MARICO MARINE

BELFAST HARBOUR COMMISSIONERS

BELFAST HARBOUR TOWAGE OPERATIONS MANUAL

Belfast Harbour

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MARINE AND RISK CONSULTANTS LTD

BELFAST HARBOUR COMMISSIONERS

BELFAST HARBOUR TOWAGE OPERATIONS MANUAL

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Towage Operations Manual

FIGURES

ANNEXES

ABBREVIATIONS

Abbreviation	Detail
ASD	Azimuth Stern Drive
ATD	Azimuth Tractor Drive
BHC	Belfast Harbour Commission
BML	Boat Masters Licence
BTA	British Tug Owners' Association
CHA	Competent Harbour Authority
DPA	Designated Person Ashore
ETA	European Tug Owners' Association
GtGP	A Guide to Good Practice on Port and Marine Facilities
HW	High Water
IMO	International Maritime Organisation
ISM	International Ship Management Code
kt	Knot (unit of speed equal to nautical mile per hour, approx. 1.15 mph)
LW	Low Water
m	Metre
Marico Marine	Marine and Risk Consultants Ltd
MCA	Maritime and Coast Guard Agency
MGN	Marine Guidance Note
nm	Nautical Mile
NRA	Navigation Risk Assessment
NWA	National Workboat Association
PEC	Pilotage Exemption Certificate
PMSC	Ports & Marine Facilities Safety Code
PPE	Personal Protective Equipment
SHA	Statutory Harbour Authority
SMS	Safety Management System
STCW	Standards of Training Certification and Watchkeeping
VHF	Very High Frequency (radio communication)
VS	Voith-Schneider
VTE	Voluntary Towage Endorsement
VTS	Vessel Traffic Service

REFERENCES

In preparation of this manual the following documents were used as references and where appropriate utilised:

- A Guide to Good Practice on Port Marine Operations (September 2017);
- Belfast Harbour Minimum Towage Requirements;
- Belfast Harbour Towage Review – Simulation Report (Nov 2017);
- Belfast Harbour Towage Information;
- European Tug Owners' Association (ETA) – "Guidelines for Safe Harbour Towage Operations" (2015);
- Forth Ports Towage Guidelines;
- MAIB Investigation Reports;
- National Workboat Association: The Use of Workboats for Towage - Good Practice Guide (December 2016);
- Port of London Authority Towage Guidelines;
- Port Marine Safety Code (November 2016);
- Pilots' Pocket Guide and Checklist (Working Safely with Harbour Tugs) – UK Chamber of Shipping;
- Tug Use in Port – A Practical Guide (Captain Henk Hensen); and
- Tug Stability – A practical Guide to Safe Operations (Captain Henk Hensions and Dr Markus van der Laan)

Other useful references:

- IMO Resolution A765 (18) Guidelines on the Safety of Towed Ships and other Floating Objects;
- IMO MSC Circular 1175 Guidance on Shipboard Towing and Mooring Equipment;
- MGN 308 (M+F) Mooring, Towing or Hauling Equipment on all Vessels – Safe Installation and Safe Operation;
- MGN 468 M Voluntary Towage Endorsement Scheme;
- MGN 199 (M) Dangers of Interaction;
- MSN 1752 (M) The Merchant Shipping (Load Line) Regulations 1998, as amended by the Merchant Shipping (Load Line) (Amendment) Regulations 2000, Schedule 2;
- MCA: Instructions to Surveyors, Load Line Instruction (MSIS 1) Part 8, Section 8.11 Tugs and Section 8.12 Safety of Towed Ships and Other Floating Objects;
- MCA: The Safety of Small Workboats and Pilot Boats a Code of Practice (the 'Workboat Code') particularly part 11.7 Stability of Vessels Engaged in Towing and 25.2 Vessels Engaged in Towing;

- MCA Code of Safe Working Practices for Merchant Seafarers (CSWP); and
- Shipowners P&I Club - Tugs and Tows, a Practical Safety and Operational Guide.

GLOSSARY

Assisting methods	The term used to describe the way in which harbour tugs assists seagoing vessels.
Bollard	A single post or upright fitting used to secure a mooring line. Bollards are usually found on docks, piers, or wharves
Bollard Pull	A measure of a tug's pulling power. It is usually measured in tons by securing the tug to a scale. The tug then pulls against the scale and its bollard pull in tons is recorded. Bollard pull is determined by a combination of the tug's horse power and the type of propellers that it uses.
Breasted/alongside methods	A tug securely lashed alongside a ship, usually with a minimum of three lines: head line, spring line and stern line. Also called “on the hip” or “hipped up”.
Bulwark	The side plating that forms the railing around a tug's main deck. Also, it is commonly called the waist.
Dead-ship	A ship which cannot use her own propulsion.
Escort tugs	Tugs specifically built for escorting at high speeds.
Escorting tug	Any type of tug escorting a ship underway.
Girting	Risk of capsizing, especially with conventional tugs, due to high athwartships tow line forces. Also known as girding, girthing or tripping.
Gob line	A rope or steel wire used on conventional tugs to shift the towing point.
Messenger	A light rope attached to the tow line to heave the tow line on board a ship.
Norman pins	Short iron bars fitted in the gunwales of the transom to prevent the tow line from slipping over the side gunwales. Sometimes called “King Pins”.
Nozzle	A tube around the propeller to increase propeller performance. The nozzle can be fixed or steerable.
Pennant	A separate part at the final part of the tow line which is most liable to wear on board an assisted ship, at ship fairleads, etc. The pennant can be of a different construction to the tow line.
Propulsion	Azimuth propellers: 360˚ steerable propellers which can deliver thrust in any direction. Also called “Z-pellers”, “Rexpellers”, “Duckpellers” (azimuth propellers in nozzles); CPP: Controllable pitch propellers; FPP: Fixed pitch propellers; and VS: Voith Schneider propulsion: propulsion system with vertical propeller blades, also called cycloidal propulsion system.
Push-pull	A tug made fast so that it can pull as well as well as push at a ships’ side. Depending on the type of tug, its location and the assistance required, it can be secured with one, two or three lines.
Sponson	A strongly flared section in the side of a tug, commencing at or just below the waterline, which results in substantial increase in deck area and reserve buoyancy without increasing the beam at the waterline.

Stemming	A tug coming under the bow of a ship at speed.
Stretcher	That part of a tow line, between the original tow line and pennant, which absorbs the dynamic forces in the tow line. Also called a spring and often made of nylon, polyester or a polyester/polypropylene combination.
Towing on a line	A tug assisting a ship while towing on a line as is in common use in many European countries.
Towing Point	Point of application of the tow line force. It is the point from where the tow line goes in a straight line towards the ship.
Tow line	A flexible hawser used for towing purposes.
Tripping	A tug towing on a line swinging around and coming alongside a ship's hull due to excessive speed by the ship in relation to a tug's capabilities and towing angle. The expression "tripping" is also used for girting.
Tug engine power	BHP: Brake Horse Power: power delivered by the engine; SHP: Shaft Horse Power: power delivered to the propeller shaft (approx. 97% of BHP); BP: Bollard pull, equal to 1000kgf; and MCR: Maximum Continuous Rating (of tug engine).
Tonne	The practical used for force e.g. for bollard pull, equal to 1,000kg force and for "weight" equal to 1,000kg.
Tug simulation	Interactive tug: A tug simulated on bridge manoeuvring simulator, able to interact with other bridge manoeuvring simulators, which are simulating other tugs and/or the assisted ship; Vector tugs: Tugs simulated by just a force vector.
VS-tug	A tug with VS propulsion.

1 INTRODUCTION

This manual, approved by Belfast Harbour Commissioners (BHC) in consultation with Belfast Lough Pilotage Services and Belfast Harbour towage operators, describes the procedures and policies to promote and improve safety for those responsible when directing tugs during harbour ship towage, barge and dead-ship towage operations. It includes shipboard safety practices and personnel safety issues and forms a body of knowledge with which all those connected with marine towage operations in Belfast Harbour should be familiar.

BHC considers it important that pilots and tug masters understand their respective concerns when undertaking towage operations and in that respect a real-time bridge navigation simulation workshop, facilitated by HR Wallingford and led by Marine & Risk Consultants Ltd. (Marico Marine), was held between 30th October and 3rd November 2017 inclusive. Representatives from BHC, Belfast Lough Pilotage Services and Belfast Harbour towage operators attended the workshop. The simulator workshops were primarily focussed on themes of operational marine and navigation safety to inform input to this manual.

Belfast Lough Pilotage Services and the respective towage operators' management should adopt and maintain these procedures, in accordance with their own safety management systems, to ensure the safety of the tug operation and the protection of the environment by ensuring the following:

- Clearly defined standards;
- Tug crews are appropriately trained and qualified including the need to train with pilots;
- Open reporting of incidents is essential to gain maximum benefit from any lessons learned;
- Effective communication and team work between all parties including:
    - Regular liaison meetings;
    - Safety workshops;
    - Pilots tripping on tugs and tug masters accompanying pilots; and
    - All parties attending simulator training.
- The availability of up-to-date relevant industry publications and guidelines;
- Performance monitoring of towage marine services together with defect and reliability reporting measures; and

Environmental operating limits.

This manual, as part of the BHC Marine Safety Management System (MSMS), complies with the Ports & Marine Facilites Safety Code (PMSC) and will be kept under continuous review and amended where necessary to ensure the inclusion of statutory regulations, best practice and improved procedures as agreed with Belfast Lough Pilotage Services and the respective towage operators.

Compliance with this non-mandated manual shall be the responsibility of all employees connected with marine towage activities in Belfast Harbour. Regular compliance audits at the direction of Belfast Harbour Mater will be undertaken by a suitably qualified representative of BHC ensuring that the requirements as set out in the manual are being maintained.

It should be noted that this manual does not replace Belfast Lough Pilotage Services or the respective towage operator's marine safety management system or International Safety Management (ISM) Code as required under legislation.

Furthermore, this manual should be read as appropriate in conjunction with Belfast Harbour Towage Information (see **Annex A**) and Belfast Harbour Minimum Towage Requirements (see **Annex B**).

2 PURPOSE

The purpose of these marine operation policies and supporting procedures described in this manual are for the advice and guidance of all those staff actively involved in harbour towage in Belfast Harbour. The manual falls within the structure of an integrated BHC Marine Safety Management System (MSMS).

2.1 DOCUMENT APPROVAL

Document Approval			
Designation	**Name**	**Signature**	**Date**
Belfast Harbour Master	Captain K Allen		

2.2 TOWAGE OPERATIONS MANUAL – DISTRIBUTION LIST

The following table shows holders of this manual. To avoid any confusion all copies of this document will be distributed electronically as well as any future updates / amendments.

Distribution List	
1	Belfast Harbour Commissioners Harbour Master
2	Belfast Harbour Commissioners Deputy Harbour Master
3	Belfast Harbour Commissioners Deputy Harbour Master
4	Belfast Harbour Commissioners Assistant Harbour Master
5	Belfast Harbour Commissioners Assistant Harbour Master
6	Belfast Harbour Commissioners Vessel Traffic Services
7	Belfast Harbour Commissioners Port Director
8	Belfast Harbour Commissioners Designated Person
9	Belfast Lough Pilotage Services
10	David Ferran & Sons
11	Boluda SMS Towage Ltd
12	Stena Line
13	Belfast Harbour Drydock (Harland & Wolff)
14	
15	

2.3 AMENDMENT LIST

Amendment List		
Date	**Section Amended**	**Brief Description of Amendment**
30 January 2023	Updated to Issue 3	Removal of Svitzer information, updates to contact details and hyperlinks
01 May 2024	Updated to Issue 4	MGN 199 Update, updates to independent operators. New 5.14.1 Process for declining pilots' instruction added. New 8.2.2 Dispute resolution process added.
26 October 2024	Updated to Issue 5	New minimum towage requirements updated.
30 May 2025	Updated to Issue 6	New 'minimum' term added, speed description updated, and removal of service providers no longer in Belfast. Method 'Hipped up' added. Biter report synopsis added. GtGP references updated to reflect changes in the recently published code.

3 POLICIES AND RESPONSIBILITIES

All personnel involved in towage operations i.e. pilot, vessel master and tug master, have overriding authority in their areas of respective responsibility to deviate from this operations manual to make decisions in respect of safety and pollution prevention and request assistance should this be necessary.

3.1 OBJECTIVES

The objectives of this manual are to:

- Prevent incidents and protect personnel;
- Through training and appropriate experience ensure that all operations are undertaken safely;
- Develop a sense of personal responsibility for health, safety and protection of the environment;
- Demonstrate that safe systems of work are essential to efficient towage operations;
- Demonstrate preparation for handling safety and environmental emergencies; and
- Demonstrate through satisfactory records that towage operations are conducted in accordance with these policies.

3.2 IMPLEMENTATION

Responsibility for implementation of the procedures set out in this manual rests with BHC line management. However, Belfast Lough Pilotage Services and each of the respective towage operator line managers and onboard staff are also expected to ensure adherence to the spirit of this manual.

BHC Harbour Master is responsible for ensuring that matters relating to compliance with this manual are adhered to.

All personnel involved in towage operations are required to comply with Belfast Harbour Statutory Harbour Authority (SHA) safety rules and regulations.

When considering new business or operational routines, full account will be taken to ensure that towage operation standards are maintained.

3.3 OPERATIONS MANUAL POLICY

This Operations Manual shall be available to all staff involved in harbour towage operations including:

- BHC marine staff;
- Belfast Lough Pilotage Services;
- Belfast Harbour towage operators:
    - Marine staff ashore; and
    - Tug masters and crew.
- PEC holders who may require the assistance of Belfast tug(s);
- Belfast Harbour Drydock (Harland & Wolff).

Tug masters are expected to be knowledgeable and fully conversant with this Operations Manual whilst on board the tugs under their command. Assessment of their knowledge, understanding and proficiency in operating the system will be carried out during internal audit (undertaken by an appropriate member of the BHC Harbour Master department), by informal interview and observation of standards maintained in line with the voluntary licensing scheme (see **Section 3.11**).

The respective towage operator Designated Person Ashore (DPA)/Operations Manager, tug masters, pilots and others as required will be consulted in the event of procedural changes to the manual before documents are issued. A summary of changes will be recorded in the "Introduction" section of this manual.

3.4 MANAGEMENT REVIEW OF OPERATIONS MANUAL

The BHC Harbour Master in conjunction with Belfast Lough Pilotage Services and Belfast Harbour towage operators will review the effectiveness and suitability of the Operations Manual every year or following a towage related incident whichever is the sooner.

It is the responsibility of BHC to advise those effected on the implications of safety matters being reviewed. If urgent safety management towage related matters require discussion, a management review, chaired by BHC HM may be held at any time. The tug master is responsible for facilitating and reporting all matters relating to safety to their respective company Operations Manager who in turn will report same to the Belfast Harbour Master.

3.5 PORT & MARINE FACILITIES SAFETY CODE (PMSC)

The PMSC sets out a national standard for every aspect of port marine safety. Its aim is to enhance safety for everyone who uses or works in the UK port marine environment. It is endorsed by the UK

Government, the devolved administrations and representatives from across the maritime sector and, while the PMSC is not mandatory, these bodies have a strong expectation that all harbour authorities will comply. In that respect, it should be noted that a successful prosecution has been brought against a harbour authority for breach of section 3 of the Health and safety at Work Act 1974[1], in that non-compliance with the fundamental elements of the PMSC evidenced a failure to provide a safe system of work.

3.6 A GUIDE TO GOOD PRACTICE ON PORT AND MARINE FACILITIES (GTGP)

A "Guide to Good Practice on Port Marine And Facilities" (GtGP) is intended to supplement the PMSC. It contains useful information and more detailed guidance on many issues relevant to the management of ports and other marine facilities. With regards to towage the following statement is extracted from Section 4.6 of the GtGP (see **0**):

"Procedures for towage in ports, harbours and at terminals need to be developed, managed and regularly reviewed by harbour authorities, tug operators, pilots and ship owners, to ensure a safe and efficient service. Procedures should include responses to emergencies. Effective communication and team work between all parties is essential".

3.7 BELFAST HARBOUR TOWAGE INFORMATION & MINIMUM TOWAGE REQUIREMENTS

Belfast Harbour has produced a source of information on tugs and towage procedures for masters of vessels using Belfast Harbour known as: "Belfast Harbour Towage Information" (see **Annex A**). It should be read, as appropriate, in conjunction with the Port's "Minimum Towage Requirements" (see **Annex B**) which state the minimum towage requirements for each berth within the port for various vessel sizes and types and the "Navigational Guidelines" within the port.

3.7.1 Belfast Drydock Towage Guidelines

In consultation with BHC Belfast Drydock have developed towage guidelines (see **Annex D**) for vessels entering and leaving the drydock.

[1] http://www.hse.gov.uk/enforce/hswact/scopeapplication.htm

3.8 MARINE SAFETY MANAGEMENT SYSTEM

Not all towage operators are required to comply with the ISM Code, it is however recognised that implementing a MSMS is consistent with good practice. A structured and recorded system of an appropriate size to the operation not only improves safety, and protects the employees but also protects the owner/operator. It is difficult to comply with accepted good practice if no MSMS system is in place.

Experience shows that accidents often occur during routine operations and an MSMS assists to identify the risks, allowing important lessons to be learnt so they will not be repeated. Risks are increased with:

- Poor planning;
- Poor communication;
- Poor supervision;
- Failure to appreciate the dangers of a task or operation;
- Lack of experience or knowledge;
- Misuse of equipment;
- Taking of short cuts, possibly due to commercial pressure;
- Unpredictable environmental factors such as weather, tide or current;
- Changes or unappreciated factors of the tow, such as cargo shift; and
- Unexpected events, such as equipment failure or unusual traffic movements.

Effectively managing the human factor can lessen the exposure to accidents. A MSMS allows a company to put into place the building blocks for reducing incidents of human error.

3.9 LIAISON AND CO-ORDINATION

Ship towage operations have inherent risks. These risks can largely be mitigated by good communications with open reporting, dialogue and regular liaison.

Among the means of facilitating cooperation and understanding between stakeholders, the following should be considered:

- Regular stakeholders' meetings to include, but not limited to, marine incident reports and lessons learnt;
- Regular tug master and pilot meetings;
- Management of change, such as modern technologies and the introduction of new tugs;

- Strategic planning for port developments as they impact on towage requirements, including new berths or vessel types;
- System to communicate changes to dedicated port fleet, including dry-docking or redeployment;
- BHC advocates an integrated approach to the training of tug masters and pilots where appropriate (through simulation, if required);
- Pilots to accompany tug masters on tug operations; several during initial training and thereafter periodical re-familiarisation;
- Tug masters to accompany pilots on the same basis as above;
- Clear directions from harbour authorities when there are requirements to act contrary to guidelines;
- Encourage open discussion between stakeholders in case of any difficulties being experienced and promote "no blame" culture;
- Institute incident and near-miss reporting system including feedback and lessons learnt;
- Contingency planning including towage in restricted visibility; and
- Emergency response exercises.

3.10 STANDARD SHIP TOWING RISK ASSESSMENT

Belfast Harbour MSMS is underpinned by effective identification and assessment of navigational hazards. Belfast Harbour use the HAZMAN II system to be the basis for initial identification and review of hazards, and to ensure consistent and effective review and implementation of control measures. BHC navigation risk assessment includes a generic harbour towage risk assessment which will be reviewed with the respective key stakeholders on a regular basis or following an incident. Hazards associated with harbour towage operations are detailed in **Section 7**.

All towage companies operating in Belfast Harbour will have a risk assessment covering all standard towing operations and any unusual or specific operation will require at least a dynamic risk assessment.

The following risk control measures are key criteria, in reducing the resultant risk scores for each hazard, when preparing for and during a towage operation:

- BHC "Minimum Towage Requirements" document;
- BHC Navigational Guidelines;
- BHC MSMS including navigation risk assessment;
- Towage operator SMS/ISM, including risk assessment and standard operating practices;

- Adequate passage planning;
- Tug master qualification, training and experience;
- Pilot authorisation (including PEC holders), training and experience;
- Vessel traffic monitoring through a 24 hour VTS;
- Communication (ship master/pilot and tug master/pilot exchange of information);
- Assessing the size and type of vessel or barge to be towed and any limitations of the tow;
- Tow wire and towing equipment is suitable (inspected and tested);
- Adequate manoeuvring space;
- Appropriate speeds agreed during; connection, under tow and disconnection;
- Tug maintenance; and
- Emergency contingency plans.

The towage risk assessment will also consider the vessel in relation to the existing:

- Port geography;
- Tug power / bollard pull;
- Berth facilities, length, fendering, bollard strength, gangway positions;
- Wind strength and direction;
- Tidal current rates, and ship handling windows;
- Tidal heights and under keel clearances in channel and in berth;
- Mooring arrangements and the extent of berth overhangs;
- The effect on vessels in other berths;
- The effect on other vessels using the harbour channels or swing basin including interaction effects;
- Day/night manoeuvres;
- Vessel beam in relation to berth pocket width;
- Vessel displacement in relation to tug power;
- Vessel engine power in relation to displacement;
- Vessel type and block coefficient;
- Vessel handling characteristics;
- Vessel manoeuvring aids;
- Vessel turning circle diameter and stopping distance;
- Vessel windage area; and
- Visibility from the bridge.

3.11 TUGS/WORKBOATS AND TOWAGE OPERATOR'S VOLUNTARY LICENSING REGIME

It is intended that BHC will implement a voluntary licencing regime to approve tugs, workboats and operators.

The following list, extracted from "A Guide to Good Practice on Port and Marine Facilities" (GtGP) (Section 4.7), will form the basis of a basic checklist for the master and crew (see **Annex C**):

- Master and crew experience and in-house training;
- Master and crew certification;
- Master's knowledge of relevant directions, bye laws, contingency plans and guidelines (if any);
- Master's knowledge of generic or own passage plans;
- master's knowledge of stability, watertight integrity and vessel interaction
- Master's knowledge of facilities' MSMS;
- Master's awareness of watertight integrity issues when towing;
- Capability of the vessel;
- Ability of the vessel and crew to respond to emergency situations;
- Crew's general safety culture, tool box talks, pre-operational briefings;
- PPE standards and knowledge of required use;
- Charts relevant and in date;
- Communication equipment checks;
- Certification, condition and maintenance standards of the vessel
- P&I liability cover held and level
- Drills are conducted, particularly PIW/MOB exercises
- Risk Assessments and contingency plans are relevant, understood and used infrastructure
- Such a berths and access to shore power, usually provided by the port owners, is fit for purpose, and that means of safe access and mooring of Small Commercial Vessels is provided
- Bollard pull certification is available as per towage guidelines
- Tug skippers / crews are aware of specific port emergency arrangements such as established casualty evacuation points or protocols

The licencing regime will assess a tug or workboat and its crews' suitability to operate in Belfast Harbour (see **Annex C** for possible licence format).

The licensing process will be subject to appropriate consultation.

3.12 BELFAST HARBOUR TOWAGE INFORMATION

Belfast Harbour does not provide towage. Towage within Belfast Harbour is provided commercially by two independent operators:

- David Ferran & Sons;
- Boluda Towage; and

Whilst stipulating minimum towage requirements and regulating movements within the port through the Vessel Traffic Service (VTS), under normal circumstances Belfast Harbour are not involved with the contracting of towage services.

The booklet "Belfast Harbour Towage Information" has been produced to provide a source of information on tugs and towage for masters of vessels using Belfast Harbour. The full document can be found in **Annex A**.

3.13 TOWAGE CERTIFICATES

Provided certain conditions are met vessels which call regularly to the port may be exempted from some or all the Belfast Harbour "Minimum Towage Requirements" (see **Annex B** for clarification).

3.14 WORKING LANGUAGE POLICY

The English language is the official working language spoken on board all tugs operating in Belfast Harbour, when complying with this manual as well as when undertaking operational duties. All written reports, log books and other correspondence are to be completed legibly in the English language.

3.15 MEDICAL REQUIREMENTS POLICY

All crew employed on tugs operating in Belfast Harbour must be in possession of an in date medical certificate in line with the recommendations of national and international legislation.

3.16 EXPERIENCE

Towage operators must ensure their crews are trained (see **Section 4**) with a competent understanding of:

- The tugs they operate;
- Towage techniques e.g. ship assist, push/pull etc.; and
- The berth to/from which they will operate.

3.17 WORKING HOURS

All tug crew members must be properly rested in line with the requirements of national and international legislation.

4 TRAINING AND CERTIFICATION

As a minimum, the qualifications of crews on board tugs shall meet the requirements of the MCA guidelines as set out in "A Guide to Good Practice on Port Marine And Facilities" Section 4.7.7 (see **Annex F**) as detailed below:

Where tugs and workboats are working with pilots and/or other craft in the performance of towage, team work, tool box talks, briefings and clear communications are essential. Team training on location, in simulators and at safety workshops should be prescribed as necessary.

The Maritime & Coastguard Agency (MCA) does not determine qualifications for personnel operating tugs within the harbour but does support and approve training schemes for towage which form the basis for standards available to facilities. These requirements are:

- **Boat Masters Licence** (BML) or commercially endorsed equivalent with Towage Endorsement (BML TE): Seen as the minimum requirement to conduct any towage operation in harbour or at sea in workboat coded vessel.
- **Certificate of Competence** (CoC) as per Workboat Code edition 3, with a Voluntary Towage Endorsement (VTE): a British Tugowners Association (BTA) and The Workboat Association (WA) jointly supported scheme which includes a detailed towage-specific syllabus recognised by the MCA covering recorded training, assessment and independent examination. Holders do not need to undertake the Boat Master Licence (BML) Tier 1 and 2.
- **STCW Tug Mate/Master Certificate of Competency** (CoC): This scheme, and its small vessel Engineer equivalent, are those that are considered "best practice" on ship assist tugs, of tugs more than 24 metres registered length, 150 GT or 350 kW.
- **STCW Restricted or Unlimited Master Certificate of** Competency (CoC): Persons holding STCW Certificates of Competence entering the towage industry should be subject to a bespoke in-house training scheme – relevant parts of the VTE syllabus could be utilised as a basis for such schemes.

4.1 FAMILIARISATION TRAINING

To ensure full continuity of operations on-board the tug and to ensure that the safety of all personnel, the tug and the environment are protected, all personnel joining a tug should familiarise themselves with all aspects of their responsibilities and the vessel's emergency procedures. Each towage operator should ensure that an appropriate induction familiarisation checklist is in place.

4.2 CREW TRAINING

Following investigations into a number of tug incidents (see **Annex E**), the MAIB strongly urged:

- All tug operators review their training schemes to ensure that tug masters receive comprehensive familiarisation training before taking control of a tug that is equipped with significantly different propulsion systems. Such training should incorporate instruction and validation on all manoeuvres that the master is likely to undertake in their port or operations; and
- All harbour authorities, pilots and tug operators regularly review the capabilities and limitations of their harbour tugs and their crews; (see Capt. Henk Hensen, "*Bow Tug Operations with Azimuth Stern Drive Tugs",* NI, UK, 2006).

A good training system should:

- Lay out clearly in writing the whole structure of dos, don'ts, whys and wherefores;
- Design the structure to protect the rights of all parties concerned, i.e.:
    - The trainee;
    - The training master;
    - The competency check master;
    - The clients (pilot and ship-owner);
    - Owners of third party assets (BHC, berth tenant etc.) and
    - BHC authorised towage operators.
- Ensure competency-based training starts with the basic steps and works its way through listed and identified steps one by one, thus climbing a ladder of competency and confidence to an agreed predetermined standard.
- Use skilled, respected and qualified trainers who have empathy with the trainees and are adapt at getting the message across to colleagues;
- Include repetitive training that fixes the basic moves in the subconscious minds of the trainees;
- Ensure trainees are trained to competently drive the tug before undertaking towage operations;
- Give equal emphasis to operational and procedural knowledge;
- Develop a tug master's professionalism in all facets of the job;
- Be designed to cope equally with timid, apprehensive trainees as well as over confident; and
- Be based on an effective 'style' of tug driving using a combination of authority, control and finesse.

4.3 TRAINING – SEAMAN

A seaman training logbook will assist in developing and progressing the seaman's skills with the aim of becoming tug master. The training logbook recommended is as described and detailed in the Marine Guidance Note (MGN) 468[2].

The MGN describes the arrangement for the MCA recognised voluntary towage endorsement scheme. It has been developed at the request of the United Kingdom towage and workboat industry to help ensure that masters engaged in towage operations have the necessary skills for such specialist operations.

The MGN identifies competence standards and the specific knowledge, understanding and proficiency needed to safely operate in the towage industry.

The logbook is not compulsory but seamen, whether they wish to progress to tug master or not, are positively encouraged to use the logbook.

Seamen should complete the logbook and tasks that are listed in the book. A tug master should sign off each task once satisfied that the seaman has reached a competent level in that task.

The checklist for tug handling states the minimum number of manoeuvres a seaman is expected to achieve competently per class of tug.

Once the logbook has been completed, with the tasks and checklist also completed, the master may issue a "Certificate of Training". More than one tug master must sign off this certificate.

Tug masters are encouraged to pass on their knowledge and skills to their crews to help in their development. Tug masters should bear in mind that should they become incapacitated, the seaman is the individual tasked with maintaining the safety of the tug.

4.4 TOWAGE TRAINING FOR PILOTS

BHC requires Belfast Lough pilots, as part of their initial training and revalidation process, periodically attend on board tugs during harbour towing operations and ideally should find time to attend on both the bow tug and the stern tug.

Pilots will have done so during their initial training period, but as they progress further through their career whilst qualifying to handle larger vessels, they may tend to forget how it feels to be at the other

[2] http://www.dft.gov.uk/mca/mgn468.pdf

end. Therefore, by attending periodically on board a tug during a live harbour towing operation and, if opportunity exists, by attending simulator sessions ideally together with the tug masters, they will constantly keep in mind the tug masters' concerns and the tug masters can gain insight in the pilot's concerns. This will eventually work to the benefit of the tugs' crews and the crews of the assisted vessels because it will undoubtedly influence the safety of all parties concerned.

5 TOWAGE OPERATIONS

There are several types of towage operations undertaken in Belfast Harbour each of which brings its own challenges and risks. These can be summarised as:

- **Ship Assist Towage** or assisting vessels under way, typically during entering or leaving and/or shifting berth within a harbour;
- **Dead Tows** or assisting vessels without propulsion including, but not limited to; barges, pontoons, dredgers, rigs which typically involves vessels entering and leaving harbour being towed by a sea-going tug or other vessel;
- **General Towage** including towage of smaller barges, pontoons, rigs normally within harbour limits and marine construction equipment; and
- **Project Towage** including unusual events which require special consideration.

Towage can be undertaken utilising several different methods and in many differing configurations including over the bow, over the stern, pushing, pulling, using long or short towlines, fixed or adjustable lengths, with or without towing bridles, lashed alongside ("hipped up") and using single or multiple tugs.

The choice of method will depend on the type/size of the assisted vessel and type/size/capability of the tug or workboat. The tug master and crew must be suitably qualified (see **Section 4**) and experienced and are competent to not only to conduct the manoeuvre but also advise if the plan and/or its execution is unsafe.

The following section describes the policy on the use of tugs with relation to movement carried out on vessels in the approaches to, and within Belfast Harbour.

5.1 TYPES OF TUGS OPERATING IN BELFAST HARBOUR

There are currently three (3) tugs permanently based within the port, these fall into two established categories:

- 2 x omni-directional tugs; and
- 1 x conventional tug.

The following is a brief description of the types of tugs operating in Belfast Harbour. A full description of individual tugs and their respective towage operators can be found in **Annex A**.

5.1.1 Tractor Tugs

Tractor tugs are extremely manoeuvrable and are principally used for ship docking operations. There are three commonly used tractor types, Voith-Schneider (VS), Azimuth Tractor Drives (ATDs) and Rotor Tugs. Azimuth Stern Drive (ASD) tugs are commonly called Reverse Tractors when towing bow to bow.

5.1.2 Voith-Schneider Tractor Tug (VST)

The term "Tractor Tug" is used where the propulsion units are located about 0.3 x LOA from the bow with the towing point located at the opposite end of the tug, close to the stern. The main difference between the azimuth stern drive and the tractor tug types is the location of the propulsion units.

The Voith-Schneider Tractor Tug (employing Voith-Schneider cycloidal propellers) as shown below in **Figure 1** was introduced for ship-handling due to its exceptional manoeuvrability and ability to rapidly change heading.

Figure 1: Voith Schneider

5.1.3 Azimuth Stern Drive (ASD) (Z-peller)

ASD's (see **Figure 2**) have azimuth propulsion units in place of conventional propulsion; these enable the propeller and its associated nozzle to rotate about its vertical axis (360° rotation). The position of the propulsion units is identical to that of a conventional twin-screw tug. Just as with a twin-screw tug, these propulsion units can operate independently, making it possible for the tug to move forwards, backwards, sideways and turn around its own axis with great precision. ASD tugs can tow over the bow (see below), normally from a bow winch, which is typical when operating in a Push/Pull mode or when fast on the centre-lead.

Figure 2: Azimuth Stern Drive.

5.1.3.1 ASD Tugs – Bow to Bow Towage

Early European designed ASD tugs, not fitted with full length box keels (or skeg) do not have the same course stability as later ASD tugs when operating in the Bow-to-Bow mode. The guide detailed below is aimed at those ASD tugs without full length box keels.

The established procedure is for ASD tugs to tow over the bow of the tug.

Where there is a mix of Voith and ASD tugs, the ASD tug will normally be employed at the stern of the towed vessel.

Should there be a requirement to use an ASD tug on the bow of a towed vessel particular attention should be paid to the safe speed of the vessel being towed (see **Section 5.15.4**).

This manoeuvre must not be rushed: tugs should be made fast as early as is reasonably practical. The tug master should confirm to the pilot that the design, handling characteristics of his tug, together with his risk assessments and training are appropriate for the operation. He should inform the pilot immediately at any point during the manoeuvre should he have any safety related concerns.

5.1.4 Conventional Screw Tug

Worldwide, the largest number of tugs belongs to the conventional screw type (see **Figure 3**). The towing point (e.g. towing bits, hook or winch) is located approximately 0.45 x LOA from aft. To improve their manoeuvrability, conventional screw tugs may be fitted with a steerable nozzle, a bow thruster or a retractable azimuthing bow thruster. Tugs fitted with the latter device are referred to as "Combi-Tugs".

Figure 3: Conventional Tug

Twin-screw conventional tugs offer increased manoeuvrability over a single-screw tug, as the two screws can be worked independently and in opposite directions, thus enabling the tug to pivot within its own length.

5.2 TUG TYPE – ADVANTAGES AND DISADVANTAGES

The design of the tug (its hull shape, skeg, power, winch arrangements etc.) will affect its suitability for different types of manoeuvre. Typical examples are listed in the following table:

Tug type	Advantages	Disadvantages	Typical use
ASD standard	Most common; Highly manoeuvrable; and Safer bow to bow.	Older designs not so manoeuvrable; and Not all capable of safe bow to bow.	Ship assist in port.
Tractors Voith	Highly manoeuvrability in confined spaces e.g. locks; Lower risk to girting.	Costly to build and maintain/run.	Mainly lock ports.
Conventional	Lower operating costs.	Less manoeuvrable; and Higher risk of girting.	Mainly small ships, barges etc.

5.3 INSPECTION OF TOWING EQUIPMENT

Inspection of towing equipment shall include all ropes, wires, shackles, messengers, winches, hooks and any other item specifically designed or used, to provide towage services. In date test certificates shall be held on board for all equipment in use.

Equipment shall be inspected every time before use and on recovery after completing towage services. Damaged or suspect items of equipment are to be immediately withdrawn from service and clearly marked "*Not to be used*".

If any item of equipment is damaged during towage operations, the Master/Pilot of the vessel shall be informed and the respective towage operator Operations Manager.

Under no circumstances should a tug crew leave a tug, after completing a job, without replacing damaged equipment or advising the respective towage operator Operations Manager and the engineer responsible of the situation.

5.4 TOWING WINCHES VERSUS TOWING HOOKS

Towing hooks on tugs are gradually being replaced by towing winches, the latter having significant advantages over towing hooks.

Towing winches come in various designs. Some winches have the capacity to shorten the towline whilst pulling at full power, others need to be made tension-free for hauling in the towline.

When using towing hooks, the length of the towline cannot be adjusted, whereas where winches are provided, the length of the towline can be adjusted as best suited to meet the requirements of the harbour towing operation.

Furthermore, in the unfortunate event of a towline parting, the tug can rapidly recover the parted towline and reconnect with a second line. In some cases, tugs are fitted with winches have a split drum or even better a double drum. This will make it easier for a second line to be passed onto the vessel if the towline parts.

5.5 TESTING OF WINCH AND HOOK RELEASE MECHANISMS

Towing winch and towing hook release mechanisms are to be frequently tested for correct operation. All methods of "tripping" or "run out" are to be tested (pneumatic, manual pull, lever or knock out etc.).

Release mechanisms are also to be tested at other times, if a fault is suspected or an exceptional shock loading has been experienced.

Under no circumstances must towing equipment be connected to any winch or hook that has a suspect release mechanism. Correct maintenance and operation are essential.

5.6 PREPARING FOR TOWAGE OPERATIONS

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 ship master (see **Section 5.12**) taking account of all relevant factors, including tide, wind, visibility, the ship's size, type and characteristics and the berth operator requirements. The pilot should have a good knowledge of the type and capabilities of the tugs allocated to the job. Furthermore, it is important that the pilot and master ensure that the tug(s) are both suitable for the task ahead and positioned on the vessel to be most effective 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), line-handlers or mooring gangs and other port 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.

5.7 PREPARATIONS ON BOARD THE TUG

Operations such as towing impose very great loads upon ropes or warps, gear and equipment. Because of the imposed loads, sudden failure in any part of the system may cause death or serious injury to personnel. Tug 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. Attention is drawn to the need to ensure that fairleads, lead bollards, mooring bitts etc. are:

- Used appropriately and within their design capabilities;
- Correctly sited; and
- Effectively secured to a part of the ship's structure which is suitably strengthened.

5.8 MAINTAINING WATERTIGHT INTEGRITY ON MAIN DECK AND TOWING DECK

It is essential that a watertight seal is always maintained on main-deck and towing deck, whilst towing, to avoid water entering below decks in a girting situation.

This applies to all watertight doors, hatch openings and emergency escapes. Openings that are required to be closed should be marked accordingly with an appropriate sign.

Rubber seals and locking dogs are to be kept in good working condition and properly fitted. Always operate all closing devices and dogs fitted; it is not sufficient to lock two dogs on a watertight door fitted with six.

If entry is required through a hatch or door during towage operations, the tug-master should be informed and the hatch or door closed immediately after entry. Do not leave open, even if only inside for a brief period.

5.9 METHOD OF OPERATION

There are three principal methods of ship handling operations:

- On-the-line or centre-lead towing;
- Push-pull method; and
- Indirect Towing.
- Hipped up

5.9.1 On the Line

"On the line" towing means that the tug is connected to the assisted vessel by a towline normally made fast on or close to the centre-lead forward or aft.

The towline is connected to the tug by a towing hook, towing winch or secured to towing bitts (all of which are known as the towing point). The location of the towing point will vary between tugs types: conventional, ASD or Tractor.

When made fast to a vessel's bow, the effectiveness of tugs towing on a line will decrease with increasing headway. This is because, as headway increases, more of the tug's power is used in maintaining its position relative to the vessel, as opposed to being applied as an assisting force through the towline.

The danger with towing on the line is the risk of girting and capsizing. Girting happens when the towline comes at right-angles to the tug. The tug is pulled bodily through the water by its tow, which can lead to deck-edge immersion, flooding and capsize; unless the towline is released in good time. The location of the towing point on ASD tugs (when operating over the bow) and Tractor tugs reduces the risk of girting.

Tugs towing centre-lead forward are also exposed to the danger of being "run down". A higher probability occurs when making fast close under the bow, a manoeuvre which must be managed very carefully.

5.9.2 Push-Pull

The push-pull operation means that the tug is connected to the assisted vessel by a tow line (ASD and conventional tugs will use a bow line, whilst tractor tugs will use a stern line) and remains in close proximity to the vessel. This enables the tug to push on the vessel, but then check/control the vessel by pulling-back on the tow line.

Due to the loss of power of conventional tugs when running their propellers astern (about 25%), their ability to pull-back on the line will be limited. It is more difficult for conventional tugs to maintain position when pulling back than tugs with azimuthing propulsion units.

5.9.3 Indirect Towing

Indirect towing is a way of enlarging the exerted force when turning and/or decelerating the tow. This mode applies only to the trailing tug, or stern tug. The tug is made fast to the vessel by a towline and is dragged by the assisted vessel. The tug uses its thrust to maintain a sheered position relative to the tow's heading whilst the towing force is generated by the drag forces acting on the tug's hull and transmitted via the towline. The drag forces on the tug can be substantially higher than the bollard pull when the speed through the water is greater than about 6 knots.

With the towline at a large angle to the tug's centre line, indirect towing is a potentially dangerous manoeuvre. Indirect towing requires a highly skilled tug master to achieve the high towline forces without endangering the tug and her crew.

The advent of the purpose-built escort tug, designed for exerting such high loads, has made this operation much more predictable and controllable.

5.9.4 Hipped Up

The **"on the hip"** method, also referred to as **"tug alongside"**, involves securing the tug firmly to the side of the vessel to be towed, typically near the stern quarter. This arrangement creates a rigid or semi-rigid connection, enabling the tug to act as part of the tow. It is a commonly used method for harbour towage, particularly for short-distance movements, berthing and unberthing, or when towing vessels without propulsion.

As described by Henk Hensen in *Tug Use in Port* (4th Edition), this method allows the tug to provide both propulsion and steering to the tow. Steering is achieved by varying the engine thrust and rudder angle of the tug. The effectiveness of this method depends on several factors, including:

- The relative size and displacement of the tug and tow
- The strength and arrangement of securing points
- The configuration and effectiveness of fendering
- Environmental conditions (wind, current, sea state)

A rigid connection (often using fore and aft lines under constant tension) enhances control, allowing the tug to exert pushing or braking forces directly to the hull of the tow. This method offers excellent manoeuvrability and is particularly effective in confined waters. However, it may not be suitable in open waters or heavy weather due to potential structural stress on both vessels.

5.10 TOW LINES

The tow-lines used on tugs operating in Belfast Harbour should be designed to withstand all reasonable forces they are likely to be subjected to during towage operations and are to be used wherever possible. The pilot, master and tug master should confer with regards to the minimum safe working load of the rope (see **Sections 5.12** and **5.13**).

5.11 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, can communicate promptly throughout the towage operation, should the need arise.

At all times whilst a tug is manned and available for towing operations a listening watch shall be maintained on working and Belfast Harbour VHF frequencies, by the duty tug or the next tug in line if duty tug is working.

Contact should be made to "*Belfast VTS*" prior to joining the shipping *channel* on *VHF Channel* 12, or 028 9044 3504 if no *VHF* is carried.

A continuous VHF radio listening watch must be maintained. At the beginning of each shift, the tug master must ensure that the VHF radio is correctly working and set to the harbour communications channel (usually VHF Channels. 8, or 9 in Belfast Harbour) and that the volume is sufficiently high to be able to hear any communications even if not in the immediate vicinity of the VHF radio.

5.12 PILOT/VESSEL MASTER EXCHANGE

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;
- 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, and ascertain that the heaving lines available on-board to be passed to the tug are made without any added weight at the throwing end except the acceptable monkey's fists made from rope and rags according to IMO directives;
- That on release, the tug's gear should be lowered back always under control;
- Areas of the transit posing risks with respect to the possible use of the tug;
- Intentions about use and positioning of the tug(s) for berthing manoeuvres;
- Intentions about use of the tug(s) in an emergency (escort operations); and
- Primary and secondary VHF channels for use in the operation.

5.13 PILOT/TUG MASTER EXCHANGE OF INFORMATION

Once VHF communications have been established, tested and relevant information has been exchanged, personnel should keep transmissions to a minimum and should normally only call when passing or receiving instructions, in doubt, or in an emergency.

Prior to towing operations being undertaken, the pilot, master, and tug master(s) should establish suitable means of communication and agree a plan for the towage operation and discuss as a minimum the following issues:

- Confirm tug name(s), type and bollard pull;
- Agree geographical position to make fast;
- The Safe Working Load (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 connection position in relation to the vessel's propulsion location, considering the prevailing weather and sea conditions. Agree safe position for passing heaving line forward (at the shoulder is safest);
- Check safe heaving line is used;
- The planned (optimum) ship speed when connecting to the tug's lines;
- The maximum speed of the tug:
    - Running free;
    - Connecting/disconnecting; and
    - Whilst connected/working.
- 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;
- Discuss back-up communication arrangements (VHF Ch. 8 primary channel, secondary channel VHF Ch. 9);
- Intended and emergency use of ships anchors;
- Any unusual items regarding the vessel as gleaned from the master/pilot exchange;
- The tug master 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 tug master should also confirm both the tug's name and her position on the vessel.

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

- Towing vessel and both the bridge team, and the mooring decks of the vessel under tow; and
- Ship's tow party and the bridge team.

Communication should be brief, relevant and professional. Remember, other port users are listening and may be waiting to speak on the frequency. If necessary, repeat back orders received, to ensure that they have been recorded correctly.

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

If an incident occurs during a normal harbour towage job, log any VHF conversation that you think may have a significant effect on the incident or be contentious at a later date (e.g.: from ship to harbour authority, "*I am aground and require tugs*"). This works both ways, remember, "*what you say*", is also being recorded.

5.13.1 Maintain Communications

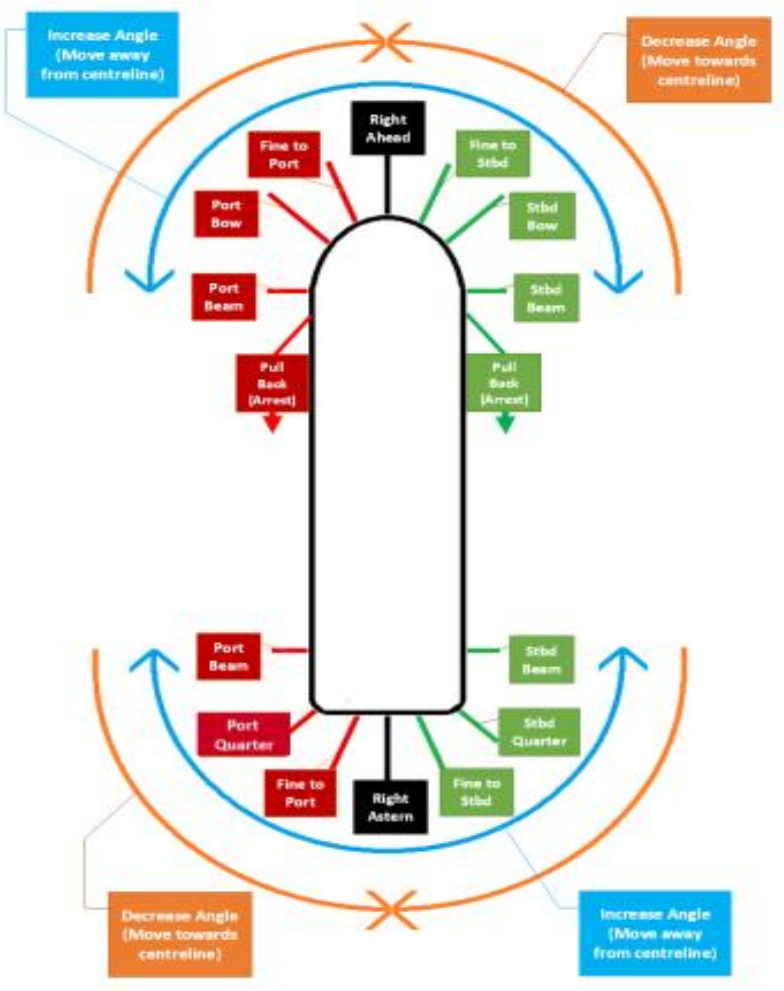
The pilot/master and tug master should ensure that effective communication is maintained throughout the operation. The pilot should ensure that the vessel master is kept appraised of the use/intended use of the tugs, especially should circumstances dictate a change from the intended plan.

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.

5.14 PILOT INSTRUCTIONS TO THE TUG

It is vital in any regular towage operation that instructions to tugs are specific, consistent and easy to understand.

- Instructions given to tugs should be clear, concise and unambiguous;
- The name of the tug to which the order applies should be called first followed by the command;
- Tug masters should repeat all orders to ensure that they have been understood;
- To avoid confusion, pilots will ask for tug power and directional requirements as follows:
- Minimum – this term is commonly used between pilots and tug masters, understood to refer to the minimum force a tug can apply with two engines. Less than minimum, i.e. using one engine, may be requested using clear, concise terms. However, pilots and tug master's should be aware this may reduce the manoeuvrability of the tug and vessel.
- The power required will be indicated as **force in tonnes**; and
- The direction of pull will be indicated as in the diagram below.



5.14.1 Process for Declining Pilots Instruction

- 1. Assessment of Safety and Operational Considerations:

Upon receiving a pilot's instruction, the tug master shall conduct a thorough assessment of safety and operational considerations, considering factors such as:

- Vessel characteristics and manoeuvrability.
- Environmental conditions
- Traffic density and proximity to other vessels or navigational hazards.
- Available tug resources and capabilities.

- 2. Communication procedure

If tug master determines that complying with the pilot's instruction may compromise safety, they shall communicate their concerns at the earliest opportunity to the pilot.

Communication should be clear, concise, and conducted via VHF Ch8.

The tug master should provide reasoning for declining the instruction and suggest alternative courses of action if possible. (reasoning should be given if time permits unless the declining of instruction was putting the tug in immediate risk at what stage reasoning would be given when safe to do so)

- 3. Risk Assessment and Decision Making:

The tug master, in consultation with bridge team, shall conduct a dynamic risk assessment to evaluate the potential consequences of declining the pilot's instruction versus complying with it. Factors to consider in the risk assessment include the likelihood and severity of potential hazards, consequences for vessel safety and navigation, and compliance with regulatory requirements. Based on the risk assessment, the tug master shall make an informed decision regarding whether to decline the pilot's instruction or proceed with an alternative course of action.

- 4. Escalation:

If agreement cannot be reached between the pilot and tug master regarding the course of action, the following escalation protocols shall be followed.

Escalation may involve notifying the vessel's master or the Harbour Master for a resolution. (this only likely at the pilot tug master exchange)

- 5. Reporting

All decisions and actions related to declining a pilot's instruction shall be accurately documented in the vessel's logbook.

Any incidents or near misses resulting from the decision to decline a pilot's instruction shall be reported immediately to the harbour authority.

This process provides a structured framework for tug master's to follow when faced with the decision to decline a pilot's instruction, emphasizing safety, communication, risk assessment, and documentation within the MSMS framework.

5.15 PASSING AND RECOVERY OF TOWING GEAR

5.15.1 Connecting Towing Gear

Before arrival at the tug connecting position, the pilot should establish effective communications with the tug(s) and agree working channel.

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 pilot and with (all) the tug master(s) involved. At all times during the connecting process, the pilot should be aware of the

position and intention of all relevant shipping movements in the area. He should always keep the Belfast Harbour VTS appraised of his intentions, requesting advice on shipping as necessary.

Passing and recovery of towing gear are hazardous operations exposing crew to risk of injury and the tug to the effects of interaction. The following guidelines are to be always observed:

- Never allow a crew member to stand in the direct line of throw of a heaving line being passed from the ship;
- Always ensure that towing gear being passed is clear to run and not likely to snag on an obstruction;
- Do not stand in the bight of a rope or wire;
- Pass the towing gear to the ship in a controlled manner; and
- Always confirm with the ship's crew that the towing equipment has been made fast.

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

5.15.2 Securing Stern Tug First

It is highly recommended to secure the stern tug first so that the tug can be immediately employed to "brake" the vessel's speed and steer the vessel as necessary. Normally, connecting the stern tug is much easier and thus quicker than connecting the bow tug. By making fast the stern tug first the pilot can depend on the stern tug to provide immediate assistance if the vessel's propulsion system or steering gear fails. Moreover, once the vessel is making headway through the water, the vessel's pivot point shifts forward from mid-ship and will continue to move forward as the speed increases. Thus, assistance from the stern tug will undoubtedly be more effective than any assistance that can be rendered by the bow tug particularly at speed in the region of 4 - 6 knots or above through the water, thus further enhancing the argument in favour of connecting the stern tug first.

5.15.3 Tug Positioning and Speed

The pilot should always advise the tug master 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 tug master(s), having full regard for the areas of the hull, which should be avoided, e.g. watertight doors, between frames etc.

If the tugs are made fast alongside they are at their most effective with a minimal ship speed through the water.

When the engines are put on astern and /or the vessel starts to move astern, the stern tug will be drawn in towards the vessel. It is therefore imperative that the tug master is fully informed and aware that the vessel has engaged its engines astern so that he may take evasive actions, if necessary.

5.15.4 Safe Speed – Advice to Pilot/Master

When taking up the tow line, tug masters will ideally expect a speed of about 4 to 6 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 tug master is trying to balance the tug and able 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 tug master 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 will position itself very close under the bow, sometimes under 1m from the ship's water-plane. The tug master 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 tug master 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.

When making fast a conventional tug, whether alongside on the hip or stern-to-stern for towing, maintaining a safe and controlled speed is essential for the safety of both vessels and crew. A maximum speed of 2 knots, ideally just above bare steerage, is recommended. This allows the tug to manoeuvre safely without excessive momentum or strain on equipment.

In stern-to-stern connection —the tug typically approaches the stern of the tow vessel at a shallow angle. Once in position, the towline is passed, and the tug can then peel off and fall astern under control, taking up slack on the towline gradually. Timing and coordination are critical: the tow should maintain a steady heading with minimal way on, and the tug's crew must be fully prepared with the towline rigged and tested for quick deployment.

5.15.5 Releasing Towing Gear

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.

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. The following guidelines should be observed when releasing towing gear:

- Beware of ships crews releasing gear in an uncontrolled manner and not using the messenger to lower rope/wire to tug;
- Whenever possible "shorten in" to shortest length possible before giving ship's crew the "all clear" to let go. This will avoid the possibility of a rope or wire being caught in tugs propellers or trapped between sections of fendering, if released in an uncontrolled manner;
- Never stand directly under the ships fairlead during letting go;
- Be aware of possible interaction effects. The violent movements caused by two vessels coming into contact could cause a crew member to be injured in a slip or fall;
- When recovering towing gear, clear the ship as soon as possible. It is always easier to recover gear at a slow speed than a higher speed, which may be necessary if running ahead of the ship; and
- Always re-stow gear correctly so that it is ready for use immediately, should an incident arise.

5.15.6 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.

5.16 REPORTING OF DAMAGE

All damages to Belfast Harbour operated tugs and towed vessels must be formally reported to BHC and the respective towage operator responsible person.

Damages should be reported by the fastest means possible. Also, at the time of the incident verbally report damage to pilot or Master of the vessel.

5.17 ESCORTING DUTIES

The two modes of escorting duties are:

- **Active** - Tug is connected to the stern of ship by towline; and
- **Passive** - Tug is not connected to ship by towline.

"Active Escorting" can only be conducted if the following criteria can be met:

- Crews and pilots are familiar with active escorting procedures and techniques; and
- Active escorting is port policy.

Passive Escorting, whereby a tug shadows the progress of a ship during the transit, is undertaken at Master's / Pilot's discretion.

Active Escorting or indirect towing – (when the tug is dragged through the water by the tow line during transit) is not currently undertaken within the Port. However, in the interests of completeness an explanation of this procedure is detailed below.

5.17.1 Active Escorting

Direct Towing:

- **Direct Arrest Mode** - Used to take the way off a ship. The escort tug applies force to the towline to take the way off the ship; and
- **Combination Mode** - Used to oppose the turning moment of a disabled ship. From a position broad on the quarter of the disabled ship, the escort tug applies a force on the towline to counter a steering sheer.

Indirect Towing:

- **Indirect Arrest Mode** - To turn a ship. The escort tug applies the towing force at an angle of about 90 degrees to its towing point, from a position off the ship's quarter, so that a combination of towline force and tug hull interaction is applied to the ship's stern to turn the ship. There is also an element of braking force in this mode.

The decision to put crew on the aft deck to handle the towline and messenger to connect from the escorted ship will rest solely with the tug-master. The criterion for this task will be whether the man can safely carry out the task.

When connecting/disconnecting, the tug-master is to manoeuvre the tug as close to the ship's stern as is safely practicable. If the tug master considers that weather/sea conditions or the ship's speed is excessive at the normal position for making fast, he will passively escort the ship and delay making

fast until satisfied that it is safe to do so and contact the ship explaining why he/she is unable to make fast.

Should the tug master decide that conditions preclude the crew from going on the aft deck for letting go, he will manoeuvre the tug as close to the stern of the ship as is safely practicable. He will then instruct the ship's crew to lower the towline and messenger at a controlled speed, so that it can be heaved onto the tugs winch without being dropped into the water during the recovery process.

When connecting/disconnecting, the time spent on the aft deck by the tug crew member is to be kept to the minimum.

5.17.2 Passive Escorting

No additional safety procedures are required for "Passive Escorting". However, in the event of an emergency onboard the escorted vessel, which requires the escort tug to provide assistance, normal safety procedures will apply.

If in the opinion of the tug-master, he and his crew are fatigued to the point that they are unable safely to undertake a "Passive Escort", the Master is to inform line management and/or VTS.

SAFETY POINTS TO REMEMBER:

- Escorting is a risk reducer not a risk eliminator;
- Always have 1.5 - 2.0 knots of extra speed in hand; and
- Do not attempt active escorting unless you have been trained and procedures are in place.

5.18 TOWING BARGES/DEAD SHIPS

A dead ship is defined as a vessel in a condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power.

Towing barges and dead ships by their nature require careful consideration and as such are subject to an individual risk assessment (see **Section 3.10**) and approval process (see **Annex B**).

5.19 NON-STANDARD MARINE MOVEMENT (SPECIAL CATEGORY MOVEMENTS)

It is recognised that due to the considerable variations in vessel size, shape, condition and degree of capability, certain marine movements may require an individual assessment of the planned movement undertaken and a pre-movement planning meeting is to be held between all organisations/individuals

who are involved. This is particularly pertinent when a damaged or disabled vessel or unusual floating structure is to be moved within the port.

There may be other circumstances such as abnormal berthing arrangements or a reduction in available towage assets, which would call for an individual assessment of a proposed shipping movement.

5.19.1.1 Factors to be considered

In addition to the baseline criteria, there are numerous other factors which need to be included in the overall assessment of tug support including, albeit not exhaustive, are listed in the table below:

Assessment of tug support	
Vessel draught	Orientation of berth;
Sea state	Weather forecast/restrictions
Assets available	Berthing crew;
Destination berth	Tug master experience
Vessel windage	Line boat availability
Tow line length	Vessel defects damage
Pilot experience	Load-line exemption certificate
Risk mitigation	Marine warranty /insurance.

The method for implementing a "Special Category" assessment should consist of the BHC HM representative, vessel manager, pilot(s) and tug master(s) to complete an appropriate dynamic risk assessment.

The assessment of the risk and the methods for mitigating such risks shall be firstly determined by local knowledge, professional experience and where appropriate simulation.

The results of the assessment and/or simulation shall be considered and the lead pilot in consultation with other relevant stakeholders shall agree a risk assessment and method statement with the master. This risk assessment and method statement will be basis in which approval will be given and should complement the vessels' passage plan.

5.19.2 Barge/Dead Ship to have a Tow Master

A recommendation made by the MAIB following the Chieftain report (see **0**) states:

"*planning should take into account the need for a contractor's method statement setting out the various contracted stages and responsibilities, a full passage plan, relevant experience and the need for a person to be in charge*."

Unless otherwise agreed with the port authority, a barge/dead ship operation is to have a Tow Master (responsible person) to be in charge on board the barge/dead ship; this should not be the pilot. The Tow Master should be suitably competent and experienced in barge operations, and will have overall responsibility for the safety and conduct of the passage and towage operation. The Tow Master must also be satisfied that all appropriate risk assessments are in place.

The Tow Master where appropriate and safe will board the barge on arrival/departure (in the absence of an embarked individual) and will act as Tow Master. He / she will always remain responsible for the safety of the barge. Whilst alongside a responsible organisation is to be nominated and Belfast VTS notified accordingly.

If it is not safe or appropriate to be aboard the barge then the Tow Master will be on board an agreed tug and their responsibilities will remain the same as if they were on the barge.

5.20 "DO NOT" AND "DO" IN HARBOUR TOWAGE OPERATIONS

DO NOT actions of Pilot, Ship's Master and Mooring Parties:

- Send the crew to the mooring stations (too) late;
- Maintain the speed of the vessel too high whilst securing tugs;
- Use DANGEROUSLY HEAVILY WEIGHTED HEAVING LINES;
- Execute course changes whilst the tugs are securing their towlines;
- Use tug masters' name when communicating orders to the tugs;
- Engage the vessel's engine/s during manoeuvres without first informing the respective tug masters;
- Throw the heaving line (at the bow) from the centre line but from the ship's shoulder;
- Make rapid and excessive steering changes without informing the tugs;
- Build up speed in excess of 6 knots through the water with the bow tug (still) connected;
- Use full engine power particularly on a large vessel when a tug is secured aft;
- Keep floodlights shining into the tug master's eyes; this will impair his night vision and will seriously hamper his ability to estimate distances and to assess the operations;
- Keep floodlights shining towards the tug in case of restricted visibility;
- Make headway on own power in very dense fog with a bow tug secured without prior agreement between tug and pilot. Consider letting the tug(s) tow the vessel rather than using the vessel's propulsive power;
- Build up speed over 6 knots through the water starting from a "dead ship" with a bow tug secured;
- Drop the towline at the stern when disconnecting the tug (unless instructed otherwise by the tug.);
- Delay "to drop" the towline at the bow when disconnecting the tug once instructed to do so by the tug; and
- Wait for something to happen to start preparing the heaving line(s) again.

DO Pilot - Master exchange of information or vice versa:

- Pilot-Master exchange to include info on modus operandi of tugs:
  - Tug name(s), type, bollard pull and position for securing;
  - Normal heaving line or heavy messenger line; and
  - Position for passing heaving line forward (bow/shoulder).
- First make fast the stern tug then the bow tug;
- First let go the bow tug, then the stern tug;

- Pilot to instruct vessel's Master to have his crew at mooring stations in ample time, agree on period of notice needed by ship's crew;
- At night, pilot to instruct vessel's Master to turn off blinding floodlights;
- Inform vessel's Master of local regulations, if applicable;
- To secure the bow tug in very dense fog, it is imperative that the assisted vessel takes off all speed through the water and the tug moves in to make fast;
- It should be discussed and agreed well in advance with the tug master whether once the bow tug is secured the vessel may use her own propulsion power;
- Keep vessel's speed at maximum 6 knots through the water particularly when the bow tug is being connected and whilst the bow tug is still connected;
- Pilot to use tug's name when giving orders, so the bridge team can understand the Pilot to inform the stern tug when engaging the vessel's propeller in order to watch out for the propeller wash;
- Pilot to inform the stern tug about any rudder position changes about to be effected during manoeuvring;
- Tug Master to inform the pilot whilst reaching 75% of the total engine power of the tug; and
- Pilot to be made aware of any "novice" or "trainee" Tug Masters or of any Tug Masters who may not be familiar with the area and who will be participating during the harbour towing operation.

DO **actions of Pilot, Ship's Master and Mooring Parties:**

- Bring speed down sufficiently before securing a tug, especially the bow tug;
- Limit use of propeller to the minimum required for steering;
- Drop the towline at the bow when disconnecting the tug, however only when instructed to do so by the tug;
- Slack away the towline slowly at the stern when disconnecting the tug and only let go off the messenger line when instructed to do so by the tug;
- Use tug's names when conveying orders to the tug and provide clear and concise instructions;
- Turn off floodlights as soon as the tug is secured;
- Have a spare heaving line ready at hand and a skilful deckhand to handle same;
- Use heaving lines with light weights, preferably using soft sand bags; and
- Inform the stern tug before engaging engines astern.

6 TUG NAVIGATION OPERATIONS

6.1 WATCHKEEPING RESPONSIBILITIES

Watchkeeping responsibilities whilst carrying out normal harbour towage operations are to comply with Belfast Harbour Regulations, as well as the guidelines for keeping a safe navigational watch. Fundamental to any safe watch keeping routine, whilst underway, are the following four factors.

- Maintain a proper and efficient lookout;
- Comply with collision regulations;
- Be sure of tug's position; and
- Never leave the bridge unattended.

6.2 NAVIGATING WITHIN BELFAST HARBOUR LIMITS

In addition to the guidelines contained above in **Section 6.1** it is a fundamental requirement to comply with all Belfast Harbour Regulations, contingency/emergency plans and the international collision regulations.

Speed restrictions must be strictly complied with. Remember other port users may not be professionally aware of the dangers involved e.g. small pleasure craft, people on the foreshore, divers and contractors working on jetties/berths may be swamped and injured by a tugs wash, if going at an excessive speed.

6.3 NAVIGATING IN RESTRICTED VISIBILITY

When visibility is reduced the hazards associated with towage operations are increased.

Belfast Harbour has parameters in place (see **BHC MSMS**) due to restricted visibility. However, there will be times when despite the docks or terminals being closed to vessel movements towage operations which have started may need to proceed to a conclusion.

These procedures apply to all towage operations which started prior to the onset of restricted visibility.

Restricted visibility is all circumstances where visibility is, or is expected to, reduce to a distance where the tugs normal ability to perform may be impaired. Such restrictions in visibility could be due to fog, mist, snow, rain, sleet or any other conditions which impair visibility.

In circumstances where restricted visibility exists, or is likely to exist, the Master/Pilot and tug master shall as part of the passage plan and risk assessment process agree how the operation will be conducted, what dangers are associated with towing in restricted visibility and what risk reduction measures should be applied. When completing this assessment, the following should be considered:

- Type of tug, propulsion method, towing from winch or hook and location of winch/hook;
- Proposed method of towing;
- Operational status of navigational aids and equipment;
- Minimum speed to maintain steerage of vessel to be assisted;
- Movement of other vessels in the area;
- Navigational characteristics of the area of the port including the use of information from VTS; and
- Contingency plan should visibility deteriorate after the tow has commenced and/or if the tug must disengage at any stage of the operation.

Minimum visibility for all planned towage operations is 0.5nm, and such that the Master/Pilot can see the tug and the tug master can see the towed vessel.

Should visibility fall below the minimum once a towage operation has commenced, and the pilot can no longer see the bow tug, he/she shall reduce speed to a minimum safe speed and if safe and appropriate to do so take all way off the vessel. Following discussion with the tug master the contingency plan discussed and agreed at the planning stage will be implemented. This could include one or more of the following:

- Use the tugs to turn the vessel, let go the tugs and the vessel proceeds either to an anchorage or to the outer Lough
- Let go the forward tug and/or both tugs and have the tugs assist in a pushing mode;
- Allow the tugs to manoeuvre the vessel under the pilot's instructions. This may include using the tugs to maintain the vessels position at a safe location in the Lough, channel or turning circle; and
- If safe to do so the aft tug may remain attached for escort, when required. If considered unsafe by any party the aft tug will be let go and remain passive for escort.

If the above options are not safe or practicable then as a last resort, with the agreement of all parties that it is the safest course of action, the operation can continue to completion.

The agreed course of action should be fully communicated to Belfast VTS.

All towage operations in restricted visibility should be conducted with the assisted vessel maintaining minimum safe manoeuvring speed.

The tug master should immediately inform the Pilot/Master of any concerns that he may have as to the safety of his tug and crew. The pilot and tug master should take immediate action to ensure the safety of both the tug and assisted vessel; if necessary they should abort the operation as soon as it is safe to do so.

The tug master proceeding to a job and all parties involved in the operation, should report any lack of visibility, immediately it is observed, to Belfast VTS and the vessel that they are rendezvousing with.

6.3.1 Additional Watch-Keeping Responsibilities aboard Tug

During restricted visibility additional watch-keeping responsibilities must be considered, these are:

- The tug master must take charge of conning the tug and have another member of crew on to act solely as lookout;
- Maintain a moderate speed (defined as a speed at which a collision is avoidable);
- Use all electronic navigational aids at your disposal to determine own position and other ships positions (if possible do not rely solely on electronic navigation aids);
- Close watertight doors and openings to maintain watertight integrity;
- Make the appropriate sound signals in accordance with collision and port regulations; and
- Comply with Rule 19, “Conduct of vessels in restricted visibility”:

(a) This Rule applies to vessels not in sight of one another when navigating or near an area of restricted visibility.

(b) Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel will have her engines ready for immediate manoeuvre.

(c) Every vessel shall have due regard to the prevailing circumstances and conditions of restricted visibility when complying with the Rules of Section I of this Part.

(d) A vessel which detects by radar alone the presence of another vessel shall determine if a close-quarters situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when her action consists of an alteration of course, so far as possible the following shall be avoided:

(i) an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken;

(ii) an alteration of course towards a vessel abeam or abaft the beam.

(e) Except where it has been determined that a risk of collision does not exist, every vessel which hears apparently forward of her beam the fog signal of another vessel, or which cannot avoid a close-quarters situation with another vessel forward of her beam, shall reduce her speed to the minimum at which she can be kept on her course. She shall if necessary take all her way off and in any event, navigate with extreme caution until danger of collision is over.

6.4 TOWING IN ADVERSE WEATHER CONDITIONS

When towing in adverse weather, hazards associated with towage operations are increased.

In circumstances where heavy weather (i.e. high winds and/or heavy swell) exists, or is likely to exist, the Master/Pilot and tug master shall as part of the passage plan and risk assessment process agree how the operation will be conducted, what hazards are associated with the towage operation and what risk reduction measures should be applied. When completing this assessment, the following should be considered:

- Sea and/or swell conditions at the intended operating area and the route to/from same;
- Wind speed, direction and trend i.e. rising, steady or falling;
- State of tide and trend;
- Information offered by latest weather forecast and other vessels in the area;
- Type of tug, propulsion method, towing from winch or hook and location of winch/hook;
- Proposed method of towing, including likelihood of shock-load to towing gear;
- Movement of other vessels in the area; and
- Navigational characteristics of the area of the port including the use of information from VTS.

Contingency plan should weather deteriorate before/after the tow has commenced and/or if the tug must disengage at any stage of the operation. This could include after careful consideration, but not only be limited to, one or more of the following:

- Tugs do not make fast and remain on station to assist the vessel to a position of safety;
- Tugs are let go and remain on station to assist the vessel to a position of safety; and
- Tugs are let go to assist in a pushing mode.

If there is likelihood that the weather conditions may pose a significant threat to the tug crew/tug/towing gear, the tug master should immediately inform the pilot/Master of any concerns

that he may have. The pilot and tug master should take immediate action to ensure the safety of the assisted vessel/tug/tug crew and, if necessary, the operation aborted as soon as it is safe to do so.

The agreed course of action should be fully communicated to Belfast Harbour VTS.

When the tug is proceeding to a job in poor weather conditions, the tug master is to make a pro-active report to discuss the weather conditions with Belfast Harbour VTS, the pilot and, if necessary, the vessel with which they are rendezvousing.

6.5 MOORING TUG ALONGSIDE A BERTH OR AT A BUOY

Tugs are to be moored alongside a berth or at a buoy in a condition that sufficient mooring lines are used to prevent excessive movement due to tide or other vessel movements, and provide a safety margin should a rope or ropes part due to a sudden surge.

When moored to a buoy consider implications of swinging circle, particularly at low water and the use of a slip wire or rope for letting go safely.

At all moorings, a safe means of access must be provided. This means a gangway or approved ladder with, where applicable, a safety net.

6.6 MONITORING PERFORMANCE OF NAVIGATION AIDS AND EQUIPMENT

The tug crew should be fully conversant with the operating manuals for navigation equipment fitted on board their tug.

Many items of equipment are fitted with a self-test facility (e.g. a Search and Rescue Transponder (SART) and an Emergency Position Indicating Radio Beacon (EPIRB) etc.) and these should be checked on a regular basis (following switching on and correct adjustment or at frequent intervals if continuously running) to confirm correct operation. If a self-test facility is not fitted, other known means should be used to establish correction function. Radar ranges and bearings against visual fixing, echo sounder against charted depth, compass error (both gyro and magnetic) by transit bearing or leading lights etc.

7 TOWAGE HAZARDS

7.1 SAFETY OF TUG CREW

Safety of crew is the first responsibility of tug masters.

All towage operations and manoeuvres must be conducted in a safe and seamanlike manner. If at any time a tug master is requested to carry out a manoeuvre, which he considers will result in a hazardous situation; he is to decline the order, stating the reasons why.

During towage operations, the towing gear equipment and personnel should be continuously monitored and any change in circumstances immediately relayed to the tug master. This is particularly important on tugs where the tug master has a restricted view of the towing area/personnel.

Whilst engaged in towing operations the minimum number of crew essential to carry out duties, is to be on deck, and never exposed to a rope or wire under tension or load. Crew should be aware that the tow may have to be released in an emergency, and that this may occur without warning. Wherever possible, a "clear deck" of crew should be in operation whilst towing.

Personal Protective Equipment (PPE) and working lifejackets should be worn always whilst engaged in, or near, towing operations on towing deck. It is the tug master's responsibility to enforce the wearing and use of safety equipment.

7.2 INTENTIONS WHEN TOWING

The pilot or Master should always advise the tug master of his intentions, allowing the tug master to anticipate the effect of the manoeuvre on his tug. Whenever possible the pilot or master should advise the tug master before making any engine movements. Un-notified sudden or large speed increases or course alterations should be avoided. The positioning of tugs on a vessel is a matter for discussion between the pilot and/or Master and the tug master(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 absorbed in maintaining position on the vessel before applying thrust to the vessel.

7.3 INTERACTION AND SHALLOW WATER EFFECTS

The effects of interaction between vessels and shallow water are well known, and it is not intended for this manual to give guidance on all the various kinds that can be experienced.

However, tug-masters should be aware of the critical manoeuvres when these effects are most likely to be apparent, that is whilst connecting and disconnecting to the ship, whilst manoeuvring away from the ships side and moving ahead.

In areas where interaction exists, and when manoeuvring alongside a tow, the tug master should be aware of the possibility of underwater obstructions such as bulbous bows, stabiliser fins etc. He/she should be aware of the actions of side thrusts which may present a hazard to the tug.

7.4 GIRTING

Ship's Masters, Pilots and Tug Masters must have a clear understanding of girting and its consequences. Girting happens when the towline comes at right-angles to the tug. The tug is pulled bodily through the water by its tow, which can lead to deck-edge immersion, flooding and capsize; unless the towline is released in time. It can occur very rapidly and it should not be assumed that the winch will pay out or that the towline will part before capsizing occurs. It can happen at the forward as well as at the stern of an assisted vessel. A conventional tug is particularly vulnerable and, being less manoeuvrable, it may be impossible to extract from a problematic situation. Girting may occur because:

- The assisted vessel turns abruptly and without warning away from the tug;
- The speed of the vessel is too high; and
- The tug is too far astern of its intended position, compared to the speed of the vessel.

7.4.1 Use of Gog Rope to Prevent Girting in Tugs and Workboats

This brief guide extracted from National Workboat Association "The Use of Workboats for Towage - Good Practice Guide" is intended as an aide memoire for conventionally propelled tugs and workboats in the safe use of gogs and gogging arrangements (otherwise known as bridles or gobs) in the prevention of girting.

Girting can occur when the tug is attached over her stern with a towing line from a hook or winch and is dragged astern at a speed through the water which prevents being able to manoeuvre and so brings the tow line over the side of the tug and the consequent heeling moment either capsizes her or pulls her over until down-flooding and sinking occurs. Trials and experience show that this can occur at speeds lower than 3 knots, depending on tug size, sea state, propeller wash and other factors and smaller workboats are particularly vulnerable.

Incidents have occurred in the workboat industry when a workboat has been at the opposite end of the tow to a larger and more powerful sea or harbour tug, where the imbalance in power and manoeuvrability (particularly if a modern tractor harbour tug is on the other end of the tow) means that the workboat can easily become overpowered by the other tug, and Masters should always be aware of the dangers of this potential imbalance when assisting tows or being assisted with their own tow.

Masters of modern manoeuvrable workboats can be overconfident of the ability of their vessel and themselves to withstand such forces until it is too late, there are sufficient well documented incidents to show that caution is always required.

Girted tugs have frequently been lost due to not following the basic, well promulgated and seamanlike precaution of ensuring that all appropriate hatches, doors and vents are closed before undertaking a towing manoeuvre, due to the possibility of very quick down-flooding through such openings when the tug starts to heel to larger angles.

If the tug may be put in a position where girting is possible at any stage during the planned towing manoeuvre, all such precautions must be taken.

It should be noted that some workboats are built without the necessary deck fittings required to attach an effective gog, and should therefore never be used in a situation where there is any risk of girting until they are suitably modified.

The necessity for towing over the stern at all should be considered bearing in mind that many tug/workboats can provide useful manoeuvring assistance by being the stern tug with the towing line rigged from the tug's bow with up to 60% of the ahead BP being available with the engines astern, or alternatively by being made fast alongside (hipped up) or indeed close coupled as a pushing/stern tug, all of these providing a safer and perhaps more appropriate alternative.

Trials have shown that the forces applied on a gog can exceed 70% of the BP of the tug, so the strength of the gog and fittings must be commensurate with the forces that may be applied, bearing in mind that parting of the gog or failure of a fitting will have an instantaneous and severe effect on the tug. All parts of the arrangement must therefore be maintained in good condition and regularly inspected. The point of attachment of the gog on the tug must be on the centreline and as close to the after end as possible. The gog may be attached to the towing line by shackle if there is a suitable connection in the towing line in the right location, but if it is attached by having a riding saddle over the tow line this should preferably be in the form of a saddle rather than a shackle bow to prevent bending the tow line round a small radius.

If the gog cannot be heaved in under load, it must be secured hard down at the start of operations and only released once the danger of girting has passed (e.g. when the tow is close to the berth and the speed of the tow is suitably slowed).

Trials and experience have shown that the dangers of girting are high when the speed of the tow approaches 3 knots and above, but that they can occur at lower speeds, particularly with smaller vessels and with the effect of environmental factors such as propeller wash, tidal effects and sea state.

Experience also shows that if a girting situation starts to develop it will do so extremely rapidly so tug masters and crews need to be practised in releasing the tow under load when the tension required to release the tow hook may be much higher than expected, or at least be aware of the extra force that will be required if practice trials have only been done with minimal load on the hook.

Communication between the tug master(s), vessel/tow master and/or pilot must be clear and concise, leaving no room for misunderstandings to develop, bearing in mind that each party sees it from their own perspective and that may be very different from that of others. Before the operation commences all must be clear about the intended sequence of events and must raise any issues of perceived risk or potentially safer ways of operating. Any necessary changes to the plan during the operation must be clearly communicated to all parties and acknowledged as understood.

The most difficult decisions to be taken by the tug master concerning the use of a gog may be the requirement to have it slack so as not to interfere with the necessary manoeuvring ability of the tug, and therefore the ability to properly assist/control the towed vessel, but then to be sure of having it snugged down or of being safely released from towing duties when the towed vessel's speed increases towards 3 knots or more. This can occur, for example, when acting as stern tug in assisting a ship from a berth when the ship is clear of the berth and starts to come ahead and make way with the tug still attached.

In these circumstances, the tug must be able to release from the tow before the ahead speed generated starts to build up, thus putting the tug in danger of girting, or must be able to be gogged hard down if the tug is required to remain attached, for example if the ship is shifting berths within the port.

Clearly if the tug lacks a gog winch it will be very difficult to safely harden it down, and if the tug is using her own towing gear it is not easy to manoeuvre effectively to enable the tow line to be released by the ships' crew.

Another dangerous circumstance arises if the tug is acting as a head tug and the towed vessel starts to overtake it, either because it is a ship and needs to make way for any reason and so applies power,

or when the tow is non-propelled. This can happen either because the tow has built up speed and then does not respond quickly enough to the slowing down or alteration of course of the head tug, or because of another tug is pushing or towing alongside and adding power.

This is especially dangerous when the head tug is on a very short towline: If it is too short to allow the tug to move to the side of the tow, perhaps in the case of a square bowed, wide barge, so that the stern of the tug contacts the tow and gets run over, or with any tow where the towline length is insufficient to allow the tug to make a required alteration of course and/or speed while allowing the space for it to take effect on the tow.

Since the head tug must be able to move from side to side to control the heading of the tow, a gog would increase the dangers to the tug unless slack enough to allow the necessary manoeuvring room.

As always, the tug should avoid trying to make any sharp turn with the tow and keep the towing speed low to avoid dangerous circumstances arising.

There is not always a simple answer to these risks, so they must be clearly understood and allowed for in the planning of the tow between the tug master(s), pilot and master of the towed vessel 15. If a tug is to make fast stern first to a tow under way, the normal safe operational sequence would be as follows:

- When the speed of the tow has been reduced and it is safe to do so, run alongside the stern quarter on the lee side of the tow and come alongside, holding station by maintaining the same speed as the tow and keeping the helm slightly towards the tow;
- Pass up (or take down from the tow if they have a suitable towline) the towline to the stern of the tow, make fast, rig and secure the gog hard down;
- When the towline is fast and the gog rigged, move ahead slowly, remaining alongside the tow, until the towline is under tension;
- When the speed of the tow is sufficiently reduced through the water and the pilot/tow master is ready, start to move slowly away from the tow while maintaining tension on the towline by easing the helm slightly away from the tow;
- The tow will move ahead and the tug will come around in an arc until astern of the tow; and
- Do not slack off the gog until the ahead motion of the tow is sufficiently slow to allow the tug to manoeuvre safely with a slackened gog without risk of girting.

Additional Information on girting can be found in Tug Stability a Practical Guide to Safe Operations by Henk Hensen and Markus van der Laan.

7.5 SPEED WHEN MAKING FAST

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 tug(s) master(s) involved. The recommended maximum safe speed through the water for a centre-lead forward tug is six knots. 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/she should always keep Belfast Harbour VTS appraised of his intentions, requesting advice on shipping as necessary.

When making fast a conventional tug, whether alongside on the hip or stern-to-stern for towing, maintaining a safe and controlled speed is essential for the safety of both vessels and crew. A maximum approach speed of 2knots, ideally just above bare steerage, is recommended. This allows the tug to manoeuvre safely without excessive momentum or strain on equipment.

In stern-to-stern connections —the tug typically approaches the stern of the tow vessel at a shallow angle. Once in position, the towline is passed, and the tug can then peel off and fall astern under control, taking up slack on the towline gradually. Timing and coordination are critical: the tow should maintain a steady heading with minimal way on, and the tug's crew must be fully prepared with the towline rigged and tested for quick deployment.

7.6 UNCONTROLLED RELEASE OF TOWLINE

When releasing the tow, it is important that the tug's messenger is not disconnected from the towline and the ship is at a safe speed. At the bow, the towline should be released in one motion. At the stern, or with the tug alongside, the towline should be slackened gently using the messenger line so that the towline can be recovered back onto the tug's winch safely. Communication, with the pilot advising the tug first and then instructing the master of the ship to order his crew to release in a controlled manner once the tug has confirmed in position, is critical.

8 SAFETY MANAGEMENT

The GtGP recommends that harbour authorities develop systems to ensure continued safe and efficient towage services including the ability to respond to emergencies. BHC expects towage operators to include a reference to managing safety within their respective SMS/ISM, but for the avoidance of doubt the following section gives some basic safety management guidance.

8.1 CONTINGENCY PLANS

Contingency plans could include the following:

- Girting or girding situation;
- Failure or parting of the tow wire;
- Failure of gob wire arrangements;
- Grounding of the tug or tow;
- Loss of hull integrity in either tug or towed vessel;
- Collision or contact with a fixed object or installation;
- Loss of main propulsion power or electrical power;
- Failure of steering and/or other critical control systems;
- Man overboard;
- Bridge, accommodation or engine room fire; and
- Actions to take in the event of unexpected poor weather.

Regular emergency training exercises should be encouraged.

8.2 ACCIDENT, INJURY AND HAZARDOUS INCIDENT REPORTING

An accident is any unforeseen, uncontrolled event which has the potential for injury or loss, whether injury or loss were sustained at the time or not.

In the event of a serious accident, major injury or time critical severe injury contact Belfast Harbour VTS Duty Officer, with urgent request for assistance from the emergency services, who will initiate the necessary action.

Guidelines:

- During initial contact keep report brief and factual;
- Description of incident;
- Whether any injuries;

- Extent of damage;
- Whether assistance is required;
- Allocate a dedicated VHF channel or telephone line to deal with communications;
- Administer first aid, if possible;
- Prepare tug for receiving emergency services (e.g. helicopter evacuation); and
- Maintain a log of events as they happen.

The incident/accident should be recorded on an appropriate incident form.

8.2.1 Incident Reporting

All incidents, accidents and near misses must be reported, however trivial they may seem at the time, not just those that cause injury. These include:

- Reporting of hazards and potential hazards;
- Dangerous occurrences;
- Near misses;
- Accidents to vessels;
- Accidents resulting in personal injury;
- Technical incidents resulting in damage, or potential damage to machinery; and
- Pollution of any kind (oil or garbage).

In addition to the above local reporting requirements, it is a legal requirement for UK "Flag State" vessels to report to the MCA/MAIB) certain incidents and accidents.

In general terms, a "Reportable Accident" means any contingency caused by an event on board a tug or involving a tug when:

- There is loss of life or major injury to any person on board or any person is lost or falls overboard from a tug; and
- A tug is lost, presumed lost; abandoned; materially damaged by fire; explosion, weather or other cause; is in collision; is disabled or causes serious harm to the environment.

Any of the following occur and where, taking into account their circumstances, they might have been liable to cause serious injury or to cause damage to the health of any person, a collapse or bursting of any pressure vessel, pipeline or valve; a collapse or failure of any lifting equipment, access equipment, hatch cover, staging or boatswain's chair or any associated load bearing parts; a contact with loose asbestos fibre except when full protective clothing is worn; or an escape of any harmful substance or agent.

A reportable major injury is any fracture other than to fingers, thumbs or toes; any loss of limb or part of a limb; dislocation of the shoulder, hip knee or spine; loss of sight (whether temporary or permanent); penetrating injury to the eye; or any other injury leading to hypothermia, or requiring resuscitation or admittance to hospital for more than 24 hours.

A reportable serious injury is any injury other than a major injury which results in incapacity for more than 3 working days, excluding the day of injury.

A minor injury is an injury that does not incur lost time and is therefore **not reportable.**

8.2.2 Dispute Resolution Process

This process provides a structured framework for resolving disagreements or concerns regarding incident review process and the sharing of findings with stakeholders.

- Any stakeholder who perceives an issue with the incident review process or the sharing of findings can initiate the dispute resolution process by formally raising their concerns with the port authority.
- Upon receipt of the dispute, the port authority will assess the nature and scope of the concerns raised. They will document the details, including the parties involved along with the issues raised with evidence or documentation.
- If it becomes necessary the port authority will facilitate meetings to have discussions between the parties involved, which will encourage all parties to work towards a mutually accepted resolution.
- If necessary, the port authority may conduct investigation in the dispute through interviews and reviewing evidence/documentation. This gives a comprehensive understanding of the issues at hand.
- Based on the information and discussions held, the port authority may propose a resolution to the dispute. This proposal may include recommendations for addressing the concerns raised and reviewing incident review process or sharing findings with stakeholders.
- The resolution is shared with the parties involved for review and feedback and are invited to provide input, suggest modifications, and raise any further concerns.
- After considering the feedback the port authority will make the final decision on the resolution of the dispute. This decision will be communicated to all parties involved.
- The agreed resolution is implemented, and any necessary follow up actions are addressed.
- The entire dispute resolution process, including the initial concerns raised, the discussions held, and the final resolution reached, is documented for future reference. Lessons learned from the dispute are identified, and recommendations for improving the incident review process or the sharing of findings are incorporated into the MSMS.

By establishing the dispute resolution process within the towage operations manual, stakeholders can effectively address concerns related to the incident review process and stakeholder engagement, which will promote transparency, fairness, and accountability in safety management practices.

8.3 MAINTENANCE OF SAFETY EQUIPMENT

At all times safety equipment is to be maintained to the highest standard. It is ultimately the responsibility of the tug-master to ensure equipment is in date and has been serviced at the appropriate time.

8.4 SAFE SYSTEMS OF WORK

A Safe System of Work is a means of implementing control measures which may be taken to protect those who may be put at risk in some key areas on board ship. Such measures should be based on the findings of the risk assessment.

All components of the work should be examined. Consider the following:

- **People**: - who is involved, competence, information, training, instruction, supervision etc.;
- **Plant and equipment**: - what is used, suitability, design, maintenance, guarding arrangements, isolation and ergonomic factors (matching person to the task);
- **Materials**: - handling (mechanical or manual) and health hazards;
- **Environment**: - lighting, heat, cold, noise, ventilation, wet conditions, welfare facilities etc.; and
- **Place of work**: - condition of floors and decks, access into and egress from, means of emergency escape, working space etc.

Only when all the components of the work have been examined can a safe system be devised. The following controls should be considered in descending order of priority:

- **Eliminate the hazard** - highly unlikely aboard a tug;
- **Reduce the hazard** - Is there a safer alternative (e.g.; less toxic, low voltage, lower noise level etc.);
- **Enclose the hazard** - fit guards, spill trays, insulation etc.;
- **Isolate the hazard from people** - fencing, guard rails, trip switches, isolation locks;
- **Control the extent of the exposure/contact with the hazards** - Reduce the length of time and exposure, rotate persons more frequently, purchase toxic substances in smaller containers etc.; and
- **Personnel Protective Equipment** - Wear PPE to lessen the effect of the injury or accident.

8.5 SAFE MEANS OF ACCESS

It is the tug master's responsibility to ensure a safe "Means of Access" between the tug and jetty or another vessel alongside and wherever possible the following "Means of Access" should be provided:

- A gangway, or portable ladder, securely rigged, and fenced. Gangways should not be inclined more than 30˚ and portable ladders rigged at an angle of between 60˚ and 75˚ from the horizontal;
- A bulwark ladder, or steps, where the gangway rests on top of the bulwarks or rails;
- Adequate lighting, either fixed or portable for the full area occupied by the gangway, both ashore and onboard;
- A lifebuoy fitted with light and safety line should be provided ready for use at the point of access aboard the tug; and
- A safety net rigged to minimise the risk of injury to a person falling from the gangway or ladder.

Consideration should always be given on how to transfer personnel and equipment to the towed vessel or unit during an emergency. Personnel should always wear life-jackets and utilise communication equipment and portable lights during darkness. The safety of personnel is paramount and a transfer should not go ahead if considered too dangerous.

Points to Remember:

- Portable and rope ladders are only to be used for access where no alternative, safe means is available;
- When boarding an unmanned tug, check the "Means of Access" first. Do not assume it is in the same safe condition as when it was last used.

9 TOWAGE AUDITS

Towage audits, as part of the non-mandatory licensing regime (see **Section 3.11**), are intended to determine, by objective evidence, whether safety activities relating to towage operations are evaluated for effectiveness in compliance with this operations manual. The audit should identify if there are deficiencies, and any requirement for action on board the tugs or ashore.

Audits will be led by suitably qualified personnel, authorised by BHC Harbour Master.

The person(s) assigned to conduct the audit shall have received adequate training or be qualified and competent as follows:

- Have pertinent and demonstrated knowledge of Management Systems or Quality Assurance Standards and their applicability in respect of shipping and port regulations, or
- Have received adequate training, or
- Have participated in an audit as a team member under the supervision of a trained and competent person until they are deemed competent.

Prior to the audit, the auditor(s) should meet with the tug master and the following should be discussed:

- Time scale of audit;
- Safety of crew and auditors;
- Limitations due to operational circumstances;
- Agree areas to audit; and
- Previous observations/non-conformances.

The auditor(s) shall assess the activities under review using a copy of the relevant checklist. The auditor will raise non-compliance and corrective action lists for each failure to comply with the requirements of this manual.

If time and conditions permit, areas of audit should be as thorough and complete as possible. However, it is not essential to complete every checklist or every point on a checklist.

If deficiencies are found a non-conformance should be raised. It should not be an auditor's goal to create non-conformances for the sake of proving an audit has been completed. Non-conformances should only be raised when a procedure has not been followed.

On completion of audit, the auditor will:

- Where possible, hold a closing meeting with the Tug Master and other personnel that deemed appropriate. The auditor should present their findings and conclusions. This should include positive elements as well as non-conformances; and
- Prepare an audit report and forward to the respective towage operator responsible person.

The towage operator responsible person should ensure that the audit report and non-conformances are acted upon and respond directly to BHC Harbour Master.

9.1 SAMPLE AUDIT CHECKLIST

AUDITOR GUIDELINES & CHECKLIST
1. All internal audits are to be conducted in using the following checklist for guidance.
2 Wherever possible an audit trail should be followed. Individual procedures and systems of work should not be audited in isolation. Remember you are following the system through from shore to tug and this includes all aspects of general, safety and quality management.
3 There is no need to check all records made available since previous audit. Sample at random and only look further if you find an unacceptable high-level of irregularities.
4 Discuss with tug crew and staff how they "do the job". It is only by doing this that you will be able to establish their understanding and compliance with procedures and Operations Manual.
5 Ensure that you comply with all Safe Systems of Work when conducting audits. For safety reasons, **do not audit a tug without another person in attendance**. This does not have to be an auditor.
6 When writing the audit report, "paint a picture" and describe the condition. To state that a system is "satisfactory" is not sufficient.
7 Hold an informal opening meeting to establish the outline structure of the audit visit.
8 Consider working together when auditing a tug, particularly if time is at a premium.
9 On board tugs, consider carefully the implications, consequences and frequency of use, when recommending "Immediate Corrective Action" required before further operation.
10 When inspecting equipment, wherever possible see it running and check full operation.
11 Unsafe systems of work and potential fire risks are to be given the highest audit priority.
12 Do not let cosmetic appearance, old age or lack of sophistication cloud your judgement. Fit for purpose, properly maintained and recorded are the main priorities.
13 Cleanliness and orderliness are often good indicators both afloat and ashore on how well a system is operating.
14 Hold an informal closing meeting to summarise audit findings and agree corrective action timescales.
15 Corrective actions, with completion timescales are to be listed in the audit report and referenced to the applicable system procedure.

Annex A Belfast Harbour Towage Information

INTRODUCTION

This booklet has been produced to provide a source of information on tugs and towage procedures for Masters of vessels using Belfast Harbour. It should be read, as appropriate, in conjunction with the Port's Minimum Towage Guidelines which state minimum towage requirements for each berth within the port for various vessel sizes and types and the General Directions for Navigation within the port.

Towage within Belfast Harbour is provided commercially by 4 independent operators. Belfast Harbour does not provide towage. Whilst stipulating minimum towage requirements and regulating movements within the port through the Vessel Traffic Service (VTS), under normal circumstances Belfast Harbour are not involved with the contracting of towage services.

Within Belfast Harbour a Towage Committee has been established. This consists of representatives from: each of the towage companies, Belfast Lough Pilotage Services, PEC holders and Belfast Shipping Agents Association. The drafting of this document has been undertaken with the involvement of the committee.

MINIMUM TOWAGE REQUIREMENTS

Belfast Harbour has published a document entitled Minimum Towage Requirements which is available for download at: BHC-MINIMUM-TOWAGE-REQUIREMENTS-2024-rev-2.pdf

These Towage Requirements state the minimum towage for each berth, broken down into categories consisting of ship's length, vessel orientation and whether or not they are fitted with a bow thruster. It should be noted that these are minimum requirements and in no way, prevent the Master of a vessel or the Port Authorities from increasing the number or size of tugs as they see necessary. Where the requirements state 'individually risk assessed'; the Harbour Master, in consultation with the ship's Pilot and Master as appropriate, will decide upon the necessary towage.

TOWAGE CERTIFICATES

Provided certain conditions are met; vessels which call regularly to the port may be exempted from some or all of the minimum requirements. Such exemptions are subject to a procedure contained within the Port's Marine Safety Management System and, if successful, will result in the vessel being issued with a Towage Certificate. This certificate is valid for wind strengths below 20 knots only, above 20 knots Minimum Towage Requirements apply. Possession of a Towage Certificate does not prevent the Master of the vessel from using tug(s) should it be deemed necessary.

PROCEDURE FOR OBTAINING TOWAGE SERVICES

Towage within Belfast Harbour is arranged through the local Shipping Agents.

All of the towage operators operating within the port can provide tug assistance at two hours' notice. Therefore, the Master should request any tugs he requires through his Agent taking this notice period into consideration.

Direct contact details for the Towage Operators are provided in Annex I of this booklet.

In exceptional circumstances, should Port Control be asked to contact tugs on behalf of the Master, the exact towage provider, type size and number of tugs should be clearly stated.

In cases of emergency, that is when the Master or Pilot of a vessel deem that towage is required to safely execute a transit or manoeuvre that has already commenced, the Port Controller is authorised to allocate any towage resources immediately available to go to the assistance of that vessel.

Nothing in this procedure prevents the Duty Harbour Master from allocating towage to any vessel as he considers appropriate.

Except in cases of emergency or otherwise as directed by the Duty Harbour Master, an inbound vessel requiring a tug for arrival will not be permitted to pass the Fairway Buoy until the tug has confirmed it is ready to be mobilised.

TUG TYPES AVAILABLE WITHIN THE PORT

There are currently 3 tugs permanently based within the port, these fall into two established categories:

- Omni-directional tugs (x 2); and
- Conventional tugs (x 1).

1. **Omni-directional tugs**:

Omni-directional tugs are tugs fitted with omni-directional propulsion units, either vertical Voith Schneider propulsion units or Azimuth Propellers.

Such units can deliver thrust in any horizontal direction, hence the term `omni-directional'.

The propulsion units (two; side by side) can be situated:

a. under the bow, as is the case with Voith Schneider tugs and can be the case with azimuth propellers; such tugs are called tractor tugs; and

b. under the stern, as is the case with azimuth propellers; such tugs are called ASD-tugs (azimuth stern drive tugs).

2. **Conventional Tugs**

Single screw, twin screw or triple screw tugs, all called conventional tugs, are less manoeuvrable compared to tugs with omni-directional propulsion units.

Manoeuvrability of conventional tugs can be upgraded by installing specific rudder systems and/or bow thrusters. Another alternative is the use of steerable nozzles, which also increase manoeuvrability.

Details of each individual tug in the Port, including a description of their propulsion systems are provided in Annex II to this booklet.

Note that for purposes of the Belfast Harbour Minimum Towage Requirements, the Tugs are classified by bollard pull strength rather than propulsion type:

- Intermediate Tugs are tugs with a bollard pull of less than 20 tonnes; and
- Large Tugs are tugs with omni-directional propulsion systems and a bollard pull greater than 20 tonnes.

METHODS OF TUG USAGE

Belfast Harbour Minimum Towage Guidelines specify the minimum number and bollard pull of tugs. Currently, the tugs within the port with bollard pull less than 25 Tonnes are twin screw tugs and those with bollard pull over 25 Tonnes are omni-directional tugs.

Escorting:

Active Escorting or indirect towing – (when the tug is dragged through the water by the tow line during transit) is not currently undertaken within the Port.

Passive Escorting, whereby a tug shadows the progress of a ship during the transit, is undertaken at Master's/Pilot's discretion.

Push/Pull

The push-pull operation means that the tug is connected to the assisted vessel by a short line and remains in close proximity to the vessel.

This enables the tug to push on the vessel, but then check/control the vessel by pulling-back on the short line.

Should only pushing be required, a tow line may not be necessary.

Due to the limited power of conventional tugs when running their propellers astern, their ability to pull-back on the line will be limited. As a rule of thumb, the maximum astern bollard pull of conventional tugs is approximately 65% of the ahead bollard pull.

When in Push/Pull use, ASD and conventional tugs will normally be bow-to, whilst tractor tugs will normally be stern to the vessel.

On the line

On the line towing (also referred to as the European method as this is the traditional method of tug assistance in European ports) involves the towline being connected to the tug by a towing hook or towing winch. The location of the towing point will vary between tug types: conventional, ASD or Tractor.

When made fast to a vessel's bow:

The effectiveness of tugs towing on a line will decrease with increasing headway. This is because, as headway increases, more of the tugs power is used in maintaining its position relative to the vessel, as opposed to being applied as an assisting force through the towline.

When configured in a stern-to-stern tow:

The following safety matters should be taken into account by the ship:

- Speed of the ship should be kept low, preferably 2 knots and never over 3 knots; with an agreed understanding during pilot and tug master exchange.
- Ship's propeller use to be limited to Dead Slow Ahead/Dead Slow Astern; should more engine power be needed this should be done in consultation with the Tug's Master;
- Similarly, ship's rudder use should be such that it does not cause any problem for the tug;
- When approaching the berth the ship's speed is to be lowered to approximately 1 knot in good time to enable the tug to reposition/drop gob rope to assist in mooring; and
- Beware that tug may need to release tow line at short notice should a risk of girting arise*.

***There are dangers associated with towing on the line; namely risk of girting and capsizing. Girting happens when the towline comes at right-angles to the tug. The tug is pulled bodily sideways through the water by its tow, which can lead to deck-edge immersion, flooding and capsize - unless the towline is released in good time. As a safety measure, all conventional tugs operating within Belfast Harbour are equipped with gob rope systems and on load release hooks. A gob rope system (or similar system) keeps the tow line low and fixed to the after end of the tug and, when operating stern to stern, can prevent the tug veering off course and presenting a dangerous aspect to the direction of travel. The location of the towing point on ASD tugs (when operating over the bow) and Tractor Tugs significantly reduces the risk of girting**.

TOWAGE OTHER THAN HARBOUR TOWAGE

The Master of a vessel engaged in towing or pushing, other than those engaged in harbour towage operations, shall give a minimum of 60 minutes notice to Port Control and shall specify the details of the tow.

Dead ship tows require the authorisation of the Harbour Master and are to be conducted in hours of daylight.

Vessels engaged in towing/pushing may only tow/push one other vessel/object at a time.

Tugs and tows will be subject to the Harbour's Pilotage Directions.

PREFERRED VHF ETIQUETTE WHEN WORKING WITH TUGS

Establishing Communications:

Bridge to Bridge Communication between the vessel being assisted and the tugs should primarily be established on the port operations frequency, VHF Channel 12. Thereafter a working channel should be selected by the Pilot/Master of the vessel being assisted for all subsequent tug and berthing communications – Usually VHF Ch. 8, 10 or 14.

On changing to the working channel, all vessels should radio check with the Pilot/Master.

Prior to the berthing manoeuvre, the plan pertaining to each tug should be passed by the Master/Pilot. This will include:

- The position of the tug relative to the vessel;
- If lines are to be used and whether they will be tugs lines or ships lines (Note: tugs in Belfast normally use tugs lines);
- Method of use, e.g. On the line, push/pull, escorting; and
- Berthing instructions and whether the vessel will swing prior to berthing.

Tug Position

Throughout the manoeuvre the Master/Pilot should endeavour to keep the Tug's Master fully updated, with particular reference given to the desired position of the tug relative to the vessel. It should be borne in mind that it will take time for a tug to reposition during the operation, for example:

- From pushing to pulling (and vice versa); and
- Pulling on stbd bow to pulling on port bow, etc.

This will mean the ship's Master/Pilot needs to anticipate the next required tug movement and communicate this to the tug in order to allow the Tug Master time to reposition:

- If working on the line, the tug may need time to change sides of the vessel or to change direction of thrust in the case of conventional tugs; and
- If working in push/pull mode, the tug will need advance warning to either be "out on the line" ready to take the weight, or to "come in ready to push".

Tug Pushing/Pulling instructions

In order to avoid possible confusion between differing bollard pull strengths of varying tugs, any instructions to tugs should state force in tonnes.

Examples of preferred VHF instructions between vessel and tug	
Master/Pilot	**Surrey, stand by to pull on stbd quarter**
Tug	**Surrey ready to pull on stbd quarter**
Master/Pilot	**Surrey, 15 tonnes pull on stbd quarter**
Tug	When power is on **Surrey pulling 15 tonnes**
Master/Pilot	**Surrey, increase to 20 tonnes pull**
Tug	**Increase to 20 tonnes** When power has been increased **Surrey pulling 20 tonnes**
Master/Pilot	**Surrey, ease to 10 tonnes… Pull 10 tonnes on stbd beam**
Tug	When in new position and at new power setting **Surrey pulling 10 tonnes on stbd beam**
Master/Pilot	**Surrey, stop**
Tug	When power is off **Surrey all stopped**

Note:

The tug master will keep that power setting and position relative to the ship until instructed to do otherwise by the Master/Pilot.

Instructions with PORT or STARBOARD in them refer to the port or starboard side of the vessel being towed.

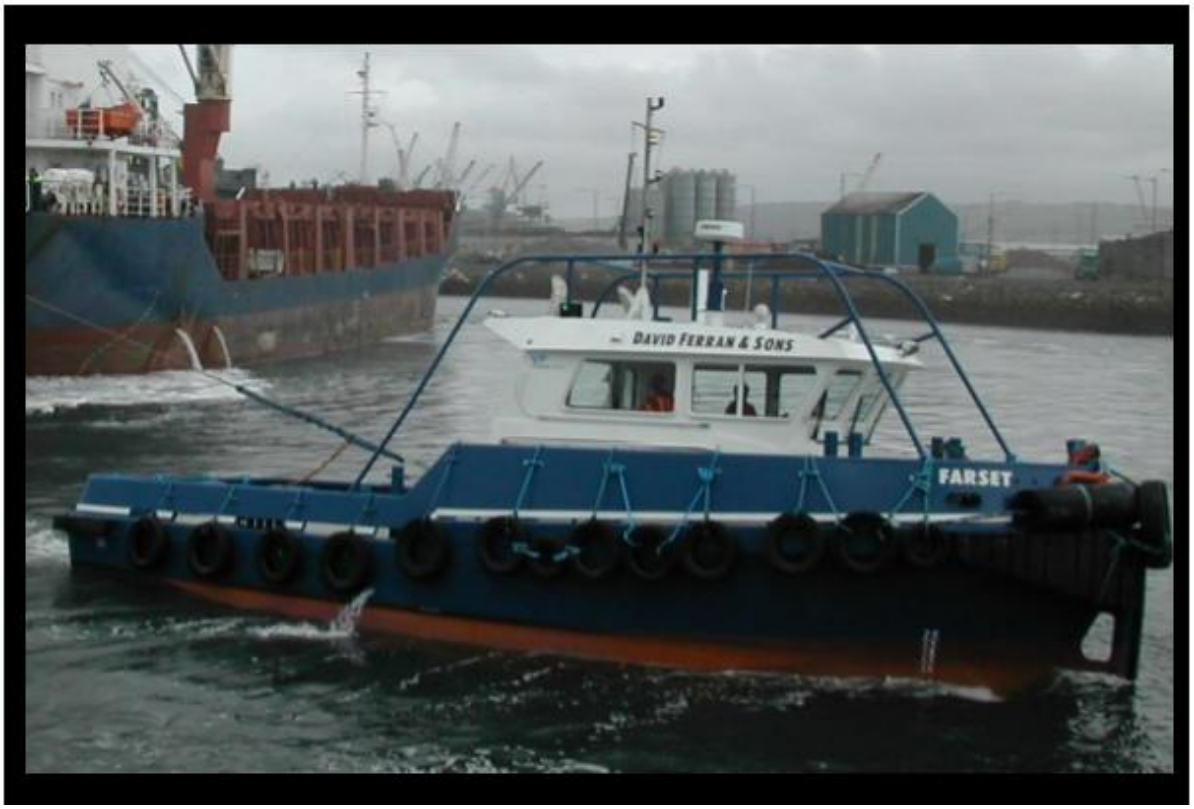
Contact details for towage operators within the port:

Towage Provider	Contact Details
Boluda SMS Towage	Gotto Wharf 1 Herdman Channel Road Belfast BT3 9LG ops.ho.sms@boluda.eu. 01482 350999 Out of hours will divert to on call ops team.
David Ferran & Sons	Ferran Port Services LTD Ferran Marine Services LTD Gotto Wharf 1 1 Herdman Channel Road Belfast Harbour Belfast BT3 9LG justin@davidferran.co.uk administrator@davidferran.co.uk 02890 351 411 (Dock Office, 24 hrs)

VESSEL IDENTIFICATION	
Vessel's Name:	**Masterman**
Operator:	**SMS Towage**
Callsign:	**2GXM9**

PERFORMANCE	
Maximum Speed:	**13 knots**
Bollard Pull:	**45 Tonnes**
Engines:	**2 x Caterpillar Type 3512 B. 3200BHP**
Propulsion Type:	**2 x Rolls Royce Azimuth Stern Drive (ASD)**
TOWING EQUIPMENT	
Fwd:	**Single Drum Towing Winch – 25m/Min. Brake 100T Hold**
Aft:	**Single Drum 750m x 40mm Wire**
VESSEL DIMENSIONS	
L.O.A.:	**24.39m**
Beam:	**9.15m**
Draught:	**4.4m**
GT:	**144.26**
CERTIFICATION	
MCA:	**Workboat Cat 2**
Class:	**Germanisher Lloyd 100 A5**

VESSEL IDENTIFICATION	
Vessel's Name:	**Merchantman**
Operator:	SMS Towage
Callsign:	2IVH2
PERFORMANCE	
Maximum Speed:	13 knots
Bollard Pull:	50 Tonnes
Engines:	2 x Caterpillar Type 3512B. 3200BHP
Propulsion Type:	2 x Rolls Royce Azimuth Stern Drive (ASD)
TOWING EQUIPMENT	
Fwd:	Single Drum Towing Winch – 25m /Min. Brake 100T hold
Aft:	Mampaey Towing Hook – Cert 50T
VESSEL DIMENSIONS	
L.O.A.:	24.39m
Beam:	9.15m
Draught:	4.4m
GT:	144.57
CERTIFICATION	
MCA:	Workboat Cat 2
Class:	Lloyds Register



VESSEL IDENTIFICATION		
Vessel's Name:	**Farset of Belfast**	DAVID FERRAN & SONS
Operator:	David Ferran & Sons	
Callsign:	MAKF8	
PERFORMANCE		
Maximum Speed:	12 knots	
Bollard Pull:	14.8 Tonnes	
Engines:	2 x Volvo Penta TAMD D12-550 – 408kW (550bhp) @ 1900rpm.	
Propulsion Type:	Twin screw, fixed pitch in Kort nozzles.	
TOWING EQUIPMENT		
Fwd:	-	
Aft:	Swivel hook, quick release. Remotely controlled gob rope winch.	
VESSEL DIMENSIONS		
L.O.A.:	15.43m	
Beam:	5.45m	
Draught:	1.7m half load condition	
GT:	N/A (Displacement 55 tonnes half load condition.)	
CERTIFICATION		
MCA:	Workboat Cat 3 (20 miles from safe haven), Pilot Boat endorsement	
Class:	-	

Annex B Belfast Harbour Minimum Towage Requirements

MINIMUM TOWAGE REQUIREMENTS

Mariners are advised that as of 0001 on the 1st October 2024 the following minimum towage requirements will be in operation within Belfast Harbour and constitute an update to Belfast Harbours Marine Safety Management System. These requirements have been produced by Belfast Harbour (The Port Authority) after a thorough process which included several consultations and workshops with the engagement of stakeholders including BLPS Ltd and all Towage operators within Belfast Harbour.

These towage requirements are effective for average wind speeds up to 20 knots. For average wind speeds in excess of 20 knots, the Towage Requirements will be assessed by the Ships Master and Pilot and confirmed with the Harbour Master or their Deputy.
It is assumed that all vessels have a bow thruster, and all manoeuvring equipment is operational and effective.

Where this equipment is inadequate or defective then the towage requirement will be as given for in the next higher requirement row in the matrix unless otherwise agreed between Master, Pilot, HM or their Deputy.

These Harbour Minimum Towage Requirements are intended to be dynamic and adaptable, subject to periodic review and updates to reflect advancements in technology, changes in operational practices, and lessons learned from incidents or near misses locally, nationally or internationally.

By adhering to these requirements and the guidance provided in Belfast Harbour Towage Operations manual we aim to promote a culture of safety, professionalism, and efficiency among all stakeholders involved in towing operations within our harbour.

Thank you for your commitment to safety and compliance, together, we can uphold the highest standards of maritime safety and ensure the safe and efficient movement of vessels in and out of Belfast Harbour.

Musgrave Channel – MSW, OB1, OB2 and OB3

ARRIVALS						
Channel/Berth	LOA	DWT	BOW THRUSTER	DEFECT	ORIENTATION	TOWAGE
MUSGRAVE						
OB1	<115	<7999	Y	N	N OR S	None. If no B/T or defect, then 1 tug >12t.
OB2	<115	≥7999	Y	N	N OR S	1 tug >20t * If no B/T 1 tug >40t
OB3	115-130	<12000	Y	N	N OR S	1 tug >20t * If no B/T 1 tug >40t
MSW	130-150	≥12000	Y	N	N OR S	1 tug >40t * If no B/T 2 tugs >40t
	*Bitumen & LPG cargoes will be individually risk assessed.					
ALL SHIFTS REQUIRE THE SAME TOWAGE AS ARR/DEP WHICHEVER IS GREATER						

DEPARTURES						
Channel/Berth	LOA	DWT	BOW THRUSTER	DEFECT	ORIENTATION	TOWAGE
MUSGRAVE						
OB1	<115	<7999	Y	N	N OR S	None. If no B/T or defect, then 1 tug >12t.
OB2	<115	≥7999	Y	N	N OR S	1 tug >20t * If no B/T 1 tug >40t
OB3	115-130	<12000	Y	N	N OR S	1 tug >20t * If no B/T 1 tug >40t
MSW	130-150	≥12000	Y	N	N OR S	1 tug >40t * If no B/T 2 tugs >40t
	*Bitumen & LPG cargoes will be individually risk assessed.					
ALL SHIFTS REQUIRE THE SAME TOWAGE AS ARR/DEP WHICHEVER IS GREATER						

BERTH	MAX LOA	MAX DRAFT
OB1, OB2, OB3,	150m	8.5m
MSW	150m	8.3m

Victoria Channel West, South Quays – OB4, (D1 and D3 – as per Stormont)

ARRIVALS						
Channel/Berth	LOA	DWT	BOW THRUSTER	DEFECT	ORIENTATION	TOWAGE
Victoria Channel West						
OB4	<120	<7999	Y	N	N OR S	None. If no B/T or defect, then 1 tug >12t.
	<120	≥7999	Y	N	N OR S	1 tug >20t. If no B/T 1 tug >40t
	120-140	<9999	Y	N	N OR S	1 tug >20t. If no B/T 1 tug >40t
	120-140	≥9999	Y	N	S	1 tug >20t. If no B/T 1 tug >40t
	120-140	≥9999	Y	N	N	1 tug >40t. If no B/T 2 tugs >40t
	140-160	≥9999	Y	N	N OR S	1 tug >40t. If no B/T 2 tugs >40t
	160-190	N/A	Y	N	N OR S	2 tugs >40t
	OB4 VESSELS >190 INDIVIDUALLY RA.					
D1 & D3	D1 & D3 – CARGO VESSELS AS PER STORMONT WHARF					
PROJECT VESSELS/ACTIVITIES WILL BE SUBJECT TO INDIVIDUALLY RA AND SIMULATION IF REQUIRED.						
ALL SHIFTS TO THESE QUAYS ARE REQUIRED TO TAKE THE ARRIVAL TOWAGE OR THE DEPARTURE BERTH TOWAGE, WHICHEVER THE GREATER.						

DEPARTURES						
Channel/Berth	LOA	DWT	BOW THRUSTER	DEFECT	ORIENTATION	TOWAGE
Victoria Channel West						
OB4	<120	N/A	Y	N	N OR S	None. If no B/T or defect, then 1 tug >12t.
	120-140	<9999	Y	N	N	None. If no B/T 1 tug >20t
	120-140	<9999	Y	N	S	1 tug >20t. If no B/T 1 tug >40t
	120-160	≥9999	Y	N	N	1 tug >20t. If no B/T 1 tug >40t
	120-160	≥9999	Y	N	S	1 tug >40t. If no B/T 2 tugs >40t
	160-190	N/A	Y	N	N OR S	2 tugs >40t
	OB4 DEPARTURE VESSELS >190 AS PER INDIVIDUALLY RA.					
D1 & D3	D1 & D3 – CARGO VESSELS AS PER STORMONT WHARF					

PROJECT VESSELS/ACTIVITIES WILL BE SUBJECT TO INDIVIDUALLY RA AND SIMULATION IF REQUIRED.
ALL SHIFTS TO THESE QUAYS ARE REQUIRED TO TAKE THE ARRIVAL TOWAGE OR THE DEPARTURE BERTH TOWAGE, WHICHEVER THE GREATER.

BERTH	MAX LOA	MAX DRAFT
OB4	200m	10.5m
D1	360m	10.2m
D3	TBC	TBC

Victoria Channel West, North Quays – VT1, VT2, VT3 & VT4

ARRIVALS						
Channel/Berth	LOA	WINDAGE * (LSA)	BOW THRUSTER	DEFECT	ORIENTATION	TOWAGE
Victoria Channel West						
VT3	<140	<2500	Y	N	N OR S	None. If no B/T or defect, then 1 tug >12t
VT3N	140-180	>4000	Y	N	S	1 tug >40t. If no B/T 2 tugs >40t
VT3S	140-180	>4000	Y	N	N	VT3N 1 tug >40t. If no B/T 2 tugs >40t VT3S 1 tug >40t if VT2 not occupied. If no B/T 2 tugs >40t VT3S 2 tugs >40t if VT2 occupied.
	ALL VESSELS > 180M WILL BE INDIVIDUALLY RISK ASSESSED.					
	SHIFTS > 50M ON VT3 WILL REQUIRE THE ARRIVAL TOWAGE.					
VT1, VT2, VT4, AQR	RORO VESSEL OPERATIONS ARE SUBJECT TO TOWAGE AS AGREED BETWEEN THE VESSELS SENIOR MASTER AND THE HARBOUR MASTER.					

DEPARTURE						
Channel/Berth	LOA	WINDAGE* (LSA)	BOW THRUSTER	DEFECT	ORIENTATION	TOWAGE
Victoria Channel West						
VT3	<140	<2500	Y	N	N OR S	None. If no B/T or defect, then 1 tug >12t
VT3N	140-180	>4000	Y	N	N	1 tug >40t. If no B/T 2 tugs >40t
VT3S	140-180	>4000	Y	N	S	VT3N 1 tug >40t. If no B/T 2 tugs >40t

						VT3S 1 tug >40t if VT2 not occupied. If no B/T 2 tugs >40t VT3S 2 tugs >40t if VT2 occupied.
	ALL VESSELS > 180M WILL BE INDIVIDUALLY RISK ASSESSED.					
	SHIFTS > 50M ON VT3 WILL REQUIRE THE ARRIVAL TOWAGE.					
VT1, VT2, VT4, AQR	RORO VESSEL OPERATIONS ARE SUBJECT TO TOWAGE AS AGREED BETWEEN THE VESSELS SENIOR MASTER AND THE HARBOUR MASTER.					

*Windage has been calculated by determining lateral surface area using LOA and the vessels Height, once LSA determined the bollard pull is considered using the LSA and the wind speed of 20kts.

BERTH	MAX LOA	MAX DRAFT
VT3	240m	8.8m

Herdman Channel – HWN, HWS, GOTTO, SINCLAIR, POLLOCK, RW

ARRIVALS						
Channel/Berth	LOA	DWT	BOW THRUSTER	DEFECT	ORIENTATION	TOWAGE
Herdman Channel						
HW	<100	-	-	-	-	No towage.
GW	<120	<7999	Y	N	N OR S	None. If no B/T or defect, then 1 tug >12t.
SW	<120	≥7999	Y	N	N OR S	1 tug >20t. If no B/T 1 tug >40t
PD RW	120-140	<9999 / ≥9999	Y	N	N OR S	1 tug >20T. If no B/T 1 tug >40t / 1 tug >40T. If no B/T 2 tugs >40t
	140-160	≥9999	Y	N	N OR S	1 tug >40T. If no B/T 2 tugs >40t
	160-185	N/A	N/A	N/A	N OR S	2 tugs >40T. *Additional assisting tug >20t for vessels 160-185m if berthing PD in offshore wind
	PROJECT VESSELS/ACTIVITIES WILL BE SUBJECT TO INDIVIDUALLY RA AND SIMULATION IF REQUIRED.					

DEPARTURE						
Channel/Berth	LOA	DWT	BOW THRUSTER	DEFECT	ORIENTATION	TOWAGE
Herdman Channel						
HW GW SW PD RW	<100	-	-	-	-	No towage.
	<120	<7999	Y	N	N OR S	None. If no B/T or defect, then 1 tug >12t.
	<120	≥7999	Y	N	N	None. If no B/T or defect, then 1 tug >12t.
	<120	≥7999	Y	N	S	1 tug >20t. If no B/T 1 tug >40t
	120-140	<9999	Y	N	N	None. If no B/T or defect, then 1 tug >12t.
	120-140	≥9999	Y	N	N	1 Tug >20T. If no B/T or defect, then 1 tug >40t.
	120-140	<9999 / ≥9999	Y	N	S	1 TUG >20T. If no B/T 1 tug >40t / 1 TUG >40T. If no B/T 2 tugs >40t
	140-160	≥9999	Y	N	N OR S	1 TUG >40T. If no B/T 2 tugs >40t
	160-185	N/A	N/A	N/A	N OR S	2 TUGS >40T.
	PROJECT VESSELS/ACTIVITIES WILL BE SUBJECT TO INDIVIDUALLY RA AND SIMULATION IF REQUIRED.					

BERTH	MAX LOA	MAX DRAFT
HWN/HWS	140m	7.9m / 7.6m
GW	200m	8.5m
SW	200m	8.5m
PD	185m (200m cruise)	8.5m
RW (Restricted Operations)	130m	7.9m

Stormont & SRQ

ARRIVALS						
Channel/Berth	LOA	DWT	BOW THRUSTER	DEFECT	ORIENTATION	TOWAGE
Stormont Wharf & SRQ						
WTS STN	<100	-	-	-	-	No towage.
	<120	<7999	Y	N	N OR S	None. If no B/T or defect, then 1 tug >12t for vessels >100m.
	<120	≥7999	Y	N	N OR S	1 tug >20t. If no B/T 1 tug >40t

ST2,3,4,5 SRQ	120-140	<9999	Y	N	N OR S	1 tug >20T. If no B/T 1 tug >40t
	120-140	≥9999	Y	N	N OR S	1 tug >40T. If no B/T 2 tugs >40t
	140-160	≥9999	Y	N	N OR S	1 tug >40T. If no B/T 2 tugs >40t
	160-240	N/A	N/A	N/A	N OR S	2 tugs >40T.
	PROJECT VESSELS/ACTIVITIES WILL BE SUBJECT TO INDIVIDUALLY RA AND SIMULATION IF REQUIRED.					
	ALL VESSELS > 240M WILL BE INDIVIDUALLY RISK ASSESSED.					

DEPARTURES						
Channel/Berth	LOA	DWT	BOW THRUSTER	DEFECT	ORIENTATION	TOWAGE
Stormont Wharf & SRQ						
WTS	<100	-	-	-	-	No towage.
STN	<120	<7999	Y	N	N OR S	None. If no B/T or defect, then 1 tug >12t for vessels >100m.
ST2,3,4,5 SRQ	<120	≥7999	Y	N	N	None. If no B/T or defect, then 1 tug >12t for vessels >100m.
	<120	≥7999	Y	N	S	1 tug >20t. If no B/T 1 tug >40t
	120-140	<9999	Y	N	N	None. If no B/T or defect, then 1 tug >12t.
	120-140	<9999	Y	N	S	1 tug >20T. If no B/T 1 tug >40t
	120-140	≥9999	Y	N	N	1 tug >20T. If no B/T or defect, then 1 tug >40t.
	120-140	≥9999	Y	N	S	1 tug>40T. If no B/T 2 tugs >40t
	140-160	≥9999	Y	N	N OR S	1 tug >40T. If no B/T 2 tugs >40t
	160-240	N/A	N/A	N/A	N OR S	2 tugs >40T.
	PROJECT VESSELS/ACTIVITIES WILL BE SUBJECT TO INDIVIDUALLY RA AND SIMULATION IF REQUIRED.					
	ALL VESSELS > 240M WILL BE INDIVIDUALLY RISK ASSESSED.					
	LOADED DEPARTURES 10.2m OR DEEPER WILL REQUIRE TO BE INDIVIDUALLY RISK ASSESSED.					

BERTH	MAX LOA	MAX DRAFT
Stormont	240m	10.2m
Stormont Extension	240m	11.0m
SRQ	300m	8.6m

York and Barnett Docks

ARRIVALS						
Channel/Berth	**LOA**	**DWT**	**BOW THRUSTER**	**DEFECT**	**ORIENTATION**	**TOWAGE**
BD **YD**	**≤115**	**N/A**	**Y**	**N**	**N OR S**	**None. If no B/T or defect, then individually risk assessed.**
VESSELS > 115m OR IF ≥7999 DWT TOWAGE TO BE INDIVIDUALLY RISK ASSESSED						

DEPARTURE						
Channel/Berth	**LOA**	**DWT**	**BOW THRUSTER**	**DEFECT**	**ORIENTATION**	**TOWAGE**
BD **YD**	**≤115**	**N/A**	**Y**	**N**	**N OR S**	**None. If no B/T or defect, then individually risk assessed.**
VESSELS > 115m OR IF ≥7999 DWT TOWAGE TO BE INDIVIDUALLY RISK ASSESSED						

BERTH	MAX LOA	MAX DRAFT
BD	**Normally 115m / >115m to be agreed with HM**	**8.5m**
YD	**Normally 115m / >115m to be agreed with HM**	**7.3m**

Belfast Building Dock / Belfast Drydock

Building Dock Gate	As per H&W SOP for building dock gate movements
Building Dock	Individually Risk Assessed and where necessary subject to simulation
Drydock	Individually Risk Assessed and where necessary subject to simulation

BERTH	MAX LOA	Sill Height
BBD	**Individually Assessed.**	**4.9m**
BDD	**Individually Assessed.**	**8.1m**

Towage Providers in Belfast Harbour

BHC requires Towage Service Operators operating in the Port of Belfast to comply with the following minimum standards:

Crew Training:
Crew must be suitably qualified and able to demonstrate the competencies necessary to achieve the towage acts defined within these Towage Requirements. Evidence of training must be available and provided to BHC Harbour Master on request.

Tugs with a Bollard Pull <25 Tonnes will:
• Be equipped with twin screw propulsion or meet the requirement of a tug more than 25 tons.
• Provide appropriate and recent certification of bollard pull capability.
• Be equipped with a swivel hook with remote release or suitable winch and equipped with running gog winch arrangement; and
• Be inspected annually to the MCA code of Practice for The Safety of Small Work Boats and Pilot Boats for operation in Category 3 Waters and have no outstanding findings to such code other than those waived by BHC Harbour Master as unnecessary to operations within Belfast Harbour

Tugs with a Bollard Pull >40 Tonnes will:
• Be omni-directional and demonstrate the manoeuvring capability necessary to achieve the towage acts defined within these Towage Requirements;
• Provide appropriate and recent certification of bollard pull capability;
• Be equipped with a swivel hook with remote release;
• Be equipped with a suitable winch; and
• Hold valid Certification to the UK Ship Classification or other International Standard to operate as a Tug not engaged in Long International Voyages and have no outstanding findings to such certification other than those waived by BHC Harbour Master as unnecessary to operations within Belfast Harbour.

Towage Exemption Certificates

Under certain circumstances, vessels which call regularly to the port may be exempted from the minimum requirements. Such exemptions are subject to a procedure contained within the Port's Marine Safety Management System, and if successful will result in the vessel being issued with a Towage Exemption Certificate. Certificates are valid for wind strengths below 20 knots only. Possession of a Towage Exemption Certificate does not prevent the Master or Pilot of the vessel from using tug(s) should they deem necessary.

Shifting & Notes

Different berths not on same wharf.

The same towage requirements will apply for vessels being shifted between different berths not on same wharf within the Port, as per departure/arrival whichever is the greater.

Shifting on same wharf.

1. Vessels which do not require towage for either arrival or departure as per BHC Minimum Towage Requirements will not normally require tug assistance for shifting.
2. Any vessel requiring 1 tug >40 tonnes bollard pull as per BHC Minimum Towage Requirements will normally require 1 tug >20 tonnes when shifting distances in excess of a ships length.
3. Any vessel requiring more than 1 tug >40 tonnes bollard pull as per BHC Minimum Towage Requirements will normally require 1 tug >40 tonnes when shifting distances in excess of 50m. (With prior agreement of the Harbour Master 2 tugs each being ≥ than 20 tonnes but with a combined bollard pull of ≥40 tonnes may replace 1 tug of not less than 40 tonnes Bollard Pull)
4. Linesmen are required for ships covered by points 1 and 2 when shifting more than a ships length. Vessels covered by point 3 are required to have linesmen for shifts in excess of 50m. Ship's crew must wear appropriate PPE for this operation including a Lifejacket

When towage is required for shifting then a pilot must be assigned to that vessel unless the Master or other attending Deck Officer holds a suitably endorsed PEC.

The Master of a vessel retains the right to ask for towage in excess of this requirement.

Cruise vessels and other marine projects will be individually risk assessed, for further details please refer to Belfast Harbour's towage operation manual.

The Harbour Master has the right to override these towage requirements at any time.

Annex C Ship Towage & Master/Crew Licence Application Forms

PART A: SHIP TOWAGE APPLICATION & LICENCE

POLICY
Whilst the issue of this license, by Belfast Harbour Commissioners, is not mandatory, vessels engaged in towage within Belfast Harbour are strongly recommended to apply for this licence.
Any vessel intending to engage in Ship Towage operations within Belfast harbour shall be in possession of:
A current Certificate of Registry……
A valid Load Line Certificate or Certificate of Class……
A valid Safety Equipment Certificate or Record of Inspection……
A valid Statutory Certificate of Coding for a vessel under 24m……

TUG DETAILS		
Name of tug		
Year of build		
Tug Classification		
Vessel Number		
Owner Details		
LOA:		**Beam:**
Maximum Draught		**Tonnage:**

BOLLARD PULL (Maximum continuous bollard pull over 10 min period)	
Date of Certificate:	
Max Cont. Pull Ahead:	
Max Cont. Pull Astern:	
Copies of Certificates Attached	**Yes**……**No**……

TOW-LINES	Use	Type	Diameter-Length-MBL	Date Commissioned	No. of Tows
Winch No 1					
Main Line					
1st Pennant					
2nd Pennant					
Winch No 2					
Main Line					
1st Pennant					
2nd Pennant					
Winch No 3					
Main Line					
1st Pennant					
2nd Pennant					
TOWING SYSTEM - Type Hook/Bitts/ Gob Line condition					
TOWING HOOKS – Type and condition					
WINCHES – Type and Condition (Single, Split or Twin)					
GOB EYES/ROPES					

Closest First Aid Point to Towing Equipment:
Location of Secondary Emergency Towing Release:

QUICKRELEASE SYSTEMS: Suitability of Bridge System Control to Master for Release:			
	Local	Remote	Secondary
Winch No 1			
Loaded Condition			
Winch No 2			
Loaded Condition			
Winch No 3			
Loaded Condition			
Comments:			

The above vessel has been inspected and deemed to meet the requirements for the issue of a Ship Towage Licence
The above vessel has been inspected and ***failed*** to meet the full requirements for the issue of a Ship Towage Licence.
BHC Inspection Officer: Date:

PART B: MASTER & CREW TOWAGE LICENCE CERTIFICATION

Vessel:	**Owner:**
Name of crew members:	
Master:	**Mate:**
Engineer:	**Seaman:**
Master and crew experience and in-house training.	
Master and crew certification.	
Master's knowledge of relevant directions, bye laws, contingency plans and guidelines (if any).	
Master's knowledge of generic or own passage plans.	
Master's knowledge of tug stability, girting and vessel interaction.	
Master's knowledge of Company SMS.	
Master's awareness of watertight integrity issues when towing.	
Ability of the tug and crew to respond to emergency situations.	
Crew's general safety culture, tool box talks, pre-operational briefings.	
PPE standards and knowledge of required use.	
Charts relevant and in date.	
Communication equipment checks.	
Condition and maintenance standards of the tug/workboat.	
Towing winch emergency release mechanisms proven.	
Frequency of checks on emergency release mechanisms.	
Level of liability cover.	
The crew of the above vessel have been inspected and deemed to meet the requirements for the issue of a Master/Crew Towage Licence.	
The crew of the above vessel have been inspected and *failed* to meet the full requirements for the issue of a Master/Crew Ship Towage Licence.	
BHC Inspection Officer:……Date:……	

Annex D Belfast Drydock Towage Guidelines

GUIDANCE ON TOWAGE APPLICABLE TO VESSELS ENTERING/LEAVING BELFAST DRYDOCK.

LOA	No. of Tugs		Comments	Weather
	BEAM <35m	BEAM >35m		
≤180m as per Belfast Harbour Minimum Towage Requirements				
180-220m	2 Tugs >70t Bollard Pull One of which must be >40t			Wind speeds Should be ≤15 knots
180-220m		2 Tugs >70t Bollard Pull One of which must be >40t. An Additional Tug of ≥20t will also be required.	Mules to be used	
220-270m	2 Tugs > 70t Bollard Pull One of which must be > 40t. An Additional Tug of ≥20t will also be required.			Wind speeds Should be ≤10 knots
220-270m		2 Tugs >70t Bollard Pull One of which must be >40t. An Additional Tug of ≥20 tons will also be required.	Mules to be used	
>270m	3 Tugs >100t Bollard pull. One of which must be >40t.	3 Tugs >100t Bollard pull. One of which must be >40t.	Mules to be used	

The Harbour Master may change these requirements as he considers appropriate.

All vessels must be fully operational and at a draft which allows the proper and effective use of manoeuvring equipment, including bow thrusters.

Dead-ship movements and special projects will be individually risk assessed.

All tugs ≥25tons must be Omni-directional.

Annex E MAIB Recommendations for Port and Towage Operators

MARINE ACCIDENT INVESTIGATION BRANCH RECOMMENDATIONS

Summarised below are conclusions made by the MAIB to port authorities and towage operators (Dutch Safety Board in the case of the *Fairplay 22*) following incidents with the tug's concerned.

1. TUG DOMINGUE – 20TH SEPTEMBER 2016

The tug Domingue girted and capsized while assisting the container ship CMA CGM Simba departing from the port of Tulear, Madagascar. As a result of the accident two of Domingue's five crew died.

Domingue had been connected to CMA CGM Simba's port quarter to help pull the vessel's stern off the berth. During the manoeuvre, the prevailing tidal conditions caused CMA CGM Simba to move towards a mooring dolphin. To avoid striking the dolphin, CMA CGM Simba's master briefly manoeuvred his vessel ahead, the pilot did not warn the tug that they would be coming ahead. As CMA CGM Simba built up ahead speed Domingue girted and capsized.

Safety Issues

Domingue was less manoeuvrable than the port's normal tug which was undergoing maintenance, and its crew were inexperienced in assisting ships.

The tug was not fitted with a gog rope, nor did the towing point have any mechanism to release the tow in an emergency and doors and hatches on the tug were open.

The extent to which a plan for CMA CGM Simba's departure had been discussed between the pilot and Domingue's skipper before commencement is uncertain, and during the manoeuvre no-one on board CMA CGM Simba monitored the tug's position.

2 ASTERIX – FAWLEY, SOUTHAMPTON 30 MARCH 2015

2 x injuries

Girting, capsize & foundering.

Conclusions.

Although girting was recognised as a hazard, the tug operators risk assessment's control measure was simply to use a gog rope on every tow.

Coxswain was not sufficiently trained or experienced to use the gog rope to best effect, or to make an early assessment that an extremely hazardous situation was developing.

Asterix's gog rope was set at an intermediate length that was neither short enough to move the towing point sufficiently aft to prevent girting nor long enough to facilitate maximum manoeuvrability.

With the gog rope secured to the H-shaped bit, it was not possible for the crew to rapidly and safely adjust the towing point when the towline was under tension.

With additional controls in place, such as effective proactive communications between the pilot and *Asterix's* coxswain at defined stages of the operation, the risk of girting could have been reduced.

mv Donizetti's pilot relied on tug masters and launch coxswains to act autonomously and to inform him when in doubt or difficulty.

Asterix's coxswain and deckhand showed a low perception of risk, which delayed their response to the developing situation.

Asterix's coxswain did not anticipate the potential danger of girting and the need to communicate his concerns to the pilot at an earlier stage.

The company's launch crew training programme for coxswains did not recognise the level of skill and experience required to prevent girting.

There is a current lack of formal published guidance for the operators of small vessels engaged in towing operations, including specific actions required to prevent girting.

A lack of joint training and interaction between pilots and mooring launch coxswains in Southampton is likely to have had a negative impact on operational liaison.

The effort required to operate *Asterix's* towing hook emergency manual release mechanism increased in proportion to the loading on the hook.

Asterix's coxswain's RYA/MCA Yachtmaster certificate of competence, if commercially endorsed, would have allowed him to operate without any form of towage endorsement or completion of the company's training programme contrary to the guidance contained within the PMSC Guide to Good Practice.

As *Asterix* began to roll following its capsize, water from the wheelhouse was able to enter the accommodation through the open hatchway.

3. CHIEFTAIN - RIVER THAMES 12TH AUGUST 2011

Collision, capsize & foundering

1 x fatality.

Conclusions

Late & inappropriate action taken to avoid buoyed area and *Chieftain's* lack of reserve power contributed to the collision.

Risk assessment of short tow lines, the inability to lengthen the tow and appropriateness of emergency stop trials to determine a safe tow not fully recognised.

Lack of formal risk assessments of vessel operations Lack of watertight integrity discipline – doors & hatches left open led to down-flooding.

Functionality of *Chieftain's* towing hook release system in doubt – no evidence of planned maintenance.

Chieftain's Mate did not always wear lifejacket on deck.

Dangers of overrun due to variation in speeds between the tow and tug not properly recognised or considered.

Lack of experience of all with push/pull configuration not recognised during planning/risk assessment of operation

Method statement not provided, nor was need for it considered.

Loss of situational awareness in terms of positioning, monitoring & effect of tidal stream.

4. FAIRPLAY 22 - (DUTCH SAFETY BOARD) – NEAR HOOK OF HOLLAND 11TH NOVEMBER 2010.

2x fatalities, 1 x injury

Collision & capsize.

Fairplay 22 capsized during securing at the bow of ferry in high winds and at high speed.

Conclusions

Capsize followed a heeling moment caused by collision, which heeled tug over to 35 degrees. Water was able to flood into engine room through vents and a watertight door which was left open. The tug was unable to right itself and capsized.

Hydrodynamic forces around bow caused tug to lose position, colliding with bulbous bow and ending up broadside to bow. These forces increase with speed and proximity of tug to the other vessel.

Risk assessment associated with sailing close to the bow of a seagoing vessel to take measures to minimise risk. Particular attention to be paid to speed through the water.

Monitor operational procedures including speed maintained during tug assistance and the closing of watertight & weathertight operations.

5. LLANDDWYN ISLAND – 1 MARCH 2010

On 1 March 2010, a deckhand on board the workboat "Llanddwyn Island" was struck by a towing hawser after it had parted during a towing operation.

The MAIB investigation found that the use of commercially endorsed RYA certificates alone, as acceptable qualifications for the operation of workboats, was highly questionable. The report went on to note that the introduction of voluntary towing endorsements would have a positive impact on the safety of towing operations if workboat owners and authorities commissioning workboat services insist that skippers hold the relevant towing endorsements for the work undertaken.

6 IJSSELSTROOM - PETERHEAD 14TH JUNE 2009

No casualties.

Girting & capsize.

Conclusions

Lack of a bridle (or gob rope) – once pull of tow and direction of thrust became misaligned, there was nothing to prevent towline leading onto the beam.

Speed of tow – as tug was towed stern first using engines ahead to manoeuvre, became less effective as the speed of the tow picked up.

Angle of deck edge immersion 7.6˚ – would have further increased angle of heel.

Tug would only have needed to be heeled over for 10 seconds for sufficient water to enter engine room to create 46.4˚ angle of list – allowing further flooding to continue.

Lack of instruction or guidance regarding towing in "winch" or "freewheel" mode".

Lack of familiarity and testing of emergency brake release.

Lack of risk assessment or briefing (pilots, tug skippers, port).

Conning position and bridge ergonomics.

Underestimated severity of result of girting.

7. FLYING PHANTOM - RIVER CLYDE 19TH DECEMBER 2007

3 x fatalities & 1 x injury.

The "*Flying Phantom*" was girted and sank in dense fog while working as bow tug, with tragic loss of life.

Conclusions

Tow-line emergency release did not act quickly enough.

Limits for towing in restricted visibility.

No formal pre-towage checks – resulted in engine room door being left open.

Bridge ergonomics & crew experience in restricted visibility in confined waters.

Procedures & risk assessments not robust.

Lessons from an accident at one port are not always being learnt at another.

8 TRIJNIE – 8 SEPTEMBER 1998

On 8 September 1998, the workboat Trijnie was acting as a stern tug to the 7686grt tanker Tillerman for a manoeuvre to the entrance lock for Milford Docks. As Trijnie attempted a peel-off turn, from where it was running ahead on the tanker's starboard quarter to its port quarter, the towline became tight across the tug's port beam, heeling it over to port and allowing water over the after deck. Despite his best efforts, the coxswain could not break out of the girting, and Trijnie capsized and sank with the loss of its deckhand, whose body was later recovered from the wheelhouse.

The MAIB investigation found that Trijnie did:

- Not have a gog rope rigged;
- The emergency towing hook release wire was not connected;
- The operations manager who assigned Trijnie did not know what towing mode it would use; and
- Tillerman's pilot could not see the tug from the bridge, assuming that it had been running with the ship stern-to-stern, from which position it would have been relatively easy for the tug to position itself on the ship's port quarter.

Furthermore, the pilot did not know that this was the first time that the tug coxswain had undertaken such an operation. Had Trijne's engine room hatch cover been properly secured, it is probable that the tug would have remained afloat longer than it did.

9 BITER / HEBRIDEAN PRINCESS – 24 FEBRUARY 2023

SYNOPSIS

At about 1527 on 24 February 2023, the twin screw conventional tug Biter girted and capsized off Greenock, Scotland while attached to the stern of the passenger vessel Hebridean Princess, which was making its approach to James Watt Dock. Biter's two crew were unable to escape from the capsized vessel and lost their lives.

The investigation found that Biter girted and capsized because it was unable to reverse direction to operate directly astern of Hebridean Princess before the tug's weight came on to the towing bridle and, when this happened, the tug's gob rope did not prevent it being towed sideways. The investigation also found that Hebridean Princess's speed meant that the load on Biter's towlines was between two and five times more than at the port's recommended speed range. Thereafter, given the tug's rapid capsize, it was unlikely that Biter's crew had sufficient time to operate the tug's emergency tow release mechanism. Once the tug was inverted, the open accommodation hatch might have prevented air being trapped inside the wheelhouse, potentially limiting the crew's chance of survival.

The investigation also found that the master/pilot and pilot/tug information exchanges were incomplete and that the opportunity to correct the pilot's assumption about Biter's intended manoeuvre was lost. Further analysis indicated that the training provided had not adequately prepared the pilot for their role and that it was likely that the tug master did not fully appreciate the risks associated with the manoeuvre.

Annex F A Guide to Good Practice on Port and Marine Facilities (Section 4.6 Towage)

The following section is extracted from "A Guide to Good Practice on Port and Marine Facilities" Section 4.6 "Towage":

4.6 Towage

This section provides guidance on establishing good practice for the safe operation of towage services within port, harbour and terminal limits including:

- Risk Assessment & Towage Guidelines;
- Towage Types:
  - Ship Assist Towage;
  - Dead Tows & Project Towage; and
  - General Towage
- Tugs/Workboats & Operator's Approval; and
- Training & Certification.

Procedures for towage in ports, harbours and at terminals need to be developed, managed and regularly reviewed by harbour authorities, tug operators, pilots and ship owners, to ensure a safe and efficient service. Procedures should include responses to emergencies. Good communication and team work between all parties is essential.

10.1.2 This section provides guidance on establishing good practice for the safe operation of towage services within port, harbour and terminal limits.

4.6.1 Risk Assessment & Towage Guidelines

All towing operations in harbours should be risk assessed by Harbour Authorities. Based on that Risk Assessment the Harbour Authority, in consultation with other stakeholders, should develop specific towage guidelines which should be incorporated into their Safety Management Systems.

For routine ship assist towage, it is recommended that the guidelines include the minimum bollard pull, number and type of tugs for a ship of a particular size for each berth location. Guidelines should take account of assisted ship length, draft, manoeuvrability and anticipated SWL of bollards. Guidelines will have to be modified on the day depending on environmental conditions, any defects with the assisted ship and the capability of the tugs available. It is strongly recommended not to deviate from port towage guidelines

When considering towage activities, it is appropriate for organisations to specify certain limitations. As a minimum, it is recommended that the following be included in the towage guidelines:

- minimum acceptable visibility;

- maximum swell conditions
- maximum speed through the water for both making fast the tugs and for the operation
- maximum wind strength and direction.

Guidelines on when to abort or cancel an intended towage operation, due to restricted visibility or the potential for restricted visibility, will depend on factors including manoeuvring room, duration of the tow, minimum speeds, abort contingency plans and the towage method employed. Organisations and towage operators should set limits for towage in restricted visibility and stipulate any special measures, necessary at other agreed levels of visibility, such as push/pull versus centre-lead towing, especially for the forward tug.

Swell conditions will not affect all facilities but, where they do, the ability of tugs to make fast safely, remain fast once connected without snatching or parting the towlines and being able to maintain position are critical considerations. The tug master must have the final decision on whether to make fast the tow.

It is essential that the pilot/ship master agrees with the tug master, (as part of the pre-operation interchange) what the ship's speed through the water will be when the tug is made fast and thereafter. Excessive speed will cause dangerous interaction between the ship and tug and can lead to serious damage to the tug, ship and potential fatalities, especially when the tug is working bow to bow with the assisted vessel

The Pilots' Pocket Guide and Checklist1 gives additional specific guidance on:

- checklist and communications
- developing the pilotage plan and master/pilot exchange
- vessel familiarisation
- closed-loop communications
- briefings and debriefings
- best Practice in Harbour Towage:
  - at all times
  - pre-arrival
  - making fast and manoeuvring
  - end of tow/departure
- points of good seamanship for assisted ship's crew
- restricted visibility
- tug types

- messenger and heaving lines
- towing points and girting
- hydrodynamic Interaction
- escort towage
- pilot and tug master liaison meetings

It is recommended that Competent Harbour Authorities ensure the Pilots' Pocket Guide and Checklist - Working safely with harbour tugs - reducing the risks in port towage is made available to pilots.

MCA guidelines should be used to ensure that tug crews are appropriately trained and qualified. They should also include the need for tug crews to train with pilots. pilots, Pilotage Exemption Certificate (PEC) holders and tug masters', should conduct regular liaison meetings, safety workshops, visits including pilots tripping on tugs and tug masters accompanying pilots and all parties attending simulator and refresher training together. Trips should cover as varied a selection of towage activities as possible including active escorting (where applicable). It is recommended that, at minimum, liaison meetings between facility representatives, pilot associations and towage providers take place every quarter.

Open reporting of incidents and candid exchanges are essential to gain maximum benefit from any lessons learned. The Pilots' Pocket Guide and Checklist includes bullet points for items to be discussed at liaison meetings including identification of good practice and improvements. Any accidents and near misses should be thoroughly reviewed and relevant MAIB reports discussed with changes to guidelines being made if necessary.

4.6.2 Towage Types

10.3.1 There are several different types of towage operation each of which brings its own challenges and risks. These can be summarised as:

Ship Assist Towage or assisting vessels under way, typically during entering or leaving and/or shifting berth within a harbour;

Dead Tows or assisting vessels without propulsion including, but not limited to, barges, pontoons, dredgers, rigs which typically involves vessels entering and leaving harbour being towed by a sea-going tug or other vessel;

General Towage including towage of smaller barges, pontoons, rigs normally within harbour limits and marine construction equipment; and

Project Towage including unusual events which require special consideration.

Escort towage facilitating the safe transit into and out of the port, sometimes as a precautionary measure

Towage can be undertaken utilising several different methods and in many differing configurations including over the bow, over the stern, pushing, pulling, using long or short towlines, fixed or adjustable lengths, with or without towing bridles, lashed alongside ("hipped up") and using single or multiple tugs.

The choice of method will depend on the type/size of the assisted vessel and type/size/capability of the tug or workboat. The tug master and crew must be suitably qualified and experienced and are competent to not only to conduct the manoeuvre but also advise if the plan and/or its execution is unsafe.

4.6.3 Ship Assist Towage

Larger facilities are likely to have resident commercial towage operators with smaller operations having their own arrangements or mobilising tugs from elsewhere on an ad hoc basis.

Ship assist towage can be an extremely hazardous activity and good teamwork is essential to safe operations.

If escort towage is required by the port or terminal operator for the safe transit into and out of the port, they should develop their own escort guidelines in association with relevant Harbour Authorities. Escorting may include escorting passively (tug running free with the vessel) or actively (tug made fast normally centre lead aft). The vessel requiring escort must be equipped with suitable towing arrangements to deal with the forces applied by the tug during the operation. These escorting criteria should be readily available and confirmed prior to arrival. The equipment would normally consist of a bollard of the required SWL or a chock arrangement, and a fairlead of adequate strength. All parties involved (master, crews and pilots) should be trained and practiced in the operation through regular pilot/tug master training and liaison. Pilots, ships and Tug Masters exchange of information should include agreement on suitable speed.

Where possible, centre lead forward towage is to be risk assessed and alternative methods such as push/pull used. Tugs forward of assisted vessels are in a vulnerable position with little scope to manoeuvre clear in event of an emergency.

When a vessel piloted under a PEC requires a tug, it is recommended that a pilot be engaged as PEC holders have limited experience in tug handling and are not normally engaged in tug/pilot PMSC

meetings. Best practice within ports is to have an additional endorsement for PEC holders which requires further training and tripping with pilots.

4.6.4 Dead Tows & Project Towage

Dead tows, unusual objects and non-routine towage events will require individual assessment, including Risk Assessment, and planning.

For arrivals and departures from/to sea, dead tows should be pre-approved by the facility utilising a towage plan format which includes Risk Assessment and method statements regarding:

- harbour tug positioning and utilisation;
- whether the tow is to be transferred from the sea tug: transferring tows creates additional hazards, particularly handling heavy equipment, and whether the sea tug remains fast until the tow is alongside will depend on berth characteristics, locks etc., the characteristics of the sea tug and the availability of suitable harbour tugs;
- riggers/line handlers being transferred to the tow to recover sea gear, emergency tow lines and to prepare the tow for berthing;
- weather limitations and sea state;
- suitability of destination berth and whether adjacent berths need to be cleared; and
- the number of suitably experienced pilots required for the sea tug and/or tow.

For in-harbour non-routine tows, key decisions should be recorded and the person (acting as towing or barge master) who is responsible for the safety of the manoeuvre and the towage plan, should be clearly identified. This person is responsible for:

- conducting an appropriate risk assessment/safety case to be submitted to the harbour authority;
- producing a method statement;
- the passage plan; and
- the safety of the manoeuvre.

The facility should give written approval for the tow to go ahead once the towage plan has been reviewed and agreed.

In exceptional circumstances, and for major projects, the use of simulated trials should be considered.

Pilots training should include towage events of non-routine towage including dead tows utilising a variety of tug types.

4.6.5 General Towage

Some ports and harbours will have multiple towage activities being conducted by small tugs and workboats that are routine, repetitive and may be conducted with standard plans.

Although guidelines cannot prescribe definitive procedures for all possible towage activities, since each operation will present individual and sometimes unique challenges, facilities are recommended to issue general directions to ensure safe practise.

It is not recommended to utilise a tug, workboat or other vessel that is not designed or equipped specifically for towing. For example, a fishing vessel conducting a rescue of another fishing vessel may need to release the tow to a suitable harbour tug or workboat before entering restricted waters. Equally, vessels performing routine towage supporting a dredging project should not be used to berth a ship. This practice has resulted in tragedy in the past and should only be undertaken by an experienced ship-assist master in an emergency situation.

4.7.6 Tugs/Workboats & Operator's Approval and auditing

It is recommended that facilities develop their own criteria to approve tugs, workboats and operators. Such criteria may include inspections of the vessels themselves and may, where the legal process exists, include a licensing regime.

This recommendation extends beyond Small Commercial Vessels under 24m to Ship Assist Tugs of all sizes.

When assessing a tug or workboat and its crews' suitability to operate the following issues, focussed on Ship Assist Towage, should be considered:

- Master and crew experience and in-house training;
- Master and crew certification;
- Master's knowledge of relevant directions, bye laws, contingency plans and guidelines (if any);
- Master's knowledge of generic or own passage plans;
- Master's knowledge of tug stability, watertight integrity and vessel interaction;
- master's knowledge of operators' MSMS, the Harbour Authorities' MSMS (if appropriate the bridging document), including environmental operating limits
- Capability of the tug;
- Ability of the tug and crew to respond to emergency situations (if appropriate including the bridging document)
- Crew's general safety culture, tool box talks, pre-operational briefings;

- PPE standards and knowledge of required use;
- charts relevant and in date;
- communication equipment checks;
- certification, condition and maintenance standards of the vessel
- condition and maintenance standards of the tug/workboat;
- P&I liability cover held and level
- drills are conducted, particularly PIW/MOB exercises
- Risk Assessments and contingency plans are relevant, understood and used infrastructure
- such a berths and access to shore power, usually provided by the port owners, is fit for purpose, and that means of safe access and mooring of Small Commercial Vessels is provided
- bollard pull certification is available as per towage guidelines
- tug skippers / crews are aware of specific port emergency arrangements such as established casualty evacuation points or protocols.

Towage specific criteria:

- master's knowledge of towing stability, watertight integrity when towing, girting and vessel and pilot interaction towing
- winch / hook emergency release mechanisms proven, and frequency of testing evidenced.

4.7.7 Training & Certification

Commercial vessels required to operate at sea

The MCA documents within Workboat Code edition 3 (2023), the safe manning requirements for sea going commercial vessels under 24m.

Existing vessels that are certificated under the Brown Code, its equivalent standard published in the technical Annex to MGN 280(M), or Workboat Code Edition 2, Amendment 1 shall meet the requirements of Workboat Code Edition 3 by the vessel's next renewal examination or three years after the date of entry into force of the Workboat Code Edition 3, whichever is later, except, where references to previous requirements are explicitly specified within individual sections of the Workboat Code Edition 3 they may comply with such requirements.

Workboat Code Edition 3, 2023

The Work Boat Code Edition 3 is recognised as an equivalent standard to full compliance with

the Merchant Shipping (Small workboats and Pilot Boats) Regulations 2023, SI 2023/1216, ("the enabling Regulations").

The Work Boat Code Edition 3 applies to commercial vessels of under 24m in Load Line Length that operate to sea and to pilot boats of any size operating either at sea or in categorised (i.e., inland) waters.

The Work Boat Code Edition 3 aims to provide, in a single document, all the information needed for the design, construction, engineering, electrical systems, hull systems, fire protection and provision of firefighting, navigation and radio equipment. It includes the requirements for manning and of the qualifications needed for the crew, plus the carriage of dangerous goods, towage, remotely operated unmanned vessels and alternative fuels and propulsion systems.

Commercial vessels not required to operate at sea

Some vessels are not subject to these regulations. In this case, Harbour Authorities should have procedures for ensuring they are properly maintained, equipped and manned and used only for purposes for which they are capable. Harbour Authorities should have regard to their own capabilities when carrying out these inspections and may use commercial organisations if they do not have the competence in-house.

Risk assessment should form the basis of locally developed codes of practice and particular attention should be paid to circumstances where the operation requires more personnel than that necessary for the safe and compliant navigation of the vessel, and/or when the operation of specialist equipment is necessary.

Vessels engaged in towing

Qualifications should be legally appropriate for the size and type of vessel in operation. The MCA does not determine qualifications for personnel operating tugs within ports and harbours but does support and approve training schemes for towage which form the basis for standards available to facilities.

These requirements are:

- **Boat Masters Licence (BML)** or commercially endorsed equivalent with Towage Endorsement (BML TE): Seen as the minimum requirement to conduct any towage

operation in harbour or at sea in workboat coded vessel.

• **Certificate of Competence (CoC)** as per Workboat Code edition 3, with a Voluntary Towage Endorsement (VTE): a British Tugowners Association (BTA) and The Workboat Association (WA) jointly supported scheme which includes a detailed towage-specific syllabus recognised by the MCA covering recorded training, assessment and independent examination. Holders do not need to undertake the Boat Master Licence (BML) Tier 1 and 2.

• **STCW Tug Mate/Master Certificate of Competency (CoC):** This scheme, and its small vessel Engineer equivalent, are those that are considered "best practice" on ship assist tugs, of tugs more than 24 metres registered length, 150 GT or 350 kW.

• **STCW Restricted or Unlimited Master Certificate of Competency (CoC):** Persons holding STCW Certificates of Competence entering the towage industry should be subject to a bespoke in-house training scheme – relevant parts of the VTE syllabus could be utilised as a basis for such schemes.

Organisations should satisfy themselves that towage operators have suitable in- house training and assessment schemes for their tug masters, which address tug types and local conditions, skills and experience.

Joint collaborative training

On board all Small Commercial Vessels, teamwork, toolbox talks, briefings and clear communications are essential. Team training on location, in simulators and at safety workshops should be prescribed by Harbour Authorities as well as sector good practice guides. Operational information exchange between different working groups, for example, pilots and tug masters' is highly commended and should be strongly encouraged by the Harbour Authority.

More detail on training can be found in Section 8. Of GtGP.

Pilot launches

Harbour Authorities should ensure compliance with the boarding and landing Code of Practice. pilots should be instructed not to use facilities which do not comply with statutory safety requirements. Failure to board a pilot for this reason does not entitle a master to proceed without a pilot where his vessel is subject to pilotage directions.