

Southwest Baltic Case

Topic Paper on Shipping / Transport

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This Topic paper is the working paper based on the joint Baltic SCOPE exercise and cannot be treated as the official opinion of the European Commission and Member States involved.

Swedish Agency for Marine and Water Management









SYKE







EUROPEAN UNION European Maritime and Fisheries Fund

DANISH MARITIME AUTHORITY

REPUBLIC OF ESTONIA MINISTRY OF THE FINANCE

Preface

This Topic paper has been developed during the first two phases of the South West Case in the Baltic Scope project. In total four topic papers have been developed in the Case, one for each of the topic dealing with Energy, Shipping, Environment and Fishing. The Case study has also produced a technical paper about Shipping and safety distances to structures like offshore windfarms. The papers have been developed generically over a period from Marsh 2015 to march 2016.

The main purpose of the topic papers was to initiate the discussions about which topics might be interesting, and why so, in a transboundary maritime spatial planning context in the region. Another aim was to create a joint knowledge's base for the planners to discuss common transboundary issues to be handled in the process of developing coherent maritime spatial planning in the region. Therefore, the papers shall be assessed in its context of the Case studies and the purpose of the Baltic Scope project and not as a full technical report stating the exact and current situation in South West Baltic.

The responsibility of developing the topic papers was a shared between the project partners with one country responsible for one topic each, Germany was topic lead for Energy, Denmark for Shipping, Poland for environment and Sweden for Fishing. In the process of developing the papers the Topic leader have had contacts with relevant authorities in the other countries to secure a comprehensive understanding and view. Earlier versions have been discussed and adjusted accordingly in the process to what is now the final version.

The topic papers have also been used to as knowledge base in stakeholder discussions and the final versions have been influenced by stakeholders input.

As the project moved on in to discussing planning solutions it was jointly decided that the topic papers has served its purpose and that it would not gain more to the project to do more work on the papers. Therefore, it was decided to not spend time on layout, cross reading and updating of facts to make it in to a full Topic report. Therefore, once more, the papers should be understood as working documents and **not** technical reports as such.

Case study Coordinator for the South West Case in Baltic Scope.

Tomas Andersson

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Initial conclusion and recommendation

Marine Spatial Planning (MSP) is a process that brings together multiple users of marine areas, including shipping, offshore energy, aquaculture, fishing, conservation and recreation and industry to make informed, co-ordinated decisions about how to use marine resources sustainably and reduce user conflicts. MSP has its origins in marine ecological and environmental protection, but has evolved to encompass economic and navigational safety concerns.

Main elements of the MSP process and the specific navigational concerns are to be considered when assessing the impact on existing marine traffic routing and navigational safety caused by offshore developments. It is important that preparation and planning takes place to ensure that safety at sea and navigation requirements are adequately addressed.

- The future planning in the SWC (South West Baltic Case) must respect UNCLOS regulation including the strait regime in the Sound and the approaches to the Great Belt (transboundary issue).
- It is recommended not to make rerouting in and/or adjacent to existing Traffic Separation Schemes (TSSs) (transboundary issue).
- It is recommended to avoid rerouting of existing main routes. Main routes mean recommended routes (DW Route T) as well as transit traffic flow in connection with TSSs through the area (transboundary issue).
- It is recommended to establish a safety distance to fairways, routes, TSSs and marking of offshore facilities i.a.w. NTI MSP recommendation (The Shipping Industry and Marine Spatial Planning by The Nautical Institute) and IALA O-139 (transboundary issue).
- Consideration must be paid to the separation of sea traffic if there is conflict between commercial vessels and leisure craft, e.g. the above-mentioned safety distance must include space for leisure craft (transboundary issue).
- The assessment of the risk of major hazards must be in accordance with Guideline 1018 and follow recognised risk assessment methods, e.g. the IALA risk management toolbox or the IMO adopted Formal Safety Assessment methodology (FSA).

Further taking accounts of Notes from Workshops on Transport and shipping in Riga (29 September 2015)

Background

For many millennia, shipping has been present in the Baltic Sea and, over the last 10 years, it has become one of the themes that is under pressure from other activities, especially areas with many constructions like Offshore Wind Farms (OWF).

The Baltic area consists of highly and increasingly trafficked waterways, connecting large ports around the Baltic. The waterways are used by a large number of cargo ships, oil and chemical tankers, container ships, cruise ships, etc. to transport goods and passengers to the Baltic Sea from other parts of Europe and overseas destinations. Furthermore, ferries with frequent daily departures transport passengers between the countries bordering the Baltic Sea. Finally, an increasingly large number of leisure craft (sports and tourism) use the area during the summer season.

In the project area of the SWC, shipping is seen as accumulating in the western part, splitting up into more routes and traffic flows north through the Sound and west through the western part of the Baltic Sea between Denmark and Germany. The latter route is subdivided into a route through the Great Belt (IMO Route T) and a route to the Kiel Canal (German: Nord-Ostsee Kanal).

The seabed is very delicate with many grounds and draught limitations, especially in the western part. In addition, shipping has to deal with rough weather conditions, storms and hurricanes during the autumn and winter seasons, strong currents in the straits and sometimes icy waters during the winter season.

Shipping – General analysis SWC

International regulation of shipping in the project area SWC: UNCLOS:

The legal situation of shipping is influenced to a great extent by international regulations. These include in particular UNCLOS in which the freedom of navigation is guaranteed under Art. 58. Art. 60 para. 7 UNCLOS also states that artificial islands, installations and structures and the surrounding safety zones may not be established where they may cause interference with the use of sea lanes that are recognised and important for international shipping.

According to the Copenhagen Convention of 1857 and, more recently, to United Nations Convention on the Law of the Sea (UNCLOS), Denmark is obliged to ensure harmless or innocent passage for all ships passing through the straits (the Sound (Danish side), Great Belt and Little Belt). At the same time, we are obliged to make pilotage available, though it is not mandatory for transit.

Link to more information on the UNCLOS transit passage regime

International Maritime Organization (IMO):

- The IMO SOLAS Convention, chapter V, "Safety of navigation"
- Ships' routeing (Guidelines), SOLAS regulation 10 (General Provisions on Ships' Routeing (GPSR))
- Guidelines for Formal Safety Assessment (FSA) for use in the IMO rule-making process
- Proposed amendments to resolution A.572(14) (GPSR)

The high intensity of various types of ship traffic in combination with the relatively narrow navigation routes in some parts of the area give rise to critical situations every year.

To ensure the safety of large vessels in accordance with chapter V of the SOLAS Convention on "Safety of navigation", a number of Traffic Separation Schemes (TSSs) and recommended (DW) routes have been established within the project area. All TSSs and the Route T in the SWC have been adopted and approved by the IMO member States (GPSR):

• TSS "In the Sound" between Elsinore and Helsingborg (joint Danish and Swedish TSS)

- TSS "Off Falsterbo" (roundabout, joint Danish and Swedish)
- TSS "S of Gedser" (joint Danish and German)
- TSS "North of Rügen"
- TSS "Bornholmsgat" (joint Danish and Swedish)
- TSS "Adlergrund"
- TSS "Slupska Bank"
- TSS "On the approaches to the Polish Ports in the Gulf of Gdansk"

Other hot spot areas

Channels and DW routes:

- Drogden Channel (narrow channel off Copenhagen, with a width of approximately 350 metres between the lateral buoys)
- Flinterenden (narrow channel under the Sound bridge off Malmö)
- Upcoming fixed link (tunnel) at the Fehmarn Belt
- Deep water routes through the area from NE to SW.

Ships' routeing systems contribute to safety of life at sea, safety and efficiency of navigation and/or protection of the marine environment. Ships' routeing systems are mandatory for, all ships, certain categories of ships or ships carrying certain cargoes, when adopted and implemented in accordance with the guidelines and criteria developed by the IMO.

The TSSs and ships' routeing systems contribute to avoid collisions and groundings.

The IMO's responsibility for ships' routeing is enshrined in SOLAS chapter V, which recognizes the Organization as the only international body for establishing such systems.

TSSs are often found in connection with the narrowing and bending of the routes (traffic flow), i.e. areas that are highly difficulty to navigate.

The main transit (recommended) route between the Skaw and the area northeast of Gedser within the project area is named "Route T". The maximum obtainable depth in most parts of Route T is 17 metres. However, in the area around Gedser in the south of Route T, the maximum obtainable depth has been reduced to 16.4 metres due to sand migration. In some places along the route, Route T has been split into two routes, one of which is for deep draught vessels, which means that the route is only for passing ships with a draught of more than 10 metres.

This map shows all the traffic (AIS) in 2014 with routes and TSSs. Passage line counts are noted for selected areas:



It is important to recognize that the GPSR was developed at a time when large concentrations of multiple objects at sea, such as wind farms, did not exist. These multiple objects could pose a significant risk to maritime safety as shipping traffic continues to grow. In congested areas in particular, large concentrations of objects at sea, such as wind farms, may entail additional risks to navigation in comparison with single objects at sea. When planning for shipping in the area,

these planned routes should, as closely as possible, follow the existing patterns of traffic flow in the area as determined by traffic surveys (AIS data).

As ships' size and the traffic density increase, the ability of vessels to act according to the International Regulations for Preventing Collisions at Sea, 1972, as amended (COLREG), becomes more and more challenging, in particular when the available maneuvering space decreases due to the development of large concentrations of objects at sea.

At present, the IMO GPSR does not provide guidelines on how to deal with such large concentrations of objects related to established or new routing measures.

A proposed draft amendment to the GPSR has been submitted to the 95th session of the MSC:

Some extracts from the proposed amendment:

It should be recognized that concentrations of multiple structures have a different impact on the **ability of vessels to act according to the COLREG**, compared to single objects such as e.g. drilling rigs (MODUs), exploration platforms and other similar structures.

The GPSR provides guidelines for the establishment of such single objects, but not for multiple structures.

Additional risks to the safety of navigation related to the establishment of multiple structures are, amongst others:

1. the **difficulty of detecting vessels sailing** within such an area containing multiple structures, and leaving such an area, while those vessels may still have right of way in a crossing situation as per rule 15 of COLREG; and,

2. the effect of such an area containing multiple structures on vessel radar systems.

The benefits of the above-mentioned factors are:

1. awareness of the **additional risks** that may be created by multiple structures at sea, as compared to single objects; and

2. the safeguarding of **sufficient maneuvering space** for ships in the vicinity of multiple structures at sea, and as such the safeguarding of safety of navigation.

The proposed amendment text is as follows:

"In planning to establish multiple structures at sea, such as extensive concentrations of wind turbines, Governments should take into account, as far as practicable, the impact these could

have on the safety of navigation. Traffic density and prognoses, the presence or establishment of routeing measures in the area, the manoeuvrability of ships, and their obligations under the International Regulations for Preventing Collisions at Sea, 1972, as amended should be considered when planning to establish multiple structures at sea."

IALA (International Association of Lighthouse Authorities)

Recommendations and guidelines related to MSP and shipping:

IALA Maritime Buoyage System (MBS)

IALA Recommendation O-139, Marking of Man-made offshore structures

IALA Guideline 1018, methods for risk assessment, the IALA risk management toolbox (IWRAP)

IALA Draft Guideline on Navigational Safety within Maritime Spatial Planning under way:

Describes the main elements of the MSP process and the specific navigational concerns to be considered when assessing the impact on existing marine traffic routing and navigational safety caused by offshore developments.

Other papers of importance

The Shipping Industry and Marine Spatial Planning by The Nautical Institute (NTI)

An operational (main) guide to the risks and benefits connected with the shipping industry that should be considered during the MSP process. Developed in association with IALA.

National input regarding guidelines and issues for planning of shipping in relation to other activities

SWEDEN

Below you will find comments on the questions asked with regard to marine spatial planning within Swedish waters.

 To the extent that they are available, your guidelines, considerations and requirements on the planning of shipping (how is the space defined) in relation to your national MSP especially in relation safety of navigation.

Today there are no formal MSP implemented in Sweden. However the national legislation is under construction and all parties involved in the Swedish MSP has collected and submitted data and information for a draft map of the present situation.

With regard to shipping the aim has mainly focused on how to make shipping routes safer in order to reduce accidents such as collisions and groundings.

This work has mainly been done by analysing AIS data and then constructing recommended shipping routes. These recommended routes are then complemented by traffic separation schemes adopted by IMO in places where it has been found necessary/suitable. Work has also been done to designate main shipping routes in Swedish waters. For the transit traffic in the Baltic Sea Sweden has together with the other HELCOM countries also been working on strengthening the surveys of shipping routes and taking action to enhance the safety of navigation.

 Guidelines, etc. in connection with the planning of offshore wind farms (OWF) and other similar offshore constructions (wave, oil and aqua cultural) next to shipping routes

In 2009 the SMA and STA together made a guideline for establishing of offshore windfarms along the Swedish coast. This guideline is focusing on risk assessment and based on the results of risk assessment each individual windfarm can have different safety levels (safety distances).

There are no formal minimum distances given within the guideline. Until now safety distances have been dealt with locally depending on traffic situation and other risks.

The guideline is written in Swedish and can be found at the link below:

https://www.transportstyrelsen.se/globalassets/global/sjofart/dokument/vagledning_vid_proj_o_ris kanalys_av_vindkraftverksetabl_svenska_kusten.pdf

In Sweden there are no offshore oil installations as per of today. With regard to other activities such as wave power and agriculture there are no specific rules or guidelines available.

 Are you at present aware of conflicting issues/ synergetic issues e.g. rerouting of main traffic flow due to present or future planning of multiple offshore obstructions (OWF) both national and international?

International

Krieger's Flak between Sweden, Denmark, and Germany is an example where conflicts between shipping and OWF may occur. SMA and the STA are still concerned regarding the cumulative effects if all three countries will go ahead and build as planned. Today the designated shipping route, pointed out in Sweden between Trelleborg and Travemunde ends up in the OWF at the boarder of the EEC which forces the ship traffic to take other routes.

National

Blekinge Offshore is the so far largest OWF project in Sweden. If permission is given it may be up to 500 windmills. The project will involve rerouting of shipping lanes however this lane has a relatively small density of merchant traffic and therefore probably less effect on accessibility of shipping.

o Your present activities in your area, which installations exist and where, what space is the sector using and where.

Until today there are about 60 offshore windmills within Swedish waters established within five OWF.

The largest OWF is Lillgrund situated in the southern part of Öresund consisting of 40 windmills.

The safety distance which has been used until now is mainly the 500 metres which are described in UNCLOS.

o Do you see any future conflicts in your area which will have an impact on shipping (routes)? If so will they be bilateral or multilateral.

More areas may be considered as (environmental) protective areas in the future, subsequently an increased demand for rerouting of international shipping routes may occur. The conflicts may be both national and international.

Lithuania is a country which is implementing MSP and Sweden has raised concerns with regard to Midsjöbankarna and how this area will be used in the future. A study with regard to how future shipping routes may be affected is essential when implementing MSP, also in between countries. As shipping is an international business the cooperation and bilateral work between countries is essential when it comes to MSP. There is a compelling need to sync and adjust our national MSP with other countries MSP especially when it comes to navigation and shipping.

The Swedish Maritime Administration submits above mentioned observations in regard to presented questions from the Danish Maritime Authority for their work within the project "Baltic Scope".

The comments and information presented in this letter has been coordinated and consulted with the Swedish Transport Agency.

Above mentioned has been handled by the Head of the Infrastructure unit Marielle Svan in participation with the senior nautical adviser at the Infrastructure unit Johan Eriksson, the latter as reporting officer.

DENMARK

In Denmark we have not yet implemented MSP, but in connection with planning of existing and future areas for OWF, we have developed some general guidelines in order to facilitate shipping and OWF without risking the safety of navigation:

1. Basically at least 3 NM safety distance from main routes to multiple structures

2. Whatever safety distance all identified areas for multiple structures like OWF should undergo a formal assessment of safety of navigation. If areas is known but not the design of the structures

(e.g. many small wind mills or fewer big ones) the assessment must be based on worst case scenario. When the design of OWF is known the analysis must be recalculated.

Formal assessment on safety of navigation always requires a hazard identification (Hazid workshop) for the individual OWF taking all stakeholders (pilots, port authorities, local communities, sailing clubs etc.) opinion into account.

3. Marking of OWF is based on the IALA Recommendation O-139, Marking of Man-made offshore structures

4. As starting point all OWF are free for Navigation in operating phase. Closed in construction phase.

5. Some fishing is normally allowed with in OWF but because the cables created cable protection zones there are prohibition against anchoring and fishing with trawl.

6. The distance between the sea surface and bottom wing tip must be at least 20 meters compared to HAT (Highest Astronomical Tide).

7. Turbine foundations must be designed "collision friendly". No "can-opener effect"

8. There must be procedures that can perform emergency stop of one or more turbines at risk of vessel collision with turbines.

For example if national surveillance authorities (rescue centre) discover or reporting on such a risk, then they should be able to contact "operations centre" to stop the turbines.

9. There could be additional requirements on security for the individual park.

POLAND

Thematic input paper about Traffic lines in Poland (part of the paper below)

Traffic lines on Polish sea waters can be divided to transit routes and approaching routes leading to Polish harbours.

 Transit routes on Polish sea are mentioned in "BSHC-HELCOM Revised Baltic Sea Harmonized Hydrographic Re-Survey Scheme" (http://www.helcom.fi/Documents/Ministerial2013/Ministerial%20declaration/Adopted_end orsed%20documents/BSHC-HELCOM%20Revised%20BS%20Harmonised%20Hydrographic%20Re-

survey%20Scheme.pdf). According to this declaration, routes will be re-surveyed by Poland (Polish Navy). These routes are not mandatory (except of TSS) but recommended by Polish and foreign nautical publications. Polish Maritime Administration using AIS technology monitors traffic on these routes. There is a system under construction named Krajowy System Bezpieczeństwa Morskiego – KSMB (National System for Safety of Marine Navigation) which will improve monitoring of shipping (e.g. by radar covering of TSS "Ławica Słupska" (TSS "Slupska Bank"), data transfer between Maritime Offices etc.).

2. Approaching routes leading to Polish harbours are fairways with parameters strictly defined in Polish law. Polish Maritime Administration is obligated to maintain these parameters (length, width and depth). Traffic on approaching routes is regulated by law ("Port regulations") and monitored by Harbour Masters (in Poland – part of Maritime Administration, not port authorities). Approaching channels to main Polish ports (Szczecin, Świnoujście, Gdynia, Gdańsk) are under coverage and supervising of VTS.

The Polish Maritime Administration is about to start of preparations for making Maritime Spatial Plan (MSP). We do not have any formal guidelines, considerations and requirements on the planning of shipping in relations to offshore installations. We hope we will work out such a guidelines during a process of MSP creating and agreeing. At this point we are at the phase of gathering expert's opinions and we also are sure, we can use good experiences of our international partners within "Baltic SCOPE" project and modify these experiences to Polish conditions. There is a forum in Poland created for exchanging opinions between specialists, business and administration – "Foundation for Sustainable Energy". A task of these foundations is, inter alia, to create guidelines for offshore activities to be helpful both for investors and for administration. Effect of the work is publication "Guide to the location determination and environmental impact forecasting procedures for offshore wind farms in Polish maritime areas" which is a conclusion of present regulations and knowledge, and also gives directions to be followed in future planning of offshore installations.

Back to your question: routes declared by Polish Government to HELCOM should be a basis for further planning and other activities at the sea (including offshore installations) cannot interfere with shipping. According to this, although we do not have the MSP, we determined preliminary areas for Offshore Wind Farms. Investors are obligated put to the Ministry of Infrastructure and Development their applications including IMO Formal Safety Assessment (taking into account

existing shipping lanes and TSS) and expert's report about influence of planning Offshore Wind Farms to safety of survey and exploration of mineral resources in neighbouring areas.

GERMANY

 To the extent that they are available, your guidelines, considerations and requirements on the planning of shipping (how is the space defined) in relation to your national MSP especially in relation safety of navigation.

Regulations

The German MSP formulates guidelines and regulations for the purpose of securing and strengthening maritime traffic. The main navigation routes, which comprise the traffic separation schemes as well as frequently travelled routes, form the basic framework for overall planning. Other uses in the EEZ must align themselves with this framework.

In the German MSP priority areas have been designated for shipping; other uses are prohibited in such areas unless they are compatible with the priority uses. The designation of areas for shipping takes account of the principle of international law attributing priority to this use. Also reservation areas have been designated for shipping that are considered particularly important when balancing with spatially significant competing uses (cf. Chapter 3.1 German MSP Baltic Sea EEZ).

Planning Targets (legally binding for sectoral planning on project level):

• Shipping is granted priority over the other spatially significant uses in the priority areas for shipping as indicated in the map. To the extent spatially significant planning, measures and projects are not compatible with the function of the shipping priority area in these areas they are not permitted. (Priority areas for shipping)

• Submarine cables for the transport of power generated in the EEZ shall cross priority areas for shipping by the shortest route possible if they cannot be run parallel to existing structures.

Planning Principles (guidelines that need to be particularly considered in the decision process):

• Special consideration is given to shipping in the reservation areas for shipping as indicated in the map. This needs to be taken into account in a comparative evaluation with other spatially significant planning tasks, measures and projects. (Reservation areas for shipping)

• Pollution of the marine environment by shipping shall be reduced. Besides applicable regulations of IMO, the "best environmental practice" according to the HELCOM-Convention and the respective state-of-the-art technology shall be taken into account.

• Reservation areas designated for shipping should be crossed by the shortest route possible if parallel laying to existing structures is impossible.

• The laying, operation, maintenance and dismantling of pipelines and submarine cables should not impair the safety and efficiency of navigation. Pipelines and submarine cables should not be laid parallel to areas designated for shipping.

• When selecting the burial depth of submarine cables for the transport of power generated in the EEZ, special attention should be paid to the interests of shipping.

The width of the designated priority and reservation areas was based on the basic requirement for spatial planning to secure a routing network for shipping. Nautical considerations were one important concern. The priority areas represent the framework that must be kept free of all incompatible uses, high-risk structures in particular.



o Guidelines, etc. in connection with the planning of offshore wind farms (OWF) and other similar offshore constructions (wave, oil and aqua cultural) next to shipping routes

1. Construction of offshore wind farms is not permitted in areas where shipping might be affected.

2. There is an obligation of Technical Risk Analysis about the probability of a ship/wind-turbine-collision.

3. A safety zone with a radius of 500 m is always required around wind farms.

4. Between OWF and traffic separation schemes a minimum distance of 2 nm plus a safety zone of 500 m is required.

5. The minimum distance between wind turbines and other routes used for shipping is defined individually from case to case under consideration of traffic requirements and further framework conditions. The standard value is 2 nm plus a safety zone of 500 m.

6. Wind turbines have to be designed and constructed so called "collision-friendly".

Relevant documents can be found at the BSH website (mostly only available in German). Additionally the Spatial Offshore Grid Plan comprises further rules and regulations regarding cable connections and converter stations for offshore wind.

 Are you at present aware of conflicting issues/ synergetic issues e.g. rerouting of main traffic flow due to present or future planning of multiple offshore obstructions (OWF) both national and international?

There is only one minor ferry connection that will be somewhat affected by construction of wind farms in the region of Adlergrund: Ferry Line Sassnitz/Rügen – Rönne/Bornholm (only late March to late October, 1-2 departures/day/direction in summer months, other 1 - 2 departures/day on 3 - 4 days/week). Redirection might slightly increase travelling time from now 3:20 to 4:00 hrs.

o Your present activities in your area, which installations exist and where, what space is the sector using and where.

In German waters of the Baltic Sea there are two wind farms in operation at the moment: Baltic 1 (21 turbines, 7 qkm) in the territorial sea of Mecklenburg-Vorpommern and EnBW Baltic 2 (80 turbines, 27 qkm) in the Kriegers Flak area. In 2016/17 construction of two more big wind farms will start in the Western Adlergrund area.

o Do you see any future conflicts in your area which will have an impact on shipping (routes)? If so will they be bilateral or multilateral.

There is the persisting conflict between Germany and Poland on the status of the harbour approach and anchorage for the ports of Swinoujscie and Szczecin (an issue to be solved on high diplomatic level) – with some planning and work going on for dredging to make the ports accessible to vessels

with larger draught. In the German MSP no designation has been made for this area of the harbour approach, which has been excluded from the Spatial Plan due to contradictory legal views.

IWRAP: (IALA Waterway Risk Assessment Program)

IWRAP Mk2 is a risk-modelling tool developed by IALA in close cooperation with a number of universities and maritime administrations around the world. The tool has been endorsed by the IMO as a useful tool for assessing risk of collisions and groundings in waterways. IWRAP Mk2 is capable of extracting the characteristics of vessel traffic in a given waterway from an AIS dataset. Based on this information a mathematical model of traffic density and geographic distribution is derived, and the probabilities of collisions and groundings can be calculated.

Based on AIS data, it is possible to assess how often ships will be on a collision or grounding course. In most cases, the ships will give way. But in approx. 1 out of 10,000 situations, it will go wrong.

The navigation patterns are described by means of probability distributions. The figure below shows that the ships navigating in a SW-NE direction are separate, for which reason the probability of a collision is low. In the deep-water route, the traffic is not separate, which makes the probability of head-on collisions greater. At the junctions, the probability of the ships meeting each other will be assessed on the basis of their number, speed and size.

IWRAP has been used in connection with ship traffic worldwide and have proven to generate results close to the values observed historically.



Example of impacts when rerouting shipping in SWC area using AIS risk management tool IWRAP:



3 models:

- a) Today's situation
- b) 1.2 nm to the northern route
- c) 2.7 nm to the northern route

Traffic:

Approx. 6,300 westbound ships Approx. 8,400 eastbound ships A total of approx. 14,700 ships east-west

	[Years between incidents]			
	Today	1.2 nm	2.7 nm	
Ship collisions	35.6	34.7	34.3	
Collisions with wind farms	-	64.7	85.6	
Route extension		2.5%	4.4%	

The probability of ship collisions increases somewhat (3.5%) due to the increased sailing time and the extra turn.

Here, the distance between the wind farm and the uttermost most should be at least 2 nm.

Crossing ferry routes are not included since the number of crossings is the same – however, in other places.



Motive for/discussion on including this topic/sector in the project

We are of the opinion that this topic should be prioritized for the simple reason that shipping, and especially future planning of shipping, is a major issue of importance to the entire Baltic region. All of the parties involved have an interest in protecting and optimizing the sea area, and this can be achieved only through cooperation and a common understanding of the topic.

By prioritizing this topic, we will get an opportunity to improve already established transboundary networks and make new ones. There will be a need for multilateral as well as bilateral thematic meetings in order to make common guidelines on safety of shipping. This will help us take transboundary issues about shipping into account.

Whether or not we should divide the topic into areas of interest to the different countries, or whether all the countries involved should work on the same area is up for discussion. We would like to pursue the aim of achieving coherence and consistency between the different national approaches to the topic.

Information of ships Traffic 2014 in the area taken from the AIS-system

(HELCOM output)





Appendix

Guidance of spatial needs on safety distances to OREIs in the Baltic Sea Region (Draft)

Background and references

The construction of large Offshore Renewable Energy Installations (OREI) such as offshore wind farms (OWF) requires coherent, cross-border planning in the Baltic Sea to ensure safety of navigation, achieve environmental protection and provide for energy needs.

The purpose of this Guidance is to inform planners in the Baltic Sea Region (BSR) about the specific navigational concerns to address when assessing the impact of offshore developments on existing marine traffic routes and navigational safety so that they can, already at an early stage, take account of the factors involved when planning OREIs within their allocated water space.

The draft guidance is based on already existing experience and documents developed by nautical experts dealing with this topic. The list below shows detailed guidance documents. Planners are recommended to scrutinize these papers, including the subtopics included in them.

• Offshore Renewable Energy Installations Guidance on UK Navigational Practice, Safety and Emergency Response Issues (MGN 371), MCA 2004

- includes a "shipping route" template.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/441130/37 1.pdf

• The Netherlands' summary of the international regulations and guidelines for maritime spatial planning related to safe distances to multiple offshore structures (e.g. wind farms)

 determining the manoeuvring space that vessels need in order to keep at a safe distance from OREIs.

- Germany Spatial Plan for the German EEZ in the Baltic Sea
- description of priority and reservation areas for shipping http://www.bsh.de/en/Marine_uses/Spatial_Planning_in_the_German_EEZ/

• The Shipping Industry and Marine Spatial Planning – a professional approach, The Nautical Institute 2013

- Aimed at mariners and maritime professionals who should play a role in MSP, and MSP professionals that want to better understand maritime stakeholders' requirements. http://www.nautinst.org/en/forums/msp/

• New upcoming IALA guideline, "Navigational Safety within MSP". (Final draft expected to be adopted by IALA ARM during October 2016

- The guideline describes the MSP process and provides guidance on the role of AtoN and other maritime authorities in contributing to the navigational assessment elements of MSP. The guideline also refers to some of the above-mentioned documents.

• TPEA Good Practice Guide. Lessons for Cross-Border MSP from Transboundary Planning in the European Atlantic.

http://www.tpeamaritime.eu/wp/wpcontent/uploads/2014/11/TPEA_bestpract_34_download.pdf

General guidance on safety distances to Offshore Renewable Energy Installations (OREI) in the Baltic Sea (Draft)

Shipping routes in a transboundary context can roughly be divided into 3 types:

1. International transit routes – 2. Ferry + high speed craft routes – 3. Other small traffic such as leisure boating

International traffic routes:

(Commercial) vessels on international voyages, passing through one or more country zones in the BSR are normally regulated by General Provisions on Ships' Routeing Systems (GPSRS) issued by the IMO, e.g. Traffic Separation Schemes (TSS), recommended routes, deep water (DW) routes, etc. They prescribe mandatory sea lanes (paths) for opposing streams of traffic.

United Nations Convention on the Law of the Sea (UNCLOS) confers special status on shipping, thereby guaranteeing its freedom and granting priority to main navigation routes (paths or the traffic flow between TSSs or recognised sea lanes essential to international navigation). OREIs must not be constructed in areas where they can impede the use of recognized (e.g. recognized by AIS) shipping routes of importance to international trade.

Minimum spatial needs for international traffic routes:

The path (traffic Lane) + a safety margin to OREI + (possibly an UNCLOS security zone of 500 metres)

The path

The path is normally regulated by an IMO GPSRS as the space required by ships in normal circumstances .The path width can be calculated in either of the two ways presented below:

1) Recommended: the path is the width of existing TSS/DW lanes: The path width connecting the TSSs exceeds in to the open sea by linking the outer edges of the path between, for example, the Bornholm TSS and the Falsterbo/Gedser TSS, figure 1 and 2:

Figure 1







2) or, the space for the path is calculated on the basis of an AIS study (the Netherlands' approach; Nautical Institute paper):

- Number and type of ships (standard length of ship)
- Space required to pass and overtake
- Space required to give way within the traffic lane

Formula: Density of ships, 2L ships domain (Number of ships overtaking)* x Length of standard ship (L = 400/300 metres BSR), analysed by AIS data, incl. future prediction for the life span of OREI = 30 years, if possible.

*

a < 4400 vessels per year: 2 vessels side to side

b >4400 vessels and < 18000 vessels: 3 vessels side to side

c >18000 vessels: more than 4 vessels side to side

Examples:

a) Minimum path width between BHM and Gedser TSS or other routes with the same density and ship length (Density > 18000, ship length = 400 metres):

4L X 2 X 400 metres = 3200 metres ~ 1.73 NM

b) Minimum path width between BHM and Falsterbo TSS or other routes with the same density and ship length (Density > 18000, ship length = 400 metres):

4L X 2 X 300 metres = 2400 metres ~ 1.3 NM

c) Minimum path width route to Polish ports (Density < 4400, ship length = 400 metres):

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2L X 2 X 400 metres = 1600 metres ~ 0.86 NM
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The safety margin

The safety margin is a space NOT normally used by shipping, but which is used in an emergency to avoid an accident, incl. collision, grounding, emergency stop.

The safety margin must be measured from the outer edge of the path/TSS to the OREI (wind turbine) or the edge of the UNCLOS 500 metre security zone, if applied.

The safety margin must take account of both the characteristics of the particular location, the safety requirements of the particular shipping route and the type and size of the ships. In other words, the safety requirements must reflect the minimum amount of space that a ship requires to fulfil its international obligations according to the **IMO SOLAS/COLREG** conventions.

<u>Guidance on calculation of safety margin (distance to OREI, the Netherlands' approach, Nautical</u> <u>Institute paper):</u>

Normal avoidance (both starboard and port turn) = 0.3 NM + emergency turnaround = 6 X Length of ship + eventual 500 metres (UNCLOS zone):

Examples:

Safety margin from route between BHM and Gedser TSS:

0.3 NM plus 6 X 400 metres = 0.3NM + 1.6NM (+0,3NM) = appr. 2.2 NM

Safety margin from route between BHM and Falsterbo TSS

0.3 NM plus 6 X 300 metres = 0.3NM + 1.0NM (+0.3NM) = appr. 1.6 NM

Ferry routes

In the SWC and CBC area, more ferry routes are crossing and passing country borders and areas. The paths could be calculated by means of the formula mentioned above:

Example for TT Line between Trelleborg and Travemünde:

The path for normal traffic should accommodate 3500 per year and 200 metres of length):

2 X 2 X 200 = 800 ~ 0.43 NM - both directions ~ 0.8 ~ 1 NM

Safety margin = 6 X 200 metres + 0.3 NM = 0.9 ~1 NM



Other traffic e.g. leisure boating (ships lesser than 20 meters)

Small fishing vessels and pleasure craft normally use the area next to the TSSs and major traffic lanes to avoid dangerous situations with the larger traffic. When pointing out new areas for OREIs, it should be ensured that there is sufficient room for these small craft to pass at a safe distance from the large shipping routes. The interference of small sailing vessels with major traffic can cause dangerous situations.



Calculation of areas for other traffic (Annex A, Nautical Institute paper)

Conclusion

When the safety distances between shipping lanes and OREIs are to be established, the following plan should be observed:

- 1. Determine the length of the ship
- 2. Determine the path
- 3. Determine the safety margins to starboard (and port)
- 4. Determine the criteria (e.g. taken from AIS study on density and number of leisure boat visits to region/marinas)
- 5. Determine the safety margin alongside the traffic lane
- 6. Determine any mitigating measures
- 7. Special arrangements

The conclusion is that the total amount of space required by a ship for safe navigation has several components. First and foremost, there is the 'path width', which is calculated on the basis of either the TTS width (international main routes), the 2L ship domain (ferry and other routes) and the traffic volume on the route.

Then there is the safety margin, which is based on criteria such as the space required for avoidance maneuvers, for turning around, for drifting, for radar interference and for special circumstances. The total requirement should be measured from the 500 meter safety zone stipulated by UNCLOS. In individual cases, additional criteria (like comfort zone for leisure boating) may be determined.

Despite the above-mentioned framework for determining the safety distances to OREIs, it is always recommended to make a case by case Formal Safety Assessment in the planning, construction, operation and decommissioning phase as an annex to e.g. the Environmental Impact Assessment (EIA) when pointing out new areas for OREIs. The FSA will provide the arguments for selecting the safe space for ship routes and mitigating measures. For further information on risk assessment, refer to the above mentioned papers.

Comparing selected information on guidance of spatial needs for shipping in a transboundary context when ships density > 18000 - ship length = 400 meters.

	Path	Safety distance	UNCLOS 500 metres	Total space required for one direction
UK, MGN 371, template		>2 NM (not TSS)	(500 metres)	Path + 2.3 NM
Netherlands, white paper	Formula	0.3 NM + 6L	500 metres	Path + 2.3 NM
Germany MSP for EEZ	TSS width	2 NM	500 metres	Path + 2.3 NM
Nautical Institute paper	Formula	0.3 NM + 6L	(500 metres)	Path + 2.5 NM
DK Route T	-	(FSA)	No	>3 NM
BSR(proposal)	TSS width	2 NM (formula,ferries etc.)	(500 metres)	TSS + 2NM+(500 metres)

Guidance map with spatial data from SWC area including some guidance on path + safety margin for international transit routes and selected ferry routes.

