

BWEA

BMT NAVIGATIONAL RISK MODELING GUIDANCE CONSULTATION

The BWEA welcomes the chance to comment on the guidance. It is felt that the issue of safety and navigation is an issue that needs to be successfully addressed in order for developers to gain consent. Any guidance as to how this can be done and to give more certainty to the process is strongly approved.

Analysis of the Guidance

At a higher almost strategic level

1. It is appropriate that Navigational Risks Assessments (NRAs) are undertaken.
2. That NRAs should be undertaken in a consistent way
3. That Hazard Logs are used as the key tool to undertake a NRA.
4. There are concerns over the requirement to undertake modelling using BMT's DYMITRI and COLIDE models.
5. There are concerns over which of the several models available should be used.
6. The time scale of the final guidance and when developers are expected to complete NRAs in line with the guidance.

Addressing of the points in more detail:

1/. From a Developers perspective it can only help to understand and consistently apply the risk assessment process. It is of course appropriate that a risk assessment is part of the approval process.

2/. These are marine risk assessments and so should be conducted with IMO requirements [\[1\]](#) in mind, as this will ensure international compatibility and consistency. It would also be logical if they were undertaken in the same way and to the same standards as those for assessing the need for a new traffic separation scheme, Vessel traffic service etc. The requirements for these are also set by DTi/MCA.

3/. It is appropriate to use a Hazard Log to undertake this assessment. That is to undertake a HAZID and HAZOP to identify the key risks and then set out ways to manage these identified risks to ALARP (As Low As Reasonably Pratical). It is also appropriate to cast these risks onto a risk matrix to allow them to be easily interpreted and ranked. BWEA suggests:-

- 3.1/ If a Dt/MCA hazard log is developed for OREIs, and this is what must be considered in an NRA, then this can only be a living document. As new developments and new circumstances may lead to additional or new hazards being identified, which had not been previously contemplated, and
- 3.2/ It would be appropriate for BMT to review several submitted NRA's to ensure that their draft Hazard Log is as complete as possible.

4/. It is appropriate that the highest and most chronic risks should be studied in more detail and more care taken in considering the risk reduction measures to be applied. However, these highest and chronic risks may not be the collision or grounding of ships passing off the OREI. Yet, this is the area that is very heavily focused on by this study.

Thus BWEA have concerns over the explicit need to undertake computer modelling using BMT's DYMITRI and COLIDE models on a number of levels:

- 4.1/ Firstly there is the implied assumption that ALL developers would have to model the traffic flows around their sites using BMT's DYMITRI software. This to us seems to be overly prescriptive.
- 4.2/ If modelling is required to be undertaken then BMT's report should include an evaluation and comparison of DYMITRI and SAMPSON (Marin's model) as well as the models developed by Bureau Veritas and Germanischer Lloyd two of the major ship classification societies. This would allow DTi/MCA to recommend and the Developers choice the best and most suitable model.
- 4.3/ The purpose of the modelling appears to be to establish a base risk and the change of risk with the OREI in place. It seems to BWEA that the decision to licence a site should based on the principle that :-
 - a/.The risks are acceptable and
 - b/. That they are as low as practical.

Consequently simply identifying the change of risk does not assist with this process. Therefore it should not be a decision element of the NRA.

4.4/ However, BWEA can see that such modelling would be of assistance in helping decide the merits of two different sites or different layouts. Thus this tool is more appropriate to the conceptual planning phase before a Crown Estates lease is granted or in the early stages of planning to optimise the proposed layout. By the time the NRA is submitted the site layout has been optimised to reduce, amongst other things the collision risks and the sites impact on shipping. There are doubts that these models could reliably indicate the increase or decrease of collision risks. However, BWEA believe that changes in traffic density can be reasonably predicted and this can be used as an indicative tool for the assessment of collision risk.

4.5/ It should also be borne in mind that modelling in general tends to reduce the perception of risks because the risks are better understood by the modeller and assessor. A classic case was demonstrated by the use of the COLIDE model to show that ship to turbine collisions could be avoided by certain actions or managed to a satisfactory conclusion. However the general precautionary principle should be applied and this would consider the consequences of the right actions not being taken. Thus, this type of modelling should not be used for an NRA.

5/. Until an analysis and comparison of the various models has been undertaken then there must remain concerns over accuracy compatibility and comparability between them. Thus Developers and Dti/MCA must have concerns over which model to use and how to compare studies undertaken using different models.

BWEA believes there are two options :-

5.1/. Either, a dictated choice.

This provides easy compatibility and comparability of results from different submissions. It also simplifies interpretation. There would be a need to fix the factors/multipliers and constants used within the model for all users and these would have to be robust to prevent future challenges to the results. This would create a monopoly on this type of analysis for the owner of the model. However, this is the route that the Dutch Government are following for their NRAs. If adopted for the UK sector then there would be some logic in using the same software across the whole of the North Sea.

5.2/ Or, a free choice,

This is likely to provide better modelling as the most appropriate model can be selected for a particular site. However, interpretation of the results and comparison would be much more difficult. There could also be differences in opinion on the factors/multipliers and constants used within the model allowing challenge to the results or requiring the running of many sensitivity calculations.

6/ BWEA asks for clarification as to when NRAs are expected to be in line with BMT guidance. At the moment the guidance is MGN275. BWEA asks for clarification as to whether this is sufficient at the present time. BWEA hopes that the DTI/MCA can issue some intermediate advice - before the final guidance is released - expressing a time table of when developers need to start using the guidance. Also if there are any situations where developers may be exempt from using it.

Analysis of specific points:

1. In the summary at point 3 the term Hazard Log is used. In many places through the oil and gas industry this is synonymous with a HAZID or HAZOP the process that identifies the risks. There is clearly a further step to take after the HAZID, that of assessing the risks. It would help many readers if this were made clear.
2. In the summary at point 4 there is a requirement to define the 'risk controls' that will be put in place. It would be more appropriate to record all the risk controls that could be put in place and then select the ones that will be used on a project on a need and cost effectiveness basis. (This would then be in line with IMO and other guidelines).
3. At Section 5.2.5) the papers note that 'that the evidence is quality checked and verified. Such as radar data, AIS data qualitative and quantitative risk assessment' Is it really necessary to check by all these means? or is this a typo and 'and' should read 'or'?
4. Section 6.2 discusses the acceptance of individual risks by setting them against a risk matrix. It is proposed that a 4x4 matrix as suggested by IMO is used. Experience in offshore oil and gas has shown this to be only a rough tool and the process is better served by using a finer matrix, perhaps 5x6 or even 8x8.
5. Section 6.3 discusses the acceptance of an overall level of risk. It concludes that a Hazard Log may not be sufficient to assess these levels as many of the risks are interrelated in both cause and consequence. It is true that some risk reduction measures will principally effect the consequence and other measures the chance of it happening, but many will effect both. This problem can usually be overcome by the use of a larger risk matrix where the smaller effects can become apparent. This can then eliminate the need for quantitative assessment with its associated calculations of probability. It will be remembered that these calculations were ridiculed in several of the round one NRA's as being unrealistic.
6. At section A.1.2 there appears to be a requirement that the NRA must be supported by Oil spill and Search and Rescue modelling. Indication from the presentation was that these should be carried out in detail with the aid of computer modelling. While it is appropriate that these areas should be properly addressed in an OREI's emergency response plan (which is prepared at a latter stage of the development) BWEA does not believe it appropriate to carry out this detailed computer modelling for the NRA.
7. At section B2 there is guidance set out on predicting future levels of traffic. This is an area that is notoriously difficult to predict and the predictions made have rarely matched reality. For example, the method proposed would not have predicted or captured the dramatic crude oil price changes. These effect both the cost, pattern, nature and type of trade in an area. Further, most local changes are step changes not smooth progressions, trying to capture these by analysing past data is likely to be ineffective. However, it is appropriate that some test is made to ensure that an OREI does not limit future shipping movements, this could be undertaken by conducting a simple sensitivity calculation, say at 20% and 40% above current levels and/or a brief review of local ports development plans.
8. At section B.3.1 point 2 the Developers are asked to include 'The positioning, configuration, and structural details of the development'. At the time the NRA is commissioned the positioning and configuration are well defined, but the structural details may not be, as this is typically decided by the EPIC contractor when the building contract is let. Thus Developers may have difficulty in complying with this instruction except at a conceptual level or by including several options.

9. At section B.3.4 there is no mention of fishing with drift nets, sport diving or kite boarding. Nor, of future cable and pipeline installation activity or of high speed and sub sea craft.
10. At section B.3.9 there is no mention of Traffic separation schemes, VTS, adjacent hazards and shallow water, all of which influence how a Master navigates his vessel through an area.
11. In section B3 there is now no mention of the assets supporting safe navigation. (This was originally included in table 5.5 of the 24 March 2005 papers.) BWEA believes that these should be included and even expanded to include vessel to vessel calling using VHF and DSC.
12. At section C.2.1 the marine traffic modelling scenarios are set out diagrammatically. The indication is that the output from the model will be a navigational risk based upon calculating encounter frequencies. But encounters are a probability and risk has two elements probability and consequences. The consequences of a collision do not appear to be addressed here and they are critical for vessel type, cargo, speed and angle of blow will all determine the consequences of the collision, which may range from scratched paint to foundering with a major oil spill.
 13. At Section C.2.3 the capabilities of the model are set out. One area to be modelled is ship behaviour, this is in practice a hugely difficult area to reliably model and errors in modelling this will have significant effects in predicting encounter rates. This should be only undertaken with an extremely robust and well proven set of algorithms which have been independently examined and tested and the constants/factors used in them well investigated and proven.

This section also notes that ships 'should' have the ability to slow down and accelerate. BWEA believes that this is a 'must' as the COLREGS call for this ability as a collision avoidance option.

14. Section D.4.7 calls for the use of FN curves to assess the risks. From the quality and range of data we have on offshore windfarm operations to date we would have serious doubts that this analysis could be reliably undertaken.
15. The Hazard Log is a useful tool and one that is likely to grow in detail over time. Large hazard logs can become difficult to analyse. One technique to reduce the amount of presented information is to use the Hazard Log to develop Worst Credible Scenarios. These have the advantage of being more readily understood and by addressing these highest hazards the other hazards identified are also addressed. BWEA asks that these Worst Credible Scenario techniques should be allowed , or even encouraged in the preparation and presentation of the NRA.