Maritime Administration Perspective

Nico Nolte,
Federal Maritime and Hydrographic Agency
BSH is the central maritime service provider in Germany with several maritime tasks including research.

- Employees: ca. 850
- Printing facility at BSH Rostock (especially nautical charts)
- 5 ships for hydrographic surveys and wreck search
Tasks in the service of shipping and the sea

- Administration of ships under German flag
- Nautical and hydrographic information (e.g. sea charts)
- Marine surveillance and data service
- Maritime forecasting services and (ice) warnings
- Spatial planning and permits for offshore structures such as offshore wind farms in the German Exclusive Economic Zone
- Research and Development (research institute of the Federal Ministry of Transport and Digital Infrastructure)
Marine Monitoring (MARNET) - BSH

MARine Monitoring NETwork in the North and Baltic Sea
National activities

- **PIMO** (Pilot Monitoring of Continuous Sound in German Waters), 2016-2019
  - Project to investigate suitable monitoring strategies

- national expert group to work out a strategy for handling the topic underwater sound in German waters (in the framework of MSFD)

- three federal agencies BSH, BfN and UBA are involved
- experts from state governmental agencies, the German Navy
- research institutes and consultants
Regional Projects

• **JOMOPANS** (Joint Monitoring Programme for Ambient Noise in the North Sea), 2018-2020
  - Close link with OSPAR activities

• **BIAS** (Baltic Sea Information On The Acoustic Soundscape), 2013-2016
  - Project is completed (results used for ongoing HELCOM activities)
JOMOPANS (Joint Monitoring Programme for Ambient Noise in the North Sea)

Objectives and results of the project

- Framework for monitoring ambient noise
- Measurements at sea
- Numerical modelling
- Noise maps
- Management tool for evaluation of Good Environmental Status

Duration: 2018-2020
Budget: 3.5 million Euro
EC contribution: 1.75 million Euro
Lead partner: Rijkswaterstaat, NL

www.northsearegion.eu/jomopans

EU Marine Strategy Framework Directive requires monitoring of the environment (including underwater noise)

Marine management requires tools for evaluation of underwater noise
Underwater sound measurements (+ auxiliary data) at 14 stations for one full calendar year.

Validation of modelled and measured data.

Numerical modelling of acoustic soundscape (AIS Data + Environmental data).

Management tool for evaluation of Good Environmental Status.
Management strategy – taking measures

- **Maritime Spatial Planning** for the German EEZ (2009): Wind farm installation and operation are prohibited in nature conservation areas (Natura 2000 sites)

- **Incidental provisions in licenses** granted by the Federal Maritime and Hydrographic Agency for offshore constructions (e.g. wind farms): Limitation of underwater sound emission during the erection of offshore installations by given thresholds (2004 ongoing), rules for soft start and deterrence

- **Concept** for the protection of Harbour Porpoises in the North Sea by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU, 2013)
  - construction work has to be coordinated in a way that no more than 10% of the nature conservation area or of the total German EEZ will be disturbed by noise emissions, assuming disturbance radius of 8 km when complying with the threshold.
  - For the calving ground „Sylt Outer Riff“ not more than 1% of the area may be disturbed
Management strategy – Reducing the noise input

Mitigation of sound emission at the source

Precautionary Principle

- Avoiding TTS in Harbor Porpoise - scientifically backed by studies of the Environment Protection Agency (UBA)
- Preventing impacts due to pile driving noise

Threshold: 160 dB re 1µPa²s (SEL₀₅) at 750 m source distance

Incidental provisions for offshore wind farms & grid connections, converter

Holistic Approach for Monitoring and Assessment

- Enforcement of a noise threshold at the source and monitoring of compliance (measurements)
- Long-term and large-scale survey on occurrence and habitat use of Harbour Porpoise
Preparation – Requirement for efficient mitigation

Implementation steps for noise mitigation

Concept of Noise Mitigation

Two years prior to construction

- Noise prognosis and consideration of project characteristics (e.g. soil condition, distance to Natura 2000 sites and pile design)
- Technical solutions: driving process (hammer energy, capacity and adaption), mitigation system (bubble curtain systems, hydrosound dampers, isolating casings)

Implementation Plan of Noise Mitigation Measures

Three months prior to construction

- Coordination of activities at the construction site
- Reporting in the framework of construction releases
- Monitoring of the effectiveness of noise mitigation measures

Construction
Monitoring at offshore construction sites

**Objectives:**

Assessment of the compliance with the threshold during construction

“On site” monitoring and assessment of short terms effects on harbour porpoises,

**Requirements:**

- Solid data for “on site” assessment
- Basis for decisions on construction releases
- Standard methods (published)
- Quality Assessment

Underwater noise measurements combined with CPOD investigations

- At 750 m distance to each piling location
- At 1.500 m distance to each piling location
- At the closest nature conservation area

CPOD investigations at four to five fixed stations around the construction site
Long-time and large-scale monitoring

Monitoring the effects on harbour porpoise -
Harbour porpoise activity and use of habitat

- Solid data basis for EIAs and SEAs
- Standard methods
- Quality Assessment
Management strategy – Reducing the noise input

10+ years of experience – the achievements

- Technical innovation and system developments by the industry
- Noise mitigation systems significantly reduce the noise input of pile driving
- Reliable compliance with threshold since 2014, despite increasing pile diameters and water depths of project sites
Noise reduction during construction (bubble curtain as an example)

Source: E.ON
New Foundation Type: Suction Bucket

http://assets.dongenergy.com/DONGEnergyImages/Suction_bucket_jacket_in_water_Borkum_Riffgrund1.jpg
Smart data – Requirement for efficient measures

National noise registry – Information system

- Marine Explorer And Registry of sound
- supporting national and international duties, backbone of the German noise registry
- includes measurements of underwater sound of impulsive and continuous type
- Provides information on the efficiency of measures based on observations

e.g. pile driving impulsive sounds  e.g. ambient and operational noise
MSFD: European Noise Registry

Impulsive sound
(explosions, seismic, offshore construction, sonars)

Continuous low frequency sound
(ambient noise)

Common Register
for both OSPAR and HELCOM area at ICES

Monitoring of ambient noise:
Measuring and modeling
MSFD: Sound Mapping – Results from BIAS

Sound Maps...

Time Period: 2014-00
Centre frequency: 63 Hz third octave band
Depth interval: 0 m - bottom
Exceeded sound level: 105 (5% of time)

- 5% of time
- 25% of time
- 75% of time
- 95% of time
Thank you very much!