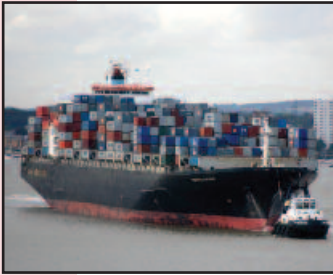


Code of Practice for Ship Towing Operations on the Thames

2010



PORT OF
LONDON
AUTHORITY 

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PORT OF LONDON AUTHORITY

**CODE OF PRACTICE FOR SHIP TOWAGE
OPERATIONS ON THE THAMES
2010**

FOREWORD

This Code of Practice is published following an extensive review of the 2005 edition. In particular, the Guidelines for the Utilisation of Ship Towage Tugs have been revised significantly into a more logical and user-friendly format.

The Code remains in two parts:

Part One - Safe Working Practices for Ship Towage Operations; and

Part Two - Guidelines for the Utilisation of Ship Towage Tugs on the Thames.

The Code is provided for the guidance of masters, pilots and tug crews involved or likely to be involved in ship towage operations on the tidal Thames. Ships' agents are also recommended to make themselves familiar with the content of the Code, and in particular the application of the Guidelines for the Utilisation of Ship Towage Tugs.

This Code forms an integral part of the port's navigational Safety Management System, and hence contributes to the PLA's compliance with the requirements of the Port Marine Safety Code.

October 2010

PART ONE

SAFE WORKING PRACTICES FOR SHIP TOWAGE OPERATIONS

SECTION ONE - INTRODUCTION

Part One of the Code provides both generic guidance on ship towage operations and also specific references to local good practice in ship berthing and unberthing operations on the Thames.

SECTION TWO – PREPARING FOR TOWAGE OPERATIONS

2.1 Planning and Co-ordination

Before beginning towing operations, a comprehensive plan of action (part of the ship's port passage plan) should be (prepared and) agreed by the Pilot and Master – if a Pilot is embarked - taking account of all relevant factors, including tide, wind, visibility, the ship's size, type and characteristics, the berth operator requirements. A good knowledge of the type and capabilities of the tugs allocated to the job is important, in order that the Pilot and Master can ensure tugs are both suitable for the task ahead and positioned on the vessel so as to be most effective, and to facilitate a safe operation.

Any conflict or mismatch between the required manoeuvre and the tugs allocated must be resolved before the towage operation begins.

Responsibility for co-ordinating a towage operation lies with whoever has the conduct of the vessel being towed, be that the Master or the Pilot. When berthing and unberthing, it is the duty of the Master and Pilot to ensure that the vessel is handled in a safe and controlled manner, having due regard to the safety of all those involved, whether it be on the ship, assisting tug(s), linehandlers or mooring gangs and other river users as appropriate.

The number of personnel employed in any towage operation should be determined having due regard for the size of the vessel and the prevailing operational and environmental circumstances. In all cases, sufficient manpower should be provided to ensure that individuals are not exposed to undue risk, and that the operation can be conducted safely and efficiently. Due regard should also be given to the size, weight and scope of the towing gear and lines to be handled.

All those with a responsibility for personnel or equipment involved in assisting the towage/mooring of vessels have a duty to ensure that safe working practices are followed, and that associated equipment is fit for purpose. They should also ensure that those involved are properly trained, adequately briefed in their duties, and issued with, and use, suitable and effective personal protective equipment.

2.2 Pilot / Vessel Master Exchange

In addition to the standard information passed to the Pilot, it is recommended that the Master provide the Pilot with a deck General Arrangement showing the layout and safe working load (SWL) of the mooring fittings, where known, and inform him:

- which fairleads, chocks, bollards and strong points can be used for towing;
- the SWL of this equipment;
- areas of hull strengthened or suitable for pushing by tugs and relevant identification marks employed. (This information is needed due to variations in ship construction and the appropriate area frequently being out of line with the chock);
- using ships' mooring lines as towlines is not recommended (except in an emergency) as the strength may not be in accordance with tug towing force and may therefore limit the tug's performance; and
- any special features (i.e. controllable pitch propellers, thrusters etc).

The Pilot should advise the Master:

- the tug rendezvous time and position;
- the number of tugs and the mode of towage;

- the planned (optimum) ship speed when connecting to the tug's lines;
- whether the ship's or the tug's line are recommended for use;
- the type of tugs to be used and their bollard pull(s);
- if escorting, the maximum towline forces that the tug may generate at escort speeds;
- maximum planned speed for the passage;
- the method by which the ship's crew should take on board and release the tug's tow line;
- the prohibition on the use of weighted heaving lines;
- that on release, the tug's gear should be lowered back always under control;
- areas of the transit posing particular risks with respect to the possible use of the tug;
- intentions with regard to use and positioning of the tug(s) for berthing manoeuvres;
- intentions with regard to use of the tug(s) in an emergency (escort operations); and
- primary and secondary VHF channels for use in the operation.

2.3 Pilot / Tugmaster Exchange

The Pilot and Tugmaster should, as a minimum, discuss the following issues:

- the SWL of the vessel's chocks, bollards and strong points to be used for towing. (Failure to provide this information could result in broken equipment);
- the tug hook up point, taking into account the prevailing weather and sea conditions, for escorting operation (if appropriate) and berthing;
- the planned (optimum) ship speed when connecting to the tug's lines;
- if active escorting, the start point of the escorted passage;
- the maximum speed of the tug;
- passage details in their entirety while accompanied by the tug(s), particularly details of any swing manoeuvre, release position and sequence of release;

- berthing details in their entirety, including tug positioning around the vessel's hull and the vessels required position on the berth;
- intended and emergency use of ships anchors;
- any unusual items regarding the particular vessel as gleaned from the Master/Pilot exchange;
- if appropriate, any shallow water or bank effect areas where significant surges may be experienced that might add to the tug loads;
- the Tugmaster should advise the Pilot (as far in advance as possible of the scheduled manoeuvre) if the tug is experiencing a failure or reduction in its ability to manoeuvre or deliver full bollard pull; and
- when confirming that the tug is fast and ready to assist, the Tugmaster should also confirm both the tug's name and her position on the vessel.



2.4 Pilot / Boatmen & Linesmen Exchange

(As described in the PLA's Code of Practice for the Safe Mooring of Vessels on the Thames)

- the Pilot should ensure that the Boatmen/Linesmen are fully briefed as to the mooring/unmooring plan, being clear as to the allocation of tugs and which lines are to be run and when;
- the Pilot and Boatmen/Linesmen should exchange information regarding any restrictions that may affect line handling or the operation of line boats;
- any last minutes changes to mooring requirements must be passed as quickly as possible to avoid confusion or unsafe operations; and
- the Pilot should not leave the bridge or break communication with the Boatmen/Linesmen until the towage/mooring operation is complete.

2.5 Preparations on board

Tug and Vessel Procedures

Operations such as mooring and towing impose very great loads upon ropes or warps, gear and equipment. The Code of Safe Working Practices for Merchant Seamen sets out certain precautions, which should be taken, but the circumstances of recent accidents show that greater emphasis should be given to considering the system as a whole.

As a result of the imposed loads, sudden failure in any part of the system may cause death or serious injury to personnel. Masters should avoid men being stationed or necessarily working in the bight of a warp or rope formed by the lead from the winch or windlass round and through the fairleads and over-side. In any case, the consequences of failure in any part of the system must be carefully considered and effective precautions taken.

All fixed and running gear including ropes should be carefully maintained, tested, certified and regularly inspected against wear, damage and corrosion. Particular attention is drawn to the need to ensure that fairleads, lead bollards, mooring bitts etc are:

- (a) used appropriately and within their design capabilities;
- (b) correctly sited; and
- (c) effectively secured to a part of the ship's structure which is suitably strengthened.

Investigation of one accident showed that due to corrosion fatigue, a roller pin fractured at a sharp change of section machined at the lower end. The place of fracture was inaccessible to inspection and maintenance, being just below the housing surface. In another instance, the welding between fairlead and deck failed. In a third case, a bollard which was pulled out had been secured to a deck pad by bolts of inadequate diameter and had loose nuts.

Watertight Integrity

The watertight integrity of the tug should be maintained at all times. When a tug is engaged on any towage operation all watertight openings should be securely fastened. All watertight openings should be marked with a sign stating that they are to remain closed during towage operations.

Any such openings used whilst moving about the tug during a towage operation should be re-secured immediately after use.

Testing and Inspection of Towing Equipment

Towing hooks and alarm bells, if fitted, should be inspected daily. The emergency release mechanisms on towing hooks and winches should be tested, both locally and where fitted remotely, at frequent intervals to ensure correct operation. All towing equipment in use should be inspected for damage before undertaking and after completing a towage operation.

Tug/Workboat Personnel

Vessel crews involved in towage operations should always:

- wear approved and in-date self-inflating lifejackets and other appropriate PPE (e.g. hard hat, safety footwear, etc) throughout the operation;
- ensure that the working area is safe and free from trip or slip hazards;
- remain alert to what the vessel crew is doing; and
- refuse a damaged towing hawser whilst notifying the Tugmaster and vessel.

Tugs, Workboats and Linehandling Boats

(As described in the PLA's Code of Practice for the Safe Mooring of Vessels on the Thames)

Engines and other equipment should be maintained to the manufacturers' specifications and be properly serviced. Equipment such as heaving lines and messengers should be of appropriate length and strength. All equipment should be checked before the start of each operation. Life saving equipment should be available for immediate use.

PLA Licensing Requirements

All ship towage tugs and workboats (including line handling boats) used within the Port of London are required to be inspected and licensed by the PLA as being 'fit for purpose'. They should only be used in assisting ship manoeuvring and berthing/unberthing operations for which they have the capacity and are licensed.

The details of which tugs are currently licensed by the PLA to undertake ship towage operations in the port are promulgated by Notice to Mariners.

Linehandling boats should be crewed such that they are capable of handling safely all the wires and ropes needed to complete the operation. It is strongly recommended that safe manning in linehandling boats should include a Coxswain and at least one Linehandler. The person in charge of the boat should meet the minimum competency standards as specified by the PLA.



SECTION THREE – COMMUNICATIONS

VHF communications are a vital component of safe towage operations. It is essential that those onboard the vessel, the tug(s), where appropriate the mooring/line boats, and those on the berth, are able to communicate promptly throughout the towage operation, should the need arise.

Prior to towing operations being undertaken, the Pilot, Master, Tugmaster(s), and Linehandlers and Boatmen should establish suitable means of communication, exchange relevant information (e.g. speed of vessel), and agree a plan for the towage operation. Pilots, Linehandlers and Boatmen should carry a fully charged spare battery for their hand held-VHF.

Once VHF communications have been established, tested and Pilot/Tugmaster/Linehandlers and Boatmen information has been exchanged, personnel should keep transmissions to a minimum and should normally only call when in doubt, or in an emergency. Mooring personnel should consider monitoring the tug/ship VHF working channel in order to have a proper appreciation of progress in the berthing/unberthing operation.

During operations, it is important that effective communications should be maintained between:

- (a) the towing vessel and both the bridge team, and the mooring decks of the vessel under tow; and
- (b) the ship's tow party(ies) and the bridge team.

In all communications, clear identification of the parties' communicating should be used to prevent misunderstandings. The Tugmaster and Boatmen should be kept informed of engine movements, helm orders, proposed use of thrusters and anchors on the towed vessel.

London VTS

The PLA operates two Vessel Traffic Services (VTS) Centres at Gravesend and Woolwich. Both use the call sign London VTS, but operate on different frequencies.

It is important that London VTS is included in the communication loop, as appropriate, when planning and then executing a ship towage operation. London VTS has its own role and responsibilities to undertake on such

occasions and will be available to provide information on tug allocations, act as a communication link with the berths, agents, and where necessary Boatmen and Linehandlers. VTS will also advise the Pilot/Master of any traffic likely to be affected by or affect the towage operation.

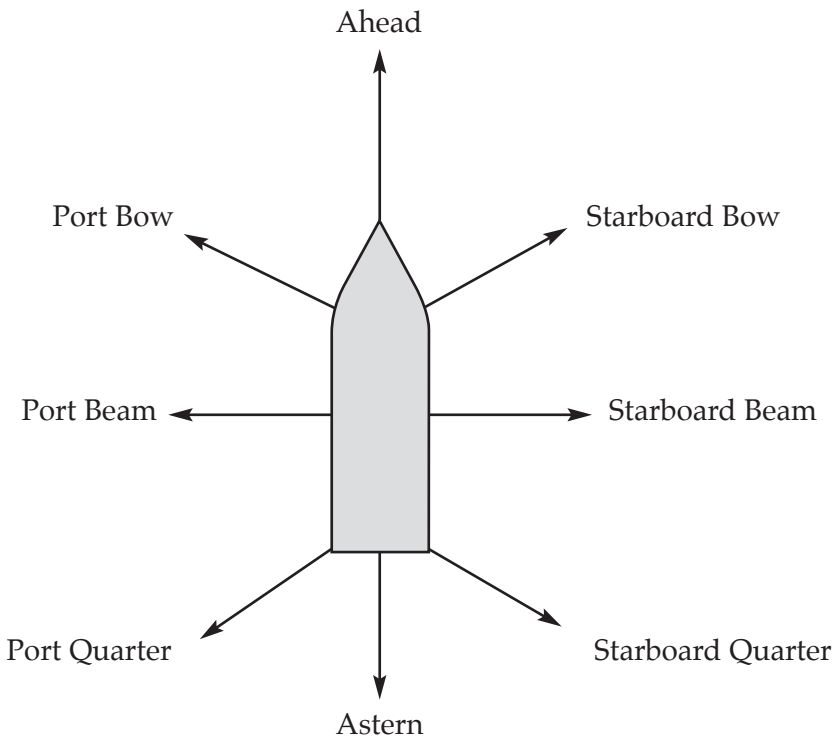
During the towage operation, it is important for Pilots and Masters to keep London VTS fully apprised of the planned manoeuvre and its progress, in order that VTS can keep other port users apprised, and to warn of dangers or restrictions created by the operation. Pilots and Masters are to advise London VTS of the tug VHF working channel.

SECTION FOUR – PILOT INSTRUCTIONS TO THE TUG

It is vital in any regular towage operation, but especially important in a port the size and as diverse as London, with a large number of operational Pilots, that instructions to tugs are specific, consistent and easy to understand.

To avoid confusion, Pilots will ask for tug power and directional requirements as follows:

The direction of pull will be indicated as follows:



The power required will be indicated as percentages, i.e.

Stop - 25% - 50% - 75% - Full

SECTION FIVE – TOWAGE OPERATIONS

5.1 Connecting and Disconnecting Towing Gear

Connecting

Before arrival at the tug connecting position, the Pilot or Master should establish effective communications with the tug(s) and agree working channels. Likewise, effective communications must be established between the bridge and the vessel's crew at 'stations' and they should confirm that they are ready to receive the tug (as appropriate).

The vessel's speed should be reduced to that which allows a safe rendezvous and connection with the tug(s). The required speed should be agreed in advance between the Master (and Pilot if embarked) and with (all) the Tugmaster(s) involved. At all times during the connecting process, the Pilot/Master should be aware of the position and intention of all relevant shipping movements in the area. He should keep London VTS apprised of his intentions at all times, requesting advice on shipping as necessary.

The Pilot or Master should ensure that his planning takes full account of the time taken to connect the tow(s), especially if adverse conditions are likely to extend this process. Account should also be taken of potential language difficulties as it is not unknown for there to be uncertainty and confusion as to which ship's lead is to be used. Vessel mooring parties should be fully briefed and the Pilot/Master should check when in doubt and be confident that his instructions are being followed.

Before commencing a tow, the Tugmaster should determine which towing gear is suitable for the operation and instruct the crew accordingly. When receiving heaving lines, the tug crew should be aware of the risk of injury through being struck by a 'Monkey's Fist'. **Extra weights should NEVER be inserted in the 'Monkey's Fist' or attached to the heaving line.** Ships' personnel should wherever possible, agree with the tug crew the area where the heaving line is to be thrown, to allow the recipients to move clear. When connecting to a tow, the tug crew should ensure that the towing gear is clear of any obstructions, able to run freely and is released from the tug in a controlled manner. The eye of the towline should always be passed around the first horn of the bitts and over the second to spread the towing load on the bitts. This is the basis upon which the SWL is calculated.

The ship should not test the bow or stern thrust controls prior to berthing at the time when the tug is under the bow or stern passing up a line. Changes in speed should also be avoided while the towing gear is being connected as it may not be possible for tugs to react sufficiently quickly to sudden increases or decreases in a ship's speed. Where a change in speed is necessary, the Pilot should ensure that all tugs involved in the operation are advised in good time.

The Pilot or Master should maintain radio contact with the Tugmaster/vessel crew throughout the process. He should be ready to revise the intended tug position if the Tugmaster reports any restrictions at the chosen position, e.g. large flare, overhanging anchor or unsuitable push up point. The Pilot or Master must keep all those involved up to date and apprised of any changes to the agreed plan.

Tug Positioning and Speed

The Pilot or Master should always advise the Tugmaster before making headway on the vessel, allowing the tug to move to a suitable position for towing while making way.

The positioning of tugs on a vessel is a matter for discussion between the Pilot and/or Master and the Tugmaster(s), having full regard for the areas of the hull, which should be avoided, e.g. watertight doors, between frames etc.

In strong tidal conditions a high percentage of the tug's power may be utilised in maintaining position on the vessel before applying thrust to the vessel. If the tugs are made fast alongside they are at their most effective with a minimal ship speed through the water.

Disconnecting

During disconnection, both the vessel's and tug's crew on deck should be aware of the risk of injury if the towing gear is released from the tow in an uncontrolled manner and avoid standing directly below.

They should also be aware that any towing gear which has been released and is still outboard may 'foul' on the tug's propeller(s), steelworks or fendering, causing it to come tight unexpectedly. The towline should always be lowered onto the tug deck, never just 'cast off' and left to run.

Ships Mooring Lines

Ships mooring lines should not normally be used for towing operations except in an emergency, or where a proper risk assessment has been carried out. Where such use is authorised, extreme caution should be taken to ensure that the size and condition of the line is suitable and that it is kept slack and under control when lowering to the tug and making fast.



5.2 Precautions during Towing Operations

Crew Safety during Towing Operations

Once the towing gear is connected, the crew should indicate this to the Tugmaster and then clear the area and, if required to remain on deck, stand in a safe position. If the crew are required to attend the towing gear during a towing operation, the length of time exposed should be kept to a minimum.

During towing operations the towing gear equipment and personnel should be continuously monitored and any change in circumstances immediately relayed to the Tugmaster. This is particularly important on tugs where the Tugmaster has a restricted view of the towing area/personnel. Crew should be aware that the tow may have to be released in an emergency situation, and that this may occur without warning.

The Tugmaster, having verified the towline is fast to the tug, must confirm this with the vessel's bridge. The Pilot or Master should then confirm 'all fast' to the tug, thus completing the loop. Sometimes it is not possible for the Tugmaster to see the crew on deck due to structural design or at night when they may be obscured by deck lighting on the ship.

Safety of Boatmen and Mooring Boats

Tugmasters, Pilots and Masters should be aware, at all times, of the position and intentions of mooring boats, especially in strong tidal conditions; at night; or during restricted visibility or adverse weather conditions. This is particularly important in circumstances where visibility is limited from the tug wheelhouse and ship's bridge. Remember that bow and stern thrusters, and the wash from tugs and the vessel being assisted, can all cause significant problems for mooring boats, especially when they are in close to the vessel and/or tug(s) picking up and running with lines. Controllable pitch propellers are a separate, but equally dangerous hazard.

When running aft breast or stern lines, the Pilot or Master should never use the vessel's engines without confirming with the Boatmen and/or Linehandlers as to the position of the mooring boat.

Sound signals can be used as a warning on occasions when vessel noise compromises VHF monitoring.

Use of Bridal/Gog/Gob rope during Towing Operations - Girting or Girding

A suitable bridle/gog/gob rope or wire should be used where it is identified, through the position of the tug in assisting the tow or the nature of the operation, that the tow line is likely to reach such an angle to the fore and aft line of the tug that a 'girting' or 'girding' situation may arise.

Maintain Communications

The Pilot or Master and Tugmaster should ensure that effective communication is maintained throughout the operation. The Pilot should ensure that the vessel Master is kept apprised of the use/intended use of the tugs, especially should circumstances dictate a change from the intended plan. The towage operation should be maintained at a safe speed, commensurate with the conditions and circumstances. The vessel's crew should be warned that the tug may be used at full power at any time.

SECTION SIX – SAFE SPEED

6.1 Speed Kills

This concept applies equally well to ship towage operations as it does to road transport. Most ship towage manoeuvres should be carried out with the minimum of way on the ship. This is especially true when swinging, and no way should be on the ship when working a conventional tug stern to stern.

Exercise caution when using the engines while the tugs are working. The after tug will be affected by the wash and every tug will be affected by the change of speed either up or down, and a rapid change in speed is all the worse. If the situation dictates the use of the engines, the minimum that the situation allows should be used and the tugs should be informed of what the ship is about to do as it will affect their own actions.

Taking the example of a conventional tug on forward, swinging the ship and broad out on the bow. Then if the ship starts to move ahead it is in danger of running past the tug, which once past the point of balance, will be swung on the end of a pendulum to smash against the ship's side. The Tugmaster's only option is to trip the tow line. If, however, the Pilot or Master warns the tug before he starts the ship's engine, the Tugmaster should immediately reduce the angle of the tow off the bow and thus remove the risk of being over run.

6.2 Some speed is required at times

When taking up the tow line, Tugmasters will ideally expect a speed of about 4 knots through the water. This gives the necessary way to assist the tugs in manoeuvring close to the ship whilst also giving plenty of power in reserve should they have to break away. As the Tugmaster is trying to balance the tug in a position to pass the towline he is looking for a steady speed. If the Pilot or Master requires to change the speed, e.g. to maintain steerage way, he must tell the Tugmaster of his intentions before ordering a change to the engine speed.

The forward tug is especially vulnerable when passing up the tow line. This tug has to position itself very close under the bow, sometimes under 1 metre from the ship's waterplane. The Tugmaster will be concerned about any bulbous bow or other underwater protrusion, the proximity of the flare of

the bow and other odd bits sticking out (some container ships for example). At the same time the Tugmaster is fighting the hydraulic pressure wave that exists around the bow. The forward tug would be most disconcerted with a change of speed while passing up the tow. Alterations of course should also be avoided whilst connecting the tow. Voiths do not.

Conventional tugs will also require a little way to enable them to disconnect. Voiths do not.



SECTION SEVEN – TOWAGE IN FOG

7.1 Introduction

The following procedures are to be followed by all those involved in ship towage operations in the Port of London, including:

- Tugmasters;
- Pilots;
- Vessel Masters;
- Duty Port Controllers;
- VTS Supervisors; and
- Duty Towage Controllers.

Purpose and Application

The purpose of these procedures is to clarify, in good time, what towage services will be available to vessel Masters and Pilots when Fog exists or is expected to exist in, or in the vicinity of, the areas of the Port where tugs will assist vessels. They will apply at times when the vessel requiring tug assistance is either preparing to leave a berth or is at, or west of, the South West Oaze Buoy inward bound.

Fog

“Fog” means all circumstances when visibility is less than 0.2 nautical miles.

7.2 Procedure when Fog exists or is expected

1. When Fog is deemed to exist in or is expected to exist in, or in the vicinity of, the areas of the Port where tugs will assist a vessel, the Duty Port Controller or Duty VTS Supervisor will ascertain from the Duty Towage Controller what towage services will be available to the vessel at the time when the towage service is required.
2. To assist in the identification of the actual towage requirements it may be effective for the Pilot or Master of the vessel to liaise directly with a duty Tugmaster. In these circumstances it is important that the Duty Port Controller (and/or Duty VTS Supervisor) and Duty Towage Controller are apprised of any resultant decisions made by the Pilot or Master and the Tugmaster.

It is suggested that the range of towage services potentially available may be categorised as follows:

- Normal towage services;
- Push/pull operations (made fast alongside);
- Push operations (not made fast);
- Other (as agreed between Pilot or Master and the Tugmaster); or
- No service.

Notes:

1. Within the Thames a Harbourmaster or his designated Deputy may, using all available information, decide that Fog pertains in a particular area or at a particular time or is likely to pertain and inform shipping as appropriate.
2. For inward bound vessels having a maximum draft of 10m or more, this procedure is applicable prior to the vessel passing the South West Oaze Buoy. This is to ensure that the vessel has sufficient sea room to abort the transit should that be necessary.
3. The procedure assumes that Fog persists throughout the towage operation. Because it is recognised that Fog can lift very quickly, the decision on the level of service agreed may be qualified by 'if the Fog persists'. The response from the Duty Towage Controller must however be positive in regard to the service, which will be available, when the vessel requires it and the fog persists.

7.3 Procedure when Fog occurs during a towage operation

1. Should Fog occur during a towage operation, the Pilot and/or Master and the Tugmaster(s) will discuss the situation immediately and agree upon a course of action to ensure the safety of all persons and vessels involved, given the location, environmental and vessel traffic conditions, seeking the advice of London VTS as appropriate.
2. The Pilot or Master will advise London VTS of the circumstances and the decision immediately, keeping VTS informed of any operational developments, or any improvement or deterioration of the visibility, as necessary.

SECTION EIGHT – THE USE OF TUGS IN SHIP HANDLING

Different tug types and their capabilities and characteristics are discussed in several good reference publications (See Section 11). Pilots and Tugmasters should be aware of the limitations of the tugs involved in each operation. Particular consideration should be given as to the best use of individual tugs bearing in mind the planned manoeuvre, and the local conditions and circumstances. The following provides an introduction to some of the major issues involved in the use of ship towage tugs. Further reading is recommended.

The Duty Towage Controller should make every effort to provide tugs of appropriate bollard pull and capability for the particular towage operation in question.

8.1 Interaction

Interaction and its effects on the tug and its handling are well known, and appreciated in port/harbour towage. Pilots, Masters and Tugmasters are reminded that these effects increase with speed.

In areas where interaction exists, and when manoeuvring alongside a tow, the Pilot/Master should be aware of the possibility of underwater obstructions such as bulbous bows, stabiliser fins etc; and areas of the ship's sides, such as pilot doors, which are to be avoided. The use of bow thrusters by the towed vessel may present a hazard to the tug. When in close proximity to or coming alongside a tow, the crew should be aware of interaction and the effect it may have on the tug. This may take the form of sudden movement or contact and result in loss of balance or movement of equipment and other objects.

Marine Guidance Notice 199 (M) - Dangers of Interaction - provides further guidance and information on the effects of interaction, including when manoeuvring at close quarters.

8.2 Tug Escorting

Escorting as a regular operation is becoming common within the port towage industry. It should only be carried out after investigating the suitability of the tug for the operation and the Pilot, Master and Tugmaster(s) agreeing a plan.

This type of operation is carried out in the 'passive' and 'active' modes: passive when running free in close attendance, and active when fast to the tow. If active escort is being undertaken the form of towage can be 'direct' or 'indirect', depending on the speed of the tow. When made fast, all those involved should be aware that increased loads can be applied to towing gear, especially when operating in the indirect mode.

SECTION NINE – LOCAL TOWAGE OPERATIONS

The following identifies established local procedures as examples of good practice in ship towage operations.

9.1 Coryton, Shellhaven and other river berths

Great care is to be exercised when coming alongside the Coryton and Shellhaven tanker berths due to the complexity of pipework on the jetties. Vessels should always land parallel to distribute the landing load evenly along the jetty length. The tide runs strongly in these areas and care must be taken to allow for this when berthing and unberthing. Communication should be established on the relevant VHF working channel with mooring team at the earliest opportunity and positioning/mooring requirements confirmed.

When manoeuvring at river berths in general, make the tug(s) fast in advance of arrival off the berth and allow for the strength of the current when swinging and approaching the berth. Remember that making fast a tug or tugs too early can severely reduce the maximum speed available to the vessel, increasing the time from making fast the tug to approaching the berth. The after tug can be used to reduce the speed of the vessel and the vessel's engine can still be used to maintain steerage, but be aware that the propeller wash could cause the after tug some difficulties.



9.2 Tilbury Lock

Inward vessels should take their tugs in Gravesend Reach and communicate on VHF Ch 04 with Tilbury Lock and VHF Ch 15 with the tugs.

A flood tide approach is normally made by swinging the vessel off Northfleet Hope Container Terminal and approaching close to Tilbury Lock upper lead-in arm. The positioning of tug(s) is dependent on the manoeuvring characteristics and the manoeuvring aids of the vessel involved, and thus the resultant tug allocation guidance.

An ebb tide approach to the lock is normally made close to and landing on the lower lead-in arm, before swinging into the lock at slow speed. If a single tug is used in this manoeuvre, it is normally made fast aft to assist lifting the stern up against the ebb tide. If a second tug is taken, it would normally be used at the bow of the vessel.

Ebb tide berthing at Tilbury Lock is generally only allowed for vessels up to 166 metres or 8.0 metres draught. Any potential exceptions to this rule must be discussed with the Duty Port Controller and the Tilbury Dockmaster in advance of the vessel's arrival.



9.3 Tilbury Grain Terminal – Inner Berth

The extension to the Northfleet Hope Container Terminal (NHCT) impacts on larger vessels berthing and unberthing at the Tilbury Grain Terminal - Inner Berth. It is acknowledged that the limited area available to the rear of the Tilbury Grain Terminal jetty restricts the use of tug assistance for ships manoeuvring to and from the Inner Berth.

Pilots adhere to the requirement that vessels of over 90 metres LOA manoeuvring to and from the Tilbury Grain Terminal - Inner Berth should take a suitable PLA licensed ‘ship towage tug’, particularly when there is a large vessel moored alongside the NHCT Upper Berth. The table below indicates when this requirement may be relaxed.

In addition, vessels of over 100 metres LOA, not employing a Pilot, should also take a tug unless they have been properly assessed for exemption from taking a tug and have adequate manoeuvring aids. The exemption procedure requires the Pilot to assess and report on the handling capabilities of the vessel concerned during the berthing/unberthing manoeuvre. The recommended number of tugs are required to stand by, but will only be asked to assist if the Pilot considers it necessary. (See also Part Two, Section Two – Assessments for Reduced Tug Allocation).

	Vessel Length (loa)		
	0-90m	90-100m	100-128m (max)*
No manoeuvring aids	NIL	1 TUG**	1 TUG**
CPP & enhanced rudder	NIL	NIL	1 TUG**
Bow thrust but no CPP or enhanced rudder	NIL	NIL	1 TUG**
CPP, enhanced rudder & bow thrust	NIL	NIL	NIL

Notes: * Agents and Masters wishing to arrange for the berthing/unberthing of a vessel of over 128 metres must consult the Duty Port Controller and the Duty River Pilot.

** A suitable PLA licensed ‘ship towage tug’ as listed in the relevant, current Notice to Mariners is adequate for manoeuvring under most circumstances.

9.4 Barking Creek

Some vessels trading to berths in Barking Creek are very close to, or at the physical limits in terms of length and/or draught, which allow a vessel to transit the Creek, manoeuvre and swing safely for the berth. In some cases, these operations require tug assistance.

The use of tug assistance in Barking Creek is necessarily restricted by the confined nature of the area, the draught limitations imposed by the Creek itself and the cill depth of the Barking Creek Barrier.

Access for vessels to and from the Creek is limited to a short period over the high water. For most wind conditions of under Force 5 an attendant suitably (PLA) licensed workboat of 120 horsepower is adequate to assist by pushing in, swinging and manoeuvring. A workboat is of particular help in pushing a vessel away from a berth.

In conditions where a vessel is being manoeuvred in the Creek in a wind over Force 5 from directions south through to west, and particularly when leaving the Creek stern first, it is strongly recommended that a suitable tug licensed by the PLA as a 'ship towsage tug' is employed. Due to depth limitations in the Creek the tug should have a draught of no more than 4.0 metres.

9.5 Northfleet Hope Container Terminal – Tilburyness

The strong tidal flows around Tilburyness have resulted in a number of incidents where ships departing the container terminal have failed to successfully negotiate the bend. Some of these incidents have resulted in vessels making contact with berths on the south side of the River. The effect is particularly pronounced when vessels are departing on the flood tide.

When a vessel, berthed head down, is departing on a flood tide from the container terminal, it is strongly recommended that tugs are retained until it is clear that the vessel can safely negotiate Tilburyness.

SECTION TEN - COMMON HAND SIGNALS

The following hand signals are in common use:

- 1 An outstretched arm with hand open and flat being waved downwards means "slack off";
- 2 A sharp upward movement of the arm with the hand cupped towards the signaller means "let go" or "cast off";
- 3 Crossed arms in front of the body means "make fast" or "is made fast";
- 4 A circular movement of the hand above the head means "heave away";
- 5 Both hands raised above the shoulders, with open hands facing forward means "stop";
- 6 A raised hand with the fist being clenched and unclenched means "heave or hoist slowly" (inching).



SECTION ELEVEN – FURTHER GUIDANCE AND ADVICE

Further guidance and advice can be found in the following publications:

- Tug Use in Port: A Practical Guide – Nautical Institute;
- Recommendations for Ships’ Fittings for use with Tugs – OCIMEF;
- The Shiphandlers Guide – Nautical Institute;
- Current relevant Merchant Shipping Notices;
- Code of Safe Working Practices for Merchant Seamen;
- Management of Health & Safety at Work Regulations 1999;
- Current relevant Merchant Shipping Acts;
- Code of Practice for the Safe Mooring of Vessels on the Thames - PLA.

Acknowledgements

The PLA wishes to extend its thanks to all those who involved in the review and consultations exercises undertaken during the development and subsequent revision of the tug allocation tables and the further development of the Code. We are particularly grateful to those Pilots, Tugmasters, Boatmen, Berth Operators and others who contributed text and photographs.

Selective guidance and advice from several of the above publications has been used in this Code of Practice.

While the advice given in this Code of Practice has been developed using the best information currently available, it is intended purely as guidance to be used at the user’s own risk. It is for the user to decide in each case whether, in the circumstances arising it is appropriate to use the guidance. No responsibility is accepted by the Port of London Authority (PLA) or by any person, firm, corporation or organisation who has been in any way concerned with the supplying of information, the compilation or publication of this Code. Or for the accuracy of any information or advice included in it or for any omission from it or for any consequences whatsoever resulting directly or indirectly from compliance with or adoption of this guidance

This Code and other PLA navigational information, Byelaws and Directions can be viewed and downloaded from the PLA website at www.pla.co.uk

PART TWO

GUIDELINES FOR THE UTILISATION OF SHIP TOWAGE TUGS ON THE THAMES

SECTION ONE - INTRODUCTION

These guidelines were first established in 1993, following extensive consultation with a wide cross-section of river users and terminal operators, and in the light of technical advice from British Maritime Technology. They were last updated in 2005.

Overall the utilisation guidelines remain appropriate and relevant to shipping operations in the tidal Thames. These criteria align very closely with the guidance and data published in Nautical Institute publications, such as: Tugs Use in Port, The Work of the Harbourmaster, and The Shiphandler's Guide.

SECTION TWO – APPLICATION OF THE GUIDELINES

It is not intended, subject to the requirements of specific named Berth Owners (see below) that the Guidelines be regarded as a rigid set of rules that must be followed on all occasions. The final decision on the number of tugs to be used must rest with the Master of the vessel, in consultation where appropriate, with the Pilot and/or the PLA Duty Port Controller (DPC), who will take account of the particular exceptional circumstances, including the prevailing weather and tidal conditions.

It should be noted however, that in cases where the vessel Master refuses to accept the Pilot's, or in advance of the Pilot being embarked, the Duty Port Controller's advice in respect of the number of tugs required to facilitate a safe operation, the Harbourmaster may impose the required number of tugs by Special Direction. These tugs will be for the owner's account.

This current review has considered the tug requirements at two major facilities - Coryton Refinery and Northfleet Hope Container Terminal. The results are two new sets of tug allocation tables - Tables D and E for Northfleet Hope and Coryton respectively.

The purpose of these Guidelines is to ensure, so far as possible, safe ship manoeuvring operations. Any advice given by a Pilot, DPC or by the Harbourmaster asking a vessel Master to comply with the Guidelines will be given on that basis, and against significant experience and knowledge of local conditions and operating parameters.

In establishing the Guidelines, the following assumptions have been made:

- a) The vessel receiving ship towage assistance in manoeuvring is a normally responsive vessel with all mechanical equipment in proper working order;
- b) The weather conditions are favourable;
- c) The tidal conditions are advantageous;
- d) There is no adverse local vessel traffic activity or effect;
- e) All manoeuvring aids in full working order and producing the power advertised; and
- f) Any bow and stern thrusters are fully operational, suitably immersed and delivering their full rated output.

Note: Thrusters on a common hydraulic line with deck machinery are known to be badly affected when winches are operated, and therefore will make the vessel unable to comply with f) above.

This Part also serves to provide guidance to Agents and others involved with the programming of shipping that will enable them to plan safe and efficient operations within the Port of London.

Ships' Agents are not in a position to make judgements on behalf of the vessel Master, on the number of tugs allocated to a vessel.

If vessel Masters and/or Ships Agents have any queries regarding the allocation of tugs or the number of tugs to be allocated as identified by the Code, they must discuss these questions with the Duty Port Controller at the Port Control Centre, Gravesend. If necessary, the DPC will seek the advice of the Pilot allocated to the vessel, and/or the Harbourmaster.

Mandatory Requirements

Berth owners and operators may continue to impose their own tug requirements for vessels using their terminals, which are equivalent to or in excess of those identified in this Code of Practice.

The operators of the berths listed below require that the provision of the Guidelines be adhered to in respect of vessels manoeuvring at their facilities.

North

Calor, Canvey
Oikos
Coryton
Shellhaven Bravo
Tilbury Power Station
Tilbury Landing Stage
Tilbury Ro-Ro
Tilbury Lock
Northfleet Hope Container Terminal
Tilbury Grain Terminal
Grays Terminal
Vopak

South

Northfleet Thames Terminal
Bevans
Tower Wharf
Littlebrook Power Station
Victoria Deep Water Wharf
Central London Cruise Moorings:
-Greenwich Ship Tier
-Tower Bridge Upper (HMS Belfast)

Note: Tate & Lyle require any vessel sailing from Thames Refinery **stern to tide**, having a length overall of between 130m and 149.9m, be provided with an additional tug over and above the Code of Practice guidelines.

Assessments for Reduced Tug Allocation

Vessel owners and operators whose vessels having good manoeuvring capabilities and characteristics and which regularly visit the Thames, may apply to have those vessels assessed individually to reduce the number of tugs allocated to them (but only) under reasonable weather and tidal conditions.

Application should be made in writing to the PLA's Marine Pilotage Manager, who will arrange for the nominated vessel to be assessed, generally on its next visit. During the assessment the vessel will have the recommended number of tugs available but the Pilot, given reasonable conditions and within the bounds of safety, will endeavour to use fewer tugs. He will then submit a report to the Harbourmaster on how the vessel handled. Recommendations will then be based on the assessment.

SECTION THREE - NOTES TO THE TUG ALLOCATION TABLES

Part A – River Berths: London Bridge to Lower Hope Point

Table 1 - Ship Type Code

The figures in brackets indicate approximate maximum lateral underwater area in square metres based on draught x length.

Table 2 - Manoeuvring Aids Allowance Code

The figures in brackets in the 'Ship Type Code' columns indicate the likely required bollard pull based on underwater lateral area v water depth of 1.1 x draught in still water.

Note: Any windage must be allowed for separately using the table and indicative diagram included in Part F – see below.

Part B - Tilbury Lock

Table 1 - Ship Type Code

Docking ebb tide column, notes on maximum allowable parameters have been enhanced to improve clarity.

Part C - River Berths: Below Lower Hope Point - Large Vessels

This table includes all vessels with large displacements (i.e. dry or liquid bulk carriers and gas carriers) arriving and departing from any river berth below Lower Hope Point. The table provides an indicative displacement for the upper deadweight figure in each range.

Approximate bollard pull requirements are included in the 'No Manoeuvring Aids' column. Tug requirements are equated to 1 tug = 50 tons bollard pull.

Unberthing

A cautionary note has been added to warn that when a vessel is leaving a berth in a loaded condition and a swing is involved, the Berthing Table is to be used.

Part D – Northfleet Hope Container Terminal

These three part tables use an indicative bollard pull for tugs of 40 tonnes. The tables should be entered with LOA and maximum draught to find a ship letter. This is then entered into the subsequent tables to find the towage requirement.

Part E – BP Coryton: Oil Tankers

Uniquely in the port, the tugs used at Coryton are managed by Petroplus, the berth owner/operator. The specified tug allocations are mandatory at these facilities.

Part F – Allowances for Wind

The Guidelines include a table and indicative diagram to take account of windage. High-sided vessels may require additional tugs when manoeuvring in strong winds. The windage table and accompanying indicative area of a large container vessel should be used in conjunction with the main tables as a guide to determine what additional bollard pull might be required in strong wind conditions.

Part G - Table of Equivalences

Contains Kw and bollard pull equivalents for the upper figure of each horsepower range used in the Guidelines.



SECTION FOUR – USING THE TUG ALLOCATION TABLES

1. Step 1

Turn to the appropriate Part (A-D) dependent upon the destination or departure berth and/or the vessel type and size.

Step 2

Using Table 1, identify the Ship Type Code (or Ship Size Code in respect of Part D - Northfleet Hope Container Terminal), as defined by the vessel's length overall and draught.

Step 3

Take the *Ship Type Code* from Table 1 and the vessel's operational manoeuvring aids to establish the *Manoeuvring Aids Allowance Code* in Table 2.

Step 4

Table 3 will then identify the number of tugs required as defined by the *Manoeuvring Aids Allowance Code* and the nature of the manoeuvre.

Step 5

Part F provides an estimated allowance for windage as necessary.

- Notes:**
1. The number of tugs for larger oil tankers, bulk carriers and gas carriers is established through a single matrix in Part C.
 2. The number of tugs/level of assistance for vessels manoeuvring in Barking Creek and at the Tilbury Grain Terminal Inner Berth are described in Part 1 of the Code (Section 9).
 3. Not all vessels have the Safe Working Load (SWL) marked on bollards used for towing. In all cases, the SWL of ships' bollards should be compared with the potential bollard pull of the tug(s) employed.

2. **For Part E** – Identify the required tug allocation using the relevant ship characteristics and criteria.

SECTION FIVE – TUG ALLOCATION TABLES

PART A
RIVER BERTHS; LONDON BRIDGE TO LOWER HOPE POINT

TABLE 1 - SHIP TYPE CODE

LOA (m)	MAXIMUM DRAUGHT (m)									
	Up to 5m	Up to 6m	Up to 7m	Up to 8m	Up to 9m	Up to 10m	Up to 11m	Up to 12m	Above 12m	
Up to 95.9	A (600)	A (600)	A (700)	A (900)	-	-	-	-	-	-
100 to 109.9	B (650)	B (650)	B (750)	B (950)	C (900)	C (1050)	-	-	-	-
110 to 139.9	C (700)	C (700)	C (800)	C (1150)	C (1000)	D (1400)	-	-	-	-
140 to 149.9	C (750)	C (800)	C (1050)	C (1300)	D (1300)	E (1500)	E (1650)	E (1800)	E	E
150 to 159.9	D (800)	D (850)	D (1150)	D (1350)	E (1400)	E (1600)	E (1750)	E (1950)	E (2150)	E
160 to 169.9	E (850)	E (1000)	E (1150)	E (1350)	F (1350)	F (1700)	F (1900)	F (2100)	F (2300)	E
170 to 179.9	E (900)	E (1050)	E (1200)	E (1400)	E (1600)	E (1900)	E (2000)	E (2100)	E (2300)	E
180 to 189.9	E (950)	E (1100)	E (1300)	E (1500)	E/E (1700)	E/E (1900)	E/E (2000)	E/E (2100)	E/E (2300)	E/E
190 to 199.9	E (1000)	E (1200)	E (1400)	E/E (1600)	E/E (1800)	E/E (2000)	F (2000)	F (2100)	F (2300)	F
200 to 219.9	E (1050)	E (1300)	E (1500)	E/E (1700)	E/E (1900)	F (2000)	F (2100)	F (2300)	F (2500)	F
220 to 239.9	E (1050)	E (1400)	E (1600)	E/E (1800)	E/E (2000)	E/E (2100)	F (2100)	F (2300)	F (2500)	F
240 and above	F	F	F	F	F	F	F	F	F	F

Note: Figures in brackets approximate maximum lateral underwater area in square metres - draught x length.

RIVER BERTHS: LONDON BRIDGE TO LOWER HOPE POINT

TABLE 2 - MANOEUVRING AIDS ALLOWANCE CODE

SHIP TYPE CODE FROM TABLE 1 / BOLLARD PULL							
MANOEUVRING AIDS	A (50)	B (60)	C (60)	D (70)	E (70-110)	E/E (120)	F (150)
No Manoeuvring Aids	S	T	U	V	W	W	X
Controllable Pitch Propeller and/or Enhanced Rudder	S	S	U	V	W	W	X
Twin Screw, Enhanced Rudder & Bow Thruster (Min 1600hp)	S	S	T	T	V	W	X
Bow Thruster - Maximum Power: (100hp = 1.1)							
500hp to 999hp (745Kw)	S	S	T	U	W	W	X
1,000hp to 1,499 hp (1118Kw)	S	S	T	T	V	W	X
1,500hp to 1,999hp (1401Kw)	S	S	T	T	U	W	W
2,000hp and above (1164Kw)	S	S	T	T	U	U	W
Bow and Stern Thruster - Maximum Combined Power:							
1,500hp to 1,999hp (1491Kw)	S	S	S	T	U	U	W
2,000hp to 2,499hp (1804Kw)	S	S	S	T	U	U	W
2,500hp to 2,999hp (2217Kw)	S	S	S	T	U	U	W
3000hp and above	S	S	S	T	U	U	W

Note: Figures in brackets indicate likely required bollard pull based on underwater lateral area versus water depth of 1.1 x draught in still water

RIVER BERTHS: LONDON BRIDGE TO LOWER HOPE POINT

TABLE 3 - NUMBER OF TUGS REQUIRED

MANOEUVRING AIDS ALLOWANCE CODE FROM TABLE 2									
LOCATION AND OPERATION		S	T	U	V	W	X		
Tower Bridge Moorings	Berth	0	0	1	1	-	-		
	Berth (S)	0	1	1	2	-	-		
	Sail	0	0	1	1	-	-		
	Sail (S)	0	1	1	2	-	-		
Regents Canal Dock to Margaretness	Berth	0	0	1	1	2	-		
	Berth (S)	0	0	1	2	2	-		
	Sail	0	0	1	1	2	-		
	Sail (S)	0	0	1	2	2	-		
Margaretness to Lower Hope Point	Berth	0	0	1	1	2	2		
	Berth (S)	0	0	1	2	2	3		
	Sail	0	0	1	1	2	2		
	Sail (S)	0	0	1	2	2	3		

Notes

1. (S) - Staying necessary or manoeuvring rates to tide.
2. Vessels over 100m requiring rate for West India Dock berths and backing up to Greenwich must use 3 tugs unless fitted with adequate manoeuvring AHS as agreed with the Harbour Master.

PART B
TILBURY LOCK

TABLE 1 - SHIP TYPE CODE

LOA (m)	FLOOD TIDE DOCKING & EBB AND FLOOD TIDE UNDOCKING							EBB TIDE DOCKING *
	Up to 5m	Up to 6m	Up to 7m	Up to 8m	Up to 9m	Up to 10m	Above 10m	
MAXIMUM DRAUGHT (m)								
Up to 99.9	A	A	A	A	B	B	-	A*
100 to 129.9	A	A	A	B	B	B	-	B*
130 to 139.9	B	B	C	C	D	D	-	C*
140 to 149.9	D	D	D	D	D	E	-	D*
150 to 159.9	D	D	E	E	E	F	-	E*
160 to 169.9	D	D	E	E	E	F	F	E*
170 to 179.9	D	D	E	E	E	F	F	E*
180 to 189.9	D	D	E	E	E	F	F	-
190 to 199.9	D	D	E	E	E	F	F	-
200 and above	F	F	F	F	F	F	F	-
235 and above, undocking stern first	G	G	G	G	G	G	G	-

Note: * Agents and Masters arranging tag allocation for ebb tide docking must consult the Tilbury Port Controller before final arrangements are made.

TILBURY LOCK

TABLE 2 – MANOEUVRING AIDS ALLOWANCE CODE

MANOEUVRING AIDS	SHIP TYPE CODE FROM TABLE 1						
	A	B	C	D	E	F	G
No Manoeuvring Aids	S	T	U	V	W	X	Y
Controllable Pitch Propeller and/or Enhanced Rudder	S	T	U	V	W	X	Y
Twin Screws, Enhanced Rudder & Bow Thruster (Min 100hp)	S	S	T	T	U	X	Y
Bow Thruster - Maximum Power: 100hp +1.1m	S	T	U	V	W	X	Y
500hp to 999hp (753Kw)	S	S	T	U	V	X	Y
1,000hp to 1,499 hp (1118Kw)	S	S	T	U	V	X	Y
1,500hp to 1,999hp (1491Kw)	S	S	T	U	V	X	Y
2,000hp and above (1864Kw)	S	S	T	U	V	W	Y
Bow and Stern Thruster - Maximum Combined Power	S	S	T	T	U	W	Y
1,500hp to 1,999hp (1491Kw)	S	S	T	T	V	X	Y
2,000hp to 2,499hp (1864Kw)	S	S	T	T	V	X	Y
2,500hp to 2,999hp (2237Kw)	S	S	T	T	U	W	Y
3000hp and above	S	S	T	T	U	W	Y

TILBURY LOCK

TABLE 3 - NUMBER OF TUGS REQUIRED

MANOEUVRING AIDS ALLOWANCE CODE FROM TABLE 2									
LOCATION AND OPERATION	S	T	U	V	W	X	Y		
Tilbury Lock	Docking	0	1	2	2	2	2		
	Undocking	0	0	0	1*	2*	2*		
	Undocking - Stern First				-	-	-	3	

Notes:

1. The PLA Duty River Pilot must be contacted before the Master or Agent arranges the sailing of a vessel exceeding 185m L.O.A or 29.5m beam on an ebb tide.
2. Vessels in excess of 185m L.O.A should employ 2 tugs when undocking on spring ebb tides which are considered to occur on high waters predicted 1200 to 1600 and 0900 to 0920

PART C
RIVER BERTHS BELOW LOWER HOPE POINT: LARGE VESSELS

TABLE 1 - NUMBER OF TUGS REQUIRED FOR BERTHING

APPROXIMATE DISPLACEMENTS	MAXIMUM SUMMER DEADWEIGHT / CUBIC CAPACITY					
	Up to 7,499	7,500 to 14,999	15,000 to 44,999	45,000 to 94,999	95,000 to 149,999	Above 150,000
	9,400	30,200	54,200	108,700	135,100	-
MANOEUVRING AIDS						
No Manoeuvring Aids (Approx Bollard Pull)	0 (45)	1 (58)	2 (72)	3 (105)	3 (121)	4
Controllable Pitch Propeller and/or Enhanced Rudder	0	1	2	3	3	4
Twin Screw, Enhanced Rudder & Bow Thruster (Min 1000hp)	0	0	1	2	3	4
Bow Thruster - Maximum Power: (100hp = 1.1)						
Up to 499hp (57Kw)	0	0	2	3	3	4
500hp to 999hp (745Kw)	0	0	2	3	3	4
1,000hp to 1,499 hp (1118Kw)	0	0	1	2	3	4
1,500hp and above	0	0	1	2	2	4
Bow and Stern Thruster - Maximum Combined Power						
Up to 1499hp (1118Kw)	0	0	1	2	3	4
1,500hp to 1,999hp (1401Kw)	0	0	1	2	2	4
2,000hp to 2,999hp (2237Kw)	0	0	1	2	2	4
3,000hp and above	0	0	0	2	2	4

RIVER BERTHS BELOW LOWER HOPE POINT: LARGE VESSELS

TABLE 2 - NUMBER OF TUGS REQUIRED FOR UNBERTHING *

APPROXIMATE DISPLACEMENTS	MAXIMUM SUMMER DEADWEIGHT / CUBIC CAPACITY					
	Up to 7,499	7,500 to 14,999	15,000 to 44,999	45,000 to 94,999	95,000 to 149,999	Above 150,000
	9,400	25,600	45,100	77,100	100,000	-
MANOEUVRING AIDS						
No Manoeuvring Aids	0 (45)	1 (55)	2 (67)	2 (86)	3 (106)	3
Controllable Pitch Propeller and/or Enhanced Rudder	0	1	2	2	3	3
Twin Screw, Enhanced Rudder & Bow Thruster (Min 1000hp)	0	0	1	1	2	3
Bow Thruster - Maximum Power: 600hp or less						
Up to 499hp (372Kw)	0	0	2	2	3	3
500hp to 999hp (348Kw)	0	0	2	2	3	3
1,000hp to 1,499 hp (1188Kw)	0	0	1	1	2	3
1,500hp and above	0	0	1	1	2	3
Bow and Stern Thruster - Maximum Combined Power						
Up to 1499hp (1118Kw)	0	0	1	1	2	3
1,500hp to 1,999hp (1491Kw)	0	0	1	1	2	3
2,000hp to 2,999hp (2237Kw)	0	0	1	1	1	3
3,000hp and above	0	0	0	1	1	3

* See Note 3 - page 4-7

PART D

(NORTHLEET HOPE CONTAINER TERMINAL) - TUG ALLOCATION TABLES

These tables are based on a minimum tug bollard pull of 40 tonnes.

TABLE 1 - SHIP SIZE CODE

LOA	Maximum Draught (m)									
	<6m	<7m	<8m	<9m	<10m	<11m	<12m	>12m	<12m	>12m
110-140	A	A	A	A	B					
140-150	A	A	A	B	C	C	C	C	C	C
150-160	B	B	B	C	C	C	C	C	C	C
160-170	C	C	C	C	C	C	C	C	C	C
170-180	C	C	C	C	C	C	C	C	C	C
180-190	C	C	C	D	D	D	D	D	D	D
190-200	C	C	D	D	D	E	E	E	E	E
200-220	C	C	D	D	E	E	E	E	E	E
220-240	C	C	D	D	E	E	E	E	E	E
240+	E	E	E	E	E	E	E	E	E	E

TABLE 2 - MANOEUVRING AIDS ALLOWANCE CODE

Manoeuvring Aids	Ship Size Code				
	A	B	C	D	E
No aids	U	V	W	W	X
Enhanced Rudder	U	V	W	W	X
Bow Thruster Power (hp)					
500-999	T	U	W	W	X
1000-1499	T	T	V	W	X
1500-1999	T	T	U	W	W
2000+	T	T	U	U	W
Bow and Stern Thruster combined power					
2000+	T	T	U	U	W

TABLE 3 - TUG REQUIREMENTS

Number of Tugs Required	Manoeuvring Aids Allowance				
	T	U	V	W	X
Herth	0	1	1	2	2
Swing + Berth	0	1	2	2	2
Sail	0	1	1	2	2
Sail + Swing *	0	1	2	2	2

Note: Bow thruster/stern thruster ratings are for delivered power – where a shared powersack is used with other deck equipment, then the actual power may be decreased significantly.

The following tables provide for variations in the towage requirement dependant on situation and wind conditions. Any variation must be agreed with the Duty port Controller

Augmentation of Towage requirement due to wind conditions.

	Wind Direction							
	Between		Between		Between		Between	
	118	208	298	028	208	298	028	118
Less than 25 kts	Tug Norms Apply				Tug Norms Apply			
Less than 35kts	Tug Norms Apply				Tug Norms Apply			
Gusts over 25 kts	Tug Norms Apply				Tug Norms + 1			
Gusts over 35kts.	Tug Norms + 1				Abort Manoeuvre			
Gusts over 40 ts.	Abort Manoeuvre				Abort Manoeuvre			

Reduction in towage requirement for vessels sailing

The tug requirement can be reduced by one providing the following is satisfied:

Vessel LOA less than 225m

Windspeed less than 15 knots

Operational bow thruster of 1475hp/1100kW or more

Draught less than 10 metres

Vessel must be berthed head down.

If unberthing on the ebb tide from the upper berth, the lower berth must be clear.

Additional towage requirements for stern-to-tide berthing

An additional tug will be required under the following circumstances:

1. Vessel berthing stern to tide on the upper berth, and
2. Vessel LOA greater than 225 metres, or
3. Vessel draught greater than 10 metres.

**PART E
CORYTON BERTHS**

TUG ALLOCATION TABLES

Oil Tankers (Maximum Summer Deadweight) & Gas Carriers (Cubic Capacity)	Manoeuvring Aids Allowance								
	No Manoeuv -ring Aids	C/P Prop &/or Enh'ced Rudder	Bow Thrust with Max Power			Twin Screw enhanced rudder plus bowthrust of Min 1000hp	Bow & Stern Thrust with Max Combined Power		
			Up to 499hp	500hp to 999	1000hp to 1499		1500hp to 2000+	Up to 1499	1500hp to 1999
BERTHING									
Up to 7500	0	0	0	0	0	0	0	0	0
7500 to 15000	1	1	1**	0	0	0	0	0	0
15000 to 45000	2	2	2	1 or 2*	1	1	1	1	0
45000 to 95000	2	2	2	2	2	2	2	2	2
95000 to 150000	2	2	2	2	2	2	2	2	2
Above 150000	2	2	2	2	2	2	2	2	2
UNBERTHING									
Up to 7500	0	0	0	0	0	0	0	0	0
7500 to 15000	1	1	1	0	0	0	0	0	0
15000 to 45000	2	2	2	1 or 2*	1	1	1	1	0
45000 to 95000	2	2	2	1 or 2*	1	1	1	1	1
95000 to 150000	2	2	2	2	2	2	2	2	2
Above 150000	2	2	2	2	2	2	2	2	2

* When a Vessel inadequately complies with the guidelines an extra Tug is required.

** Tug to be used in or out when ship is loaded.

Notes:

1. All technical and formulae references are taken, as appropriate, from the Nautical Institute publications: Tugs Use in Port and The Shiphandler's Guide.

Parts A – C, Tables 1 & 2

2. Figures in brackets indicate minimum required bollard pull based on the formula: Bollard pull in tons = (displacement/100,000 x 60) + 40.
3. Deadweight tonnages are approximate displacement equivalents for representative ship sizes rounded up/down to nearest 100 tonnes at a maximum of 13.5m draught.

Part C – Tables 1 & 2

4. For Oil tankers and Bulk Carriers, read as deadweight. For Gas Carriers read as cubic capacity.

Part C – Table 2

5. When a vessel is **unberthing** in a loaded condition and a swing is involved, the **berthing table** - Table 1 - is to be used to identify the tug requirement.

Parts A - D

6. The operators of the berths listed below require that the Guidelines are mandatory in respect of vessels manoeuvring at their facilities:

North

Calor, Canvey
Oikos
Coryton
Shellhaven Bravo
Tilbury Power Station
Tilbury Landing Stage
Tilbury Ro-Ro
Tilbury Lock
Northfleet Hope Container Terminal
Tilbury Grain Terminal
Grays Terminal
Vopak

South

Northfleet Thames Terminal
Bevans
Tower Wharf
Littlebrook Power Station
Victoria Deep Water Wharf
Central London Cruise Moorings:
-Greenwich Ship Tier
-Tower Bridge Upper (HMS Belfast)

Part E – Petroplus Coryton

7. Tug allocations are mandatory at these facilities. The tugs used are owned and managed by Targe Towing on behalf of Petroplus.

8. Tate & Lyle require any vessel sailing from Thames Refinery **stern to tide**, having a length overall of between 130m and 149.9m, be provided with an additional tug over and above the Code of Practice guidelines.

PART F
ALLOWANCES FOR WIND

Figures 1 - 3 shown below, provide an indication of the lateral wind forces that might be experienced by high-sided vessels, including tankers and container ships in varying wind conditions.

[All figures are reproduced by kind permission of the Nautical Institute]

Fig 1

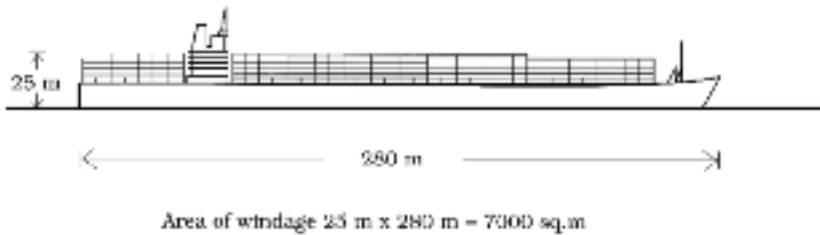


Fig 2

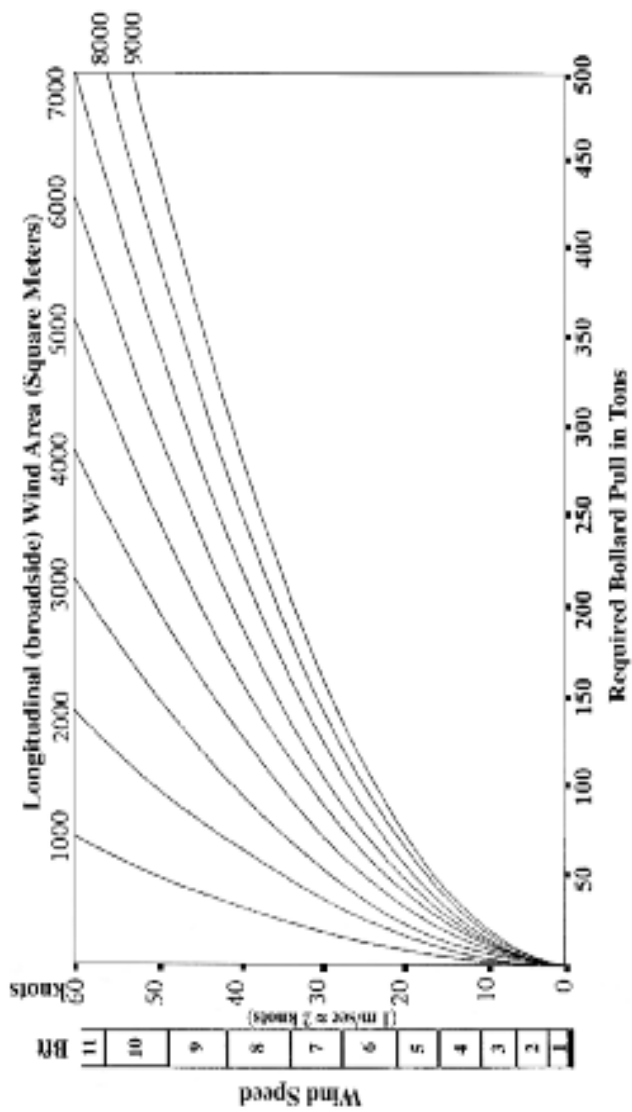
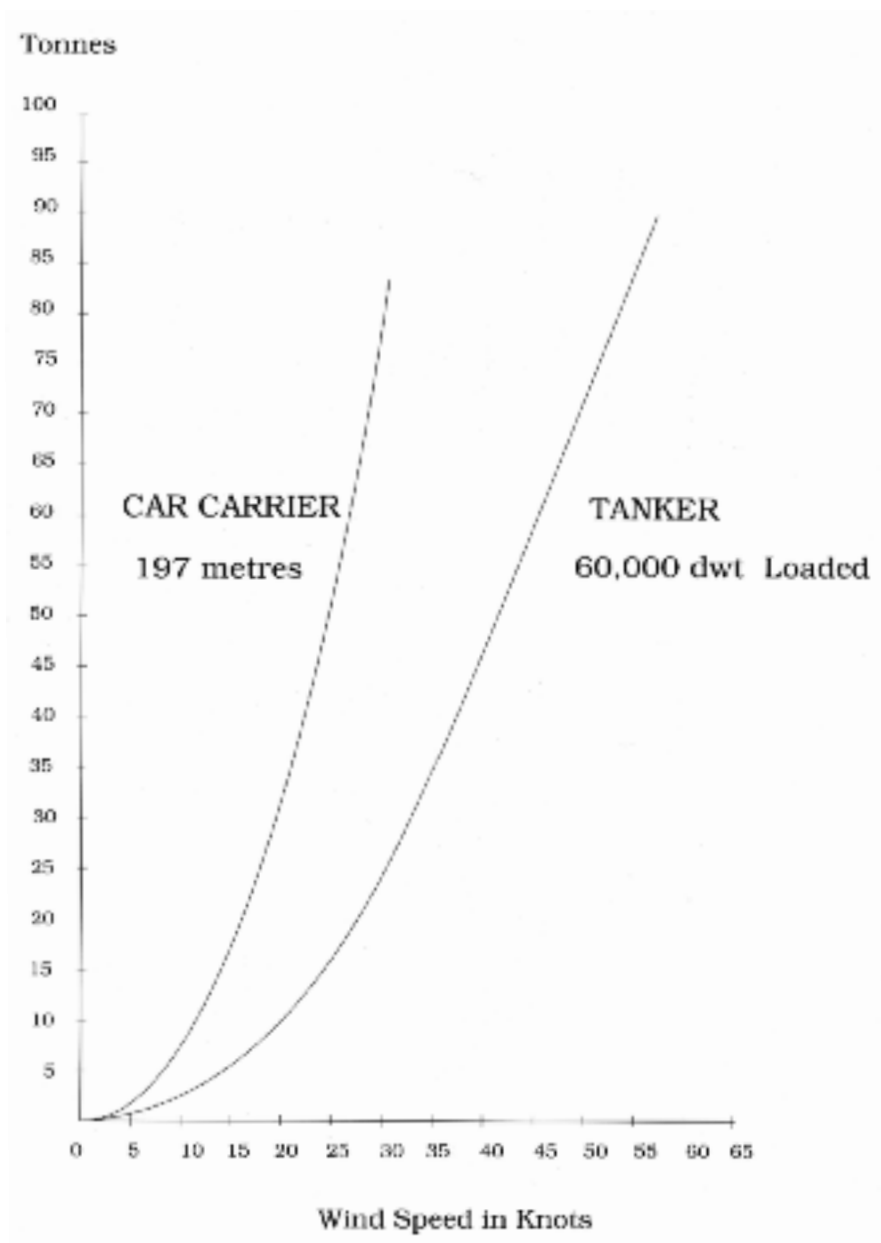


Fig 3



PART G

TABLE OF EQUIVALENCES: HORSE POWER / Kw / BOLLARD PULL (Approximate)

Horse Power	Kw	Bollard Pull (t)
499	372	5.5
999	745	11.0
1499	1118	16.5
1999	1491	22.0
2499	1864	27.5
2999	2237	33.0

NOTES



Published by:
The Port of London Authority
London River House
Royal Pier Road
Gravesend, Kent DA12 2BG

Telephone 01474 562200
Fax 01474 562281

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