

GOMO Chapter 10

Bulk Cargo Operations

GOMO Chapter 10 Bulk Cargo Operations

Revision History

Revision Number	Date	Section	Changes
1	December 2022	10.1 General Requirements	Bullet point 2: reworded to clarify need for vessel and bulk system to be fit for purpose
			Bullet point 3: "segregation" added
			Bullet point 4: extra bullet added to cover need for integrity checks of hose and lifting arrangement
		10.2 General Precautions	Bullet point 4: wording added to consider secondary/back up means of comms
			Bullet point 9: reference changed from "Master or Senior OOW" to "a designated member of the bridge team"
			Bullet point 13: reference to ISGOTT publication added
			Bullet point 14: reworded in respect of use of "compressed air" for clearing of hoses
			Bullet point 17: reference to floating hoses added
			Bullet point 19: wording updated to emphasise manual handling risks
		10.3.1 Vessel Responsibilities at the Facility	Extra bullet added to consider securing of hoses and diffusers where necessary
		10.7 Bulk Hose Handling Procedures & Securing arrangements	Title updated to reflect merge with previous section 10.8 on Hose Securing Arrangements
			Details on traditional hose securing method removed and reference to example good practice methods in appendix 10-C added
		10.8.1 Bulk Transfers of Common Liquids – Cargo Fuel (Marine Gas Oil)	Reference added to development of tank management plans and also MSF Marine Gas Oil guidance
		10.8.2 Bulk Transfers of Common Liquids – Potable Water	Reference added to development of tank management plans and also to MSF Pot Water Guidance
		10.9.4.1 Methanol	Reference added to the MSF / OCIMF document "The Carriage of Methanol in Bulk Onboard Offshore Vessels"
			Recommendation to consider crew training in Methanol handling added
		10.13 Tank Cleaning	Section updated and reordered to follow the natural flow of an operation

UNCONTROLLED WHEN PRINTED

GOMO Chapter 10
Bulk Cargo Operations

Contents

10	Bulk Cargo Operations	10-3
10.1	General Requirements	10-3
10.2	General Precautions	10-3
10.3	Bulk Operations in Port & at Facility	10-4
	10.3.1 Vessel Responsibilities at the Facility	10-4
	10.3.2 Facility Responsibilities	10-5
10.4	Preparations Relating to Transfer of Dry Bulk Materials	10-5
10.5	Hose Usage.....	10-6
10.6	Hose Markings & Connections	10-6
10.7	Bulk Hose Handling Procedures & Securing Arrangements	10-6
10.8	Bulk Transfers of Common Liquids	10-6
	10.8.1 Cargo Fuel (Marine Gas Oil)	10-6
	10.8.2 Potable Water.....	10-7
10.9	Bulk Transfers of Special Products	10-7
	10.9.1 Shipper	10-7
	10.9.2 Operating Company & Base Operator	10-7
	10.9.3 Vessel Master.....	10-7
	10.9.4 Characteristics of Some special Liquid Products	10-8
10.10	Attendance of Facility Personnel During Bulk Transfer Operations.....	10-9
10.11	Back-Loaded Liquid Bulk Cargoes.....	10-9
10.12	Transfer of Noxious Liquids During Hours of Darkness	10-9
10.13	Tank Cleaning.....	10-10
	10.13.1 Preparations	10-10
	10.13.2 Operations.....	10-11
	10.13.3 Completion of Tank Cleaning	10-12

10 Bulk Cargo Operations

10.1 General Requirements

Cargoes carried in bulk on offshore support vessels include dry products in powder form, together with various types of oil and water-based muds, base oils, brine and numerous other chemicals transported in liquid form.

Attention is drawn to Chapter 3 which emphasises, that when planning to load any cargo, including those consisting of bulk powders or liquids onto an offshore support vessel, the various parties involved have several joint responsibilities, including ensuring that:

1. The proposed vessel is fully fit for the purpose intended
2. Vessel and bulk system is fully in compliance with all relevant legislation, rules and codes relating to the carriage of the relevant goods or products. Relevant documentation such as MSDS shall be provided to vessel to assist in checking compliance
3. Appropriate procedures for the loading, segregation, carriage and discharge of the products are in place
4. Suitable integrity checks for the hose and lifting arrangement are in place and up to date
5. The personnel involved have relevant experience and competencies

Bulk cargo transfers are potentially hazardous operations and must be done in a controlled manner.

10.2 General Precautions

In undertaking bulk cargo operations, the following precautions should be observed:

1. The pressure ratings of all components of the transfer system should be verified to ensure that they are appropriate for the proposed operation.
2. Prior to commencement, agreement shall be reached between all relevant parties, including vessel, base, facility or roadside tanker regarding the pressure rating to avoid overpressure.
3. The protocols for control of the transfer operation are to be agreed by all parties involved.
4. Communications arrangements shall be agreed and tested prior to the commencement of the operation and at frequent intervals as it proceeds. Means of a secondary/back up communications method shall be discussed.
5. If communications are lost, "Stop the Job"
6. Shipper and receiver should confirm quantities to be transferred and subsequently monitor at regular intervals.
7. Shipper and receiver shall agree on rates of delivery and densities of cargo being transferred.
8. Relevant personnel must be readily available and nearby throughout transfer operations.
9. At facility, a designated member of the bridge team must ensure they can see bulk hose(s) at all times and not be distracted from these. Particular attention should be paid during hydrocarbon transfers to ensure that proper consideration is given of potential hazards when carrying out concurrent cargo operations.

GOMO Chapter 10 Bulk Cargo Operations

10. Each party shall give sufficient warning prior to changing over tanks and communicate when changes have occurred.
11. **Do not** close valves against a cargo pump
12. If, at any point, vessel Master, shipper, OIM or any other person has concerns relating to the safety of the transfer operation, it must be stopped.
13. Unregulated compressed air should not be used to clear any bulk hoses back to the vessel as this may damage tanks. Refer to ISGOTT for further information.
14. The use of regulated compressed air to clear hoses used for the transfer of any hydrocarbon-based products should be fully risk assessed by all parties involved where the flashpoint of the product is less than 60°C.
15. Do not transfer any other liquids using potable water hoses.
16. Before use, flush potable water lines through to clear any residues.
17. Hoses must remain afloat at all times through use of sufficient flotation devices or floating hoses.
18. Use of self-sealing weak link couplings in the mid-section of the hose string is recommended.
19. The number of reducers and connections should be kept to a minimum to avoid unnecessary weak points and ease manual handling at the hose end.
20. The hose from the facility should not be connected to the vessel until both parties have agreed that all preparations have been completed and that the transfer can commence immediately after the connection has been satisfactorily completed.

10.3 Bulk Operations in Port & at Facility

Flow charts illustrating the processes involved in handling of bulk cargoes both in port and at the offshore facility are included in Appendix 10-A.

Particular responsibilities associated with such operations are described below.

A check list which should be completed prior to commencing any transfers of bulk cargoes is included in Appendix 10-B.

10.3.1 Vessel Responsibilities at the Facility

Before offloading bulk cargo, confirm the following details with facility:

1. Communications protocols have been agreed and, in particular, how calls to “STOP” will be managed.
2. Quantity of bulk to be offloaded.
3. That the hoses and connections, colour codes and dimensions all correct.
4. That the rigged hose lengths are adequate.
5. Procedures for venting and blowing through hoses.
6. The facility is ready to receive cargo; all valves and vents are open and correct tanks lined up.
7. Emergency shut down procedures are in place and the crew are familiar with these.

UNCONTROLLED WHEN PRINTED

GOMO Chapter 10 Bulk Cargo Operations

Ensure that:

1. All pollution prevention equipment is in place, as per SMPEP.
2. All manifold valves are in good condition.
3. The person in charge cannot or will not be distracted from the operation.
4. Facility under-deck lighting is adequate.
5. Dry bulk vent line positions are identified.
6. Hoses and diffusers are secured where necessary.
7. Hose and connection(s) are observed throughout transfer operations

The Master or delegate shall submit the following to the designated contact person:

1. All receipts, where applicable, including meter readings, for cargoes transferred.
2. Any other relevant documentation and information.

10.3.2 Facility Responsibilities

Ensure that:

1. Communications protocols have been agreed and, in particular, party whose “STOP” it is.
2. Hoses, manifolds, and valves are visually inspected, maintained and replaced as required in accordance with the planned maintenance system.
3. Slings and lifting points are visually checked and replaced as required.
4. Hoses are lifted by a certified wire stop on a certified hook eye fitting.
5. Under-deck lighting adequately illuminates the transfer hose and vessel.
6. Appropriate flotation systems are intact and in place.

10.4 Preparations Relating to Transfer of Dry Bulk Materials

The following recommendations are included to supplement those in the flow-charts included in Appendix 10-A.

It is recommended that procedures should be adopted as follows in addition to the use of the Transfer Checklist at appendix 10-B:

1. Prior to confirming that a vessel is ready to transfer any dry bulk cargoes, it should be verified that all on-board preparations have been completed.
This includes a requirement to ensure that, where relevant, all elements of the system have been vented to atmospheric pressure.
2. When transferring dry bulk cargoes to or from vessels, personnel responsible for delivering the product should confirm that personnel responsible for receiving it have completed all relevant preparations.
Assumptions that preparations have been completed can be dangerous and must be avoided. Relevant check lists shall be completed as required by the parties involved.
3. When transferring dry bulk cargoes to or from vessels, care should be taken when deciding the sequence and manner in which the various valves are opened to avoid the risk of inadvertently over-pressurising any elements of the system.

UNCONTROLLED WHEN PRINTED

GOMO Chapter 10 Bulk Cargo Operations

4. It is important to remember that the handling of dry bulk materials involves systems containing large volumes of pressurised air. Such systems contain considerable stored energy and the potential for serious personal injury in the event of failure is high.
5. All personnel involved in such operations must therefore comply with all relevant procedures and to ensure that all checks have been satisfactorily completed prior to confirming their readiness to deliver or receive the product.

10.5 Hose Usage

Appendix 10-C contains general guidelines regarding the usage and care of offshore bulk hoses.

10.6 Hose Markings & Connections

Appendix 10-E contains information relating to hose marking, usage and connections.

10.7 Bulk Hose Handling Procedures & Securing Arrangements

A safe system of handling bulk hoses at the offshore facility should be developed to address and minimise the risks associated with bulk hose operations. This should specifically address the risks posed to vessel crew in handling suspended loads.

Any arrangements which reduce or avoid personnel exposure to suspended hoses should be investigated. Two such examples of hose handling procedures are included at Appendix 10-C.

The “Sling and Pin” and “Over Rail” methods described in appendix 10-C require only minor modifications on the vessel. These must be assessed in conjunction with the vessel to assess the safest method for the vessel configuration.

Vessel crews should be reminded that, whenever possible, hose couplings should avoid contact with the ship’s structure. The integrity of the couplings should be monitored by visual inspection of the painted line on the couplings, where applied.

In marginal weather, increased awareness is required by the vessel to avoid over running the hose, especially if deck cargo is also being worked. In such circumstances, consideration should therefore be given to carrying out bulk hose operations on their own.

10.8 Bulk Transfers of Common Liquids

10.8.1 Cargo Fuel (Marine Gas Oil)

Establish a sampling and receipting procedure when transferring fuel.

Samples must be taken in accordance with MARPOL Annex VI and will normally suffice for these operations. However, in some circumstances, more rigorous sampling procedures may be required. Any such requirements should be included in the Master’s sailing instructions and should always be observed.

The duration that fuel is stored in tanks should be minimised to avoid build-up of condensation, which can lead to microbial growth. Each vessel is recommended to have a tank management plan to addresses potential build-up of any water and particles, with procedures in place to keep these as low as reasonably practicable. Further guidance is available from documents such as the Marine Safety Forums “Delivering Quality Bulk Marine Gasoil to Offshore Installations”.

UNCONTROLLED WHEN PRINTED

GOMO Chapter 10 Bulk Cargo Operations

10.8.2 Potable Water

Storage tanks used for transporting potable water must be dedicated solely for that purpose. The duration that water is stored in tanks should be minimised to avoid stagnation. Details of how this is controlled shall be captured in a tank management plan.

Specific national or charterer's requirements may apply to the carriage, storage and transfer of potable water.

An example good practice document "Delivering Quality Potable Water to Offshore Installations" can be found on the Marine Safety Forum website.

The Charterer, Owner and Master should ensure that any such requirements are understood and followed.

10.9 Bulk Transfers of Special Products

Special care must be taken to follow correct procedures when transferring special products which include but are not limited to methanol and zinc bromide.

Appropriate risk management procedures should be in place when transferring special products. Reference should be made to Chapter 4 of this document, with particular attention being given to PPE required for personnel involved.

When transferring these products, the following should be observed:

10.9.1 Shipper

1. Provide full details of products being shipped, including details of all handling precautions to be taken.
2. Staff shall be on site throughout to advise on pumping, handling, earthing and discharge of tanks.
3. Ensure appropriate firefighting equipment is available, where relevant.

10.9.2 Operating Company & Base Operator

1. Nominate berth after liaising with harbour authority, fire brigade and harbour police or security.
2. Ensure sufficient cooling or drenching water is available.
3. Cordon-off area, with signs posted to indicate a hazardous area.

10.9.3 Vessel Master

1. Complete a ship to shore safety check with shipper.
2. Authorise loading.
3. If required, ensure a permit to work is in place before any loading operations can commence.
4. Ensure vessel's restricted zone is clear, fire hoses are rigged and SMPEP equipment is ready for use before loading commences.

10.9.4 Characteristics of Some Special Liquid Products

Whilst the shipper must provide full details of any products being shipped, characteristics of some of the more common chemicals which may be shipped in bulk liquid form are included below.

10.9.4.1. *Methanol*

Particular characteristics of this product are as follows:

1. Burns with no visible flame in daylight conditions.
2. Readily or completely miscible with water.
3. Is a class 3 substance with noticeable odour.
4. Is highly flammable, with a flashpoint below 23 °C.
5. Can evaporate quickly.
6. Has heavier than air vapour that may be invisible and disperses over the ground.
7. Can form an explosive mixture with air, particularly in empty unclean offshore containers.
8. Experiences pressure increase on heating, with the risk of bursting followed by explosion.
9. Is very toxic, and possibly fatal, if swallowed or absorbed through skin. Symptoms may not appear for several hours.
10. Can cause significant irritation of the eyes.

The following specific precautions should be observed when transferring this product:

1. Ensure that integrity of system is intact, and that all relevant certification is valid and in-date.
2. During bulk methanol transfer, smoking and the use of ignition sources are prohibited.
3. During electrical storms (lightning) operations should be stopped.
4. Ensure free deck space around bulk loading / discharge stations so that coverage of foam monitors is not obstructed.
5. No other operations to be undertaken when handling this product.

It is recommended that crew are trained and familiar in Methanol handling prior to operations commencing.

Further guidance on the safe loading, carriage and discharge of methanol by offshore support vessels is available in the document “The Carriage of Methanol in Bulk Onboard Offshore Vessels” available on the Marine Safety Forum website.

10.9.4.2. *Zinc Bromide*

Zinc Bromide is a highly corrosive and environmentally contaminating product.

Due to its corrosive nature, protection against injury from exposure is essential.

Information provided by the shipper should be used when undertaking risk assessments involving the carriage of this product to determine the appropriate level of PPE which should be used.

GOMO Chapter 10 Bulk Cargo Operations

10.10 Attendance of Facility Personnel During Bulk Transfer Operations

Whilst vessels are connected to offshore facilities by hoses for the purpose of delivering bulk commodities to facilities, it is important that, in the event of a change in the operating circumstances developing, personnel on the facility remain available at all times to disconnect the hose(s) at short notice.

Failure to disconnect the hoses in a timely manner may result in significant risk of injury to personnel and/or damage to assets or the environment.

The facility crane operator and deck crew shall therefore remain readily available, contactable, and nearby throughout transfer operations.

If any such personnel are required to leave the vicinity of operations for any reason, the vessel should be immediately advised. The vessel bridge team, in conjunction with the facility manager, should assess current and anticipated operational risks. It is the Master's decision as to whether the vessel remains connected to the facility pending restoration of the required level of support.

10.11 Back-Loaded Liquid Bulk Cargoes

Please refer to Appendix 10-F for further details.

10.12 Transfer of Noxious Liquids During Hours of Darkness

It is recognised that it may be necessary to transfer hydrocarbon or other noxious liquids during the hours of darkness, particularly in higher latitudes in the winter months.

For clarity, these Guidelines do not advocate that such operations should be curtailed or restricted but seek to identify the additional risks involved in such transfers and to make appropriate recommendations to manage such risks.

It is recognised, for example, that leaks are most likely to occur in the early phases of any transfer operation as connections become pressurised. Once all aspects of the transfer operation have been stabilised, leaks are less likely to occur.

It is therefore recommended that, where practical, the following practices are adopted in relation to the bulk transfer of hydrocarbons (or other recognised marine pollutants) during the hours of darkness:

1. Adequate artificial illumination of the operational areas on the facility, the vessel and the water between them should be provided.
2. Additional high-visibility and / or reflective panels on the hoses (or their buoyancy elements) are recommended.
3. All preparations for the transfer to be completed in daylight, where practical.
4. Careful checks to be made for leaks, etc., on vessel, facility and connecting hose as transfer commences.
5. Transfer may continue into the hours of darkness, provided that the entire area and associated equipment is adequately illuminated to an acceptable standard.

In the event that the transfer continues, a careful watch of the connections and hose should be maintained throughout.

It is recommended that hydrocarbons or other noxious products should not be transferred

UNCONTROLLED WHEN PRINTED

GOMO Chapter 10

Bulk Cargo Operations

simultaneously in these circumstances.

6. On completion of the transfer, extra care should be taken when breaking the connection and returning the hose to ensure that the risk of spillage is minimised.

General precautions to be observed regarding safety of personnel working on deck during the hours of darkness should continue to be implemented.

10.13 Tank Cleaning

10.13.1 Preparations

10.13.1.1. *Check List*

A typical example of a check list which should be completed prior to the commencement of tank cleaning operations is included at Appendix 10-G.

10.13.1.2. *Simultaneous Operations (SIMOPS)*

Where simultaneous tank cleaning and other operations, i.e., cargo operations, are undertaken, suitable safety precautions must be in place. Interfaces between vessel's officers, tank cleaning and quay supervisors must be kept open and active during the tank cleaning operation.

10.13.1.3. *Risk Assessment*

The Tank Cleaner Supervisor must demonstrate to the Master or delegate that they understand the principles and have undertaken a full and comprehensive risk assessment relevant to the intended task, including all mitigative and preventative measures.

The outcomes of the risk assessment need to be addressed in the subsequent toolbox talk with all risks controlled prior to commencing the task.

10.13.1.4. *Emergency Response & Escape*

The Tank Cleaning Supervisor must demonstrate to the Master or delegate that the emergency response and escape arrangements identified in the risk assessment are in place and available, if required.

Equipment used for emergency escape must be tested, certified, and fit for the intended purpose.

10.13.1.5. *Permit to Work*

Prior to all tank cleaning operations, a permit to work must be opened to cover (but not be limited to) all work activities associated with the tank cleaning and not just limited to tank entry, i.e., setting up equipment, line flushing, scaffolding etc.

10.13.1.6. *Isolations*

Isolations to be agreed and in place prior to commencement of tank cleaning. Refer to Appendix 10-G for more information.

GOMO Chapter 10 Bulk Cargo Operations

10.13.1.7. ***Toolbox Talk***

A detailed toolbox talk must be conducted with all key personnel prior to commencement of tank cleaning operations. Refer to Appendix 10-G for more information.

10.13.1.8. ***Initial Atmosphere Testing & Tank Entry***

All tanks should be considered as “dangerous spaces” which, if appropriate precautions are not taken, would represent a serious risk to personnel entering them.

The Tank Cleaning Supervisor must demonstrate to the Master that the atmosphere in the tank has been tested to prove that it does not represent a threat to any personnel who may be required to enter the space. They must also be able to demonstrate that any equipment utilised for this purpose has been calibrated & bump tested and used in accordance with the manufacturer’s instructions.

The results of the atmosphere testing should be recorded on the permit or other agreed document.

10.13.1.9. ***Personal Protective Equipment & Respiratory Protective Equipment***

Personnel working in the tank shall wear the appropriate PPE as identified in the risk assessment, COSHH or equivalent assessment and MSDS.

All PPE must be pre-inspected prior to use and be correctly fitted for the user and certified where applicable.

10.13.1.10. ***Communications***

Communication system between all personnel within tank and at access must be agreed, tested prior to commencement of cleaning activities, and checked at frequent intervals until all persons have exited the tank on completion of operations.

A standby person at each tank will almost always be required. This person should be competent and trained to take the necessary action in the event of an emergency.

Effective means of ship/ship and ship/shore communication shall be established and maintained throughout the tank cleaning operation.

10.13.2 Operations

10.13.2.1. ***Control***

Although the tank cleaning operation is conducted by a contractor under control of the contractor’s supervisor, the safety of the operation remains the responsibility of the vessel Master. The operation should be continuously monitored by a designated responsible vessel person, who should stop any operation that they consider to be unsafe.

10.13.2.2. ***Continuous Atmosphere Testing***

Continuous tank atmosphere testing by competent personnel from both the vessel and tank-cleaning contractor must be undertaken both prior to commencement of cleaning activities and checked at frequent intervals until all persons have exited the tank on completion of operations. Equipment utilised to conduct these tests of the tank atmosphere must be used by a user competent

UNCONTROLLED WHEN PRINTED

GOMO Chapter 10

Bulk Cargo Operations

in the use and in accordance with its manufacturer's instructions.

The results of the atmosphere testing should be recorded on the permit or other agreed document.

10.13.2.3. *Shift Handovers*

Handover between shifts of vessels and tank-cleaning personnel must be carefully controlled to ensure continuity and a further toolbox talk must be conducted.

10.13.3 Completion of Tank Cleaning

On completion of tank cleaning operations, the vessel Master or delegate must carry out an inspection, together with the tank cleaning contractor supervisor and/or client surveyor to ensure that the tanks have been cleaned to the required standard and lines and pumps have been thoroughly flushed.

The various commonly accepted tank cleaning standards are described in Appendix 10-H. The tank inspection should confirm that the tanks have been cleaned to the appropriate standard.

On completion of tank cleaning activity all equipment and consumables to be removed from the vessel and permits closed out.