

GOVERNMENT OF RAS AL KHAIMAH RAK PORTS

TOWAGE GUIDELINES

RAK PORTS INTEGRATED MANAGEMENT SYSTEM

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Document Owner: Harbour Master, RAK Ports

Revision History:

Version	Date	Reason for change	Author
Orig.	06-09-2017	Initial Release	
1*	10-11-2020	First revision in order to update 1) Reference documents, 2) Guidance on Towage (Section eight – Tow line length) and 3) Fleet information – Plant & Equipment List (Annex 3). Changed the Document Control Number from RP MD 011 to RP MD 004. Incorporated Content page with hyperlinks. Incorporated updated weblinks throughout the document. Incorporated RAK Ports documentation requirements. Refer MoCRF's (20-MD-02 and MoCRF 20-MD-03) for details.	НМ

* This issue supersedes all previous versions.



GENERAL INTRODUCTION

The 'Towage Guidelines' are intended to provide generic and specific guidance to ship masters, pilots and tug crews engaged in tug assisted navigation and also scope for using tugs as a means of reducing navigational risk within RAK Ports limits. Owners, charterers, towage operators and agents of vessels are also recommended to make themselves familiar with the content of these guidelines.

These Guidelines have been produced with safety in mind and to meet the requirements of Port Marine Safety Code (PMSC) and Marine Safety Management System (MSMS). This document sets out the requirements for towage operations and lays down the criteria for permitting Towage Operators who seek out to provide towage service within RAK Ports.

Notwithstanding anything contained in this document, the towage requirement for a ship, tug and a combination of tug and barge or any other craft remains the responsibility of the Master.

The Guidelines are subject to review as soon as reasonably practicable in the event of the occurrence of any incident, or series of incidents, related to this activity; and in any case at intervals, NOT LATER THAN 3 YEARS from the date of issue.

CONTACT PORT

The Harbour Master's Office is located in the Marine Department, Saqr Port. The Harbour Master's Office co-ordinates the statutory compliance for navigational safety across all RAK Ports. All operational marine matters are dealt with by respective Ports.

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WEBSITE OF THE PORT www.rakports.ae

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The 'Towage Guidelines' for RAK Ports will be distributed as follows:

One copy will be posted on the company website and the following will be notified when there are any changes or amendments:

- 1. Harbour Master
- 2. Chief Executive Officer
- 3. HSEQ Manager
- 4. All Ports' Operations Managers
- 5. Deputy Harbour Master, Saqr Port
- 6. Pilots and Tug Masters
- 7. Control Tower

One PDF copy shall be filed in the Integrated Management System as an External Document.

AMENDMENTS

Proposed amendments are to be sent to the Document Owner, Harbour Master, who will maintain a record of changes in accordance with the Control of Documents and Records Procedure.

DOCUMENTS AND RECORDS

The definition of documents and records is defined below:

- **Documents:** Documents may be in any form or type of medium such as paper, magnetic, electronic, photos and templates. They are designed to capture information on activities or results.
- **<u>Records</u>**: Records provide evidence that activities have been performed or results have been achieved. They always record the past.

REFERENCE DOCUMENTS

Document Title
IMO Resolutions and Guidelines
SOLAS Conventions
Port Marine Safety Code (PMSC)
GCC Safety Regulations for Non-Conventional Ships
European Tug Owners Association' Guidelines for Safe Harbour Towage Operations
RAK Ports Regulations & RAK Ports Marine Guidelines
RAK Ports Marine Safety Management System (MSMS)



SECTION ONE General Information

Preamble

- 1. For the purpose of these guidelines "towage" refers to any activity undertaken by a tug within the Port Authority Waters, whether towing with ship's own lines or tug's lines, holding, pushing, pulling, moving, escorting, guiding or standing by. Towage operations include the provision of assistance to an operational ship, a composite unit of tug-barge, a cold (dead-ship) movement of a ship and the movement of barges and floating equipment and objects into, out of or within the Ports limits.
- 2. RAK Ports evaluate risk associated with activities within its jurisdiction of responsibility and apply appropriate safety control measures.
- 3. The prime consideration in developing these guidelines is to enhance the safety of those that operate in the ports and to prevent accidents, to enhance good communications and teamwork between Port Tugs and Towage Services, Pilots, Towage Operators, and Vessels calling RAK Ports and Stevin Rock Harbour.
- 4. In compiling these guidelines RAK Ports Pilots, RAK Ports Tug Masters, Stevin Rock Harbour Officials and limited number of other persons having towage expertise have been consulted.
- 5. These guidelines are made up in accordance with Article (12) of RAK Ports Regulations.

Application and Use

- 6. These Guidelines shall apply to all vessel movements carried out within RAK Ports limits and Stevin Rock Harbour, with the assistance of (towing) tug.
- 7. For the purpose of these Guidelines the tow process starts when the tug moves to receive any verbal orders from the vessel to pick up ropes or lines, and the tow process ends when the final order from the vessel being towed to cast off ropes and tug is safely clear of the vessel being towed.
- 8. The recommended number of tugs will be dependent on the manoeuvrability of the vessel, draught, wind and tidal conditions (UKC), handling characteristics of the vessel, proximity of other vessels, other special circumstances, and the dynamic Risk Assessment made by Duty Pilot prior to the vessel's arrival.



Interpretations

- 9. **"Vessel"** shall include any vessel, ship, tug, barge, pontoon, and craft of any kind or an object of whatsoever nature, however navigated, propelled or moved (whether or not coming within the usual meaning of the word "vessel") requiring a towage assistance.
- 10. **"Barge"** shall include manned and unmanned dumb vessels, including but not limited to: barges, crane barges, engineering barges, pontoons, dredgers but excludes any power driven vessels.
- 11. "Watertight" means capable of preventing the passage of water through the structure in any direction under a head of water for which the surrounding structure is designed.
- 12. "Weathertight" means that in any sea condition water will not penetrate into the ship.
- 13. **Girting** (*Also similar: Girding and Tripping*). Where a vessel is caused to potentially capsize, most commonly as a result of external towline and interaction forces.
- 14. **Crew:** any person employed effectively to carry out the functions or services of the ship during the voyage of the ship, and is included on the crew list.





SECTION TWO Towage Operators

Registered Towage Operators

- A registered Towage Operator may be granted consent by RAK Ports Harbour Master to provide towage service by their tug(s). Towage Operators wishing to provide towage service in RAK Ports area of jurisdiction are required to have their tugs endorsed by the Port Authority. To obtain an endorsement they must demonstrate that their tugs and crews meet the required national standards. The Towage Operator must also demonstrate a robust safety management system. Such endorsed Tugs are to be renewed annually.
- 2. A competent person/organisation appointed by the RAK Ports shall have the right to inspect any registered tug to ensure that it is fit for its intended purpose.
- 3. The Harbour Master must be provided with the following documents:
 - a. A copy of the Towage Operators Safety Management System.
 - b. Operational Information on each tug to be employed.
 - c. Copies of all statutory ship's Certificates.
 - d. Recent bollard pull test certificate.
 - e. Detailed information regarding crew experience and qualifications.

Registered Tugs

4. All tugs operating within RAK Ports Limits must be able to undertake towage operations safely. Tugs must also be crewed by certificated professionals with appropriate experience and skills to operate the tug correctly.

Operating Company Standards

5. Towage companies operating at RAK Ports should operate to required standards.

Automatic Identification Signal and Charts

6. Registered tugs (including supply boats) are required to have an Automatic Identification System (AIS) unit fitted in order to aid relevant Port Control and to allow other vessels maintain situational awareness of applicable movements. All vessels navigating anywhere within RAK Ports must have on board a folio of updated navigational publications, including charts required for the transit.



Tug Crews - Minimum Qualifications, Experiences and Requirements

- All tug crew must have appropriate certifications. All Masters of tugs must hold a Certificate of Competency (CoC) to STCW standards or Boat Master (or equivalent) with appropriate towage experience. This applies to General Towage (towing and pushing).
- 8. RAK Ports Approved Towage Operators must ensure their crews are trained with a firm understanding of the tugs they operate, towage techniques and the area which they operate. Evidence of training must be available and provided to the Harbour Master on request.
- 9. All tugs operating in RAK Ports area of jurisdiction must be manned in accordance with flag state requirements and at a safe level with regard to crew number. All tug crew members must be properly rested in line with the recommendations of national and international legislation.

Personal Protective Equipment (PPE)

- 10. Personnel on exposed decks are to wear appropriate Personal Protective Equipment (PPE). All PPE should be approved and in date.
- 11. Crew members are recommended to only proceed on deck during towage operations with the following equipment:
 - a. High Visibility Jacket.
 - b. Lifejacket.
 - c. Safety shoes or boots.
 - d. Safety Helmet fitted with chinstrap or approved safety head wear.
 - e. Gloves.

3-5 years

0-2 years

Retention



SECTION THREE General Guidelines

Communications

- Throughout towage operations good VHF communications between all parties are a vital component of safe towage operations in RAK Ports areas of jurisdiction. At all times tug crew, vessel crew and shore-side staff must be able to communicate efficiently and clearly.
- Attention should be given to the communication equipment on board tug and manned towed unit as well as assisting tugs, and that should include at least two portable VHF radio. Lack of effective communication is often a factor in the cause of accidents.
- 3. Towage operations in each port are carried out on the dedicated VHF channels. The Instructions given to a tug by the Pilot should be clear, concise and follow convention (Pilots should only refer to the tug's name when conveying instructions to the tug and refrain from using the Tug Master's name. This will also assist the vessel's bridge team to understand what is going on). Instructions should be acknowledged and repeated by the Tug Master. The Tug Master should be kept informed of significant engine movements, proposed use of thrusters and anchors on the towed vessel. If hand signals are used, they should comply with industry standards.
- 4. The tug master should immediately inform the pilot/master and Port Control 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 the assisted vessel. If necessary, the operation should be aborted as soon as it is safe to do so.

Towing Responsibility

- 4. RAK Ports shall not be held responsible for any damages whatsoever that may be caused by the tug to the vessel or by the vessel to the tug, or any loss or damage to anything on board or any injury to any person.
- 5. The master or the Owner of the vessel which uses the tug for any purpose shall be held responsible for any losses, damage, injuries, and accidents resulting in death, and he shall indemnify the Port Authority against all the consequences of such damage including any claims from any other party.



Tug Watertight / Weather-tight Openings

6. It is essential that whilst engaged in towage operations that a watertight seal is maintained on main deck and towing deck openings to avoid water entering the tug's hull and superstructure. This applies to all watertight doors, hatch openings and emergency escapes. Openings that are required to be closed must be marked accordingly with an appropriate sign. Rubber seals and locking dogs are to be kept in good working condition at all times and be fitted properly. 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 must be informed and the hatch or door closed immediately after use.

Towing Equipment

7. Inspection and Maintenance

All towing equipment shall be tested on a regular basis and replaced when below standard. All towing equipment in use must be checked before undertaking a towage operation and after completion of each towage operation. 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 relevant equipment in use. Damaged or suspect items of equipment are to be withdrawn immediately from service and clearly identified as not fit for use. If any item of equipment is damaged during towage operations, the Master/Pilot of the vessel must be informed.

8. Tow Quick Release

The emergency release mechanisms on winches and towing hooks are to be tested both locally and where fitted remotely. Towing winch and towing hook release mechanisms are to be tested frequently 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. Records of testing of the emergency release mechanisms shall be kept and made available to the Port Authority on request. Under no circumstance is towing equipment be connected to any winch or hook that has a suspect release mechanism.

Options for slipping the rope include:

a. Paying out the rope and allowing it to run off the towing machine (freewheeling).



- b. Cutting the rope with a torch or explosive cable cutter. Synthetic rope under no tension can be cut with an axe (provide an axe).
- c. If a ship with power is being towed, it can sometimes cast off the towing pendant on the tow's bow.
- 9. Vessel Mooring Lines as Towlines

Using a vessel's mooring lines as towlines is not recommended (unless agreed between Master/Pilot and Tug Master), as the safe working load may not be compatible with the assisting tug's performance. Use of a vessel's mooring lines as towlines may limit a tug's ability to assist.

Under normal circumstances and in line with Port practice the vessel will always use the Tugs line. In exceptional circumstances a vessels line maybe used provided the tug master is in agreement.

Towing Hazards

10. Speed When Making Fast and Letting Go

The vessel's speed through the water must be reduced to that which allows a safe rendezvous and connection/disconnection of the tug. The required speed shall be agreed in advance between the Master/Pilot and with the Tug Master. At all times during the connecting/disconnecting process, the Pilot/Master must be aware of the position and intention of all relevant shipping movements in the area.

11. Intentions When Towing

The Pilot/Master must always advise the Tug Master of their intentions, allowing the Tug Master to anticipate the effect of the manoeuvre on the tug. Whenever possible the Pilot/Master shall 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 a tug on a vessel is a matter for discussion between the Pilot/Master and the Tug Master, having full regard for the areas of the hull which must be avoided; e.g. watertight doors, between frames etc. In strong tidal conditions, a high percentage of a tug's power may be absorbed in maintaining position on the vessel before applying thrust to the vessel.

12. Interaction

Interaction and its effects on a tug and its handling are well known and appreciated in port/harbour towage. Masters and crew are reminded that these effects increase with speed in areas where interaction exists. When manoeuvring alongside a tow, the Tug Master should be aware of the possibility of underwater obstructions such as bulbous bows, stabiliser fins etc. The Tug Master should be aware of the actions



of side thrusters which may present a hazard to the tug.

13. Girting

Vessel'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 good time.

Towing in Restricted Visibility

- 14. Restricted visibility in any occasion 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, rain, or any other conditions which impair visibility. Whilst tugs are equipped with radar, keeping a radar watch by the Master whilst towing may be impractical and unsafe, and poses the most serious threat to the safety of the tug, its crew, and other harbour users. Should visibility be severely restricted towage operations must be suspended until conditions improve. Relevant Port Control will give guidance in consultation with the Pilots and Tug Masters. In the event that visibility reduces whilst a tow is under way, the vessel/barge should be held in a safe position until visibility improves. The minimum visibility for all towage operations is 0.5 nautical mile at any point within the harbour.
- 15. Should visibility fall below the aforementioned minimum once a towage operation has commenced, and the Pilot/Master can no longer see the bow tug, the vessel's speed shall be reduced 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 must be implemented. The agreed course of action must be fully communicated to relevant Port Control.
- 16. All towage operations in restricted visibility must be conducted with the assisted vessel maintaining minimum speed.
- 17. A Tug Master proceeding to a job and all parties involved in the operation, must report any lack of visibility, immediately it is observed, to relevant Port Control and the vessel with which the tug is to rendezvous.
- 18. In dense fog it is ultimately the Tug Master who will decide whether it is safe to manoeuvre the tug in position to secure the line to the vessel or not. After all,



Towage Guidelines

he is the person responsible for handling the tug. It goes without saying that this has to be discussed with the pilot well in advance.

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

Blinding Floodlights

20. Strong glares from floodlights can impair the Tug Master's vision at night, which could eventually result in an inherently extremely dangerous situation especially when approaching the bow. Therefore, it is important that floodlights are positioned in such a way that they do not affect the assisting tugs.

Towing in Adverse Weather Conditions

- 21. When towing in adverse weather, hazards associated with towage operations are increased.
- 22. In circumstances where heavy weather (e.g., 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 are to be applied. When completing this assessment, the following must be considered:
 - a. Sea and/or swell conditions at the intended operating area and the route to/from same.
 - b. Wind speed, direction and trend; e.g., rising, steady or falling.
 - c. State of tide and trend.
 - d. Information offered by latest weather forecast and other vessels in the area.
 - e. Type of tug, propulsion method, towing from winch or hook and location of winch/hook.
 - f. Proposed method of towing, including likelihood of shock-load to towing gear.
 - g. Movement of other vessels in the area.
- 23. A contingency plan should weather deteriorate before/after the tow has commenced and/or if the tug has to disengage at any stage of the operation must be formulated. This could include after careful consideration, but not only be limited to, one or more of the following:
 - a. Tug does not make fast and remains on station to assist the vessel to a



position of safety.

- b. Tug is let go and remains on station to assist the vessel to a position of safety.
- c. Tug is let go to assist in a pushing mode.
- 24. If there is likelihood that the weather conditions may pose a significant threat to the tug, its crew or towing equipment, the Tug Master shall immediately inform the Pilot/Master of any concerns that he may have. The Pilot/Master and Tug Master shall take immediate action to ensure the safety of the tug and the assisted vessel (and their respect crews) and, if necessary, the operation shall be aborted as soon as it is safe to do so.
- 25. The agreed course of action must be fully communicated to relevant Port Control.
- 26. 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 relevant Port Control and the vessel with which the tug is to rendezvous.

Housekeeping

27. All vessels (especially barges) should have proper housekeeping; cargo spilt on the deck, sidewalks of deck and fenders that presents potential hazard to assisting tug and crew when operating in close contact, should be swept up and removed.

Overboard Leakage

28. Any leakage or spill of oil from any source including hydraulic systems, should never be allowed to lie on deck that makes the deck slippery and hazardous and presents a pollution risk since the oil could drain overboard or be washed over by an overflow of ballast.



SECTION FOUR Towing Vessels

Bollard Pull

 The bollard pull of a tug is the amount of static force (pull) that can be exerted on a stationary object. The towing force that the tug can apply to an assisted vessel depends upon the type of propulsion unit and the method of assistance. Please see *Annex 2* to this document for information on Bollard Pull Requirement.

Safe Working Load of Vessel's Mooring Equipment

 The Pilot/Master should establish the SWL of the vessel's mooring equipment intended to be used for towage operation as part of the Pilot/ Master exchange. This information should be compared with the bollard pull (or dynamic escort force) of the allocated tug.

Passing on Heaving Lines

3. Due to the dangers arising from interaction between the tug and the vessel, conventional tugs and azimuth stern drive tugs employed at the bow in conventional mode usually insist on having the heaving line passed on from the ship's (lee) shoulder rather than letting it down from the centreline chock as illustrated below.



Fig.1 - Pass the heaving line from the ship's shoulder

- 4. RAK Ports however does recognise that on some ships, due to their construction, it would be very difficult to arrange for a heaving line to be passed through the centre chock and handed further aft so that it may be handed over to the tug from the ship's shoulder as shown in the right hand side illustration above. Some improvisation might be needed from the ship's crew.
- 5. Vessels having curvature must be attentive to providing enough room when the

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Assisting Tug making fast under the curvature of quarterdeck, particularly if the vessel is in ballast condition which will prevent endangering safety of assisting tug.



Fig.2 - Try to pass the heaving one to the ship's shoulder attached to a closed loop of line running back to the centre line chock inside the closed forecastle

6. A workable solution could be an endless loop made from a small diameter line (heaving line size) passed beforehand through the centre chock around the bow structure to the side "window", by which the heaving line to be used can be pulled from the centreline chock to the ship's shoulder. Nevertheless, it is advised that crews should make efforts to resolve this type of situation for the sake of SAFETY.

Secure the 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.
- 8. 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 in the event that 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.



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Do Not Alter Course or Start Turning the Vessel whilst Securing the Bow Tug

 Tug Masters, particularly those employed on the bow tug, cannot always see the side of the ship and therefore could be taken off guard if the vessels starts altering course unexpectedly. Pilots should in advance advise the tug of any significant course changes.

Always Inform the Stern Tug Before Putting the Engines Astern

10. 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 aware that vessel has engaged its engines astern so that he may take evasive actions if necessary.

Receiving/Letting go of Towlines

- 11. Connecting:
 - a. Before reaching the tug connection point, communication shall be established between the Pilot/Master and Tug Master via VHF. Before the tug approaches the connecting position, the vessel's bridge team shall contact the vessel's mooring crew and confirm that they are ready to receive the tug. In most cases the vessel's speed through the water must be reduced.
 - b. A suitable speed must be agreed between the Pilot/Master and the Tug Master; a maximum of 6 knots through the water is recommended for connecting a tug to the centre lead forward. During the connection, the Pilot/Master must advise the Tug Master of any alteration in speed or course. The vessel's mooring crew must be briefed on the procedure for making the tug fast.
 - c. When the tug has been connected, the tug crew must be instructed by the Tug Master to vacate the deck. If this is not practical, they must be positioned in as safe a position as possible. Having made fast to the tow is an opportunity for the tug's crew to check that watertight integrity has not been breached.

12. Disconnecting:

- a. During the disconnection of the tug, both tug and vessel crews should be made aware of the danger of serious injury if the towlines are released in an uncontrolled manner.
- b. The towline must always be lowered in a controlled manner onto the tug's deck, and not just 'cast-off', unless otherwise requested by the Tug Master.



13. Release the Bow Tug First:

- a. During sailing, the bow tug would usually be released first.
- b. If this is delayed, the speed may start to build up and this can rapidly bring the tug into the dangerous zone of varying pressures around the vessel's bow.
 Bow tugs should always be released prior to speed exceeding 4-6 knots through the water.
- 14. Different procedures for releasing bow and stern tug:
 - a. There is an important difference in procedure when disconnecting the bow or the stern tug. The bow tug will be ahead of the vessel and can easily manoeuvre clear from the vessel. Therefore, the bow tug towline should be released and let go rapidly as there is very little risk that the towline will end up in the tug's propellers.
 - b. If the towline is released and immediately dropped down in the water the vessel's propeller wash will push the towline towards the tug with the possibility of it fouling with the tug's propellers. Therefore, it is imperative that the towline is lowered down slowly as requested and indicated by the tug crews. At no time should the line be dropped down into the water before a clear sign from the tug to do so is received.



Fig.3 - Releasing tugs - different procedure for bow and stern tug

Standard Risk Assessment (Ship Towage)

15. All Towage Operators licensed by RAK Ports shall have in place current risk assessments for all standard towing operations and any unusual or specific operation will require at least a dynamic risk assessment.



SECTION FIVE

Non-Routine Towage (Dead-ship)

Towing Barges/Dead-ship

- 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 requires careful consideration.
- 2. Non-Routine Towage shall apply to vessels, barges etc. requiring non routine towage including but not limited to Dead Tows (cold move), unusual objects or floating objects, etc. which are subject to compulsory pilotage.

Barge/Dead ship to have a Tow Master

- 3. 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. 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.
- 4. Ship owners, Marine Agents, Tenants/Operators and Tug Masters are advised that there must be a designated Towing Master allocated to each move (berthing, sailing or shifting) who will also produce risk assessment and method statement, including a passage plan which must be discussed with the port authority prior to the manoeuvre. The Towing Master must not be the Port Pilot or any RAK Port staff.
- 5. The Tow Master will board the barge on arrival/departure (in the absence of an embarked individual) and will act as Tow Master who will remain responsible for the safety of the barge at all times.
- 6. Whilst alongside a responsible organisation is to be nominated and Port Authority notified accordingly.
- 7. The Tow Master must ensure that he is in possession of the contact details (Phone and/or VHF) of the rigging crew and shore side line handlers.
- 8. The correct use of tugs on such objects requires special consideration and proper planning should be given to the movement of such vessels or floating objects.

Dead Tow Application

9. The dead tow method statement must be submitted by the responsible person/organisation to Harbour Master's Office / relevant Marine Department / Port



Towage Guidelines

Control for approval. All dead tows are subject to a consultation with either relevant RAK Ports Pilot / Port Manager (Al Jazeera Port) / Port Manager (Ras Al Khaimah Port) or Deputy Harbour Master / Harbour Master at a minimum of 72 hours' notice. Arrivals/departures from/to sea should be pre-approved by the Port Authority utilising Non-Routine / Dead-Ship Towage Application Form (see **Annex 4** to this *document*). A method statement regarding the following to be submitted:

- a. Riggers/line handlers being transferred to the tow to recover sea gear.
- b. Emergency tow lines and to prepare for berthing.
- c. Weather limitations.
- d. Suitability of destination berth and whether adjacent berths need to be cleared.
- e. Key decisions should be recorded and the person (acting as Towing Master) who is responsible for the safety of the manoeuvre and the passage plan should be clearly identified.
- 10. In the event of requiring line handlers to board an unmanned tow, this activity will not be permitted during the hours of darkness unless adequate lighting is provided.

Special Towage Operations

10. The majority of this document is aimed at ship/barge assist towage operations. There are occasions when towage occurs involving very unusual objects. Whenever there is a need to conduct such an operation, a specific pre-movement planning meeting is to be held to discuss the operations and to agree actions between all stakeholders involved. The Harbour Master or nominated deputy will chair any such meeting.

Safe Means of Access, Lighting and Transfer of Personnel

11. A safe means of access must be provided for personnel boarding barge/deadship. A vessel must be provided for the transfer of personnel, unless otherwise agreed by the Port Authority neither pilot boat or tug can be used for this purpose. Barge/deadship must have adequate lighting for personnel working on board. Daylight only restrictions will be applied when no form of artificial light is available.

Pilotage Requirements

12. Information on Pilotage requirements is contained in the Pilotage Directions. Pilots or Deputy Harbour Master should be consulted prior to commencement of an operation to determine requirements of pilot for each job. For the sake of clarity, the length overall of a tug and tow is the combined length of towing vessel and



Towage Guidelines

vessel being towed, and the towing medium. See Pilotage Directions at: http://rakports.ae/wp-content/uploads/2019/12/Pilotage-Directions.pdf

Toolbox Talks/Pre-Job Briefing

- 13. The Toolbox Talk/ Pre-Job Briefing is normally a brief meeting (10- 15 minutes), with the people who will be carrying out the work to discuss potential hazards & safety issues and to ensure everybody knows what they are supposed to be doing.
- 14. Briefings should be held between relevant parties such as shore crew, boatmen, riggers, tow master and pilots. Tug crews should be briefed about dead-ship/barge tow directly by the pilot after arriving on scene. More complicated jobs requiring the need for numerous tugs may need a toolbox talk with all Tug Masters in attendance. Time should be made in the schedule for such pre-job briefings, including tugs arriving earlier on a job.



SECTION SIX

Towing Arrangements

Barge/Dead-ships/Structures

1. Barge/Dead ships/Structures must have appropriate securing points and rope leads, clear of sharp edges, to attach towing gear to.

Sea Bridle and Emergency Towline

2. Adequate resources and equipment must be provided for the recovery of the Sea bridle and the streaming/recovery of the emergency towline. Pilots and tug crews cannot assist with these tasks.

Bridle Work

3. The preferred method of towing a non-propelled object is with towing bridle/s. The bridle consists of two equal length ropes which are shackled to the tug's towing hawser. Bridles will only be provided with Harbour Tug sufficient notice.

Use of Gog Rope during Towing Operations

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

Retention



Composite Unit

5. When pushing a barge ahead, the use of winches is recommended to ensure that the barge is securely attached to the tug, thereby ensuring that the tug and tow operate as a single unit during manoeuvres. The winch wires should be secured to the most outboard set of bollards of any pushed barge or combination of pushed barges. In addition, there should be two substantial lines connected from the barge's port and starboard quarter bollards to the tugs head post preventing the horizontal movement of the tug across the width of the barge.





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Towing Alongside/Towing on the Hip

6. Towing alongside should be undertaken using a suitable heavy spring, a head rope and stern rope. The tug should be positioned so that the stern of the tug just overhangs the stern of the barge. However; there are exceptions to this, for example when considering the length of tow or the direction in which you want the vessel to turn the quickest. The further the tug is positioned forward the more difficult it is for the stern of the tug to direct the heading of the tow. Considerations should be given to this when making up a tow alongside.

Fig.5 – the figure below is an illustrative example only



Towing Alongside



SECTION SEVEN

Preparing for Towage Operations

Planning and Coordination

- Before beginning towing operations, a comprehensive plan of action (part of the ship's port passage plan) should be discussed and agreed by the Pilot and Master

 if a Pilot is embarked - taking account of all relevant factors, including tide, wind, visibility, the ship's size, type and characteristics, the Berthing Schedule, Berth Operator's/Tenant's requirements.
- 2. A good knowledge of the type and capabilities of the tugs allocated to the job is important, in order that the Pilot and Master can ensure tugs are both suitable for the task ahead and positioned on the vessel so as to be most effective, and to facilitate a safe operation.
- 3. Any conflict or mismatch between the required manoeuvre and the tugs allocated must be resolved before the towage operation begins.
- 4. When berthing, shifting 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 as appropriate.
- 5. 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.
- 6. All those with a responsibility for personnel or equipment involved in assisting the towage/mooring of vessels have a duty to ensure that safe working practices are followed, and that associated equipment is fit for purpose. They should also ensure that those involved are properly trained, adequately briefed in their duties, and issued with, and use, suitable and effective personal protective equipment.

Raising of Concerns during Operation

7. 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.



SECTION EIGHT

Guidance on Towage

General

 This section seeks to offer guidance on towage operations based on standards procedures for towage and local procedures specific to RAK Ports areas of jurisdiction.

Exchange information Beforehand

2. The tug information can be exchanged during the voyage under the pilot's advice, as opposed to being exchanged at the time of pilot boarding/guiding, when there are other navigational priorities to be addressed.

Communication in Pilot Passage Planning

3. Good communication between master and pilot is paramount. The pilot and master should discuss and agree the intended passage plan prior to commencing passage in order to be aware of the conduct of the operation.

Pilot/Vessel Master Exchange

- 4. In addition to the standard information passed to the Pilot, it is recommended that the master provide the Pilot with a deck General Arrangement showing the layout and safe working load (SWL) of the mooring fittings, where known, and inform him:
 - a. Which fairleads, chocks, bollards and strong points can be used for towing.
 - b. The SWL of this equipment.
 - c. Areas of hull strengthened or suitable for pushing and relevant identification marks employed.
 - d. Using ships' mooring lines as towlines is not permitted except in an emergency.
 - e. Any special features (i.e. controllable pitch propellers, thrusters etc.).
 - f. The Pilot should advise the Master:
 - (1) The tug rendezvous times and positions.
 - (2) The type of tugs and mode of towage.
 - (3) Maximum planned speed for the passage.
 - (4) The method by which the ship's crew should take on board and release the tug's tow line.
 - (5) The use of appropriately weighted heaving lines.



- (6) Areas of the transit posing particular risks with respect to the possible use of the tug.
- (7) Intentions with regard to use and positioning of the tug(s).

Pilot/Tug Master Exchange:

- 5. The Pilot and Tug Master Exchange should, as a minimum, discuss the following issues:
 - a. The SWL of the vessel's equipment used for towing.
 - b. The tug hook up point, taking into account the prevailing weather and sea conditions.
 - c. The maximum speed of the tug.
 - d. Passage details in their entirety while accompanied by the tug(s), particularly details of any swing manoeuvre, release position and sequence of release.
 - e. Berthing details in their entirety, including tug positioning around the vessel's hull and the vessels required position on the berth.
 - f. Emergency use of ships anchors.
 - g. Any unusual items regarding the particular vessel as gleaned from the Master/Pilot exchange; any failure or reduction in the tug's ability to manoeuvre or deliver.

Pilot/Tow Master Exchange

- 6. In addition to items listed in Pilot Vessel Master Exchange and Pilot Tug Master Exchange, the Tow Master and the Pilot must establish the following:
 - a. Methods of Communication.
 - b. Clear understanding of responsibilities.

Pilot/Tug Master and Mooring Team Exchange

7. The Pilot/Tug Master should ensure that the Mooring Team are fully briefed as to the mooring/unmooring plan, information regarding any restrictions that may affect line handling; and the Pilot/Tug Master should not break communication with the mooring team until the towage/mooring operation is complete.

Pilot/PEC Holder and Tug Master

- 8. The Pilot/PEC Holder (with towage endorsement) and Tug Master shall, as a minimum, discuss the following issues:
 - a. Methods of communication.

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- b. Clear understanding of responsibilities.
- c. The SWL of the vessel's bollards, fairleads, strong points etc. to be used for towing (failure to provide this information could result in damage to the vessel or tug);
- d. The tug hook up point, taking into account the prevailing weather and sea conditions, or escorting operation (if appropriate) and berthing.
- e. The planned (optimum) vessel speed through the water when connecting to the tug's towline.
- f. If active escorting, the start point of the escorted passage.
- g. The maximum speed of the tug.
- h. Passage details while accompanied by tugs, particularly details of any swinging manoeuvre, release position and sequence of release.
- i. Berthing details in their entirety, including tug positioning around the vessel's hull and the vessel's required position on the berth.
- j. Any significant weather forecast/anticipated.
- k. Any unusual items regarding the particular vessel as gleaned from the Master/Pilot exchange.
- I. If appropriate, any shallow water effect areas where significant surges may be experienced that may add to the tug's towline loads.
- m. The Tug Master shall advise the Pilot immediately if there is any reduction in the tug's operational characteristics, such as ability to manoeuvre, deliver bollard pull or any other operational defect which could affect the tug's capabilities.
- n. When confirming that the tug is fast and ready to assist, the Tug Master shall also confirm both the tug's name and position on the vessel.

Towing Lines

9. Always inspect the lines externally and internally, if they are to be used for tug assistance. All types of towing lines are subject to wear and tear, even steel wires, but it is quite understandable that synthetic lines are much more vulnerable. It is important to verify that the chocks or leads through which towing lines will be led have a really smooth surface.

Tow Line Length

10. Tow line length should be carefully considered prior to commencing any towage operation. The benefits of opting for a long or short towline should be weighed



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against their hazards, against all parts of the transit. It is possible that tow line length may need to be adjusted, along with tug positioning during each stage of the transit through the harbour. If adjustments are required then, where these are to be done should also be planned in advance to minimise delay but also maximise the safety of all concerned.

11. Where tow line length is short, Pilots, Masters and Tug Masters should pay particular attention to vessel speed, due to the reduction in available time available for the Tug master to react to changes in course and speed of the assisted vessel.



SECTION NINE

General Guidelines to Minimum Tug Requirements

The General Guidelines

 These Guidelines establish minimum tug usage in average conditions. Proposed movement is further assessed on a case by case basis. Pilots may vary the tug requirement for any movement, depending on experience, prevailing conditions or special circumstances that may apply in consultation with the Harbour Master/Deputy Harbour Master/Port Manager. See "Tug Allocation Table" in RAK Ports 'Towage Procedure' at:

http://rakports.ae/wp-content/uploads/2019/12/Towage-Procedure.pdf

- Additionally, ad hoc vessel movements will be reviewed on a case by case basis. In ALL such cases and Non-Routine Towage, a method statement and risk assessment must be submitted to the Harbour Master in advance of the proposed time of commencement of the operation. Failure to comply with this requirement will result in delay.
- 3. Azimuth drive propellers, Bow and Stern Thrusters which are fully operational, producing a sufficient thrust appropriate to the vessels size may be considered by the Pilot and/or Deputy Harbour Master/Harbour Master in reducing towage requirements.
- 4. A tow service will not normally take place in winds, in excess of 20 kts (steady) for Arrivals and in excess of 25kts (steady) for Departure. The following provides guidance for planning the tug use requirements:
 - a. Wind speed less than 20 knots from an adverse direction.
 - b. Swell prediction to indicate 1.5 metres or less from an adverse direction.
 - c. Tow hook set length tows are not favourable for the port entrance and are only accepted on a case by case basis.
- Towage of barges into and out of the port will not be undertaken until receipt of a Towage Approval Certificate. The Towage Approval Certificate needs to be issued in accordance with the Guidelines for Safe Ocean Towing issued by IMO (Ref. T1/3.02) (MSC/Circ.884, dated 21 December 1998). In addition, the following documents must be readily available for inspection.
 - a. Approved Barge Stability Booklet.
 - b. Vessels P & I certificate covering Collision, wreck removal, pollution and damage to fixed and floating objects.
- 6. The barge calling RAK Ports and Stevin Rock Harbour must ensure:

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- a. Load condition is in accordance to the loading conditions as stipulated in the stability booklet.
- b. The Cargo is stowed properly and that the barge has positive stability for all stages of the voyage.
- c. All barge manholes covers and other deck openings are properly secured and watertight prior to departure load port.
- d. The hull integrity of the barge is intact and that no water ingress or list is observed.
- e. Safe access shall be provided for the tug and barge upon berthing.
- f. Fendering on both sides of barge and tugs have to meet to the satisfaction of the Port Authority.
- 7. The following conditions have to be met to the satisfaction of the Port Authority:
 - a. The tug shall have onboard the latest Navigation Charts for calling RAK Ports, Stevin Rock Harbour and approaches as well as the latest Notice to Mariners and Marine Safety Notice.
 - b. Safe gangway with a properly secured safety net for accessing the tug and barge.
 - c. Lights and shapes, which comply with international regulations for collision prevention at sea.
 - d. The loading marks of a Barge shall not be submerged at any time during a voyage or on arrival.
 - e. No tow shall be undertaken with the low line led directly to a set of bitts.
 - f. The barge shall display the appropriate the shapes and lights.
 - g. The barge shall have appropriate boarding facilities when alongside berth.
 - h. The towing operations shall be conducted in a safe manner in order to ensure safety at sea and in accordance with good seamanship practice.
- 8. Preventing the loss of human life, avoidance of damage to the environment and to property and in accordance with the following IMO Recommendations and guidelines:
 - a. Resolution A.765(18) on Guidelines on the safety of towed ships and other floating objects, including installations, structures and platforms at sea.
 - b. MSC/Circ.884 on guidelines for Safe Ocean Towing.



ANNEX 1

TUG TYPES AND METHOD OF OPERATION

Conventional Screw Tug

Worldwide, the largest number of tugs belong to this type. The towing point (e.g. towing bits, hook or winch) is located approximately 0.45xLOA 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". 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.

Azimuthing Stern Drive (ASD) (Z-peller)

This is a tug where normal propellers and shafts have been replaced by azimuthing propulsion units, which enables 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 twinscrew 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. The towing point on an ASD tug is located on the foredeck; however, some ASD tugs may have additional towing points on their after decks, thus enabling them to function in a similar manner to a conventional twin-screw tug (but with increased manoeuvrability).

ASD tugs can be referred to as "reverse-tractor tugs". This definition is applied mainly to tugs with stern-mounted azimuthing propellers but with limited or no towing fixtures on their aft decks.

Voith-Schneider Tractor Tug (VST)

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

The Voith-Schneider Tractor Tug (employing Voith-Schneider cycloidal propellers) was introduced mainly for ship-handling due to its exceptional manoeuvrability and safety in operation, which is inherent in the tractor principle.

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Skeg-First Escort Tug

An advance in tractor tug technology, primarily designed for active escorting of large vessels on long approaches/passages. Similar in construction to the conventional Voith-Schneider Tractor; however, designed specifically for exerting much larger steering forces (generated by in-direct towing techniques).

Azimuthing Tractor Tug (ATT)

Tractor tugs using azimuthing propulsion units were first built in the 1970's as a possible alternative to the Voith-Schneider system, introduced some years earlier. The azimuthing units are placed in the same location as the Voith-Schneider propellers, i.e., under the forward part of the hull. Differences between the Voith-Schneider tractor tug and the azimuthing tractor tug are:

- Propulsion systems, cycloidal propellers verses screws in nozzles
- Response time of Voith-Schneider tug is faster
- Azimuth tractor tug is more efficient (in terms of tonnes bollard pull per BHP)

Variations on the ATT design are the "ROTOR-Tug" and "Ship Docking Module" (SDM).

Тид Туре	Azimuth Stern Drive (Z-Peller)	Tractor Tugs (Azimuth Tractor or Voith-Schneider Tractor)
Typical Example	Harbour/terminal/escort tug	Same as stern drive
Main purposes	Mooring/un-mooring	Same as stern drive
Propulsion	Mounted under tug's stern Azimuthing (360 °) propulsion unit (May be optimised by the use of controllable pitch propellers or slipping clutches)	Propulsion units ¼ aft of bow Voith-Schneider propellers or Azimuthing propulsion units
Manoeuvrability	Excellent for use in harbour/terminal towage.	Voith: very rapid response time due to the fast pitch changing of the blades, excellent for dangerous operations.
Bollard Pull & related power	30 tonnes and over	30 tonnes and over. For similar BHP, VST will have a lower BP than ATT
Offshore Capabilities	Good	Reasonable
Main disadvantage	Limited offshore capabilities	Draft and unable to undertake long distance tows.

Main Characteristics of Tug Types (ASD, VST & ATT)

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Propulsions Systems

At the heart of every tug, and the feature that probably attracts most attention, is the propulsion system. In order to give an overview of the various propulsion systems, the following table has been prepared.

Propulsion System	Function	Тид Туре	Manoeuvrability
Conventional Screw Propellers	Strait Ahead Propulsion, limited performance running astern	Conventional or twin screw tugs	Limited (better with twin screws)
Special Rudders	Increase the manoeuvrability of conventional screw tug	Conventional single or twin screw tugs	N.A
Propulsion Nozzles	Fixed/Steerable tubular shroud fitted around the propeller to increase the BP of the tug	Conventional tugs, ASD and ATT	N.A
Controllable Pitch Propellers	The pitch of the blades can be adjusted to suit the operation. Offers fast response from ahead to astern	Conventional tugs, ASD, ATT and VST (cycloidal). Also fitted to Ocean-going tugs	Decreases the response time, especially from ahead to astern
Azimuthing Propulsion	Entire propeller can be rotated 360°. Effectiveness may be increased by use of CPP or slipping clutches.	ASD and ATT as harbour or terminal tugs	Excellent for mooring/unmooring
Voith-Schnelder Cycloidal Propeller	Propulsion units have blades attached to a hub that roates about a vertical axis. Changing the angle of the balde gives a new pitch and thrust direction.	Voith Tractor Tugs only	Control is superior to other propulsion types. Efficiency of BP/BHP is lower than screw props.
Bow Thruster	Bow thruster provides additional thrust to tug @ 90 ^o to centre line	All types except Tractor tugs	Improves Manoeuvrability Retractable thrusters enables tugs to be multifunctional

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Retention



The bollard pull of a tug is the amount of static force (pull) that can be exerted when tethered to a measuring device. Mostly this is done through a secured towing line connected to a dockside bollard. Due to the requirements of the classification society/authority, the locations of these trials are mostly in very secluded places, where weather conditions would have little effect on the results. These trials have been introduced because the variety of propulsion systems available at this moment no longer make it possible to judge the force available from a tug by the horsepower of its engines alone. Particularly with ship-handling tugs, the trials will include the pulling both ahead and astern, due to the fact that both functions are used during different modes of operation.

The towing force (pull) of the tug depends on its engine power and on the type of propeller, as becomes evident in the following table:

Type of Propeller	BP Ahead in tonnes/100 BHP (approximate value)
Conventional (with Nozzle)	1.50
Azimuthing with Nozzle (ahead pull)	1.35
Conventional (without Nozzle)	1.30
Voith-Schneider Propeller	1.15

Conclusion:

For the same installed horsepower, an ASD or ATT tug will have a higher bollard pull rating than a VST tug.

On the Line

"On the line" towing means that the tug is connected to the assisted vessel by a towline. This is the traditional method of harbour assistance in many ports.

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

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.

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The location of the towing point on ASD tugs (when operating over the bow) and Tractor tugs reduces the risk of girting.

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.

Push-Pull

The push-pull operation means that the tug is connected to the assisted vessel by a short 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 short line. This method originates from Japan and South-Asia.

Due to the limited power of conventional tugs when running their propellers astern, their ability to pull-back on the line will be limited.

When the tug is not connected to the vessel by a bow or stern line, this is simply called pushing. This method of operation is used by (amongst others) conventional tugs operating in North America.

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, here referred to as the 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 6 knots (approximately).

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

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Tug Types and Methods of Operation

The table below summarises the suitability of the three distinct tug types in relation to the basic ship-handling methods as earlier discussed. It also gives a very clear reason why Marine Service Providers favour ASD and tractor tug types over conventional tugs for ship handling. Given the fact that, where possible, Push-Pull is the preferred method of operation, it could be said that to undertake the equivalent operation employing conventional tugs only, double the number of conventional tugs could be required when compared to a similar operation employing either ASD or tractor type tugs.

Тид Туре	Method	Remarks
Conventional Tug	On the line	Poor manoeuvrability at large
		sheering angles.
	Push-Pull	Only pushing or puling.
	Indirect	Very difficult due to lack of
		directional control of the tug.
Azimuth Stern Drive Tug	On the line	Good performance when
(ASD) (Z-Peller)		working over the stern, but
		risk of girting exists at higher
		speeds. Working over the bow
		reduces girting risk.
	Push-Pull	Very good performance
		working over the bow.
	Indirect	Good performance working
		reduced over the bow.
Tractor Tug (VST or ATT)	On the line	Good performance with
		reduced risk of girting.
	Push-Pull	Good performance.
	Indirect	Good performance with
		reduced risk of capsizing.

Table of Tug Types and Methods of Operation

Please see **Annex 3**, for the list of current ship-handling tugs and other purposes boats operating in RAK Ports.

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ANNEX 2

BOLLARD PULL REQUIREMENTS

The following tables have been produced to assist determining towage requirements with respect to windage. Tidal calculations have not been modelled owing to the general requirement for slack water movements.

		Vessel Height in Metres													
LOA	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40
50	250	375	500	625	750	875	1000	1125	1250	1375	1500	1625	1750	1875	2000
75	375	563	750	938	1125	1313	1500	1688	1875	2063	2250	2438	2625	2813	3000
100	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500	3750	4000
125	625	938	1250	1563	1875	2188	2500	2813	3125	3438	3750	4063	4375	4688	5000
150	750	1125	1500	1875	2250	2625	3000	3375	3750	4125	4500	4875	5250	5625	6000
175	875	1313	1750	2188	2625	3063	3500	3938	4375	4813	5250	5688	6125	6563	7000
200	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000
225	1125	1688	2250	2813	3375	3938	4500	5063	5625	6188	6750	7313	7875	8438	9000
250	1250	1875	2500	3125	3750	4375	5000	5625	6250	6875	7500	8125	8750	9375	10000
275	1375	2063	2750	3438	4125	4813	5500	6188	6875	7563	8250	8938	9625	10313	11000
300	1500	2250	3000	3750	4500	5250	6000	6750	7500	8250	9000	9750	10500	11250	12000

Determine lateral surface area

Determine Bollard Pull

	Wind speed in knots									
Lateral surface Area (m²)	5	10	15	20	25	30	35	40	45	50
0	0	1	2	4	6	9	12	16	20	25
1000	1	2	5	8	13	18	25	32	41	50
1500	1	3	7	12	19	27	37	48	61	75
2000	1	4	9	16	25	36	49	64	81	100
2500	1	5	11	20	31	45	61	80	101	125
3000	2	6	14	24	38	54	74	96	122	150
3500	2	7	16	28	44	63	86	112	142	175
4000	2	8	18	32	50	72	98	128	162	200
4500	2	9	20	36	56	81	110	144	182	225
5000	3	10	23	40	63	90	123	160	203	250
5500	3	11	25	44	69	99	135	176	223	275
6000	3	12	27	48	75	108	147	192	243	300
6500	3	13	29	52	81	117	159	208	263	325
7000	4	14	32	56	88	126	172	224	284	350
7500	4	15	34	60	94	135	184	240	304	375
8000	4	16	36	64	100	144	196	256	324	400
8500	4	17	38	68	106	153	208	272	344	425
9000	5	18	41	72	113	162	221	288	365	450
9500	5	19	43	76	119	171	233	304	385	475
10000	5	20	45	80	125	180	245	320	405	500
10500	5	21	47	84	131	189	257	336	425	525
11000	6	22	50	88	138	198	270	352	446	550
11500	6	23	52	92	144	207	282	368	466	575
12000	6	24	54	96	150	216	294	384	486	600

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Retention	@ Office	@ Archives		
	0-2 years	3-5 years		



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ANNEX 3

PLANT & EQUIPMENT LIST – RAK PORTS

Vessel	Age	Туре	Rating	Power	Propulsion	LOA	Beam	Draft	Remarks
Osprey	Jul 2018	Damen ASD Tug	80t Bollard Pull	5050kW	ASD	29.1m	13.2m	5.5m	Fi-fi
Kestrel	Jun 2013	Damen ASD Tug 2411	69t Bollard Pull	4180 kW	ASD	24.5m	11.3m	5.5m	Fi-fi
Falcon	Nov 2012	Damen ASD Tug 2310	48t Bollard Pull	3000 kW	ASD	22.7m	10.4m	4.35m	Fi-fi
Sha'm	Feb 2008	Damen Stan Tug 2608	53.8t Bollard Pull	2850 kW	Twin Screw	26.2m	7.94m	3.91m	Fi-fi
Durrah	May 2002	Damen Stan Tug 2207	36.7t BP	2028 kW	Twin screw	22.5m	7.25m	3.35m	Fi-fi
Hulaylah	Nov 1995	Damen Stan Tug 1906	18.0t BP	1044 kW	Twin Screw	19.5m	6.04m	2.5m	Fi-fi
Hawk	Nov 2019	Damen Stan Tug 1907	29.7t Bollard Pull	1492 kW	Twin Screw	19.3m	7.34m	2.95m	Fi-fi
Hobby	Feb 2019	Damen Muticat 1908	13.5t Bollard Pull	894 kW	Twin Screw	19.0m	8.06m	2.10m	20t Crane
Masafi	Nov 1995	Damen Stan Tug 1906	18.0t BP	1044 kW	Twin Screw	19.5m	6.04m	2.5m	Fi-fi
Ghalilah	1976	Damen Stan Tug 1605	9.6t BP	720 hp	Twin Screw	15.7m	4.9m	2.25m	Plough can be fitted
Hannah 1	2008	Harbour Patrol		2 x 150 hp	Twin Outboards	8.7m	2.4m	0.44m	Security patrol
Vulture	2014	Pollution response		86 hp	Twin Screw	9.2m	3.8m	1.5m	Garbage/ debris collection
Eagle	2016	Pilot Boat UAE		1200 hp	Twin Screw	15.0m	5.1m	1.1m	
Al Hamra 1		Pilot/Patrol Boat				12.7m			Owned by AJZP
Kite	2017	Catamaran Survey Vessel	-	700 hp	TS	13.0m	5.6m	1.2m	Hydrographic survey vessel

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Potention	@ Office	@ Archives		
Retention	0-2 years	3-5 years		



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ANNEX 4

NON-ROUTINE/DEAD-SHIP TOWAGE APPLICATION FORM

RAK PORTS



NON-ROUTINE/DEAD-SHIP TOWAGE APPLICATION FORM To be completed by Project Manager/Agent/Towing Master/Responsible In-charge RAK PORTS Doc. No. RP MD 010-01 Rev. Orig. Issue Date: 06-09-2017

completed by Project Manager/Agent/Towing Master/Responsible In-cha Online form available at: <u>https://www.rakports.ae/marine/</u>

Port name \Box SPA \Box AJZP RAKP \Box RAKMCFZ AJRP Dead-ship / Tow Details Other Dead-ship Barge (alone) **Unusual Object** Intended Move Berthing Sailing Shifting Name of the Vessel/Tug/Craft/Barge/Other (specify): LOA Breadth Draft Gross Tonnage Flag IMO No. Class Brief Description of Tow Is the Tow Manned Yes No No If Yes, Specify Are Safe boarding arrangements available on each vessel requiring a pilot/crew transfer? No Yes Give Details of Boarding Arrangements: What Functioning Propulsion/Steerage does the Tow Have? Thruster(s): Rudder(s): None Propeller(s): Does the vessel have overhangs? (If yes, give details): Are there visibility restrictions owing to structures or cargo? (If yes, give details): Additional Manoeuvring Information/Restrictions: **Date & Location** Date/time of Intended Move Berth/Location (From) Berth/Location (To) Last Port of Call Next Destination Agent/Operator (Responsible Organisation – Alongside) Marine Agent & Contact Details **Operator/Tenant & Contact Details** Service Required / Vessel Alongside / Double Banking Pilot Tugs Seaman Shore Bosun / Mooring STBD side Preferred vessel alongside? Portside Mediterranean / Special If double banking required, give details: Nominated Person/In-charge On Board the Dead-Ship/Tow Rank or Position Name

 Company/Vessel
 Contact Number(s)

 • The Nominated Person/In-charge must be on-board the dead-ship with Overall Responsibility for the safety of the manoeuvre.

 • He will be acting as the Towing Master.

He will be responsible for the production of risk assessment and method statement.

A passage plan must be discussed and agreed with the pilot/tug master prior to commencing movement.

Method Statement & Sketch (How will you achieve the Tow/Transfers)	Person Completing the Form
	I confirm all details provided are accurate and correct to the best of my knowledge.
	Stamp & Signature:
Note: To be submitted at least 24 hours before arrival and 12 hours before departure	vintornal chifting

Note: To be submitted at least 24 hours before arrival and 12 hours before departure/internal shifting.

Any change in the intended move and ETA/ETD must be notified to Port Control in advance.

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Retention	@ Office	@ Archives
	0-2 years	3-5 years



ANNEX 5

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

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

Do not send the crew to the mooring stations (too) late.

Do not maintain the speed of the vessel too high whilst securing tugs.

Do not use DANGEROUSLY HEAVILY WEIGHTED HEAVING LINES.

Do not execute course changes whilst the tugs are securing their towlines.

Do not use tug Master's name when communicating orders to the tugs.

Do not engage the vessel's engine/s during manoeuvres without first informing the respective Tug Masters.

Do not throw the heaving line (at the bow) from the centre line but from the ship's shoulder.

Do not make rapid and excessive steering changes without informing the tugs.

Do not build up speed in excess of 6 knots through the water with the bow tug (still) connected.

Do not use full engine power particularly on a large vessel when a tug is secured aft.

Do not 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.

Do not keep floodlights shining towards the tug in case of restricted visibility.

Do not 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.

Do not build up speed over 6 knots through the water starting from a "dead ship" with a bow tug secured.

Do not drop the towline at the stern when disconnecting the tug (unless instructed otherwise by the tug).

Do not delay to drop the towline at the bow when disconnecting the tug once instructed to do so by the tug.

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ANNEX 5 (CONT'D...)

DO Pilot - Master Exchange of Information or Vice Versa

Do not wait for something to happen to start preparing the heaving line(s) again.

Pilot-Master exchange to include info on modus operandi of tugs.

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.

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.

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.

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ANNEX 5 (CONT'D...)

DO Actions of Pilot, Ship's Master and Mooring Parties

Do bring speed down sufficiently before securing a tug, especially the bow tug.

Do limit use of propeller to the minimum required for steering.

Do drop the towline **at the bow** when disconnecting the tug, however only when instructed to do so by the tug.

Do 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.

Do use tug's names when conveying orders to the tug and provide clear and concise instructions.

Do turn off floodlights as soon as the tug is secured.

Do have a spare heaving line ready at hand and a skillful deckhand to handle same.

Do use heaving lines with light weights, preferably using soft sand bags.

Do inform the stern tug before engaging engines astern.

As may be noticed, items are repeated in both the **DO** and **DO NOT** section, obviously in the opposite way. This was done intentionally to increase the chances that they will be noted and remembered.

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