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# Maritime Administration Perspective

**Nico Nolte,  
Federal Maritime and Hydrographic Agency**



# BSH – Federal Maritime and Hydrographic Agency



BSH in Hamburg



BSH in Rostock



BSH-Laboratory in Sülldorf

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

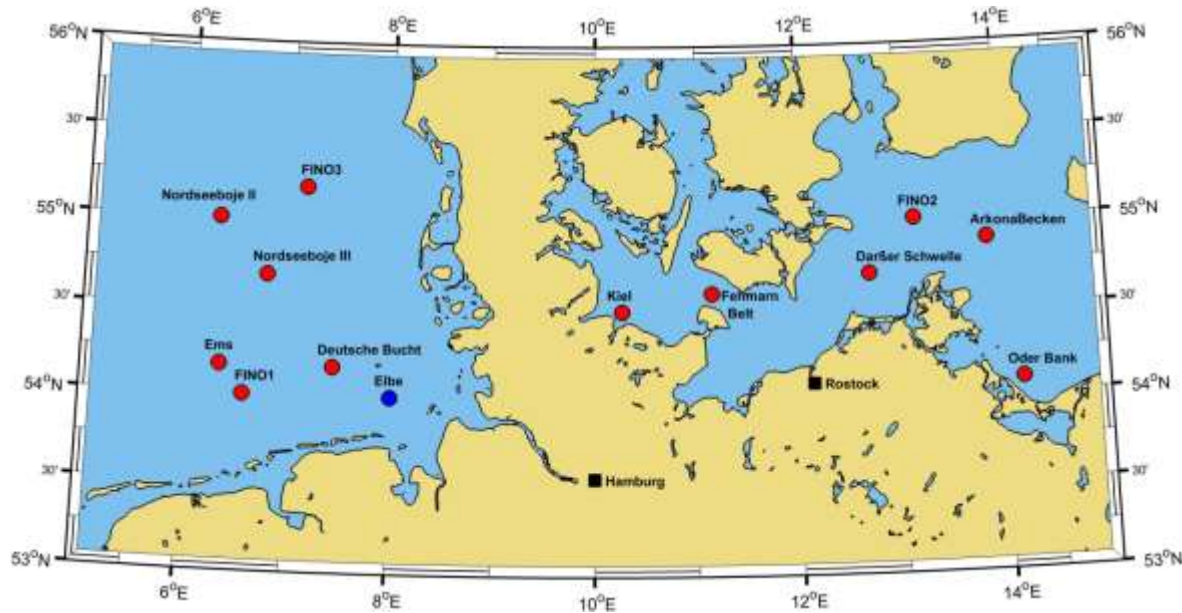
# Tasks in the service of shipping and the sea

- 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)



Federal Agency for  
Nature Conservation (**BfN**)



Federal Environmental  
Agency (**UBA**)



Federal Maritime and  
Hydrographic Agency (**BSH**)

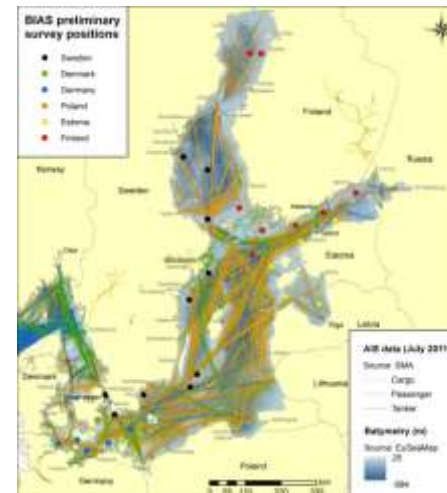
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- three federal agencies BSH, BfN and UBA are involved
- experts from state governmental agencies, the German Navy
- research institutes and consultants

# Joint Monitoring

## 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)

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

Marine management requires tools for evaluation of underwater noise

## 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](http://www.northsearegion.eu/jomopans)

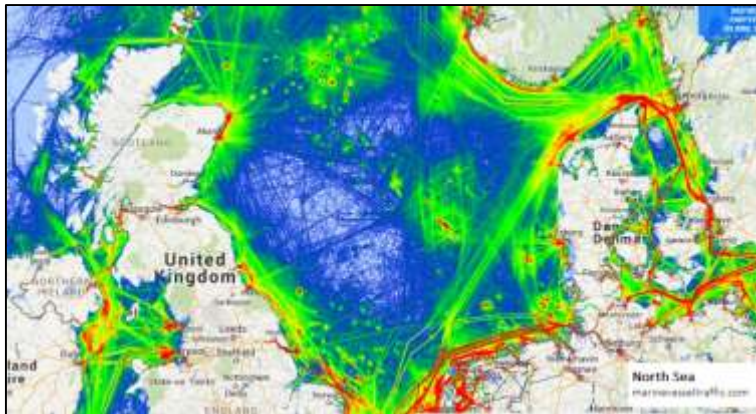
# JOMOPANS (Joint Monitoring Programme for Ambient Noise in the North Sea)



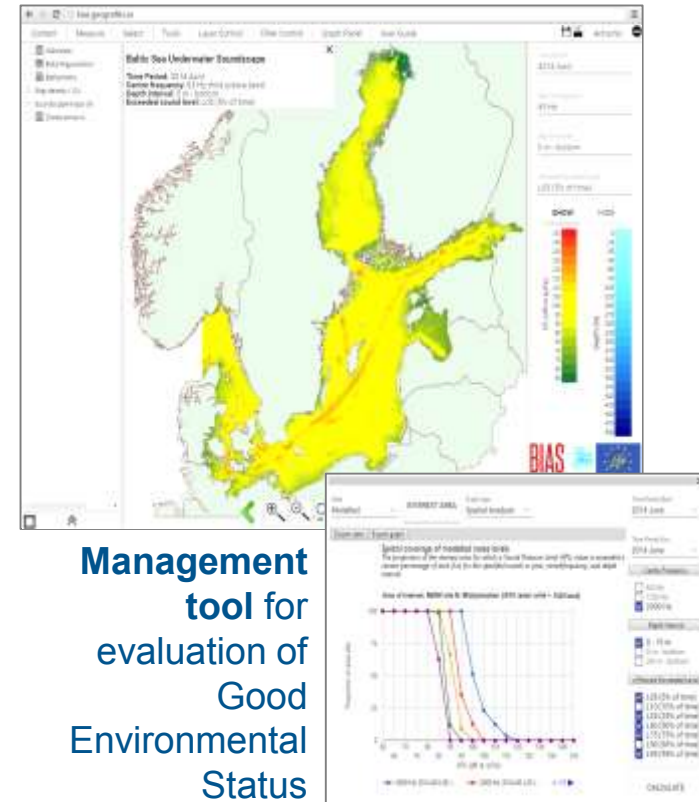
Underwater sound measurements (+ auxiliary data) at **14 stations** for **one full calendar year**



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 1 $\mu$ Pa<sup>2</sup>s (SEL<sub>05</sub>) 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,**

**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**

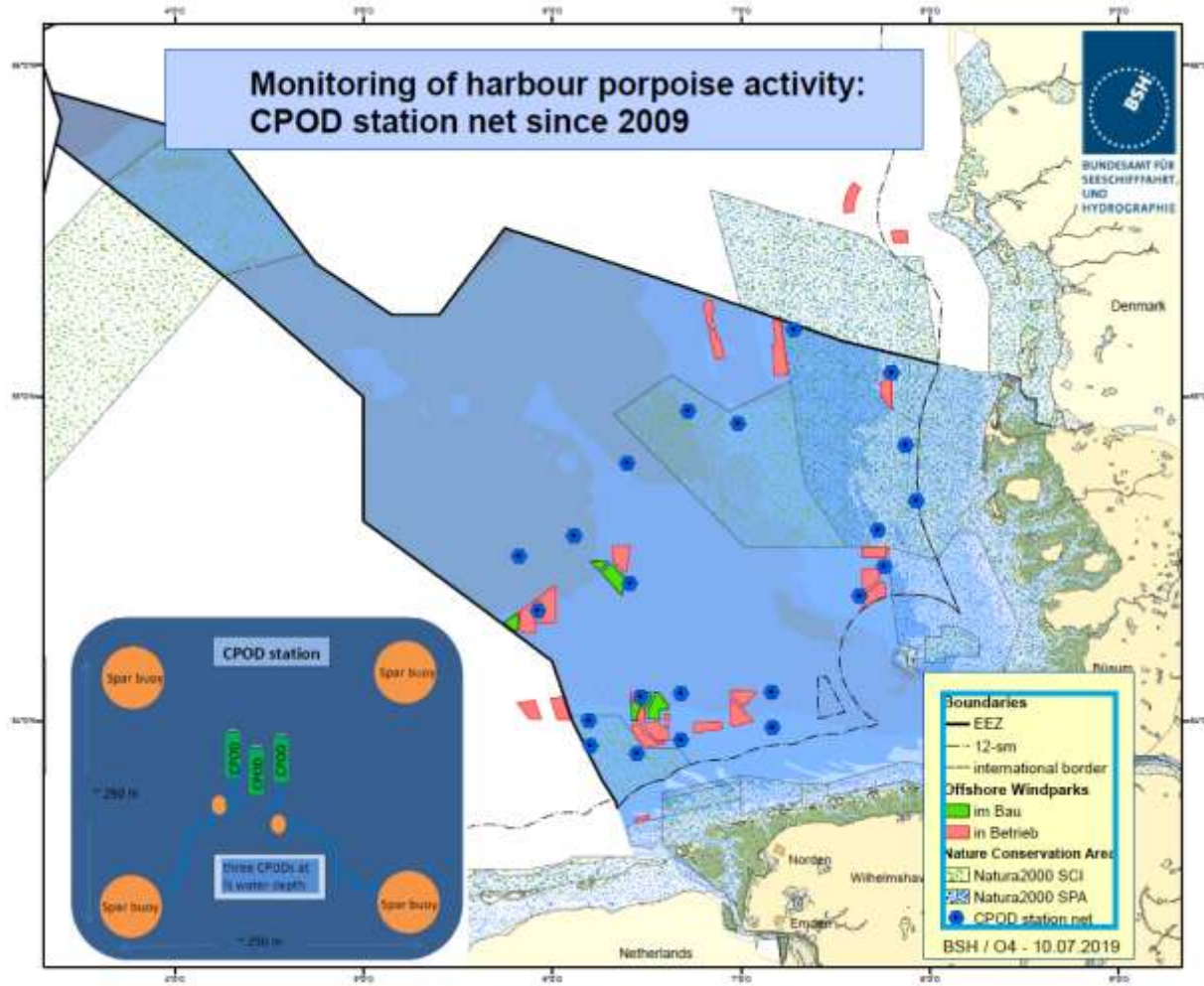


**Requirements:**

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



# Long- time and large- scale monitoring



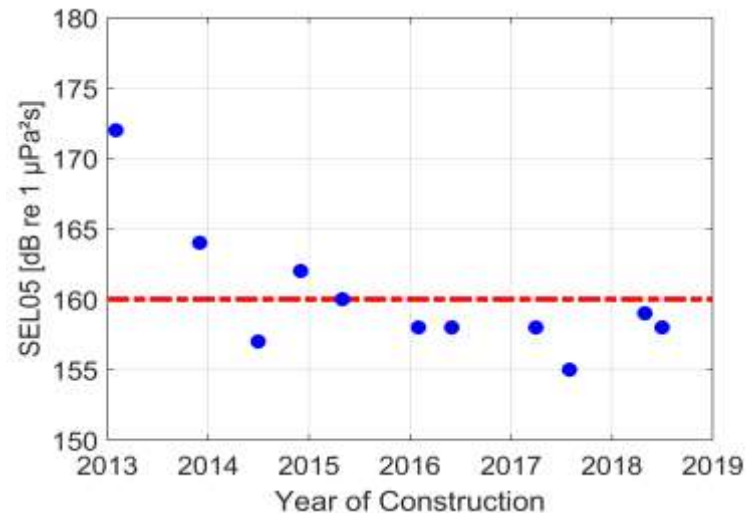
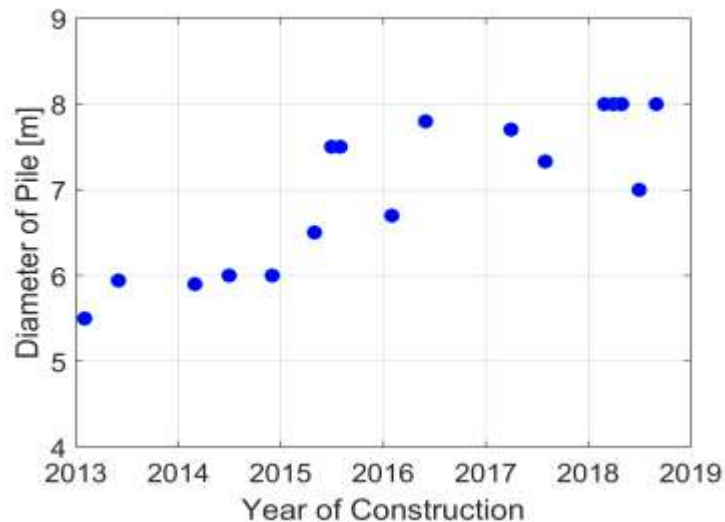
**Monitoring the effects on  
harbour porpoise -  
Harbour porpoise activity  
and use of habitat**

- **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 )



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Source: E.ON



# New Foundation Type: Suction Bucket





# Smart data – Requirement for efficient measures

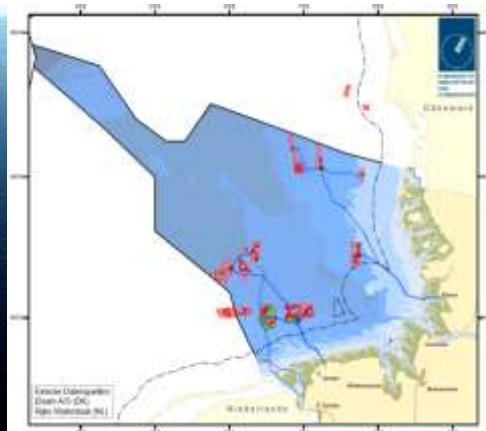
## National noise registry – Information system

marinEARs  
BSH

- ✓ 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

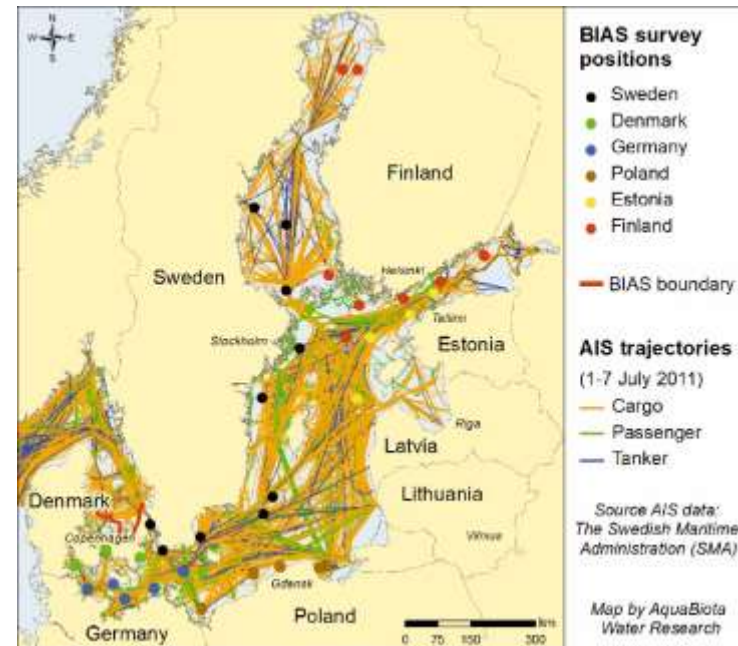
(explosions, seismic, offshore construction, sonars)



Common Register

➔ for both OSPAR and HELCOM area at ICES

## Continuous low frequency sound (ambient noise)

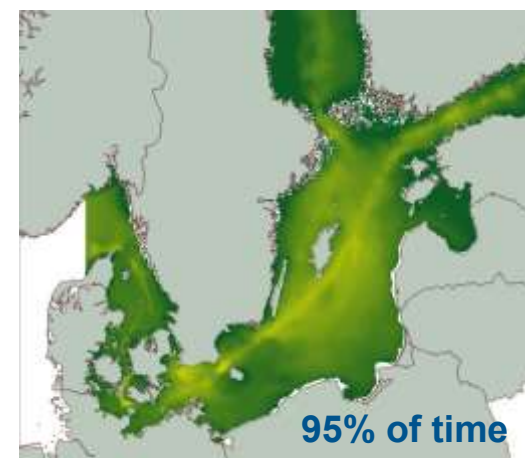
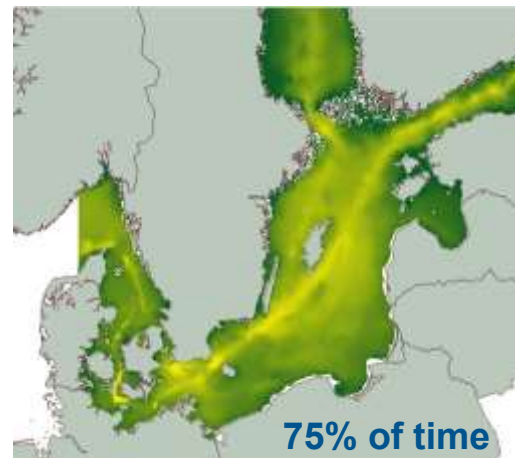
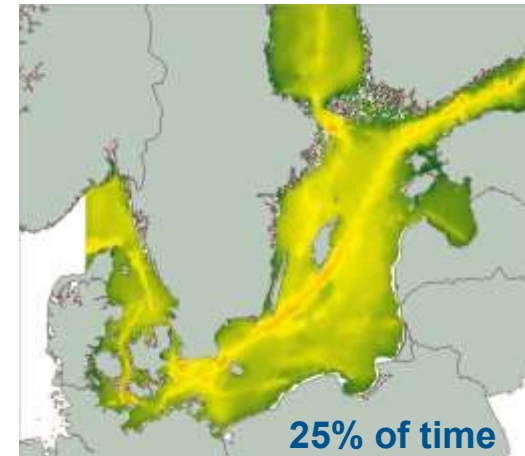
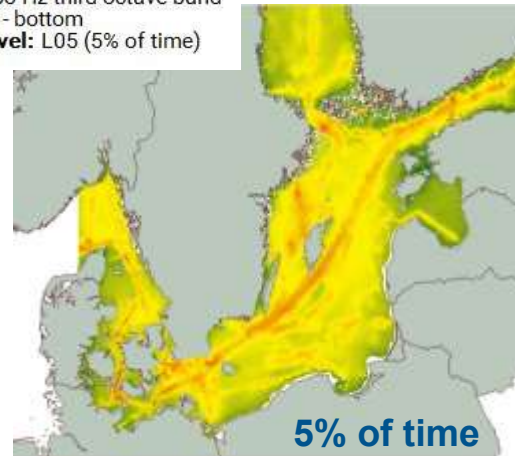


➔ Monitoring of ambient noise: Measuring and modeling

# 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: L05 (5% of time)



Thank you very much!



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