibility of States. However, FAO has an important role to play in encouraging and facilitating the implementation of the Code and to provide technical support to national and regional initiatives in this regard. The work done by FAO in this regard includes establishing an internet website to facilitate public access to the CCRF and the Compliance Agreement, which is linked to national sites (www.fao.org/fi), and establishing an Interregional Programme of Assistance to Developing Countries for the Implementation of the Code of Conduct for Responsible Fisheries (the FishCode Programme).

FAO has developed several Technical Guidelines in support of the implementation of the Code of Conduct for Responsible Fisheries¹.

FAO Compliance Agreement

15. The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, 1993 (FAO Compliance Agreement) which was elaborated as an integral part of the FAO Code of Conduct, entered into force in 2003, following the deposit of 25 instruments of acceptance with FAO. It seeks to strengthen the provisions in LOSC relating to high seas fishing. This treaty

¹ These guidelines include: *Fishing Operations, 1. Vessel Monitoring Systems* (Rome, FAO, 1998). They are available on the FAO Fisheries Department website (www.fao.org/fi).

has two primary objectives. The first is to require all States whose vessels fish on the high seas to take a range of steps to ensure that those vessels do not undermine measures to conserve and manage the living resources of the high seas. The second objective is to increase the transparency of all high seas fishing operations through the collection and dissemination of data.

16. Article III of the FAO Compliance Agreement contains its most significant provisions for purposes of MCS, including three fundamental responsibilities of flag States:

- a) Flag States should ensure that their vessels do not undermine fishery conservation and management measures that apply in any high seas area.
- b) Vessels should not fish on the high seas except pursuant to express authorization to do so issued by the flag State.
- c) A flag State should not grant such authorization to a vessel unless it can ensure that the vessel will not undermine fishery conservation and management measures that apply in a high seas area in which the vessel will operate.

17. Article III of the Compliance Agreement also requires each flag State to ensure that its fishing vessels are marked to be readily identifiable in accordance with generally accepted standards (such as the FAO vessel marking scheme), to obtain information on the operations of their vessels, and to impose sanctions for non-compliance that are sufficiently severe to deter further non-compliance. Although the FAO Compliance Agreement allows parties to exempt vessels under 24 metres in length from some of the administrative requirements of the treaty, flag States must take effective measures to ensure that any exempted vessels that undermine the effectiveness of international conservation and management measures cease to engage in such activities.

1995 UN Fish Stocks Agreement

18. The Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (the UN Fish Stocks Agreement) sets forth a broad range of obligations designed to create greater control over fisheries for certain valuable stocks, including the strengthening of MCS capabilities.

19. The UN Fish Stocks Agreement entered into force on 11 December 2001, following the deposit of instruments of ratification or accession by 30 States. This treaty builds on several general provisions of LOSC in an effort to strengthen cooperation in the conservation and management of certain fish stocks that occur both within EEZs and on the high seas:

- a) “straddling” fish stocks, which are stocks whose natural ranges straddle the line dividing areas under the fisheries jurisdiction of one or more coastal States and the adjacent high seas areas. Examples of such stocks include cod in the Northwest Atlantic Ocean and pollock in the Bering Sea; and
- b) “highly migratory” fish stocks, which are stocks that migrate extensively across the high seas and through areas under national jurisdiction of coastal States. Examples of such stocks include tuna and swordfish.

Other international instruments

20. To date, four International Plans of Action (IPOAs) have been developed within the framework of the Code of Conduct. FAO adopted three of these instruments in 1999 to deal with the incidental catch of sea birds in long-line fisheries, the conservation and management of sharks and the management of fishing capacity. The IPOA on IUU Fishing was adopted in 2001 and will be discussed later in this paper.

IV. MONITORING CONTROL AND SURVEILLANCE

Definition of MCS

21. An Expert Consultation on MCS organized by FAO in 1981 developed a definition of MCS that is commonly accepted by fisheries personnel:

- a) **monitoring** – the continuous requirement for the measurement of fishing effort characteristics and resource yields;
- b) **control** – the regulatory conditions under which the exploitation of the resource may be conducted; and
- c) **surveillance** – the degree and types of observations required to maintain compliance with the regulatory controls imposed on fishing activities.

22. Since the 1981 MCS Conference, the definition of MCS has been enhanced to clarify the concept that MCS covers more than just fisheries enforcement – it is an integral and key component for the implementation of fisheries management plans. It encompasses not only traditional enforcement activities but also the development and establishment of both data collection systems, the enactment of legislative instruments and the implementation of the management plan through participatory techniques and strategies. A 1993 workshop in Ghana offered the following clarifications.

- a) **Monitoring** includes the collection, measurement and analysis of fishing activity including, but not limited to: catch, species composition, fishing effort, by-catch, discards, area of operations, etc. This information is primary data that fisheries managers use to arrive at management decisions. If this information is unavailable, inaccurate or incomplete, managers will be handicapped in developing and implementing management measures.
- b) **Control** involves the specification of the terms and conditions under which resources can be harvested. These specifications are normally contained in national fisheries legislation and other arrangements that might be nationally, sub-regionally, or regionally agreed. The legislation provides the basis for which fisheries management arrangements, via MCS, are implemented. For maximum effect, framework legislation should clearly state the management measures being implemented and define the requirements and prohibitions that will be enforced.
- c) **Surveillance** involves the regulation and supervision of fishing activity to ensure that national legislation and terms, conditions of access and management measures are observed.

These wider definitions amplify the importance of all aspects of MCS.

Strategies for Effective MCS

23. MCS activities need a central umbrella of policies and guidance under which local governments, according to the level of devolution permitted by law, can operate. In particular:

- if the political will is not present, there will not be successful implementation of coastal fisheries management and MCS systems; and
- provision must be made for the devolution of management responsibilities to coastal communities and other stakeholders.

24. The success of MCS operations in almost all cases has been as a result of liaison between parties with a vested interest in the fishing industry. Clear delineation and acceptance of roles, responsibilities and obligations has made the process easier for all parties to accept. The harvesting of any natural resource by a party intending to make a profit has always been a challenge, and nowhere is this more evident than in fisheries. Successful MCS operations have demonstrated the necessary requirement for all participants to understand and accept MCS management plans.

25. The degree to which a government becomes involved in the fishing industry will have an impact on fisheries management and the resultant MCS activities. For example, a government can:

- a) assume a controlling role, where it actually runs the industry, impacts the potential income of fishers, and micro-regulates the harvesting sector; or
- b) maintain a less intrusive or co-management role, whereby the fishers and the fishing industry are encouraged to accept their resource responsibilities and roles within the framework of general government conservation principles and legislation.

26. Effective MCS involves a two-pronged, parallel approach. The preventive approach is to encourage “voluntary compliance” through understanding and support for the management strategies and this includes:

- a) enhancement of community/fisher awareness and understanding of management practices and MCS through seminars, public awareness and information, education, and communication campaigns;
- b) participatory management development to promote ownership of the management regime and input into the regulatory/control aspect of management (laws and regulations) in preparation for acceptance by the fishers of their joint “stewardship” role for the management of their fisheries in partnership with government;
- c) peer pressure towards voluntary compliance and support for the management regime;
- d) the institution of accurate and verifiable data collection regimes; and
- e) surveillance and verification for compliance.

27. The parallel approach of deterrent/enforcement MCS is necessary to ensure compliance by fishers who resist the regulatory regime to the detriment of both the fishery and the economic returns to their fellow fishers. Deterrent and enforcement include inspection, investigation, prevention and court proceedings to enforce the law. Voluntary compliance will fail if stakeholders see non-compliant fishers successfully evading the law and receiving economic returns from their illegal activity, at the expense of the fishers who comply with all requirements.

28. Today, a more typical role for a central government is to set national policies and standards and to co-ordinate the implementation of these policies and standards. Responsibility for actually carrying out MCS activities is now typically shared by central governments with smaller governmental units. Central governments also monitor and evaluate local government performance to enhance future co-ordination and planning. MCS planning and operations still need this national co-ordination for consistency in implementation of management plans, and for conflict resolution. However, the overall trend is for central governments to devolve responsibility for MCS activities to lower levels of governmental authority.

29. Negative results of centralised, micro-management control mechanisms have become evident in both industrialised and developing States in small scale fisheries. Consequently, there is an emerging trend toward the second, participatory co-management approach. Fishers and the fishing industry want, and in fact are demanding, a more active role in management planning and implementation. Central governments are responding by devolving authority to smaller units of government (provinces, districts and municipalities) and by fostering community-based management, stakeholder involvement, and the acceptance of responsibility for the care, conservation and protection of their local marine resources by the fishers and industry.

“Low Cost” strategies

30. Due to the relatively high cost of MCS operations, there has been a growing trend to seek “low cost” MCS strategies. The intent here is to pick those MCS tools that can be used to exercise sufficient monitoring and surveillance at the lowest cost possible and to avoid intrusive methods of observation and measures that generate confrontation with fishers.

31. The use of these cost-effective "low cost" tools is becoming popular. These include:
- a) granting fishing authorization only to vessels that are in "good standing" on a national or regional register;
 - b) observer programmes;
 - c) VMS, satellite imagery, remote video and digital photography and infrared tracking; and
 - d) port State controls for safety at sea and compliance monitoring.
32. These strategies can all be cost-effective and, if applied on a cost-recovery basis, can be of minimal cost to the State after the initial investments in the procurement of base equipment and in training staff for inspections and observer duties.

Conventional Tools of MCS

33. There has been much debate as to whether military forces should be used for fisheries patrols giving them a useful peacetime role, or whether fisheries MCS requires a more specialised, dedicated fleet. Suffice to say that such debate is confined to countries that have the luxury of choosing between the two options. Many developing countries have neither option.
34. There are three main components to MCS: land, sea and air. The proper configuration of these components for a given system will depend on such factors as cost, commitment, and organizational structure (national, sub-regional, or regional).
35. The main land component of an MCS system serves as the base of operations, the co-ordinating centre for all MCS activities from which governments can regulate the deployment of resources to best address changing situations. The land component also entails port inspections, dockside monitoring, and the monitoring of transshipments and trade in fish products to ensure compliance with relevant rules. Governments must also undertake a variety of land-based activities in order to carry out their responsibilities as flag States of vessels that may be fishing in remote areas, including on the high seas and in waters under the jurisdiction of other States. New technology has allowed States to link the land components of their MCS system to those of other States on a regional or sub-regional basis, which can greatly foster co-ordinated and responsible management.
36. The sea component includes MCS activities undertaken in marine areas under the jurisdiction of a State and may also cover high seas areas. Technology that comes into play can include radar, sonar and vessel platforms. While physical presence through at-sea patrols remains a fundamental part of this component (necessary for arresting violators and securing evidence), the costs involved have prompted a growing number of States to employ "low cost" surveillance techniques. Examples of such techniques include the placement of independent observers on board fishing vessels, national or regional vessel registers and VMS requirements. Recently FAO published a Fisheries Circular on the typical costs of MCS² and a Fisheries Technical Paper on Recent Trends in Monitoring, Control and Surveillance for Capture Fisheries³.
37. The air component covers the aircraft and helicopters used in MCS activities. The flexibility, speed and deterrence of aircraft make them very popular tools for fisheries management especially for the outer areas of an EEZ. Because governments can use air, video and advanced digital photographic technology to address tasks beyond MCS (e.g. environmental and coastal zone monitoring, customs, immigration, and search and rescue), this equipment can improve the cost-effectiveness and efficiency of an integrated ocean management programme.

² Kelleher, K. The costs of monitoring control and surveillance of fisheries in developing countries. *FAO Fisheries Circular No. 976*. Rome FAO. 2002. 47p.

³ Flewwelling, P; Cullinan,C; Balton, D.; Sautter R.P.; Reynolds, J.E. Recent trends in monitoring control and surveillance systems for capture fisheries. *FAO Fisheries Technical Paper*. No 415. Rome, FAO. 2002. 200pp.

New Technologies for MCS

38. The International Maritime Satellite Organization (Inmarsat) was established because it had been recognised that satellite radio communications were of special interest to the seafaring community. With small modifications, this technology was readily recognised as being useful for tracking fishing vessels and these systems became known in fisheries as Vessel Monitoring Systems (VMS). Although first experimented with 15 years ago and only systematically used 10 years ago, VMS has been rapidly adopted by many countries as a method of monitoring the activities of their fishing vessels, even in the remote waters of the high seas. The benefits of VMS are that it is relatively inexpensive and its synergy with the other tools in the MCS toolbox greatly adds to the cost-effectiveness of the other activities of MCS. However VMS has several drawbacks, the most serious being that it only monitors the activities of vessels that are fitted with the equipment. At present authorities have to rely on the conventional vehicles of MCS - aerial and marine patrols - to detect and arrest vessels fishing illegally and not fitted with, or operating the VMS.

39. Increasingly the information derived from VMS is used to feedback into real-time fisheries management decisions, which then change the management regime which in turn alters the monitoring criteria. At present VMS is based on satellite communications systems that have a relatively narrow bandwidth. However with the increasing number of communications satellites being deployed, greater bandwidth and hence high speeds of data transmission is now available. This can enable video quality images to be transmitted to a vessel monitoring centre. Although these technologies are likely to be used initially for medical and mechanical emergencies, they could be available for visually monitoring of what is happening on the deck of a fishing vessel. Inmarsat's Global Area Network (GAN) service was launched in January of 2002 and already provides a wide band service that could well be cost-effective for industrial fishing vessels.

40. In some cases the fishery is just too small or the scale of the fishery in terms of revenue/boat difficult to justify the capital costs and running costs of a VMS system. In some areas, regional cooperation of the type seen in the Fisheries Forum Agency, and the European Commission can be implemented. Areas which could be considered for such regional systems include the West and East Coast of Africa, particularly the Sub-Regional Fisheries Commission (SRFC) in West Africa and the Caribbean Islands. The FAO FishCode programme funded a SRFC VMS Workshop in October 2002, with the objective of developing a sub-regional strategy for the implementation of VMS. A concurrent possibility would be the introduction of low cost systems. The evidence of the importance of this development to the fishing industry is the fact that in 1996, 2,000 fishing vessels were fitted with satellite communications – by 2000 this figure had increased to 10,000. The rapid and recent implementation of GMDSS and VMS has inevitably created problems and opportunities for the developers.

41. Recent developments concerning Maritime Terrorism will greatly speed up the implementation of methods of monitoring of all vessels, including fishing vessels. Under the mandate of the International Maritime Organization (IMO), the measures to counteract maritime terrorism will be implemented by amendments to the Safety of Life at Sea Convention (SOLAS). Although fishing vessels are exempted from most of SOLAS, they are specifically included in Chapter 5 "Safety of Navigation". Two measures which can be used for fisheries MCS are the Automatic Identification System (AIS) and Voyage Data Recorders (VDR). AIS is a system whereby a vessel automatically responds to an interrogation by VHF with details of its course, speed, identity, manoeuvring characteristics and details of its cargo. Originally designed for traffic control in busy sea lanes, it is easy to see how this can be adapted for fisheries monitoring by the vessel reporting details of its fishing licence in addition to the other information. A VDR is similar to the black box carried by aircraft and it records information relevant to the navigation of the vessel. According to the SOLAS Convention all vessels over 300 tons need to be fitted with AIS and VDR by the end of 2004.

Satellite Surveillance (SAR and the visual spectrum)

42. VMS has one particular weakness in MCS and that is that it cannot detect a vessel that is not actively participating in the system, therefore the activities of IUU Fishing vessels remain undetected by simply not transmitting the signal required by the Fisheries Monitoring Centres. This loophole in VMS is now being countered by the new technology of satellite surveillance. Currently the subject of an experiment at the Joint Europeans Research Centre with the cooperation of EU countries and NEAFC it is expected that satellite surveillance will be implemented under the European Common Fisheries Policy in 2004. The current system

uses Synthetic Aperture Radar (SAR) because of the area which it can monitor and the cost. However the eventual choice of surveillance will depend on new satellite systems becoming available. Radar is the preferred method of satellite surveillance because it can detect vessels through cloud cover. Although not known to be used in a practical situation at present, the advantages of using visual images to investigate any suspicious echo from a radar image, will probably be used in the future.

Electronic Logbooks

43. The success of VMS has led to the development of electronic logbooks. These are designed to succeed the traditional paper logbooks that have been developed over the years for fishing vessel skippers to record and report details of their fishing activities to fisheries administrations. Electronic logbooks are designed to be incorporated into VMS systems in an electronic format. This allows the reporting and monitoring of fishing activities in a near real-time basis by incorporating the catch data in the VMS message. Several fisheries administrations have used this technology to develop some very innovative and interactive methods of fisheries management. In the Barents Sea, Norway is able to close areas in which too many juvenile species are being caught. Canada has a scallop fishery where VMS can ensure that the fishing effort can be targeted at different areas to maximise the return of the scallop harvest. USA has a series of closed areas off the East coast to avoid excess catch of juveniles. Australia has a very innovative system for managing a trawl fishery off the North West coast. By allocating each fishing vessel a limited time to fish in six different sub-areas, the fishery can target three different species at different fishing effort. This strategy overcomes the previously seemingly intractable problem of the management of multiple species trawl fisheries. Electronic fishing logbooks are being implemented in the USA, Norway, Canada, Australia and the EU plan to introduce electronic logbooks to all its vessels over 24m by 2004. Recently FAO commissioned a text on Electronic logbooks to update the FAO Guidelines on Fishing Vessel Monitoring Systems.

Catch Documentation, Audit schemes and Traceability

44. Another method of achieving control over vessels fishing on the high seas is to monitor and control the import catches of certain species through Catch Documentation. This system was initiated by the International Commission for the Conservation of Atlantic Tunas (ICCAT) to improve catch statistics of tunas by monitoring the catches being imported into Japan and the EU. It was found that up to 30% of the catch was not being reported. Most of this unreported catch came from vessels flying “ flags of convenience”, and in order to encourage reporting ICCAT threatened to impose import bans of these species into ICCAT countries unless they were accompanied by a Catch Document. The success of this scheme rapidly spread to other regional fisheries management bodies (the Indian Ocean Tuna Commission (IOTC) and the Commission for the Conservation of Southern Bluefin Tuna (CCSBT). The Commission for the Conservation of Antarctic Living Marine Resources (CCAMLR) has introduced a similar system for two species of toothfish); ICCAT has extended the scheme to Bluefin Tuna and Swordfish. This has been seen by some as a trade issue and although not directly referred to the World Trade Organization for a decision, the Trade and Environment Committee have referred to the Catch Documentation Schemes as good examples of environmentally motivated trade measures. Similar schemes can be used for national documentation. For instance, in the case of Norway, which is characterised by a long coastline with low population and a limited number of markets for fish, it has been found cost-effective to implement an audit scheme that traces fish product throughout the chain of custody from the vessel through the processing system. It is also noted that the EU has introduced legislation that requires all food products to be labelled with their sources so that in the case of any food scare the food can be traced back through the chain of custody to find out where the contamination took place. This legislation is expected to be in force by 2005 and European fisheries administrations are already experimenting to ensure that this can be implemented by the time the legislation enters force.

Regional Networks for MCS

45. One of the first regional networks was established by the South Pacific Commission as the Fisheries Forum Agency (FFA) in the 1980s. The extension of the EEZs of the South Pacific Islands under LOSC, gave these countries greatly extended areas of jurisdiction and the responsibility of managing the tuna resources of the regions. Nevertheless the countries had very little physical or financial resources to undertake national fishing activities or MCS in the region and, in fact, such a task would have been a challenge even to highly developed countries. The FFA, composed of fourteen South Pacific Islands, New Zealand and Australia agreed to a regional approach to the management of fisheries resources. VMS was a central plank in the development

and a regional database was set up of foreign “vessels in good standing”. Only vessels included in the database were allowed licences to fish in the region and they have to be fitted with VMS. The fishing vessels report by VMS to a central Fisheries Monitoring Centre in Honiara in the Solomon Islands, which then transmits the data to the individual members of the FFA. The revenues paid by the vessels are then allocated to the islands according to the time in which the vessels have spent in the area. Australia and New Zealand contributed to the FFA by providing technical assistance, supplying patrol boats and aerial surveillance.

46. VMS has also been a central technology which was adopted by the EU countries. Unlike the FFA, the EU developed a distributed network system in which each country operated a VMS. Each country retains control over its own “zone”, is responsible for the MCS in that area, and is responsible for its own vessels’ activities. The vessels report by VMS to their own flag state. If the vessel is within the zone controlled by another EU state, the VMS message is passed onto that country. Thereby each country has details of all the fishing vessels in the area that it controls along with the details of all its national vessels wherever they are.

47. A similar extended system has been applied to the North East Atlantic Fisheries Commission (NEAFC) Regulatory Area. The EU countries, including the newly joined countries form a major number of the signatory countries of NEAFC, along with Norway, Russia, and Iceland. Hence it is very easy for the VMS system to regard the NEAFC regulatory area (RA i.e. areas in the North East Atlantic outside national jurisdiction) as another “country”. Hence if a country receives a VMS report from the NEAFC, the VMS message is passed on to the NEAFC Secretariat. In order to encourage members to participate in MCS patrols in the Regulatory Area, the information on vessels fishing in the area is only supplied to countries that have a patrol activity within the Regulatory Area. The satellite surveillance system reported in another part of this paper is being implemented in the NEAFC area. A similar VMS is operational within the North Atlantic Fisheries Organization (NAFO) which has a similar Regulatory Area in the North West Atlantic. It should be noted that, at the time of writing this paper, the satellite surveillance system being experimented and described in another section is currently being used along the outside of the Icelandic EEZ monitoring vessels fishing for redfish.

48. Other regional fisheries bodies which are in the process of implementing VMS for their members and “cooperating parties” are CCAMLR, ICCAT, IOTC. FAO has promoted the foregoing type of regional cooperation in developing countries and will be raising the issue in the future meeting of the FAO regional fisheries bodies. The first of a series of workshops to encourage regional cooperation in VMS was held in Senegal in October 2002 and a second planned for the SWION in late September 2004. Further similar workshops are planned for the Gulf Area and for the Central America and Caribbean sub Region. FAO organised a Seminar on VMS and Satellite Surveillance during the 25th Session of the FAO Committee on Fisheries in February 2003.

Participatory management and MCS

49. The cooperation of the fishing industry and fishers is essential to cost-effective fisheries management. If the industry, fishers and their communities, organizations, cooperatives, unions and fishing companies actively participate in fisheries management, including MCS planning and implementation exercises, the potential for successful implementation of these plans is much greater. Alternatively, lack of attention to these aspects often results in non-compliance, alienation of the fisheries sector and even active subversion of the intended fishery management plan.

50. The well-known independence of fishers tends to hamper the creation of strong organizations in the fishery industry. Fisheries managers should nevertheless help fishers recognise the advantages of developing such organizations in order to enter into successful partnerships with governments in the management of fisheries. Through such organizations, fishers can provide collective input into management plans, including MCS. In fact, it is difficult to avoid the maxim that good fisheries management generates responsible fisheries operations, which in turn minimises the need for MCS.

51. Effective fisheries management provides benefits to the fishers of current and future generations. Despite the obvious need to involve fishers in fisheries management decisions, States too often provide very little opportunity for input from fisheries practitioners. As a consequence, fishers are often suspicious of government actions.

V. THE IPOA ON IUU FISHING

52. The International Plan of Action (IPOA), which is of the greatest relevance to MCS, and has been adopted by FAO in 2001, is the IPOA to prevent, deter and eliminate illegal, unreported and unregulated (IUU) fishing⁴. The FAO Fisheries Department has produced detailed Technical Guidelines to help governments and others implement this IPOA.

53. The IPOA on IUU fishing offers many tools for States to use to combat IUU fishing, individually and in collaboration with other States. Some of the tools are designed for use by all States. Other tools are tailored for use by flag States, coastal States and port States. The IPOA-IUU also calls for the use of “internationally agreed market-related measures”, which aimed at keeping fish that have been harvested by IUU fishers from being sold or traded.

54. The IPOA on IUU fishing calls upon all States to develop and adopt, as soon as possible but not later than March 2004, national plans of action to further achieve the objectives of the IPOA. To the extent possible, each State’s national plan of action should consider how each of the basic tools in the IPOA could be put to use in the fisheries in which it is involved. States are encouraged to report to FAO on steps they have taken to implement their national plans and the IPOA itself.

55. The IPOA on IUU Fishing also suggests a number of ways in which States, acting through regional fishery management organizations (RFMOs), can do more to prevent, deter and eliminate IUU fishing. Among other things, RFMOs can:

- a) collect and disseminate information relating to IUU fishing;
- b) identify vessels that are engaging in IUU fishing and co-ordinate measures against them;
- c) identify States whose vessels are engaging in IUU fishing and urge identified States to rectify such behaviour;
- d) call on their members to take action against vessels without nationality that are fishing in the relevant region; adopt rules to ensure that vessel chartering arrangements do not lead to IUU fishing;
- e) adopt port inspection schemes, restrictions on transshipment at sea and schemes creating a presumption that fish harvested by non-member vessels in the relevant region should not be permitted to be landed in ports of members;
- f) adopt catch documentation and/or trade documentation schemes; and
- g) adopt other market-related measures to combat IUU fishing.

Flags of Convenience and Open Registers

56. Throughout discussion on IUU Fishing there has been constant reference to the issue of “Flags of Convenience” and “Open Registers”. In further discussions held in other fisheries fora, two other terms have emerged “Ports of Convenience” and “Flags of Non-Compliance”, to better differentiate between the areas of competence of fisheries administration and of maritime administrations. Central to these considerations is the issue of flag State responsibilities as it is defined in the LOSC and of the responsibilities of countries responsibilities to control the activities of fishing vessels which use their port facilities. Regional Fisheries Management Bodies have published lists of vessels that they consider to be engaged in IUU Fishing. It is a small step for a list of “Flags of Non-Compliance”, based on the percentage of fishing vessels on these lists on a countries register. It should be noted that some of these Open Register Countries have recently taken action to bring the activities of their fishing vessels under control in response to the trade embargoes imposed under the Catch Documentation Schemes. This has subsequently led to a decrease in the number of fishing vessels registered in these countries. However, it should be remembered that over the years, the number of fishing vessels that are recorded in Lloyds database as being of “Unknown” flag have increased significantly,

⁴ The text of the IPOA-IUU is available on the website of the FAO Fisheries Department.

indicating that the problem is shifting to other flags rather than being solved. It should be mentioned that FAO will be holding an Expert Consultation on Open Registers in Miami in September 2003.

Flag State Control

57. The flag State has responsibility under international law for controlling the fishing activities of a vessel, no matter where the vessel operates:

- a) If the vessel is fishing in waters under the jurisdiction of the flag State, the responsibility of the flag State is exclusive. Generally speaking, no other State has the right or responsibility to control the fishing activities of the vessel.
- b) If the vessel is fishing on the high seas, the flag State has exclusive responsibility for controlling the fishing activities of the vessel. However, as noted above, a number of recent international agreements have given States other than the flag State certain rights to take action with respect to fishing vessels on the high seas.
- c) If the vessel is fishing in waters under the jurisdiction of a State other than the flag State (or is in the port of a State other than the flag State), the coastal (or port) State has rights and responsibilities with respect to the fishing activities of the vessel. In such situations, however, the flag State also continues to have responsibilities with respect to those fishing activities, including the responsibility to ensure that the vessel does not conduct unauthorized fishing in waters under the jurisdiction of another State.

Port State Measures

58. International law does not impose any significant restrictions on the powers of a State to regulate foreign fishing vessels voluntarily in its ports. A State may deny foreign fishing vessels access to its ports outright, or may place conditions on access such as advance notice of arrival, requiring specified information be provided in advance, and boarding and inspection. A port State enjoys the advantage of being able to inspect a vessel in port and to control its movements with relative ease. A port State can enforce its laws (usually without the need to use the force which may be required at sea) and can obtain and forward to the flag State any information concerning suspected unlawful activities of the vessel.

59. Port State Control is a well established procedure for merchant vessels to enforce IMO and ILO Conventions which cover marine safety, marine pollution and maritime labour standards. This concept has increasingly been seen as a possibility for exercising MCS over foreign fishing vessels when they are in the ports of another country. Up until now there has been a lack of international instruments for this type of control of fishing vessels; however the FAO Compliance Agreement, the UN Fish Stocks Agreement (both now in force) and the FAO Code of Conduct for Responsible Fisheries refer to Port State Measures. These port State measures should be seen in the light of the port State assisting the flag State to implement its responsibilities under the international agreements to which it is a signatory. The question of Port State Measures has been addressed by an FAO/IMO Joint Working Group on IUU Fishing, which reported to the IMO Sub Committee on Flag State Implementation(FSI). FSI agreed that IMO Secretariat should advise FAO on the practical implementation of a Port State Measures regime. Subsequently FAO held an Expert Consultation on Port State Measures in November 2002.

VI. ONGOING FAO ACTIVITIES AND MCS NETWORK

60. The FAO FishCode Sub-Programme on Monitoring Control and Surveillance has fielded 33 missions pertaining to MCS and has conducted four Regional Workshops on MCS (Kuala Lumpur, Muscat, Songkhla and Goa). In addition, legal advice on the formulation of Fisheries Acts has been provided under the project. The Sub-Programme has also produced numerous publications on its activities, including lecture notes from the aforementioned Workshops, and it has recently revised the FAO Fisheries Technical Paper on Monitoring, Control and Surveillance.

61. The International Network for the Cooperation and Coordination of Fisheries Related Monitoring, Control and Fisheries Surveillance (MCS Network) was founded at an International Conference on Monitoring Control and Surveillance which was held in Santiago, Chile in January 2000. Its membership currently includes

Australia, Canada, Chile, New Zealand, Peru and the USA with the EC as an observer. They have subsequently held another three meetings in Key Largo, Hobart and Auckland. FAO staff has attended the meetings with an observer status. The MCS Network has a web-site on which details and hyperlinks to MCS information of the member countries. (<http://imcsnet.org/>)

VI. FAO COMMITTEE ON FISHERIES

62. The FAO Committee on Fisheries (COFI), in its 25th Session held in February 2003, reviewed the current status of monitoring, control and surveillance (MCS) and vessel monitoring systems (VMS) as tools for responsible fisheries management. Many Members commended initiatives undertaken by FAO and the FishCode Programme to promote human resources development and institutional strengthening to achieve more effective use of MCS and VMS. Particular acknowledgement was given for the provision of technical and legal advisory services to developing countries through the FishCode Programme, and it was urged that such assistance be continued and expanded.

63. The Committee recognized the need for international cooperation in making VMS more effective as part of the MCS toolkit and particularly for dealing with the serious and growing problems of IUU fishing. Members called for the standardization of data formats and procedures, and spoke of the desirability of FAO's study or FAO convening an Expert Consultation on such standardization which Norway offered to host. Some Members noted the need to minimize the burden to fishers, confidentiality considerations and cost efficiency with regards to MCS measures.

64. The Committee noted the activities of the International MCS Network (see above) and encouraged Members to join in this voluntary effort. The Committee further agreed that FAO should continue to be closely involved with the work of the Network, including provision of strengthened technical support for the coordination of communications and facilitation of awareness-raising among Members for Network activities depending on the availability of resources to do so.

VII. FUTURE FAO ACTIVITIES IN MCS AND IN DETERRING IUU FISHING

65. In the immediate future, FAO shall hold workshops on VMS in the Seychelles for the countries of the South West Indian Ocean Fisheries Commission and in the Gulf area for the RECOFI group of countries. The countries of SE Asia and the remaining countries of the Gulf of Guinea will have workshops in 2005. An Expert Consultation will be held in Norway on Standardised Data Formats to be used in VMS messages and in Electronic Logbooks to ensure compatibility between regions and between different formats in 2004. FAO shall continue to demonstrate how the new information technologies of MCS can be used to improve fisheries management by allowing more real time information to be available to fisheries managers. Catch Documentation and Traceability of fish products will be an agenda item at the Committee on Fish Trade in February 2004 and the FAO Secretariat will make recommendations for future activities.

VIII. SUGGESTED ACTION BY THE COMMISSION

66. The Commission is invited to discuss the desirability of holding three mini-workshops on VMS in the WECAF region under FishCode funding, if available. In view of the number of countries, one workshop might be held in the mainland countries of South America, another for Central American countries and one for the island countries of the Caribbean Sea. In addition to information on the new technologies of VMS and satellite monitoring, the workshops would explore the possibility of sub-regional arrangements for MCS and/or the strengthening of the regional arrangements already in force.

67. The Commission is invited to review and discuss the role of MCS as a tool for fisheries management in the WECAFC region, especially with respect to small scale fisheries which predominate in the region. The Commission may also wish to suggest actions that could be taken to improve fisheries management in region through the use of MCS, in particular whether its member countries should be encouraged to participate in the activities of the MCS Network.