JNCC guidelines for minimising the risk of injury and disturbance to marine mammals from seismic surveys

August 2010

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Introduction

The guidelines have been written for activities on the United Kingdom Continental Shelf (UKCS) and are aimed at reducing the risk of injury to negligible levels and can also potentially reduce the risk of disturbance from seismic surveys to marine mammals including seals, whales, dolphins and porpoises. Whilst there are no objections to these guidelines being used elsewhere JNCC would encourage all operators to determine if any special or local circumstances pertain, as we would not wish these guidelines to be used where a local management tool has already been adopted (for instance in the Gulf of Mexico OCS Region). In this context, JNCC notes that other protected fauna, for example turtles, will occur in waters where these guidelines may be used, and would suggest that, whilst the appropriate mitigation may require further investigation, the soft-start procedures for marine mammals would also be appropriate for marine turtles and basking sharks[i].

The guidelines require the use of trained Marine Mammal Observers (MMOs) whose role is to advise on the use of the guidelines and to conduct pre-shooting searches for marine mammals before commencement of any seismic activity. A further duty is to ensure that the JNCC reporting forms are completed for inclusion in the MMO report. In addition to the visual mitigation provided by MMOs, if seismic surveys are planned to start during hours of darkness or low visibility it is considered best practice to deploy Passive Acoustic Monitoring (PAM).

The 2010 version of the JNCC seismic guidelines reflects amendments (2007 and 2009 amendments) to the Conservation (Natural Habitats &c.) Regulations 1994 (Habitat Regulations, HR) for England and Wales[ii] and the Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (Offshore Marine Regulations, OMR**,** as amended in 2009 and 2010). Both regulations have revised the definition of deliberate disturbance of 'European Protected Species' (EPS), which now excludes

[i] Basking sharks are protected from intentional capture or disturbance in British waters (up to 12 miles offshore) under a 1998 listing on the Wildlife and Countryside Act (1981), Schedule 5.
[ii] In 2010 a consolidated version of the regulations came into force: The Conservation of Habitats and Species Regulations 2010.

trivial disturbance from the offence. Both regulations now also include the offence of deliberate injury. European Protected Species include cetaceans and turtles.

It has been recognised that sound generated from seismic sources has the potential to cause injury and possibly also disturbance to marine mammals. Seismic surveys have therefore the potential to cause a deliberate injury offence as defined under regulations 41(1)(a) and 39(1)(a) and a deliberate disturbance offence as in 41(1)(b) and 39(1)(b) of the HR and OMR, respectively. The JNCC seismic guidelines reflect best practice for operators to follow during the planning, operational and reporting stages. **It is considered that compliance with the recommendations in these guidelines will reduce the risk of injury to EPS to negligible levels**.

Please note that the mitigation measures recommended in the existing guidelines are more relevant to the prevention of injury rather than disturbance as defined in regulations 41(2) and 39(1A), of the HR and OMR, respectively. The onus should be on the entity responsible for the activity to assess whether a disturbance offence is likely to occur. Guidance on how to carry out such risk assessment is provided in the JNCC, NE and CCW document 'The protection of marine European Protected Species from injury and disturbance'.

In relation to oil and gas seismic surveys in the UKCS, it is a requirement of the consent issued under regulation 4 of the Petroleum Activities (Conservation of Habitats) Regulations 2001 (& 2007 Amendments) by the Department for Energy Climate Change (DECC), that the JNCC Seismic Guidelines must be followed, and the elements of the guidelines that are relevant to a particular survey are incorporated into the legally-binding condition of consent. It should be noted that it is the responsibility of the company issued consent by DECC[iii], referred to in these guidelines as the 'applicant', to ensure that these guidelines are followed, and it is recommended that a copy of the JNCC guidelines are available onboard all vessels undertaking seismic activities in UK waters. Where relevant, when the survey is completed a MMO report must be submitted to the JNCC.

[iii] Department of Energy and Climate Change was formerly known as Department for Business and Regulatory Reform (BERR)

Index

Terminology

Marine European Protected Species: These are marine species in Annex IV(a) of the Habitats Directive that occur naturally in the waters of the United Kingdom. These consist of several species of cetaceans (whales, dolphins and porpoises), turtles, and the Atlantic Sturgeon.

Marine Mammal Observer (MMO): Individual responsible for conducting visual watches for marine mammals. For some seismic surveys it may be requested that observers are trained, dedicated and / or experienced. The MMO may also be a PAM operative if trained.

- **Trained MMO**: Has been on a JNCC recognised course
- **Dedicated MMO**: Trained observer whose role on board is to conduct visual watches for marine mammals (although it could double up as a PAM operative)
- **Experienced MMO**: Trained observer with 3 years of field experience observing for marine mammals, and practical experience of implementing the JNCC guidelines
- **PAM Operative**: Person experienced in the use of PAM software and hardware and marine mammal acoustics

Mitigation Zone: The area where a Marine Mammal Observer keeps watch for marine mammals (and delays the start of activity should any marine mammals be detected).

Passive Acoustic Monitoring (PAM): Software system that utilises hydrophones to detect the vocalisations of marine mammals.

Seismic Survey: Any survey that uses airguns, including 2D/3D/4D and OBC (On-Bottom Cabling) surveys and any similar techniques that use airguns. Surveys using multibeam systems and sub-bottom profiling equipment such as boomers, pingers etc are not considered in these guidelines. However, the guidelines can be adapted and applied to the operation of such systems if considered appropriate.

Shot Point Interval (SPI): Interval between firing of the airgun or airguns.

Site Survey: Seismic survey of a limited area proposed for drilling, infrastructure emplacement etc (typically with source size of 180 cubic inches or less).

Soft-Start: Turning on the airguns at low power and gradually and systematically increasing the output until full power is achieved (usually over a period of 20 minutes). The appropriate soft-start method is dependant upon the type of seismic survey and is discussed in section 3.

United Kingdom Waters: Parts of the sea in or adjacent to the United Kingdom from the low water mark up to the limits of the United Kingdom Continental Shelf.

Vertical Seismic Profiling (VSP) or Borehole Seismic: Seismic survey undertaken ‘down hole’ in connection with well operations (typically with a source size of 500 cubic inches).

Section 1 – Assessing and minimising the risk of injury

1.1 The Planning Stage

When a seismic survey is being planned, the applicant should consider the following recommendations and best practice advice:

- Determine what marine mammal species are likely to be present in the survey area and assess if there are any seasonal considerations that need to be taken into account, for example periods of migration, breeding, calving or pupping. For UKCS activities the 'Atlas of cetacean distribution in north-west European waters' (Reid *et al*. 2003) is a useful starting point.
- Consult the latest relevant regulatory guidance notes; in the UK, DECC issues guidance notes for oil and gas seismic activities.
- As part of the environmental impact assessment, assess the likelihood of injuring or disturbing a European Protected Species. In the UK, it will be necessary to assess the likelihood of committing an offence as defined in the HR and in the OMR.
- Consult the JNCC, NE and CCW guidance on 'The protection of marine European Protected Species from injury and disturbance' to assist in the environmental impact assessment. To obtain a copy of the latest draft version of the guidance please contact JNCC.

The operator should whenever possible implement the following best practice measures:

- If marine mammals are likely to be in the area, only commence seismic activities during the hours of daylight when visual mitigation using Marine Mammal Observers (MMOs) is possible.
- Only commence seismic activities during the hours of darkness, or low visibility, or during periods when the sea state is not conducive to visual mitigation, if a Passive Acoustic Monitoring (PAM) system is in use to detect marine mammals likely to be in the area, noting the limitations of available PAM technology (seismic surveys that commence during periods of darkness, or low visibility, or during periods when the observation conditions are not conducive to visual mitigation, could pose a risk of committing an injury offence).
- Plan surveys so that the timing will reduce the likelihood of encounters with marine mammals. For example, this might be an important consideration in certain areas/times, e.g. during seal pupping periods near Special Areas of Conservation for common seals or grey seals.
- Provide trained MMOs to implement the JNCC guidelines.
- Use the lowest practicable power levels to achieve the geophysical objectives of the survey.
- Seek methods to reduce and/or baffle unnecessary high frequency noise produced by the airguns (this would also be relevant for other acoustic energy sources).

Section 2 - Marine Mammal Observers

2.1. Role of an MMO

The primary role of an MMO is to act as an observer for marine mammals and to recommend a delay in the commencement of seismic activity should any marine mammals be detected. In addition, a MMO should be able to advise the crew on the procedures set out in the JNCC guidelines and to provide advice to ensure that the survey programme is undertaken in accordance with the guidelines. Before the survey commences it is important to attend any pre-mobilisation meetings to discuss the working arrangements that will be in place, and to request a copy of the survey consent issued by DECC (if applicable). An MMO may also work closely with Passive Acoustic Monitoring operatives. As the MMO role in relation to the vessel and survey operations is purely advisory, it is important to be aware of the command hierarchy and communication channels that will be in place, and determine who the main MMO / PAM operative contacts should be.

In a typical vessel based seismic survey, the MMO / PAM operative may pass advice to the party chief and client's representative through the navigators or seismic observers, and it is important to establish what the working arrangements are, as this may vary from one survey to the other. The MMOs should consider themselves as part of the crew and respect the chain of command that is in place.

MMOs should make certain that their efforts are concentrated on the pre-shooting search before the soft-start. These guidelines cannot be interpreted to imply that MMOs should keep a watch during all daylight hours, but JNCC would encourage all MMOs to manage their time to ensure that they are available to carry out a watch to the best of their ability during the crucial time - the 30 minutes before commencement of the firing of the seismic source (or 60 minutes if surveying where deep diving marine mammals are likely to be present). Whilst JNCC appreciates the efforts of MMOs to collect data at other times, this should be managed to ensure that those observations are not detrimental to the ability to undertake a watch prior to a soft-start. Where two MMOs are onboard a seismic vessel, JNCC would encourage collaboration to ensure that cetacean monitoring is always undertaken during all daylight hours.

2.2. Training requirements for MMOs

A prerequisite for an MMO to be classified as a 'trained MMO' is that they must have received formal training on a JNCC recognised course. (Further information on MMO course providers is available at: http://www.jncc.gov.uk/page-4703)

2.3. MMO equipment and reporting forms

MMOs should be equipped with binoculars, a copy of the JNCC guidelines and the 'Marine Mammal Recording Form' which is an Excel spreadsheet and has embedded worksheets named: 'Cover Page', 'Operations', 'Effort' and 'Sightings'. A Word document named 'Deckforms' is also available, and MMOs may prefer to use this when observing before transferring the details to the Excel spreadsheets.

The ability to determine range is a key skill for MMOs to have, and a useful tool to perform this function is a range finding stick.

All MMO forms, including a guide to completing the forms, and instructions on how to make and use a range finding stick are available on the JNCC website.

2.4. Reporting requirements – the MMO report

A report, the 'MMO report', should be sent to the JNCC after the survey has been completed. It is the responsibility of the consent holder to ensure that the MMO report is sent to JNCC. Ideally the MMO report should be sent via e-mail to seismic@jncc.gov.uk, or it can be posted to the address on the front page of these guidelines. Reports should include completed JNCC marine mammal recording forms and contain details of the following:

- The seismic survey reference number provided to the applicant by DECC.
- Date and location of survey.
- Total number and volume of the airguns used.
- Nature of airgun array discharge frequency (in Hz), intensity (in dB re. 1µPa or bar metres) and firing interval (seconds), and / or details of any other acoustic energy used.
- Number and types of vessels involved in the survey.
- A record of all occasions when the airguns were used.
- A record of the watches made for marine mammals, including details of any sightings and the seismic activity during the watches.
- Details of any problems encountered during the seismic survey including instances of non-compliance with the JNCC guidelines.

If there are instances of non-compliance with the JNCC guidelines that constitute a breach of the survey consent conditions, JNCC will copy the report, and their comments on the potential breach to DECC. It is therefore essential that MMO reports are completed as soon as possible after the survey has been completed.

Section 3 – Guidance before and during seismic activity

All observations should be undertaken from the source vessel (where the airguns are being deployed from), unless alternative arrangements have been agreed with DECC. The MMO should be positioned on a high platform with a clear unobstructed view of the horizon, and communication channels between the MMO and the crew should be in place before commencement of the pre-shooting search (this may require portable VHF radios). The MMO should be aware of the timings of the proposed operations, so that there is adequate time to conduct the pre-shooting search. Figure 1 illustrates a typical seismic survey with decision making pathways in the event a marine mammal is detected.

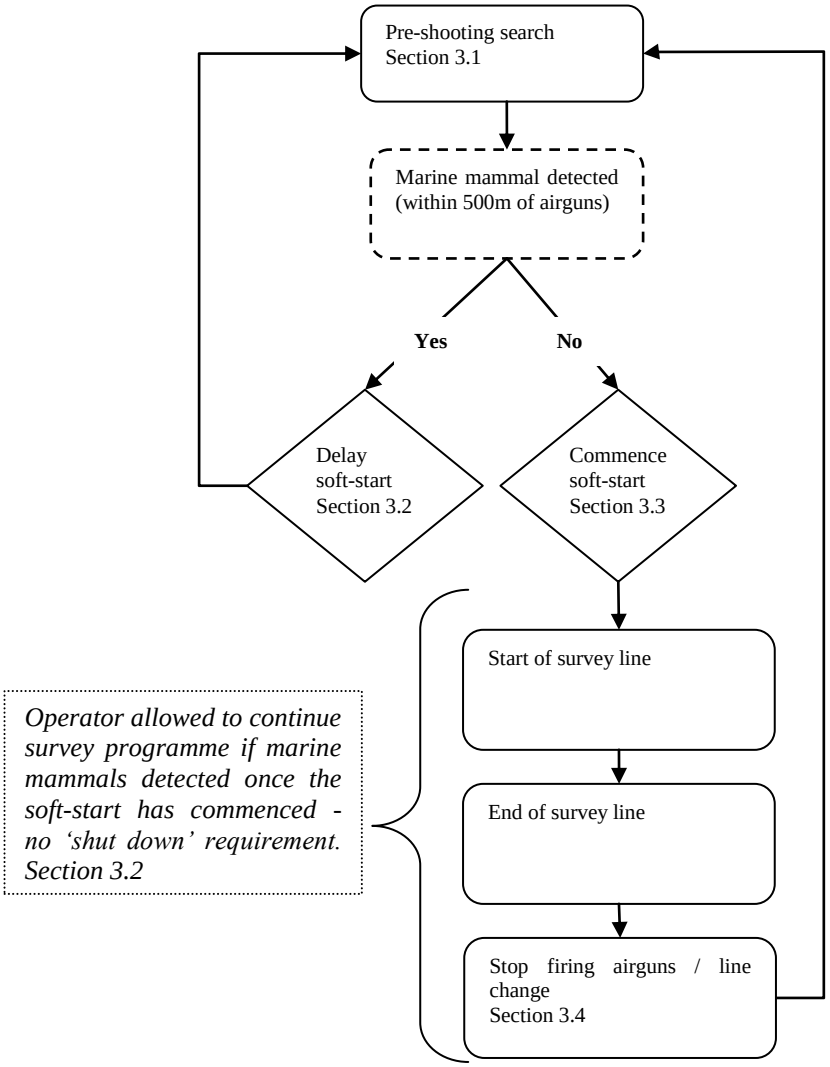

Figure 1. Flowchart illustrating the decision making pathway of a Marine Mammal Observer during a seismic survey.

3.1 Pre-shooting search

The pre-shooting search should normally be conducted over a period of 30 minutes before commencement of any use of the airguns. The MMO should make a visual assessment to determine if any marine mammals are within 500 metres of the centre of the airgun array.

In deep waters (>200m) the pre-shooting search should extend to 60 minutes as deep diving species (e.g. sperm whale and beaked whale) are known to dive for longer than 30 minutes. A longer search time in such areas is likely to lead to a greater detection and tracking of deep diving marine mammals.

To facilitate more effective timing of proposed operations when surveying in deeper waters, the searches for marine mammals can commence before the end of the survey line (whilst the airguns are still firing); this condition may be necessary for surveys which have relatively fast line turn times. If any marine mammals are

detected whilst the airguns are still firing, then no action is required other than for the MMO to monitor and track any marine mammals. The commencement of the soft-start for any subsequent survey lines should be delayed for at least 20 minutes if marine mammals are detected when the airguns have ceased firing.
If PAM is used in conjunction with visual monitoring the PAM operatives should ensure the system is deployed and being monitored for vocalisations during each designated pre-shooting period.

3.2 Delay if marine mammals are detected within the mitigation zone (500 metres)

If marine mammals are detected within 500 metres of the centre of the airgun array during the pre-shooting search, the soft-start of the seismic sources should be delayed until their passage, or the transit of the vessel, results in the marine mammals being more than 500 metres away from the source. In both cases, there should be a 20 minute delay from the time of the last sighting within 500 metres of the source to the commencement of the soft-start, in order to determine whether the animals have left the area. If PAM is used it is the responsibility of the PAM operatives to assess any acoustic detections and determine if there are likely to be marine mammals within 500 metres of the source. If the PAM operatives consider marine mammals are present within that range then the start of the operation should be delayed as outlined above.

If marine mammals are detected within 500 metres of the centre of the airgun array whilst the airguns are firing, either during the soft-start procedure or whilst at full power, there is no requirement to stop firing the airguns.

In situations where seal(s) are congregating around a drilling or production platform that is within the survey area, it is recommended that the soft-start should commence at a location at least 500 metres from the platform.

3.3 The soft-start

The soft-start is defined as the time that airguns commence shooting till the time that full operational power is obtained. Power should be built up slowly from a low energy start-up (e.g. starting with the smallest airgun in the array and gradually adding in others) over at least 20 minutes to give adequate time for marine mammals to leave the area. This build up of power should occur in uniform stages to provide a constant increase in output. There should be a soft-start every time the airguns are used, the only exceptions being for certain types of airgun testing (section 3.3.2), and the use of a ‘mini-airgun’ (single gun volume less than 10 cubic inches), these are used on site-surveys (section 3.3.1). The duration of the pre-shooting search (at least 30 minutes) and the soft-start procedure (at least 20 minutes) should be factored into the survey design.

General advice to follow for soft-starts:

- To minimise additional noise in the marine environment, a soft-start (from commencement of soft-start to commencement of the line) should not be significantly longer than 20 minutes (for example, soft-starts greater than 40

minutes are considered to be excessive, and an explanation should be provided within the MMO report).

- Where possible, soft-starts should be planned so that they commence within daylight hours.
- Once the soft-start has been performed and the airguns are at full power the survey line should start immediately. Operators should avoid unnecessary firing at full power before commencement of the line.
- If, for any reason, firing of the airguns has stopped and not restarted for at least 10 minutes, then a pre-shooting search and 20 minute soft-start should be carried out (the requirement for a pre-shooting search only applies if there was no MMO on duty and observing at this time, and if the break in firing occurred during the hours of daylight). After any unplanned break in firing for less than 10 minutes the MMO should make a visual assessment for marine mammals (not a pre-shooting search) within 500 metres of the centre of the airgun array. If a marine mammal is detected whilst the airguns are not firing the MMO should advise to delay commencement, as per the pre-shooting search, delay and soft start instructions above. If no marine mammals are present then they can advise to commence firing the airguns.
- When time-sharing, where two or more vessels are operating in adjacent areas and take turns to shoot to avoid causing seismic interference with each other, the soft-start and delay procedures for each vessel should be communicated to, and applied on, all the vessels involved in the surveying.

3.3.1 Soft-start requirements for site survey or Vertical Seismic Profiling (VSP)

Surveys should be planned so that, whenever possible, the soft-start procedures for site surveys and Vertical Seismic Profiles (VSP's) commence during daylight hours. Whilst it is appreciated that high resolution site surveys / VSP operations may produce lower acoustic output than 2D or 3D surveys it is still considered desirable to undertake a soft-start to allow for marine mammals to move away from the seismic source.

For ultra high resolution site surveys that only use a 'mini-airgun' (single airgun with a volume of less than 10 cubic inches) there is no requirement to perform a soft-start, however, a pre-shooting search should still be conducted before its use.

For site surveys and VSPs, a number of options are available to effect a soft-start.

- The standard method, where power is built up slowly from a low energy start-up (e.g. starting with the smallest airgun in the array and gradually adding in others) over at least 20 minutes to give adequate time for marine mammals to leave the vicinity.
- As the relationship between acoustic output and pressure of the air contained in the airgun is close to linear and most site surveys / VSP operations use only a small number of airguns and a soft-start can be achieved by slowly increasing the air pressure in 500 psi steps. From our understanding, the minimum air pressure which the airgun array can be set to will vary, as this is dependent on the make and model of the airgun being used. The time from initial airgun start up to full power should be at least 20 minutes.

- Over a minimum time period of 20 minutes the airguns should be fired at an increasing frequency (by decreasing the Shot Point Interval (SPI)) until the desired firing frequency is reached.

3.3.2 Soft-starts and airgun testing

Airgun tests may be required before a survey commences, or to test damaged or misfiring guns following repair, or to trial new arrays. Individual airguns, or the whole array may need testing, and the airguns may be tested at varying power levels. The following guidance is provided to clarify when a soft-start is required:

- If the intention is to test all airguns at full power then a 20 minute soft-start is required.
- If the intention is to test a single airgun on low power then a soft-start is not required.
- If the intention is to test a single airgun, or a number of guns on high power, the airgun or airguns should be fired at lower power first, and the power then increased to the level of the required test; this should be carried out over a time period proportional to the number of guns being tested and ideally not exceed 20 minutes in duration.

MMOs should maintain a watch as outlined in the pre-shooting search guidance (section 3.1) before any instances of gun testing.

3.4 Line Change

Seismic data is usually collected along predetermined survey lines. Line change is the term used to describe the activity of turning the vessel at the end of one line prior to commencement of the next line. Depending upon the type of seismic survey being undertaken, the time for a line change can vary. Line changes are not necessary for all types of seismic surveys, for example, in certain regional surveys where there is a significant distance between the lines, and for VSP operations.

The guidance relating to line change depends upon the airgun volume.

3.4.1 Seismic surveys with an airgun volume of 500 cubic inches or more

- If the line change time is expected to be greater than 20 minutes, airgun firing should be terminated at the end of the line and a full 20 minute soft-start undertaken before the next line. A pre-shooting search should also be undertaken during the scheduled line change, and the soft-start delayed if marine mammals are seen within 500 metres of the centre of the airgun array.

3.4.2 Seismic surveys with an airgun volume of 180 cubic inches or less (site surveys)

- If the line change time is expected to be greater than 40 minutes, airgun firing should be terminated at the end of the line and a full 20 minute soft-start undertaken before the next line. The pre-shooting search should also be

undertaken during the scheduled line change, and the soft-start delayed if marine mammals are seen within 500 metres of the centre of the airgun array.

- If the line change time is expected to be less than 40 minutes, airgun firing can continue during the turn, but the Shot Point Interval (SPI) should be increased (longer duration between shots). Ideally, the SPI should not exceed 5 minutes during the turn.

Depending upon the duration of the line turns and the nature of seismic survey it may be necessary to vary the soft-start procedures. If an applicant determines that an effective line change can not be achieved using the above methods please contact JNCC at the earliest possible opportunity to discuss the proposed alternative, and include the details of the agreed procedure and the consultation with the JNCC in the application for survey consent.

3.5 Undershoot operations

During an undershoot operation, one vessel is employed to tow the seismic source and a second vessel used to tow the hydrophone array, although the main vessel will still tow the hydrophone array. This procedure is used to facilitate shooting under platforms or other obstructions. The MMO may be too far away from the airguns to effectively monitor the mitigation zone, and it is therefore recommended to place the MMO on the source vessel. If this is not possible, for example for logistical reasons, or the health and safety implications of transferring personnel from one vessel to another, the application should explain that the recommended procedure cannot be followed in the application for the survey consent, or the application for a variation of that consent. Irrespective of the MMO location agreed with DECC, the pre-shooting search and soft-start procedures should still be followed prior to undertaking an undershoot operation.

Section 4 - Acoustic Monitoring

Visual observation is an ineffective mitigation tool during periods of darkness or poor visibility (such as fog), or during periods when the sea state is not conducive to visual mitigation, as it will not be possible to detect marine mammals in the vicinity of airgun sources. Under such conditions, PAM is considered to be the only currently available mitigation technique that can be used to detect marine mammals. Current PAM systems can be particularly helpful in detecting harbour porpoises within the 500 metre mitigation zone, although the systems have their limitations and can only be used to detect vocalising species of marine mammals.

PAM systems consist of hydrophones that are deployed into the water column, and the detected sounds are processed using specialised software. PAM operatives are needed to set up and deploy the equipment and to interpret the detected sounds.

4.1 Use of PAM as a mitigation tool

PAM can provide a useful supplement to visual observations undertaken by MMOs and JNCC may recommend that it is used as a mitigation tool when commenting on applications for survey consents. However, in many cases it is not as accurate as

visual observation for determining range, and this will mean that the mitigation zone will reflect the range accuracy of the system. For example, if the range accuracy of a system is estimated at +/-300 metres, animals detected and calculated to be within 500 metres from the source could, in reality, be 500 + 300 = 800 metres, but their detection would still lead to a delay in the soft-start. Although, at present it is not possible to express the range accuracy of most PAM systems in numerical terms, this example serves to illustrate that it is in the operator's best interests to use the most accurate system available, and for the PAM operative to factor in a realistic estimate of the range accuracy.

Some PAM systems do not have a reliable range determination facility or can only calculate the range for some species. In such cases, the detection of a confirmed cetacean vocalisation should still be used to initiate postponement of the soft-start if the PAM operator is able to make a judgement about the range of the animals from the airgun source, because of their experience gained in differentiating between distant and close vocalisations. In the absence of PAM systems capable of range determination, this expert judgement will constitute the basis for deciding whether an area is free from cetaceans prior to the soft-start.

In all cases where PAM is employed, a brief description of the system and an explanation of how the applicant intends to deploy PAM to greatest effect should be included in the application for survey consent.

In the last few years, software that processes and analyses cetacean sounds has been developed. An example of this is PAMGuard, an open source software that has been developed as part of the International Association of Oil and Gas Producers Joint Industry Project (JIP). JNCC recognises that PAMGuard is currently in a transition period between use as a research tool and widespread adoption as a monitoring technique. Moreover, JNCC recognises the need to balance proactive implementation of PAM with the need to further develop its capability, for example to include species recognition and baleen whale detection, and therefore encourages users of these systems to actively contribute to their development and refinement.

Section 5 – Requirements for MMOs and PAM

Any survey application or consultation received by JNCC will be considered on a case-by-case basis, and the mitigation measures advised to DECC will reflect the particulars of the survey and the importance of the survey area for marine mammals. The following paragraphs are provided as a guide to the advice applicants are likely to receive following submission of an application with JNCC.

For areas that are currently considered particularly important for marine mammals, for example in the UK this includes areas West of Scotland, the Moray Firth and Cardigan Bay, JNCC may recommend that:

- The MMOs should be experienced MMOs, and that PAM should be used.
- The PAM system should be used to supplement visual observations, or as the main mitigation tool if the seismic survey activity commences during periods of

darkness or poor visibility, or during periods when the sea state is not conducive to visual mitigation.

JNCC will advise that two marine mammal observers should be used when daylight hours exceed approximately 12 hours per day (between 1st April and 1st October north of 57^{O} latitude), or the survey is in an area considered particularly important for marine mammals.

When a non-dedicated MMO is recommended by JNCC (e.g. for VSPs and certain site-surveys), and the recommendation is incorporated into the conditions of the survey consent, a member of the rig's or vessels crew can perform the duties providing the crew member is a trained MMO.

When a dedicated MMO is recommended and this is a condition of the survey consent, the MMO should be employed solely for the purpose of monitoring the implementation of the guidelines and undertaking visual observations to detect marine mammals during periods of seismic activity.

When two dedicated MMOs are requested and this is a condition of the survey consent, both should be employed solely for the purposes of monitoring the implementation of the guidelines and undertaking visual observations, and the use of a crew member with other responsibilities as the second observer is not considered to be an adequate substitute for a dedicated MMO, or to be in compliance with the conditions of the survey consent.

Section 6 - Background Information

These guidelines were originally prepared by a Working Group convened by the Department of the Environment, and were developed from a draft prepared by the Sea Mammal Research Unit (SMRU). The guidelines have subsequently been reviewed three times by the Joint Nature Conservation Committee, following consultation with interested parties.

6.1. Existing protection to cetaceans

Section 9 of the Wildlife and Countryside Act 1981 (CRoW amended) prohibits the intentional or reckless killing, injuring or disturbance of any cetacean. The UK is also a signatory to the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS) and has applied its provisions in all UK waters. Amongst other actions required to conserve and manage populations of small cetaceans, ASCOBANS requires range states to "work towards...the prevention of ...disturbance, especially of an acoustic nature".

Reflecting the requirements of the Convention on the Conservation of European Wildlife and Habitats (the Bern Convention) and Article 12 of the EC Habitats and Species Directive (92/43/EEC), the UK has the following legislation in place:

- The Conservation of Habitats and Species Regulations 2010
- The Conservation (Natural Habitats, &c.) Regulations 1995 (Northern Ireland) (and 2009 amendments)

- The Conservation (Natural Habitats, &c.) Amendment (No. 2) Regulations 2008 (Scotland) (and 2009 amendments)
- The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (and 2007 amendments),
- The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (and 2009 and 2010 amendments) (beyond 12 nautical miles UKCS)

Section 7 – References and contacts

Further information on DECC's survey consent procedure can be found at: http://www.og.decc.gov.uk/.

A copy of these guidelines, the standard forms (electronic and hard copy) and further background information is available from the above address, or can be found on the JNCC website at: http://www.jncc.gov.uk/page-1534

Reid, J.B., Evans, P.G.H., & Northridge, S.P. (2003). *'*Atlas of cetacean distribution in north-west European waters*'* (Online). http://www.jncc.gov.uk/page-2713

If you have any comments or questions relating to these guidelines, or suggestions on how they may be improved, please email seismic@jncc.gov.uk