## Impulsive noise (TA M33 - appendix 4.2, templates)

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## Introduction

This instruction describes the requirements for reporting impulsive noise to the Danish Environmental Protection Agency as part of the obligations of the EU Marine Strategy Framework Directive (MSFD). The MSFD requires member states to report and assess the environmental status with respect to emission of energy, including underwater noise, which fulfils the criteria of being a) below 10 kHz in frequency and which b) may detrimentally affect marine life (European Commission, 2008).

Impulsive noise is not a precisely defined concept, but in the management of anthropogenic noise it has turned out to be useful for making a distinction between impulsive noise and continuous noise. While continuous sources are numerous, persistent and distributed widely, impulsive sources are usually well defined in time and space and impact animals by affecting their behaviour and hearing, causing tissue damage and, in the most extreme cases, death from intense noise such as explosions.

## Reporting

The following templates are divided into eight impulsive sources (pile driving (large and small), explosions, isolated explosions, seismic surveys, sonars, [acoustic deterrent devices (seal scarers etc.)](#_Toc42154899) and other impulsive sources. The templates contain a description of mandatory reporting as well as an additional information section. The mandatory information must be reported, while any additional information included is appreciated as it rasises the data quality. Only one template should be filled in per activity. If more than one activity takes place at the same time, a template for each category is to be completed.

The Danish Environmental Protection Agency is responsible for the quality assurance of the reported data and the final reporting to the ICES impulse noise register. It is therefore important that information about the relevant contact person(s) connected to the reporting is given should be needed during the quality control.

**General information (must always accompany the reporting):**

* name of company, contractor, unit or institution undertaking the activity and the reporting
* contact person, telephone number and/or e-mail address
* date of reporting to the Danish Environmental Protection Agency

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| 4.2.1 Impact pile driver, large piles | | | | | | | | | | | | | | | | | | |
| Mandatory information | | | | | | | Non-mandatory information | | | | | | | | | | | |
| ID or serial number | Start date | End date if different from start date | Latitude (WGS84) | Longitude (WGS84) | Maximum hammer energy (in kJ or MJ per impact or size class) | Use of noise abatement system (yes or no) | Type of pile. Monopile, jacket or conductor pipe | Type of noise abatement system, if used (see instructions) | Start time (HH:MM) | End time (HH:MM) | Alternatively: total duration of the pile driving operation (HH:MM) | Sound exposure level (SEL), single pulse (dB re 1µPa²s) | Peak sound pressure measured, single pulse, Lpeak (dB re 1µPa) | Distance from sound measurement to pile driver | Type of hammer (manufacturer and model) | Water depth | Diameter of the pile | Remarks |
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| 4.2.2 Impact pile driver, small piles | | | | | | | | | |
| Mandatory information | | | | | Non-mandatory information | | | | |
| ID or serial number | Start date | Latitude (WGS84) | Longitude (WGS84) | Alternative: unique locality name (e.g.. Hanstholm Havn). | Type of pile: sheet piles, moorage pile, pier foundation etc. | Material: steel, concrete or wood | Numbers of piles driven per day | Type of hammer (manufacturer and model) | Remarks and specification of where the pile driver was placed – in the harbour or outside the pier |
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| 4.2.3 Isolated explosions | | | | | | | | |
| Mandatory information | | | | | | Non-mandatory information | | |
|  |  | Fill in length or ICES rectangle | | |  |  |  |  |
| ID or serial number | Date and time for the explosion | Latitude (WGS84) | Longitude (WGS84) | ICES rectangle (see instructions) | Explosion size (TNT equivalent or size class, see instructions) | Water depth | Depth of explosion if not on the bottom | Remarks, including type of explosive and whether the explosion was fully or partly covered |
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| 4.2.4 More than one explosion | | | | | | | | |
| Mandatory information | | | | | | Non-mandatory information | | |
|  |  | Fill in length or ICES rectangle | | |  |  |  |  |
| ID or serial number | Date and time of the explosion | Latitude (WGS84) | Longitude (WGS84) | ICES rectangle (see instructions) | Size of the largest explosion (TNT equivalent or size class, see instructions) | Water depth (approximately) | Number of explosions (approximately) | Remarks, including type of explosive and purpose of the explosions |
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| 4.2.5 Seismic survey with airguns **One line for each ICES sub-rectangle on each day with an activity** | | | | | | | | | | | |
| Mandatory information | | | | | | Non-mandatory information | | | | | |
|  |  | Stationary sources | | Moving sources |  | Start and end time | | Total time |  |  |  |
| ID or serial number | Date | Latitude (WGS84) | Longitude (WGS84) | ICES rectangle (see instructions) | Size of airgun array. Source factor or total volume of airgun (see instructions) | Start time for the moving source. Time when the ship entered the ICES rectangle | End time for the moving source. Time when the ship left the ICES rectangle | Total time with airguns in the rectangle per day | Depth of the airgun array | For moving sources: sailing speed | Remarks |
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| 4.2.6 Sonars **One line for each ICES sub-rectangle on each day with an activity** | | | | | | | | | |
| Mandatory information | | | | Non-mandatory information | | | | | |
| ID or serial number | Date | ICES rectangle (see instructions) | Power of source. Can be specified as size class (see instructions) | Total duration of transmission in ICES rectangle per day (including intervals between pulses in series) | Frequency or frequency range | Duration of sonar pulses | Repetition rate of sonar pulses | Remarks, e.g. sailing speed |
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| 4.2.7 Acoustic deterrent devices (seal scares etc.) **One line for each installation and each period of active acoustic deterrent devices** | | | | | | |
| Mandatory information | | | | | Non-mandatory information | |
| ID or serial number | Start date | End date | Latitude (WGS84) | Longitude (WGS84) | Type of acoustic deterrent device (manufacturer and model) | Remarks, including details about the signal if not a commercial sound source |
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| 4.2.8 Other noise sources **For stationary sources: One line for each position on each day that the source was active.**  **For moving sources: One line for each ICES sub-rectangle on each day that the source was active.** | | | | | | | | | | | | | | | | |
| Mandatory information | | | | | | Non-mandatory information | | | | | | | | | | |
|  |  | Stationary sources | | Moving sources |  |  | Either start and end time or total time | | |  |  |  | Stationary sources | | Moving sources |  |
| ID or serial number | Date | Latitude (WGS84) | Longitude (WGS84) | ICES rectangle (see instructions) | Size of source as size class (see instructions) | Type and model of equipment | Start time for a stationary source. Time when the ship entered the ICES rectangle for moving sources | End time for a stationary source. Time when the ship left the ICES rectangle for moving sources | Total time with source active in the rectangle/on the position per day | Frequency or frequency range of signal | Duration of pulses | Repetition rate of pulses | Water depth | Source depth | Sailing speed | Remarks, including information on any directionality of the source |
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