# Havs och Vatten myndigheten

Ref. no. 2122-21



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# Summary

The Swedish Agency for Marine and Water Management (SwAM) has been tasked with implementing the proposals presented by the Agency to the Government in a previous government assignment<sup>1</sup> regarding how a camera surveillance trial (REM – Remote Electronic Monitoring) of fishing vessels can be implemented to ensure compliance with the landing obligation. SwAM presents the implementation of the trial in this report.

The most central premise in the implementation of this trial has involved voluntary participation by fishing industry operators. There is general opposition to cameras aboard fishing vessels among fishing industry operators, and this greatly influenced the outcome of the trial. SwAM conducted two public procurement procedures: one for acquiring the technology, and one for finding holders of Swedish fishing licences who were willing to make their fishing vessels available for the trial. Only two fishing licence holders chose to respond to the procurement procedure and participate in the trial. This is why SwAM conducted the assignment with considerably fewer vessels than the fifteen recommended in the report on the previous government assignment.

The technology provider installed the devices aboard the two vessels together with staff from the local shipyards. They installed three and four cameras respectively on board the vessels, along with one and two sensors respectively. The cameras were sited according to SwAM's requirements to follow the fish from trawl to tank.

The trial has provided operational experience and demonstrated that the information collected using the REM system generally allows logbook data to be verified, including the time and place of fishing activities. With a camera sited at the species sorting point, it is also possible to see whether there is any bycatch in pelagic fishing and, in some cases, to determine the species in question.

SwAM, as the data controller, has had to process personal data in connection with the video recordings on board the vessels. SwAM has undertaken a number of measures to minimise the collection and processing of personal data in the trial. Furthermore, the Agency has deemed the information collected via the REM system within the framework of the trial to constitute a public document.

The EU Control Regulation has been revised during the trial implementation period. The new provisions require Member States to ensure that certain Union fishing vessels are equipped with REM systems.

REM systems are deemed to play a key role in the monitoring of rules on the landing obligation by fisheries control services going forward. The trial conducted has enhanced the expertise of the Agency and is also deemed to have increased the expertise of the fishing industry stakeholders and operators involved. This enhanced expertise will be useful in the detailed design of future rules and systems.

<sup>&</sup>lt;sup>1</sup> Government assignment to investigate and propose the implementation of a trial involving camera surveillance of fishing vessels to ensure compliance with the landing obligation

The lessons learned from the trial are both general and more operational in nature. The primary lessons learned and conclusions drawn are summarised below:

- The camera surveillance conducted by SwAM within the framework of the assignment (areas on board the fishing vessels where catches are handled and where catches could be discarded from the vessel, as well as the water just outside the fishing vessels) does not require a permit under the Swedish Camera Surveillance Act.
- It is important to consider the size and complexity of the vessel when calculating the time needed to install REM systems on board vessels. The single most time-consuming and resource-intensive installation step in the trial involved laying cables on board the vessels. It is appropriate for local technicians to carry out the installation and any servicing.
- The trial has demonstrated that it is possible to detect species other than the target species in pelagic fishing. Some bycatches are generally noticeable among the target species when the catch is pumped into the storage tanks. With a camera sited over the gunwale of the vessel, SwAM is of the opinion that it is also possible to see whether any slipping (deliberate release from fishing gear before the catch is brought on board) would occur.
- The trial has shown that the information generated by the system makes it possible to monitor whether sampling of species composition is carried out on board pelagic vessels, and also to monitor that this takes place, along with when and how. In some cases, it is also possible to identify bycatch species during the sorting process.
- Species that are very similar to one another, such as herring and sprat, are difficult to tell apart on the video.
- From a privacy protection perspective, there may be a need to explore the possibility of legislating for stronger privacy protection for recorded data, in particular personal data, in material produced through camera surveillance.
- Masking features are necessary in order to protect privacy and to video only the areas that of relevance for the purpose as far as possible (in an attempt to verify compliance with the landing obligation).

# 1. The assignment and its preparation

# 1.1. Description of the assignment

SwAM was previously tasked by the Government with investigating and proposing how a trial involving camera surveillance of fishing vessels could be implemented to ensure compliance with the landing obligation (referred to below as "the previous government assignment").<sup>2</sup> SwAM reported the results of this<sup>3</sup> to the government in 2019.

In the public service agreement for the 2021 financial year, SwAM was tasked with implementing the proposals that the Agency reported to the government in the previous government assignment. Fishing with a risk of porpoise bycatch should also be included if necessary. In this report, SwAM presents the implementation of the proposal from the previous government assignment.

Please note that to an extent, the implementation does not fully match the proposals presented by SwAM following the previous government assignment. This is mainly due to circumstances beyond SwAM's control. For the most part, these deviations relate to fishing industry participation as this had to be on a voluntary basis.

One anticipated effect of conducting the trial was that the Agency and fishing industry operators and stakeholders would gain more of an understanding of the criteria for introducing REM systems<sup>4</sup> through developed procedures and methods, for example.

# 1.2. Boundaries

This trial aims to evaluate a method for ensuring compliance with the landing obligation. Any other needs, such as automatic catch and gear registration or control of fishing activities in marine protected areas which could be addressed by REM systems, are not covered by the trial.

There was no integration with other digital systems, such as the electronic logbook or the satellite-based positioning system (VMS), during the trial. The arguments that formed a basis for this decision focused on the uncertainty regarding the number of participating vessels, the nature of future regulatory requirements and general technological developments.

# 1.3. Consultation

### The fishing industry

As participation in the trial is voluntary, there has been a great deal of dependence on the willingness of fishing industry operators to participate in the trial. One key element in the work has

<sup>&</sup>lt;sup>2</sup> See Uppdrag att föreslå hur försök med kamerabevakning av fiskefartyg kan genomföras för att se till att landningsskyldigheten efterlevs (Government assignment to investigate and propose the implementation of a trial involving camera surveillance of fishing vessels to ensure compliance with the landing obligation) – Regeringen.se.

<sup>&</sup>lt;sup>3</sup> Report on government assignment "Förslag till utformning av försök med kamerabevakning av fiskefartyg" (Proposal for the design of trials involving camera surveillance of fishing vessels), Ref. no. 2742-19, <u>https://www.havochvatten.se/download/18.3fb191f616fc305244b42d63/1579789999348/ru-kamerabevakning.pdf</u>

<sup>&</sup>lt;sup>4</sup> The electronic systems for monitoring vessels' activities at sea are made up of cameras and sensors. The term Remote Electronic Monitoring (REM) is used.

therefore involved identifying potential solutions that could help make operators more willing to participate. During the first period of the assignment for the most part, dialogues were conducted with representatives of the fishing industry in order to enhance their understanding of the need to conduct a trial of on-board cameras, as well as discussing appropriate incentives together.

#### **Other Member States**

The EU regional cooperation programmes Scheveningen Group in the Skagerrak and Kattegat and Baltfish in the Baltic Sea,<sup>5</sup> have ambitions for Member States to conduct pilot projects involving camera surveillance. The European Fisheries Control Agency (EFCA) has supported the work of the Member States, and Sweden, through SwAM, has participated in the joint projects within the framework of the implementation of the government assignment. The Member States have discussed common challenges and lessons learned during the implementation process. However, most Member States have experienced problems with encouraging vessels to participate in their pilot projects, which is why the actual outcome of the collective pilot projects has been significantly lower than expected.

#### Denmark

Of all the EU Member States, Denmark has the most experience with REM. They have conducted a number of trials and have implemented REM as part of their regular control activities for Norway lobster fishing in the Kattegat. The project team at SwAM has held a number of discussions with and also visited the Danish Fisheries Agency to gather information and exchange experiences. The project team was on site in Denmark both before and during the trial.

#### **Swedish Coast Guard**

The Swedish Coast Guard has participated in the trial's reference group and thus received regular updates on the progress of the trial. Furthermore, Coast Guard fishing officers have taken part in a workshop to discuss REM in future fisheries control services.

The Coast Guard has been notified of which vessels have participated in the trial and told that Coast Guard personnel may be filmed in connection with sea inspections. The Coast Guard has also received information on how SwAM processes any personal data that could be collected on such occasions.

#### Swedish University of Agricultural Sciences (SLU)

SLU has also participated in the trial's reference group for ongoing information and has had the opportunity to contribute its knowledge and reflections.

<sup>5</sup> Regional bodies providing platforms for discussion and cooperation on key fishing issues in the Skagerrak and Kattegat (Scheveningen Group) and the Baltic Sea (Baltfish).

# 2. Starting points

#### Control of the landing obligation

The EU landing obligation was introduced in order to minimise discards and to accelerate the development of more selective fishing. The landing obligation was introduced gradually from 2015 and will apply to all commercial fishing for quota species from 2019 onwards, with a few exceptions.

Intelligence on compliance with the landing obligation is based on a combination of different sources. There are gaps in the information provided by these sources, but summarising all the information available provides a fairly clear indication that compliance with the landing obligation is poor.<sup>6</sup>

The Swedish Agency for Marine and Water Management (SwAM)<sup>7</sup> concluded as early as 2013 that the control methods in place at the time were not an effective way of ensuring reliable catch reporting and compliance with the landing obligation. Instead, SwAM reckoned that systems with control observers or camera surveillance would be best placed to fulfil the conditions for fully documented fishing and ensure compliance with landing obligations. Due to the high cost and logistical difficulties of observer programmes, SwAM believed that camera surveillance systems were most appropriate for monitoring compliance with landing obligation rules.

In 2019, the Swedish Agency for Marine and Water Management and the Swedish Coast Guard were commissioned by the Government to investigate Swedish fisheries control services and propose how they could be improved and made more efficient<sup>8</sup> while not increasing the administrative burden on businesses. In this investigation, the public authorities stated that the pilot study involving REM systems as recommended in the previous government assignment needed to be implemented in order to improve compliance with the landing obligation and verify that discards are recorded in the logbook.

#### Voluntary participation

This assignment meant that SwAM would implement a previously described proposal on how a trial involving camera surveillance aboard fishing vessels could be implemented. There may be challenges in describing precise implementation in advance, as obstacles may arise along the way that could not be predicted, or the implementation may be based on certain assumptions that cannot be realised.

There have been difficulties with implementing the trial in the manner proposed in the previous government assignment. The most central premise in the implementation of this trial has involved voluntary participation by fishing industry operators: see Chapter 3. As there is general opposition to camera surveillance aboard fishing vessels from fishing industry stakeholders, both individual business owners and representatives of producer organisations, this premise has greatly

<sup>&</sup>lt;sup>6</sup> Government assignment "Förslag till utformning av försök med kamerabevakning av fiskefartyg" (Proposal for the design of trials involving camera surveillance of fishing vessels), Ref. no. 2742-19.

<sup>&</sup>lt;sup>7</sup> Report on government assignment on control of the ban on discarding fish in the Skagerrak. Government assignment L2013/1017/JFS. Swedish Agency for Marine and Water Management report, 31 May 2013.

<sup>&</sup>lt;sup>8</sup> Assignment for investigating fisheries control services and proposing how to reinforce them. Government assignment N2019/02976/FJR

influenced the outcome of the trial. Only two fishing licence holders chose to participate in the trial. This is why SwAM conducted the assignment with considerably fewer vessels than the fifteen recommended in the report on the previous government assignment. Hence the opportunity to monitor and evaluate the impact of camera surveillance in relation to compliance with the landing obligation has been severely curtailed. None of the participating vessels have engaged in fishing operations that involve a risk of porpoise bycatch.<sup>9</sup>

#### The IT system

SwAM chose to procure systems available on the market rather than develop its own, in line with the Agency's digitalisation strategy. Moreover, as the trial was limited in time and the future was uncertain, SwAM also made the decision to rent the equipment instead of buying it. The aim of this was to minimise costs as far as possible (including the cost of storing or selling electronics that are no longer needed) and to conserve finite resources from a sustainability perspective. The premise for storing information was that this should be done locally on SwAM servers (known as on-premise storage), instead of storage solutions in the cloud (known as on-demand storage).

#### **Camera surveillance permits**

The premise for the start of the trial was that the areas to be monitored by camera in connection with the government assignment were areas on board the fishing vessels where the catches are handled and areas on board where catches could be thrown off the vessel during fishing trips. The water just outside the fishing vessel where catches are taken out of the sea during fishing trips could also be monitored by camera. As a starting point, camera surveillance would only take place when the vessel was outside the port area, and only in connection with fishing activities.

The Swedish Camera Surveillance Act (2018:1200) states that a permit is required for camera surveillance of any place to which the general public has access if the surveillance is to be carried out by a public authority. The general public could be at sea just outside the vessel and thus be subject to the surveillance intended to take place when catches are taken out of the sea. This is why SwAM applied to the Swedish Authority for Privacy Protection (IMY) for permits for camera surveillance aboard the two fishing vessels in question before the cameras and other equipment were to be installed on board the vessels.

Given the information provided by SwAM in its applications, IMY was of the opinion that the areas on board the vessels were not places to which the general public had access, which is why no permits for surveillance were required on board the vessels. With regard to the water outside the vessels, IMY considered that the public could not be considered to have access to the area because the surveillance was to be carried out in connection with fishing activities and the area had to be considered to be virtually closed to the public when fishing was taking place. IMY was therefore of the opinion that the camera surveillance to be carried out within the framework of the assignment was not subject to a permit<sup>10</sup> under the Swedish Camera Surveillance Act.

<sup>&</sup>lt;sup>9</sup> Given the fact that the main purpose of the trial related to the use of REM as a control tool for compliance with the landing obligation, while the presence of porpoise as bycatch in some fishing operations is related mainly to data collection, we have found it difficult to reconcile these elements of the trial (in both practical and legal terms). Moreover, a joint trial involving SwAM and SLU has been taking place in parallel with camera surveillance aboard fishing vessels engaged in fishing where there is an increased risk of porpoise bycatch.

<sup>10</sup> Ref. no. IMY 2022-4266

# 3. Participation of fishing industry operators

SwAM's view in the previous government assignment was that participation in a trial involving camera systems should be voluntary. A clear lesson learned from previous trials of similar schemes was that there is more chance of implementing a successful trial if the fishing industry accepts the trial. Furthermore, SwAM's assessment in the same government assignment was that if the conditions for voluntary participation are lacking, mandatory legislation needs to be in place – in the Swedish Fisheries Act, for example – to allow the trial to be carried out.

The willingness of operators in the fishing industry to participate in a trial involving cameras and sensors on board fishing vessels has been the most decisive and dimensioning premise for the implementation of the assignment. This is because SwAM is unable to impose or prescribe participation, and so this needs to be voluntary.

# 3.1. Relevant fishing segments (target)

SwAM proposed inclusion of vessels from the following three segments in its report on previous government assignment:

- bottom trawling for fish and nephrops;
- bottom trawling for northern prawns;
- pelagic trawl fishing.

These segments were selected mainly because there are indications of non-compliance with the landing obligation in the case of bottom trawl fishing, and also to increase the knowledge base on discards and bycatches in all three fishing operations.

Including several different types of fishing and vessels was also justified, given the fact that the aim of the trial was to investigate how camera surveillance systems can be used as a tool for fisheries control services and data collection. This is how SwAM intended to make it possible to obtain a good idea of when camera surveillance systems add value to fisheries control services work.

The discussions on camera surveillance conducted in various processes within the EU were another factor in favour of including these three segments. Proposals for camera surveillance systems were discussed in the revision of the EU Control Regulation with plans to implement regional pilot projects in the Baltic Sea and the Skagerrak and Kattegat. By including a number of segments in a Swedish trial, SwAM wanted to create a readiness for potential decisions on camera surveillance systems in the Control Regulation and the regional pilot projects.

# 3.2. Number of vessels (target)

In a previous government assignment, SwAM reckoned that five vessels in each segment should be included in a trial to generate sufficient video and sensor data to allow the control method to be evaluated. There was also an identified risk of non-completion during the trial due to factors such as repairs to both equipment and the vessels, which is why SwAM was of the opinion that using a smaller number of vessels was too vulnerable. Given the Swedish climate, SwAM was of

the opinion that the trial should continue for at least one year so that the test could be conducted under varying weather conditions and in different seasons. SwAM proposed gradual expansion of the trial, i.e. to start off with one segment and then extend the trial to the other two segments. This proposal was due mainly to the need to adapt the trial to SwAM capacity limitations in respect of receiving and analysing the type of data generated by participating vessels. There were no procedures and systems in place for this type of control activity at the start of the trial.

# 3.3. Summary of attitudes towards REM trials among fishing industry operators

From the consultation responses received and discussions with representatives from the demersal and pelagic commercial fishing industries at earlier consultation meetings, SwAM was able to make the preliminary assessment that a number of operators in the pelagic fishing industry were cautiously in favour of participating in a trial involving cameras, while operators in the demersal fishing industry were generally clearly against it.

The Agency has held further dialogue meetings with representatives of the fishing industry's producer organisations and a co-management organisation during the current government assignment. The purpose of these meetings was to provide information about the trial and how it would be implemented, to increase acceptance of the trial, and to provide an opportunity to ask questions and, where applicable, to jointly identify incentives that could encourage fishing industry operators to participate. To summarise, representatives of producer organisations have indicated that they are not keen on the development of cameras as part of fish management. Only representatives of one of the organisations stated that they would be willing to help contact fishing licence holders who might be interested in participating in the trial. The co-management was more positive regarding the issue of on-board cameras, indicating that they were keen to maintain the discussion on encouraging sustainable fishing.

# 3.4. Incentives for participation

As indicated shown above, fishing industry representatives and industry operators are generally against the use of cameras on board vessels. The main arguments set out are privacy-related. SwAM perceives that large parts of the fishing industry (with the exception of the pelagic sector) are clearly demonstrating a high degree of reluctance to participate in and assist with the development of a future REM system. Additional incentives besides intrinsic benefits, such as camera surveillance ensuring full transparency and accountability for what is caught, and helping to improve decision data by enhancing data quality, were needed to increase willingness to participate. However, previously evaluated incentives for participation, such as increased fishing opportunities and exemptions from technical regulations and control rules, were not deemed sufficient by fishing industry producer organisations. Hence the project team carried out in-depth work on incentives.

Ultimately, SwAM offered the following conditions in order to increase the willingness of individual fishing licence holders to participate in the trial:

• **Financial compensation**. SwAM developed a compensation model to ensure that trial participants did not experience adverse financial impact on account of their participation. This takes into account factors such as the estimated efforts required for the trial in

relation to the type of fishing, the size of the vessel and the historical value fished. Vessels participating in the trial received financial compensation in accordance with the model.

- Management of the information. SwAM clearly indicated that only a limited number of designated employees at the Agency would have access to personal data and other information collected via the REM system. However, as the videos could need to be disclosed as public documents, the Agency was also clear that this might happen, as well as indicating how that procedure would work.
- **Dealing with infringements**. Any infringements of the law in respect of fishing activities that might emerge from the REM data during the trial period would be addressed primarily through dialogue. However, very serious infringements, or repeated infringements despite previous dialogue on them, could be dealt within the ordinary procedure for infringements.
- Information on participation. SwAM described in writing, clearly and in detail, what participation in the REM trial would involve before, during and after the trial. These descriptions covered everything from what was expected of the fishing licence holder during installation and duty of care regarding the equipment, to how SwAM intended to process any personal data.
- **Cost of the technology**. The Agency clarified that it would bear all the costs of the technical equipment, as well as the costs of installation, removal and any servicing of this equipment during the trial period.
- **Opportunity to influence development.** Conducting a trial that uses cameras is a skills enhancement exercise for both the Agency and fishing industry operators. Participating in the trial as the holder of a fishing licence provides an opportunity to experience and understand first-hand how the technology works. Moreover, participation provides an opportunity to influence the design of a future system together with the Agency.

## 3.5. Financial compensation for participation through procurement

Following dialogues with representatives of the fishing industry, it became clear that it was unrealistic to expect to achieve the target of 15 voluntary fishing licence holders with fishing vessels from three selected fishing segments. Hence SwAM decided to set its sights lower and request a total of six vessels, two in each segment. This number was deemed sufficient to fulfil the purpose of the trial while also achieving a reasonable total cost of the trial.

As set out above, financial compensation for participation in the trial was the strongest and most appropriate incentive for individual fishing licence holders. For this handling to be carried out fairly, transparently and correctly, SwAM invited Swedish fishing licence holders to respond to a public procurement procedure in which the Agency offered financial compensation to fishing licence holders who made their fishing vessels available for the trial.

#### Implementation

The procurement procedure was conducted in accordance with the Swedish Public Procurement Act (2016:1145). SwAM produced a requirements specification that clearly described what being involved in the trial would involve and what the Agency expected in return. The scope of the procurement procedure specified how many fishing licence holders we wanted to associate with the trial and the type of fishing in which the vessel should be active. As fishing licence holders cannot normally be expected to have a great deal of experience in responding to public

procurement procedures, SwAM held a discussion with producer organisations and operators in the commercial fishing sector so that any questions arising during the procurement procedure could be answered. SwAM also invited people to attend an information meeting during the procurement period, where the Agency presented the documentation and answered questions. The procurement procedure was designed to minimise the amount of work required to submit tenders, which included the use of a response form.

#### **Financial compensation**

The financial compensation offered by SwAM was a percentage of the previous fished value of the fishing vessel in question over a certain period. The percentage varied depending on the fishing segment. SwAM selected this model because the compensation would be attractive to fishing licence holders with both small and slightly larger fishing vessels, and because the Agency deemed that it reflected the anticipated effort that participation in the trial would involve.

#### Results

When the procurement period ended, SwAM found that only two fishing licence holders had chosen to respond. The Agency established agreements with these two organisations, both of which operated in the pelagic segment. This meant that no fishing licence holders operating in the bottom trawl fishing industry chose to submit tenders to participate in the trial.

## 3.6. Communication activities

Obviously, communication was an important element in persuading fishing licence holders to participate in the trial. Prior to the trial, SwAM placed major emphasis on well thought-out communication, clear messages and transparency with regard to how the trial would be conducted.

#### Messages

The approach to communication was to avoid the sense of surveillance and control, and instead to reinforce the sense of cooperation that the Agency wished to achieve. Moreover, SwAM concluded that clear communication and open dialogue were crucial factors in implementing the REM trial, and therefore formulated messages about why SwAM wanted to conduct a trial involving REM technology on board fishing vessels. SwAM reckoned that the trial needed to be implemented in order to:

- contribute to long-term sustainable fishing
- create transparency and impact trust in the fishing industry
- increase the chances of credibly monitoring fishing activity and improving conditions for monitoring the regulatory framework in respect of the landing obligation

As regards the link to the landing obligation, SwAM has formulated additional messages during the course of the trial, including:

• the control of the landing obligation needs to be more effective as the Agency has been able to perceive clear indications of failure to comply with the rules in its regular control

activities. For instance, SwAM can see that reported catch data generally deviates from catch data from corresponding sampling operations on board vessels

 cameras and other REM technology are a resource-efficient control tool, and so SwAM favours the use of cameras in certain types of fishing operations where the risks are highest.

#### **Communication initiatives implemented**

Prior to and during the trial, SwAM has implemented a number of communication initiatives of different types and with different aims. The above messages and approaches have provided a foundation on all occasions.

- SwAM held dialogue meetings with representatives of fishing organisations on two
  occasions in the autumn of 2021, on 8 October and 26 November. The purpose of these
  was to let people know that SwAM was intending to conduct the trial, and to provide an
  opportunity to ask questions and provide input for the trial.
- On 17 December that same year, SwAM was invited to present the planned trial at the board meeting of the Swedish Fishermen's Producer Organisation (Sveriges Fiskares Producentorganisation, SFPO). Besides presenting the approach, the Agency suggested simple activities that the organisation could implement in order to assist in our efforts to find participants for the trial. Examples of such activities included distributing information on their own website and assisting fishing licence holders with administration. Following the board meeting, SwAM received feedback from the producer organisation indicating that they had decided not to participate in the activities proposed by SwAM.
- In February 2022, the Agency created an informative page about the trial on the SwAM website.<sup>11</sup> This page included an extensive FAQ (frequently asked questions) section.
- The Agency provided information about the trial for the first time in March 2022 in Fiskenytt, SwAM's newsletter to operators in the fishing industry. SwAM also released a video about the trial on both Facebook and its website.
- In April, SwAM published another issue of Fiskenytt containing notification of the trial and an invitation to an information meeting. SwAM held this information meeting in April, and the Agency looked in detail at what participation in the trial would mean for individual fishing licence holders.
- SwAM has conducted information and training initiatives with participating vessels in connection with the installation of the technical equipment on board the vessels.
- In the autumn of 2023, SwAM presented the trial and its implementation at a commercial fishing conference attended by commercial fishing operators, representatives of producer organisations and politicians, among others.

In parallel with the above external activities, SwAM has provided information about the REM trial through internal channels, its intranet and authority-wide meetings, and has held demonstrations on how the technology works.

<sup>&</sup>lt;sup>11</sup> https://www.havochvatten.se/fiske-och-handel/aktuella-fragor/projekt---kameror-och-sensorer-pa-fiskefartyg.html

# 4. Technology and information

## 4.1. Procurement of technical equipment

The environmental analysis conducted by SwAM showed that there were a number of providers of REM technology on the international market. Given SwAM's digitalisation strategy, SwAM decided to try to acquire the technical equipment needed for the trial through a procurement procedure. Moreover, as this trial was only to be conducted for a limited period of time, the Agency opted to tender for the rental of the equipment. The aim of this was to be able to return the technology to the provider, who would hopefully allow still-functioning hardware to be reused.

#### Implementation

A team from the Agency with expertise in areas such as fisheries control services, law, procurement law, digitalisation, technical infrastructure and communication conducted the procurement procedure.

The EFCA, together with the member countries, has defined REM as a system and documented the technical requirements to ensure that the equipment on board the vessels is robust and functional. This is why SwAM chose to refer to the EFCA guidelines when procuring REM equipment for the trial.<sup>12</sup> Insofar as SwAM had requirements that differed from those set out in the guidelines, the Agency clearly described this in the procurement documents. For instance, SwAM perceived no need to transmit information via satellite-based communication, or to have removable hard drives on board. The EFCA guidelines are generic, and it is important to adapt the requirements to national circumstances where necessary. Moreover, when procuring technical systems, it is important to ensure that the technology works on the Agency's existing technical platform, which may mean that various additional requirements will need to be imposed in connection with a procurement procedure.

The vessel-oriented procurement procedure was already completed when the technical procurement began. Hence it was known which fishing vessels would participate in the trial, so SwAM was able to describe the vessels in question and the type of fishing they do. This meant that the procurement documents could be clear about the scope. The Agency also procured the corresponding equipment for installation at SwAM's premises, in addition to the equipment for the vessels participating in the trial.

In the procurement documentation, SwAM chose to describe the desired functionality on board the vessel, but also for reviewing incoming information in the form of sensor data and videos. Describing the functionality meant that the Agency gave the provider more responsibility and freedom to offer the right equipment to perform the function. For instance, a provider can be expected to have a great deal of in-depth knowledge of how many cameras would be needed to gather information on a particular type of activity on the basis of the needs described by SwAM: in this respect, it was more important to meet the needs for functionality than to have a certain number of cameras sited on the fishing vessels.

<sup>&</sup>lt;sup>12</sup> <u>https://www.efca.europa.eu/en/content/technical-guidelines-and-specifications-implementation-remote-electronic-monitoring-rem-eu</u>

SwAM chose to conduct what is known as a Request for Information (RFI) early on in the process in order to obtain more information on two detailed issues. The responses to the Request for Information allowed SwAM to define certain technical requirements more clearly on the basis of intelligence provided by the providers to the Agency. This process gave SwAM an insight into the fact that the equipment to be used during the trial could be rented from the providers, and that local storage of information (known as on-premise storage) was possible.

#### **Evaluation and results**

The tenders received were evaluated by assessing factors such as how well the providers fulfilled the optional requirements and by allowing the providers to provide technical demonstrations of certain functions and use cases described by SwAM. The technical demonstration was evaluated by operational and technical experts at SwAM. All mandatory requirements had to be met for providers to be included in the evaluation of optional requirements and use cases.

Two providers had submitted bids by the end of the procurement procedure. Both providers met the mandatory requirements, and both had interesting technical solutions to offer.

The technology provider engaged by SwAM is an international technology company with 20 years' experience of developing electronic solutions for the fishing sector. This company provides services and support to customers all over the world. The technology provider had more than eight years' experience in the field and had installed over 250 systems worldwide.

#### 4.2. Installation on board the vessels

#### Preparation prior to installation

SwAM carried out physical visits to both fishing vessels prior to installation of the equipment on board. Where and when SwAM would visit the vessels was decided in dialogue with the fishing licence holder and with regard to regular vessel activities. During these visits, SwAM discussed matters such as appropriate camera locations, received information about the vessels' power supply and the types of winches and net rollers on board. SwAM also talked to the fishing licence holders about what they regarded as the primary challenges for installation, such as the potential impact on the vessel due to cabling. The fishing licence holders provided SwAM with drawings of the vessels and other technical information that was specifically requested by the technology provider in order to prepare the equipment and technicians prior to installation.

SwAM decided in consultation with the fishing licence holders on when and where the equipment would be installed. This planning was based on attempts to cause as little disruption as possible to regular fishing activities. The installation work also needed to include personnel from shipyards who could assist with welding and other practical issues during the actual installation work.

#### Installation on board the vessels

The technology provider installed the devices on board the vessels together with staff from the local shipyards. They installed four cameras and two sensors on one vessel, and three cameras and one sensor on the other. These cameras were sited according to SwAM's requirements to monitor the fish from trawl to tank; one over the gunwale where the catch is pumped on board, the area after the water separator at the fish channel, and one at the site where the species

composition samples are carried out. Sensors were installed on the net rollers of both vessels, and also at the sampling table (the place on board the vessel where the crew conducts species composition samples). The sensor on the net roller was installed to record when the trawl is winched out for fishing, or winched back in after fishing. The sensor at the sampling table was installed to record and start the system when sampling is performed. The technology provider installed a GPS antenna on the roof of the bridge, and inside the wheelhouse was installed a control box for storing information, a 4G modem for transmitting the information and a laptop where the master can always see what the cameras are filming and ensure that the system is working. While the cameras and other equipment were being installed, the images from each camera were customised with static masks that were designed to cover areas where catches are not handled but which are within the area filmed by the camera.

The installation of the equipment was documented in a Vessel Monitoring Plan (VMP): see the template in the EFCA guidelines.

The installation was estimated to take no more than five days: it took five days on one of the vessels, three days on the other. It is important to consider the size and complexity of the vessel when calculating the scope of the installation. The single most time-consuming and resource-intensive step involved laying cables on board the vessels. The technology provider's installers needed more assistance from technicians from the local shipyard than anticipated by both SwAM and the technology provider. Although the technology provider had extensive experience of installations, they had no experience of the type of fishing and vessels involved in the trial.

#### Comments on the installation process from fishing licence holders

SwAM has conducted interviews with the fishing licence holders for the two vessels in order to find out what they thought of the installation process.

One of the fishing licence holders says that the planning and preparations for the installation worked well, that the people responsible for the vessel received the information they needed, maintained good cooperation with SwAM and had the opportunity to influence the installation within the framework of planning. However, the installation work began later than planned, which meant that the work disrupted a couple of planned fishing days. The fishing licence holder also says that there were shortcomings in the installers' knowledge of circumstances on board the vessel, and that it was difficult to communicate with them on account of the language. The licence holder feels that it would probably have been better if a Swedish company had carried out the installation work.

The other fishing licence holder reckons that the installation process was generally substandard. He feels that the installers should have been more familiar with the circumstances and says they needed a lot of help from the local shipyard. According to the fishing licence holder, it would be better to involve a local shipyard or another Swedish company more directly. However, the people responsible for the vessel, together with the shipyard, were prepared for the installation work not to proceed as planned. This meant that the installation had no adverse impact on operations.

# 4.3. Installation of equipment at the Agency's premises

#### Summary

In the procurement procedure, SwAM required all information to be stored at the Agency and not in a cloud solution. The provider was able to fulfil this requirement by installing their software in the Agency's technical infrastructure. The Agency's operating organisation set up the technical environment in accordance with the performance required by the provider. The Agency also created a secure channel where the provider could access the technical environment remotely, known as a VPN solution.

A compartmentalised network was created within the Agency which restricted access to the information collected. The aim of this was to reduce the chances of potential distribution of the information to parties other than SwAM employees working on the trial, thereby minimising the chances of unauthorised use of the information.

The Agency chose to provide SIM cards in the equipment on the boats so as not to breach existing contracts with the Agency's telephone services provider.

Figure 1 (provided by the provider) below shows how the various parts of the REM system relate to one another.



Figure 1. Shows the various components of the REM system as a whole and how they relate to one another. Information from the vessel to the Agency was transmitted only via 4G.

#### Cameras and sensors at the Agency's premises

SwAM chose to install full on-board equipment in one of the project rooms on SwAM premises in order to evaluate the system and functions on board the vessels. The REM trial project team at SwAM carried out the installation work with the assistance of SwAM IT support and the provider. SwAM gained a more in-depth understanding of the equipment and technology during the installation work.

Using the locally installed equipment, the project team was able to distribute information and knowledge about system functionality to the rest of the staff at the Agency without displaying information from the vessels.

The test equipment also allowed SwAM to work with the various functions for dynamic and static masking of the images.

### 4.4. Collection, transmission and storage of information

#### Collection of data on board the vessels

Data collected on board the fishing vessels comes from sensors and cameras in various forms. This information is stored in the control box installed on board the vessels. The control box is a sturdy computer that cannot be tampered with by staff or unauthorised persons on board the vessel. It is encrypted, and access rights are required to log in. The computer has built-in support for various communication methods (satellite communication, mobile data, 4G/LTE, WiFi and Bluetooth).

Data can be stored for a long time on board and cover a large number of fishing trips, estimated at 200–300 days of fishing. The computers on board the vessels have permanent hard disks and data is transferred only via wireless means. Transfer has taken place automatically when the vessels have been connected to mobile data (4G). Transfers have mostly been completed without problems during the trial, with a few exceptions. In the trial, the system was configured only to transmit information via mobile data (4G).

The information kept on board the vessel is deleted when the videos have been transferred from the vessel to SwAM. If the hard drive of the control box is filled up before the vessel has transferred its videos to SwAM, it will automatically overwrite the oldest recordings. The control box has two hard disks, each with 1 TB of storage space. Throughout the trial, one vessel generated 534 GB of video that was transferred to SwAM, and the other vessel 397 GB.

#### Sensor data

Sensor data includes information about activities on board the fishing vessels, such as the start of net roller movement and the position of the vessel. Sensor data makes up part of the information that is transferred to SwAM for analysis. The sensors on the net roller are used to activate the cameras on board. Activity in a sensor where the trawl is winched out is not of as much interest as when the trawl is winched back into the vessel after fishing.

#### Camera data

The cameras on board record all activity and this information is saved locally to the control box, but camera data is only transferred to SwAM when activity is detected by the sensors. Camera data needs to be of sufficiently high quality to allow details to be seen in order to identify different species of fish and shellfish, for example. High quality videos generally generate large data volumes. The ambition is to minimise the data volumes transferred to the Agency. This is why the film quality may be lower in some cases: such as videos from the cameras filming over the gunwale where catches are brought on board. There is slightly less need to be able to see details there.

# 4.5. Processing of information and personal data during the trial

The data controller is the body which determines the purposes and means of the processing of personal data, either alone or jointly with others.<sup>13</sup> It may be possible to regulate by law who the data controller is where the purposes and means are determined by Union law or national law of the Member States.

There was no specific legislation designating a data controller for camera surveillance aboard fishing vessels at the time of the REM trial. Instead, this was determined by means of a customary assessment where SwAM was the data controller as the information was collected for SwAM purposes. The fishing licence holder was a data processor for SwAM as they processed personal data on behalf of SwAM. Data processing agreements (DPAs) were therefore drawn up between SwAM and the relevant fishing licence holders for the vessels included in the trial in order to regulate how personal data could be processed.

### Access to information from the REM system

SwAM devised procedures for processing collected information in order to restrict access to collected data. The procedures were communicated to all parties concerned. Only a limited number of SwAM staff had access to information and personal data generated by the REM system. In some instances, the videos and information have been shown to other employees at SwAM following assessment of whether this was in line with the trial's assignment or necessary for the implementation of the trial.

The Agency has implemented the following technical measures to minimise the risks of unauthorised persons using the information in an unauthorized manner:

- transmissions of information between fishing vessels and the Agency were encrypted
- information was stored locally at the Agency's premises without cloud services
- the Agency has clear rules on storage locations and storage periods
- the Agency's access to the system has been controlled by access rights, and every use has been logged automatically

The fishing licence holder, the master and other crew of the fishing vessel have had access to information generated by the REM system on board the vessel in question.

The contract does not provide the technology provider with access to the information generated during the trial. In instances where the technology provider has requested access to information, the matter has been dealt with in accordance with the procedures applicable to requests for disclosure of public documents (see also the section entitled Disclosure of information from the REM system).

### Risk assessment and protective measures

SwAM has needed to film on board fishing vessels where personal data is present in order to develop a method for future camera surveillance of commercial fishing vessels. The aim of this has been to find out how to film, what to film, and how the technology works, including masking

<sup>&</sup>lt;sup>13</sup> See Article 4(7) of the GDPR.

methods. SwAM, as the data controller, has needed to process personal data in connection with the video recordings, and so SwAM has implemented a number of measures in order to keep collection of personal data to a minimum.

The use of cameras on board vessels that could capture individual workers in their workplace on video, even if that is not the intention, is an issue that very much relates to the privacy of individuals. This is why SwAM, in this case, carried out an impact assessment pursuant to the GDPR<sup>14</sup> in order to prevent potential risks when processing personal data and hence protect the rights and freedoms of individuals.

SwAM has not identified a likely high risk to the rights and freedoms of individuals in its work on the impact assessment. However, a number of risks related to the processing of personal data were identified in the impact assessment. These risks were complemented by measures that mitigated the risks or eliminated them entirely.

Access to the personal data collected has also been restricted by ensuring that only designated SwAM employees have had access to the personal data collected. The masters of the participating vessels have also been able to view the recordings in real time.

Personal data collected in the form of video footage will be stored until 31 May 2024 at the latest, given the purpose of the processing. The data will be deleted at this time.

#### Disclosure of information from the REM system

If data collected by SwAM is to constitute a document, this has to be a recording that can only be read or viewed using a technical instrument.<sup>15</sup> Camera surveillance footage is one such recording.

For a document to also be public and covered by the right of access to public documents, it must be <u>stored</u> at the Agency's premises and be <u>received or created</u> there.<sup>16</sup>

Information to which a public authority has access is considered to be held by that public authority. Where the recording is physically located is of no importance.<sup>17</sup> A recording is regarded as being held by a public authority if the recording is accessible to the public authority using technical instruments utilised by the public authority itself for transmission in such a form that the recording can be read, listened to or otherwise understood. A recording is regarded as having been received by a public authority when it is to be regarded as being held by that authority, provided that someone outside the public authority made the document available to the public authority.<sup>18</sup>

The Swedish Freedom of the Press Act makes no distinction between access by SwAM to electronic information collected by SwAM for the Agency's own purposes and activities, and

<sup>&</sup>lt;sup>14</sup> Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation, GDPR).

<sup>&</sup>lt;sup>15</sup> See Chapter 2(3) of the Swedish Freedom of the Press Ordinance (1949:105).

<sup>&</sup>lt;sup>16</sup> See Chapter 2(4) of the Swedish Freedom of the Press Ordinance.

<sup>&</sup>lt;sup>17</sup> This follows from Chapter 2(6), first paragraph of the Swedish Freedom of the Press Ordinance, and from preparatory works such as Government Bill 1975/76:160 Section 89 and SOU 2012:90 p. 65.

<sup>&</sup>lt;sup>18</sup> See Chapter 2(9), first paragraph of the Swedish Freedom of the Press Act.

electronic information collected by the licence holder for its own purposes and activities, but which is technically accessible to SwAM by means of direct access. This is why the information collected from the REM system within the framework of the trial has been deemed to be prepared and stored by SwAM and to constitute a public document.

Public documents must be disclosed to anyone requesting them, except for any parts that may be subject to confidentiality. The confidentiality provisions that may be of relevance in relation to information from the REM system are mainly those relating to personal data, business relationships and operating relationships. Whether confidentiality prevents disclosure is assessed on a case-by-case basis.

If SwAM deems information to be protected by confidentiality in the case in question, this means that the information in question will not be disclosed, or that it will be disclosed with restrictions on its potential use.

#### Video recording at the office as part of the REM trial

The same system has been installed in one of the project rooms at the Agency's premises so that SwAM could evaluate the system and functions on board the vessels. SwAM has produced and reviewed information for data subjects on how the Agency processes personal data, what the legal basis for its collection is, who processes the data internally at SwAM and how long the data is stored. This information also explains the data subjects' rights under the GDPR.

Information to other co-workers using the project room to indicate that the system is operational only when project participants are present is posted on the door of the project room.

# 5. Practical result

#### Video

During the trial, SwAM has analysed all fishing trips where the system has been operational. This has been possible because only two vessels participated in the trial. The EFCA's recommends analysing about 10 per cent of fishing trips when REM is used in regular control activities.

Despite concerns about being unable to distinguish pelagic species to any great extent, the trial has shown that it is possible to detect species other than the target species and verify logbook data. Incorporation of some bycatches is generally noticeable among the fish when the catch is pumped into the storage tanks. Videos from the camera at the species sorting point need to be analysed for details on bycatches. This system also provides an opportunity to guarantee both the time and the location when the vessels are fishing. With a camera sited over the gunwale of the vessel, SwAM is of the opinion that it is also possible to see whether any slipping (deliberate release from fishing gear before the catch is brought on board) would occur.

It is also possible to see whether sampling is carried out on board, and if so, when and how. As described above, it is also possible in some cases to identify bycatch species during the sorting process. Species that are very similar to one another, such as herring and sprat, are difficult to tell apart on the video.

#### Masking

SwAM has evaluated different types of masking during the trial; dynamic masking, which only masks out faces or people, and static masking, which involves black fields that are masked out. The advantage of dynamic masking is that catch handling can be seen more clearly. The disadvantage is that the technology is not entirely reliable, which means that there is a risk that masking will not be entirely complete and it will be possible to identify individuals. Static masking conceals entire areas, which can make it difficult to obtain an overall view of the catch and its handling.

SwAM has tested and evaluated the various masking types using the equipment that SwAM had in the office.

#### Technology

The technology has caused more problems than SwAM had anticipated. There have been problems with the on-board equipment on a number of occasions: the camera lenses have been blurred, for example, and water has entered one of the camera housings. The activity sensors have not always worked as intended. SwAM has been able to establish that information has not always been transferred from fishing vessels to the Agency. However, the information has always been stored in the control box, and the transfer has begun automatically after restarting the on-board system.

The technical challenges have meant that SwAM, in dialogue with the technology provider, has had to perform troubleshooting and work to remedy the problems to a relatively great extent. Problems with video quality have meant that some fishing trips could not be analysed in full.

#### Analysis tool

A robust and intuitive analysis tool that can combine various items of sensor data together with recorded video is needed to effectively analyse large amounts of footage. The software provided by the technology provider during the trial has proven to be inadequate in a number of respects. A number of technical problems have arisen during the course of the trial, the software has not been adapted to the fishing covered by the trial, functionality such as zooming has been inadequate, and the program has locked up during analysis on a number of occasions.

#### Masters' reflections

SwAM has conducted interviews with fishing licence holders and, in some cases, fishing licence holders who are also masters of the two vessels in order to find out how having REM on board went, for instance.

One of the fishing licence holders reported the following. The technology did not work properly right from the outset. For instance, the people responsible for the vessel had no passwords for the computer that was installed on board. A lack of information from the installers also meant that it was unclear from the outset what the people responsible for the vessel should and should not do. It took a long time for action to be taken once a problem had been identified: when there were problems with camera angles, for example. Several months had passed before good results were achieved. Somebody from SwAM ought to have been involved from the outset to make sure everything worked as planned. The people responsible for the vessel could have wiped down the cameras, but they did not know how to tell whether that measure was working. All in all, decisions and action in the event of problems should have been quicker. It would have been better to have a provider that was closer and easier to communicate with.

The second fishing licence holder, who is also the master, reported the following. There were occasional problems with the computer locking up and needing to be restarted. There were no major problems with ice and frost forming on cameras during the trial, but he does not think the cameras would work if there were more frost and ice. The people responsible for the vessel cleaned the cameras at the request of SwAM on a few occasions, and have done so on their own initiative on at least one occasion. All in all communication and cooperation with SwAM has been good. The rights and obligations of the people responsible for the vessel were clear. The crew experienced a degree of stress due to being monitored. Dynamic masking worked, with varying quality. Static masking worked better. He stresses that it is important to have competent staff to analyse the videos so that there is no ambiguity about what the videos show.

# 6. Costs

Implementing the REM trial has included costs for the REM equipment, including installation, servicing and dismantling, but also for the participation of fishing industry operators and personnel costs at SwAM. The trial has been funded as follows:

- SwAM's 1:11-anslag (grant) "Measures for the marine and aquatic environment" (specifically linked to conditions on use for projects and measures relating to the participation of the commercial fishing industry in research projects, environmental projects or method development projects)
- SwAM's administrative grant 1:15
- European Maritime, Fisheries and Aquaculture Fund (EMFAF)

Work on the trial has been taking place from 2021 until early 2024. The total cost of the trial has amounted to about SEK 5.2 million. Most of the total cost relates to personnel costs at SwAM.

# 7. Discussion – REM in the fisheries control services of the future

REM will play a key role in future fisheries control services. The trial conducted has enhanced the expertise of the Agency, and probably also of the fishing industry operators involved. The chapter below discusses how future fisheries control services with the REM system implemented could work to deliver the benefits sought in respect of control of the landing obligation. Figure 2 sums up the REM for future fisheries control services, demonstrating its complexity and indicating that the design of a future system will both influence and be influenced by various factors.



Figure 2. REM systems on board fishing vessels will play a key role in future fisheries control services. The design will both influence and be influenced by various factors.

# 7.1. New provisions on REM in the Control Regulation

The EU Control Regulation has been revised while the trial has been in progress.<sup>19</sup> The new provisions<sup>20</sup> require Member States to ensure that Union fishing vessels of an overall length of 18 metres or more which fly their flag and present a high risk of failure to comply with the landing obligation are equipped with operational remote electronic monitoring systems (REM systems).

<sup>&</sup>lt;sup>19</sup> Council Regulation (EC) 1224/2009 of 20 November 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy, amending Regulations (EC) No 847/96, (EC) No 2371/2002, (EC) No 811/2004, (EC) No 768/2005, (EC) No 2115/2005, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007, (EC) No 676/2007, (EC) No 1098/2007, (EC) No 1300/2008, (EC) No 1342/2008 and repealing Regulations (EEC) No 2847/93, (EC) No 1627/94 and (EC) No 1966/2006

<sup>&</sup>lt;sup>20</sup> Regulation (EU) 2023/2842 of the European Parliament and of the Council of 22 November 2023 amending Council Regulation (EC) No 1224/2009, and amending Council Regulations (EC) No 1967/2006 and (EC) No 1005/2008 and Regulations (EU) 2016/1139, (EU) 2017/2403 and (EU) 2019/473 of the European Parliament and of the Council as regards fisheries control

Article 13, which regulates REMs, will be supplemented by implementing provisions decided by the European Commission, which must specify and clarify the necessary details. Exactly how the overall legislation in this area will be structured will remain unclear until these implementing provisions are decided. The fact that the implementing provisions are to be adopted in accordance with a given procedure<sup>21</sup> means that the Member States will at least have an opportunity to both comment on and influence the provisions. Knowledge and experiences from joint efforts conducted by the Member States with the EFCA are likely to be utilised by the European Commission. It is important to ensure that Sweden, through the Government Offices, and through SwAM as the competent authority, is involved as far as possible in efforts to formulate implementing provisions.

Given the text in the regulation and experiences gained from the completed trial, SwAM makes the following observations:

- As things stand at present, it is unclear exactly how many Swedish vessels will be subject to the requirements of Article 13. The European Commission has announced that the risk assessment will be based on existing cooperation and regional risk analyses prepared within the EFCA. Based on these assumptions, and with a fishing fleet of the same size as today, some 30–40 vessels will be subject to the requirements of Article 13. The precise number of Swedish vessels that will be subject to the requirements of Article 13 may also be influenced by factors such as the design of any system of transferable fishing rights in respect of demersal fishing.<sup>22</sup>
- Article 13 requires the master to ensure that the competent authorities have access to the data from the remote electronic monitoring system, but more detailed provisions on access to data will be regulated in the Commission's implementing provisions. Detailed provisions will be necessary in order to specify and clarify these elements. Access to data may influence the assessment of the data for which SwAM will be responsible. Access may also influence what constitutes public documents. It is also worth noting that there are no provisions on who is to stand responsible for the purchasing, installation, operation and maintenance of the actual REM equipment on board.
- "All areas where discards may occur" needs to be clarified or explained, as this can be interpreted as meaning either the entire vessel or those places where discards may take place as described/determined by a vessel's specific VMP. The latter needs to be combined with the option of viewing and identifying the entire catch and comparing it with the logbook and landing declaration.
- It is necessary to clarify the level of "whether natural persons can be identified". Does this
  require a picture of a clear face or a unique tattoo, or will it suffice just to know the crew
  and therefore be able to recognise an individual? Regardless of the level, it is important to
  use masking functions in the software when filming, and also to have the opportunity to
  mask videos in retrospect.
- Equal access to data by flag and coastal Member States places stringent demands on technical solutions. For instance, it is important to ensure that data from different types of

<sup>&</sup>lt;sup>21</sup> Procedure under Article 119(2) of the Control Regulation.

<sup>&</sup>lt;sup>22</sup> Government assignment to propose how a system of transferable fishing rights for demersal species (demersal fishing) in the Swedish fishing industry should be designed. SwAM Ref. No. 1738-23.

on-board systems can be sent and received independently of the analytical software of flag and coastal Member States.

- The regulatory framework allows for national extension of the requirements for vessels less than 18 metres in length, and also by providing incentives for voluntary vessels that are not subject to REM requirements. However, provided that a decision is made in Sweden to allow such an extension, it will be appropriate to wait until the mandatory vessels are equipped and operational and the organisation at SwAM is developed.
- The regulatory framework also allows Member States to prescribe the use of REM systems for controlling compliance with provisions in the common fisheries policy other than the landing obligation. It is appropriate to adapt national regulations with regard to the possibility of using REM data for control purposes other than the landing obligation. One example involves the control of fishing activities in marine protected areas.
- In its reporting on previous government assignments, SwAM has emphasised the need to
  examine possible legal obstacles to camera surveillance aboard fishing vessels when the
  vessel is outside Swedish waters. SwAM has raised this issue at meetings with the EFCA
  and other Member States in respect of REM. Other Member States have not perceived
  the same need for legal review. The EFCA has undertaken to examine this further in the
  development of the EFCA Memorandum on data protection for camera surveillance
  aboard fishing vessels: this is currently being finalised and will be available in future work
  on Commission implementing provisions.
- SwAM estimates that somewhere in the region of two full-time equivalents will be needed to work on the implementation initiative following on from the requirements of Article 13 and additional implementing provisions, as well as work on practical preparation and any national adaptations. SwAM is of the opinion that when Article 13 has been implemented, the resource requirement will increase to four full-time equivalents for continuous work on factors such as image analysis and technology management.

# 7.2. REM equipment

Requirements for camera equipment on board fishing vessels can be addressed in two different main strands regarding purchasing, installation, maintenance and responsibility for the operation of the equipment. Either the regulating body is responsible for all or some elements, or the fishing licence holder is responsible. Regardless of what choice is made, the responsible regulating body must be able to receive, analyse and store information of relevance to the assignment. All combinations of solutions have different implications, but there should be further investigation and consultation with the fishing industry before a decision is made on who should be responsible for the various elements outlined below. Note that this list may be impacted by the Commission's forthcoming implementing provisions.

#### Purchase of on-board equipment

#### Regulating body responsible

Purchases need to be made in accordance with the Swedish Public Procurement Act. Procurement procedures need to be conducted at specified intervals, and equipment needs to be replaced in accordance with the latest procurement procedure. This means it will constantly be possible to introduce new technology aboard vessels, thereby ensuring that modern, up-to-date technology is deployed at no major cost to the business owner in question.

If necessary, the Agency can demand the transfer of data to the new system in a new procurement procedure and thereby gain access to historical data.

All equipment on board, regardless of the vessel, will be from the same provider if the Agency is responsible for purchasing. Moreover, there will be an option to procure the entire system, i.e. both vessel equipment and office equipment, at the same time. This will facilitate compatibility.

SwAM has good legal procurement expertise but not as much experience of technically complex procurement procedures. Therefore, skills development in terms of hardware and software may be necessary.

#### Fishing industry responsible

The scope of procurement and purchasing for SwAM is reduced if fishing industry operators are to be responsible for purchasing the on-board equipment. However, the Agency needs to devise clear requirements and possibly guidelines that the operator can use when purchasing the equipment.

The operator should be able to select the provider itself on the basis of SwAM's requirements for functionality and a common format for the transmission of information. This may mean different vessels have different providers.

There may be a beneficial situation for the provider supplying equipment to SwAM, as this means it is likely to be easier for the operator to deploy its on-board system. This is only of relevance as long as there is no common format for the transmission of information.

If operators who will be subject to requirements relating to on-board REM are to be responsible for purchasing, the option of financial compensation through the European Maritime, Fisheries and Aquaculture Fund (EMFAF), for example, should be clarified.

#### Installation of on-board equipment

#### Regulating body responsible

SwAM needs to decide who will implement the installations in operational terms if the regulating body is to be responsible for the installations on board the vessels. These can be technicians employed by the Agency, or local installation companies can be used. A procurement procedure for the service will need to take place in the latter case.

At the very least, SwAM needs client expertise in the installation of vessel-related equipment. This can be ensured by subcontracting an installation company.

#### Fishing industry responsible

If the fishing industry is responsible for the installation of on-board equipment, the licence holder itself will be able to select technicians and an installation company. There are advantages to this option in terms of familiarity with the vessels and facilitated dialogue during installation.

The installation process needs to be elucidated and documented. SwAM needs to be active when it comes to planning the installation by compiling a preliminary VMP where factors such as camera locations are clarified and boundaries are drawn in respect of the division of technical responsibilities. When installation is completed and testing has been passed, it is appropriate for SwAM to make a decision on the individual vessel's VMP.

#### **Operation and maintenance**

Depending on whether vessels would be restricted in their ability to leave the quayside in the event of system faults, there may be high demands for servicing at the ports from which the vessels depart.

The REM system needs to be viewed as a whole where the equipment at SwAM needs to have at least the same operational requirements as the equipment on board the vessel. SwAM may define requirements for on-call service.

#### Data transfer

In the trial, the system has automatically transferred all data recorded and stored to SwAM, and virtually all trips have been reviewed. Having data from the REM system that corresponds to the vessels' fishing trips has been beneficial. This has also made it clear when data has not been transferred on a number of occasions.

One alternative to automatic transfer of all data is for SwAM to use sensor data to indicate which parts of a fishing trip should be transferred to SwAM. This request is then queued in the fishing vessels' computers and is executed as soon as the fishing vessels are in an area where the transmission capacity is good enough. This option is recommended by the EFCA and is linked to the corresponding recommendation that about 10 per cent of fishing trips need to be reviewed. Unless all information is reviewed, automatic transfer presents a risk of information being transferred to the Agency and requiring storage space without generating operational benefits.

However, in an initial and training phase, SwAM is of the opinion that it is appropriate to transfer all information from the fishing vessels in order to develop risk analyses and working methods, and to have full consistency in respect of REM information in relation to logbook data.

# 7.3. Technical standard

The information generated by REM is a combination of different data sources: camera data, sensor data and position data. In today's market, providers offer only complete system solutions where everything from sensors to analysis software is included in relatively closed systems. This market structure presents a challenge as it makes it difficult to switch technologies when it comes to collecting data. For instance, sensors and the "net roller" signal could have different names and even be processed differently in the individual systems, which coulf make it difficult to know which information applies to what.

The challenges could be even greater when Swedish vessels fish in waters belonging to other Member States, or when other Union vessels fish in Swedish waters. Data could then be shared between the flag Member State and the coastal Member State. Things becomes even more complex in the case of fishing in third country waters and when third country vessels fish in Swedish waters, in the absence of agreed technical standards for sharing the types of data that may be involved. It would be unreasonable for vessels to need different REM systems in order to fish in different waters, both inside and outside the EU.

The European Commission has already worked in cooperation with Member States on developing common standards for the transmission of fishing information. The issue of developing a corresponding technical standard for the transmission of REM information will also need to be addressed within the EU, and SwAM should play an active part in this work. The technical standard will need to address both the transmission of information between vessel and Agency, as well as between relevant Member States and third countries.

## 7.4. Information

#### **Responsible for information collected**

The premise is that SwAM is responsible for the information that is the Agency's information, regardless of whether SwAM has collected the information or has received it from someone else. When assessing whether the information belongs to the Agency, we need to consider who needs the information and the purposes for which it is collected.

Therefore, whether the equipment used for video recording on board the fishing vessels is owned by the fishing licence holder, SwAM or a third party, for example, is of no relevance when assessing who is responsible for the information collected. SwAM has been responsible for all data collected within the framework of the trial, and the equipment has been hired. The information has been collected on behalf of SwAM for its own purposes.

The fishing licence holder or the master is responsible for the information collected by each operator with a view to fulfilling their reporting obligations. SwAM is responsible for the information requested by the Agency and received by SwAM, or for all information to which SwAM has direct access via the computer systems to be able to perform its controls. Who is responsible for this data and at what time will depend on what is specified in the Commission Implementing provisions for Article 13. The information owner is responsible for notifying the persons concerned, such as fishing licence holders, administrators and inspectors, about the processing of information and personal data.

#### Confidentiality

From a privacy protection perspective, there may be a need to explore the possibility of legislating for stronger privacy protection for recorded data, in particular personal data, in material produced through camera surveillance. From the same perspective, there is an interest in not collecting and processing more personal data than is necessary for the actual controls performed for a given vessel, i.e. only transmitting information from vessels during controls. Here, the EU, or SwAM, must specify how long a vessel has to store information and ensure that any personal data is not stored for longer than necessary. Detailed regulations on the storage of data from the electronic remote monitoring system are covered by the Commission's regulation powers in future implementing provisions.

#### Masking

Masking features are necessary in order to protect privacy and to video only the areas that of relevance for the purpose as far as possible (to verify compliance with the landing obligation). Static masks remove entire areas, while dynamic ones can remove moving objects such as people. Mask settings are defined when the on-board equipment is installed and need to be fully transparent to the licence holder. If the licence holder or the Agency requests adjustment of the masking after a certain period, this must be possible as long as it does not affect the purpose for which the information is being collected.

#### Access to real-time REM information

There are certain times when it is appropriate for the Agency to have real-time access to the onboard system. Benefits always need to be balanced against costs, and be proportionate to privacy issues. The master and other personnel must be aware if real-time connectivity occurs, and if so when. The main appropriate occasions for this access are during installation and repair/maintenance, such as:

- Setting up and adjusting the masking
- Setting up measuring instruments
- Sensor adjustment

The Danish Fisheries Agency uses remote connection during installation and any adjustments, but does not access the on-board system after installation without the fisherman's consent.<sup>23</sup>

## 7.5. REM as a control tool

Fisheries control services will be influenced and developed in a variety of ways in the future, when REM becomes mandatory in certain fleet segments. Experiences and documentation from the trial conducted will be able to assist in this development work.

#### Landing and sea inspection

With the requirement for REM on board vessels for certain fishing operations, it is likely that both the work of the Coast Guard's operational sea inspections and SwAM's landing inspections will be affected. For instance, there will be opportunities to verify afterwards the fish caught and landed using the information provided by REM. The control of the landing obligation is expected to be more efficient than the current system, where a landing inspection needs to be preceded by a sea inspection so as to ensure that fish caught (from the fishing operation checked during the sea inspection) are landed as well. There may also be new control elements in both sea inspection and landing inspection, such as inspection of and discussion on the REM equipment itself, such as the importance of ensuring that cameras are clean. Assessments regarding the scope of sea inspections and landing inspections on vessels with REM equipment will need to be performed during risk analysis work. Coast Guard personnel will need to be told that vessels are equipped with REM systems and how SwAM will process any personal data.

<sup>&</sup>lt;sup>23</sup><u>https://fiskeristyrelsen.dk/fileadmin/user\_upload/Fiskeristyrelsen/Erhvervsfiskeri/Kameraprojekt\_i\_Kattegat/Evalueringsrapport/</u> Evaluation\_REM\_Kattegat\_phase1\_21.pdf

In Danish fisheries control services, REM has replaced parts of the physical inspection at sea in the Kattegat.<sup>24</sup> According to conclusions drawn by the Danish Fisheries Agency, electronic monitoring provides an opportunity to redirect physical inspection towards foreign vessels or other fishing operations presenting challenges involving compliance with rules other than the landing obligation. This is because they are of the opinion that vessels with REM systems on board can be adequately controlled for compliance with the landing obligation regulations using the video recordings.

As there are no detailed regulations in place as yet, where and when the REM system regulated in Article 13 is to be active is uncertain. Given the project team's experiences and preliminary assessment, the benefits of filming at ports (to which the general public may have access) and during landings are not sufficiently beneficial given the potential disadvantages, in view of the fact that this involves using REM systems to check compliance with the landing obligation provisions and that licensing requirements may be applicable to such camera surveillance under the Swedish Camera Surveillance Act (2018:1200), as well as proportionality between the benefit of control and potential restrictions on personal privacy, for instance. As long as there is no need for camera surveillance at ports or other locations that can be accessed by the general public, the Agency does not need to apply for a permit for camera surveillance under the Swedish Camera Surveillance Act.

#### Analysis of REM information

Analysing information generated via the REM system will be a completely new area of work for the Agency. Activities will need to be developed in respect of factors such as organisational location, as well as work procedures and descriptions.

#### Feedback after completion of the analysis

It is appropriate for the regulating body to provide feedback to the master or fishing licence holder when the REM information has been analysed. This feedback should be in writing and include information on what the regulating body has analysed and observed during the analysis, such as discards observed, but also feedback on the video quality.

After analysing the REM information, the regulating body should consider the need for feedback on the landing obligation, either directly to individual masters or at group level if certain infringements occur among the operators involved at certain intervals.

#### **Risk analysis work**

Fisheries control services in Sweden are based on risk analysis. Risk analysis work will be both influenced and developed with REM as a genuine control tool. Risk analysis work at segment level will be handled at regional level, and risk analysis work at vessel level will be handled at national level. This analysis work will be allowed to evolve to include new risk elements.

<sup>&</sup>lt;sup>24</sup>https://fiskeristyrelsen.dk/fileadmin/user\_upload/Fiskeristyrelsen/Erhvervsfiskeri/Kameraprojekt\_i\_Kattegat/Evalueringsrapport/ Evaluation\_REM\_Kattegat\_phase1\_21.pdf

#### **Restrictions and other potential effects**

Although REM is a live control tool that will help to ensure greater compliance with the landing obligation<sup>25</sup>, SwAM is of the opinion that the introduction of REM systems cannot be expected to result in across-the-board compliance with the landing obligation. Cameras are unlikely to capture all areas on board, it will not always be possible to identify all catches with sufficient certainty, it will not be possible to analyse all information, and video quality will be variable.

It is hoped that introducing REM will bring about a change in the behaviour of operators in the fishing sector who have failed as yet to comply with the provisions in full. One assumption is that the percentage of recorded discards and catches below minimum size among recorded catches will be more in line with what is observed during public authorities' sampling operations on board fishing vessels. Moreover, accelerating the development of selective fishing gear and increasing consumer demand for food from transparent and fully documented fishing would be additional desirable effects resulting from the introduction of REM.

<sup>25</sup> Through a significantly higher proportion of recorded BMS catches, for example: see <u>https://fiskeristyrelsen.dk/fileadmin/user\_upload/Fiskeristyrelsen/Erhvervsfiskeri/Kameraprojekt\_i\_Kattegat/Evalueringsrapport\_/Evaluation\_REM\_Kattegat\_phase1\_21.pdf</u>