

RESPONSEABLE

Environmental pressures in the construction phase of wind energy generation at sea

Educational program

ResponSEAble project WP 5, deliverable 5.5: Educational packages for professionals

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Date: February 23, 2018

Project coordinator:



Project beneficiaries:



Introduction

This educational program is a result from the ResponSEAbLe project, that has received funding from the European Union's Horizon 2020 Framework Program for Research and Innovation. The goal of ResponSEAbLe is to raise the awareness of European citizens on how – whoever they are – they affect, and benefit from, the ocean. To do this, the project focuses on six main issues (or Key Stories) that capture the complex interaction between people and the oceans. One of the issues the project focusses on is Marine Renewable Energy (MRE).

Marine Renewable Energy (MRE) includes both offshore wind and ocean energy. Offshore wind energy uses wind turbines to harness the power of the wind and make electricity. Ocean energy can be harvested in many forms and makes use of wave, tide, temperature and salinity gradients to generate electricity. Driving MRE in the European Union is the need to meet a growing energy demand, to support sustainable jobs and growth in the 'blue economy' and to reduce carbon emissions from burning fossil fuels. The EU's Renewable Energy Directive (2009/28/EEC) requires that all Member States get 20% of their total energy consumption from renewable energy sources by 2020.

As a partner in the ResponSEAbLe project, the ProSea foundation leads the development of educational packages for professionals working at sea. This syllabus describes an educational program about environmental disturbances for maritime professionals involved in the construction phase of wind energy generation at sea.

Part A – Course framework

Target group

Offshore and onshore staff of companies involved in the construction phase of wind energy generation at sea.

General objectives

The goal of this educational package is to make participants aware of the environmental issues connected to the construction of wind energy structures at sea, and to strengthen Ocean Literacy, as a basis for pro-active thinking (in all situations) and taking adequate responsibility for environmental/sustainability in construction projects.

Detailed learning objectives

All detailed learning objectives are understood to be prefixed by the words: "After completing this course the trainee will be able to"

- Recognize that construction activities at sea affect abiotic factors of the sea, including electromagnetic fields, turbidity and underwater noise
- Explain the environmental impacts of electromagnetic radiation on marine life
- Explain the environmental impacts of turbidity on marine life
- Explain the environmental impacts of underwater noise on marine life
- Relate these impacts to sensitive species, such as sharks and rays
- Share experiences, suggestions and operational tips and tricks to further improve the performance of wind energy construction at sea.

Teaching facilities

For the theoretical part of the course, a classroom equipped with presentation facilities and audiovisual materials is required.

The practical element of this module uses a shark (or ray) from a fish vendor to introduce the subject of sensitive species to the group. For the practical course element, enough space must be available to facilitate the group to gather around the shark.

Background information and suggested videos about sharks can be used by the educator to prepare him-/herself, or to share with the participants during or after the workshop.

Background information - Electromagnetic radiation, turbidity and noise.docx

Video's

- Video - A Shark's Entire Body Is an Ear
Link: <https://www.youtube.com/watch?v=NnVfSjNxFnU>
- How Do Sharks and Rays Use Electricity to Find Hidden Prey
Link: <https://www.youtube.com/watch?v=JDPFR6n8tAQ>
- Video - The Secret of Sharks Eyes
Link: <https://www.youtube.com/watch?v=3pxZw-97VMU>
- Video - Thresher Sharks Kill Prey With Tail Like A Whip
Link: https://www.youtube.com/watch?v=ANjYYXII_C8
- Video - Thornback Ray
Link: <https://www.youtube.com/watch?v=lrkmYxjkwNQ>

Part B – Course Elements and Time Table

Course elements

The course consists of a practical element about sensitive species, a lecture about disturbances and sensitive species and concluding conversation and discussion.

Practical Course Element

The practical element of this module uses a shark (or ray) from a fish vendor to introduce the subject of sensitive species to the group. Instructions for this practicum can be found in 'Practical Element instruction - Sensitive Species ResponSEable'.

Participants are invited to investigate and talk about the shark, learning how it perceives its environment and discuss how human activities can interfere with these abilities. By introducing and focusing on these sensitive species (sharks and rays), environmental disturbances get more tangible, enabling the educator to discuss the subject from the perspective of such animals. For this purpose, the module should be kept 'short and snappy'. The practicum should not take longer than 20-30 minutes for optimal effectiveness.

PowerPoint presentation

The PowerPoint presentation 'Disturbances by construction activities' was designed to start and structure the discussion on man's impact on elasmobranchs, fish and cetaceans after the practicum. During the presentation, the educator shares knowledge about the environmental disturbances of electromagnetic radiation, turbidity and underwater noise, when possible connecting it to the experiences of the practical shark workshop.

Questions, conclusion, discussions & personal responsibilities

The workshop is closed with a plenary Q and A/discussion session, aimed at answering any questions participants might have, and discussing potential consequences of this information for MRE construction projects, sharing experiences and ideas of best practices in mitigating environmental impacts and exploring personal opportunities to work towards solutions.

Timetable

Two timetables are presented, since this educational program can be conducted as a short workshop about environmental disturbances in the construction phase of offshore wind or as part of a more comprehensive one-day awareness course about environmental aspects of wind energy construction. bear in mind that any timetable is subject to variation, depending on the general need of the trainees and local circumstances.

Timetable - Short workshop

- 0.00 Introduction
- 0.15 Practical element: Sensitive species
- 0.45 Short break
- 1.00 Lecture: Disturbances & sensitive species
- 2.00 Questions, conclusion, discussions & personal responsibilities
- 2.30 Closure

Timetable - as part of one-day course

- 0.00 Course opening
- 0.15 Introduction: The sea as the work place
- 0.35 Workshop: What do you think of offshore wind?
- 1.05 Lecture: The Sea (how does it work?)
- 1.50 Break
- 2.05 Workshop: Environmental Impact Offshore Wind
- 2.45 Lecture: Discharges
- 3.30 Lunch
- 4.30 Lecture: Climate change & offshore wind
- 5.30 Practical element: Sensitive species
- 6.00 Break
- 6.15 Lecture: Disturbance & sensitive species
- 7.15 Workshop: Concluding discussions & personal responsibilities

8.00