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Industry Guidance Note

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Fully Documented Fisheries

Catch Quota Trials or fully documented fisheries (FDF) using onboard video cameras (CCTV), coupled with the use of highly selective gears, are seen as a valuable tool to address discards and improve stock recovery.

Electronic monitoring has been employed by fisheries managers around the world over the past 20 or so years. Electrically powered technologies can be a cost effective means of monitoring fishing activity. From 1 January 2012 all (EU) fishing vessels over 12 metres must be fitted with a Vessel Monitoring System (VMS) and must complete electronic log (catch reporting) books online at sea.

The legislative framework

In the EU there is currently no requirement for fishing vessels to carry video monitoring equipment, however other fisheries around the world do use the technology. A number of pilot studies are currently being undertaken within Europe. The drivers are:

- For managers, video footage provides a very powerful monitoring tool and an excellent way to ensure compliance with a total catch approach.
- For fishermen, video monitoring allows them to demonstrate good practice, it can be used to 'reverse the burden of proof' so fisherman can demonstrate they are adhering to management rules. In some cases use of CCTV may entitle them to various benefits such as more quota, more days at sea or access to restricted areas.

Owners, skippers and crew view onboard cameras in different ways. Some view it as *Big Brother*; there is concern over how it would be introduced specifically in mixed demersal fisheries; there are worries that advances have been too quick to allow a full understanding of all the implications; and who would bear the installation and running costs. However there may be circumstances where vessel owners see video cameras as a cost effective alternative to an inspector on board.

How the technology works

The technology is similar in many ways to terrestrial monitoring systems. Cameras are fixed to specific points on a fishing vessel. The number of cameras depends on the fishing operation and the management objectives. In long-line or potting vessels it may be sufficient to fit one camera at a point where it can film the gear coming aboard, while on a trawler there may be cameras trained on the gear, the hopper, the processing table and discarding belt.

Cameras may be switched on all the time, or activated by the movement of the vessel over the fishing ground, or by the use of a particular piece of deck equipment, such as the winch. The equipment begins to capture footage of the activity and these images can either be sent electronically to a central monitoring point or saved onboard and collected the next time the vessel visits port. It is not always necessary to collect TV-quality images and many systems are effective capturing lower quality images and as few as two images per second.

Remote electronic monitoring in practice

Since 2009 electronic monitoring, associated with a system of sensors, has been recording all fishing and processing activities on board a number of Member State vessels. The participating vessel owners have been obliged to count all catches of cod against their quotas, including those fish that were below Minimum Landing Size (MLS) and which could not therefore be sold. The participating vessels have been given access to an additional quota of cod (up to a limit of 75% of the amount they could have expected to discard if they were not in the trial). This has allowed fishermen to keep more of what they catch, and at the same time reduce overall fishing mortality. By no longer being allowed to discard small, low value cod, an incentive is created to avoid catching these fish through greater selectivity and avoidance of grounds abundant with small fish. The results have shown that discards have been reduced.

First trial in Denmark

DTU Aqua, Technical University of Denmark

These initial trials ran from September 2008 to July 2009. DTU Aqua, Denmark's National Institute of Aquatic Resources, tested electronic monitoring on six Danish fishing boats. The study was commissioned by the Danish Government. The project aimed to:

- ✓ Test whether electronic monitoring can be used to provide reliable documentation of the fishing operation and the catches;
- ✓ Investigate a new fishery management system where vessels with full documentation get incentives in the form of increased fishing possibilities.

Data were collected from 5,708 hours of fishing. DTU Aqua processed and analysed 81% of all data collected. This equates to 13,935 hours of recording – with a data loss of only 2.1%. The trial showed that: fishermen's detailed recordings on fishing events, catch composition and discards can be verified by viewing sensor data and videos; and cod discards were significantly reduced for the trial vessels.

Trials in England

A vessel that took part in the initial trial

Fishermen and scientists at work

In May 2010 the Centre for Environment, Fisheries & Aquaculture Science (Cefas) initiated a trial to investigate the use of catch quotas to reduce discards of cod in the North Sea. Fishermen who joined the pilot scheme had to account for, and land, all the cod they took out of the sea, regardless of size, with CCTV used for monitoring and enforcement.

A pilot trial ran from 1 May 2010 to 31 December 2010 with six vessels (two gill netters, three trawlers and one long-liner). Participating vessels were issued with up to 30% extra cod quota.

- All six participants demonstrated evidence of change in fishing tactics to avoid capturing small cod and discarding of cod has been low (four vessels have been fully analysed, with discard rates of <1%, 1%, 7%, <1%). http://www.cefas.co.uk/media/434085/english%20catch%20quota%20interim%20report%20(v%203)%20sept%202010.pdf

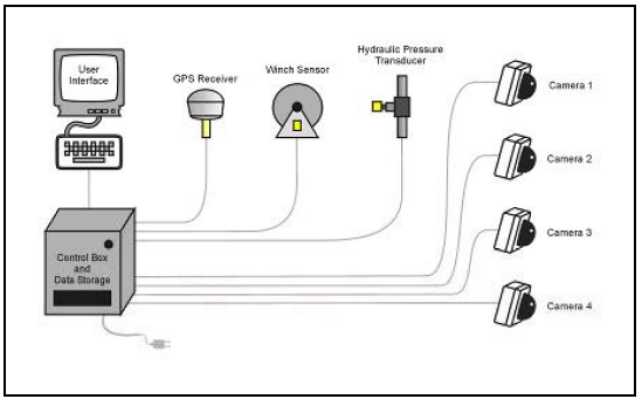
In 2011 the trial was increased to 15 vessels, three in the South West and 12 in the North Sea. Vessels taking part were not permitted to discard any West Channel sole or North Sea cod, including those below the minimum size. Once each vessels quota for these stocks was used up the vessels had to stop fishing for all species. Vessels taking part were awarded additional quota for sole and cod to account for a proportion of the fish that might otherwise have been discarded.

- Results show minimal quantities of discards (0.2% of total catches across all species under trial). These quantities were considered minimal and not indicative of deliberate discarding. The trial demonstrated the efficacy of the system to monitor for discarding activity and account for total catch mortality for trial species. In 2010, average discard rates were 38% North Sea cod trawlers and 28% for Western Channel sole beam trawlers.
- Participating fishermen have also drastically reduced discards of undersized fish of all species to between 0 and 3% of their total catch. http://www.marinemanagement.org.uk/fisheries/management/documents/quotas/cqt_final.pdf

The trial is continuing in 2012 with seven vessels in the Western Channel (four are participating in trials involving sole, plaice, angler and megrim) and 12 in the North Sea.

Trials in Scotland

One of the vessels taking part in the trial



Schematic of a typical layout

Under the Marine Scotland Catch Quota Management Scheme (CQMS), launched in July 2009, participating vessels must retain on board and land all cod that is caught, regardless of size and marketability, and must cease fishing operations when their individual cod-catch ceiling is reached. Participating vessels fully document activities in relation to cod.

A trial was launched in July 2009 for skippers to use electronic monitoring on their boats to help reduce fish discards. Seven Scottish skippers were chosen for the initial trial (four whitefish and three *Nephrops*). In June 2010 the trial was expanded to include 17 vessels.

- An interim report showed the system could provide the necessary confidence to managers and industry alike to run catch quota arrangements aligned to no discard schemes. Initial signs from the trials suggest this scheme provides a clear and strong economic driver which brings about changes in fishing tactics (spatial, selectivity, diversification). http://www.scotland.gov.uk/Topics/marine/Sea-Fisheries/17681/CQSinterimreport

In 2011 Marine Scotland increased the number of approved vessels to 25 (from 58 applicants).

- An early and recognisable feature of the catch quota trials is that it clearly provides the incentives for skippers to optimise their gear selectivity to maximise economic return.
- The Marine Scotland report highlights a number of economic considerations which should be read in context. Participation in the 2010 catch quota trial appears to have increased the volume of landings of all species in comparison to a control group, leading to an estimated increase in net fishing revenues of approximately £114,000 per participating vessel. However, this increase in fishing revenues should be set against an increase in operating costs, including leasing in of cod quota and costs of greater effort, such as fuel. On average, vessels spent an additional eight days at sea while participating in the trial. http://www.scotland.gov.uk/Topics/marine/Sea-Fisheries/17681/CQMS082011

The trial is continuing in 2012 with 23 vessels taking part.

At an EU-level

- Scottish, UK, Danish and German ministers signed the **Aalborg declaration** in October 2009. This calls for a system of catch quotas in a fully documented fishery (using onboard cameras) with more responsibility handed to fishermen, providing suitable rewards for their innovations and responsible fishing practices.
- The **Ardoe declaration** in October 2010 welcomed EU trialling fully documented fisheries to reduce the level of discards and optimise the revenue secured.
- In the European pilot studies, the main focus has been to monitor catch onboard vessels. The cameras allow scientists and managers to monitor the whole catch and in some cases, its various fractions, such as discards.
- Feedback suggests the technology can: help fill knowledge gaps in stock status data; add improved data to the scientific process; verify fishermen's anecdotal evidence; and show that fishers have adapted their fishing techniques to maximise the benefit they receive from participating in the trial including an increase in gear selectivity and spatial/temporal measures to reduce unwanted catch.

Next steps

- These trials are voluntary and it remains to be seen whether remote monitoring becomes mandatory for some fleets if discard bans are phased in. At present, the scheme is likely to be more applicable to TR1 vessels (white fish trawlers) but there are Western Channel trials with mixed species fisheries.
- There is some support for expanding the scheme to other species. It is likely that only a small number of candidate stocks would be suitable for catch quota management in the North Sea - cod, haddock, whiting and plaice - but these are a major proportion of all catches.

More about Fully Documented Fisheries

Footage from a Scarborough-based vessel taking part in the English scheme:
http://www.channel4.com/news/cctv-monitoring-keeps-an-eye-on-anything-fishy

Case studies of scheme participants:

http://www.seafish.org/retailers/responsible-sourcing/protecting-fish-stocks/discards

General

http://www.fvm.dk/CQM_%28Catch_Quota_Management%29.aspx?ID=42783

http://iss-foundation.org/2012/07/25/onboard-observation-goes-high-tech-in-monitoring-trials/

http://news.stv.tv/scotland/north/121540-cctv-on-fishing-boats-hailed-success-in-denmark/

http://www.doc.govt.nz/upload/documents/science-and-technical/DSIS136.pdf

http://keysnews.com/node/15503

http://www.youtube.com/watch?v=Wh4B_RCg7dM

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