BE-AWARE Risk Assessment Seminar 24-26 September, Tønsberg, Norway

Note of the meeting

1. Introduction

1.1 The meeting was opened by Mr Ole Kristian Bjerkemo, Norwegian Coastal Administration, who welcomed all the participants to his home town of Tønsberg and outlined the practical arrangements for the meeting. Mr John Mouat, Bonn Agreement Secretariat, outlined the seminar timetable and the presentations for the introductory session.

1.2 Mr John Mouat gave an introductory presentation on the BE-AWARE project highlighting the project background, DG ECHO co-financing, partners, project tasks and timeline. The presentation also explained the overall the aims of the seminar: to review the collection of data, identifying gaps and prioritising the collection of any supplementary information; to review the progress of key tasks that fed into the Risk Assessment; consider any barriers to progress, including identifying potential solutions; and finally to consider the outputs and challenges for the risk assessment task based upon the review of previous tasks.

2. Norwegian Risk Assessment Process

2.1 The Meeting noted a presentation from Mr Ove Njøten, Norwegian Coastal Administration, on the national Norwegian risk assessment process for marine pollution outlining actions on risk assessment, preparedness and accidental spills from ships. The process involved three steps: analysis of the probability of accidents with acute spills from shipping accidents (based on 2008 data with a prognosis to 2025), an environmental risk analysis of the consequences of different spills shipping accidents and an analysis of the preparedness (e.g. equipment and response time).

2.2 Step 1 highlighted that the highest risk area was in Oslo Fjord, however, the greatest increased risk by 2025 would be in the north of Norway. Most probably risks were from cargo ships with bunker oil volumes of up to 400 tonnes and crude oil carriers (2,000-20,000 tonnes). Step 2 had also been completed outlining the environmental risk based upon the spill probability and coastal sensitivity. This study had considered consequences for fish, seabirds, marine mammals, and maritime habitats, taking into account how oil spreads on the sea surface and in the water column. Step 3 the analysis of preparedness, which was in the process of being finalised, had been based upon a study of 7 simulations using the SINTEF OSCAR model to predict potential scenarios. This was then combined with a gap analysis to assess the preparedness required both in terms of equipment and human resources. For example one of the recommendations was that oil booms should be able to be deployed anywhere in Norway within 6 hours.

2.3 Prof. David Johnson, Bonn Agreement Secretary, enquired how the work carried out at national level would fit with the outputs of the BE-AWARE project and was informed that these would be taken into consideration along with national studies and the data supplied to project was also the data used at the national level. BE-AWARE would also allow for updating and validation of the 2008 data.

3. New developments in AIS within the Maritime field

3.1 Mr Jon-Arve Røyset, Norwegian Coastal Administration, gave a presentation outlining the Havbase, a database for systematic monitoring of ship activity, risk, and discharge of pollution from shipping. The database was developed in relation to the Norwegian system of establishing integrated management plans for all Norwegian Sea areas and the aim was that risk assessment could be undertaken automatically and on a more regular basis.

3.2 The input the database was taken from the AIS data Lloyds database and DNV information and these were combined using MSSI number as the common field. The system then allows the risk to be calculated for different ship categories broken down into 10km x 10km gird. The risk module of the database will have some new aspects built into the automatic risk algorithm for each grid cell: metrological data (each AIS point), wind, waves, level of cross traffic (each grid cell) and how close the nearest tugs with enough "pull" are (each AIS point). The database itself was also demonstrated illustrating how information on the environmental performance of individual ships could be compared using the web-based system.

3.3 The system will allow changes in risk to be monitored with a period of months or years rather than over several years or decades and automatically highlight and areas where the risk has changed rapidly. Currently the information on individual ships was only available to those organisations that paid for the database due the restrictions on the sharing of data but the aggregated data was openly available through the web interface. The risk module would be run as a demonstration, however other countries were welcome to join in its development.

4. Development of Human Activities in the North Sea

4.1 Prof. David Johnson introduced the topic of human activities and in particular the increase in offshore wind farm development in the southern North Sea which could have a significant impact upon the risk picture. He highlighted some sustainability mega trends; increased demand for space, increase middle class in the Far East, increasing sea ice melt, the economic downturn in Europe, decreasing biodiversity will encourage an increase in marine protected area designations and the lack of qualified staff for shipping. Many of these issues were highlighted at Rio+20 and the outcomes of BE-AWARE would have links to the sustainability goals which have been agreed.

4.2 The first section of the presentation had been provided by the European Wind Energy Association. It highlighted the predicted increase in offshore wind over the next 10 years, which would represent 10% of European demand. Most of this capacity is likely to be installed within the North Sea. This was expected to take up 25,000 km^2 of sea space particularly in the southern North

Sea. The areas where most development was likely to take place were highlighted as the Irish Sea, Channel and Southern North Sea, Dogger Bank and German Bight.

4.3 The second section of the presentation had been provided by Mr Nico Nolte a marine planner within the German government. It outlined the marine spatial planning process in terms of collecting data, allocating space, identifying areas of conflict and connecting them to national priorities. An early example of mapping human activities in the Irish Sea was highlighted showing the competition for space.

4.4 The presentation went on to use the German EEZ as an example for the development of a marine spatial plan highlighting the challenge to allocate space for shipping, military use, wind farms, platforms, pipelines, cables, sand extraction and mariculture. The German marine spatial plan has been in force since 2009 following a strategic environmental impact assessment. Looking at the wider North Sea the Dogger Bank was an interesting case study as different neighbouring countries had zoned it for nature protection, wind farm development and oil exploration. The BE-AWARE project would need to bear these issues in mind when considering the future prognosis for 2020.

5. Risk Assessment in the Oil and Gas Industry

5.1 Kirsti Natvig, Senior Advisor for the Norwegian Climate and Pollution Agency, introduced the topic of environmental risk assessment in the oil and gas industry and how this was handled within Norway. Approximately 50 exploratory wells are drilled in Norwegian waters annually with most new wells around 300km from the shore. Wells require a permit, which includes oil spill preparedness and response requirements, before drilling can be undertaken.

5.2 The risk assessment approach for offshore industry identifies the expected acute pollution scenarios, described as release rate and duration, and risk reducing measures. The main difference between shipping and offshore risk is that with platforms you know exactly where the risk is going to occur. The challenge is to make an integrated assessment. The main elements, as explained previously by the NCA, include the modelling of the oil spill scenarios both on the sea surface and in the water column, assessment of the environmental sensitivity and modelling of the effect on sensitive species. Typically the environmental risk assessment will create a model of oil spill distribution, taking into account different oil types and determining what is representative, considering weathering properties and current data and, on the basis of criteria for environmental damage, modelling possible impacts to affected areas.

5.3 An assessment of proposed drilling south of the Lofoten Islands had been undertaken by modelling nine scenarios including a scenario for drilling a relief well in case of a blowout. Scenario 4 a spill of 4500 tonnes a day for 2 days was highlighted including the modelled effect of the spill on seabird and fish populations. SINTEF also used the OSCAR model to assess the mass balance of the oil over time in different environmental compartments with no response and on the basis of a full response.

5.4 The results of the environmental risk assessment highlight that: modelling of oil spill transport and distribution both on the sea surface and in the water column is necessary, it is possible to compare different sensitive areas based on ERA, the same ERA method and basis criteria must be

used in order to be able to compare areas, ERA can identify valuable and vulnerable areas connected to possible oil spills and the need for oil spill preparedness can be identified based on RA/ERA. The full report on Environmental Risk Assessment of Exploration Drilling in Nordland VI (Report no/DNV Reg No.: A/ 12FJH0G-6, Rev 0, 2010-03-30) can be found at www.olf.no.

6. BE-AWARE Task C: Regional Resource Database

6.1 Mr Chris Moulton and Mr John Mouat, Bonn Agreement Secretariat, introduced the work in relation to BE-AWARE Task C and the collection of data. The Secretariat explained that the aim of Task C was to collect the information required for the project, to identify other possible sources of data (including EMSA and OSPAR) and to undertake an evaluation of data available from national risk assessments. It had been decided not to continue with the final part of Task C, the evaluation of national risk assessments, as some countries did not have them, others were not available in English and the years that had been used for data collection were different. Therefore it had been agreed by the Project Partners to focus the limited time available on data collection through the Data Collection note.

6.2 The objectives of the seminar in relation to Task C were to review the submission of data so far and identify any gaps, consider the input of data from external sources such as SafeSeaNet (SSN) and to consider if a lack of data in any area required a change in the methodology. The data requirements had been discussed at the Method Seminar which was held in Copenhagen and these had then been outlined in the Data request note developed by the consultants.

6.3 The Secretariat highlighted the data collection log which had been used to track the incoming data from Contracting Parties highlighting that there were still some gaps. In order to structure the discussion it was proposed to go through each data category in the log and identify where there were still gaps. For sections 2.1 and 2.2 AIS data and IHS Fairplay Vessel Characteristics all the data was collected.

6.4 In relation to 2.3 GIS data there was still some data missing from France who informed the meeting that the information had been sent but that there had been some technical difficulties and they would check this after the meeting. For section 3.1 Goods transported to and from ports there were several points where clarification was needed: German data was only at a generic level, data had been delivered by the UK and Ireland but adjustments to this data were still expected. Data was missing from Belgium.

6.5 Germany highlighted that the more detailed data on the transport of goods was difficult to access as this was held by either the ports themselves or the Federal States, however they would be willing to have another attempt to gather information. MARIN stressed that it was particularly important to obtain data on oil transports and the Secretariat suggested that the use of confidentiality agreements might make the ports more comfortable in releasing such data. The UK thought they had already forwarded this information and asked the Secretariat to check.

Action: Germany would try again to access the information on oil transports and the Secretariat would provide them with a blank version of the Norwegian confidentiality agreement.
Action: Secretariat to check UK data submission.

6.6 In relation to sections 3.2 and 3.3 Goods Transport Development and Prognosis and Passenger Transport Development and Prognosis there were several missing data entries. Belgium had yet to supply any data for both, Ireland had data missing for 3.2 and the Netherlands had data missing for 3.2 and 3.3. Belgium informed the seminar that work was ongoing to collect this information and it would all be submitted in one tranche along with 3.1, goods transported to and from ports. Ireland noted that further information had been gathered and they would forward it to the Secretariat. The Netherlands noted that they were still awaiting data from other companies and would submit this once they had received it.

Action: Belgium to provide data from ports in one tranche.
Action: Ireland to provide additional information.
Action: Netherlands to provide more data once supplied by the companies.

6.7 For sections 4.1 and 4.2 on Data on Accidents and Spills at Sea and Pilotage again some clarification was needed. For Germany there were only general statistics on accidents rather than ship specific information and there were some data gaps in relation to pilotage for the Netherlands and Sweden. Germany informed the seminar that they had submitted all the information available on accidents and the Netherlands stated that they were still waiting for information on pilotage. Sweden did have some additional data on pilotage but had been having database problems and would forward this to the Secretariat as soon as possible.

Action: Sweden to forward information on pilotage.

6.8 Finally for sections 4.3, 4.4 and 4.5 on RRM Parameters, STS Operations/Loading Buoys/Bunkering at Sea and Fixed Objects, several data gaps were highlighted. The Netherlands had not provided any information on RRM and Norway and the UK only for TSS' and no information had been received from the Netherlands and Norway on 4.4. Following a clarification of the Risk Reducing Measures Questionnaire, which was attached to the Data Request Note, the countries mentioned agreed to submit further details. The Netherlands noted that no STS operations take place in their waters and Norway stated that they had submitted a link to a webpage with information on offshore loading and that there was limited bunkering with the exception of some seismic vessels.

Action: The Netherlands, Norway and the UK to provide additional data on RRM parameters.

6.9 The Secretariat updated the seminar on the progress of data collection from other sources including European Maritime Safety Agency (EMSA) and the OSPAR Commission. Data had been received from OSPAR in relation to offshore wind farms and offshore installations and this had already been provided to the consultants. The Secretariat had also approached EMSA in relation to SSN data and following a meeting of the SSN High Level User group and a consultation with the Members States involved the project would now be given access to this data. A MoU was currently being drawn up between the Bonn Agreement and EMSA and when this was signed the data could be transferred.

6.10 The data would not unfortunately give the exact cargo on board vessels, as due to the system set up only the notification data is held by EMSA. The information should, however, give information if dangerous goods are on board along with the all the pre-arrival, arrival departure information that is available in SSN. The data will also include all incident reports and mandatory reporting from the Channel. There was general consensus that being granted access to the SSN data was a good step forward and would add to the project results.

6.11 In terms of the objectives of the seminar for Task C it was agreed that the data collection was sufficient for the project to proceed, provided the gaps identified were filled, and at this stage there was no need to modify the methodology due to lack of data.

7. BE-AWARE Task D: Methodology

7.1 Dr Albrecht Lentz, COWI, introduced Task D which had developed the methodology to be used for the project highlighting the various components of the model that would be used, including the options for a possible phase two. The methodology was developed at the Method Seminar, which was held on the 27th March in Copenhagen, with input from all the Bonn Agreement Contracting Parties. The comments were then taken on board and a draft version developed and circulated for comments to the Project Partners before a version 1.0 was finalised in August.

7.2 The various subsections of the methodology were highlighted including where there were modifications from the methodology that was implemented in the BRISK project e.g. the exclusion of illegal spills and a greater focus on offshore instillations. Further detail was provided upon the alterations to each of the subtasks E3 Cargo transport analysis, E4 Future traffic model 2020, E5 Offshore installation risk analysis, H1.1 AIS traffic model, H1.3 Modelling of accidents and oil releases H7 Qualitative assessment of HNS risks.

7.3 The Secretariat enquired if the Seminar felt that the risk from pollution for the platforms themselves, in terms spills, was adequately covered by the methodology. Norway felt that the data that had been provided by them provided an accurate picture of the probability of spills however that the focus of BE-AWARE should be on shipping. Belgium highlighted that at a previous meeting that it was agreed that the worst case scenarios for each platform should be included. The Netherlands confirmed that they had five oil producing installations and could provide the worst case scenarios for them.

7.4 The UK stated that all platforms in the North Sea had to have a worst case in their contingency plan and therefore they could provide the data. Norway was not so confident that it would be possible to collect all the worst case scenarios. Belgium explained that we need to think about a tiered response and should focus on the worst case scenario spills only, as medium sized spills were the responsibility of the industry and the Bonn Agreement would only be involved in the worst case. COWI highlighted that one of the strengths of the BRISK approach was that it included all spill sizes and therefore an alternative strategy would be to categorise similar types of platforms and establish common risk profiles for them allowing all spill sizes to be included. The worst case scenarios may also not present the greatest risk of pollution if they are very rare events.

Action: COWI would adjust the Methodology Note to include the categorisation of similar types of platforms and the establishment of common risk profiles for each category allowing for all spill sizes to be included.

Action: The Secretariat would undertake an additional round of data acquisition in relation to oil spill scenarios from platforms after establishing a common format in consultations with the Consultants.

7.5 Another area in the methodology which needed further consideration was the spill risk from pipelines. Oil Spill Response UK highlighted that they had responded to 3 pipeline spills in the last year in the UK sector, however the worst case scenarios were include in the contingency plans and therefore it would be a large task to extract them all. The meeting agreed with a suggestion from Dr Carsten Jorgensen (COWI) that pipelines should be removed from the methodology as this was too large a task within the constraints of the current project and was not the main aim of the work.

Action: COWI would remove pipelines for the Method Note highlighting the discussion at this meeting and the reasons for there removal.

7.6 For Task H1.1 the question of which coastal waters should be included within the project area (e.g. estuaries, fjords) had still not been agreed and would only be decided after the initial project results were made be available. Areas where the risk algorithm broke down due to the space being constricted would then be removed for the risk assessment. The Secretariat asked if the area would be spilt into sub-regions and was informed that appropriate sub-regions would be identified when the results were presented. For task H1.3 there were two main changes, the inclusion of ships at anchor and the use of a physical model for the drift grounding calculations rather than reliance only on statistics.

7.7 MARIN explained the changes in the methodology for task H7, the qualitative risk assessment for HNS, highlighting that at the Method Seminar it had been agreed to add density plots for different types of HNS. Since the Method Seminar it had also been decided to add packaged HNS goods. Belgium agreed, noting that approximately 10% of material carried on containerships was HNS but perhaps that this could be verified using the data from Antwerp.

Action: COWI would update the Method Note and circulate a version 1.1 to the Project Partners for comments before uploading a version 2.0 to the website.

8. BE-AWARE Task E: Area-Wide Traffic and Use Study

8.1 MARIN, Ms Yvonne Koldenhof, gave an introduction to Tasks E 3, 4, 5 and 6: Cargo transport analysis, future increase in ship traffic (2020) analysis, offshore installations analysis and collection of all accident and use data and risk reducing measures. Task 3 Cargo transport analysis would determine the probability that a tanker of a certain type and size at a certain location is loaded with oil and the expected amount of cargo oil that is on board, if the tanker is loaded. Most data received has been totals for each country but specific data at the voyage level had been received from Norway, subject to a confidentiality agreement, and data will be received shortly from Rotterdam.

8.2 France highlighted that it was possible to capture some of the information on ships that were transiting through the Bonn Agreement (BA) Area but not stopping at any of the ports from mandatory reports. The Secretariat confirmed that the mandatory reports for the Channel were included in the SafeSeaNet Data. Norway also had information on the vessels entering the BA area from Russia, although the likely destination was Rotterdam and most carried distillated products rather than REBCO. Thanks to port state control requirements most of these were state of the art ships (robust, double hulled).

Action: Norway to provide information on ships entering the BA area from Russia to MARIN.

8.3 Task E4: Prognosis for shipping traffic in 2020 would be based on expected fleet and cargo increases and transport route developments covering both "moving ships" and anchorage filling rates. Belgium enquired if this would include the increase of the size of vessels and was informed it would. The study would be based upon historical figures, current statistics for port and fleet development and any prognosis and literature on future developments. The work on this has yet to begin in earnest. The Secretariat suggested that MARIN should get in touch with Martin Stopford who was a London based academic working in this field.

Action: Secretariat to provide MARIN with Martin Stopford's contact details.

8.4 Task E5: Offshore installations analysis would concentrate on wind farms and oil and gas installations and would focus on spills caused by damage to vessels. The calculation on the risk of a collision with a platform would be made using AIS data coupled with ship characteristics and weather conditions. Norway asked if service platforms would be included as ships, as there had been some examples of this in recent years of these drifting and endangering platforms, and were informed that as AIS data was being used any vessel using AIS would be included. Norway also highlighted that offshore supply vessels also carried significant amounts of HNS to the platforms.

8.5 MARIN presented some of the preliminary results of the frequency of drifting collision and ramming collision with platforms for the Dutch maritime area both for shipping and attendant vessels. The Secretariat asked how the size of the platform was included in the analysis and was informed that this would be included and, where it was not available, platforms would be grouped into standard categories. Norway asked if the preventative measures were included in the methodology and were informed that whilst they were not included specifically they were covered as the model was based upon the accident statistics. Norway suggested that the final report should highlight that different Contracting Parties had different regulations in relation to operating support vessels but that this was not specifically included in this analysis due to the scale.

Action: MARIN to include a reference to assumptions relating to risk reducing measures in the final report.

8.6 MARIN explained that the same methodology could be used for the wind farms, however it was important to know the location or number of turbines in each wind farm. The Secretariat highlighted that this could be difficult for proposed development areas as some were very large and it was not clear within these where actual developments would be. Belgium considered that some

secondary shipping routes might be affected by wind farm developments in Belgian waters. COWI stressed that if there were any significant changes to shipping routes it was essential that they received details of this information immediately as they were in process of finalising the route net and it would not be possible to change this later. MARIN also highlighted that it was important to have information on the exclusion zones around wind farms as this affected the risk.

Action: Secretariat would, where possible, collect the information on the exact location of existing turbines and exclusion zones.

8.7 The Secretariat asked how the wind farms had been included within the 2020 route net and COWI explained that most of the adjustments were due to changes to traffic separation schemes and that for major shipping routes clearways were usually introduced in wind farm areas. Also wind farms were usually positioned outside areas of high intensity shipping so any changes would have less impact on the risk picture.

Action: COWI to consider the impact of proposed wind farms on the 2020 route net.

8.8 Task E6: Collection of all accident and use data and risk reducing measures was introduced including some of the initial results. For the total number of accidents the UK stood out as having a much higher number than other Contracting Parties but this could be due to the greater size or a different reporting procedure. The main accident types were ship-ship collisions and groundings. Belgium enquired what the difference was between incidents and accidents as this was not clear and also there was no recording of groundings without pollution in Belgian waters. Norway stated that they had not yet forwarded the information on the accidents and that only spill data had been forwarded. COWI highlighted that it was extremely important to know this information for the risk calculation.

Action: MARIN to check with each country on how the accident and spill data request was interpreted and contact them if an update is need.

8.9 MARIN highlighted the number of shipping accidents resulting in a spill, per accident type, noting that ships that sank and ship-ship collisions were most likely to result in a spill. For accidents that did result in a spill, volatile oil was the most likely type of pollution (75%). The most common spill size was in the range of 1-15 tonnes and no accidents were reported with spills of over 15,000 tonnes. Of the 145 spills in the database 140 were oil and 5 were HNS and in relation to spills from each offshore platform had decreased from 1 a year in 2000 to 0.38 in 2008.

8.10 Finally MARIN introduced the information on the use of maritime space, which aimed to create an overview of offshore oil-transferring activities in the area including: STS operations, oil loading/discharging at loading buoys and bunkering at sea. Denmark highlighted that they had submitted information on loading buoys and this should be checked and the Netherlands asked if this information was also required for the 2020 prognosis and was informed if it was available it should be submitted. Norway highlighted that there may be more than one location of STS per oil field even though one location was given per field.

Action: MARIN to check Danish loading buoy data.

9. BE-AWARE Task F: Environmental and Socioeconomic Sensitivity

9.1 Mr Ronny Schallier, MUMM RBINS Belgium, introduced project Task F outlining that in the first phase of BE-AWARE this was a standalone task as it related to the impacts of spills rather than the risk, however it was important to establish common criteria for environmental and socio-economic analysis and mapping. At this stage a review of the current status or 'state of the art' in sensitivity mapping had been undertaken to establish a basis for further work. The work on common criteria will focus on coastal impacts and will be based upon existing work in the Bonn Agreement, the outcomes of the BRISK project and a major socio-economic analysis by OSPAR.

9.2 The Bonn Agreement had already undertaken a review of national sensitivity analysis and mapping and whilst there was a considerable difference in the scales of mapping there were also striking similarities. Two Contracting Parties only map the sensitivity, as experts will judge the likely impact during an accident, whilst most Contracting Parties rank sensitivity using a qualitative or quantitative scale. Most Contracting Parties also considered the shoreline type, as this affects the sensitivity, and the conservation values, e.g. all marine protected areas are included. An example of ranking was the environmental sensitivity index for shoreline type which ranks different shorelines from 1-10 based on sensitivity. Most Contracting Parties consider coastal sensitivity but some also consider offshore sensitivity (e.g. areas under the Birds Directive or spawning areas for pelagic fish) and this will be taken into consideration in the BE-AWARE project.

9.3 At the Bonn Agreement sensitivity mapping workshop it was decided that it was too difficult to harmonise national sensitivity approaches but that sensitivity should be mapped at the regional level using a simple approach. The workshop concluded that the main criteria should be: the shoreline type; sensitive, natural and socio-economic resources; and designated protected areas and hence this approach would largely mirror the national systems.

9.4 MUMM also reviewed the system used in BRISK project and noted that it is simple and effective, systematic (step-by-step approach), well-documented, underpinned by literature and in line with previous BA findings and conclusions. The two steps in the ranking process, namely identification of features and vulnerability ranking of identified features, were further explained. The process then took into consideration the fate of the oil and the impact of oil on organisms/habitats for each ranking feature before a vulnerability rank was assigned. The end point of the process is then a sensitivity map for the region for each season. MUMM's conclusion was that the BRISK approach was applicable for BE-AWARE however the challenge was to adapt it to a wider North Sea context, considering the different sensitive features, subsea spills and more consideration of socio-economic considerations.

9.5 The sensitive features that could be included in the Bonn Agreement area include examples, such as the Dogger Bank and Frisian Front (both Natura 2000 sites), as well as deep water species, including those on the OPSAR list of threatened and/or declining species. The OSPAR regional socio-economic analysis, which is part of the initial assessment of the EU Marie Strategy Framework Directive (MSFD), is underway but this is a challenging task as the way data is collected is different in each country. Given the heterogeneous and detailed nature of the study it could be too detailed for

the BE-AWARE analysis but perhaps the more qualitative guidance in the IMO Resolution A.949 (23) - Guidelines on places of refuge for ships in need of assistance and IMO/IPIECA Report on Sensitivity mapping for oil spill response could be of more use in selecting socio-economic sensitive features.

9.6 For ranking the socio-economic features there are two approaches that might be of interest to BE-AWARE - the CEDRE Index and the DNV method. The CEDRE index is based on length of interruption of an affected activity/service and keeps the socio-economic Index separate from ecological/geomorphological Index. Whilst the DNV method sums up ecological and socio-economic sensitivity giving a ranking based upon 4 factors: natural occurrence, compensation, conservation value and sensitivity towards oil. However, if the feature is of natural occurrence for the area the sensitivity is double or if the sector cannot be compensated the sensitivity is doubled. This prevents the socio-economic sensitivity overriding the ecological sensitivity.

9.8 The Secretariat asked why DNV had chosen to double the sensitivity and was informed that it was to give more weight to ecological sensitivity, however, MUMM would discuss the methodology in more detail with DNV in the near future and would raise this point. The Secretariat also highlighted that the OSPAR MPA's should be included as well as the list of threatened and/or declining species. Belgium asked if OSPAR had habitat and species maps and was informed that these were available. Norway suggested that the outcome of the Safety at Sea project should also be taken into account.

Action: MUMM to discuss methodology with DNV

9.7 It was concluded that the Bonn Agreement work was a good learning experience, the BRISK approach could be considered best practice and the Task F workshop in early 2013 should consider an adapted 'BRISK' method with additional features and steps for the North Sea context.

10. BE-AWARE Task H: Risk Assessment

10.1 Dr Albrecht Lentz, COWI, introduced Task H: Risk Assessment by outlining the model flow and highlighting the stage that BE-AWARE project would reach. A first part of the risk assessment was the analysis of the 350 GB of AIS into a density plot of 500x500m resulting in over 5 million individual segments (7 times more than generated for the BRISK project). The density plot could then be used to develop a route net, however this should be less detailed. The example of the Dover Straight gave an overview of how the density plot was transformed into a route net. There was a gap density plot in the Northern part of the North Sea due to lack of AIS coverage, however this could be fixed using an algorithm, but the more challenging part was ships visiting platforms as they could not be as easily picked up by AIS leaving the area of poor coverage. Once the route net was complete a lateral deviation model would be used to provide input to the modelling of accidents and oil releases.

10.2 The modelling of accidents had yet to start but would be mostly based upon the process in the BRISK project, however drifting groundings would be done using a physical model rather than only being based upon statistics. The modelling of ship-ship and groundings is a three step process firstly calculating accident frequency, secondly the frequency of spill in a given accident and thirdly the distribution of spill size in a given spill. Accidents involving offshore installations would be

modelled by MARIN and fire and explosion, damage and foundering due to other causes, STS operations, bunkering at sea and collisions with ships at anchor would be included in a more basic way. The advantage of this approach was that it assessed all routes and locations, all ship types, all ship sizes, all oil types, all spill sizes and therefore gave the complete picture.

10.3 Norway was impressed with the quality of the work but highlighted the gap in AIS coverage in the North Sea and pointed out that there was commercial coverage (North Sea filter) on some of the platforms. However, this is not common knowledge. COWI highlighted that it would be difficult to go back and include raw AIS data but if there were a clear picture of vessel movements in the area it could be used to validate traffic modelling.

Action: COWI to contact Norway in relation to AIS data gaps.

10.4 The Secretariat enquired as to how the project results would be presented and if they would follow the same format as in the BRISK project and was informed that they would. COWI outlined the benefits of using the bubble approach to highlighting the risk, rather than using for example a coloured grid approach, as it really allowed the high risk areas to be identified in relative terms. In terms of displaying the results in an electronic format COWI would be able to provide them in shape files as well as jpegs.

10.5 France asked COWI how they dealt with routes that only had one or two vessels and how they scaled up the route net for the 2020 prognosis. During the route net development they tried not to just establish routes for very small numbers of vessels but where this was essential the route nodes would be placed at large spacing's, such as 10-20 miles, so that the algorithm would select the correct route. For the 2020 prognosis based upon the work undertaken by MARIN the individual route would be adjusted by a factor to include future developments.

10.6 Norway highlighted that they thought there was data missing in the German Bight area and wondered if this would be supplied. Germany could not confirm if the data had been included but suggested that if further data was required this should be applied for formally. Denmark informed the group that when they had requested the data from the server in Copenhagen they were told the German data was included and had received permission to use it in this project, which was confirmed by Germany. COWI stated at this point they didn't need more raw AIS data but that if there was more general information about ship numbers going in and out of Hamburg port or Elbe River, for example, this would be helpful in validating the traffic model. Germany thought some of this data had been supplied already but if not would be willing so submit additional information.

Action: COWI to check data in Tack C database and Germany to supply COWI with more general shipping numbers for the German Bight area if necessary.

10.7 The Secretariat asked if all the ships coming from Russia into the Bonn Agreement area would be captured and was informed by Norway that Ships transiting to the USA mostly change route near the Lofoten Islands and therefore do not go through the Bonn Agreement area and those heading to Rotterdam followed the coast. The Secretariat also asked MARIN if there were any areas that could already be identified as potential case study areas and was informed that work had yet to start but it should be in an area where the risk was already know so that a comparison could be made.

10.8 The Secretariat asked COWI if they had any view on whether the density plots should be shared or used for communication purposes and was informed that care should be made to mark them as preliminary results to avoid confusion and the difference in the density of data in Danish waters should be highlighted. Germany highlighted that they thought the intensity of shipping into Hamburg looked low and were informed that this may be due to the colour scale used on the map where dark blue as no shipping and black was high intensity.

10.9 The Netherlands suggested that a map of the AIS coverage in the North Sea should be included to highlight the gaps. Belgium also thought that it would be valuable to show in the results that BE-AWARE had taken this into consideration. COWI felt that as the data set was heterogeneous the project should avoid using the whole North Sea picture for communication purposes and rather focus on areas which we knew were homogenous, such as the Dover Straight or Irish Sea, therefore reducing the need for additional explanations, which was agreed.

Action: The Netherlands would send a map of AIS coverage to COWI and COWI would provide the Secretariat with a density map of the Dover Straight area.

11. Conclusions

11.1 The Chair outlined the aims of the final session inviting questions for clarification, any final comments, take home messages and any action points. The Secretariat started the tour de table by suggesting that as Task H is quite long there should be some intermediate dissemination of information/opportunities for clarification and proposing the World Maritime University as a potential venue for the final conference. In terms of general remarks the project was on track, CP's had been informed and the interest of stakeholders was welcomed. For take home actions the Secretariat would follow up on the SSN data, inform Contracting Parties at the Bonn Agreement annual meeting in the following days and update the incoming Secretary Dr Darius Campbell.

11.2 The Common Wadden Sea Secretariat thanked the presenters for the high quality of the presentations and noted the quality of the dataset collected. The project as a whole was great interest to the Wadden Sea area particularly after the recent Katia and Flaminia incidents and the results would be keenly followed.

11.3 Peter Poulsen noted that it was a shame that not all contact points for Task C had been able to attend as there was still some data missing. As an action point Peter proposed following up with the Secretariat and MARIN to identify the remaining missing data and to collect this as soon as possible. Demark highlighted that the seminar had been successful in bringing all the Contracting Parties up to date with the project implementation and their take home message would be that the project was on track.

11.4 Belgium noted that at the start of the project they had been worried about whether it would be possible to collect all the data required but now felt confident that the remaining gaps could be filled. The cooperative approach taken so far was encouraging and the consultants were thanked for their high quality work. In terms of actions points there was still some data collection to

follow up on including the accidents/incidents and work would continue with the sensitivity task including a workshop in the spring.

11.5 COWI thought the seminar had been very productive and held in a very good atmosphere. The opportunity to go through the project tasks in detail was very timely, for example identifying gaps in the AIS data, and would save much time later in the project. It was also noted that phase 2 of the project needed to considered soon and that COWI were willing to participate in those discussions.

11.6 Sweden felt the workshop was well organised but noted that the project was still a work in progress. Germany noted that it was important for them to know the project was developing well and to be aware of what additional data needed to be submitted, as the data collection contact point could not be there due to the Flaminia incident.

11.7 Norway noted that the project was "state of the art" in terms of risk assessment and highlighted it was important for them to be able to provide feedback at the national level on the progress. One area where action was needed however was offshore installations and it would be important to describe the system in operation around platforms in the final report. Finally it would be an important action to ensure that the project results were disseminated widely.

11.8 France noted that it was a very interesting project and the most important stages were ahead in terms of identifying the high risk areas in the North Sea. In terms of points of clarification there were two points which need further clarification: Would the impact of the error bars in the lateral deviation model on the frequency of accidents be elaborated in the future reports and would the 2020 prognosis use a different route net? COWI informed the seminar that they would investigate the impact of wind farms on the route net in the next few days but did not expect major changes.

Action: COWI to investigate the impact of wind farms on the 2020 prognosis route net.

11.9 Ireland welcomed the progress in the project and noted that they were currently undertaking an ETV feasibility study which had also looked into LRIT data off the west coast of Ireland and if this could be used to augment the AIS data for this area they would forward it to the project. The Netherlands noted that it was good to see the progress in the project and that following the clarification of accidents and incidents they would check the data they had submitted to the project.

11.10 MARIN thanked all the CP's for their effort in collecting the data, which was vital for the success of the project, including the data from SSN and welcomed the input from the participants at the seminar. The UK stated they had high confidence in the outcome of the project and would take home the information on sensitivity ranking which was not currently being undertaken within the UK.

11.11 Finally the Secretariat summed up the outcomes of each task addressed at the seminar and thanked Norway for their hospitality as hosts before the Chair closed the meeting.