

# **BEST MARITIME PRACTICE- EMERGENCY OFFSHORE TOWING**

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## **1. OVERVIEW**

The objective of this Best Maritime Practice is to set forth the Harbor Safety Committee's expectations regarding the planning and execution of emergency towing operations. This BMP provides guidance to ensure that the best towing assets with the most appropriate equipment and properly trained crews are deployed from San Francisco Bay for emergency towing. This BMP has been compiled so that the assigned tug(s) and vessel in distress have a common understanding of what is likely to occur in the event an emergency towing operation is necessary.

The following entities have a role in executing this Best Maritime Practice:

- 1) The San Francisco Harbor Safety Committee – With representatives from within the Maritime Industry, Regulators, Environmentalists, and the general public this organization has proven to be a valuable team to insure all stakeholder interests are represented.
- 2) Vessel Owners/Operators – The companies that operate the vessels that provide the resources to keep our economy moving.
- 3) San Francisco Bay Area-based Tug Companies – The companies that conduct various towing operations on San Francisco Bay and are capable of performing offshore Emergency Ship Towing.

## **2. GEOGRAPHIC SCOPE**

The jurisdiction of the Harbor Safety Committee of the San Francisco Bay includes all of the inland Bay waters and extends to the "SF" buoy and the sea approaches to San Francisco Bay east of that point. This BMP is intended to protect the resources within the San Francisco Bay by ensuring that appropriate actions are taken to prevent a drift grounding along the CA coast and the consequent environmental damage, which would ensue both to the coast and possibly to the Bay. The tenets of this BMP apply to emergencies within the Bay, and those outside of San Francisco Bay, which may require the deployment of the organic tug assets normally available in San Francisco Bay. The anchorages and dock spaces

which may be the final destination for any vessel experiencing a loss of propulsion whether offshore or within the Bay are located within San Francisco Bay, as are many of the Potential Places of Refuge (PPOR). The decision on the final destination for an emergency tow will be made by a Unified Command, defined in Section 3 below.

### **3. GENERAL GUIDELINES / COMMUNITY RESPONSIBILITIES**

#### **EARLY NOTIFICATION**

The USCG has developed a Homeport Alert Warning System for early notification to tug companies of potential offshore emergencies that may require the use of tugs. This early notification is for informational purposes only and allows the industry to begin to assess their equipment and crew capabilities and timelines for an organized potential response. The tug company can greatly reduce the risk to its crews and be more productive preparing the tug while it is in the harbor rather than having crews do the prep work on deck at sea. Once a company is selected by the Responsible Party, response time will be dependent on the urgency of the situation. All tug companies with interest in and capabilities of responding to Emergency Ship Towing situations offshore are encouraged to sign up for and enroll in the Home Port Alert Warning System, which may be done by contacting the Coast Guard.

#### **RESPONSE PRIORITY**

The Harbor Safety Committee has established the following priority actions for emergency towing situations. Parties should consult closely with the Coast Guard to collaboratively establish specific priorities for each emergency towing incident:

- Triage – assess the situation and send appropriate assets to address the highest concern situation (eg, drift grounding)
- Stabilize – initially stabilize the drifting vessel and isolate it from immediate danger. If adequate assets are not initially available to begin a towing evolution, it may be necessary to send smaller / less powerful assets to temporarily stabilize and hold the vessel.
- Tow – once the highest risk situations have been avoided and the situation is stable, commence tow to gain full control of the situation.
- Identify Destination – Identify a destination for the towed vessel (if applicable). Should the situation warrant use of the PPOR process (as determined by the Coast Guard and/or appropriate Unified Command), begin vetting process for PPOR within the Bay. Note: the typical emergency ship towing scenario will not require use of the PPOR process.

For incidents that occur within the San Francisco Bay, available tug assets will be immediately dispatched to respond to the situation. Due to the traffic density within the Bay, most casualties which result in the need for such assistance occur where adequate tug assistance is immediately available. This BMP outlines the procedures and practices to ensure timely and appropriate response to incidents in the offshore environment.

The Typical Decision/Action Matrix for Emergency Offshore Towing (**Appendix A**) graphically depicts the risk-based priority for getting tugs underway and on scene outside of the Golden Gate. The Matrix is a tool designed to assist the Coast Guard, vessel operators and towing companies in determining the highest risk areas, and to inform vessel operators of potential actions and expectations of the Coast

Guard given the distance offshore. The Matrix does not definitively dictate the boundaries between the areas of highest, medium and low risk, but rather is a tool to enhance risk assessment and decision making. Other factors such as prevailing weather, vessel traffic conditions, and vessel material condition also impact assessment of risk and associated response posture. The goal of any response should be to prevent a vessel from drifting into the highest risk (red) areas without the assistance of adequate tugs to stabilize and control the situation. When an incident occurs further off the coast, where the risk of the vessel drifting near shore is reduced, it is possible and prudent to spend more time preparing a response and tow plan.

Under normal circumstances, the Coast Guard will direct the RP to ensure that adequate tugs to control the situation are in place at the 12nm line. The matrix is designed to prompt action in such a manner as to ensure this safeguard is in place and actionable. The Coast Guard will typically require a minimum two tug escort for vessels entering San Francisco Bay following a loss of propulsion.

#### **AVAILABLE TOW VESSELS AND RECOMMENDED TOWING EQUIPMENT**

An inventory of towing vessels in the San Francisco Bay that may assist a vessel offshore can be found in **(Appendix B)**. The inventory is also available on the San Francisco Marine Exchange web site in the Harbor Safety Committee pages, <http://www.sfmex.org/support/hsc/kipsratings/KIPSRatings.htm>. This list identifies tugs which may be available for dispatch to an offshore emergency. The list is for guidance and reference only, since at any given time an individual tug on the list may not be available for various reasons. Specific guidance regarding the appropriate equipment to be carried on a towing vessel is outlined in Section 5 below. The Ship Rescue Requirement Checklist template **(Appendix G)** is recommended to ensure that preparation is thorough.

#### **EMERGENCY TOW VESSEL CAPABILITY MATRIX**

Parties involved in dispatching a rescue tug should refer to the “Emergency Tow Vessel Capability Matrix” **(Appendix C)** in this document as a guide with the understanding that circumstances may warrant the need for additional resources. The matching of rescue tugs to a vessel depends on a multitude of variables. Multiple studies have been completed on this subject and there are many variables which determine a suitable matching of tug quantities and power. The Matrix in Appendix C was compiled by the West Coast Offshore Vessel Traffic Risk Management Project which was co-sponsored by the Pacific States/British Columbia Oil Spill Task Force and the US Coast Guard, Pacific Area. Information was evaluated from five studies from separate sources to develop this Matrix.

#### **INCIDENT MANAGEMENT/UNIFIED COMMAND**

The RP should refer to their applicable emergency response plans to determine their responsibilities and needs. For certain incidents, the Coast Guard may determine the need for a Coast Guard Unified Command (UC) and Incident Command Post (ICP). In the event that either the Vessel Response Plan (VRP) indicates the stand-up of a UC or if the Coast Guard determines the need for a UC, the following personnel, at a minimum, should be represented and present within the ICP:

- USCG Federal On Scene Coordinator (USCG FOSC)
- State On Scene Coordinator (SOSC)

- Vessel Representative (RP)
- Applicable Towing Company representative
- Salvage Representative (as applicable under Salvage and Marine Fire Fighting Plan)

#### **TOW DESTINATION**

The vessel owner will work with Federal regulators (and in some cases State regulators and other stakeholders via Unified Command) to gain approval for the destination, taking into consideration the nature of the vessel's casualty and repair needs. The vessel operator, Pilots, or regulators may require additional tugs to be dispatched as the vessel approaches the San Francisco Bay and certain points within the Bay to ensure safe transit.

#### **CONTINUAL IMPROVEMENT / EXERCISE FREQUENCY**

The San Francisco Harbor Safety Committee is committed to partnering for the greater public trust of California shorelines and is committed to conducting drills and exercises to maintain proficiency and to improve best practices. These exercises will provide the Harbor Safety Committee with a sound feedback mechanism on the applicability of this best practice and will allow the best practice an efficient means for continual improvement.

- a. The Tug Work group will organize and execute periodic drilling of Emergency Towing Situations.
  - i. The Tug Workgroup should hold a table top exercise testing the incident response, incident management and response resources no less than twice in 3 years.
  - ii. The Tug Workgroup should also perform a field exercise involving an actual ship with the objective of testing tow gear, techniques and communication, and sharing lessons learned across the local maritime community, no less than once every 3 years.
  - iii. An actual Emergency Ship Tow may count towards drill credit if the towing company involved is willing to present to the Workgroup a review of the actual tow.

### **4. VESSEL/OWNER/OPERATOR (RP) RESPONSIBILITIES**

#### **GENERAL**

This Best Maritime Practice is intended to assist owners/operators in preparing their ship for an emergency towing incident. Every Ship Master calling upon San Francisco Bay should review this best practice in its entirety prior to his/her first arrival in San Francisco Bay. Owners, operators and crews should take into consideration that the nature of an emergency does not allow much time for deliberation. Accordingly, emergency procedures should be developed and practiced beforehand. The International Maritime Organization has developed Guidelines for owners/operators on preparing emergency towing procedures (MSC.1/Circ.1255) and Guidelines on emergency towing arrangement for

tankers (MSC.35(63), as amended) to assist vessels with meeting the requirements of SOLAS regulation II-1/3-4 (**Appendix D**). The IMO has also developed Guidelines for Safe Ocean Towing (MSC/Circ884), which does not apply to salvage or rescue towing services but provides additional guidance which may be useful for towing vessels.

### **SHIP EVALUATION**

The Master/Crew/Owner/Operator of a vessel should prepare an evaluation to identify their ship's towing capabilities and limitations under various towing configurations. This evaluation/inspection should take into consideration the structure of the ship, the safe working loads of the mooring and ground tackle aboard the ship, the ability to use powered equipment under various causalities, and the equipment aboard the vessel that could be used in an emergency towing situation. Consult SOLAS regulation II-1/3-4 (**Appendix D**) for further details.

### **PROCEDURES**

In conjunction with the Ship Evaluation, the vessel owner/operator shall develop procedures for making up to a rescue tug. Procedures should be developed for various emergency scenarios taking into consideration scenarios involving an immediate threat of grounding, weather conditions (mild & severe), and non-availability of onboard power. Procedures should be specific to facilitate proper execution by crew members. Diagrams of possible rigging scenarios could be developed into a matrix to allow for rapid identification of a tow plan once a ship finds itself in a specific situation.

### **TRAINING**

As with any casualty the possibility of a successful outcome is increased if the crew is trained in dealing with such a situation. The ship-specific procedures should be shared with the crew and Emergency Towing Drills should be incorporated into the ship's drill schedule. Through regular drills and post-drill critiques the ship-specific procedures can be updated and improved from lessons learned during training which will further increase the chance of a successful outcome in an emergency situation.

### **EMERGENCY TOW BOOK**

The inventory gathered during the evaluation process and the resulting procedures should then be documented in a ship-specific Emergency Tow Book (ETB). A sample template of an ETB developed by the IMO is included as **Appendix E**. Vessel Owner/Operators/Agents should have access to this information and be able to immediately distribute it via email to the towing company and to other industry parties participating in the response. Receipt of a copy of the ETB prior to departure on to the distressed vessel will assist the towing companies to more efficiently prepare for the job and is a key factor in the success of the emergency tow.

### **NOTIFICATION**

Early notification to the Coast Guard of a vessel casualty is a key element of initiating an effective response. Vessel owners and operators are required to provide notifications to the Coast Guard in accordance with 46CFR4 and 33 CFR 161 (when within the VTS Area).

## **COMMUNICATION**

In the event of a casualty that may require an emergency tow, time is critical. Early activation of a response by the vessel will decrease the severity of the casualty. Most vessels will never encounter the need to activate such a response, but, if required, the complexity of the situation will be hectic and difficult to relay. The checklist contained in **(Appendix F)** is included in this BMP to serve as a reference for the timely and accurate communication of key information needed to begin a response.

Owners/Operators/Brokers should expedite the decision of which tug company to use so that the tug company can activate its plan.

## **VRP ACTIVATION**

The RP shall activate their Vessel Response Plan (VRP); and/or their Salvage and Marine Firefighting Plan (SMFFP) as applicable under 33CFR155. The provisions of this BMP are non-regulatory in nature and are complementary guidance to VRPs and SMFFPs. The goal of this BMP is to prevent a drift grounding situation by ensuring that appropriately sized and equipped tugs are dispatched to enact the Emergency Towing requirement of the SMFFP in a timely manner. In the event that either the Vessel Response Plan (VRP) indicates the stand-up of a UC or if the Coast Guard determines that a UC is needed, the RP must have a representative present in the UC.

## **5.TUG COMPANY'S RESPONSIBILITIES**

### **GENERAL**

This Best Maritime Practice is also intended to provide towing companies who may be called upon to respond with guidance to ensure that their tug is prepared to respond safely and effectively. Tug companies intending to engage in emergency ship towing operations are encouraged to review and ensure that their Safety Management System is inclusive of control measures that are applicable to such towing operations.

Each tug company offering emergency towing services should have specific procedures contained in their Safety Management System (SMS), or equivalent Operations Manual. The procedures should include specific requirements for what information, equipment, and crew complement is required for various emergency towing scenarios. The Ship Rescue Requirement Checklist template **(Appendix G)** can be a useful tool in ensuring that preparation is thorough. Making up the vessel to the tug is the largest variable in the towing operation; therefore the tug operators' procedures need to address various possible makeups. **Appendix H** shows examples of possible towing configurations that could be used for an emergency towing operation. Procedures should be divided up, separating tasks that should be completed prior to departure, while underway to the vessel, on scene arrival, and during the tow to the final destination. Job safety should be the number one priority and safety meetings with the crew should be held prior to departure and frequently during the operation, specifically including prior to making up to the vessel and after and an on scene risk assessment has been completed.

## **TRAINING**

It is important not only to have procedures, but also to incorporate those procedures into the tug company's training regimen. Not all the mariners working on tugs regularly handle the gear required to accomplish an emergency tow so it is critical that drills and exercises be held to simulate offshore towing operations. Drills should include a review of procedures for deploying an Orville Hook, use of a line throwing apparatus, deployment of an Emergency Ship Towing System (ESTS), a review of various kinds of ground tackle used in connecting a vessel tow. Tug companies offering Emergency Ship Towing services should participate in the Periodic HSC Emergency Towing Exercises. Tug companies should also attempt to hold training with their customers to incorporate ships into the training to more closely simulate actual responses.

## **COMMUNICATION**

The USCG Home Port Alert Warning System alerts tug companies of the possibility of an emergency tow and allows them to begin the process of preparation. Swift and timely preparation can save valuable time in the overall response and significantly reduce risk. The USCG Home Port Alert Warning System message is for information purposes only; it does not award the job to a specific tug company. To the maximum extent possible, Owners/Operators/Brokers should expedite the decision of which tug company to use so that company can begin its preparations accordingly.

As soon as a tug company has been selected, it should be sent a copy of the ship's Emergency Tow Book (ETB). After an initial review of the ETB, the tug company should make direct contact with the vessel to discuss the specifics of the casualty using the communication checklist (**Appendix F**) as a reference to ensure that all pertinent information is gathered. A preliminary tow plan should be agreed upon during this communication, such that the vessel and the tug can begin preparations.

This first communication should also establish the primary and back up methods of communication, as well as a schedule of communications between the vessel and the lead tug.

## **RISK ASSESSMENT**

Tug Companies should conduct a full Risk Assessment prior to getting underway. The Risk Assessment should be conducted with the objective of identifying and implementing any necessary control measures that will reduce the risk to personnel and equipment during the upcoming operation. If the company does not have an official Risk Assessment process in place, the local Coast Guard Sector has several tools available that may assist in this process.

## **MANNING**

It is the sole responsibility of the tug company to ensure that their tug is crewed adequately. In addition to the minimum manning requirements of 46CFR15, the tug company should ensure that a suitable number of crew, with appropriate training to fulfill their roles on the voyage, are aboard the tug to safely execute the emergency towing operation.

## **EQUIPMENT**

It is up to the towing company to ensure that suitable rescue towing equipment is inventoried, maintained in good working order and is readily available to be deployed. Since the various tug companies employ various equipment packages, a specific equipment list will not be included in the BMP. However, the Ship Rescue Requirement Checklist template (**Appendix G**) can be a useful guide for ensuring that preparation is thorough.

## **DEVELOPING THE TOW PLAN**

The towing company should develop a tow plan consistent with its Safety Management System/Operations Manual and the ship's Emergency Towing Booklet. The tow plan should incorporate the tenets of the Best Practices of Dead Ship Towing as applicable to the situation. Tow plans are intended to be dynamic, allowing for deviations and adjustments as dictated by the changing conditions. Where conditions permit, the tow plan should be drafted and available for review prior to the tug departing for the Emergency Ship Tow.

## **ARRIVING ON SCENE/EVALUATION OF SHIP**

When the tug arrives at the vessel's location the tug Master should circle the ship to check its condition, drafts and trim. Once that is done the Master should stop the tug and lay ahead and then astern of the ship to see how the ship and tug will drift and lay relative to each other when at each location. Keep in mind that different ships will lay to weather, seas and current differently and will drift to the lee side at different rates. If the Master determines that the actual conditions are significantly different than what was identified in the initial risk assessment, the Master should conduct an additional risk assessment and take necessary action to mitigate those risks. .

## **COMMUNICATING THE TOW PLAN**

Once the tug Master establishes his final operational plan for taking the ship under tow, he should provide the ship with a copy so the vessel understands the rigging and what is expected of them in the operation. A final pre-job conference must be held between the Master of the lead tug and the vessel's Master once the vessels are in close proximity to one another. Close radio communications between the tug and ship are crucial to executing a successful tow. Often ships have communication procedures routing all external coms (from the tug) through the ship's bridge and then on to the working deck crew. This can be very challenging. If possible, the Master of the lead tug should request direct communications with the working deck supervisor.

## **EXECUTING THE TOW PLAN**

Once the final tow plan has been communicated to the satisfaction of both Masters, the Tug Master should proceed with the tow connection, ensuring that personnel safety remains the priority.

The Tug Master should now be able to pick the best orientation of his tug relative to the ship and position the tug to make the tow connection. In most cases this will end up being in the lee of the ship's bow, but it depends on the connection method to be used and the sea conditions. If the ship has severe



bow damage, then a stern first tow will have to be considered. The Master should choose the position of the tug which reduces maneuvering and holds the tug at a constant safe distance to the vessel.

If the weather is heavy, the disabled vessel is not in immediate danger of going aground on a lee shore, and it is in the interest of safety, the Master may choose to delay the tow connection until weather and sea conditions improve. Any such decision should be communicated to the Unified Command.

#### **TOW ARRANGEMENTS, CONNECTION METHODS AND GEAR**

The ship's connection to the tug's tow gear will depend on the arrangement set forth in the Ship's Emergency Tow Book (ETB). Preferably prior to departure, the tug should obtain a copy of the ship's ETB and talk to the vessel master in order to ensure that the tug's gear is ready to be deployed. (Since every Emergency Ship Tow varies, it is not possible to outline exactly how a tug should connect to a ship. That being said, it is important for Tug Companies to utilize all resources available to them to execute a successful tow.

#### **TOWING DESTINATION**

The Tow Plan should include a destination for the ship well before the tug and ship are made up. The vessel owner must work with Federal (and State regulators and other stakeholders as required) to gain approval of the destination taking into consideration the nature of the vessel's casualty and associated repair needs. Vessel owners, Pilots, and/or regulators may require additional tugs or other operational controls as the vessel approaches its destination. Parties should reference the existing Best Maritime Practice for Dead Ship Towing in San Francisco Bay.

# Appendix A Appendix A to HSC Emergency Offshore Towing BMP

## Typical Decision/Action Matrix for Emergency Offshore Towing\*

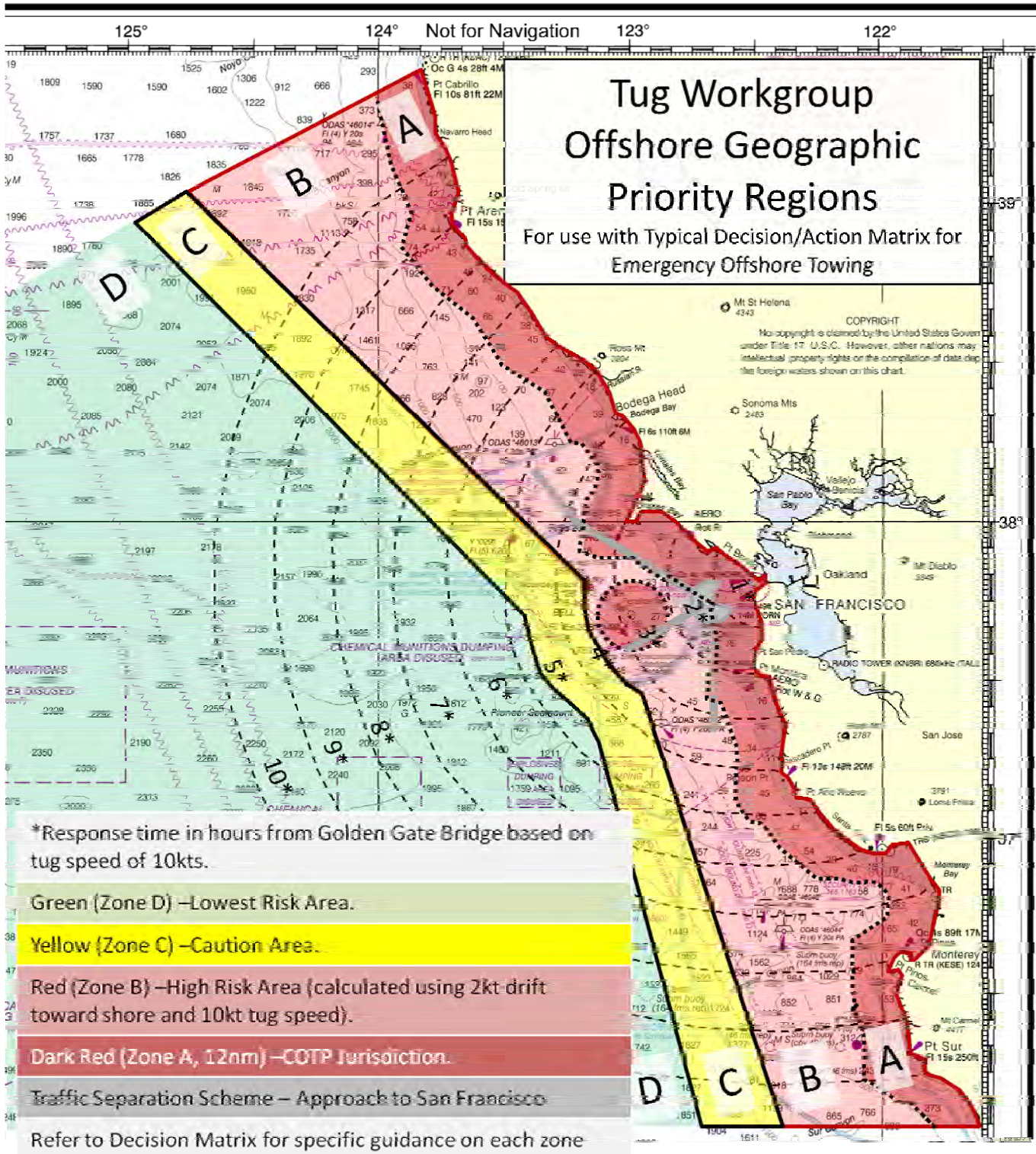
Reponse of USCG, OGAs and Port Partners will depend on the position of the vessel in distress in relation to Figure 1: Safety Risk Associated with Vessel Position Offshore. Below are general guidelines for each zone:

Green Zone "C"	Yellow Zone "B"	Red Zone "A" (Vsl > 12NM)	Red Zone "A" (Vsl < 12NM)
<ol style="list-style-type: none"> <li>Vessel provides casualty notification to USCG.</li> <li>USCG contacts vessel agent/representative (who should establish communications with the operator/owner).</li> <li>USCG transmits Alert Warning System (AWS) notification as an early warning of the potential need for tug assistance.</li> <li>Vessel/company to affect repairs, notify the USCG of intentions, and request permission to enter port, if applicable.</li> </ol>	<ol style="list-style-type: none"> <li>Vessel provides casualty notification to USCG.</li> <li>USCG contacts vessel agent/representative (who should establish communications with the operator/owner).</li> <li>USCG transmits Alert Warning System (AWS) notification as an early warning of the potential need for tug assistance.</li> <li>USCG determines if vessel has an approved VRP/SMFF or emergency response system, complying with the International Safety Management Code (SOLAS IX, Reg. 3) and 33 CFR 155.</li> <li>Vessel company to affect repairs, notify the USCG of intentions, and request permission to enter port, if applicable.</li> </ol>	<ol style="list-style-type: none"> <li>Vessel provides casualty notification to USCG.</li> <li>USCG contacts vessel agent/representative (who should establish communications with the operator/owner).</li> <li>USCG transmits Alert Warning System (AWS) notification as an early warning of the potential need for tug assistance.</li> <li>Vessel should activate VRP/SMFF or emergency response system.</li> <li>USCG review vessel particulars and weather patterns and assess the safety/security risks associated with the vessel.</li> <li>USCG discuss tug assist; ID available tug assets in the area (see VRP/SMFF)</li> <li>Determine set &amp; drift (SAROPS/NOAA)</li> <li>USCG may issue a COTP Order requiring vessel to:               <ol style="list-style-type: none"> <li>Activate VRP/SMFF.</li> <li>Develop and submit a tow plan, and/or salvage plan, with a schedule of operational intention to ensure tugs on-scene at 12nm.</li> <li>Affect repairs and notify the USCG of intentions.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>Vessel provides casualty notification to USCG.</li> <li>USCG contacts vessel agent/representative.</li> <li>USCG transmits Alert Warning System (AWS) notification as an early warning of the potential need for tug assistance.</li> <li>Vessel should activate VRP/SMFF or emergency response system.</li> <li>USCG reviews vessel particulars and weather patterns and assess the safety/security risks associated with the vessel.</li> <li>USCG discuss tug assist; ID available tug assets in the area (see VRP/SMFF).</li> <li>Determine set &amp; drift (SAROPS/NOAA)</li> <li>USCG will typically issue a COTP Order requiring vessel to:               <ol style="list-style-type: none"> <li>Activate VRP/SMFF.</li> <li>Develop and submit a tow plan, and/or salvage plan.</li> <li>Affect repairs and notify the USCG of intentions..</li> </ol> </li> </ol>

### Considerations:

- Evaluate ANOA- crew, cargoes, fuel, casualty history etc.
- Determine potential impact based on vessel particulars, cargo, fuel on board.
- Establish comms schedule w/ vessel (VTS/SCC)
- Discuss Admin Order (EEZ) and/or COTP Order
- ID environmentally sensitive areas (ACP)
- Does vessel have approved SMFF or VRP?
- Request copy of Emergency Towing Booklet (ETB)
- Engage pilots, CA stakeholders etc.
- Monitor weather & sea state, tides
- ID Potential Places of Refuge
- Potential to federalize response if RP fails to act.

\*Note: These are general guidelines only. Each response is unique and may deviate from the above guidelines on a case by case basis.



**Figure 1: Safety Risk Associated with Vessel Position Offshore**

## San Francisco Region Certified Escort Vessels

Tug	Boat ID	LOA	Propulsion System	Number	Rudders	Flanking Rudders	Kips Zones 1 & 2	Kips Zones 4 & 6	Certification Expires
<b>AmNav Maritime Services</b>									
INDEPENDENCE	ANIN	93.6	Z-Drive	2	0	0	190.00	180.00	01-Jan-2103
LIBERTY	ANLB	95.2	Z-Drive	2	0	0	79.47	79.47	01-Jan-2103
PATRICIA ANN	ANPA	93.6	Z-Drive	2	0	0	190.00	180.00	01-Jan-2103
PATRIOT	ANPT	87.9	Conventional, Open	2	2	0	65.98	65.98	01-Jan-2103
REVOLUTION	ANRV	93.6	Z-Drive	2	0	0	190.00	180.00	01-Jan-2103
SANDRA HUGH	ANSH	93.6	Z-Drive	2	0	0	190.00	180.00	01-Jan-2103
<b>Baydelta Maritime</b>									
DELTA BILLIE	Bddb	93	Z-Drive	2	0	0	266.00	264.00	01-Jan-2103
DELTA CATHRYN	BDCN	93	Z-Drive	2	0	0	266.00	264.00	01-Jan-2103
DELTA DEANNA	BDDD	105	Z-Drive	2	0	0	188.00	171.00	01-Jan-2103
DELTA LINDA	BDLA	105	Z-Drive	2	0	0	188.00	171.00	01-Jan-2103
<b>Crowley Marine Services</b>									
GOLIAH	CMGA	105	Z-Drive	2	0	0	188.00	171.00	01-Jan-2103
GUARD	CMGU	120	Cycloidal	2	0	0	210.00	190.00	01-Jan-2103
TIOGA	CMTI	85	Z-Drive	2	0	0	133.00	115.00	01-Jan-2103
VALOR	CMVR	93	Z-Drive	2	0	0	266.00	264.00	01-Jan-2103

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Vessels with an expiration date after January 1, 2100 are participants in the Escort Tug Inspection Program. So long as a vessels standing in the Escort Tug Inspection Program is maintained, its certification will not expire. The Escort Tug Inspection Program.

Tug	Boat ID	LOA	Propulsion System	Number	Rudders	Flanking Rudders	Kips Zones 1 & 2	Kips Zones 4 & 6	Certification Expires
<b>Foss Maritime</b>									
AMERICA	FMAA	98	Z-Drive	2	0	0	248.00	225.00	01-Jan-2103
ARTHUR FOSS	FMAR	102	Cycloidal	2	0	0	188.00	153.00	01-Jan-2103
BRYNN FOSS	FMBF	100	Cycloidal	2	0	0	140.00	134.00	01-Jan-2103
KEEGAN FOSS	FMKF	110	Conventional, Kort	2	2	4	73.31	73.31	01-Jan-2103
LYNN MARIE	FMLM	98	Z-Drive	2	0	0	210.00	200.00	01-Jan-2103
MARSHALL FOSS	FMMF	92.2	Z-Drive	2	0	0	210.00	200.00	01-Jan-2103
POINT FERMIN	FMPF	32	Conventional, Open	2	2	0	44.79	44.79	01-Jan-2103
POINT VICENTE	FMPV	105	Conventional, Open	2	3	0	47.05	47.05	01-Jan-2103
<b>Starlight Marine Services, Inc.</b>									
AHBRA FRANCO	STAF	98	Z-Drive	2	0	0	179.66	179.66	13-Aug-16
JOHN QUIGG	STJQ	76	Z-Drive	2	0	0	91.05	91.05	01-Jan-2103
MILLENNIUM DAWN	STMD	105	Z-Drive	2	0	0	181.00	168.00	01-Jan-2103
MILLENNIUM	STMF	105	Z-Drive	2	0	0	181.00	168.00	01-Jan-2103
MILLENNIUM STAR	STMS	105	Z-Drive	2	0	0	181.00	168.00	01-Jan-2103
ROYAL MELBOURNE	STRM	77.4	Conventional, Open	2	2	0	38.21	38.21	01-Jan-2103
TIM QUIGG	STTQ	80	Z-Drive	2	0	0	90.35	90.35	01-Jan-2103
Z-FIVE	STZ5	95	Z-Drive	2	0	0	128.00	132.00	01-Jan-2103
Z-FOUR	STZ4	95	Z-Drive	2	0	0	128.00	132.00	01-Jan-2103
Z-THREE	STZ3	95	Z-Drive	2	0	0	128.00	132.00	01-Jan-2103

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Tug	Boat ID	LOA	Propulsion System	Number	Rudders	Flanking Rudders	Kips Zones 1 & 2	Kips Zones 4 & 6	Certification Expires
<b>Westar Marine Services</b>									
BEARCAT	WSBC	69	Conventional, Open	2	2	0	18.79	18.79	01-Jan-2103
ORION	WSOR	100	Conventional, Open	2	2	0	43.79	43.79	01-Jan-2103
SAGITTARIAN	WSSA	79	Conventional, Open	2	2	0	42.33	42.33	01-Jan-2103
SCORPIUS	WSSC	124	Conventional, Kort	2	4	0	74.94	74.94	01-Jan-2103
TAURUS	WSTS	69	Conventional, Kort	2	2	0	25.04	25.04	01-Jan-2103

**Vessels with an expiration date after January 1, 2100 are participants in the Escort Tug Inspection Program. So long as a vessels standing in the Escort Tug Inspection Program is maintained, its certification will not expire. The Escort Tug Inspection Program.**

# Appendix C

## EMERGENCY TOW VESSEL CAPABILITY MATRIX (BOLLARD PULL IN TONS)

<b>Study</b>	<b>Assisted Vessel Type/Size (deadweight tons)</b>	<b>Moderate Weather Seas 10-20', Winds 20-40 kts.</b>	<b>Very Rough Weather Seas &gt; 20', Winds &gt; 40 kts.</b>
Washington State Office of Marine Safety (Allan) Emergency Towing System Task Force Report, 1994 <sup>1</sup>	All Types up to 180,000 Tons	100	150
Canadian Council of Ministers of the Environment (Allan & Dickins) A Review of Escort, Rescue and Salvage towing Capability in Canadian Waters, 1995 <sup>2</sup>	265,000 Ton Tanker	42 (South BC) – 70 (North BC) South BC = West Coast of Vancouver Island North BC = Queen Charlottes & North	120 (South BC) – 220 (North BC)
Alaska Department of Environmental Conservation Best Achievable Technology, 1997 <sup>3</sup>	265,000 Ton Tanker	Not Addressed	90-125
Enhanced Puget Sound International Tug of Opportunity System (ITOS), 1998 <sup>4</sup>	<u>Tanker/Bulker</u> <40,000 40,000 – 75,000 75,000 – 125,000 125,000 – 250,000 <u>Container/Cruise/Car Carrier</u> <40,000 40,000 – 75,000 75,000 – 125,000 125,000 – 250,000 <u>Reefer/RORO/Log</u> <40,000 40,000 – 75,000 <u>Fishing</u> <40,000	35-39 40-59 >60 >60 >60 40-59 >60 >60 >60 35-39 40-59	40-59 >60 >60 >60 >60 >60 >60 >60 40-59 >60
United Kingdom Emergency Towing System, 1998 <sup>5</sup>	265,000 Ton Tanker	Not Addressed	125

<sup>1</sup> Worst Case Planning. Planning factor was the capability to effectively respond to 99% of vessels adrift in severe conditions (slightly less than Very Rough above).

<sup>2</sup> Worst Case Planning. Planning factor was the capability to effectively respond to 94% of vessels adrift in severe conditions (slightly less than Very Rough above).

<sup>3</sup> Worst Case Planning. Planning factors based on tank vessel and tow vessel operator experience and actual towing tests.

<sup>4</sup> All Case Planning. Planning factors based on tow vessel operator experience.

<sup>5</sup> Worst Case Planning. Planning factors based on actual emergency towing experience.

## Rescue Vessel Equipment Requirements and Procedures

The process of performing a successful rescue of a disabled vessel, whether its mission is to hook up and stabilize the vessel and arrest its drift, or to actually hook up and tow the disabled vessel, is dependent upon a multitude of factors including the type and size of disabled vessel to be rescued; the existing weather and sea conditions the size, horsepower (bollard pull), propulsions and standard towing equipment available, and the urgency of the situation in terms of location and distance from shore.

- The basic equipment requirements for performing a rescue would typically include:
  1. 600' of 8" polypropylene float line;
  2. a line throwing gun;
  3. 1 ea 150X2 1/4" wire pendants;
  4. Orville Hook or special towing shackle which could choke the ship's anchor chain;
  5. 250' X 14 " nylon shock line;
  6. 400' X 1 1/4" wire
  7. If all of the above equipment is not available, an oceangoing tugboat will typically have 7" to 7 1/2": deck lines, a winch and tow wire , and/ or Orville Hook that can be used to hook up to a disabled vessel's anchor chain to provide interim assistance and arrest its drift, until such time as a suitable rescue vessel arrives to provide rescue towing assistance
  
- Providing the disabled vessel has a source of power and sea conditions allow, a rescue hook-up would involve the following steps:
  1. Ship passes an appropriate deck line to the tug and hoists up 1 ea 150' X2 1/4" wire pennant which is connected to the rescue vessel's surge chain which are connected to the rescue vessel's tow wire--- a 250' X 14" nylon shock line or the 10" shock lines can be used in addition to or in place of the rescue vessel's surge chain.
  2. If the disabled vessel doesn't have power and sea conditions allow, the rescue vessel will lay alongside the disabled vessel and pass the polypropylene line or hard wire utilizing the rescue vessel's winch, or;
  3. The rescue vessel will utilize an Orville Hook or a special towing shackle which can securely choke a ship's anchor chain to make a secure connection to the ship's anchor chain;
  4. If urgency is not an issue and there is an adequate amount of time, the rescue vessel running gear will be utilized to draw the ship's anchor chain to the work deck of the rescue tug and the tugs surge chain will be connected to the anchor chain which ultimately will be connected to the rescue vessel's tow wire.



# **Appendix I**

## **Rescue Vessel Equipment Requirements and Procedures**

### **EMERGENCY TOW VESSEL CAPABILITY MATRIX**



Ref.: T4/3.01

MSC.1/Circ.1255  
27 May 2008

**GUIDELINES FOR OWNERS/OPERATORS ON PREPARING  
EMERGENCY TOWING PROCEDURES**

1 The Maritime Safety Committee, at its eighty-fourth session (7 to 16 May 2008), following a recommendation of the fiftieth session of the Sub-Committee on Ship Design and Equipment, approved Guidelines for owners/operators on preparing emergency towing procedures, set out in the annex, aimed at assisting owners/operators in preparing ship-specific emergency towing procedures for ships subject to SOLAS regulation II-1/3-4.

2 The Guidelines are intended to help owners/operators to carry out the necessary steps in establishing emergency towing procedures, provide information on the scope of the emergency towing booklet and give guidance towards creating procedures for towage.

3 The procedures developed by means of these Guidelines aim at supporting the crew in establishing the safest and most efficient course of action to be taken when confronted with an emergency that requires towing.

4 Member Governments are invited to bring the annexed Guidelines to the attention of all parties concerned for application in conjunction with SOLAS regulation II-1/3-4 (Emergency towing arrangements and procedures).

\*\*\*



**ANNEX****GUIDELINES FOR OWNERS/OPERATORS ON PREPARING  
EMERGENCY TOWING PROCEDURES****1 PURPOSE**

The purpose of these Guidelines is to assist owners/operators in preparing ship-specific emergency towing procedures for ships subject to SOLAS regulation II-1/3-4. The procedures should be considered as part of the emergency preparedness required by paragraph 8 of part A of the International Safety Management (ISM) Code.

**2 OBSERVATIONS**

2.1 Owners, operators and crews should take into consideration that the nature of an emergency does not allow time for deliberation. Accordingly, the procedures should be practiced beforehand.

2.2 The towing procedures should be maintained on board the ship for ready use by the ship's crew in preparing their ship for towage in an emergency.

2.3 The crew should have good knowledge of equipment stowage location and accessibility. Any identified improvements to stowage arrangements should be implemented.

2.4 Crew dealing with an emergency situation should be aware of power availability required for winches and tools, as well as for deck lighting (for bad/low visibility and night time situations).

2.5 It is recognized that not all ships will have the same degree of shipboard equipment, so that there may be limits to possible towing procedures. Nevertheless, the intention is to predetermine what can be accomplished, and provide this information to the ship's crew in a ready-to-use format (booklet, plans, poster, etc.).

**3 SHIP EVALUATION**

3.1 The owner/operator should ensure that the ship is inspected and its capability to be towed under emergency situations is evaluated. Both equipment on board and available procedures should be reviewed. Items that need to be inspected are described in the following paragraphs.

3.2 The ability of the ship to be towed from bow and stern should be evaluated, and the following items should be reviewed:

- .1 line handling procedures (passing and receiving messenger lines, towsines, bridles); and
- .2 layout, structural adequacy and safe working loads of connection points (fairleads chocks, winches, bitts, bollards), etc.

3.3 The on-board tools and equipment available for assembling the towing gear and their locations should be identified. These should include but not be limited to:

- .1 chains;
- .2 cables;
- .3 shackles;
- .4 stoppers;
- .5 tools; and
- .6 line throwing apparatus.

3.4 The availability and characteristics of radio equipment on board should be identified, in order to enable communication between deck crew, bridge and the towing/salvage ship.

3.5 Unless the safe working loads of connection points are known, these loads should be determined by an engineering analysis reflecting the on-board conditions of the ship. The Guidance on shipboard towing and mooring equipment (MSC/Circ.1175) may be used for guidance.

3.6 The evaluation should be performed by persons knowledgeable in towing equipment and operations.

#### **4 EMERGENCY TOWING BOOKLET**

4.1 The Emergency Towing Booklet (ETB) should be ship specific and be presented in a clear, concise and ready-to-use format (booklet, plan, poster, etc.).

4.2 Ship-specific data should include but not be limited to:

- .1 ship's name;
- .2 call sign;
- .3 IMO number;
- .4 anchor details (shackle, connection details, weight, type, etc.);
- .5 cable and chain details (lengths, connection details, proof load, etc.);
- .6 height of mooring deck(s) above base;
- .7 draft range; and
- .8 displacement range.

4.3 All procedures developed in accordance with section 5 should be presented in a clear and easy to understand format, which will aid their smooth and swift application in an emergency situation.

4.4 Comprehensive diagrams and sketches should be available and include the following:

- .1 assembly and rigging diagrams;
- .2 towing equipment and strong point locations; and
- .3 equipment and strong point capacities and safe working loads (SWLs).

4.5 A copy should be kept at hand by the owners/operators in order to facilitate the passing on of information to the towage company as early as possible in the emergency. A copy should also be kept in a common electronic file format, which will allow faster distribution to the concerned parties.

4.6 A minimum of three copies should be kept on board and located in:

- .1 the bridge;
- .2 a forecastle space; and
- .3 the ship's office or cargo control room.

## **5 DEVELOPING PROCEDURES**

5.1 Ship-specific procedures should be identified during the ship's evaluation and entered accordingly in the ETB. The procedures should include, as a minimum, the following:

- .1 a quick-reference decision matrix that summarizes options under various emergency scenarios, such as weather conditions (mild, severe), availability of shipboard power (propulsion, on-deck power), imminent danger of grounding, etc.;
- .2 organization of deck crew (personnel distribution, equipment distribution, including radios, safety equipment, etc.);
- .3 organization of tasks (what needs to be done, how it should be done, what is needed for each task, etc.);
- .4 diagrams for assembling and rigging bridles, tow lines, etc., showing possible emergency towing arrangements for both fore and aft. Rigged lines should be lead such that they avoid sharp corners, edges and other points of stress concentration;
- .5 power shortages and dead ship situations, which must be taken into account, especially for the heaving across of heavy towing lines;

- .6 a communications plan for contacting the salvage/towing ship . This plan should list all information that the ship's master needs to communicate to the salvage/towing ship. This list should include but not be limited to:
  - .1 damage or seaworthiness;
  - .2 status of ship steering;
  - .3 propulsion;
  - .4 on deck power systems;
  - .5 on-board towing equipment;
  - .6 existing emergency rapid disconnection system;
  - .7 forward and aft towing point locations;
  - .8 equipment, connection points, strong points and safe working loads (SWL);
  - .9 towing equipment dimensions and capacities; and
  - .10 ship particulars;
- .7 evaluation of existing equipment, tools and arrangements on board the ship for possible use in rigging a towing bridle and securing a towline;
- .8 identification of any minor tools or equipment providing significant improvements to the "towability" of the ship;
- .9 inventory and location of equipment on board that can be used during an emergency towing situation;
- .10 other preparations (locking rudder and propeller shaft, ballast and trim, etc.); and
- .11 other relevant information (limiting sea states, towing speeds, etc.).

---

**EMERGENCY TOWING BOOKLET**

(in accordance with SOLAS Ch.II-1, Reg.3-4)

SHIP NAME : M/V "ABCD"

Owner name



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## **Chapter 1 - GENERAL DESCRIPTION**

### **1.1 General**

- 1.1.1 This booklet is prepared for use in emergency towing situations in accordance with SOLAS Ch.II-1, Regulation 3-4 and related MSC.1/Circ.1255.
- 1.1.2 The following information is included in this booklet:
- a) Drawings of fore and aft deck showing possible emergency towing arrangements;
  - b) Inventory of equipment on board that can be used for emergency towing;
  - c) Means and methods of communication;
  - d) Sample procedures to facilitate the preparation for and conducting of emergency towing;
  - e) Organization of tasks; and
  - f) Communication plan listing all information that is required to be communicated to the towing ship.
- 1.1.3 A copy of this booklet should be kept at hand by the owners/operators. A copy should be also kept in a common electronic file format, which will allow faster distribution to the concerned parties.
- 1.1.4 A minimum of three copies should be kept on board and located in the following locations:
- a) The bridge;
  - b) A forecastle space; and
  - c) The ship's office or cargo control room.
- 1.1.5 Owners, operators and crew should take into consideration that the nature of an emergency does not allow time for deliberation. Accordingly, the procedures should be practiced beforehand.
- 1.1.6 Typical procedures for connecting towing lines are introduced in Chapter 6 of this booklet.

### **1.2 Limitation during towing operation**

- 1.2.1 Not all ships have the same degree of shipboard equipment, so that there may be limits to possible towing procedures. Nevertheless, the intention of this booklet is to predetermine what can be accomplished.
- 1.2.2 The towing load should not exceed the safety working loads of deck fittings as shown in 2.8 and 2.9 of this booklet. When heavy weather which will significantly increase the towing load is forecasted, special considerations are to be paid to the towing speed, towing line arrangement, and ship's stability.
- 1.2.3 The loading points on stand-rollers are so high that great bending moments are generally transferred to the supporting structures. Consequently, stand-rollers are not to be used in towing line arrangement as far as practicable.

### **1.3 Master's response**

- 1.3.1 The master of a ship or shipowner's representative, when recognizing that the ship is in distress and may need towing assistance, should make the initial notification of the incident to the following parties:
  - a) Nearest port states;
  - b) Flag states; and
  - c) Other relevant parties (shipper, insurer, etc.).
- 1.3.2 The master should complete the tables in Chapter 7 'CURRENT STATUS', and prepare to communicate with the towing ship.
- 1.3.3 All information from Chapter 1 to Chapter 7 of this booklet should be delivered to the towing ship.
- 1.3.4 The master should ensure that towing lines do not become taut until towing lines are tied to the connection system of towing ship and that everyone on deck have been notified.
- 1.3.5 When the power system on board is not available or alternative connection procedures are introduced by the towing ship, the master should try to make a best decision possible considering the ship's current status in consultation with the towing ship.
- 1.3.6 When an alternative procedure is adopted, it should be well informed to all staff.
- 1.3.7 The master should ensure that survival crafts are made ready for use.

### **1.4 Safety considerations**

- 1.4.1 The Chief Officer on the mooring deck should be in contact with the Bridge at all times.
- 1.4.2 Everyone on deck should be equipped with personnel life saving appliances and be alert to avoid hazardous situations such as slips, trips, fall, etc.
- 1.4.3 All crew should be well informed of the work procedures and tasks.
- 1.4.4 When the towing line becomes strained in tension, all on-deck staff should be evacuated to a safe location.
- 1.4.5 The crew should have a good knowledge about the equipment stowage location and its accessibility. Any identified improvements to stowage arrangements should be implemented.
- 1.4.6 Whilst engaged in towing operations, the minimum number of crew essential to carry out duties is to be on deck, and they should never be exposed to a rope or wire under tension or load. Wherever possible, the deck should be cleared of crew whilst towing.

### **1.5 Towing preparations**

- 1.5.1 It is recommended that the towed ship is to display the navigation lights, shapes and, if manned, make sound signals required by the International Regulation for Preventing Collisions at Sea, 1972, as amended. Due consideration should be given to the reliability of the lights and sound signals and their ability to function for the duration of the voyage.

- 1.5.2 Prior to sailing, the watertight integrity of the towed ship should be confirmed by an inspection of the closing arrangement for all hatches, valves, air pipes, and other openings through which water might enter. It should also be confirmed that any watertight doors or other closing arrangements within the hull are securely closed and that any portable closing plates are in place.
- 1.5.3 The securing arrangements and weather protection for the cargo, equipment and store carried on the towed ship should be carefully examined to ensure that they are adequate for the voyage.
- 1.5.4 When appropriate, the rudder should be secured in the amidships position and measures should be taken to prevent the propeller shaft from turning.
- 1.5.5 The towed ship should be at a suitable draught for the intended voyage.
- 1.5.6 The towed ship should have adequate intact stability in all the loading and ballast conditions to be used during the voyage.
- 1.5.7 Life saving appliances in the form of lifejackets and lifebuoys should be provided whenever personnel are likely to be on board the towed ship even if only for short periods of time. When personnel are expected to remain on board for longer periods of time, life rafts should be provided. Other life saving appliances, including distress signals, fire appliances and radio equipment, including means of communication with the towing ship, should be provided whenever the towed ship is continually manned.

## Chapter 2 - SHIP SPECIFIC DATA

### 2.1 General information

1	Ship's name		
2	Call sign		
3	Type of ship		
4	IMO number		
5	Flag		
6	Port of registry		
7	Classification		
8	Classification ID No.		
9	Year of built		
10	Ship Yard		
11	Yard Hull No.		
12	Gross tonnage		
13	Principal dimensions	LOA	
		LBP	
		Breadth	
		Depth	
14	Height of mooring deck at centerline above base line	Fore deck	
		Aft deck	
15	Is emergency towing system(ETS) fitted?	<u>Fore deck</u> <input type="checkbox"/> Yes <input type="checkbox"/> No	<b>Particulars</b>
		<u>Aft deck</u> <input type="checkbox"/> Yes <input type="checkbox"/> No	<b>Particulars</b>

### 2.2 Draft and displacement range

	Draft [meters]	Displacement [tons]
Full load condition		
Lightest sea going condition		

### 2.3 Anchor, anchor chain and mooring lines

Equipment Number		Anchor	
		Type	
Mooring lines		Weight	
Type		Number	
Diameter		Anchor chain	
Length		Grade	
Number		Length	
Min. Breaking Load		Diameter	

### 2.4 Radio equipment

No.	Equipment	Fitted or not	Phone No. etc.
1	VHF radio installation	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	MF radio installation	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	MF/HF radio installation	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	Inmarsat – B	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	Inmarsat – C	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	Inmarsat – F	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	Navtex receiver	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	2-way VHF radio telephone (3EA)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	Weather facsimile	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	Maritime telephone	<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	Portable Wireless Radio	<input type="checkbox"/> Yes <input type="checkbox"/> No	
12			

### 2.5 Power supply and steering equipment

No.	Equipment	Location	Particulars
1	Main generator		
2	Em'cy generator		
3	Main steering gear pump		
4	Em'cy steering gear pump		
5	When all power supplies are halted, manual steering is possible?		<input type="checkbox"/> Yes <input type="checkbox"/> No

**2.6 Lifting devices**

	<b>Device</b>	<b>SWL [tons]</b>	<b>Location</b>
Fore mooring deck	Rope handling davit		
	Portable davit		
Aft mooring deck	Provision crane		
	Fuel oil hose handling davit		
	S/G Room Davit		

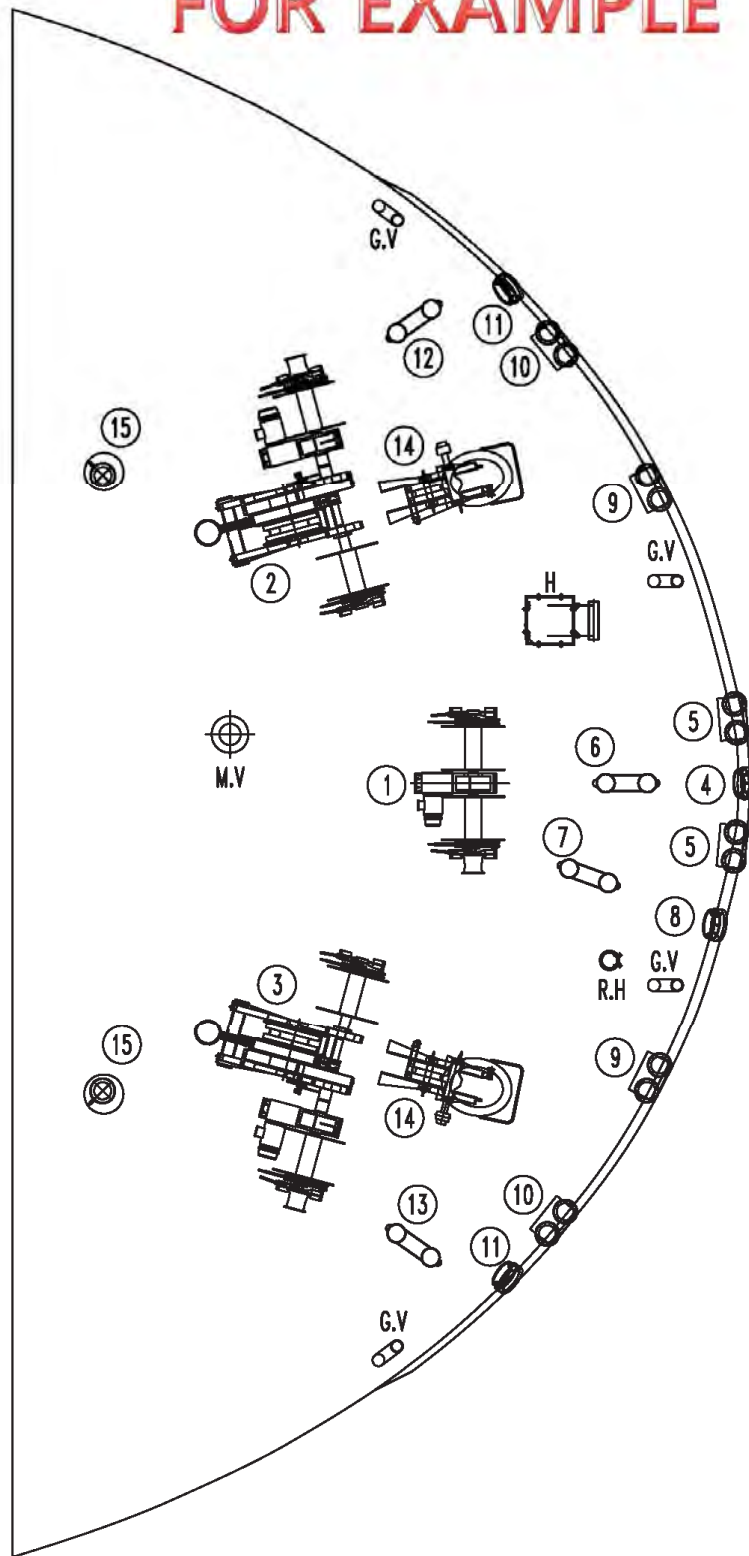
**2.7 Deck tools and other equipment**

<b>No.</b>	<b>Equipment</b>	<b>Location</b>	<b>Particulars</b>
1	Stopper Chain		
2	Shackle for the above and sling wire for connecting hawser		
3	Sledgehammer, bar, hand hammer and knife		
4	Stopper Rope		
5	Pin punch for joining shackle		
6	Seizing wire or Sprit Pin		
7	Life line throwing apparatus		
8			



## 2.8 Mooring & Towing fittings on fore mooring deck

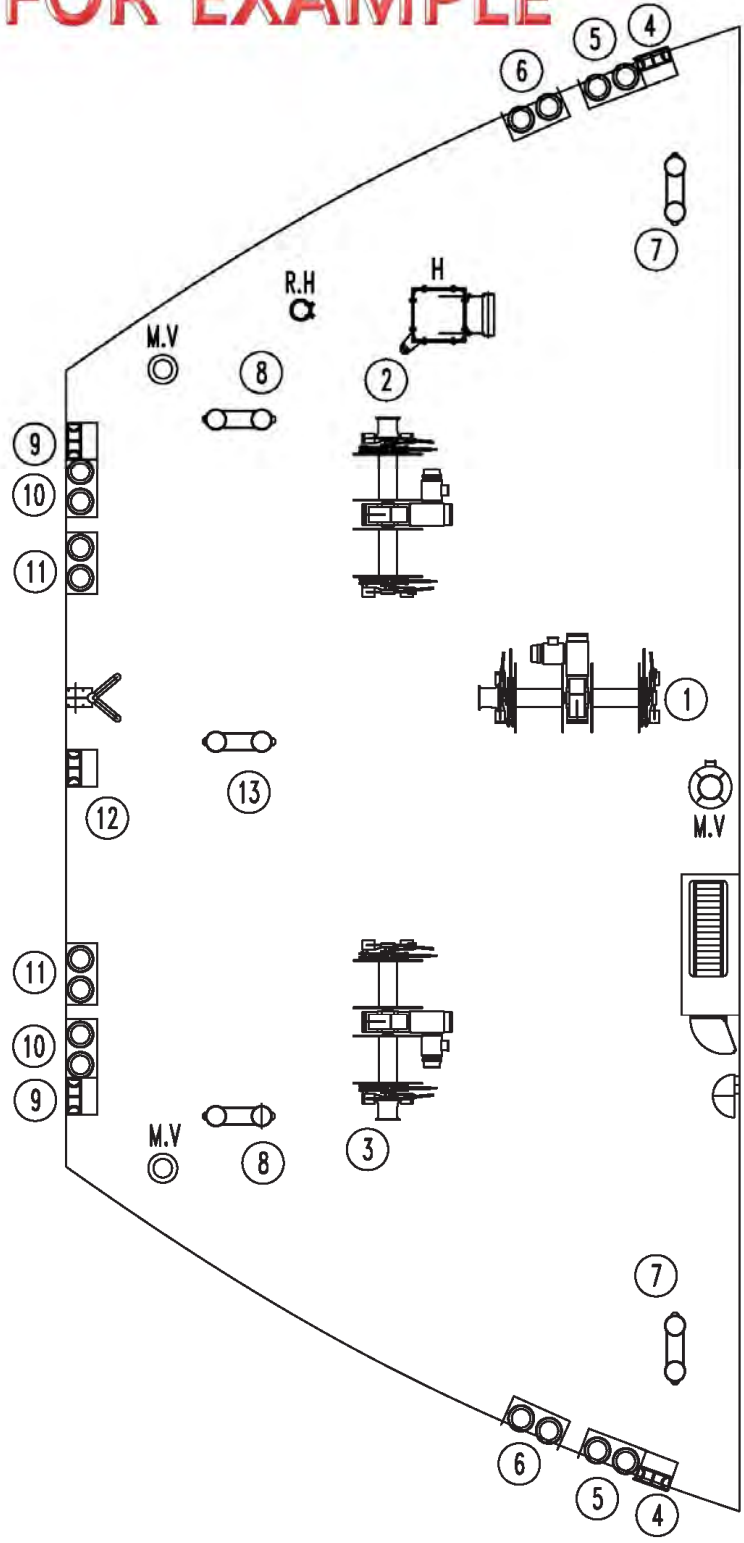
**FOR EXAMPLE**



No.	Deck fittings	Particulars	SWL [tons]
①	Mooring winch(C)	25 ton x 15m/min	-
②	Windlass(P)	40 ton x 9m/min	-
③	Windlass(S)	40 ton x 9m/min	-
④	Panama chock	A-type 360x260	64
⑤	2-Roller fairlead	A- type, Ø350	64
⑥	Bollard	A- type, Ø400	64
⑦	Bollard	A- type, Ø400	64
⑧	Bollard	A- type, Ø400	64
⑨	2-Roller fairlead	A- type, Ø350	64
⑩	2-Roller fairlead	A- type, Ø350	64
⑪	Panama chock	A-type 360x260	64
⑫	Bollard	A- type, Ø400	64
⑬	Bollard	A- type, Ø400	64
⑭	Chain compressor	Roller-type	64
⑮	Pedestal fairlead	A- type, Ø400	64
*The SWL of bollard is based on towing eye splice use.			

## 2.9 Mooring & Towing fittings on aft mooring deck

**FOR EXAMPLE**

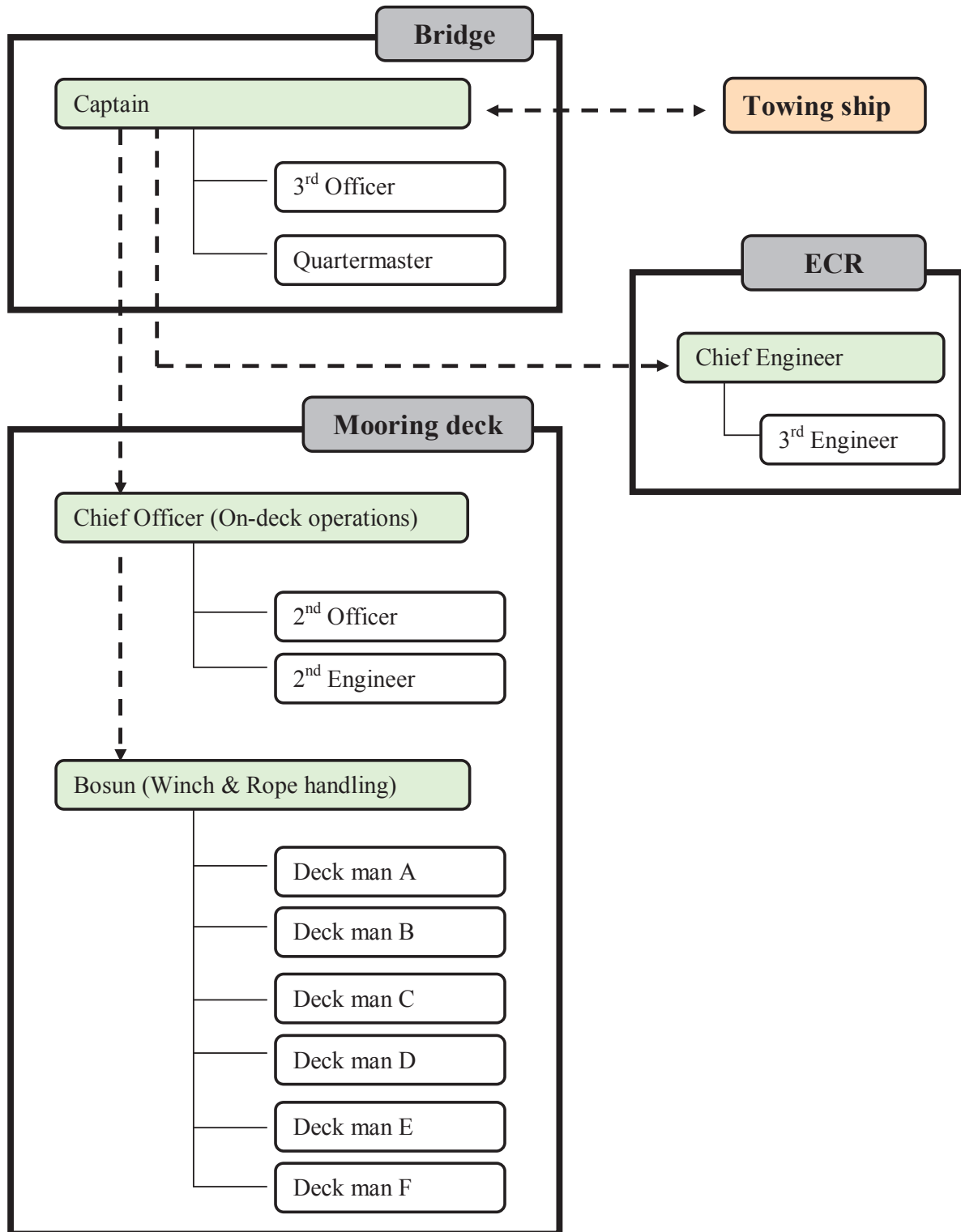


No.	Deck fittings	Particulars	SWL [tons]
①	Mooring winch(C)	25 ton x 15m/min	-
②	Mooring winch(P)	25 ton x 15m/min	-
③	Mooring winch(S)	25 ton x 15m/min	-
④	Panama chock	A-type 360x260	64
⑤	2-Roller fairlead	A- type, Ø350	64
⑥	2-Roller fairlead	A- type, Ø350	64
⑦	Bollard	A- type, Ø400	64
⑧	Bollard	A- type, Ø400	64
⑨	Panama chock	A-type 360x260	64
⑩	2-Roller fairlead	A- type, Ø350	64
⑪	2-Roller fairlead	A- type, Ø350	64
⑫	Panama chock	A-type 360x260	64
⑬	Bollard	A- type, Ø400	64
⑭	Bollard	A- type, Ø400	64
⑮			

\*The SWL of bollard is based on towing eye splice use.

## Chapter 3 - ORGANIZATION OF TASKS

### 3.1 Staff arrangement and communication



### 3.2 Tasks and equipment

No.	Person	Equipment			Task	Position
		Personnel life saving appliance	Portable wireless radio	On-deck tools		
1	<b>Captain</b>		○		Communication with towing ship Overall responsible person	Bridge
2	3rd Officer				Assistant to Captain	
3	Quartermaster				Steering	
4	<b>Chief Officer</b>	○	○		Communication with Bridge, Responsible person on deck	Mooring Deck
5	2nd Officer	○	○		Assistant to Chief Officer	
6	2nd Engineer	○	○			
7	<b>Bosun</b>	○	○		Winch & rope operations	
8	Deck man A	○		○	Winch & rope handling	
9	Deck man B	○		○		
10	Deck man C	○		○		
11	Deck man D	○		○		
12	Deck man E	○		○		
13	Deck man F	○		○		
14	<b>Chief Engineer</b>				Responsible person in engine room	ECR
15	3rd Engineer				Assistant to Chief Engineer	

## Chapter 4 - TOWING PATTERNS

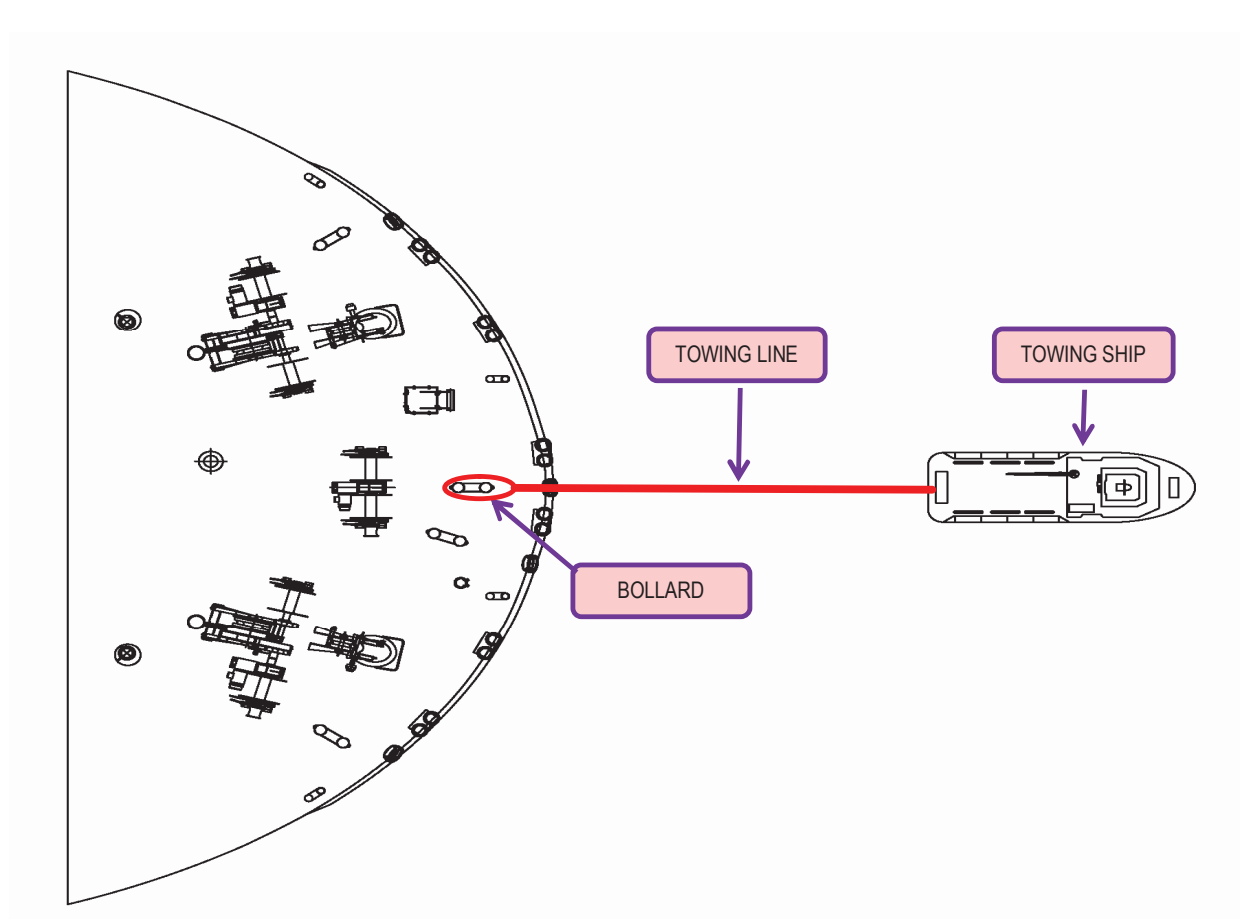
### 4.1 General

4.1.1 This chapter describes typical towing patterns on fore and aft deck.

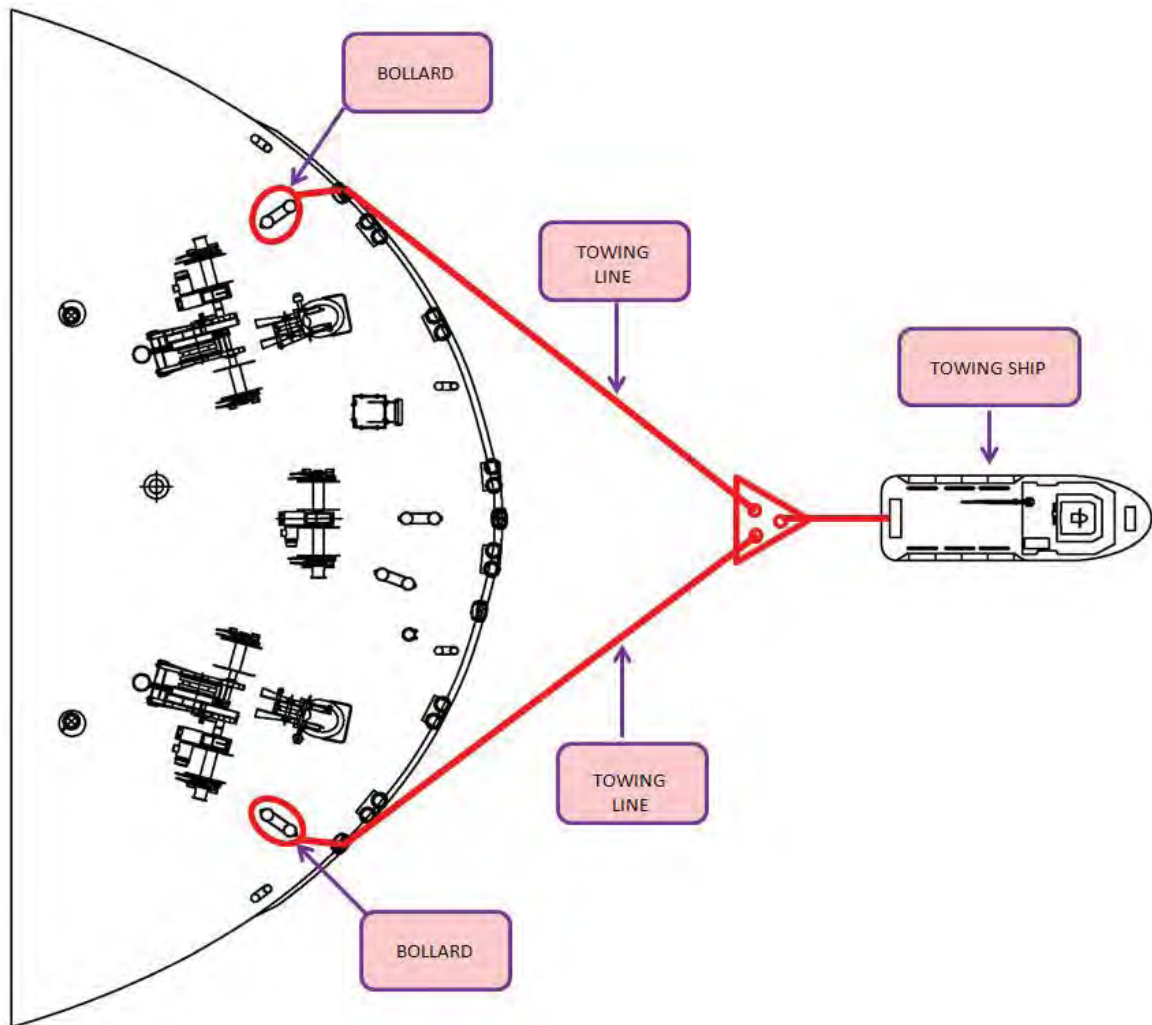
### 4.2 Towing from bow

4.2.1 The following figures show the typical arrangements of towing line connection for towing from bow.

#### [Pattern F1]



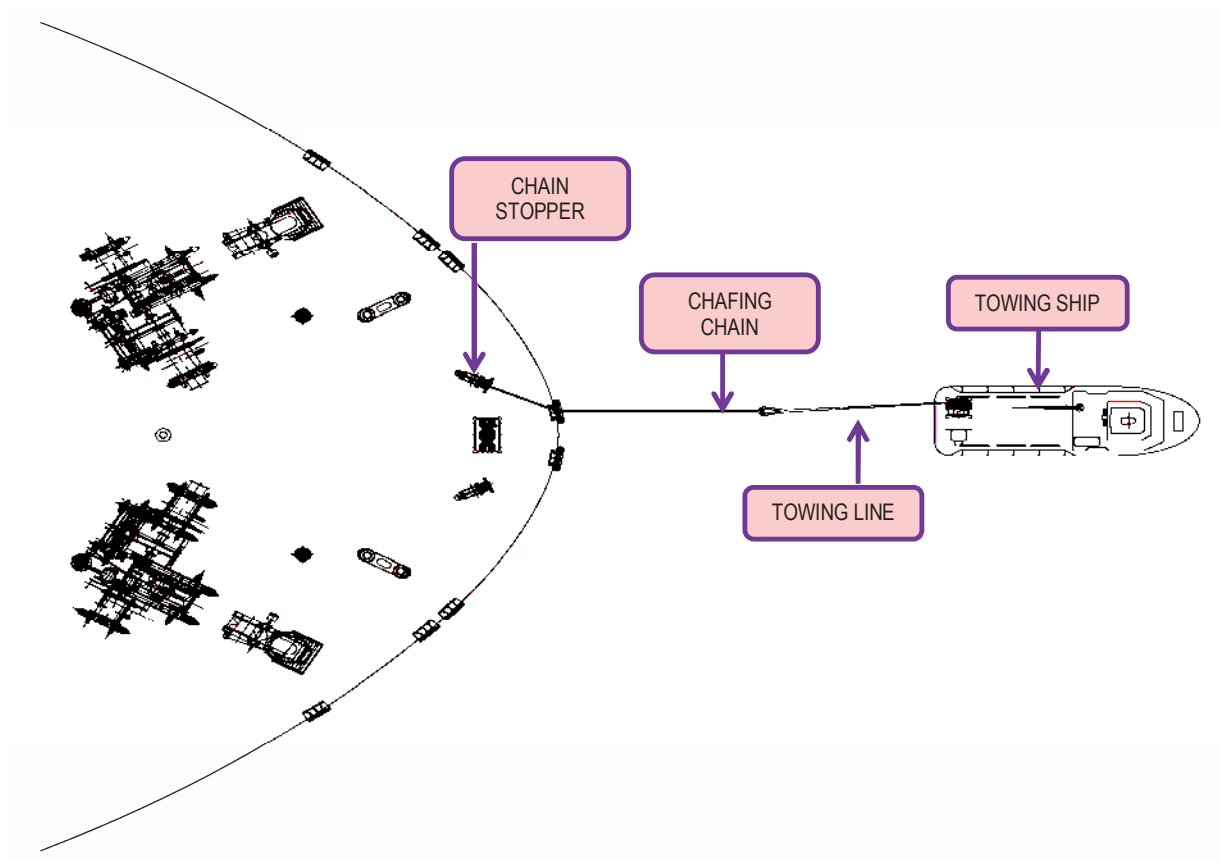
[Pattern F2]





**[Pattern F3]**

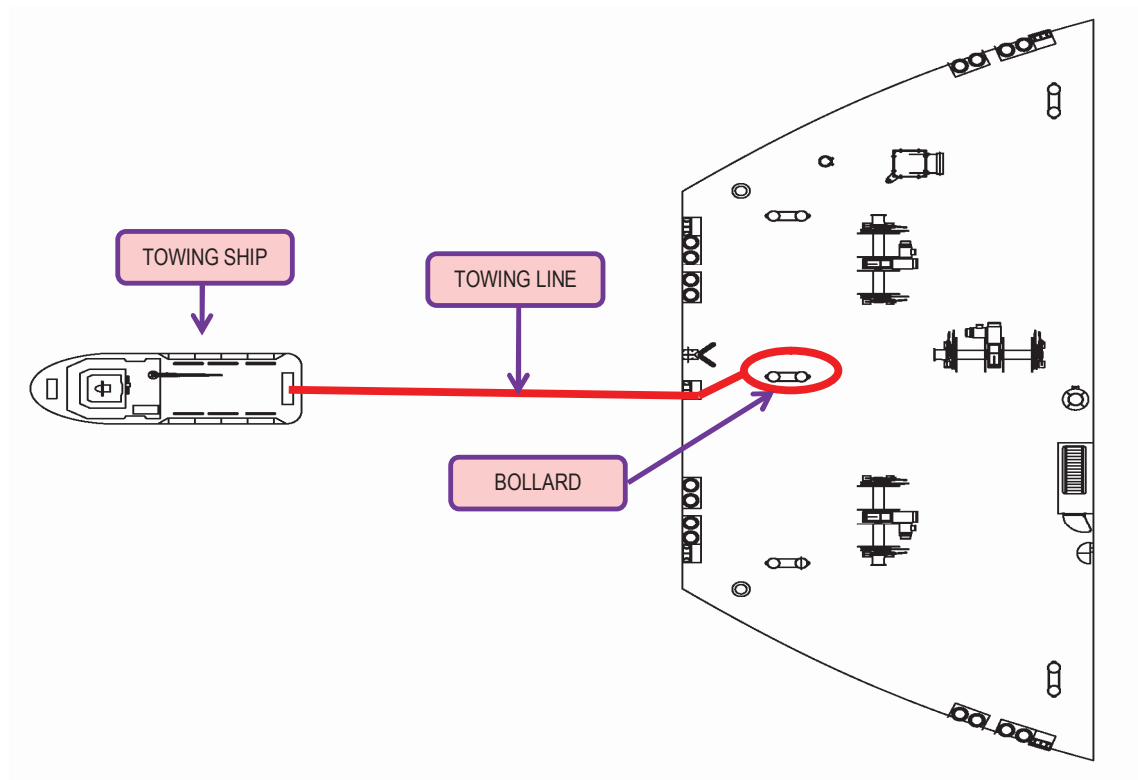
Use a chafing chain from chain stopper or Smit bracket (if ETS is fitted).



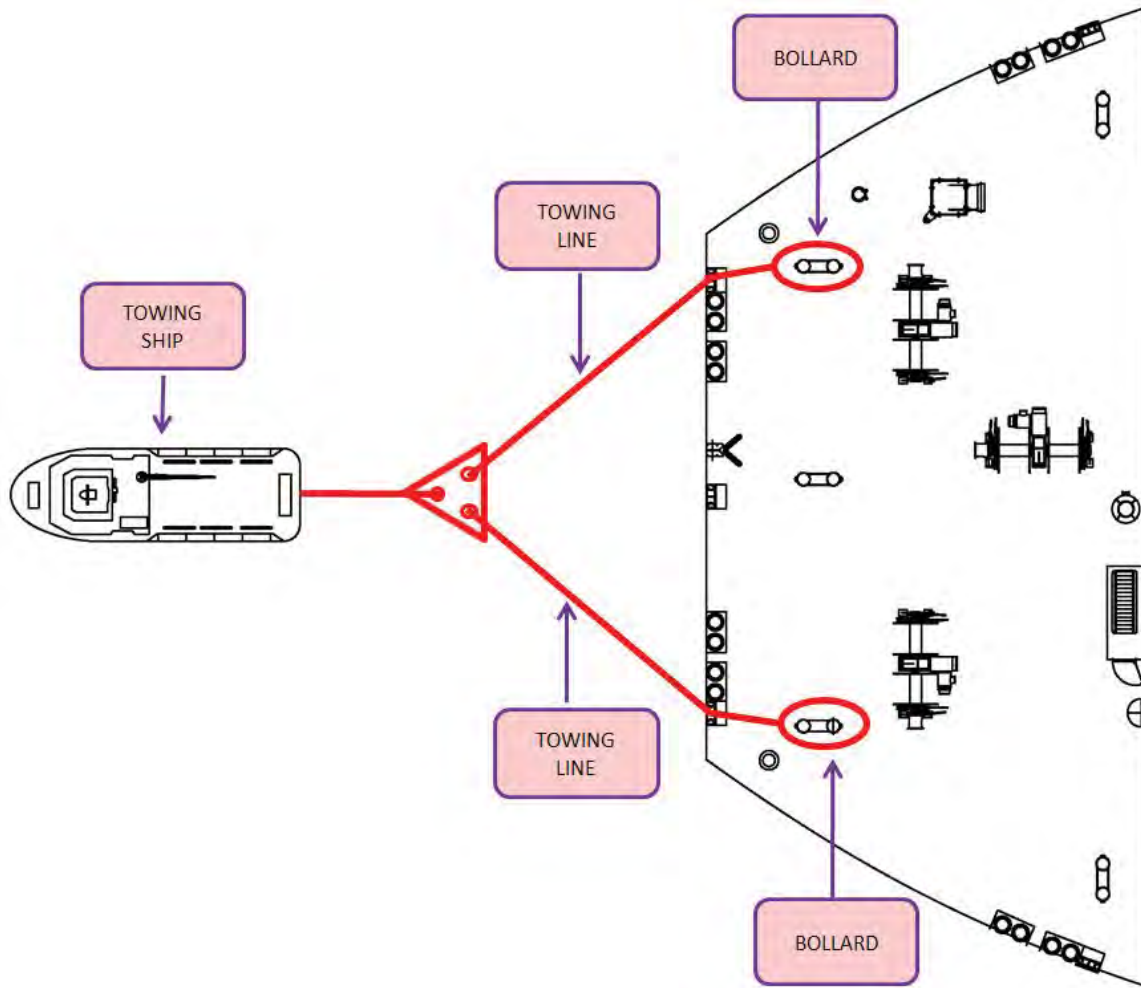
### 4.3 Towing from stern

4.3.1 The following figures show the typical arrangements of towing line connection for towing from stern.

**[Pattern A1]**

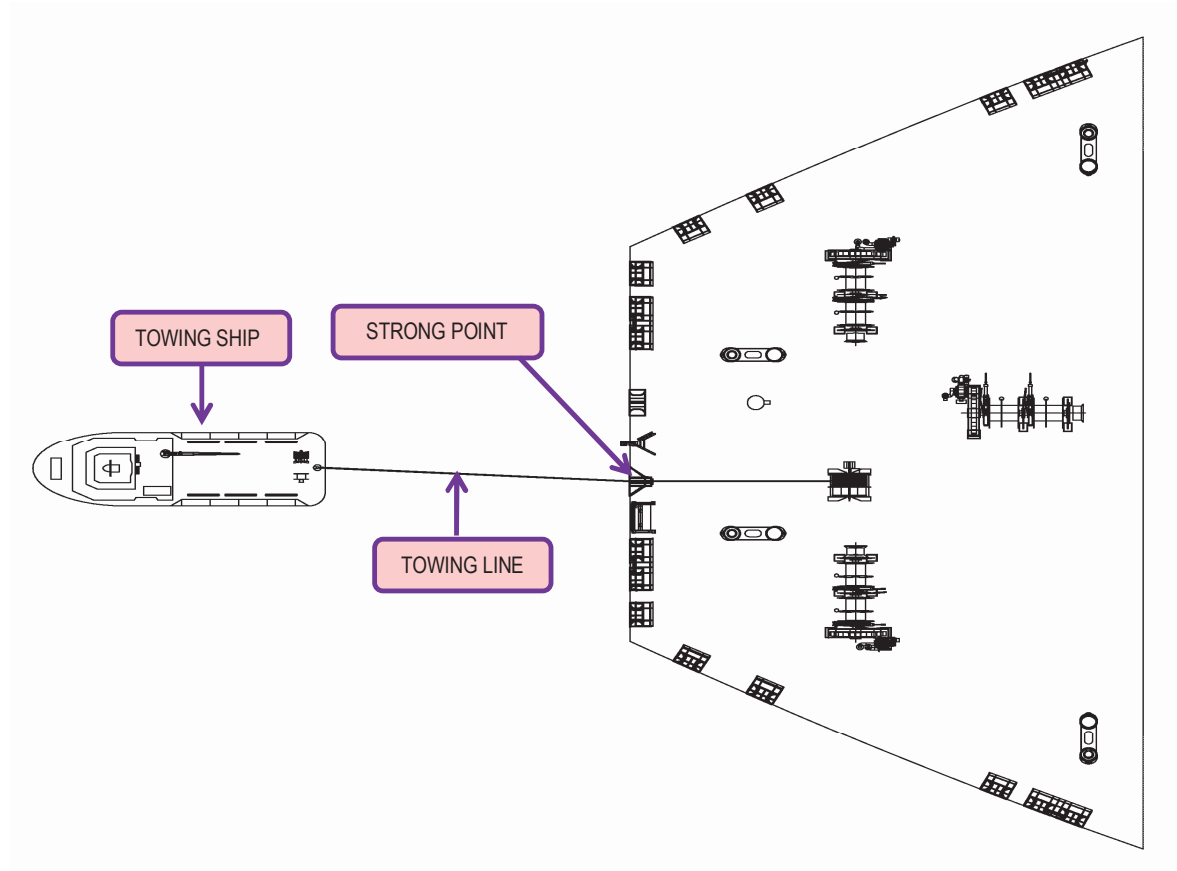


[Pattern A2]



**[Pattern A3]**

Use a storage drum and strong point (If ETS is fitted).



## Chapter 5 - DECISION MATRIX

### 5.1 Decision matrix for determining towing pattern

- 5.1.1 The towing pattern should be decided by the ship's master, in consultation with the master of towing ship, by using the following Decision Matrix.
- 5.1.2 The ship should be towed from the bow as far as possible. If it is not possible to tow from the bow for some reasons such as grounding, collision, etc., towing from the stern may be selected as an alternative.
- 5.1.3 For determining the towing pattern, the following status and surrounding conditions should be taken into account.
- Ship's position;
  - Weather and sea conditions;
  - Short-term marine forecast for the area of the incident;
  - Direction and rate of drift;
  - Distance and estimated time to any possible grounding location;
  - Availability of propulsion system; and
  - Availability of power supply for deck machinery.

### 5.2 Decision matrix (if ETS is not fitted)

Condition	Towing pattern		Status
	Bow	Stern	
Imminent and immediate danger, e.g. risk of grounding in less than 1 hour	F1	A1	<ol style="list-style-type: none"> <li>The pattern F1 or A1 is to be used provided that the towing force is controlled so as not to exceed the Safe Working Load (SWL) of the deck fittings.</li> <li>If the weather is severely bad, the additional towing lines are to be connected between the towed ship and the towing ship.</li> </ol>
The duration of being towed is long	F2	A2	<ol style="list-style-type: none"> <li>If possible, the two (2) set of towing lines are to be used.</li> <li>If possible, a chain is to be used so that the towing force can be controlled so as not to exceed the Safe Working Load (SWL) of deck fittings.</li> </ol>

### 5.3 Decision matrix (if ETS is fitted)

Condition	Towing pattern		Status
	Bow	Stern	
Imminent and immediate danger, e.g. risk of grounding in less than 1 hour	F3	A3	<ol style="list-style-type: none"> <li>The pattern A3 is the preferred method in this condition, time of deployment is less than 15 minutes.</li> <li>Alternative Pattern F3 if the time allowed is 1 hour.</li> </ol>

## **Chapter 6 - PROCEDURES FOR CONNECTING TOWING LINES**

### **6.1 General**

6.1.1 This chapter describes the towing patterns of F1, F3, A1, and A3. Similar procedures should be adopted for the other patterns.

6.1.2 The typical procedures are introduced for connecting towing lines in either case of 'on-deck power available case' or not.

6.1.3 Any identified improvement recognized through mariners' experience should be implemented.

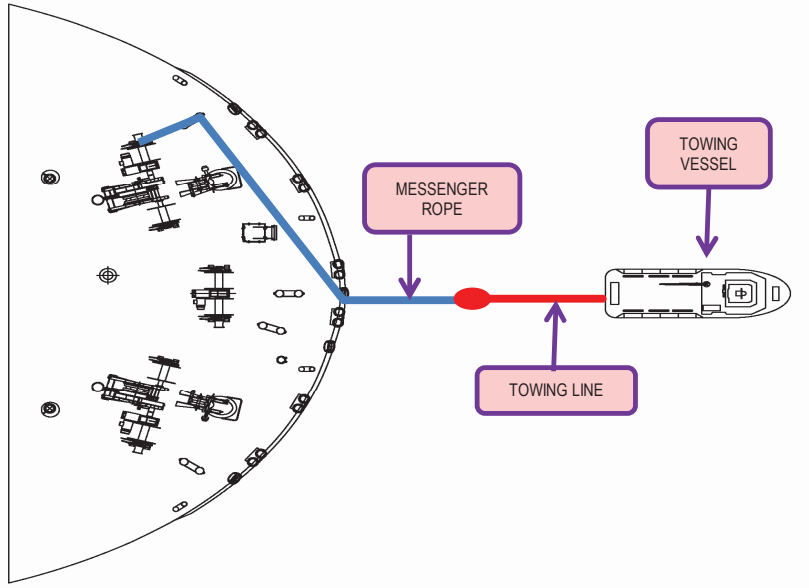
## 6.2 Towing from bow (Pattern F1 – if on-deck power is available)

### [Step 1]

Receive the messenger rope from the towing ship.

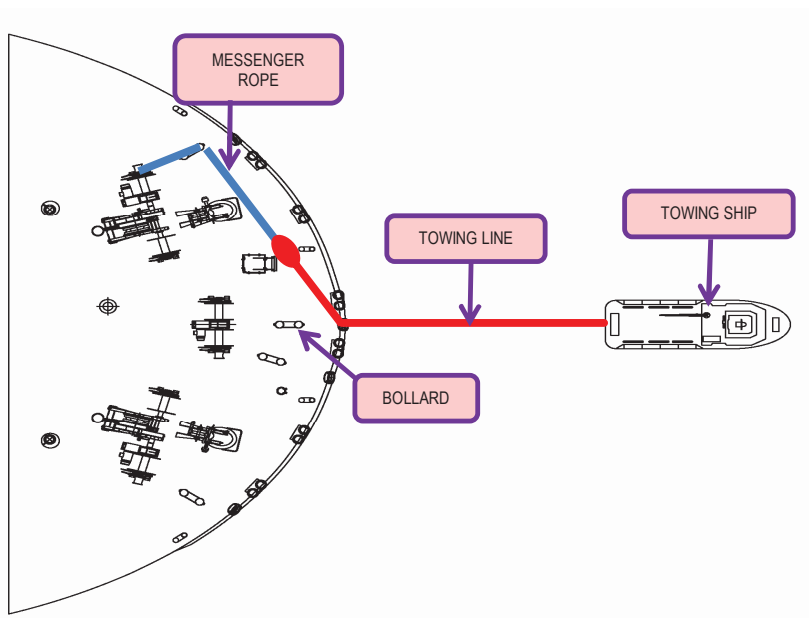
### [Step 2]

Pass the messenger rope through the closed chock.



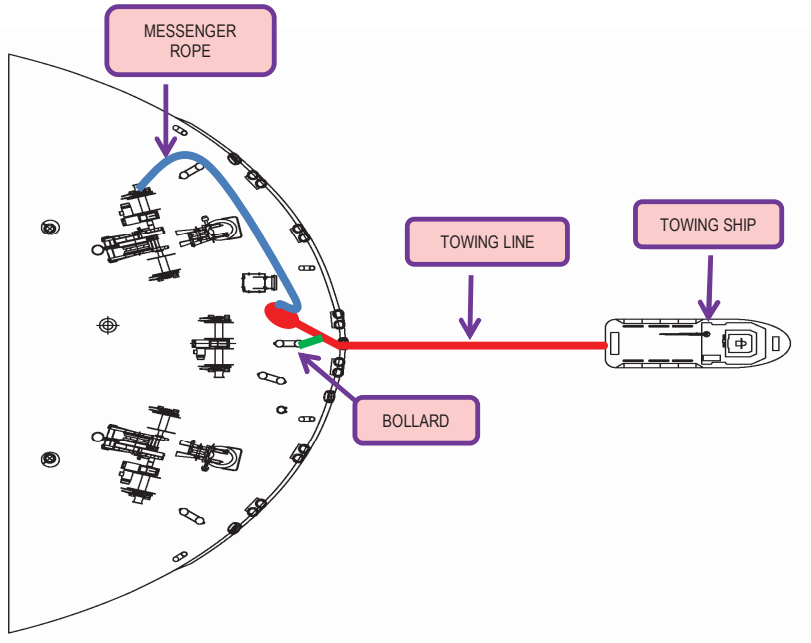
### [Step 3]

Wind the messenger rope by using warping head until the eye splice of the towing line reaches the bollard.



**[Step 4]**

Connect the rope stopper between the towing line and the bollard.



**[Step 5]**

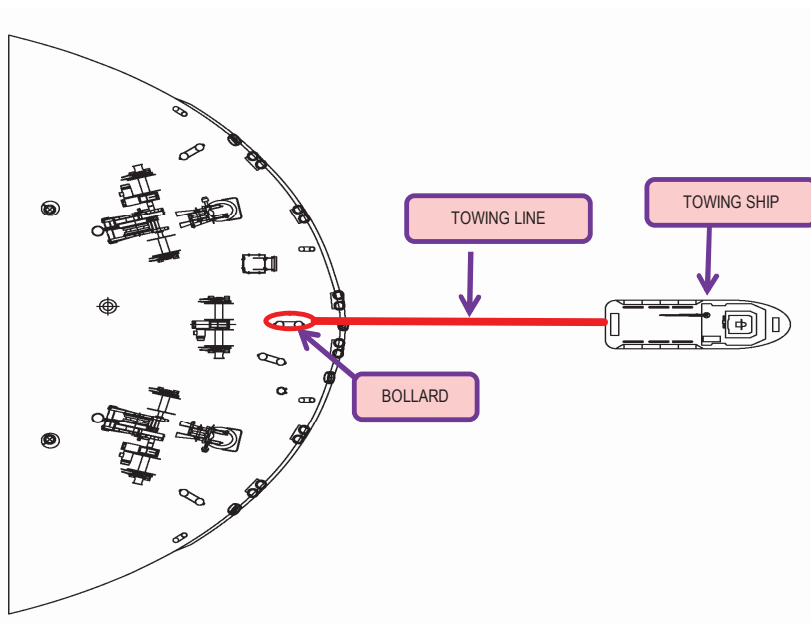
Hook the eye splice of the towing line on the bollard.

**[Step 6]**

Detach the rope stopper and the messenger rope from the towing line.

**[Step 7]**

Start towing the towed ship.





### 6.3 Towing from bow (Pattern F1 – if on-deck power is NOT available)

#### [Step 1]

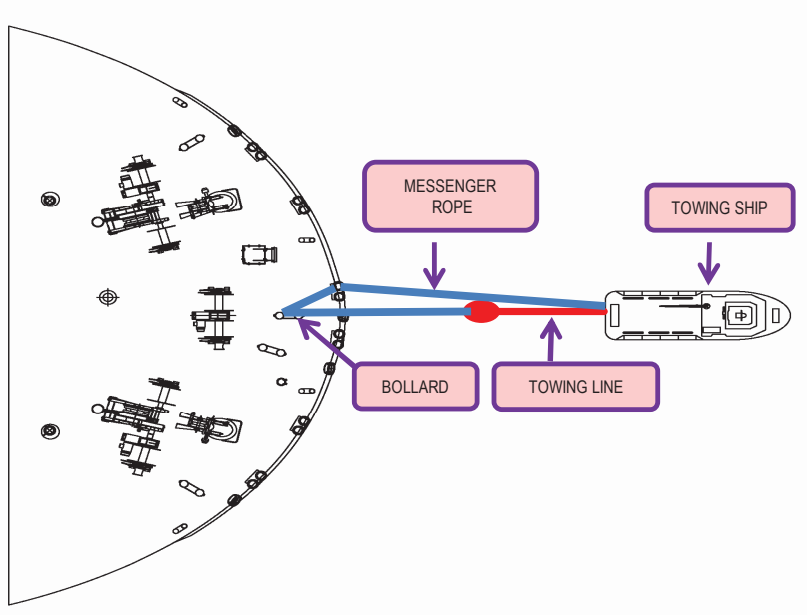
Receive the messenger rope from the towing ship.

#### [Step 2]

Pass the messenger rope through the closed chock, the bollard and the fairlead to the towing ship.

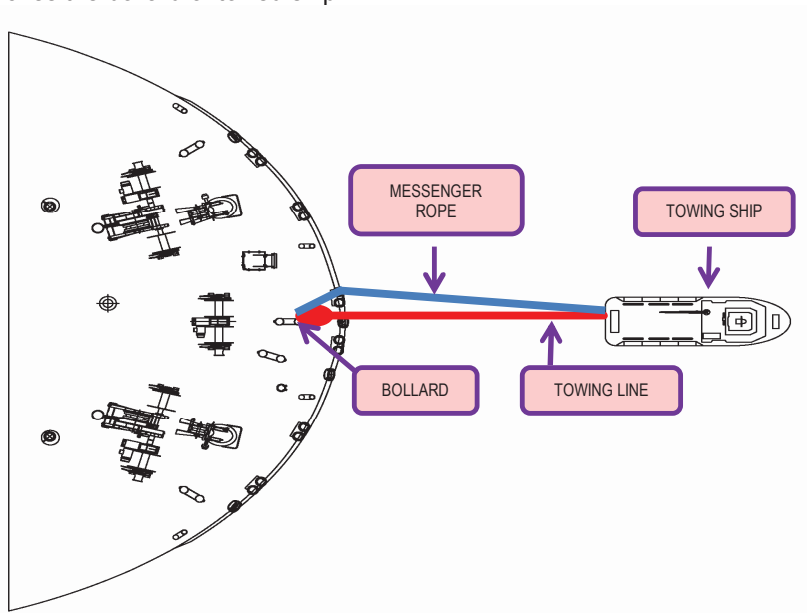
#### [Step 3]

Connect the messenger rope with the towing line on the towing ship.



#### [Step 4]

Wind up the messenger rope by using the winch on the towing ship until the eye splice of the towing line reaches the bollard of towed ship.



**[Step 5]**

Connect the rope stopper between the towing line and the bollard.

**[Step 6]**

Wind off the messenger rope from the mooring winch of towing ship.

**[Step 7]**

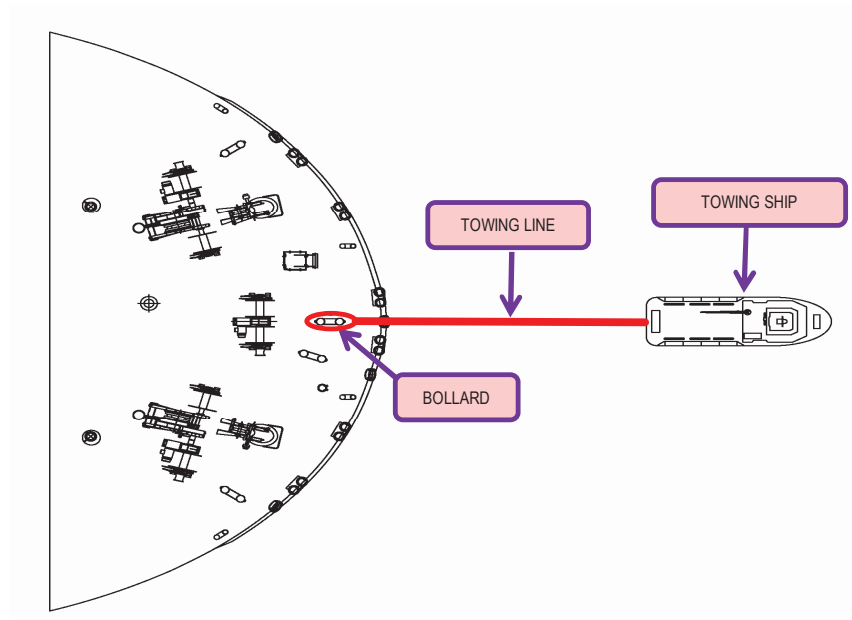
Hook the eye splice of the towing line on the bollard.

**[Step 8]**

Detach the rope stopper and the messenger rope from the towing line.

**[Step 9]**

Start towing the towed ship.



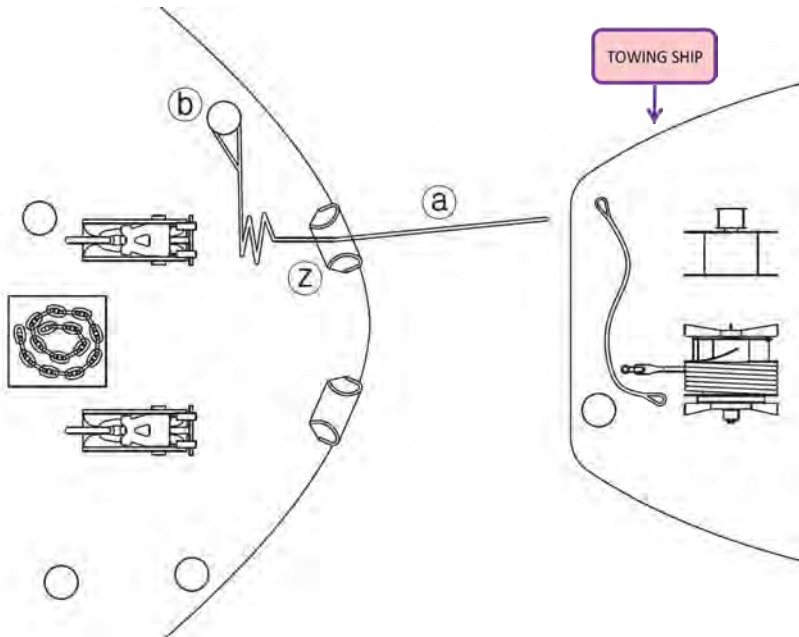
## **6.4 Towing from stern (Pattern A1)**

6.4.1 The procedures introduced in 6.2 or 6.3 are applicable for the towing from stern as well.

## 6.5 Towing from bow (Pattern F3)

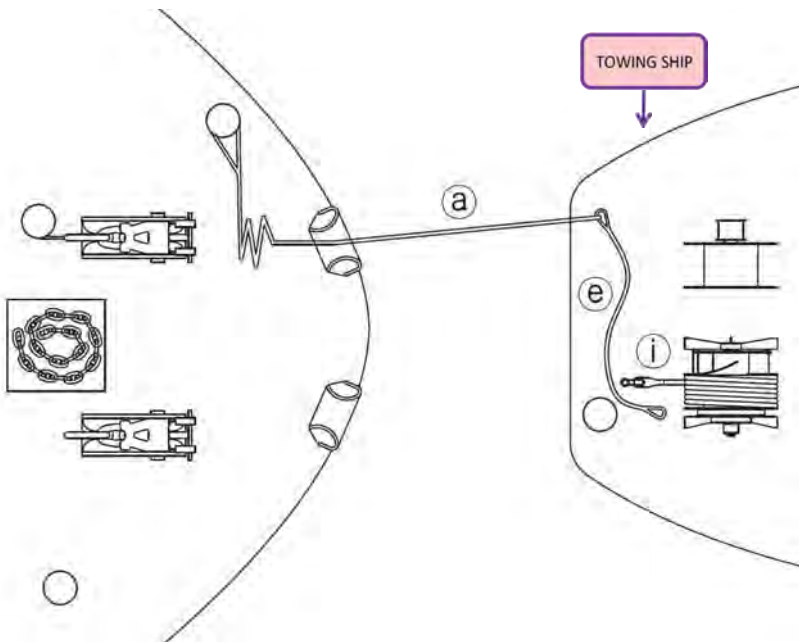
### [Step 1]

1. Tie the end of heaving rope (a) up to the towed ship.
2. Pass the heaving rope (a) through the fairlead (z) on the towed ship and throw the other end of heaving rope (a) to the towing ship.



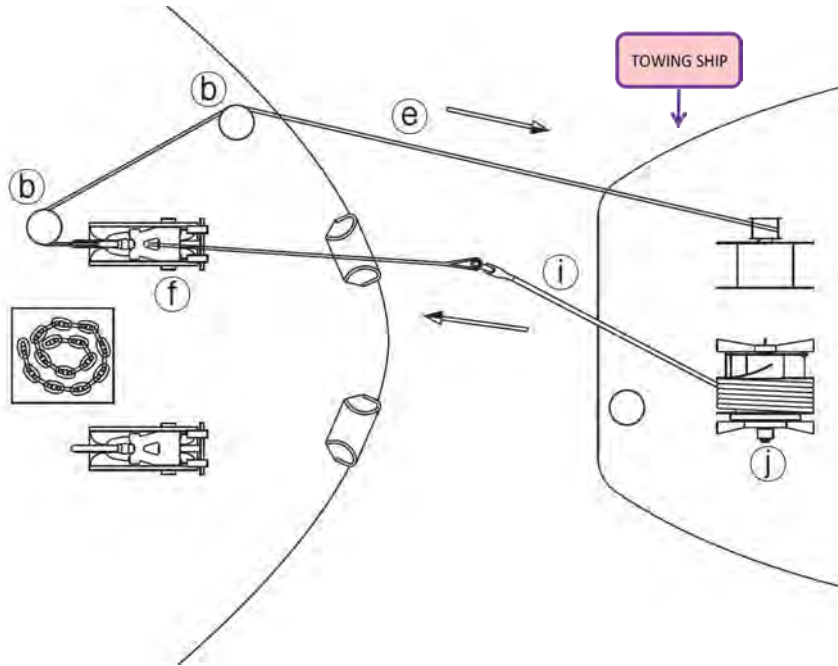
### [Step 2]

1. Pick up the heaving rope (a) at the towing ship.
2. Connect the heaving rope (a) with the messenger rope (e) and the towing line (i).



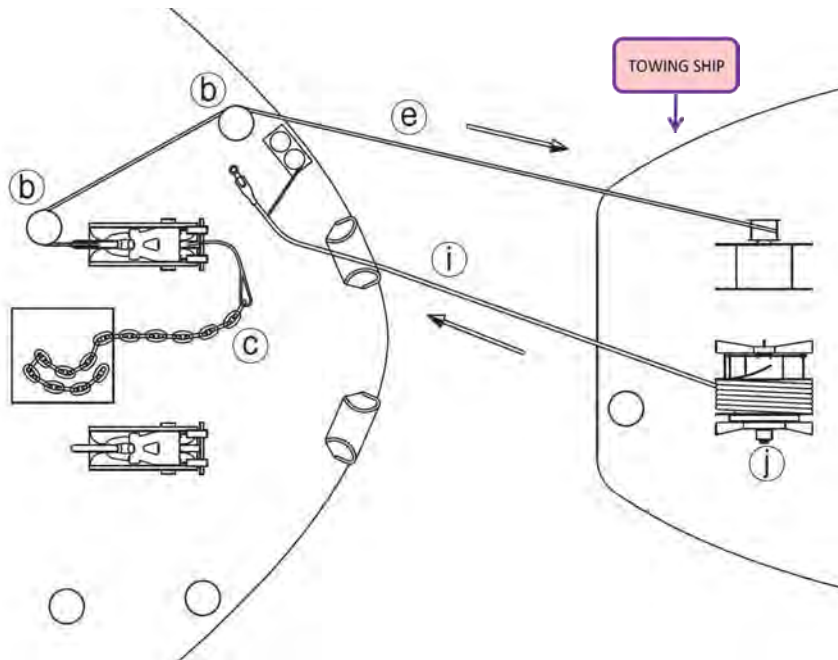
**[Step 3]**

1. Pull up the messenger rope (e) to the towed ship up to the messenger rope and pass it through the opening of the dog of chain stopper (f).
2. Return the messenger rope (e) to the towing ship by using bollard (b) and/or stand roller (b) and shipside fairlead.
3. Wind up the messenger rope by using the winch on the towing ship so that the end of towing line (i) comes to the chain stopper on the towed ship.



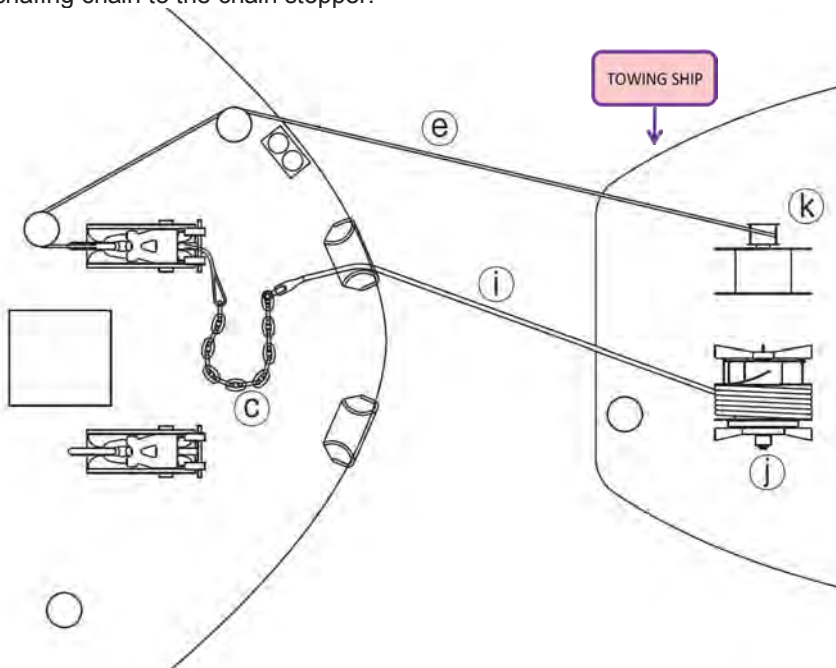
**[Step 4]**

1. Tie up the towing line (i) to bollard (b) on the towed ship by using the seizing rope.
2. Connect the messenger rope (e) to the end of chafing chain (c) on the towed ship.



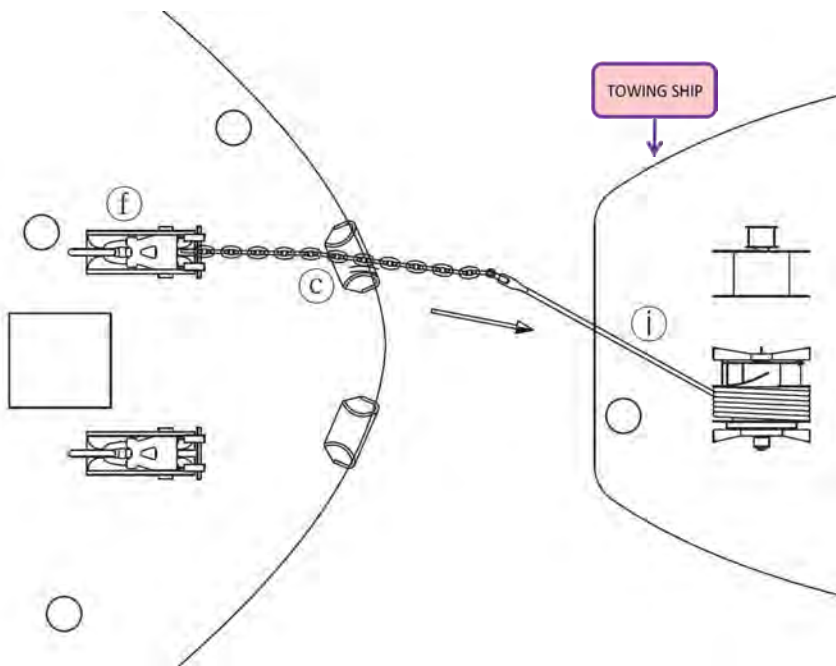
**[Step 5]**

1. Connect the towing line (i) to the end of chafing chain (c).
2. Wind up the messenger rope (e) by using the winch (k) on the towing ship in order to engage the chafing chain to the chain stopper.



**[Step 6]**

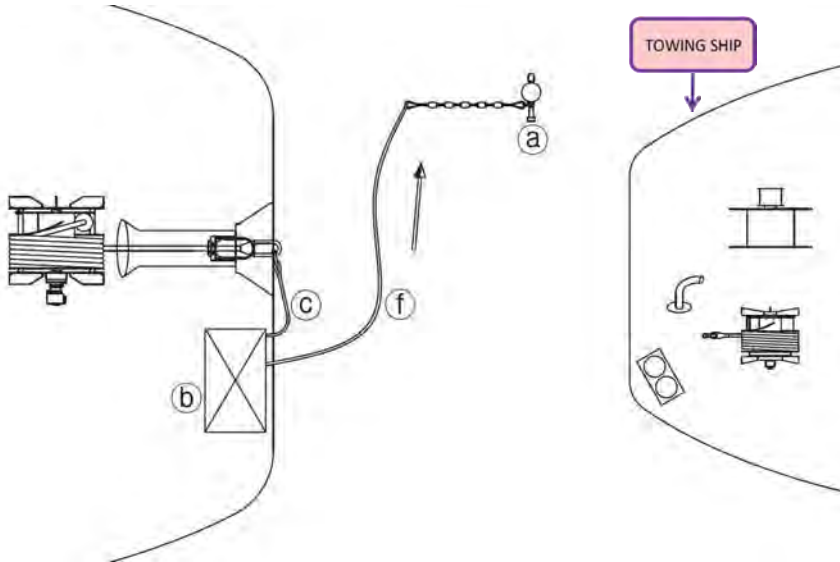
1. Connect the end of chafing chain (c) to the chain stopper (f) and engage the dog of chain stopper (f).
2. Drive the towing ship forward to start towing.



## 6.6 Towing from stern (Pattern A3)

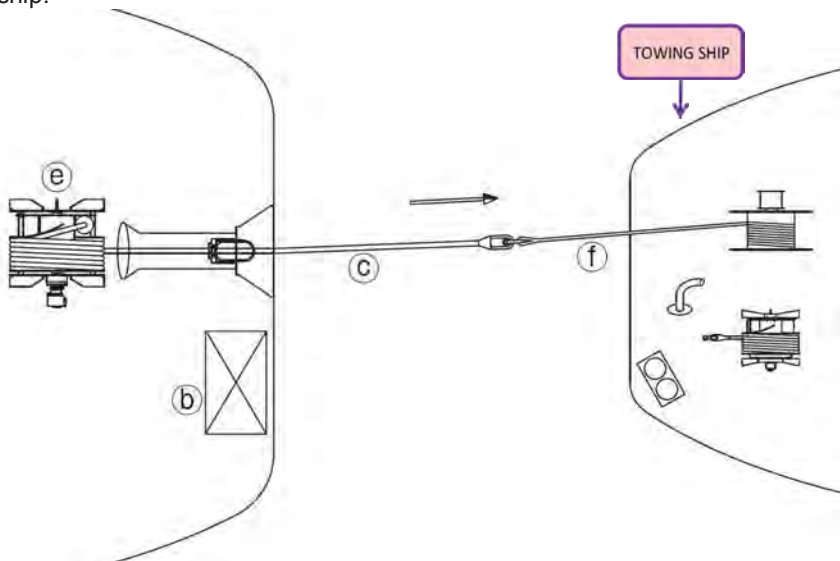
### [Step 1]

1. Open the pick-up rope box (b) on the towed ship so as drop the messenger rope (f) and self-igniting buoy (a) into the sea.



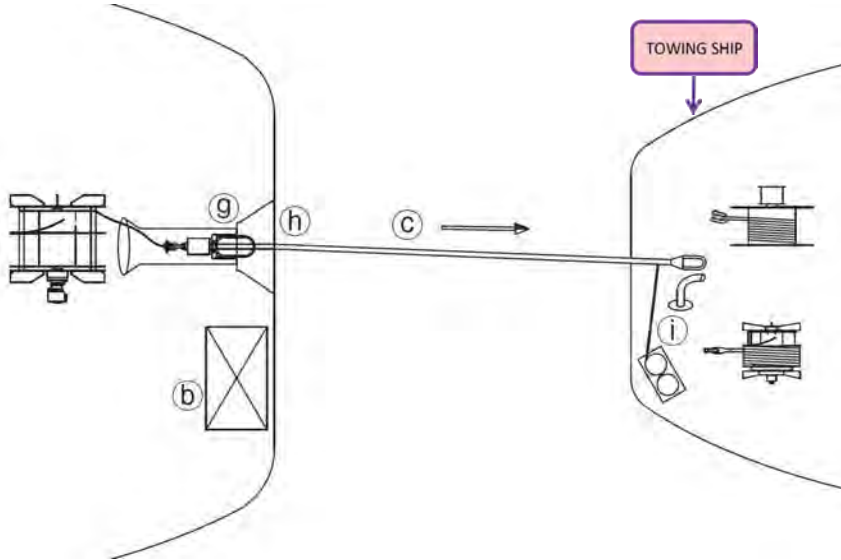
### [Step 2]

1. Pick up the messenger rope (f) and wind the messenger rope (f) by using the winch on the towing ship.



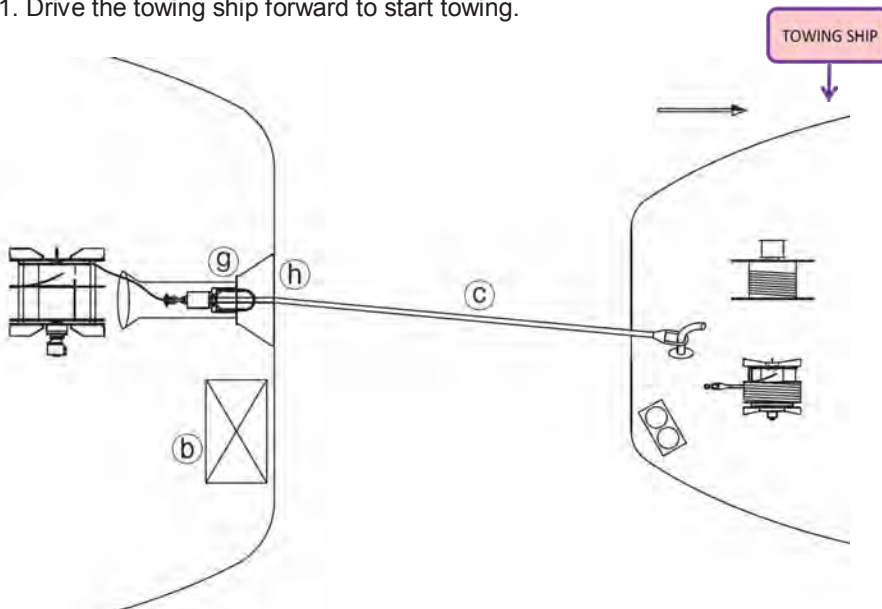
**[Step 3]**

1. Wind the messenger rope and the towing line(c) till the stopper(g) touches the strong point(h) of the towed ship.
2. Tie up the towing line(c) to the bollard on the towing ship by using the seizing rope(i).
3. Connect the end of towing line(c) to the strong point on the towing ship.



**[Step 4]**

1. Drive the towing ship forward to start towing.





## Chapter 7 - CURRENT STATUS

### 7.1 General

No.	Item	Status	
		Date/Month/Year	Time
1	Current time		
2	Current position		
3	Cause of towing	Describe the cause :	
4	Weather condition		
5	Weather forecast		
6	Wave height		
7	Ship's draft	Fore :	Aft :
8	Displacement		
9	Wind velocity and direction	Velocity [knots]	Direction
10	Drifting speed and direction	Speed [knots]	Direction

**7.2 Damage and seaworthiness**

No.	Item	Status	
1	Flooding or outflow?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :
2	Imminent danger? (e.g. grounding)	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the danger :
3	Cargo loaded?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the type of cargo :
4	Is the main engine available?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status of M/E :
5	Is the trim controllable?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	Can the ship be towed from the bow?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :
7	Can the ship be towed from the stern?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :
8	Is there heeling?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	Oil leakage? If any, give status	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :

### 7.3 Steering and propulsion

No.	Item	Status	
1	Is the rudder operable?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :
2	If the rudder is damaged, what is the current rudder angle and is it possible to return to amidships?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :
3	Can the propeller shaft be prevented from turning?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :
4	Can the mooring equipment on deck be used for tow line connection?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :

### 7.4 Power system

No.	Item	Status	
1	Is the power on board available?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :
2	Can the deck lighting be used for the towing line connection?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :
3	Can the mooring winch be used for winding the towing line?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Describe the status :
4	Can the towing side/stern lights be used?	<input type="checkbox"/> Yes <input type="checkbox"/> No	

**[Postscript] Steering Committee**

<b>Responsibility</b>	<b>Name</b>	<b>Company</b>
Manager	J. R. Oh	Samsung Heavy Industries Co., Ltd.
Member	H. S. Baek	Daewoo Shipbuilding & Marine Engineering
Member	J. H. Kang	Daewoo Shipbuilding & Marine Engineering
Member	S. Y. Hong	Hyundai Heavy Industries Co., Ltd.
Member	Y. H. Yang	Hanjin Heavy Industries & Construction Co., Ltd.
Member	T. J. Park	Hyundai Samho Heavy Industries Co., Ltd.
Member	J. H. Cha	Korea Marine Equipment Research Institute
Member	S. H. Byun	Korean Register of Shipping
Member	B. G. Kwon	Korea Shipbuilders' Association
Member	H. T. Kim	Korea Ocean Research & Development Institute

# Appendix F

<b>Emergency Ship Tow - Vessel Information Request</b>			
<b>This form is to be used to obtain information about the vessel in need of assistance.</b>			
Name of person filling out this form			
Date		Time	
Name of Vessel		Name of Master	
Call Sign		Vessel Flag	
Vessel Cargo (if empty record no cargo)			
Position of Casualty			
Nature of Casualty			
Last Port		Destination:	
Freeboard			
Is the Casualty in Immediate danger? <input type="checkbox"/> Yes <input type="checkbox"/> No   Describe: _____			
Is the vessel capable of transferring ballast? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Can the vessel safely be taken it tow? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Was the USCG notified? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Is there a pollution risk? <input type="checkbox"/> Yes <input type="checkbox"/> No   Describe: _____			
Name of person requesting assistance: _____			
Organization they represent: _____			
Phone #		Mobile/Cell #	
Email address		Fax #	
On scene weather conditions			
Set and Drift			
Vessel particulars		Vessel Length	Vessel Beam
		Draft Fwd	Draft Aft
Foc'sol deck height above the water			
Communications		VHF Channel # 1	VHF Channel # 2
		SSB Frequency	Inmarsat #
		Ship Mobile Phone	Ship Fax
		Communication Schedule	
Is the vessel equipped with an emergency towing system? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Is there a towing arrangement on the bow and or stern of the vessel? <input type="checkbox"/> Bow <input type="checkbox"/> Stern <input type="checkbox"/> Both			
If yes, what type & manufacturer? _____			
Is there a towing strong point? <input type="checkbox"/> Yes <input type="checkbox"/> No		If yes what type? _____	
Does the ship have power to deck equipment? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Is the ships steering operational? <input type="checkbox"/> Yes <input type="checkbox"/> No		Is there a need to secure the shaft? <input type="checkbox"/> Yes <input type="checkbox"/> No	
If the steering is not operational what is the rudder position? _____			
Can the rudder be secured in the amidships position? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Will the ships crew be able to steer the ship once under tow? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Is the ships windless operational? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Does the ship have a tow plan? <input type="checkbox"/> Yes <input type="checkbox"/> No		Can you obtain a copy ? <input type="checkbox"/> Yes <input type="checkbox"/> No	
If no tow plan, can photographs of the ships bow and stern decks be obtained to locate the bitts , chocks another deck fittings? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Is the crew capable of rigging the tow gear <input type="checkbox"/> Yes <input type="checkbox"/> No			
Are there English speaking officers onboard <input type="checkbox"/> Yes <input type="checkbox"/> No			
Other (fill in) _____			
Other (fill in) _____			
<b>Notes</b>			

# Appendix G

## Emergency Ship Tow Preparation & Requirements Checklist

The form is designed to assist the Master/mate in preparing a vessel for rescue or salvage towing by providing a general checklist for items necessary for rescue towing. It may be amended as needed.

Towing Vessel	
Date	
Master	
Fuel Onboard	
Lube Onboard	
Name of Towed Vessel	

Item #	Required Items (recorded variances in note section below)	Yes	No
1	Appropriate charts and publications	<input type="checkbox"/>	<input type="checkbox"/>
2	Weather reports and routing	<input type="checkbox"/>	<input type="checkbox"/>
3	Voyage Plan	<input type="checkbox"/>	<input type="checkbox"/>
4	Voyage Orders	<input type="checkbox"/>	<input type="checkbox"/>
5	Tow Plan	<input type="checkbox"/>	<input type="checkbox"/>
6	Ports of refuge on tow route	<input type="checkbox"/>	<input type="checkbox"/>
7	Stores and supplies	<input type="checkbox"/>	<input type="checkbox"/>
8	Properly qualified crew complement with documentation appropriate for the voyage	<input type="checkbox"/>	<input type="checkbox"/>
9	Miscellaneous Poly and Dacron line from 3/8' to 5/8" diameter	<input type="checkbox"/>	<input type="checkbox"/>
10	Messenger lines with adequate spares ( sizes from 1 1/2" spectra line to 7 & 8 poly eight or 12 strand preferable, RP-12 or similar line)	<input type="checkbox"/>	<input type="checkbox"/>
11	Line Gun (with spare cartridges, shot line and rods)- if another type line throwing device such as a Paine Wessex is carried, then ensure sufficient spares on board to allow more than one shot to be made.	<input type="checkbox"/>	<input type="checkbox"/>
12	1" and 1 1/2" Wire straps and stoppers from 3'/6'/12' eye and eye with spares	<input type="checkbox"/>	<input type="checkbox"/>
13	3/8" and 1/2" chain with connecting links available for chain chokers and stoppers (grade 40 or 70 preferred with appropriate strength connecting links)	<input type="checkbox"/>	<input type="checkbox"/>
14	Assorted line straps and stoppers	<input type="checkbox"/>	<input type="checkbox"/>
15	Heavy duty Snatch block	<input type="checkbox"/>	<input type="checkbox"/>
16	Cargo hook with safety latch –Crosby S-320N Alloy 22 ton	<input type="checkbox"/>	<input type="checkbox"/>
17	Carpenters clamp sized for the tugs tow wire	<input type="checkbox"/>	<input type="checkbox"/>
18	Sufficient Towing shackles and spares, cotter keys, bolts	<input type="checkbox"/>	<input type="checkbox"/>
19	Cutting torch with tips, tip cleaner, striker, working gauges & Oxygen / Acetylene bottles full	<input type="checkbox"/>	<input type="checkbox"/>
20	Surge gear onboard (2) full shots and (2) 1/2 shots of 3" stud-link surge chain.	<input type="checkbox"/>	<input type="checkbox"/>
21	Two galvanized hard wire rescue tow pennants 2 1/4" x 90ft eye on one end, towing thimble on the other.	<input type="checkbox"/>	<input type="checkbox"/>
22	Miscellaneous working shackles for straps, and messenger lines	<input type="checkbox"/>	<input type="checkbox"/>
23	150 ft x 1 1/2" Swede wire ( Can substitute Plasma line)	<input type="checkbox"/>	<input type="checkbox"/>
24	Spare Portable VHF radios (for direct communications with ship deck crew in case ship does not have enough)	<input type="checkbox"/>	<input type="checkbox"/>
25	Surge gear onboard (2) full shots and (2) 1/2 shots of 3" stud-link surge chain.	<input type="checkbox"/>	<input type="checkbox"/>
26	Appropriate PPE for deck crew?	<input type="checkbox"/>	<input type="checkbox"/>
27	Emergency Ship Towing System-ESTS (if available in the region- instructions for the use of the package can be found on the MOD in the Manuals section).	<input type="checkbox"/>	<input type="checkbox"/>
28	Other (write in)	<input type="checkbox"/>	<input type="checkbox"/>
29	Other (write in)	<input type="checkbox"/>	<input type="checkbox"/>
30	Other (write in)	<input type="checkbox"/>	<input type="checkbox"/>

### Notes