25 Marine Activities

25.1 Introduction

25.1.1 This chapter of the Environmental Appraisal provides a description of the marine activities occurring within the Bristol Channel that could potentially be affected by the construction and operation of the proposed Hinkley Point C (HPC) Project. Consideration is given to:

- maritime transport and vessel traffic; and
- extent and use of the Ministry of Defence (MoD) Lilstock Firing Range.

25.1.2 The focus of the work with respect to maritime transport is an assessment of the risk of potential collision during the construction and operation of HPC. The assessment focuses on the risk of potential collision with the temporary jetty (herein referred to as the ‘jetty’) and the cooling water outfall and intake structures extending into the Bristol Channel. This chapter does not consider potential impacts relating to commercial fisheries. The assessment of potential impacts on commercial fisheries is dealt with in the chapter on marine ecology (Chapter 19).

25.2 Methodology

25.2.1 The assessment of the risk of potential collision has been informed by a Collision Risk Assessment which is currently being undertaken by Anatec (UK) Limited to identify the range of ships that could have a potential impact on the cooling water structures; identify potential hazards and scenarios; and calculate the probability of collision. To inform this risk assessment, a review of baseline data on the existing maritime activity in the vicinity of HPC has been undertaken using the following sources of information:

- the ShipRoutes UK database administered by Anatec UK Ltd;
- an Automated Identification System (AIS) database for the area;
- a satellite vessel monitoring system;
- sightings data;
- data from the Royal Yachting Association (RYA) and the Cruising Association; and
- key stakeholder consultation (including local ports and harbours, and the Royal Navy).

a) Merchant Shipping

25.2.2 To identify shipping movements in the area, data has been obtained from the ShipRoutes UK Database, and an AIS database. ShipRoutes is a shipping route database developed by Anatec to assist in identifying shipping vessels passing in proximity to proposed off-shore developments such as oil and gas sites, wind farms and dredging areas. The database was developed in two main phases:

- **Movements Analysis** - the number of movements per year on routes passing through UK waters was estimated by analysing a number of data sources including port callings data and voyage information obtained directly from ship operators. It is noted that ShipRoutes excludes the movements of ‘non-routine traffic’ such as fishing vessels, naval vessels, tugs, dredgers, yachts and off-shore service vessels to mobile rigs.
Routing Analysis - the routes taken by ships between ports have been obtained from several data sources, including off-shore installation, standby vessel and shore-based survey data; passage plans obtained from ship operators; consultation with ports and pilots; and Admiralty charts and publications.

25.2.3 This information was combined to create the ShipRoutes database containing all the shipping routes passing through UK waters, with each route having a detailed distribution of shipping characteristics.

25.2.4 AIS tracking data has also been used to provide detailed information on merchant shipping activities in the region. This generally covers ships above 300 gross tonnes. A proportion of the other vessel traffic is also likely to be tracked on AIS although this will not be comprehensive.

b) Fishing Vessels

25.2.5 The Marine and Fisheries Agency (MFA) operate a satellite vessel monitoring system. This has been used as part of the sea fisheries enforcement programme to track the positions of fishing vessels in UK waters, and also track all UK registered fishing vessels globally. Data has been obtained from the satellite vessel monitoring system to inform Anatec’s Collision Risk Assessment. In addition, data on fishing vessel sightings have been obtained from the MFA and the Sea Fisheries Inspectorate and the Scottish Fisheries Protection Agency (SFPA).

c) Recreational Activity

25.2.6 Information has been obtained from the RYA and the Cruising Association on recreational facilities, cruising routes and sailing areas in the Bristol Channel.

d) Military Vessels

25.2.7 No military vessels were identified as navigating in this area over a two month survey period. The intake and outfall structures are not considered to be in an area where military shipping levels are likely to be high, and as a result the Collision Risk Assessment has scoped out any potential risk of collision relating to military vessels.

25.3 Baseline information

a) Navigation and Vessel Collision Risk

25.3.1 In order to support the Nuclear Site Licence application for HPC, an assessment is being undertaken regarding the impact on plant safety of a variety of external hazards such as the risk of a ship collision with the intake cooling water head structures. Such a collision could lead to a partial or total loss of the heat sink mechanism. While the focus has been in determining potential risk to the operation of HPC, clearly the assessment work is also of relevance in identifying the potential risk to vessel traffic using the Bristol Channel and in identifying measures that may need to taken to avoid such risk occurring (e.g. navigation signage). The location of the HPC intake structures in relation to water depths and navigable features is illustrated in Figure 25.1.

25.3.2 This section describes the commercial shipping movements within the Bristol Channel with particular focus on Bridgwater Bay. In addition it describes the location of the cooling water intake head structures.
25.3.3 The temporary jetty, located on the western edge of the Built Development Area West may also pose a risk to vessels using the local inshore waters of the Bristol Channel and Bridgwater Bay in particular.

25.3.4 An assessment of the likelihood of collisions between vessels and the head structures during both construction and operation is provided as well as potential measures to reduce the likelihood of collisions.

b) Overview of the Severn Estuary Bridgwater Port and Vessel Movement

25.3.5 The Severn Estuary is an important shipping route, with commercial vessels navigating through the deep water approaches to several ports and harbours. Commercial ports in the Severn Estuary include the following:

- Royal Portbury and Avonmouth Docks (owned and operated by The Bristol Port Company);
- Cardiff, Newport and Barry Docks (owned and operated by Associated British Ports); and
- the smaller commercial ports located at Sharpness, Bridgwater and Chepstow.

25.3.6 The Port of Bridgwater was established by an Act of Parliament in 1845. The port limits cover approximately 25 square nautical miles (nm) over the following areas:

- Bridgwater Bay from Brean Down to Hinkley Point;
- the River Parrett to Bridgwater;
- the River Brue as far as Highbridge; and
- a specific part of the tidal River Axe.

25.3.7 Bridgwater Harbour Authority, part of Sedgemoor District Council (SDC), is responsible for navigation and mooring, safety, rights of access, pilotage, maintenance of channels and navigation aids, oil spill contingency and port waste management. Port operations, oil spill contingency and port waste management plans have been drafted and implemented.

25.3.8 A summary of the vessel movements into the Bridgwater Port in 2008 and 2009 is presented in Table 25.1 below.

<table>
<thead>
<tr>
<th>Commercial Ports</th>
<th>Total vessels</th>
<th>Key trades</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2009</td>
</tr>
<tr>
<td>Port of Bridgewater</td>
<td>38</td>
<td>23</td>
</tr>
</tbody>
</table>

25.3.9 In addition to commercial ports, there are a number of harbours and marinas in the Estuary which are important for leisure traffic, including Watchet Harbour.

25.3.10 Recreational moorings within the port limits are located in the River Brue Estuary and Combwich Pill, with the main focus of recreational activity around Burnham-on-Sea, which is located to the north-east of Hinkley Point.

c) Baseline Data on Vessel Movements in the Bristol Channel
25.3.11 As outlined above, the existing maritime activity in the vicinity of Hinkley Point comprises merchant shipping, fishing vessels, recreational craft and military vessels.

i) Merchant Shipping

25.3.12 The ShipRoutes UK Database has identified that there are no routes in proximity to the HPC site, with the nearest shipping route heading to and from Bristol, some 10 nautical miles to the north of the site.

25.3.13 Using the AIS database, data from 2009 has been analysed. A plot of vessel routes in the wider area of the Severn Estuary is presented in Figure 25.2. A plot which is focused specifically in the Bridgwater Bay area is presented in Figure 25.3. Both figures illustrate the vessel movements in relation to the proposed intake and outfall head structures and tunnels.

25.3.14 The outputs from both databases indicate that shipping in the proposed area is very low with the AIS outputs providing a better basis due to its ability to track non routine shipping. The more detailed plot shows that there were four vessels movements passing to the south of the proposed intake head locations over the two month period, all of which were the Arco Dart dredger in-bound to Bridgwater.

25.3.15 Two other vessels were tracked within the area, which were:

- Trinity House's Multi Functional Tender vessel *Patricia* which was tracked to and from the Bell Gore buoy; and
- Briggs Marine's *Cameron* which was tracked inspecting/servicing the buoys within the Lilstock Firing Range.

ii) Fishing Vessels

25.3.16 Data relating to fishing vessel sightings were obtained from the Sea Fisheries Inspectorate and the Scottish Fisheries Protection Agency (SFPA) of the Marine and Fisheries Agency (MFA). Each patrol logs the positions and details of fishing vessels within the rectangle being patrolled. All vessels are logged, irrespective of size, provided they can be identified by their Port Letter Number (PLN).

25.3.17 Five years of data was used for the period from 2005 to 2009 and is presented in Figure 25.4. This identifies that the fishing vessels were not seen to pass by the Hinkley Point Power Station Complex, nor were they currently sighted as venturing near to the proposed locations of the intake and outfall tunnels.

iii) Recreational Activity

25.3.18 The entire area surrounding Hinkley Point is a designated sailing area for recreational crafts, as presented in Figure 25.5. There is also a racing area approximately 3.5nm to the west of the development site. There is a marina approximately 7nm to the west of Hinkley Point at Watchet and another approximately 9nm to the north-east at Uphill. Watchet Marina handles several cruising routes. All the recreational vessels tend to naturally avoid the proposed location for the intake sites, although the in-bound route to Burnham on Sea passes immediately to the south of the intake locations.

iv) Military Vessels

25.3.19 Monitoring undertaken by Anatec concluded that there were no sightings of military vessels in the study area, however, it is understood that such vessels use this area infrequently.
v) Lilstock Royal Navy Range

25.3.20 The Lilstock Royal Navy Range is located in open water approximately 4km to the west of Hinkley Point, off Lilstock. The range has previously been used for dropping sand filled practice bombs containing small amounts of explosives, however, this practice has ceased and the range is now used occasionally for rotary wing air gunnery training.

25.4 Potential Influence of the HPC Project on Marine Activities

a) Potential Influence during the Construction Period

i) Vessel Movements Associated with the Temporary Jetty

25.4.18 The jetty will be utilised for the import of aggregates and other bulky goods for the construction of HPC, enabling delivery by sea and reducing highway traffic during the construction period. The vessels will include aggregate dredgers and cement carriers. The peak number of vessels will be:

- cement carriers: 5/month (2,500dwt) or 3/month (4,300dwt);
- aggregate dredgers (sand): 5/month; and
- aggregate dredgers (stone): 8/month.

25.4.19 The anticipated normal numbers of vessels using the jetty per month will be:

- cement carriers: 1/month (4,300dwt)
- aggregate dredgers (sand): 2/month; and

25.4.20 Vessels will approach the berth on a rising tide and would try to approach the berth head facing into the wind and/or current, whichever is the stronger to maximise manoeuvrability. A rising tide would mean that the current is flowing west-east and would thus require the vessel to head in a westerly direction when approaching the jetty and berth on the port side of the vessel. A pilot would board the vessel (when necessary) at a designated position (up to two nautical miles from the jetty) and would steer it to approach the berth at slow speed from a northerly direction. At a distance of approximately 10m from the berth, the mooring lines would be run from the ship to shore, tensioned and with the thrust of the ship’s engines would assist in bringing the vessel alongside the berth.

ii) Influence of the Cooling Water Structures and Temporary Jetty on Vessel Movements and Navigation Risk

25.4.21 The above sections present details on vessel movement in the Bristol Channel with a specific focus on the Bridgwater Bay area. The movements of four vessel types have been considered and it has been determined that very few vessels pass by the zone of the proposed cooling water structures with the exception of occasional traffic to and from Bridgwater and some recreational vessels.

25.4.22 Given the level of vessel traffic and the routes that appear to be taken, the likelihood of a collision between a vessel and any works (e.g. presence of jack-up rigs) is considered likely to be low, although a full assessment of the potential risk has yet to be undertaken. This suggests that the potential influence of HPC during construction on existing navigation and vessel use of the area is likely to be limited. However, without the adequate provision of appropriate navigational safety measures, the potential for collision with the cooling water structures, both
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while being constructed and during operation, does exist, although this risk is considered to be low.

25.4.23 It is also evident that the commercial and leisure vessels referred to above would be unlikely to pass by the zone in which the temporary jetty would be located, particularly given the shallower water depths present in this area. However, due to the increased number of vessels in the area during construction and the dredging activity, there is a potential for an increase in the risk of collision.

25.4.24 Risk control measures will be implemented to minimise the likelihood of collisions and may include:

- The use of a Vessel Traffic Service (VTS) system during construction would be considered. The VTS will issue routine broadcasts on appropriate VHF channels indicating specific locations of construction traffic and placement activity;
- Construction vessel movements would be planned in order to avoid potential conflict with other commercial vessel movements;
- Notices to Mariners would be issued to inform commercial vessels of the general locations of any construction traffic in the area;
- Suitable buoyage would be used to ‘cord’ of the construction areas to enable commercial traffic to by-pass the working area. If necessary, vessels could also make an alternative approach to access their destination and they may also be asked to reduce speed when passing the construction zone; and
- The location and duration of the works would be made known to all yachting clubs, recreational fishing clubs and marinas, and these clubs will be asked to proactively communicate this information to their members.

25.4.25 Once the power station has been constructed the jetty will be decommissioned and removed. During this process there would be additional vessels in the area the movements of which will need to be managed to ensure safe navigation. The same measures as those employed during construction could be implemented during this phase.

iii) Interaction of the Temporary Jetty with the Lilstock Range

25.4.26 Vessels using the jetty during construction and operation may need to pass through the defined Danger Area marking the Lilstock Range. The interaction of operational vessel traffic with any proposed military use of the firing range will need to be evaluated. The current frequency of use of the firing range is unknown. Consultation with the MoD will be undertaken to determine the most appropriate mechanism for managing the construction and operation of the temporary jetty. This will ensure that interaction with use of the firing range can be managed without any adverse consequences to both activities.

25.4.27 The jetty will be constructed by driving piles into the bed rock and a berthing pocket will be created by dredging an area of the sea floor to accommodate vessels using the jetty at various states of the tide. During these works there is a potential risk to health and safety due to the potential for the sea floor strata to contain munitions from historic firing activities carried out in the Firing Range. This potential risk will be evaluated prior to construction of the temporary jetty and any appropriate measures to deal with identified risk implemented.

b) Potential Influence during the Operational Period

25.4.28 Following the construction of the cooling water structures it is anticipated that their presence within the waters would be potential obstructions to shipping traffic at certain states of the tide.
Due to the size and position of each outfall head there is the potential for the upper part of these structures to be exposed during Mean Low Water Spring tides.

25.4.29 Information regarding the current shipping channels, together with routes taken by fishing vessels and recreational vessels, suggests that the likelihood of a collision between a vessel and the intake and outfall heads is low. Other factors that may influence the likelihood of a collision will be the wave heights, tidal regime, draft of the vessel and manoeuvrability of the vessel. However, there are a number of mitigation measures that can be employed to further reduce the likelihood of an incident including:

- installing navigational aids in the immediate area. Such aids would include placing new buoys or spars in the relevant location and also the use of “virtual” buoys (buoys visible on electronic chart systems on board ships);
- provision of new navigation lights for the approach to Bridgwater Port; and
- communication of the changes to all yachting clubs and marinas.

c) Conclusion

25.4.30 The chapter focuses on the risk of potential collision with the jetty and the cooling water outfall and intake structures extending into the Bristol Channel. A Collision Risk Assessment is currently being undertaken by Anatec (UK) Limited to identify the range of ships that could have a potential impact on the cooling water structures; identify potential hazards and scenarios; and calculate the probability of collision. This risk assessment work is ongoing and further consultation is proposed to inform the full Environmental Impact Assessment (EIA) and Environmental Statement (ES) for submission to the IPC for DCO.

25.4.31 Baseline data analysed to date indicates that there are a number of marine activities, predominantly maritime transport, in the area that could be affected by the construction and operation of the HPC Project. These activities include merchant shipping, commercial fishing and recreational fishing, recreational sailing, military shipping and also occasional use of the Lilstock Royal Navy Range by the MoD for rotary wing air gunnery training.

25.4.32 It is anticipated that a number of measures will need to be implemented to minimise the likelihood of collisions both during the construction and operation of HPC, and could include the use of a Vessel Traffic Service (VTS) system during construction; management of construction vessel movements; notices to mariners; communication of the changes to all yachting clubs and marinas; suitable buoyage to ‘cordon off’ the construction areas; navigational aids such as buoys or spars in the immediate area of the cooling water intake and outfall structures; management of vessel speeds; and provision of new navigation lights for the approach to Bridgwater Port.