



Supplementary Environmental Information


Navigation Simulation Study, March 2012

Supplementary Report EX 14.4

June 2012

Revision: 0

Able UK Ltd & South Tyneside College

	ABLE MARINE ENERGY PARK NAVIGATION SIMULATION STUDY	JUNE 2012
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APPROVAL & REVISION REGISTER

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Approved by:	R. Cram		12/06/2012

REVISION	COMMENTS	DATE
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1 INTRODUCTION**1.1 GENERAL**

1.1.1 Able UK Ltd (Able) commissioned a navigation simulation study on the final layout of the Able Marine Energy Park (AMEP) quay, in March 2012.

1.1.2 Able commissioned South Tyneside Marine College (STMC) to undertake additional navigational simulation studies in response to the conclusions of the original study (Environmental Statement Annex 14.2) and comments received from DLA Piper on behalf of C.Ro Port Killingholme¹ (CPK) on 31st August 2011 (letter presented in Appendix 1 of this report).

1.2 OBJECTIVES OF THE STUDY

1.2.1 The aim of the study was to understand the degree of difficulty involved in berthing and unberthing of specified vessels at AMEP and at CPK's facility. The objectives were:

- To assess the arrival and departure of the largest vessels likely to use CPK at the North end of the proposed new quay; and
- Assess the departure of off-shore wind vessels from AMEP with tug assistance

1.3 ATTENDEES

1.3.1 The simulations were run by Captain Melvin Irving, Advanced Simulation Manager at South Tyneside College and attended by:


- Captain Phil Cowing – Humber Estuary Harbour Master;
- Captain Phil Pannet – Senior Humber Pilot; and
- Captain Colin Harrison – Able Ports Director

1.4 SCENARIOS

1.4.1 The following scenarios were agreed with CPK and the Harbour Master Humber:

- Berthing and unberthing of a Palatine class roro vessel (LOA 186m) at HST Berth 6 in the following conditions:
 - Ebb arrival with wind south west, force 4;
 - Ebb departure with wind north, force 6;
 - Flood arrival with wind south, force 6; and
 - Flood departure with wind north east, force 5
- Berthing and unberthing of Opaline class vessel (LOA 195m) at HST Berth 5
 - Ebb arrival with wind north, force 5;

¹ Formerly Humber Sea Terminal Ltd (HST)

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- Ebb departure with wind north west, force 6;
 - Flood arrival with wind north east, force 5; and
 - Flood departure with wind north east, force 5.
- Unberthing, with use of tugs, of 125k DWT tanker from AMEP quay (at the request of the Harbour Master Humber).

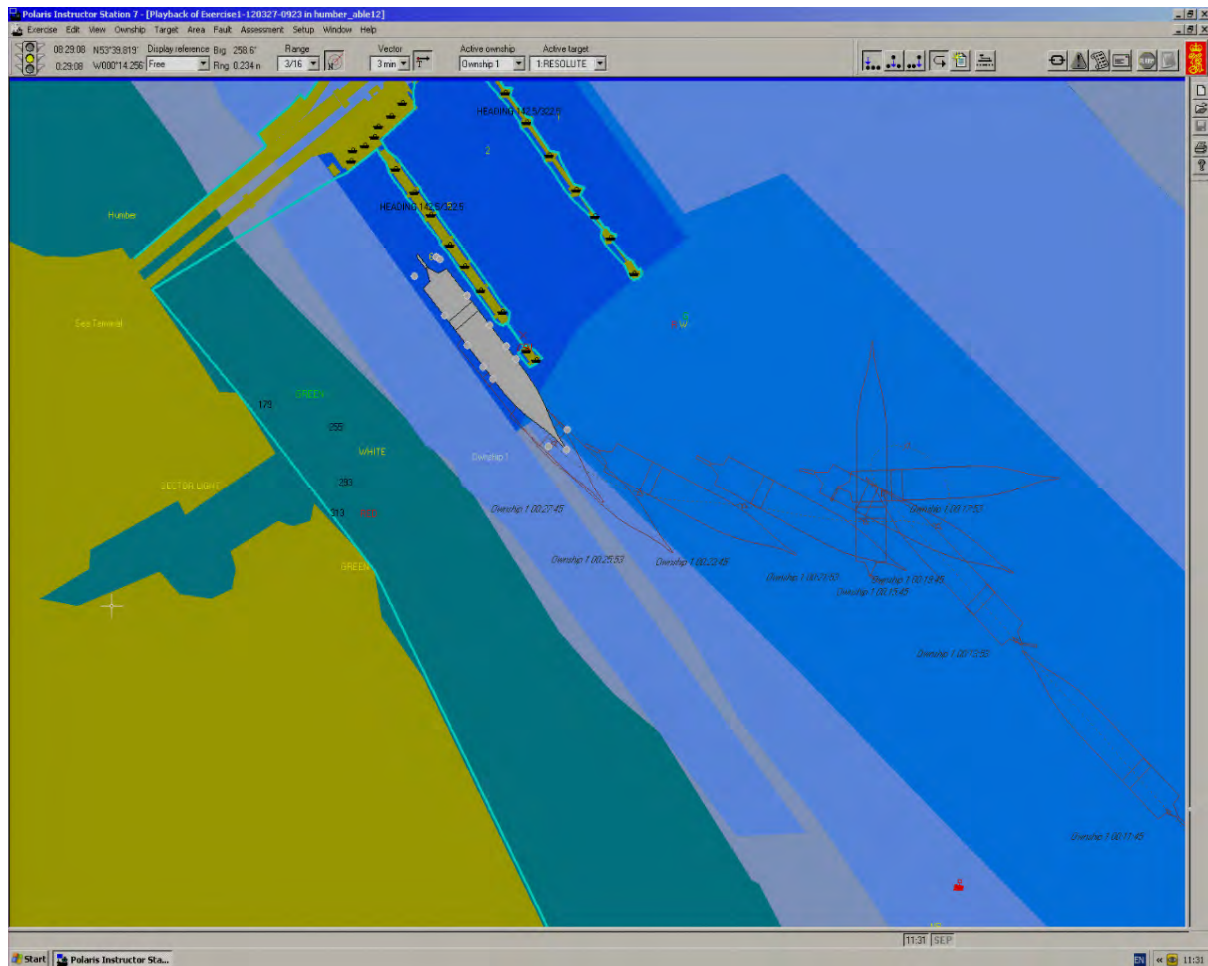
2 SIMULATIONS

2.1 INTRODUCTION

- 2.1.1 Able commissioned STMC to provide a series of simulation exercises for the finalised design of the proposed AMEP development on the River Humber. The new development was incorporated into STMC's existing Humber database.
- 2.1.2 AMEP causes existing flows to be modified within the berthing area and this modified current data was supplied to the College by HR Wallingford on a 10m x10m grid. In agreement with CPK, the modified flow data used in the model covered the spring tide on 9th September 2010. On this date the high tide level was 7.8m AOD at 07:02 hrs with a low tide of 0.3m at 13:44 hrs; this compares to a HAT of 8.0m AOD at Immingham. This high spring tidal range generates relatively high currents at the site (close to the maxima).
- 2.1.3 The simulations required two of Cobbelfret's ship models be used, for arrival and departure at CPK; the Ship models used were the Mazarine and Opaline. A request had been made that a smaller 185m Ferry be used for the assessment of number 6 berth. Unfortunately, STMC did not have a suitable model, so the larger 199m Mazarine was used instead.
- 2.1.4 The results of the nine simulations detailed in Section 1.4 are summarised below.

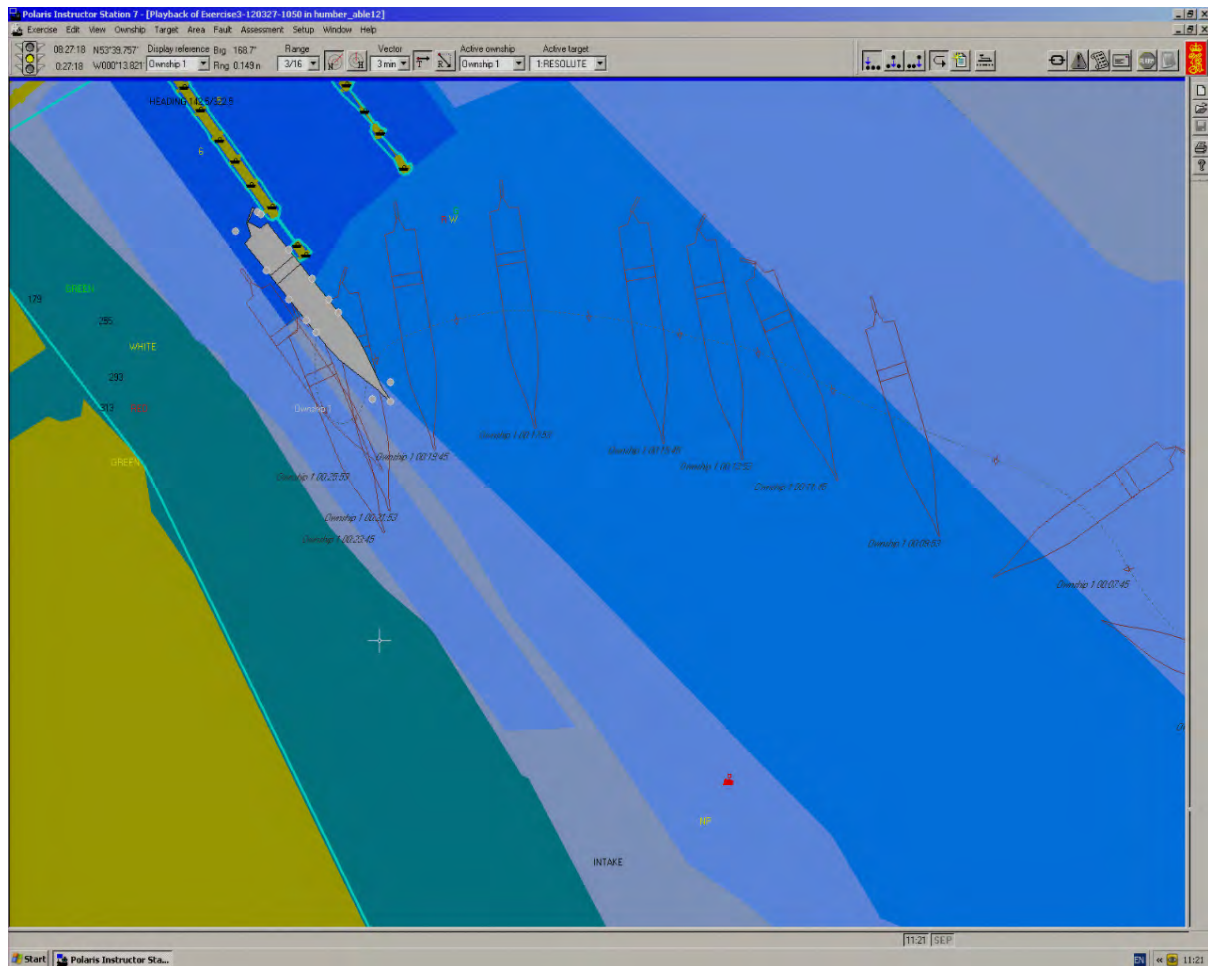
2.2 EXERCISE 1

2.2.1 Arrival of the Mazarine in to CPK Berth 6 at high water + 3 hours and with a force 4, south-westerly.



2.4 EXERCISE 3

2.4.1 Arrival of the Mazarine in to HST Berth #6 at high water -2 hours (Spring) and with a force 6 southerly wind.



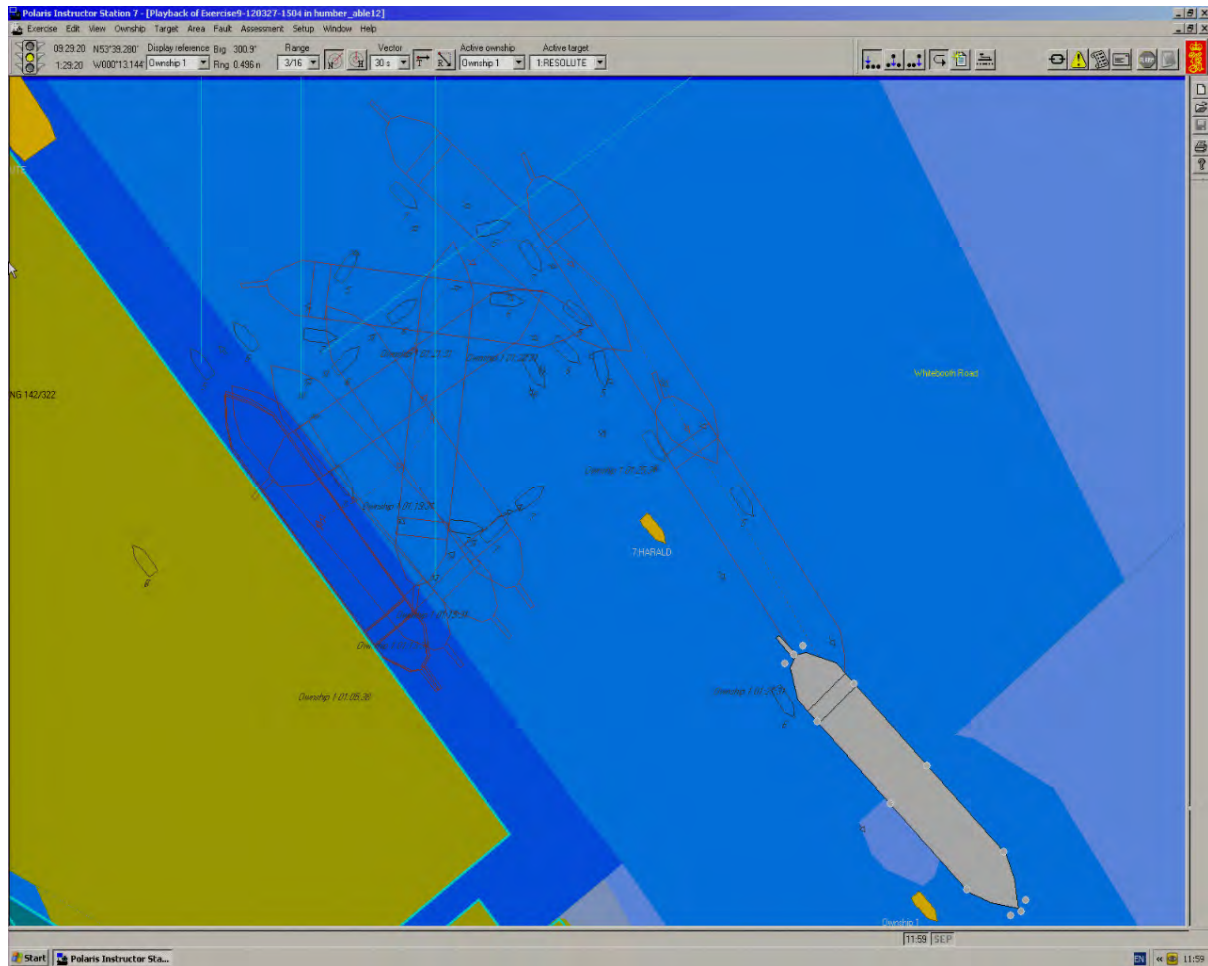
2.5 EXERCISE 4

2.5.1 Departure of the Mazarine from HST berth #6 at high water -2 hours (Spring) with a north easterly wind of force 5.

2.5.2 This exercise was not recorded.

2.10 EXERCISE 9

- 2.10.1 A 289m Bulk Carrier at 9m draught (The Huang Shang) unberthing from AMEP quay with the assistance of 3 tugs. The vessel turns short round off the berth and then proceeds to sea.



3 CONCLUSIONS

3.1 IMPACTS ON BERTHING AND UNBERTHING AT CPK

3.1.1 A comprehensive study was undertaken using updated flow data and was evidenced by the Humber Harbour Master. The study was undertaken using the largest vessels which use the CPK berths, in combination with adverse environmental conditions. A Senior Pilot who navigates vessels to these berths on a regular basis conducted the exercise .


3.1.2 While manoeuvring the vessels. it was ascertained that with the prevailing wind up to force 5 in a north easterly direction there were no evident adverse effects. The slight alteration to the alignment of the quay relative to the original simulation exercise and the updated tide and current had no adverse effect on the manoeuvrability of the vessels. It was agreed that assistance from Tugs would not be required

3.2 IMPACTS ON BERTHING AND UNBERTHING AT AMEP

3.2.1 Only one study was undertaken at this session owing to the fact that the previous simulations were considered to provide sufficient confidence that vessels could be safely berthed and unberthed from the AMEP quay.

3.2.2 On this occasion a Cape size vessel was manoeuvred on and off the quay with four tugs which is the normal practice for this size of vessel. It was agreed by all parties that the manoeuvre simulated was both safe and practical.

3.2.3 No detrimental effects owing to the new quay position were observed

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APPENDIX 1

HUMBER SEA TERMINAL COMMENTS ON ORIGINAL SIMULATION STUDY

(DLA Piper 31st August 2011)

FAO Angus Walker
Bircham Dyson Bell
50 Broadway
London SW1H 0BL

Your reference

ADW/Y059258

Our reference

BDDS/LONDP/84367/120009
UKM/37883476.1

31 August 2011

By Post and Email

Dear Sirs

**OUR CLIENT: HUMBER SEA TERMINAL LIMITED ("HST")
ABLE MARINE ENERGY PARK AND ABLE LOGISTICS PARK**

We refer to your letter of 14 July 2011 on behalf of Able UK Ltd ("Able"). We respond to the points you raise in that letter below.

Proposed acquisition of Network Rail's railway

1. It remains unclear to HST why Able seeks to acquire the railway in order to enable it to run a maximum of two trains per day, or 500 trains per year, along the relevant stretch of railway. There does not appear to HST to be any justification to acquire the railway for such limited use, bearing in mind that it would not address the need for other agreements to access the rest of Network Rail's network.
2. Given that HST currently enjoys unlimited use of the railway, and thereby connection to the national railway network, it is not clear on what basis Able asserts that "the operation of ... HST facilities would be compromised if the railway running across the site remained under Network Rail's control". There is no explanation of why this is considered to be the case, or as to why it is necessary for Able to acquire the railway for the purposes of its own projects. Please will you explain this.
3. To the contrary, HST considers that it will continue to benefit from the railway remaining in the ownership of Network Rail.
4. If there are operational or other matters relating to the railway that Able considers need to be addressed in order to enable its development, then these should be fully set out and explored as part of an examination of alternatives to compulsory acquisition. HST would expect that this information is provided as part of any application to the IPC made by Able and separately in advance to HST.
5. Without such an explanation, or sufficient detail, HST cannot be satisfied that the acquisition of the railway from Network Rail would not compromise the current and future operation of its own facilities.

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INVESTOR IN PEOPLE

Consultation

6. We note the record of meetings and other contact between our respective clients. In our letter of 26 May we were not seeking to assert that there had been no contact between HST and Able. A sequence of such meetings does not, however, necessarily fulfil the requirements of section 42 of the Planning Act 2008 (the "Act") particularly in relation to interference with HST's estates and rights in or over land. As your client would doubtless agree, far from all of these meetings related specifically to Able's proposed application to the IPC or, to the extent that they did, can they be considered to have discharged the consultation requirements in the Act, bearing in mind the amount and detail of information that HST would properly require as part of such consultation. HST does not believe that information provided to date can be considered adequate for the purposes of the Act, in particular in relation to the effects of Able's proposals on vessel movements and the estuary's hydrological, etc regime. Without having provided adequate (or in some cases, any) information relating to those effects, it is difficult to see how Able can assert that it has met the requirements of the Act and the related guidance.
7. Your letter of 14 July states that accretion and scour were (at that time) still being assessed and it was proposed that any change to HST's maintenance dredging requirements would be the subject of protective provisions. It is not appropriate to assert that any such impacts can simply be dealt with through protective provisions, which, without assessment now, would amount to environmental impact assessment after the fact. It is normal that information about such impacts, and the scope of protective provisions, would be discussed first. The same considerations apply equally to hydrodynamic modelling, which your letter of 14 July states is ongoing and would be submitted to HST as it becomes available. As yet HST has not received the results of that modelling. Please confirm that it will be provided for HST to consider prior to Able's application.
8. HST is mindful of the need to discharge its role as harbour authority and its responsibility for the safety of navigation. Detailed information is therefore essential in order for HST to discharge its statutory duties. It also has a legitimate expectation that the information that has been promised will be provided, and that in turn it will be given sufficient time to consider such information properly.
9. Notwithstanding that your client recognises that its project might have consequences on HST in terms of accretion and scour, and in relation to hydrological effects, it appears that your client's application will be submitted without HST having been consulted first about any such impacts. That would be wholly unacceptable. As a harbour authority, HST needs to be provided with adequate information, and given sufficient time to consider it. That is the purpose of the consultation requirements under the Act. HST presumes that the same position applies to other consultees, including ABP and the Environment Agency. Please confirm that you will afford these bodies the same opportunity as we have requested for HST at paragraph 7 above.

10. We note that the information provided with your letter of 14 July - and the outstanding accretion/scour and hydrodynamic information - does not form part of the Preliminary Environmental Information Report. Since that Report was published, we also understand that several details of Able's project have changed. HST should not be required to elicit information about Able's project. That information should be provided as part of consultation that meets the requirement of the Planning Act 2008 and the related Guidance. Please will you confirm the changes to the proposals made or proposed since publication.
11. It is a matter of concern that your client intends to submit an application to the IPC without having provided this information to statutory consultees, or allowed them to comment on it. In that respect, it is difficult to see how the requirements of section 42 of the Act can be shown to have been met. HST will make representations to the IPC if it remains the case that, in its view, those requirements have not been met. If they have not been met such deficiencies present the potential that any decision of the IPC will be unsafe.
12. Notwithstanding that, we address below some outline comments on the two documents you provided on 14 July. These are not exhaustive and may be subject to change and further review, bearing in mind the gaps in the information provided.

Comments on the Simulation Study ("SS")

13. Given that some elements of the SS are based on inaccurate or out of date information, HST can only at this stage provide initial comments, as follows:
 - 13.1 the simulation only uses the Mazarine and Clementine vessels. No simulation was carried out using larger vessels that currently visit HST, for example Humbermax or pure car-carriers;
 - 13.2 the simulation states that it was not based on up-to-date environmental information, in particular the latest bathymetry data for the new terminal. Please confirm that further simulations will, therefore, be run to take account of up-to-date information and the types of vessels that actually visit HST's terminal;
 - 13.3 although Able's terminal is intended to be used for the purposes of the construction of off-shore wind farms, the simulation does not appear to include the type of vessels that would be expected to use the terminal for that purpose. There is no available practical knowledge of such vessels in the River Humber. On this basis, simulation of these particular vessels is crucial in establishing terminal design, interaction with the dynamics of the River, and interface with existing adjacent and nearby facilities. It is not appropriate to simulate options only with an oil tanker and a bulk carrier. Either there is no intention to use the type of vessels expected, or the simulation is wholly inadequate. Please confirm how this will be addressed;
 - 13.4 the simulation also refers to the use of the most extreme weather and current conditions. HST does not agree that simulation using a wind speed of 15

knots and current settings of HW-5 hours can properly be considered as extreme. Please confirm what is being undertaken to address extremes;

- 13.5 in relation to the 400 metre approach exclusion, HST's berthing and unberthing parameters were devised and agreed with the ABP as a result of extensive simulation work. It was agreed that to require a large vessel to approach within 400 metres on a flood tide would result in the vessel setting down on the facility before it had successfully completed its turn. On this basis, the exclusion should not be viewed simply as a "self-imposed exclusion zone made by HST owners to protect their berth and operations". It is an essential element of the HST Marine Procedures and HST could not agree to any development that would affect this procedure without being fully satisfied that any adjustment to those limits could be safely made. That would require appropriate modelling, which has not yet been carried out. HST would also need sufficient time to test any models and have those solutions modelled itself. Please confirm your approach to addressing this safety matter;
- 13.6 the SS also identifies several areas of additional work, which would necessarily require that the simulations were carried out again. Indeed, the SS acknowledges that further simulations are necessary, although there is no evidence that they have been done. The further areas of work identified in the report, which you have not provided any information on, are: the changing of alignment of the berths and the necessity for further modelling by JBA; the effect of information provided by ABP of controlling depths and the impact on the dredge burden, including the existing control depth of the HST approach channel; and further simulation testing to be carried on the turning circle. This is not necessarily an exhaustive list. Please confirm your approach to addressing this safety matter; and
- 13.7 in addition, it is understood that the design of Able's terminal has in any event changed since these simulations were carried out. HST notes that, notwithstanding that it was not able to attend the simulation, the SS was provided to Able presumably not long after 18 November 2010. HST only received this document on 14 July 2011. It is not made clear how the SS is affected by subsequent changes to the Project, or relates to the PEIR. Please could you provide information to explain this.
14. At a recent case before the Court it was suggested that Able Marine Energy Park might be used for import/export of oil/petroleum products and, in particular, very large crude carriers. Is this in fact the case? If so, please confirm what assessments and simulations have been undertaken. Please provide copies.
15. As it currently stands, HST, which is Able's closest marine neighbour, cannot properly consider Able's proposals, or respond helpfully in relation to vessel simulations. In order to do so, HST requires that the simulations are carried out using the correct vessels, with reference to the actual design of the berths proposed by Able, and using up-to-date environmental information and potentially carry out its own simulations to discharge its own statutory duties as a harbour authority. HST would then need to be given adequate time to

consider such information. We should be grateful if you would confirm that Able will be doing so. This will make Able's later application very much more straightforward if HST's concerns are addressed.

Comments on the Estuary Modelling Study

16. HST has reviewed this study. It is not clear, however, whether any elements of it are due to be updated following changes to Able's proposals. We should be grateful if you would confirm whether that is the case.

Application by 31 August 2011

17. As set out above, HST considers that there are a number of key areas of the Project in relation to which the consultation carried out by Able does not meet the tests in the Planning Act 2008, or in related Guidance, bearing in mind that an application is apparently to be made on 31 August 2011.
18. In summary:
- 18.1 there is inadequate information about Able's proposed use of the existing railway, or any justification as to why it is necessary for Able to acquire it, having regard to alternatives;
- 18.2 HST has not been provided with the results of accretion and scour assessments, promised on 14 July, although by no set date;
- 18.3 HST has also not been provided with the results of hydrodynamic modelling, also promised on 14 July, although by no set date;
- 18.4 the vessel simulation provided on 14 July is based on inaccurate or out-of-date information in several respects, and does not, so far as we understand, reflect Able's latest proposals;
- 18.5 it is not clear whether the estuary modelling studies are up to date;
- 18.6 whilst it is appropriate that aspects of the proposals have changed in response to other consultees' comments, those changes have not been set out to HST; and
- 18.7 HST has not been provided with information in a timely and consistent way, including in relation to any project changes. The onus has been on HST to obtain information from Able, whereas it is clear that for the purposes of an application to the IPC the onus is on an applicant to provide accurate information to consultees and seek constructive engagement.
19. HST is not able to properly and adequately assess the impact of your client's proposals on its operations. For this reason, if Able does submit an application to the IPC on 31 August it is most likely that HST will not have an option but to submit representations to the IPC, should an application be accepted.



20. Alternatively, HST may be in a position to consider additional information provided by Able. It will be noted that HST should be given adequate time to consider and respond to such information prior to any application being made.

Yours faithfully



DLA PIPER UK LLP

cc: J Rubens - Humber Sea Terminal

APPENDIX 2

ADDITIONAL SIMULATION STUDY CORRESPONDENCE BETWEEN:

Able UK Ltd,
C.Ro Ports Killingholme
Harbour Master

	<p align="center">EX 14.4 NAVIGATION SIMULATION STUDY APPENDIX 2</p>	<p align="center">MARCH 2012</p>
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INTRODUCTION

The following correspondence between Able UK Ltd, C.Ro Ports Killingholme and Humber Harbour Master is in relation to the additional navigation simulation study undertaken in March 2012.

1. Emails Able UK Ltd and C.RO Ports Killingholme (18th Nov 2011 – 6th Jan 2012)
2. Emails between Able UK Ltd and C.RO Ports Killingholme (9th Jan 2012)
3. Email from Harbour Master to Able UK Ltd re. Simulation Scenarios (12th March 2012)

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1 EMAILS ABLE UK LTD AND C.RO PORTS KILLINGHOLME (18TH NOVEMBER 2011 – 6TH JANUARY 2012)

From: Richard Cram [REDACTED]
Date: Fri, 18 Nov 2011 10:40:02 +0000
To: "GATES, Hugh" [REDACTED]
Cc: "RUBENS, Joost" [REDACTED], Paul Hodgson [REDACTED], Jeremy Spearman [REDACTED], Peter Stephenson [REDACTED]
Subject: AMEP Sedimentation Modelling and Simulation

Hugh,

Can you please advise the tidal state that you consider to be the most adverse in which you would attempt to berth a Humbermax vessel or a Pure Car Carrier. For example neap tide +/- 1 hour. This will help us to ensure that we have enough tidal information for the studies. We would appreciate a response today so that we can start processing the revised current data.

Also, further to our meeting yesterday, can you provide details of your recent dredging returns so that we update the calibration of the sediment transport model results. As mentioned yesterday the Humber Maintenance Dredging Baseline Document (August 2008) states that HST dredges 500,000T annually and this has been used by us to date (although our consultants did contact HST by phone in January to obtain more up to date information); the baseline document uses wet tonnes. The figures I presented yesterday were in dry tonnes. We have used densities of 1300kg/m³ and 500kg/m³ for wet and dry tonnes respectively, so the figures may not have been readily recognisable for this reason if you are used to them being quoted as wet tonnes, (500 000 wet tonnes = 192 300 dry tonnes).

Kind regards

RICHARD CRAM
Design Manager

Able UK Ltd

From: Richard Cram [REDACTED]
Sent: vrijdag 25 november 2011 13:46
To: GATES, Hugh
Cc: RUBENS, Joost; Peter Stephenson
Subject: Re: AMEP Sedimentation Modelling and Simulation
Importance: High

Hugh,

I have not heard back from you on this.

I am instructing HRW to provide current flow data for two tides: a high spring tide and a low spring tide, for 6 hours either side. Unless I hear otherwise, HST simulations will be based on these scenarios.

Kind regards

RICHARD CRAM
Design Manager

Able UK Ltd

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From: "RUBENS, Joost" [REDACTED]
Date: Fri, 25 Nov 2011 13:09:36 +0000
To: Richard Cram [REDACTED], "GATES, Hugh" [REDACTED]
Cc: Peter Stephenson [REDACTED], "Dove-Seymour, Benjamin" [REDACTED]
[REDACTED], WALKER Angus [REDACTED]
Subject: RE: AMEP Sedimentation Modelling and Simulation

Dear Richard,

A letter dated 22/11/2011 has been sent from our lawyers to yours covering various topics, including this one.

If I may suggest, it would be best to be guided by that letter rather than commission certain works/expenditure outright that might or might not be sufficient for the discussed consultation purposes.

Looking forward to your earliest reply.

Best regards
 Joost Rubens
 Director
 Humber Sea Terminal Ltd

From: Richard Cram [REDACTED]
Sent: 25 November 2011 14:09
To: RUBENS, Joost; GATES, Hugh
Cc: Peter Stephenson; Dove-Seymour, Benjamin; WALKER Angus
Subject: Re: AMEP Sedimentation Modelling and Simulation

Joost,

OK, thanks. I have forwarded the relevant abstract to HRW.

Do you want to model a high water spring tide and a high water neap tide (+/-6 hours) to encompass the range of conditions throughout the year? With respect to 'eddy conditions', what is this referring to?

Kind regards

RICHARD CRAM
 Design Manager

From: "GATES, Hugh" [REDACTED]
Date: Fri, 25 Nov 2011 14:21:13 +0000
To: 'Richard Cram' [REDACTED], "RUBENS, Joost" [REDACTED]
Cc: Peter Stephenson [REDACTED], "Dove-Seymour, Benjamin" [REDACTED]
[REDACTED] WALKER Angus [REDACTED]
Subject: RE: AMEP Sedimentation Modelling and Simulation

Dear Richard

Without Prejudice

In response we would advise at this time modelling data to cover the full tidal cycle of a Spring and Neap range, and in accordance with your mail with reference to encompassing the range of conditions

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throughout the year, in order to provide simulation for predominantly mid tide periods. The reference to 'eddy conditions' refers to recirculation as identified in the JBA modelling report.

Kind regards

Hugh

From: Richard Cram [REDACTED]

Date: Fri, 06 Jan 2012 14:42:38 +0100

To: "GATES, Hugh" <[REDACTED]> "RUBENS, Joost" [REDACTED]

Cc: Peter Stephenson [REDACTED], "Dove-Seymour, Benjamin" [REDACTED]
[REDACTED], WALKER Angus [REDACTED] >

Subject: Re: AMEP Sedimentation Modelling and Simulation

Hugh,

Regarding your requirements for the simulation study.

I note that you are interested in the mid tide period and I assume that this is because at this time current velocities will be at their greatest and ship manoeuvring at arrival and departure from your berths will therefore carry the greatest risk.

We have tidal data for the period 6-12 September 2010 which JBA obtained to calibrate their hydrodynamic model. This data was obtained as it contained the relatively high spring tide on 9 September (7.8m at 07:02 with a low tide of 0.3m at 13:44; this compares to HAT of 8.0m at Immingham). This high spring tidal range will inevitably generate relatively high currents at your site (close to the maxima) and should be significantly higher than those occurring during neap tides (the tidal range on 2/9 for example was 3.3m and 2.9m). I have attached the data to this e-mail.

I have also attached an IECS report that provides the baseline information for bathymetry and hydrography at the site.

If you can confirm that the tidal data for 9 September 2010 is appropriate for the simulation studies I will arrange for the STMC model to be updated as soon as possible and a workshop held. For your information they have advised us that the simulator is available between 16-18 January so an early response would be appreciated.

Kind regards
RICHARD CRAM
Design Manager

Able UK Ltd

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2 EMAILS BETWEEN ABLE UK LTD AND C.RO PORTS KILLINGHOLME (9TH JANUARY 2012)

From: Richard Cram [REDACTED]
Sent: 09 January 2012 10:44
To: GATES, Hugh
Cc: Colin Harrison; RUBENS, Joost (CLDN)
Subject: AMEP Simulation Study

Hugh,

Following your conversation with Colin, it might help if I clarify a couple of issues:

1. I confirm that we have written confirmation that you will undertake your own simulation exercise but that we are to provide you with information.
2. We will, however, also instruct STMC to undertake further modelling work as well using the same tidal data.
3. Once we have agreed the tidal conditions to be used, we can agree the format for the exchange of information and this may require your marine modellers to liaise with our consultant HR Wallingford so that the data is provided in a format suitable for use by your consultant. This format may be different to STMC's requirements.
4. You, or a colleague, are welcome to attend the STMC simulation exercise.

Hopefully this clears things up.

Kind regards

RICHARD CRAM
 Design Manager

 Able UK Ltd

From: "GATES, Hugh" <[REDACTED]>
Date: Mon, 9 Jan 2012 14:30:59 +0000
To: 'Richard Cram' [REDACTED]
Cc: Colin Harrison [REDACTED] "RUBENS, Joost (CLDN)" <[REDACTED]>
Subject: RE: AMEP Simulation Study

Good Afternoon Richard

We thank you for the clarity.

As far as the tidal conditions for your own simulation work we would agree at this time to the scenario as outlined in your previous mail of 14:43 on the 6 January 2012.

It is mentioned and understood in your mail of 10:44hrs of today 9 January 2012 that AMEP will exchange, in support of the above confirmation, the HR Wallingford dynamic modeling data. We will also require precise detail/data, and supporting plans, of the final iteration of the facility as presented in the AMEP application. This is essential to allow HST to give appropriate instruction to consultants in both modeling and simulation work. In supplying this detail we would request that any drawing has appropriate reference to layout/dimension etc. and in particular with reference to the Humber Sea Terminal berths and approaches.

It would be appreciated if this can be exchanged by return.

	<p>EX 14.4 NAVIGATION SIMULATION STUDY</p> <p>APPENDIX 2</p>	<p>MARCH 2012</p>
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Regards

Hugh

Hugh Gates
Port Manager

	<p align="center">EX 14.4 NAVIGATION SIMULATION STUDY APPENDIX 2</p>	<p align="center">MARCH 2012</p>
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**3 EMAIL FROM HARBOUR MASTER TO ABLE UK LTD RE. SIMULATION SCENARIOS
(12TH MARCH 2012)**

From: Phil Cowing [REDACTED]
Date: Mon, 12 Mar 2012 13:57:44 -0000
To: Richard Cram [REDACTED] Colin Harrison [REDACTED]
Subject: STC simulation 27 March 2012

Richard, Colin
 I've checked back through my notes of previous discussion with Hugh Gates.
 The trial scenarios Hugh specified, all for top spring tides, are as follows:

"Palatine" class ro-ro vessel (LOA 186m) to/from HST berth 6

Ebb arrival with wind SW force 4
 Ebb departure with wind N force 6
 Flood arrival with wind S force 6
 Flood departure with wind NE force 5

(Full flood is considered to be HW - 2 hrs, full ebb considered to be HW + 3 hrs).

"Opaline" class vessel (LOA 195m) to/from HST 5


Flood arrival wind NE force 5
 Flood departure wind NE force 5
 Ebb arrival wind N force 5
 Ebb departure wind NW 6

Hugh believes that all these scenarios are currently achievable without tugs.

Additionally, we should trial the largest type bulk carrier expected at your berth - arrival and sailing.
 We should also trial the largest installation-type vessel expected at your berth.

The final trial would be a repeat of the 125k DWT tanker on/off South Killingholme Jetty.
 There may only be time to complete the HST trials in the one day.
 Rgds
 Phil

Capt Phil Cowing | Harbour Master Humber | Humber Estuary Services

	<p>ABLE MARINE ENERGY PARK NAVIGATION SIMULATION STUDY</p>	<p>MARCH 2012</p>
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APPENDIX 3

DRAWING

HUMBER SEA TERMINAL BERTHS 5 & 6 GENERAL ARRANGEMENT JULY 2007

(Royal Haskoning ref: 9R6182/C07/1000)

REVISIONS

CLIENT




DRAWING TITLE:

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REVISION
AB

	<p>ABLE MARINE ENERGY PARK NAVIGATION SIMULATION STUDY</p>	<p>MARCH 2012</p>
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APPENDIX 4
ADDITIONAL SIMULATION STUDY DVD