

# IMMINGHAM EASTERN RO-RO TERMINAL



Applicant's Review of DFDS' Navigational  
Risk Assessment

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## 1 Introduction

- 1.1.1 At Deadline 2 of the examination, both DFDS Seaways (“DFDS”) and Associated Petroleum Terminals (Immingham) Ltd (“APT”) as operators of the Immingham Oil Terminal (“IOT”) submitted what are purported to be alternative Navigational Risk Assessments (“NRA”) – alternatives to the formally prepared NRA submitted by the Applicant as part of its application for the Immingham Eastern Ro-Ro Terminal (“IERRT”) Development Consent Order (“DCO”).
- 1.1.2 Both alternative NRAs share similar traits – for reasons discussed below – but not least because the principal author of both NRAs was Nash Maritime, albeit instructed by different clients with different motives and objectives.
- 1.1.3 This report provides a review of and commentary on the DFDS alternative NRA (“the DFDS NRA”). A review and commentary of the IOT Operators’ alternative NRA is provided as Document Reference 10.2.57.
- 1.1.4 DFDS commissioned Nash Maritime to produce a document which describes itself as “Immingham Eastern Ro-Ro Terminal Navigational Risk Assessment” **[REP2-043]** (“the DFDS NRA”). It is evident that it was produced sometime during August 2023 during the course of this examination as part of DFDS’s representations in respect of the Proposed Development.
- 1.1.5 For reasons briefly summarised below, although the document purports to be an NRA in respect of the Proposed Development, it lacks some of the most basic requirements to be an NRA as identified below. As a consequence, it is wrong to treat it as such and as a substitute or proxy for the NRA that has been properly produced for the Proposed Development by ABPmer in relation to the DCO Application.
- 1.1.6 Although there are many points of detail that could be elaborated by way of criticism of the DFDS NRA in purporting to be an NRA of the Proposed Development, this review focuses on the key points which make the DFDS NRA inherently unsuitable for use as an NRA and which reveal why it does not in any way undermine the Applicant’s NRA that has already been produced and which presents a full and comprehensive NRA in respect of the Proposed Development.
- 1.1.7 The structure of this document is as follows:
- Section 1 – Introduction;
  - Section 2 – NRA Methodology;
  - Section 3 – Stakeholder Engagement;
  - Section 4 – Decision Making and the Statutory Harbour Authority;
  - Section 5 – DFDS NRA;
  - Section 6 – Conclusion.

## 2 NRA Methodology

- 2.1.1 This section of the document summarises the methodology that is followed when undertaking NRAs.
- 2.1.2 It should be noted at the outset that there is no policy or legislation in the UK that dictates the format of an NRA to support a new development. The Port Marine Safety Code (“PMSC”) [REP1-015] sets out policy and guidance that relates to statutory harbour authorities, jetties, terminals and marinas. In so doing, however, it is not purporting to dictate the specific requirements of an NRA or risk assessment for a particular project.
- 2.1.3 As a consequence, over the years, consultancies who provide NRA assistance to clients have constructed and refined their own templates, based on feedback from a range of clients.
- 2.1.4 It is unsurprising, therefore, that different consultancies may have different approaches to the format of NRAs depending upon what project is being assessed. However, individual preferences in presentation are not based upon any formal or mandated requirements. The term NRA is not a specifically defined term. Most consultancies that offer NRA services generally consider that risk assessments within NRAs are largely intended to consider the risks associated with the navigation or movement of vessels. Within that context, risk assessments within a Marine Safety Management System (“MSMS”) may cover a number of navigational risks, whilst also considering other risks to which a port might be subject that concern port and/or marine safety.
- 2.1.5 The outcomes of NRAs produced during the consenting stage of new developments are later incorporated into MSMSs for ports where they are continually reviewed (see Section 4 below).
- 2.1.6 Whilst the PMSC does not dictate the specific requirements of an NRA, when considering the guidance in the PMSC and its associated Guide to Good Practice (“GtGP”) [REP1-016], it is clear that most NRAs contain certain core elements which are included by consultancies like ABPmer, Anatec, Marico Marine and Nash Maritime.
- 2.1.7 These core elements include the following:
- Introduction and Policy review;
  - Data sources (Wind, Tide, AIS etc.);
  - Baseline assessment (existing review of navigation, usually accompanied by review of incidents and traffic in the study area);
  - Description of proposed change/development (if applicable);
  - Risk assessment approach and details (tolerability/acceptability, descriptors, matrices);
  - Hazard Logs (detailing risks with controls, causes, outcomes, usually produced as a result of HAZID workshops); and

- Discussion (of findings).
- 2.1.8 Some consultancies also consider a 'future baseline', where statistics and industry inference are taken into account to describe a potential future that may occur at the port. For example, on a macro scale across the UK, there is a common trend that the total freight by tonnage is increasing whilst the number of vessel movements is either constant or reducing as a result of the use of larger vessels and a consequential reduction in the number of ships being used.
- 2.1.9 It is important to note, however, that there is no agreed standard on any of the core elements of information listed above, nor any policy or regulatory requirements as to what has to be included by way of a 'navigation baseline' in an NRA.
- 2.1.10 By way of example, there is reference in the GtGP, in paragraph 4.3.10 - "*Taking stock covers a review of: the adequacy and completeness of any established incident database or similar records;*" that historic incidents should be considered but there is no guidance or advice provided as to how this could or should be satisfied, for example by means of an incident-by-incident approach or by consideration of spatial data plots. These are matters of choice for the author of the relevant NRA, with the ultimate arbiter as to whether the NRA provides sufficient information being solely a matter for the Statutory Harbour Authority (see Section 4).
- 2.1.11 It is wrong in principle to suggest that a particular approach to presentation of data or information is correct or incorrect. This misunderstands the process that is applied to NRA and the exercise of judgment by relevant authors which is ultimately overseen by the decision of the Statutory Harbour Authority.
- 2.1.12 With a view to enhancing marine safety within a port and harbour approaches, a positive analytical approach is required, including the consideration of past events and accidents, examining potential dangers and the means of avoiding them. The process of assessment is continuous, so that new hazards and changed risks are properly identified and addressed in the MSMS (see Section 4). The aim of risk assessment is to define risks so that they can be managed.
- 2.1.13 Assessing risks to help to determine precautions can be qualitative or quantitative. Quantified risk assessment is not a requirement and may not be practicable. Risk assessments should be undertaken by competent people, especially when choosing appropriate quantitative risk assessment techniques and interpreting results.
- 2.1.14 Risk assessment techniques are fundamentally the same for large and small ports, but the execution and detail will differ considerably. A risk assessment will typically involve five broad stages, which are described in turn below:
- Problem identification, scoping and risk assessment design (data gathering)
  - Hazard Identification ("HAZID")

- Risk Analysis
  - Assessment of Existing Risk Control Measures
  - Identification of Additional or Future Risk Control Measures
- 2.1.15 **Problem identification, scoping and risk assessment design (data gathering)** – Anybody undertaking a risk assessment has to start by taking account of the organisation, its culture, policies, procedures and priorities together with an assessment of the existing safety management structure.
- 2.1.16 Key to this part of the process is to engage with those working in and using the port. Port users affected by a particular risk should be informed and involved. It is likely to involve a structured process.
- 2.1.17 Taking account of the existing situation covers a review of the adequacy and completeness of any established incident database or similar records, as well as considering the current management procedures, including; pilotage, navigation management (LPS/VTS), hydrography, conservancy, and marine operations. Additionally, this will typically involve reviewing Marine Accident Investigation Branch (MAIB) reports and other investigative reports which make recommendations about incidents which have taken place in a harbour.
- 2.1.18 **HAZID** – This stage should involve the identification of hazards (something with the potential to cause harm, loss, or injury) that arise from the proposed project in the context of the existing navigational environment. Any list of hazards will include those already known to the port, including identification of the causes of previous incidents if known.
- 2.1.19 Within the process of hazard identification and risk assessment, ports should have due regard of the link between the port authority and terminal/vessel operators. Structured meetings or workshops need to be held during this process involving relevant marine practitioners. Port users, including groups such as Pilotage Exemption Certificate (PEC) holders, commercial operators, and tug operators is required (PMSC GtGP; [REP1-016]).
- 2.1.20 This stage should also identify the potential outcomes if the identified events were to happen (scenarios). One useful approach is to consider both the most likely and the worst credible outcomes (set against likely frequency of the event happening in each case). This approach provides a more realistic and thorough assessment of risk, which reflects reality, in that relatively very few incidents result in the worst credible outcome. On a standard 5x5 risk matrix used by many ports, these incidents score highly for outcome, but this is tempered by a low score on the frequency axis.
- 2.1.21 **Risk analysis** – The hazardous scenarios identified then need to be prioritised. A method which combines an assessment of the likelihood of a hazardous scenario and its potential consequences should be used. This will be a matter of judgement crucially informed by the relevant marine practitioners and likely to be best appraised by those with professional responsibility for managing the harbour, namely the harbourmaster and dockmaster.

- 2.1.22 The frequency of incidents can be established in part using historical data identified in the first stage of the work. It can be determined using a qualitative scale or on a “per-shipping’ movement basis, or a combination of the two. The likelihood of a hazardous incident and its potential consequences can often be determined with reference to historical data. However, it should be borne in mind that following an incident the risk of it reoccurring should have been reduced by management action. It therefore follows that any assessment of frequency and consequence is likely to rely to a certain extent upon the judgement of the assessors or others capable of making such a qualified estimate. Historical data alone will not provide a true assessment of the risk of the current operations, nor will it necessarily reveal an extremely remote event.
- 2.1.23 Risks and the impact of identified outcomes should normally be assessed against four criteria; the consequence to:
- Life (public safety);
  - The environment;
  - Port and port user operations (business, reputation etc); and
  - Port and shipping infrastructure (damage).
- 2.1.24 **Assessment of Existing Risk Control Measures** – Risk assessment necessarily includes a review of existing hazards and their associated risk control measures (embedded controls). As a result, new risk control measures (or changes/improvements to existing risk control measures) may be identified for consideration, both where there are gaps in existing procedures and where risk controls need to be enhanced. Some control measures might also be relaxed so that resources can be re-designated to meet a new priority. Care should be taken to ensure that any new hazards created as a result are themselves identified and managed. The overall risk exposure of the port organisation itself will be identified during this stage and will allow recommendations to be made to enhance safety.
- 2.1.25 **Identification of Risk Control Measures** – The aim of assessing and managing marine operations in harbours is to reduce risk as low as reasonably practicable (‘ALARP’). Judgement of risk should be undertaken on an objective basis and should not be influenced by the financial position of the authority. The degree of tolerable risk in a particular activity or environment can be balanced against the time, trouble, cost, and physical difficulty of taking measures that avoid the risk. If these are so disproportionate to the risk that it would be unreasonable for the people concerned to incur them, they are not obliged to do so. The greater the risk, the more likely it is that it is reasonable to go to very substantial expense, trouble, and invention to reduce it. Conversely, if the consequences and the extent of a risk are small, insistence on great expense would not be considered reasonable.
- 2.1.26 Risks may be identified which are intolerable. The decision as to whether risks are tolerable or intolerable sits with the appropriate authority, namely in the



case of the Applicant, the Duty Holder through the Harbour Authority and Safety Board rather than the authors of the NRA (see Section 4 for further detail). Measures must be taken to eliminate identified risks so far as is practicable. This generally requires whatever is technically possible in the light of current knowledge, which the person concerned had or ought to have had at the time. The cost, time and trouble involved are not to be taken into account in deciding what measures are possible to eliminate intolerable risk.

- 2.1.27 Where (as for the Proposed Development) none of the risks are considered intolerable with the (to be) applied controls, there is no requirement to eliminate activity or apply additional overly onerous (i.e., not reasonably practicable) controls to meet the tolerability thresholds set by the appropriate authority, the Harbour Authority and Safety Board.

### **3 Stakeholder Engagement**

- 3.1.1 This section explains the importance of stakeholder engagement in the NRA process.
- 3.1.2 As identified in considering the methodology above, whilst there is no specific style or format that has to be adopted for a NRA, any proper NRA will necessarily involve stakeholder engagement in the risk assessment process.
- 3.1.3 That engagement concerns both the identification of relevant hazard scenarios, their frequency and consequence, and how such hazards are to be addressed.
- 3.1.4 That does not mean that all stakeholders will necessarily agree, or have to agree, with the approach adopted in a NRA, or with the judgments that are reached. Whilst one should strive for consensus, it is in fact commonplace for there to be a range of different views by affected stakeholders, depending upon the nature of their interest.
- 3.1.5 Any proper NRA will, however, be based upon stakeholder engagement where that includes not only taking account of other users of the marine environment, but also critically (and as an essential component) engagement with the relevant harbourmaster and dockmaster responsible for that marine environment.
- 3.1.6 This basic requirement is fully addressed in the Applicant's NRA. A critical part of that process was the holding of HAZID workshops to support the NRA produced for the DCO at which the considerations of all users was taken into account. It is essential to involve those working in and using the port and others in the risk assessment process and in subsequent reviews, as risks affect both port users and the harbour authority alike. It is equally essential, however, to realise that the input from users through this process does not dictate, nor should it be permitted to dictate, the objective assessment of risk by the SHA.
- 3.1.7 SHAs are required to identify potential hazards in light of (amongst other things) input from users, but they are also required to develop and refine procedures and defences to mitigate those risks to a level which is acceptable to the SHA bearing in mind the aspirations of users and what will often be

competing aspirations and demands of those users. It is good practice to establish channels of engagement which can be used for this purpose (such as the HAZID workshops). It is simply wrong in principle, however, to suggest that feedback from users through this process can be treated as determinative or that it should be allowed to dictate the outcome of how the SHA manages the safety of the port to what it considers to be acceptable levels.

- 3.1.8 As set out below in Section 5, and in direct contrast to the Applicant's NRA, the DFDS NRA is fundamentally flawed in this respect as it has not involved essential stakeholders including the harbourmaster and dockmaster.

## 4 **Decision Making and the Statutory Harbour Authority**

- 4.1.1 This section explains the key aspects in managing navigational risk and the role of the Statutory Harbour Authority in controlling navigational risks within its statutory area. It is important to understand this in the wider context of the various roles and responsibilities for navigational risk on the River Humber. To assist with this, the Applicant submitted a note on the management, control, and regulation of the Port of Immingham and the River Humber to the Examination [REP1-014]. Within that note, the roles of the Applicant, Statutory Harbour Authority for the Port of Immingham, the Statutory Harbour Authority for the Humber Estuary, and ABP's Governance is explained.

### 4.2 **Existing Controls, Operations and Standards**

- 4.2.1 As set out above, any proper NRA will necessarily need to consider all potential controls and a port's established operations and relevant standards of acceptability in reaching any conclusions about proposed changes. A failure to understand the current operating environment and standards that are applicable to it will necessarily undermine the validity of any purported NRA. Again, as set out further below, the DFDS NRA is also fundamentally flawed in this respect as it pays no proper regard to the existing safe operations at the Port of Immingham.

### 4.3 **Marine Safety Management System**

- 4.3.1 The PMSC relies upon the principle that relevant organisations will base their policies, and procedures relating to marine operations on a formal assessment of hazards and risks to their marine operations overall. They should maintain a marine safety management system (MSMS) developed from such risk assessments.
- 4.3.2 Any subsequent risk assessments deemed necessary as time goes on (either to update an existing situation or to address changes in the port's environment) are then reflected in subsequent updates to the MSMS which itself develops and evolves over time as a result of changes in (for example) trade, and port usage or physical developments. In this context. The outcomes of the NRA produced for the Proposed Development will be incorporated within the MSMS if the DCO application is approved.
- 4.3.3 Under the PMSC and consequential MSMS that is put in place, there is a critical appraisal of all routine and non-routine activities in any risk assessment work. Those involved should not just include employees, but

others including stakeholders who use the port including contractors and terminal operators.

#### 4.4 **Statutory Harbour Authority**

- 4.4.1 It is only the relevant Statutory Harbour Authority (“SHA”) that is the relevant decision maker for the control of navigational risks within their statutory area. It is the SHA that is responsible for assessing navigational risks and therefore how they are to be assessed and managed within their area. It is therefore fundamental that it is the SHA that has to be satisfied that an appropriate NRA has been conducted for its needs. There is no power and certainly no principled basis for a third party to direct a SHA, or to seek to dictate a SHA, to as to how the SHA should discharge its own duties and responsibilities. The SHA has the overall responsibility and competency to deal with navigational safety in the ordinary running of its area.
- 4.4.2 It is evident from the very recent production of the DFDS NRA (like the IOT NRA) which DFDS now claim to be their own “NRA” that the function of an NRA, the essential role of the SHA and the exclusive duty and responsibility of the SHA in decision-making is being misrepresented or misunderstood by the IOT Operators and DFDS.
- 4.4.3 The NRA is an assessment that has to be considered by the SHA to assess navigational risks in the environment for which it is responsible for regulating safely. It therefore necessarily requires the SHA to make the necessary judgments about those risks, the myriad ways in which those risks can be mitigated (where considered necessary), the tolerability of risks and whether they have been reduced to ALARP as judgments for SHA after any such mitigation.
- 4.4.4 In so doing, the Statutory Harbour Authority is not only fulfilling the essential functions that are imposed on it (and no other body) by statute, but it is also fulfilling its obligation to ensure the safe operation of the port in light of the risks identified having regard to the interests of all users.
- 4.4.5 The River Humber is subject to navigation by a wide range of users from small leisure craft to very large commercial vessels, some transporting petrochemicals in tankers. This of itself creates a notional risk between the interaction of such craft navigating in the same area. The SHA has to consider the needs and aspirations of all such users in assessing risks and managing them to what it regards to be acceptable levels in practice. The fact that users of large commercial vessels might ideally wish to see leisure craft prevented from using the spaces that it wishes to use to reduce the risks and leisure craft might seek the same in reverse does not dictate the outcome of the Statutory Harbour Authority’s NRA of such interactions.
- 4.4.6 By the same token, the River Humber is already subject to navigation by Ro-Ro vessels operating on a daily basis and seeking access to ports like Immingham in proximity to an oil facility such as that at IOT. Again, the fact that such interactions will inevitably involve residual risks, with competing commercial aspirations of users such as Ro-Ro operators and the operators of an oil terminal does not dictate the outcome of the NRA by the SHA as to

how to manage those risks to what it considers to be tolerable levels. It is the Statutory Harbour Authority that decides what is tolerable and ALARP in all the circumstances.

- 4.4.7 In each of the simple examples above, there will not only be identification of relevant risks and controls and mitigation measures, but a subsequent judgment to be made what is tolerable and ALARP, but with the integrated step of assessment of the risk and means of mitigating it to a tolerable and ALARP level, having regard to the needs and aspirations of different users. Thus, taking the second example above, there are a number of ways of managing interaction between such marine traffic to reduce risks to what the SHA consider to be acceptable. These may include controlling or restricting use by leisure craft in areas or operations (e.g., not operating under sail, or not exceeding certain limits or not operating in certain areas when ships manoeuvring etc), or controlling or restricting use or operations by commercial traffic (e.g., not operating at certain times of tide or in certain wind conditions, requirements for use of a pilot, requirements for use of tug or tugs etc) or a combination of any that takes account of the interests of both users, rather than simply restricting one user in preference to another.
- 4.4.8 The SHA is the decision maker on what activities can occur within its respective harbour authority area. The SHA needs to be satisfied that a risk assessment conducted for those purposes is appropriate. If the SHA does not believe that a risk assessment has been conducted to a sufficient standard, it is bound to discount it. Similarly, for an external body to attempt to direct an SHA to act in a certain way would be an unacceptable interference with and impinge upon the SHA's powers and duties.
- 4.4.9 As explained below, the DFDS NRA falls into the fundamental error of seeking to impose its own expressed judgments (without any actual and genuine stakeholder engagement with key bodies like the Harbour Master or Dock Master Humber and without any understanding of existing port operational standards and measures) as if it represented judgments on tolerability or ALARP which could be substituted for the views of the SHA. That is simply not the case.

## 5 **DFDS NRA**

### 5.1 **Introduction**

- 5.1.1 This section provides a review of the "Immingham Eastern Ro-Ro Terminal Navigational Risk Assessment" **[REP2-043]** that was undertaken by Nash Maritime on behalf of DFDS (i.e., the DFDS NRA).
- 5.1.2 As already noted, much of the document that has now been produced as the DFDS NRA contains material to which it is unnecessary to provide any direct response in that it simply reflects the presentation of data (albeit in a different format or style to that in the Applicant's NRA). It is not material which either advances the position or undermines the Applicant's NRA.
- 5.1.3 This section, therefore, concentrates on the key parts of the DFDS NRA as purporting to represent a different assessment of risk to that which was

presented in the Applicant's NRA (the latter which has already been considered and endorsed by the SHA and the "Duty Holder").

5.1.4 The review of the DFDS NRA has been undertaken in the context of the fundamental principles outlined in the preceding sections of this document and is structured as follows:

- Stakeholder engagement;
- Risk scoring;
- Assessment of tolerability; and
- Use of risk controls.

## 5.2 Stakeholder Engagement

5.2.1 As identified above, one of the most basic requirements of any NRA is appropriate stakeholder engagement throughout the NRA process. The PMSC GtGP states in paragraph 4.2.6 that - *'It is essential to involve those working in and using the port and others in the risk assessment process and subsequent reviews and development, utilising their specialist knowledge and skills'*.

5.2.2 This does not mean that every stakeholder has to agree, or that there is a requirement for consensus. Many stakeholders will often disagree and inevitably have different priorities and objectives and consider their operations to be more important than others or wish to prioritise their operations over others or seek to obtain the most favourable operating conditions for their own commercial operations. It is important, however, that genuine engagement actually takes place including with those responsible, and most experienced, for the safe operation of the marine environment including the Harbour Master and Dock Master.

5.2.3 It is evident that the DFDS NRA has failed to conduct an appropriate level of stakeholder engagement. At its most basic such engagement would be expected with the Applicant, as the port operator, but also the Harbour Master, Dock Master and the various persons involved in operations such as the pilots, tug operators, VTS and, of course Stena, the proposed operator of the Proposed Development. Stena's own Masters would be responsible for navigating the particular vessels in this location for this development, even when operating under a compulsory pilotage direction, pilotage by HES pilot or under an act of self-pilotage with a pilot exemption certificate (PEC). The DFDS NRA has only considered DFDS's own view as a port user.

5.2.4 As a result, the frequency and consequence of risks along with potential control measures, does not take into consideration the expertise of those personnel that are most familiar with and currently or will operate within the Port of Immingham.

5.2.5 This is in direct contrast to the NRA produced by ABPmer for the Applicant's DCO submission **[APP-089]**, as part of which full stakeholder engagement was undertaken.

### 5.3 Risk scoring

- 5.3.1 Risk outcomes within the DFDS NRA are scored and then averaged to reach an overall score as a single number which is then used in order for the authors to describe whether the risk is acceptable by reference to their own choice of scoring. This approach is oversimplistic and does not take into consideration the fact that risks can not only affect more than one receptor (such as people, property, planet (environment), port (business)), but that the scale of effect on these receptors can be very different.
- 5.3.2 Within the Applicant's NRA, the review of risks has been undertaken against criteria of tolerance/acceptability across each of the receptor types. This prevents a risk that scores highly for one receptor from being hidden by lower risk outcomes for other receptors by reducing the average. For example, using the approach adopted in the DFDS NRA, a risk that could be considered to be intolerable to people could be masked if it scored lower for property, planet, and port.
- 5.3.3 Furthermore, the approach taken within the Applicant's NRA is consistent with the approach taken to risk assessment across the ABP Group which considers all four receptor types individually when evaluating port operations.

### 5.4 Assessment of tolerability

- 5.4.1 Fundamentally, the DFDS NRA fails to take into account the appropriate standard of acceptability of risk (i.e., tolerability) as set by the ABP Harbour Authority and Safety Board (HASB). The approach is therefore not in accordance with the PMSC GtGP.
- 5.4.2 The PMSC GtGP states that '*A safety management system should be informed by and based upon a formal risk assessment of the port's marine activities (routine and non-routine), a documented, structured and systematic process comprising; the identification and analysis of risks; an assessment of these risks against an appropriate standard of acceptability...*' (Section 4.3, page 33). The HASB has determined this appropriate standard of acceptability (i.e., tolerability), which has been published in the Applicant's NRA.
- 5.4.3 Instead, the DFDS NRA assumes or supposes a standard of acceptability for the Harbour Authority. Neither Nash Maritime nor DFDS is in a position, nor do they have the authority, to make such an assumption. Further, neither Nash Maritime nor DFDS sought to seek to discuss or agree levels of tolerability with the SHA. This approach is both inappropriate and unacceptable as it trespasses on the SHA's statutory powers, duties and obligations. To allow one operator to set its own standards of acceptability (with all of the flaws already identified) would seriously compromise, to a fundamental degree, the SHA's ability to discharge its duties and responsibilities to determine how best to manage safety within an area for which it is statutorily responsible.
- 5.4.4 In direct contrast, the Applicant's NRA has evaluated risks in accordance with the tolerability thresholds set by the HASB, and as such is in full alignment with the requirements of the PMSC GtGP.

## 5.5 Use of controls

- 5.5.1 As identified above, proper consideration of the use of controls in considering any risk is essential for any NRA and the subsequent judgments made by the Harbour Authorities. Despite this, the authors of the DFDS NRA only contemplate the use of six additional controls to help manage navigational risk during the construction and operational phases of the IERRT Project when there is quite clearly a much greater range of controls that require consideration.
- 5.5.2 In contrast, the Applicant's NRA initially considered 29 additional controls that were suggested by a wide range of stakeholders at the HAZID workshops. Representatives of the SHA and Applicant then identified a further seven controls that could be applied during a provisional cost benefit analysis meeting.
- 5.5.3 This highlights the inappropriate approach to understanding the risks and potential control measures available to the IERRT Project within the DFDS NRA. By failing to sufficiently identify control measures, the authors have failed to identify ways in which risks can be made tolerable and ALARP and, as a consequence, have over-inflated the assessment of residual risk. This has resulted in recommendations for control measures (such as the movement of the finger pier and impact protection) that are disproportionate to the scale of risk identified even if one were (inappropriately) to impose the DFDS judgments about tolerability and ALARP for those of the SHA (something which would be an abrogation of the Harbour Authorities' functions). In practice there are in fact many controls (as identified through the wider port stakeholders' engagement and identified in the Applicant's NRA) that could be applied to ensure all risks are tolerable and ALARP (as judged by the SHAs) without the need for such drastic and disproportionate solutions.
- 5.5.4 This also further emphasises the basic problem with the lack of stakeholder engagement with wider port stakeholders and partly explains why the number of controls identified in the DFDS NRA is so limited. In addition, it follows that no consultation with or consideration of the SHA's judgment on tolerability and ALARP means that any conclusion drawn has to be viewed as false as it is based upon the opinion of an Interested Party objecting in isolation.
- 5.5.5 In addition to the above there are various failings of logic that exacerbate the problems with the risk outcomes tabulated in Annexes A and B of the DFDS NRA.
- 5.5.6 These are covered in more detail in the section below and in Appendix 1, but by way of illustration, Risk 13 in the DFDS NRA proposes 'moving the finger pier' as a control. Despite this, having imposed such a control, the frequency of a Ro-Ro vessel making contact with a moored tanker in this location is still rated '3' – 'Possible'. This is illogical. Given that DFDS describe the control 'Moving the Finger Pier' to mean either complete relocation or relocation of the southern berths this control should logically eliminate the risk or not permit the risk to be scored at 3 – which was a position with which DFDS agreed

during the third HAZID workshop held by the Applicant, represented in Risk ID O1 (Appendix C, Table C1) **[APP-089]**.

- 5.5.7 In addition, DFDS identify Risk 20 (within Annex A and B of their NRA **[REP2-043]**), being a Ro-Ro making contact (allision) with the Eastern Jetty. The DFDS NRA identifies that the risk can be made tolerable by having controls that include: 'berthing/unberthing criteria', 'standby tug provision', and a 'deconfliction plan'. In essence, DFDS identify that these three controls are sufficient to assist the controlled berthing of a Ro-Ro. As a matter of principle, given that such measures can constitute management of the risk to ALARP with respect to the Eastern Jetty, it is illogical to suggest that Ro-Ro cannot be positively controlled with the three aforementioned controls in relation to the IOT Finger Pier, such that the identification of moving/removing the finger pier for other risks considered within their assessment is not justified.
- 5.5.8 Additionally, DFDS acknowledge in Risk 2 [REP2-043] that a deconfliction plan and moving the Finger Pier would reduce the risk of collision between a tanker and a Ro-Ro to what they regard as a tolerable level. The Applicant agrees that deconfliction plans are an important control however, it is unclear to the Applicant how 'Moving the Finger Pier', as suggested by DFDS, will reduce the risk of collision between vessels in the Immingham SHA. This risk already exists within the port and is well managed with the Finger Pier in its current location.

## 5.6 **Comparison of outcomes for risks considered intolerable by DFDS**

- 5.6.1 This section directly compares the differences in outcomes between the Applicant's NRA and the DFDS NRA. Overall, despite the many differences in approach outlined in the preceding sections, the differences in outcomes of both risk assessments are limited. The fundamental and important difference is what is considered tolerable by DFDS and by the SHA. This is explained in further detail below for each of the four intolerable risks identified in the DFDS NRA. A detailed comparison of each of these risks is provided in Appendix A.
- 5.6.2 It is important to note that the tables provided at Appendix A compare intolerable risks identified by DFDS and IOT Operators at the baseline/embedded stage. All three NRAs subsequently identify further controls which suitably mitigate the risks to a 'tolerable if ALARP' or 'tolerable and ALARP' state. Supplementary to this, the most significant elements to observe are; the source of the assessed risk outcomes (i.e., level of stakeholder engagement), the similarity of risk outcomes across the three assessments, and the authority/entity which has determined if the risk is tolerable (and whether they have the authority to do so).

### **Collision**

- 5.6.3 The Applicant's NRA and the DFDS alternative NRA (as well as the IOT alternative NRA) each include the assessment of a collision of a Coastal Tanker with a Ro-Ro vessel. Ultimately the Applicant's NRA supported by the diverse range of stakeholder opinion (including that of DFDS) considers that this risk currently exists and is tolerable as the area within the SHA boundary



is already used by Ro-Ro vessels and Coastal Tankers. The SHA has indicated that they are aware of the implications of this risk, and they deem it tolerable and ALARP.

- 5.6.4 Further, this risk was considered 'Tolerable if ALARP' at both the Baseline and Residual risk stages (Embedded and Future) within the IOT Operators' NRA. The DFDS NRA, although produced by the same consultancy (NASH Maritime) states that this risk is tolerable when a 'deconfliction plan' is established as a further control. As the ExA is aware, however, the Applicant does already have controls in place, such as VTS, which fulfils this function. In addition, the provisions of a 'deconfliction plan' are already in place or actionable by the Harbour Master Humber and/or the Immingham Dock Master. It follows that there is actual agreement between the three NRAs and that this risk can be suitably mitigated.

#### **Allision with Eastern Jetty**

- 5.6.5 This risk has only been considered within the DFDS and Applicant's NRAs. Of particular note is the high degree of alignment between the perceived consequences of this risk if it were to occur. Although a direct comparison cannot be made between the two likelihood/frequency scales, due to the use of alternative methodology, the two organisations broadly consider these risks quite similarly with both considering the risk tolerable if/and ALARP with mitigations put in place.
- 5.6.6 Both the Applicant and DFDS have identified and agree that a further control should include berthing criteria. These criteria will be specifically informed from ongoing simulation studies and/or berthing trials, before becoming part of the MSMS in effect.

#### **Allision with Finger Pier**

- 5.6.7 This risk has been considered across each of the three NRAs. Within the context of this risk, one element that all three NRAs agree on is that the risk can be mitigated to tolerable if/and ALARP. In this regard, the only suggested further control with which the SHA fundamentally does not agree is 'moving the finger pier' as identified by NASH Maritime within the DFDS and IOT Operators NRAs. This is because the SHA already considers this risk to be tolerable based on the full range of alternative controls that can be applied to mitigate the risk. Moving the finger pier is far too onerous for it to be considered a control that fits within the definition of ALARP.
- 5.6.8 The other further controls identified are broadly consistent with those considered by the Applicant. The Applicant has also indicated the need for berthing/unberthing criteria to be defined along with the implementation of a marine liaison plan both during construction and operation.

## Allision with Trunk Way

- 5.6.9 This risk has been considered in all three NRAs. Furthermore, all three NRAs believe that this risk can be suitably mitigated to a tolerable and/if ALARP state if further controls are put in place. Specifically, 'impact protection', 'berthing/unberthing criteria', and 'provision of a standby tug' is identified by DFDS. In this regard, however, although the Applicant broadly agrees with the DFDS NRA assessment, as is set out in paragraph 9.9.24 and Table C4 of its NRA [APP-089], as the ExA is aware, the Applicant does not consider the provision of impact protection measures to be necessary and such measures will only be provided as part of the project specific adaptive controls if required.

## 6 Conclusion

- 6.1.1 As explained throughout this review, the Applicant is satisfied and confident that it has been provided with an independent and robust NRA as part of the IERRT DCO application. The Applicant's NRA considers all relevant elements concerned with navigational risk, especially those raised by port stakeholders during HAZID workshop and thus has given comprehensive consideration to the risk against a wide range of subject matter expertise and stakeholder opinion.
- 6.1.2 The NRA conducted for the Applicant's DCO submission considers the views of stakeholders and seeks to reduce risk by increasing safety and considering a wide range of potential controls. This was achieved by identifying which hazard scenarios exist, what might cause them to happen, and how one might control or limit these causes. Following this, the Applicant's NRA analysed the risks, which involved attributing risk outcomes (consequence and likelihood/frequency) in consultation with a diverse range of stakeholders and port users. This is known as Hazard Identification and Risk Analysis and must be included in any risk assessment if it is to comply with the PMSC's GtGP ([REP1-016]).
- 6.1.3 Further, the Applicant's NRA considered the identified risks against the appropriate standard of acceptability for the SHAs, the Harbour Authority and HASB set 'tolerability' threshold. The controls identified for a hazardous scenario were then considered, in consultation with the Humber Harbour Master and the Immingham Dock Master (amongst others), against the concepts of ALARP and 'tolerability'. This stage is known as Risk Assessment and in this instance was accompanied by a preliminary cost-benefit analysis assessment. This then enabled the NRA produced for the Applicant to demonstrate to the Duty Holder, Designated Person, and SHAs that considerable effort and thought had been put into safely managing the risks identified by the stakeholders.
- 6.1.4 The SHAs have fully considered the Applicant's NRA and have determined that the identified risks are able to be mitigated to the point where safe operations can continue to occur at their port. This is in relation both to existing operations and for the construction and operation phases of the IERRT project.

6.1.5 In contrast, the evidence and assessments within the DFDS NRA are considered to be flawed. Although attempts at a qualitative risk assessment have been made, the risk outcomes have ultimately been determined subjectively and without consultation.

6.1.6 In summary, the DFDS NRA has been completed with:

- A narrow perspective with a failure to consider either the IERRT project or the Port of Immingham as a whole;
- A lack of stakeholder engagement with other port users and fundamentally the Statutory Harbour Authority.;
- No consideration of levels of tolerability set by the SHA; and
- Insufficient integration of risk controls into the risk assessment process resulting in a disproportionate assessment of residual risk and unjustified recommendations for further control measures.

6.1.7 The table below provides a summary of how each element of the Applicant's NRA and the DFDS NRA has been met, highlighting the differences and the fundamental shortcomings of the alternative NRA provided by DFDS. Ultimately, the fundamental point is that it is for the SHA to assess navigational risk, assess tolerability and to be accountable for its decisions. It is neither appropriate, nor usual, for third parties to make their own assessments independent of all other stakeholders, nor is there any mechanism for third parties to be held accountable for the outcomes of their opinions.

Table 1. Summary of approach taken in each NRA

Aspect of NRA	Applicant NRA	DFDS Alternative NRA
<b>Stakeholder engagement</b>	Comprehensive stakeholder engagement undertaken to inform risk assessment	No engagement undertaken relying on output of Applicant's NRA – biased perspective about operations with no evidence that any port stakeholder confirmed or validated internally held opinions on risks
<b>Hazard identification</b>	Based on formal HAZID process involving all key stakeholders as part of the NRA	HAZID with DFDS, Nash Maritime and an additional two consultants
<b>Existing risk controls</b>	Fully considered existing controls used to manage risk within the Port, identified at HAZID	Fully considered existing controls used to manage risk within the Port albeit based on Applicant's NRA
<b>Additional risk controls</b>	29 additional risk controls identified during HAZID and another seven controls identified with the SHA	Six additional risk controls identified in the NRA

Aspect of NRA	Applicant NRA	DFDS Alternative NRA
<b>Assessment of frequency</b>	Based on known local and extensive data, using agreed definitions of probability already accepted by Duty Holder, clearly explained to stakeholders. Aligned with SHA guidance and process.	Mixing of frequencies from one NRA with scoring matrix from another NRA. Inappropriate, not aligned with SHA accepted frequencies.
<b>Methodology</b>	Most Likely/Worst Credible principle (industry standard and appropriate) Transparent approach to risk scoring	Mixing of various methodologies used in previous NRAs. Method not agreed or used by the SHA.
<b>Outcomes</b>	No intolerable risks identified with suggested risk controls <b>agreed by SHA</b>	Four intolerable risks and application of risks controls not considered reasonably practicable – <b>in contrast to position of SHA</b>

**Appendix A**

**Collision – Ro-Ro on passage to/from Immingham Eastern Ro-Ro Terminal with another vessel**

Party	Risk and worst credible/most likely scenarios	Causes identified	Embedded Controls identified	Embedded Worst Credible Consequence/ Likelihood Outcomes	Embedded Most Likely Consequence/ Likelihood Outcomes	Further controls identified	Future Worst Credible Consequence/ Likelihood Outcomes	Future Most Likely Consequence/ Likelihood Outcomes	Tolerance and ALARP outcome
Applicant	<p>Collision; Scenario: Ro-Ro on passage to/from Immingham Eastern Ro-Ro Terminal with another vessel</p> <p>Worst Credible: Manoeuvring speed collision with no avoiding action leading to multiple fatalities, hull breach, serious impact to property, significant consequence to the environment including a tier 2 pollution event, and serious consequence to the port business and reputation.</p> <p>Most Likely: Low speed glancing collision with bridge crew taking avoiding action, minor injuries, minor impact to property, no appreciable consequence to the environment or to the port's business/reputation.</p>	<p>Failure to comply with Towage guidelines</p> <p>High traffic density</p> <p>COLREGs failure to comply</p> <p>Restricted visibility</p> <p>Failure to follow passage plan</p> <p>Vessel breakdown or malfunction</p> <p>AIS failure/ lack of AIS</p> <p>Excessive vessel speed</p> <p>Incorrect assessment of tidal flow</p> <p>Excessive vessel speed</p> <p>Poor situational awareness</p> <p>Human error/fatigue - Pilot/ Vessel Personnel</p> <p>Inadequate bridge resource management</p> <p>Inadequate procedures in place onboard vessel</p> <p>Manoeuvre misjudged</p> <p>Ship/Tug/Launch failure</p> <p>Communication failure - Personnel</p> <p>Adverse weather conditions</p>	<p>Towage, available and appropriate</p> <p>Communications - traffic broadcast</p> <p>International COLREGs 1972 (as amended)</p> <p>Passage planning</p> <p>Vessel propulsion redundancies</p> <p>Vessel Traffic Services</p> <p>Accurate tidal measurements</p> <p>Byelaws</p> <p>Aids to navigation, Provision and maintenance of</p> <p>Harbour Authority requirements</p> <p>Joint emergency drills with VTS and Port staff</p> <p>Local Port Service</p> <p>Availability of latest hydrographic information</p> <p>Arrival/Departure, advance notice of</p> <p>Oil spill contingency plans</p>	<p>The worst credible outcome for this risk (at the embedded/baseline stage) was considered by the attendees at the HAZID workshop to result in:</p> <p>People - Multiple Fatalities;</p> <p>Property - Serious (£4M - £8M);</p> <p>Planet - Significant (Has the potential to cause significant damage and impact - Tier 2, pollution control measures from external organisations required);</p> <p>Port - Serious (Negative national publicity. Serious damage to reputation. Serious loss of revenue, £4M - £8M)</p> <p>It was also considered that the risk is:</p> <p>Unlikely - The impact of the hazard might occur but is unlikely (within the lifetime of the entity)</p>	<p>The most likely outcome for this risk (at the embedded/baseline stage) was considered by the attendees at the HAZID workshop to result in:</p> <p>People - Minor injury(s);</p> <p>Property - Minor (£10,000 - £750,000);</p> <p>Planet - None (No incident - or a potential incident/near miss);</p> <p>Port - None</p> <p>It was also considered that the risk is:</p> <p>Possible - The impact of the hazard could very well occur, but it also may not (within the lifetime of the entity)</p>	<p>Nil further controls identified at HAZID Workshop and post-workshop consultation; Risk considered against existing risks within the MSMS in place and considered ALARP and tolerable with existing controls by the SHA</p>	<p>No Change</p>	<p>No Change</p>	<p>Deemed tolerable and ALARP by the SHA with the controls agreed</p>
DFDS	<p>Collision - Project Vessel (Passenger / Driver) ICW Coastal Tanker</p> <p>Most Likely: light touch, low speed contact between two project vessels whilst underway.</p> <p>Worst Credible: heavy contact collision occurrence at relative high speed resulting in loss of vessel and loss of cargo.</p>	<p>The DFDS NRA does not present a table or list of causes</p>	<p>Towage, available and appropriate</p> <p>Accurate tidal measurements</p> <p>Harbour Authority requirements</p> <p>Availability of latest hydrographic information</p> <p>Vessel Traffic Services</p> <p>Berthing procedures</p> <p>Towage guidelines</p> <p>Arrival/Departure, advance notice of</p> <p>Monitoring of met ocean conditions</p> <p>Byelaws</p> <p>Oil spill contingency plans</p> <p>Communications - traffic broadcast</p> <p>Passage planning</p> <p>Design criteria</p> <p>Adequate berth tendering</p> <p>Hydrographic Survey</p> <p>Aids to navigation, Provision and maintenance of International COLREGs 1972 (as amended)</p> <p>Anchors cleared and ready for use</p> <p>Joint emergency drills with VTS and Port staff</p> <p>Communications equipment</p> <p>Mooring analysis</p> <p>Local Port Service</p> <p>Vessel simulation study</p> <p>Port Facility Emergency Plan</p> <p>Weather limits</p> <p>Training of port marine/operations personnel</p> <p>Pilotage</p> <p>Vessel propulsion redundancies</p>	<p>The worst credible outcome for this risk (at the embedded/baseline stage) was considered by NASH Maritime, DFDS and two instructed consultants to result in:</p> <p>People - Multiple fatalities;</p> <p>Property - Major, More than £8 million;</p> <p>Planet - Major, Has the potential to cause catastrophic and/or widespread damage. Tier 3, requires major external assistance;</p> <p>Port Major, Negative national and international publicity. Major damage to reputation. Major loss of revenue, more than £8 million.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur once in 1,000 years.</p>	<p>The most likely outcome for this risk (at the embedded/baseline stage) was considered by NASH Maritime, DFDS and two instructed consultants to result in:</p> <p>People - Serious injury(s) MAIB/RIDDOR reportable injury;</p> <p>Property - Moderate £750,000 - £4 million;</p> <p>Planet - Minor, An incident that results in pollution with limited/local impact. Tier 1, Harbour Authority pollution controls measures deployed;</p> <p>Port - Moderate, Negative local publicity. Moderate damage to reputation. Moderate loss of revenue, £750,000 - £4m.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur once in 10 years.</p>	<p>RC03 Deconfliction plan</p>	<p>The worst credible outcome for this risk (at the potential/future/residual stage) was considered by NASH Maritime, DFDS and two instructed consultants to result in:</p> <p>People - Multiple fatalities;</p> <p>Property - Major, More than £8 million;</p> <p>Planet - Major, Has the potential to cause catastrophic and/or widespread damage. Tier 3, requires major external assistance;</p> <p>Port - Major, Negative national and international publicity. Major damage to reputation. Major loss of revenue, more than £8 million.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur less than once &gt; 1, 000 years.</p>	<p>The most likely outcome for this risk (at the potential/future/residual stage) was considered by NASH Maritime, DFDS and two instructed consultants to result in:</p> <p>People - Serious injury(s) MAIB/RIDDOR reportable injury;</p> <p>Property - Moderate £750,000 - £4 million;</p> <p>Planet - Minor, An incident that results in pollution with limited/local impact. Tier 1, Harbour Authority pollution controls measures deployed;</p> <p>Port - Moderate, Negative local publicity. Moderate damage to reputation. Moderate loss of revenue, £750,000 - £4m.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur once in 100 years.</p>	<p>Deemed 'Tolerable if ALARP' by authors of the DFDS NRA (NASH Maritime) against tolerance suggested by DFDS, which differs from that of the IOT Operators and the SHA.</p>
IOT Operators	<p>This risk was considered 'Tolerable if ALARP' at both the Baseline and Residual risk stages (Embedded and Future) within the IOT Operators NRA. Therefore no comparison of intolerable risk is required in this context.</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>Deemed 'Tolerable if ALARP' by authors of the IOT Operators NRA (NASH Maritime) against tolerance suggested by IOT Operators, which differs from that of DFDS and the SHA</p>



Allision with Finger Pier

Party	Risk and worst credible/most likely scenarios	Causes identified	Embedded Controls identified	Embedded Worst Credible Consequence/ Likelihood Outcomes	Embedded Most Likely Consequence/ Likelihood Outcomes	Further controls identified	Future Worst Credible Consequence/ Likelihood Outcomes	Future Most Likely Consequence/ Likelihood Outcomes	Tolerance and ALARP outcome
Applicant	<p>Allision; Scenario: Vessel proceeding to/from Immingham Eastern Ro-Ro with tanker moored at IOT Finger Pier</p> <p><b>Worst Credible:</b> Ro-Ro makes contact with berthed tanker resulting in a significant allision that punctures the tanker's double hull leading to a tier 3 pollution event with possible ignition of the petrochemical. That could cause a fire which significantly damages the vessel and/or infrastructure. Incident results in multiple fatalities, and negative international news that significantly affects the ports reputation and port operations.</p> <p><b>Most Likely:</b> An approaching Ro-Ro misses its berth and continues to the IOT Finger Pier which results in a low speed glancing collision, dislodging a tanker from its berth causing a tier 3 pollution event. Major damage to port infrastructure and vessel, serious injuries to personnel, and negative national port reputational damage.</p>	<p>Adverse weather conditions Incorrect assessment of tidal flow Restricted visibility Inadequate bridge resource management Failure to follow passage plan Inadequate procedures in place onboard vessel Manoeuvre misjudged Vessel breakdown or malfunction Ship/Tug/Launch failure Failure to comply with Towage guidelines Inadequate number/type tugs Interaction with passing vessel Poor situational awareness Communication failure - Personnel Excessive vessel speed Human error/fatigue - Vessel Personnel</p>	<p>Monitoring of met ocean conditions Passage planning Port Facility Emergency Plan Towage guidelines Towage, available and appropriate Vessel Traffic Services Harbour Authority requirements Oil spill contingency plans</p>	<p>The worst credible outcome for this risk (at the embedded/baseline stage) was <b>considered by the attendees at the HAZID workshop</b> to result in:</p> <p>People - Multiple Fatalities; Property - Major (&gt; £8M); Planet - Major (Potential to cause catastrophic and/or widespread damage - Tier 3, requires major external assistance); Port - Major (Negative national and international publicity. Major damage to reputation. Major loss of revenue, &gt; £8 M)</p> <p>It was also considered that the risk is:</p> <p>Unlikely - The impact of the hazard might occur but is unlikely (within the lifetime of the entity)</p>	<p>The most likely outcome for this risk (at the embedded/baseline stage) was <b>considered by the attendees at the HAZID workshop</b> to result in:</p> <p>People - Serious injury(s) (MAIB/RIDDOR reportable injury); Property - Serious (£4M - £8M); Planet - Major (Potential to cause catastrophic and/or widespread damage - Tier 3, requires major external assistance); Port - Serious (Negative national publicity. Serious damage to reputation. Serious loss of revenue, £4M - £8M)</p> <p>It was also considered that the risk is:</p> <p>Possible - The impact of the hazard could very well occur, but it also may not (within the lifetime of the entity)</p>	<p>Charted safety area, berthing procedures Additional pilotage training/ familiarisation Berthing criteria <i>Move finger pier to east side of trunk way</i></p> <p>Moving finger pier deemed too onerous by the SHA, other controls taken forward and amended as: Project specific adaptive procedures Charted safety area, berthing procedures Specific berthing criteria for each of the three berths</p>	<p>The worst credible outcome for this risk (at the potential/future/residual stage, in contemplation of further controls) was <b>considered by representatives of the SHA, in review of the comments made by attendees at the HAZID workshop</b>, to result in:</p> <p>People - Serious injury(s) (MAIB/RIDDOR reportable injury); Property - Serious (£4M - £8M); Planet - Minor (Incident results in pollution with limited/local impact - Tier 1, Harbour Authority pollution control measures deployed); Port - Moderate (Negative local publicity. Moderate damage to reputation. Moderate loss of revenue, £750,000 - £4M)</p> <p>It was also considered that (in contemplation of further controls) the risk is:</p> <p>Rare - The impact of the hazard is realised but should very rarely occur (within the lifetime of the entity)</p>	<p>The most likely scenario for this risk (at the potential/future/residual stage, in contemplation of further controls) was <b>considered by representative of the SHA attendees at the HAZID workshop</b> to result in:</p> <p>People - Minor injury(s); Property - Moderate (£750,000 - £4M); Planet - Significant (Has the potential to cause significant damage and impact - Tier 2, pollution control measures from external organisations required); Port - Minor (Little local publicity. Minor damage to reputation. Minor loss of revenue, £0 - £750,000)</p> <p>It was also considered that (in contemplation of further controls) the risk is:</p> <p>Unlikely - The impact of the hazard might occur but is unlikely (within the lifetime of the entity)</p>	Deemed tolerable and ALARP by the SHA with the controls agreed
DFDS	<p>Contact (Allision) - Project Vessel (Passenger /Driver) with IOT Finger Pier (or moored vessel)</p> <p><b>Most Likely:</b> light contact with Coastal tanker / Bunker Barge moored alongside resulting in moderate damage to both vessels, IOT Finger Pier, breakaway of Coastal tanker / Bunker Barge and ruptured loading arm(s).</p> <p><b>Worst Credible:</b> high impact contact with Coastal tanker / Bunker Barge moored alongside resulting in multiple vessel breakaway puncture of tanker / barge hull, rupture of IOT Finger Pier pipeline(s) and significant damage to IOT Finger Pier infrastructure (with extension of breakaway causing impact to IOT trunkway).</p>	<p>The DFDS NRA does not present a table or list of causes</p>	<p>Accurate tidal measurements Harbour Authority requirements Availability of latest hydrographic information Vessel Traffic Services Berthing procedures Towage guidelines Arrival/Departure, advance notice of Monitoring of met ocean conditions Byelaws Oil spill contingency plans Communications - traffic broadcast Passage planning Design criteria Adequate berth tendering Hydrographic Survey Aids to navigation, Provision and maintenance of International COLREGs 1972 (as amended) Anchors cleared and ready for use Joint emergency drills with VTS and Port staff Communications equipment Mooring analysis Local Port Service Vessel simulation study Port Facility Emergency Plan Weather limits Training of port marine/operations personnel Pilotage Vessel propulsion redundancies</p>	<p>The worst credible outcome for this risk (at the embedded/baseline stage) was <b>considered by NASH Maritime, DFDS and two instructed consultants</b> to result in:</p> <p>People - Multiple fatalities; Property - Major, More than £8 million; Planet - Major, Has the potential to cause catastrophic and/or widespread damage. Tier 3, requires major external assistance; Port - Major, Negative national and international publicity. Major damage to reputation. Major loss of revenue, more than £8 million.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur once in 1,000 years.</p>	<p>The most likely outcome for this risk (at the embedded/baseline stage) was <b>considered by NASH Maritime, DFDS and two instructed consultants</b> to result in:</p> <p>People - Serious injury(s) MAIB/RIDDOR reportable injury; Property - Serious, £4 million - £8 million; Planet - Significant, Has the potential to cause significant damage and impact. Tier 2, pollution control measures from external organisations required; Port - Serious, Negative national publicity. Serious damage to reputation. Serious loss of revenue, £4m - £8m.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur once in 10 years.</p>	<p>RC01 Berthing / unberthing criteria RC02 Standby tug provision RC06 Moving finger pier</p>	<p>The worst credible outcome for this risk (at the potential/future/residual stage) was <b>considered by NASH Maritime, DFDS and two instructed consultants</b> to result in:</p> <p>People - Multiple fatalities; Property - Major, More than £8 million; Planet - Major, Has the potential to cause catastrophic and/or widespread damage. Tier 3, requires major external assistance; Port - Major, Negative national and international publicity. Major damage to reputation. Major loss of revenue, more than £8 million.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur less than once &gt; 1, 000 years.</p> <p><i>It is not explained how the outcomes about allison are reached in circumstances where the controls that are being assessed include moving the finger pier.</i></p>	<p>The most likely outcome for this risk (at the potential/future/residual stage) was <b>considered by NASH Maritime, DFDS and two instructed consultants</b> to result in:</p> <p>People - Serious injury(s) MAIB/RIDDOR reportable injury; Property - Serious, £4 million - £8 million; Planet - Significant, Has the potential to cause significant damage and impact. Tier 2, pollution control measures from external organisations required; Port - Serious, Negative national publicity. Serious damage to reputation. Serious loss of revenue, £4m - £8m.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur once in 100 years.</p> <p><i>It is not explained how the outcomes about allison are reached in circumstances where the controls that are being assessed include moving the finger pier.</i></p>	Deemed 'Tolerable if ALARP' by authors of the DFDS NRA (NASH Maritime) against tolerance suggested by DFDS, which differs from that of the IOT Operators and the SHA.
IOT Operators	<p>Contact (Allision) - IERRT Ro-Ro Vessel with IOT Finger Pier</p>	<p>The IOT Operators NRA does not present a table or list of causes</p>	<p>The IOT Operators NRA does not present a table or list of embedded controls</p>	<p>The worst credible outcome for this risk (at the embedded/baseline stage) was <b>considered by NASH Maritime</b> to result in:</p> <p>People - Potential for many fatalities on site or potential for serious injury or fatality off site; Property - &gt;£10million; Planet - DETR criteria – the highest levels of harm to the receptor (long term/permanent/widespread damage); Port - International negative publicity, serious disruption to operations to port / ship register &gt;£10million International publicity.</p> <p>It was also considered that the risk could occur with a:</p> <p>1 in 10,000 to 1 in 100 chance per year</p>	<p>The IOT Operators NRA does not consider the 'Most Likely' scenario</p>	<p>IOT RC1: Impact protection IOT RC2: Relocation Finger Pier IOT RC3: Marine &amp; Liaison Plan</p>	<p>The worst credible outcome for this risk (at the potential/future/residual stage) was <b>considered by NASH Maritime</b> to result in:</p> <p>People - Potential for some (one/few) fatalities / many serious injuries on site, some potential for minor injury off site; Property - £1million - £10million; Planet - Department of the Environment, Transport and the Regions (DETR) criteria – the lowest level of harm that can be considered a MATTE; Port - Widespread negative publicity, temporary suspension of activities at port / ship register £100,000 Local publicity - £1million</p> <p>It was also considered that the risk could occur with a:</p> <p>1 in 1,000,000 to 1 in 10,000 chance per year</p> <p><i>It is not explained how the outcomes about allison are reached in circumstances where the controls that are being assessed include moving the finger pier.</i></p>	<p>The IOT Operators NRA does not consider the 'Most Likely' scenario</p>	Deemed 'Tolerable if ALARP' by authors of the IOT Operators NRA (NASH Maritime) against tolerance suggested by IOT Operators, which differs from that of DFDS and the SHA



Allision with Trunk Way

Party	Risk and worst credible/most likely scenarios	Causes identified	Embedded Controls identified	Embedded Worst Credible Consequence/ Likelihood Outcomes	Embedded Most Likely Consequence/ Likelihood Outcomes	Further controls identified	Future Worst Credible Consequence/ Likelihood Outcomes	Future Most Likely Consequence/ Likelihood Outcomes	Tolerance and ALARP outcome
Applicant	<p>Allision; Scenario: Ro-Ro allision with IOT trunk way</p> <p>Worst Credible: Ro-Ro vessel collides with IOT trunk way, severing the charged pipeline causing a tier 3 pollution incident. Possibility of ignition and fire when the motor spirit pipeline is burst due to its flammability. Two refineries must be closed for a considerable time in order to repair the pipeline. This causes significant impacts for multiple weeks and has national affect to petroleum production. Multiple fatalities, negative international publicity for port and greater than £8 million of damage to port infrastructure.</p> <p>Most Likely: Ro-Ro has a slow speed impact with IOT trunk way leading to minor damage to vessel and distortion of pipe line on trunk way. Single fatality to personnel on the trunk way and tier 3 pollution, negative international publicity and greater than £8 million of damages to the port.</p>	<p>Anchors not cleared</p> <p>Inadequate number/type tugs</p> <p>Failure to comply with Towage guidelines</p> <p>Adverse weather conditions</p> <p>Restricted visibility</p> <p>Incorrect assessment of tidal flow</p> <p>Vessel breakdown or malfunction</p> <p>Human error/fatigue - Pilot/ Vessel Personnel</p> <p>Poor situational awareness</p> <p>Excessive vessel speed</p> <p>Inadequate bridge resource management</p> <p>Inadequate procedures in place onboard vessel</p> <p>Communication failure - Personnel</p> <p>Ship/Tug/Launch failure</p>	<p>Anchors cleared and ready for use</p> <p>Towage, available and appropriate</p> <p>Towage guidelines</p> <p>Weather limits</p> <p>Vessel propulsion redundancies</p> <p>Harbour Authority requirements</p> <p>Vessel Traffic Services</p> <p>Local Port Service</p> <p>Port Facility Emergency Plan</p> <p>Oil spill contingency plans</p> <p>Communications equipment</p> <p>Training of port marine/operations personnel</p>	<p>The worst credible outcome for this risk (at the embedded/baseline stage) was <b>considered by the attendees at the HAZID workshop</b> to result in:</p> <p>People - Multiple Fatalities;</p> <p>Property - Major (&gt; £8M);</p> <p>Planet - Major (Potential to cause catastrophic and/or widespread damage - Tier 3, requires major external assistance);</p> <p>Port - Major (Negative national and international publicity. Major damage to reputation. Major loss of revenue, &gt; £8 M)</p> <p>It was also considered that (at the embedded/existing stage) the risk is:</p> <p>Possible - The impact of the hazard could very well occur, but it also may not (within the lifetime of the entity)</p>	<p>The most likely outcome for this risk (at the embedded/baseline stage) was <b>considered by the attendees at the HAZID workshop</b> to result in:</p> <p>People - Single Fatality;</p> <p>Property - Major (&gt; £8M);</p> <p>Planet - Major (Potential to cause catastrophic and/or widespread damage - Tier 3, requires major external assistance);</p> <p>Port - Major (Negative national and international publicity. Major damage to reputation. Major loss of revenue, &gt; £8 M)</p> <p>It was also considered that (at the embedded/existing stage) the risk is:</p> <p>Possible - The impact of the hazard could very well occur, but it also may not (within the lifetime of the entity)</p>	<p>Impact protection</p> <p>Berthing criteria</p> <p>Additional tug provisions</p> <p>Controls taken forward and amended as:</p> <p>Project specific adaptive procedures</p> <p>Specific berthing criteria for each of the three berths</p>	<p>The worst credible outcome for this risk (at the potential/future/residual stage, in contemplation of further controls) was <b>considered by the attendees at the HAZID workshop</b> to result in:</p> <p>People - Multiple Fatalities;</p> <p>Property - Major (&gt; £8M);</p> <p>Planet - Major (Potential to cause catastrophic and/or widespread damage - Tier 3, requires major external assistance);</p> <p>Port - Major (Negative national and international publicity. Major damage to reputation. Major loss of revenue, &gt; £8 M)</p> <p>It was also considered that (in contemplation of further controls) the risk is:</p> <p>Unlikely - The impact of the hazard might occur but is unlikely (within the lifetime of the entity)</p>	<p>The most likely outcome for this risk (at the potential/future/residual stage, in contemplation of further controls) was <b>considered by the attendees at the HAZID workshop</b> to result in:</p> <p>People - Single Fatality;</p> <p>Property - Major (&gt; £8M);</p> <p>Planet - Major (Potential to cause catastrophic and/or widespread damage - Tier 3, requires major external assistance);</p> <p>Port - Major (Negative national and international publicity. Major damage to reputation. Major loss of revenue, &gt; £8 M)</p> <p>It was also considered that (in contemplation of further controls) the risk is:</p> <p>Unlikely - The impact of the hazard might occur but is unlikely (within the lifetime of the entity)</p>	<p>Deemed tolerable and ALARP by the SHA with the controls agreed</p>
DFDS	<p>Contact (Allision) - Project Vessel (Passenger /Driver) with IOT Trunkway</p> <p>Most Likely: high impact contact resulting rupture of IOT Trunkway pipeline(s).</p> <p>Worst Credible: high impact contact at relative high speed resulting in puncture of hull and rupture of IOT Trunkway pipeline(s).</p>	<p>The DFDS NRA does not present a table or list of causes</p>	<p>Towage, available and appropriate</p> <p>Accurate tidal measurements</p> <p>Harbour Authority requirements</p> <p>Availability of latest hydrographic information</p> <p>Vessel Traffic Services</p> <p>Berthing procedures</p> <p>Towage guidelines</p> <p>Arrival/Departure, advance notice of</p> <p>Monitoring of met ocean conditions</p> <p>Byelaws</p> <p>Oil spill contingency plans</p> <p>Communications - traffic broadcast</p> <p>Passage planning</p> <p>Design criteria</p> <p>Adequate berth tendering</p> <p>Hydrographic Survey</p> <p>Aids to navigation, Provision and maintenance of International COLREGS 1972 (as amended)</p> <p>Anchors cleared and ready for use</p> <p>Joint emergency drills with VTS and Port staff</p> <p>Communications equipment</p> <p>Mooring analysis</p> <p>Local Port Service</p> <p>Vessel simulation study</p> <p>Port Facility Emergency Plan</p> <p>Weather limits</p> <p>Training of port marine/operations personnel</p> <p>Pilotage</p> <p>Vessel propulsion redundancies</p>	<p>The worst credible outcome for this risk (at the embedded/baseline stage) was <b>considered by NASH Maritime, DFDS and two instructed consultants</b> to result in:</p> <p>People - Multiple fatalities;</p> <p>Property - Major, More than £8 million;</p> <p>Planet - Major, Has the potential to cause catastrophic and/or widespread damage. Tier 3, requires major external assistance;</p> <p>Port - Major, Negative national and international publicity. Major damage to reputation. Major loss of revenue, more than £8 million.</p> <p>It was also considered that (at the embedded/existing stage) the risk could occur with a:</p> <p>An event that could be expected to occur once in 1,000 years.</p>	<p>The most likely outcome for this risk (at the embedded/baseline stage) was <b>considered by NASH Maritime, DFDS and two instructed consultants</b> to result in:</p> <p>People - Single fatality;</p> <p>Property - Major, More than £8 million;</p> <p>Planet - Major, Has the potential to cause catastrophic and/or widespread damage. Tier 3, requires major external assistance;</p> <p>Port - Major, Negative national and international publicity. Major damage to reputation. Major loss of revenue, more than £8 million.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur once in 100 years.</p>	<p>RC01 Berthing / unberthing criteria</p> <p>RC02 Standby tug provision</p> <p>RC05 Impact protection for IOT Trunkway</p>	<p>The worst credible outcome for this risk (at the potential/future/residual stage) was <b>considered by NASH Maritime, DFDS and two instructed consultants</b> to result in:</p> <p>People - Serious injury(s) MAIB/RIDDOR reportable injury;</p> <p>Property - Serious, £4 million - £8 million;</p> <p>Planet - Minor, An incident that results in pollution with limited/local impact. Tier 1, Harbour Authority pollution controls measures deployed.;</p> <p>Port - Serious, Negative national publicity. Serious damage to reputation. Serious loss of revenue, £4m - £8m.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur less than once &gt; 1, 000 years.</p>	<p>The most likely outcome for this risk (at the potential/future/residual stage) was <b>considered by NASH Maritime, DFDS and two instructed consultants</b> to result in:</p> <p>People - Serious injury(s) MAIB/RIDDOR reportable injury;</p> <p>Property - Moderate, £750,000 - £4 million;</p> <p>Planet - No Measurable Impact. An incident or event occurred, but no discernible environmental impact. Tier 1 but no pollution control measures needed.;</p> <p>Port - Moderate Negative local publicity. Moderate damage to reputation. Moderate loss of revenue, £750,000 - £4m.</p> <p>It was also considered that this risk scenario could occur in:</p> <p>An event that could be expected to occur once in 1,000 years.</p>	<p>Deemed 'Tolerable if ALARP' by authors of the DFDS NRA (NASH Maritime) against tolerance suggested by DFDS, which differs from that of the IOT Operators and the SHA.</p>
IOT Operators	<p>Contact (Allision) - IERRT Ro-Ro Vessel with IOT Trunkway</p>	<p>The IOT Operators NRA does not present a table or list of causes</p>	<p>The IOT Operators NRA does not present a table or list of embedded controls</p>	<p>The worst credible outcome for this risk (at the embedded/baseline stage) was <b>considered by NASH Maritime</b> to result in:</p> <p>People - Potential for many fatalities on site or potential for serious injury or fatality off site;</p> <p>Property - &gt;£10M;</p> <p>Planet - DETR criteria – the highest levels of harm to the receptor (long term/permanent/widespread damage);</p> <p>Port - International negative publicity, serious disruption to operations to port / ship register &gt;£10million International publicity.</p> <p>It was also considered that (at the embedded/existing stage) the risk could occur with a:</p> <p>1 in 10,000 to 1 in 100 chance per year</p>	<p>The IOT Oerators NRA does not consider the 'Most Likely' scenario</p>	<p>IOT RC1: Impact protection</p>	<p>The worst credible outcome for this risk (at the potential/future/residual stage) was <b>considered by NASH Maritime</b> to result in:</p> <p>People - Potential for serious injury / injuries on site.;</p> <p>Property - £1million - £10million;</p> <p>Planet - Catastrophic environmental impact on 2 or more MATTE categories over the designated threshold and for greater than 1 year (widespread, requires long term additional resources considered a MATTE on 2 or more environmental receptors;</p> <p>Port - National negative publicity, prolonged closure or restrictions to port / ship register £1million National publicity -£10million.</p> <p>It was also considered that the risk could occur with a:</p> <p>1 in 1,000,000 to 1 in 10,000 chance per year</p>	<p>The IOT Oerators NRA does not consider the 'Most Likely' scenario</p>	<p>Deemed 'Tolerable if ALARP' by authors of the IOT Operators NRA (NASH Maritime) against tolerance suggested by IOT Operators, which differs from that of DFDS and the SHA</p>