

**RESOLUTION BY ICCAT ESTABLISHING A PILOT PROJECT FOR THE IMPLEMENTATION OF  
REMOTE ELECTRONIC MONITORING (REM) ON BLUEFIN TUNA PROCESSING VESSELS**

*TAKING INTO ACCOUNT* that ICCAT has adopted a Recommendation establishing a multi-annual management plan for eastern Atlantic and Mediterranean bluefin tuna;

*NOTING* that at the ICCAT Working Group on BFT Control and Traceability Measures held in March 2020 the Working Group identified several aspects of the control of live bluefin tuna that would benefit from being strengthened, among them, the control exercised over processing vessels operating in the bluefin tuna fishery in the eastern Atlantic and Mediterranean Sea. The 2020 Panel 2 Intersessional Meeting considered initiating discussions on this issue based on a working paper prepared by the EU;

*RECALLING* that new technologies have advanced greatly over the last few years and these technologies can make monitoring more effective and efficient as well as supporting the collection of data for scientific purposes; and,

*CONSIDERING* the establishment of a Pilot Project for the use of REM, including Closed-Circuit Television (CCTV), would allow testing whether these technologies can be used in the future to improve control and make it more efficient, as well as assisting in the automatic collection of data;

*NOTING* that the conclusions drawn from this Pilot Project are without prejudice to the possibility for the CPCs to continue using traditional means of control, including the use of control or scientific observers.

THE INTERNATIONAL COMMISSION FOR THE  
CONSERVATION OF ATLANTIC TUNAS RESOLVES THAT:

**Pilot Project objective**

1. A Pilot Project is established to test the use of a Remote Electronic Monitoring (REM) system, including Closed-Circuit Television (CCTV) on board bluefin tuna processing vessels operating in the bluefin tuna fishery in the eastern Atlantic and Mediterranean Sea.
2. The objective of the project is to test the REM system and to evaluate the added value of this technology in improving the monitoring and control of processing vessels, the cost-efficiency of the system and its capacity to collect comprehensive and accurate data and its subsequent analysis.
3. The duration of the Pilot Project should be one year, with the possibility of extending it for a further year. The project should be implemented on at least 2 of the active processing vessels listed in the **Table 1**.
4. The pilot project would be considered as a testing phase and the information collected in it may only be used to achieve the objectives of the project, but in no case for control or enforcement purposes.

**Participation and points of contact**

5. Contracting Parties with processing vessels operating under their flag are encouraged to participate in the Pilot Project and facilitate the implementation on selected vessels under their flag. All other Contracting Parties involved in the control of processing vessels are also encouraged to participate in the Pilot Project.
6. Contracting Parties participating in the Pilot Project should submit to the Executive Secretary the following information:
  - a) National authority responsible for the processing vessel and its monitoring and control, and
  - b) Designated point(s) of contact within that authority with control responsibilities for liaison on the project, including name, telephone, fax numbers, and e-mail address.

7. A Technical Steering Group should be set up to oversee the implementation of the Pilot Project. The Technical Steering Group should be composed at least, by representative(s) of the ICCAT Secretariat, the flag Contracting Parties of the processing vessels included in the Pilot Project and, on a voluntary basis, the coastal Contracting Parties where these vessels operate. The Steering Group should be coordinated by Chair of the former Working Group on Bluefin Tuna Control and Traceability measures, set up by ICCAT Resolution 19-15.
8. The Technical Steering Group should monitor the project's progress, the fulfilment of its objectives and put forward recommendations for improved implementation of the project. They should be available for regular consultation and regular online meetings. The Steering Group should regulate its own procedures.

### **Implementation of the Pilot Project**

9. The ICCAT Secretariat, with the assistance of the Technical Steering Group, should identify a company (contractor) entrusted for the installation and maintenance of the REM system and a company or independent body in charge of auditing the REM data (analyst). The minimum technical standards in **Annex 1** should be included in the tender specifications when selecting the contractor and analyst.
10. In the performance of its tasks, the contractor implementing the pilot project and the analyst auditing the REM data should follow the minimum technical standards set out in **Annex 1**. The analyst should handle the REM data in accordance with the relevant data protection laws.
11. The ICCAT Secretariat, with the assistance of the Technical Steering Group, should identify the vessels to include in the project, following consultations with the flag States and the contractor to assure the feasibility of equipping such vessels.
12. The contractor should prepare a REM Vessel Monitoring Plan (VMP) for the vessels included in the pilot project and should submit it to the ICCAT Secretariat for approval. The ICCAT Secretariat, in consultation with the Steering Group, should evaluate the VMP and approve it if considered adequate for the purposes of the Pilot Project and that it follows the minimum technical standards set out in **Annex 1**.
13. The analyst should prepare a protocol for the analysis of the REM data and send it to the ICCAT Secretariat. The ICCAT Secretariat, in consultation with the Steering Group, should evaluate the REM data analysis protocol and approve it if considered adequate for the purposes of the Pilot Project and that it follows the minimum technical standards set out in **Annex 1**.
14. Contracting Parties participating in the pilot program should communicate and collaborate with each other and with the contractor and analyst in order to facilitate the implementation of the Pilot Project.

### **Data transmission**

15. Sensor data and video footage should be transmitted by the processing vessels to ICCAT Secretariat, which in turn will be responsible for transmitting it to the company or body in charge of auditing the data (analyst). The data and video footage will be made available to the flag CPC and the coastal CPC where the vessel operates upon request.

### **Reporting**

16. The contractor should draw up a report on the alerts and issues identify and to recommend any improvement to the set-up of the system. The analyst should produce reports including details on the implementation of the project and on the data analysed, as well as conclusions on the functioning of the project and its effectiveness. The detailed content of the reports and the reporting period will be developed by the Technical Steering Group.

17. The ICCAT Secretariat should keep all Contracting Parties updated on the progress of the project and should distribute the progress reports drawn up by the contractor and analyst and the evaluations of the Steering Group.

**Minimum technical standards for an  
ICCAT system of Remote Electronic Monitoring (REM)**

**1. Minimum technical standards**

The Remote Electronic System (REM) software should be developed to handle and control sensors and cameras, store sensor data and video footage on embedded storage, and to display all information on a screen in the wheelhouse, allowing the crew to monitor the functioning of the system. The system must be capable of storing data and video footage for the entire period of operation of the vessel (trip).

The REM system should incorporate a self-test function including at least position check, memory status check, camera image check, and sensor operation check. The system should allow the master to test it and ensure it is fully functional at all times and that it meets all the required standards. The system should be able to deliver automatically, to the master and the competent body, health messages and warnings, including warnings for missing data, malfunction or tamper events.

The REM system must comply with the following minimum technical standards:

- a) include a sufficient number of cameras to monitor the fishing activity (considered, for the purpose of this Resolution, the loading of BFT, weighing, processing, storing, transshipment and landing),
- b) include sensors that monitor parameters to detect when fishing activity occurs or may be occurring,
- c) be capable of securely storing E-monitoring records and have enough storage and back-up storage, in accordance with the number of cameras and the duration of the trip,
- d) supports remote access/configuration and have Uninterruptible Power Supply (UPS) and controlled shutdown,
- e) be of sufficient camera resolution that allows the counting of the number of specimens,
- f) include a Global Positioning System (GPS) receiver to monitor vessel position, route and speed as well as provide information on operation times and location, even during periods of poor visibility or at night (i.e. may be supported by IR lighting),
- g) be capable of issuing real time automated alerts when the system is malfunctioning,
- h) be tamper evident and prevent any manual data input or external data manipulation,
- i) be robust and withstand rough conditions at-sea with minimum human intervention.

**2. Installation of the REM system**

A certified REM Vessel Monitoring Plan (VMP) would be necessary in order to establish the layout of sensors and cameras and other relevant technical specifications to cover all monitoring needs.

It should include at least the following elements:

- General information of the vessels, including vessel length and contact details of the vessel owner and/or representative;
- Vessel plan and pictures;
- General description of the settings of sensors and cameras;
- System components location and characteristics, including image of its location;
- For or each of the cameras: view and objectives, image of location, camera settings and a picture of the camera shot, showing the field of view the camera should cover.

## **2.1 Closed-Circuit Television (CCTV)**

The number and field of view of the cameras should be such as to monitor all areas where BFT can be loaded, processed or weighed and to ensure in particular that all areas where tuna can be transferred on board are covered.

As a general setup, the position of the camera should cover both sides of the vessel and allow the number of specimens transferred on board to be counted and to identify, if possible, vessels that will be attached to the processing vessel. Since all receiving and processing operations of tuna take place on the main ship's deck, a camera with a general overview of the deck would ensure effective control.

An additional camera installed in the deck area where the fish is received and processed would make it possible to ensure a count of the number of individuals in a case where it was not possible to do so when the fish was lifted by the crane. Where possible, it should be ensured that this camera is equipped with measuring capability (lens dependable) to allowing for the automatic determination of the sizes of the individuals taken on board and to assist in the collection of fish size data to be used for scientific purposes, supporting at the same time weight control.

In parallel or alternatively, an ichthyometer or graduated rule, with an easily visible colour scale, may be placed in this area allowing to monitor a size sampling that may be set for scientific purposes.

The cameras and the camera housing need to be constructed of material that can resist the environment on board the vessel, be tamper-proof and that camera closure fittings are robust and durable.

Due to the large size of the video footage, the possibility of using on some or all cameras, photographs taken every few seconds instead of continuous video, during periods when the sensors indicate that there is no activity, should also be evaluated during the pilot project, since this alternative would allow to reduce very significantly the size of the files and facilitate its management.

The master should endeavour to ensure that the REM system is fully functional and that CCTV systems provide clear, unobstructed footage during operation. The cameras would not need to be recording when the vessel is sailing above a certain speed.

Digital signature (date and time stamp, vessel name, vessel registration and GPS coordinates), should be able to associate the video footage with a particular event in time (i.e. to check that the operation was authorized or that it has been correctly recorded).

When possible, masking capability, with the possibility to blank out parts of images for personal protection purposes and to select areas of interest, should be included.

## **2.2 Sensors**

The sensors should provide information on the possible occurrence of fishing activities. These sensors would be placed on those devices or mechanisms that are active when the vessel is or may be carrying out fishing activities, such as fish loading, processing, freezing or landing. This information would be mainly used to select the video footage to be analysed.

The sensors should also collect information on weighing operations, which will make it easier to monitor activity and allow automatic data crosschecks.

The REM systems should be able to support all types of sensors needed and a data-bus connection should be available for possible future expansions.

The following sensors should be included:

1. GPS;
2. opening of hatches or other access to the hold;
3. activation of the cranes;
4. scales used to weigh the BFT with the possibility of registering the weighing operations carried out (\*).

Other sensors whose usefulness can be assessed are:

5. activity in the freezing tunnels (introduction of fish) or motion sensors;
6. temperature in fish hold;

(\* The use of scales attached to the cranes, method already used by most of these vessels, is considered of great interest because it would allow to record and transmit the weight of all the fish taken on board. It should be assessed whether the currently available scales can be adapted to the REM system.

### **3. Data storage and transmission**

All the information should be stored in the control box and the requested data should be secured to prevent possible deletion or tampering. A backup must be made automatically. All data being stored or transmitted could be compressed and securely encrypted.

Because in case of use of different systems there could be problems of data compatibility, the format of the data, both from sensors and video footage, should be unique or compatible, so that the different authorities involved in their analysis would have no problem reading and analysing them. All vessels in the pilot project should use the same REM provider (single procurement for one single system), as this will ensure the best possible data exchange and facilitate data analysis.

Sensor data and video footage will be stored only for the period necessary for the implementation of this pilot project and in any case for a maximum of 3 years.

The storage and management of the video footage should take into account technical options, possible legislation on privacy and data protection and comply with the relevant Personal Data Protection Regulations.

The data should be transmitted via mobile data networks, via WiFi (when the ship approaches the coast and enters WiFi or 4G coverage) or via satellite system. In case of technical failures in the transmission system, information should be shared through the exchange of hard disks.

### **4. Data analysis**

REM systems on board the vessels should be able to deliver the sensor data and video footage in a specified common format for exchange (output). The land based analysing software (REM analyser) should allow to associate the data of the sensors with the video footage, facilitating and speeding up the analysis of the video footage.

The selection of the video footage to be analysed would be based on:

1. Risk analysis, using at least:
  - analysis of sensor data (i.e. crane activity or opening of hatches at times when the vessel is not authorized to transfer fish);
  - the weight or numbers of individuals (number of weighing events) transmitted by the scale sensors do not correspond to the quantities recorded;
  - vessel detention while in navigation (possibility of transshipment at sea);
  - system alerts for malfunction, missing data or tampering attempts;

- VMS information indicating activity by other vessels in the vicinity of the processing vessel or non-receipt of auxiliary vessel positions associated with the farm;
- other intelligence information held by the authorities; and,

2. Random examination:

Comprising the analysis of sensor data and video footage from some randomly selected full days. Random analysis of some of the operations would allow to verify that the amounts declared by the operators correspond to those shown in the video footage (number of individuals) and in the weighing sensor data for these operations.

The analysis of the data based on risk analysis would imply that the control authorities where the processing vessel is operating should make available to the company in charge of auditing the data, certain information such as periods in which authorization has been given to do harvesting or quantities reported by the processing vessel.

**Table 1.** List of BFT processing vessels authorised by ICCAT to operate for BFT in the eastern Atlantic and Mediterranean Sea (the list is not exhaustive and is based on processing vessels for which there has been activity in the EU in the last few years).

<i>Name</i>	<i>ICCAT No.</i>	<i>IMO</i>	<i>Flag</i>	<i>Tonnage (GT)</i>	<i>LOA (m)</i>
ASTRAEA	AT000PAN00234	9832523	PAN	2164	71,1
GOUTA MARU	AT000JPN00653	9746827	JPN	4865	97,45
KENTA MARU	AT000JPN00660	9788772	JPN	5846	122,2
KURIKOMA	AT000PAN00153	9145920	PAN	4177	105,5
LADY TUNA	AT000PAN00199	9453418	PAN	4538	113,4
PALOMA REEFER	AT000PAN00032	9309681	PAN	1267	62,6
PRINCESA GUASIMARA	AT000PAN00155	9442237	PAN	1877	72,1
REINA CRISTINA	AT000PAN00154	9011301	PAN	1176	61,33
TUNA PRINCESS	AT000PAN00185	9314612	PAN	4522	113,4
TUNA QUEEN	AT000PAN00145	9278612	PAN	4449	113,4