

Industry background

1. This appendix contains more detailed information on some aspects of the background to the towage industry, including ports and the services they provide, the types of vessel that commonly call at ports, the types of tug currently in operation, the regulatory environment for towage and an overview of the main parties' operations in UK ports.

Ports

2. Large ports are normally of three distinct types: privately-owned ports, typically owned by substantial companies, such as Associated British Ports (ABP), which owns 21 ports that account for 25 per cent of UK's port traffic, or Peel Holdings plc; trust ports; and municipally-owned ports. All three types are run independently as self-financing enterprises. There are around 100 trust ports in the UK, of which the most significant are the Port of London Authority (PLA), Dover, Milford Haven, Aberdeen and Belfast. They are independent statutory bodies established under individual local legislation, often dating back to the 19th century; any financial surpluses they make normally have to be reinvested for the benefit of the ports and their users. Although many municipal ports concentrate on leisure and fishing, several handle significant amounts of traffic. These include Portsmouth, Ramsgate, Sunderland, Flotta and Sullom Voe. For historical reasons, each port tends to have its own governing legislation.¹

Port characteristics

3. Ports include two distinct types of berth. Modern ports designed for large ships have typically developed riverside and coastal quays and piers suitable for the largest ships able to operate in the available depth of water. Riverside berths are used by large ships that normally need several powerful tugs, with at least 50 tonnes BP, for docking. Access to the berths is, however, usually comparatively straightforward and manoeuvring the ship may take less than an hour.
4. Older ports were characteristically developed with systems of enclosed docks designed for smaller ships. As enclosed dock systems typically handle smaller ships, they can usually be operated using less powerful tugs of under 50 tonnes BP. The size of the locks and the depth of water within the enclosed docks limit the size of ships that can berth. They may also limit the number and length of tugs that can be accommodated in the lock with the ship they are escorting. As towing ships into and through locks requires complex manoeuvring (often by two tugs), the operation may take several hours. Many older ports are developing riverside berths to overcome the restrictions of an enclosed dock system.

Harbour services

5. Towage is one of a number of harbour services provided to vessels calling at a port. Others include traffic control by the port authority, pilotage, the foyboatmen service (ie assistance provided to a vessel from shore-based seamen, eg in running lines

¹These commonly incorporate standard clauses specified in the Harbours, Docks and Piers Clauses Act 1847.

from ship to shore), lock operations, lighterage, stevedoring, storage and shipping agents. Of these activities, towage operators have particularly close operating arrangements with the port authority, pilots and shipping agents.

Port authorities

6. The legislation governing a port may give the port authority duties or powers to make local byelaws and issue guidelines that may affect the operation of tugs in the port. The port authority may, for example, use these powers to require towage companies to obtain a licence from it to operate within the port. The legislation governing the operation of a port may be changed by means of a harbour revision order.

Harbour masters

7. Each port authority must have a harbour master by statute. In almost every case the harbour master has a mix of statutory and management functions. He controls all the port traffic within the port authority's area of jurisdiction. In consultation with the relevant pilot and the ship's master, the harbour master stipulates the number of tugs each vessel needs to use. Their judgement is based on experience and a risk assessment made under the PMSC (see paragraph 17).

Pilots

8. When a vessel arrives in, or departs from, a port, a pilot normally takes over control of the ship from its master. Pilots advise on entry and departure manoeuvres and agree towage requirements with the harbour master. The pilot (or the ship's master where a pilot is not needed) is in overall control of manoeuvring the ship, including supervising the activity of the tugs.

Shipping agents

9. Shipping agents arrange all the necessary port services, including towage, on behalf of ship owners and charterers that choose not to make these arrangements themselves. Agents may negotiate harbour towage prices for their clients. They are invoiced for the services ordered and are thus important customers of the towage operators.

Cargo

10. Cargo is normally divided into liquid bulk, dry bulk, container traffic, ro-ro freight, and general cargo (or break bulk). Liquid bulk consists mainly of crude oil, oil products and liquefied gas. Dry bulk includes coal, iron ore and agricultural products. General cargo consists mainly of timber, iron and steel products and bundles, pallets and small containers of miscellaneous cargo.

Types of ship

11. Towage needs depend on the type and size of ship entering or leaving port. The largest types of ships are very large (or ultra-large) crude oil carriers (known as VLCCs or ULCCs) of between 150,000 and around 550,000 tonnes dwt and very

large dry bulk² carriers of over 200,000 dwt. Such ships normally use coastal or river terminals and cannot access enclosed docks. There are a wide variety of smaller ship types. Increasing proportions of cargo are now carried in standard-sized containers (to achieve economies in handling costs) and carried either on lift-on lift-off (lo-lo) container ships or on ro-ro ferries. Large container ships can have capacities of around 6,492 20-foot equivalent units (teu)³ and of over 80,000 dwt. In addition to passenger ferries, ro-ro ships include specialized cargo carriers. Purpose-built ro-ro car carriers are used to import large numbers of cars, for instance. General cargo ships are designed to carry break-bulk⁴ cargo that is difficult to carry in containers. They now carry only a small share of seaborne trade.

12. Recognized ship size ranges include:

- Capesize: ships of between 80,000 and 199,000 dwt that are too large to pass through the Panama and Suez canals and require deep-water ports. They include both liquid bulk and dry bulk carriers.
- Panamax: ships of between 50,000 and 80,000 dwt that can pass through the Panama Canal. They include both liquid bulk and dry bulk carriers and large container ships.
- Handymax: ships of between 30,000 and 50,000 dwt that have a large variation in characteristics. They include liquid bulk carriers, dry bulk carriers and container ships.
- Handysize: ships of between 10,000 and 30,000 dwt. These are the small bulk carriers that make up the majority of short-haul vessels. Can include tankers for chemicals and petrochemical products and container ships.
- Coastal: ships of between 3,000 and 10,000 dwt. These include the smallest tankers and bulk carriers and container ships with the shallow draft needed for coastal trade including access to minor ports.

Types of tug

13. Tugs allow big unwieldy ships to be manoeuvred into small spaces, tow them through locks and protect them from unexpected winds or tides that could push them out of a channel or cause them to collide with a quay or another ship. This requires a combination of power and manoeuvrability provided by specialized features such as two or more directional propellers, azimuthing⁵ or Voith Schneider⁶ propeller units, twin diesel engines and a bow thruster.⁷

²Dry bulk cargoes are solids—such as coal, iron ore, scrap metal and grain—that are shipped without any packaging.

³Twenty-foot-long containers were the original standard size. As there are now larger containers, capacities are converted on to a standardized basis.

⁴Break-bulk cargo, such as timber or steel products, consists of items that are packed in the traditional way and stowed directly in the ship's hold, rather than being carried in containers.

⁵Azimuthing propulsion units have steerable propellers mounted in pods which can be rotated to produce thrust in any horizontal direction. Conventional rudders are not needed.

⁶Voith Schneider propulsion units consist of a series of vertical hydrofoil-shaped blades fitted to a hub on the bottom of the ship. The hub rotates about a vertical axis at constant speed. The pitch of the blades at various positions can be altered continuously, resulting in an almost instantaneous change in the direction of thrust. As the thrust can be applied in any horizontal direction, these propulsion units offer more control than conventional screw propellers, remove the need for a rudder and have better manoeuvrability when going astern.

⁷A bow thruster is a propeller that provides sideways thrust at the bow of the ship to aid manoeuvring.

14. Tractor tugs are designed to pull from their sterns or push with their sterns. They can direct their thrust in any direction and have propeller units located both forward in the hull and at the tow point at the stern of the tug.
15. Tugs with an azimuthing propeller fitted at the stern are known as azimuth stern drive (ASD) tugs. Both these tugs and Voith Schneider tugs can manoeuvre better than conventional tugs and are equally suitable for towing by line and pushing vessels.
16. Deep-sea tugs are distinct from harbour tugs and perform tasks such as salvage and long ocean tows, eg to take floating docks or oil drilling rigs to new locations. Sea-going tugs need to be more powerful than those used for harbour and terminal towage; they may have a power of over 170 tonnes BP. In addition to being more powerful than harbour tugs, salvage tugs are equipped with a wide range of emergency equipment, such as fire monitors, powerful pumps and air compressors.

Regulation affecting towage operators

Port Marine Safety Code

17. The Port Marine Safety Code (PMSC) is a voluntary code published by the Department for Transport (DfT) in 2000. The PMSC requires each port authority to apply the principles of risk management and develop a safety management system. The PMSC is in two parts: the first sets out the legal duties and powers of UK harbour authorities relating to marine safety, and the second introduces a national standard for all aspects of port marine safety that applies to all marine activities. Paragraph 2.7.1 of the PMSC requires that ports should ensure that craft used in the harbour are fit for purpose and that crew are trained and qualified for the tasks they are likely to perform. Paragraphs 2.7.2 to 2.7.6 discuss the use of tugs. They require the need for tugs to be included in risk assessments. Ports are required to develop towage guidelines and keep them up to date. The joint training of tug crews with other port personnel is also advocated. The PMSC was due to be implemented by harbour authorities by the end of 2001.

A Guide to Good Practice on Port Marine Operations

18. The DfT's *Guide to Good Practice on Port Marine Operations* (the Guide) was published in 2002 to support the PMSC. Section 9.3 of the Guide discusses tugs and the factors that need to be considered in developing towage guidelines. These include: the geography of the port; difficulties associated with particular berths, locks and bridges; the applicability of escorting; tidal streams and weather; the size, type and manoeuvrability of ships using the port; and whether tugs are needed for turning ships before or after berthing. Towage guidelines should specify escorting requirements; optimum/minimum numbers and sizes of tugs for given sizes of ship and/or for particular berths; conditions under which it is acceptable not to use tugs; procedures for towage in fog; and required levels of cross-training between pilots and tug masters.

Crew qualifications

19. Section 10.6 of the Guide discusses the training and qualifications required by tug crews.
20. The MCA—which is responsible, inter alia, for safety at sea—requires that tug personnel should have appropriate certificates of competence. The requirements are set out in Marine Guidance Note 209 (M). There are detailed requirements for each

type of work on tugs. New entrants may apply to take part in the British Tugowners Association's (BTA's) Marine Apprenticeship Training Scheme which leads on to various levels of vocational qualifications. In most cases, three or more years' service are required to reach the next level of qualification.

21. The MCA plans to introduce vessel standards that incorporate all recent UK and EC standards in 2008 and a fitness-for-purpose scheme. Svitzer told us that it did not expect this to result in any significant changes as the UK already followed the relevant IMO codes, which were extensive. Although the MCA is also developing a new Boatmasters Licence that is currently subject to public consultation, Svitzer told us that this would not affect tugs, and Adsteam thought that it could make recruitment easier by lowering the required standards of qualification and allowing the use of lower-cost crews. Adsteam also considered that there were no significant obstacles to recruiting skilled tug crews.

Other regulation

22. In common with other ships, tugs have to be certified by the MCA. All ships are subject to compliance inspections. Vessels also have to be classified by a classification society such as Lloyd's. The relevant society inspects tugs to certify them for insurance purposes. These inspections occur every 2½ years, with a major inspection every five years.
23. Some port authorities use their powers to issue byelaws to require that any towage company operating in the port should be licensed by the port authority. This licence may depend on the company devoting a certain number of tugs to the port and/or on the tugs reaching specified quality standards. Some other port authorities may use less formal methods to indicate that a particular new towage operator is either welcome or unwelcome in its port.

The areas where Adsteam and Svitzer operate

24. Table 1 presents an overview of the parties' harbour and terminal towage activities in UK ports.

TABLE 1 Ports where Adsteam and/or Svitzer operate

	<i>Port characteristics</i>	<i>Svitzer operations</i>	<i>Adsteam operations</i>
Liverpool	<p>Includes the Port of Liverpool, Tranmere oil terminal, Liverpool Bay offshore terminal, Holyhead, Heysham, Mostyn and Barrow.</p> <p>Main cargoes: crude oil, dry bulk cargoes and ro-ro freight.</p>	<p>Focused on the terminals and the port of Liverpool.</p> <p>Normally operates six tugs (although only five currently).</p> <p>Carried out [§] harbour tug jobs in Liverpool and [§] terminal tug jobs in 2005.</p>	<p>Focused on Liverpool's enclosed docks.</p> <p>Operates six tugs.</p> <p>Carried out [§] harbour tug jobs at Liverpool in 2005.</p>
Milford Haven	<p>Includes the Port of Milford Haven and three LNG terminals, two of which are under construction.</p> <p>Main cargoes: crude oil and oil products.</p> <p>The terminals are operated by Chevron Texaco, Total and SemGroup.</p>	<p>Operates three tugs in the Port of Milford Haven.</p>	
Bristol	<p>The port includes the Avonmouth Dock and Royal Portbury Dock.</p> <p>Main cargoes: coal and cars.</p> <p>Planning permission for a container terminal currently being sought.</p>	<p>Operates six tugs at Avonmouth.</p> <p>Tug jobs carried out in 2005: [§].</p>	
South-east Wales	<p>Includes Port Talbot, the ports of Newport, Cardiff, Swansea and Barry.</p> <p>Main cargoes: iron ore and coal (Port Talbot); oil products (Cardiff); iron, steel products and miscellaneous dry bulk (Newport).</p>	<p>Operates four at Port Talbot and three tugs at Newport. Newport tugs are occasionally used in Barry and Cardiff.</p> <p>Tug jobs carried out in 2005: [§] in Port Talbot and [§] in Newport.</p>	
Southampton	<p>Includes the Port of Southampton, the Fawley oil terminal and the Hamble oil terminal.</p> <p>Main cargoes: crude oil, oil products, liquefied gas and containers; vehicles.</p>		<p>Operates seven tugs.</p> <p>Tug jobs carried out in 2005: [§] in Southampton.</p> <p>Operates as subcontractor to Solent Towage at Fawley.</p>
Thames Estuary	<p>Includes the Port of London, the Port of Tilbury and the Coryton oil terminal.</p> <p>Main cargoes: various, including oil, containers, vehicles, ro-ro ferries, grain, forest products and sugar.</p> <p>6,533 tug jobs carried out by Adsteam and Targe Towing in 2005.</p>		<p>Operates five tugs.</p> <p>Tug jobs carried out in 2005: [§].</p>
Medway	<p>Includes the Ports of Sheerness and Chatham, which handle fresh produce and timber; the Thamesport container port; and the Isle of Grain LNG terminal.</p>		<p>Operates six tugs.</p> <p>Tug jobs carried out in 2005: [§].</p>
Felixstowe	<p>Includes the Ports of Felixstowe, Harwich, Ipswich, King's Lynn, Great Yarmouth and Lowestoft.</p> <p>Felixstowe is a container port. The other ports handle ro-ro freight and miscellaneous dry bulk.</p>		<p>Operates four tugs at Felixstowe and seven tugs at its Felixarc operation.</p> <p>Tug jobs carried out in 2005: [§] in Felixstowe.</p>
Humber	<p>Includes the Ports of Hull, Immingham and Grimsby which handle various cargoes and the Tetney and Immingham oil terminals.</p> <p>10,427 tug jobs carried out by Adsteam and SMS in 2005.</p>		<p>Operates 12 tugs.</p> <p>Tug jobs carried out in 2005: [§].</p> <p>Low-cost operation, Humber Tugs, commenced 2006.</p>

	<i>Port characteristics</i>	<i>Svitzer operations</i>	<i>Adsteam operations</i>
Teesside	Includes Teesport and the Port of Hartlepool which handle mainly crude oil and iron ore, and ConocoPhillips oil terminal.	Operates six tugs. Tug jobs carried out in 2005: [§].	
Tyneside	Includes the Port of Tyne, Sunderland and Blyth, which mainly handle miscellaneous dry bulk, ores, cars, liquid bulk and raw materials for aluminium manufacturing.	Operates three tugs. Tug jobs carried out in 2005: [§].	
Firth of Forth	Includes the Port of Leith, Grangemouth, the Innovene terminal, the Hound Point and the Braefoot oil terminal. Main cargoes: crude oil and liquefied gas.	Operates two tugs. Tug jobs carried out in 2005: [§].	
Firth of Clyde	Includes the Port of Greenock and Clydeport. Main cargoes: coal, crude oil and oil products.	Operates four tugs. Tug jobs carried out in 2005: [§].	
Northern Ireland	Includes the ports of Belfast, Ballylumford and Coleraine	Operates three tugs based in Belfast. Tug jobs carried out in 2005: [§].	

Source: Ports' websites, *Focus on Ports* 2006 edition, *Maritime Statistics 2005*, main parties.
