

## SHIPBOARD MARINE POLLUTION EMERGENCY PLAN STEPS TO PREVENT MITIGATION OF SPILLAGE OF CRUDE OIL/ OIL AND NLS INSTO

### STEPS TO CONTROL DISCHARGE

Ship personnel will most probably be in the best position to take quick action to mitigate or control the discharge of oil or NLS from ship.

Therefore, this plan provides the master with clear guidance on how to accomplish this mitigation for different situations.

It is the master's responsibility to initiate a response in the event of discharge of crude oil/ oil and or NLS or substances threat of discharge – actual or probable-in to the sea.

In no case action should be taken that in any way could jeopardize the safety of personnel either onboard or ashore.

In case of unauthorized discharge of crude oil / oil or NLS master has to refer to the data sheet provided on board of any cargo in order to take right action to mitigate, stop discharge and minimize the result from discharge.

#### **3.1 Total Volume of oil involved**

Average worst probable discharge	50 bbl
Maximum most probable discharge	250 bbl
Worst case discharge	Loss of cargo and bunker

#### **3.2 Preventative measures**

There are mainly for crew member activities during cargo, bunker and ballast operations. During these operations the following preventative measures to be carry out.

##### **3.2.1 Personnel**

Into operation can be involved crew members perfectly known allocation of cargo tanks, cargo, bunker and stripping systems, trained for the fulfilment cargo, bunker and ballast operation. During all periods of loading/unloading operation the three persons are available:

- Person in charge
- Deck seaman
- Pump man

Person in charge for the cargo operation.

Chief Officer or supercargo is the person in charge for the cargo operation on the tanker. The person in charge is responsible for checking readiness of tanker, its equipment and systems preparedness for cargo handling operation.

Cargo operation can be started by the order of responsible person only.

#### **Responsible person for the ballast and tank washing operation**

Chief Officer or his alternate is the person responsible for the ballast and tank washing operation.

The person in charge is responsible for checking readiness of tanker, its equipment and systems, preparedness of personnel for this cargo operation.

Ballast and tank washing can be started by the order of responsible person only.

#### **Responsible person for bunkering operation**

The person responsible for the bunkering operation | the third engineer.

The person in charge is responsible for checking readiness of tanker, its equipment and systems, preparedness of personnel for the operation.

The bunkering operation can be started by the order of third only.

Responsible persons and personnel involved in cargo / bunker / ballast operation must be well trained / experienced to mitigate or control the discharge of oil or NLS from their ship accordingly.

#### **3.2.2 Action before cargo / bunkering operation**

Before cargo operation person in charge to be sure that:

1. Vessel safe berthed at terminal (mooring buoys or other vessel)
2. Mooring lines or wire ropes are in good condition and its size meets to the required holding power.
3. The using hoses are checked, tested and appropriate marked.
4. All involved persons were instructed and capable to carry out duties.

At cargo operation the following must be carried out:

1. All deck scuppers are securely blanked in case of rain the accumulating clean water shall be regularly removed and scuppers plugged.
2. Oil spill equipment prepared for use in case of probable spillage and portable emergency pump (if no fixed drain system) installed on both sides of the vessel.
3. All not unused flanges of cargo and stripping system blanked.
4. To fit (if no available fixed) save-all under intake manifold.
5. Check the readiness of cargo handling operation and stripping pipelines, gas freeing system, valve control tank sounding system, the correctness opening and closing valves on deck, pump room, tanks. Unused section of cargo and stripping system must be separated by stop valve and note tables "not open" available.

6. All outboard discharge valves, valves between cargo and water ballast systems into pump room well closed and sealed. Due entry in the vessel's log books done.
7. Illumination on the cargo handling area is well provided to and the appropriate.
8. Ship-shore terminal communication equipment in working condition and checked to satisfaction of concerned.
9. Ship-shore cargo houses in working condition and right connected.
10. Ship-shore check list fulfilled by responsible person and due record entered in the vessel's log book.

At bunker operations in the following procedure must be carried out:

1. All deck scuppers blanked (in case of rain the accumulation clean water shall be regularly removed and scuppers plugged.)
2. Prepare oil spill equipment for use in case of probable spillage and portable removal pump installed on both sides of the vessel.
3. To blank all not unused flanges of bunkering system.
4. To fit (if no available fixed) save-all under intake manifold.
5. Check the readiness of bunker system to operation, gas freeing system, valve control and tank sounding system. Unused section of pipeline must be separated by stop valve and note tables "not open" available.
6. To provide the appropriate illumination at the bunker handling area.
7. Switch on and check on all communication between tanker and terminal/bunker barge.
8. Prepare and fit the suitable hoses for bunkering.
9. When finish than prepared for bunkering operation, inform the shore/bunker barge, responsible person and make record in the deck log book.

**MAKE UP AND AGREED WITH TERMINAL OR BUNKER BARGE PERSON IN CHARGE THE TECHNOLOGY CHART WHERE PAY ATTENTION TO:**

1. Checking up the master and shore clock.
2. The production work order of the cargo/bunkering operating.
3. Time of closing shore valve and quantity of cargo/bunker inflow during closing.
4. Length and diameter of pipeline between terminal and vessel.
5. The rate of cargo/bunker operation (initial, maximum, when charge pipeline or tanks, at completion)
6. The quantity and type of working pumps.
7. The maximum available operational pipeline pressure.
8. The communication facilities and communication procedure between vessel and terminal/bunker barge.
9. Time necessary for start, stop or change over cargo bunker operations.
10. Notification procedures about all changes in cargo/bunker handling operation.
11. Emergency procedure at oil or NSL spillage.
12. Location of persons involved in cargo/bunkering operation (ship-terminal)

Take into account that adequate co-ordination between vessels and shore personal the most efficient measure for prevention of spillage.



After completion of inspection of vessel and terminal, the persons in charge must sign on check-list in two sets accordingly.

Additional, both sides (ship and shore personal) make sure that:

1. The smoking regulations are observed.
2. The fire prevention requirements on galley are observed.
3. The switched off cables too electric portable equipment.
4. Switched off cables too electric portable equipment.
5. Ship's main radio transceivers are switch off.
6. Hand torched are save approved-types.
7. Portable VHF/UHF transceivers are save approved types.
8. All outdoors and cabin windows are properly closed.
9. Air intake facilities are properly arranged and restricted the cargo vapour entry.
10. All cargo and bunker tanker hatches are closed.
11. Firefighting equipment at stand by condition.
12. Emergency towing wires is correctly rigged.
13. The mooring lines are checked before operation.
14. No any unauthorized person on board.
15. No any small craft alongside.
16. The surface around odd vessel is clean and supervised by ship and shore personal.
17. The alarm system required at cargo/bunker operation in working condition and switched on.
18. Cargo/bunker operation will be stopped if abnormal condition occurred.
19. The technology chart of operation is available and up to date.
20. The dangerous and limited cargo ones are appointed and agreed.

Both of ship and shore personal must immediately interrupt cargo/bunker operation if any item above is not available.

### **3.3 Procedures for crew to mitigate spillage**

#### **3.3.1 Operation spillage**

##### **3.3.1.0 Operation procedures at spillage**

To take all steps and carry out actions according check-list n01-6 as appropriate. Check lists are included in section 5 of plan.



No any chemicals can be used unless agreed with local authorities.



To obtain permission from local authorities and/or the terminal to continue normal cargo/bunker/ballast operations or voyage upon mitigation of spillage



- Sound the emergency alarm and initiate emergency response procedures for vessel and vessel personal.
- Inform the interested contacts according to section 2 of this plan.
- Consider whether to stop air intake into accommodation and non-essential air intake to engine room
- In the case of leakage a noxious liquid substance, to take of protection from vapour or liquid substance of emergency response team and other crew members.
- Locate source of leakage, and begin clean-up procedures (use portable pumps, sorbent and other equipment of spill kit.
- Drain effected section of pipeline into an empty or slack, slop tanks.
- If the source of the leakage is from hydraulic pipe immediately stop all operations.
- Consider mitigation activities such as decontamination of personnel who have been exposed.

#### **3.3.1.3 Tank overflow**

- Stop all cargo/bunker procedures and closed manifold valves.
- Sound the emergency alarm and initiate emergency response procedures for vessel and vessel personal.
- Inform the interested contacts according to section 2 of this plan.
- Determine the reason of the tank overflow and implemented appropriate activities.
- Locate source of leakage, and begin clean-up procedures (use portable pumps, sorbent and other equipment of spill kit.
- Reduce tank level by dropping cargo or bunkers into an empty slack tank.
- Prepare pumps transfer of cargo/bunkers to shore if necessary.
- Use portable if necessary.
- In the case of leakage a noxious liquid substance, to take of protection from vapour or liquid substance of emergency response team and other crew members.

If the spilled liquid is contained on board and can be handled by the pollution prevention team then:

- Use sorbents and permissible solvent the clean up the liquid spilled on board.
- Clean-up operation are stored carefully prior to disposal.

#### **3.3.1.4 Hull leakage**

If oil or other cargo liquid is noticed on the water near the vessel during cargo or bunkering operations and cannot be accounted for, the possibility of hull leakage should be suspected.

The following actions to be implemented immediately:

- Stop all cargo/bunker procedures and closed manifold valves.
- Sound the emergency alarm and initiate emergency response procedures for vessel and vessel personal.
- Inform the interested contacts according to section 2 of this plan.
- Make sure that air intake into accommodation and engine room from wind side, stop ventilation if necessary.

- In the source of the leaking tank is not identified on deck above the waterline, consider the use of a diver to assist in locating the leak.
- If the source of the leaking tank is not identified reduce the level of cargo or bunker oil in all tanks near leak, remember to consider the effect on hull stress and stability of the vessel.
- When appropriate, reduce the inert gas pressure to zero.
- Consider the possibility of pumping of cargo or bunker oil into empty tanks to prevent further loss of oil or a noxious liquid substance.
- In the case of leakage a noxious liquid substance, to take of protection from vapour or liquid substance of emergency response team and other crew members.

#### **3.3.1.5 Engine room equipment failure**

If the oil or NSL spillage is caused by the failure of machinery any further operation of this machinery must be stopped and the following actions take place:

- Stop all operation in engine room and immediately closed overboard valves if it is possible.
- Sound the emergency alarm and initiate emergency response procedures for vessel and vessel personal.
- Inform the interested contacts according to section 2 of this plan.
- In the case of leakage a noxious liquid substance, to take of protection from vapour or liquid substance of emergency response team and other crew members.

NOTE! The following equipment can cause an operational discharge:

- The water separating equipment or oil discharge monitor
- Ballast and bilge system overboard valve
- Oil cooler water cooling system
- Gearing of bow thrusters
- Stern tube

If no incineration on board all collected petroleum products and wastage to be collected on board for disposal at shore facilities

#### **3.3.2 Spillage resulting from casualties**

In the event of a casualty the master's first priority is to ensure the safety of the ships personnel and to initiate action to prevent the incident from getting worse. Mitigating activities that can be considered are transfer of liquid for damaged compartments, containments of on-board deck spills overboard.

##### **3.3.2.1 Grounding and stranding**

If the ship runs aground, the following steps should be taken immediately:

- Stop main engine
- Sound the emergency alarm and initiate emergency response procedures for vessel and vessel personal.



- Close watertight doors if it is available, secure sidelights.
- Eliminate all avoidable sources of ignition and ban all smoking on board.
- Switch on deck lights.
- Make sure that air intake accommodation and engine room from wind side, stop ventilation if it is necessary.
- In the case of leakage a noxious liquid substance, to take of protection from vapour or liquid substance of emergency response team and other crew members.
- Collect more detail information about vessel damage:
  - Carry out a visual inspection of the ship to determine the severity of the situation
  - Take sounding around the ship to determine the nature and gradient of the seabed
  - Evaluate tidal current in the grounding area
  - Check the difference in the tidal ranges at the grounding site
  - Danger of ship being shattered by heavy seas or swell
  - Is the vessel constantly being struck in the seaway
  - Health hazards to the ship's crew and surroundings population due to release of hazardous substances or vapour in dangerous concentrations
  - That fires may start due to release flammable substances and uncontrolled ignition, so Switch off the power in damage area
  - Is the vessel exposed to torture
  - Are there strong tidal currents in the grounding area
  - May the vessel drift further up on shore, due to high tides, wind and waves

Should the damage which the ship has sustained be of such extent that the stability cannot be computed on board, the master should seek assistance according to section 5 of this plan

Also:

- Determine and reduce the pressure in the tank to zero if necessary
- Take sounding of all cargo, ballast and bunker tanks and check all other compartments adjacent to the hull. Compare present tank and soundings against departure soundings. Ullage plugs should not be opened indiscriminately as loss of buoyancy could result.
- Evaluate the probability of additional release of oil or noxious liquid substance

Detailed information on the action to be taken when a ship is aground is contained in the ICS/OCIMF publication "peril at sea salvage – a guide for masters"

After:

- Transfer of cargo and bunkers internally. If damage is limited, for example to one or two tanks, consideration should be given to transfer of liquid from damaged to intact tanks.

- Isolate all cargo and bunker tanks to reduce further loss due to hydrostatic pressure during tidal changes
- Evaluate the possibility to transferring cargo to barges to other ships, and request such assistance accordingly

If the risk of additional damage to the ship by attempting to refloat by its own means is assessed to greater than by remaining aground until assistance has been obtained, the master should try to prevent the ship from moving from its present position by:

- Fasten the vessel position, using anchor
- Taking in ballast in empty tanks (if possible)
- Reducing longitudinal stress on the hull by transferring cargo internally

### 3.3.2.2 Fire and explosion

If a fire or explosion occurs on board consider with this priority:

- Reducing lives
- Limiting to the damage/danger to the ship and cargo
- Prevention of environment pollution

If a fire or explosion occurs on board the following steps must be taken immediately:

- Sound the emergency alarm and initiate emergency response vessel personal according to fire plan
- Inform the interested contacts according to section 2 of this plan.
- Switch on VHF radio station on channel 16, if it is necessary on channel 13
- Lower speed to stop the vessel, if it is necessary, to change the course so that the fire is on lee side
- Switch of ventilation
- Check up the closing of watertight and fire prevention doors
- Determine and specify the place, size and degree of danger of fire allocation of toxic substance and to apply the most effective ways of fire extinguishing according to conditions
- Switch off power in fire area start fire pump and prepare all fire equipment
- Switch on deck illumination in dark time
- Stop any cargo/bunker procedures and also tank cleaning operations and close operations and close all valves
- Evacuate all crew members from dangerous area
- Check up the pressure of people and organize search of missing people
- Isolate the fire area to determine the source of ignition, locate fire
- Determine the extent of fire and decide what fire control plan can be taken
- Cool by water decks, bulkheads located nearby from fire, and also adjacent oil and not gas-free tanks
- Make up measures for preventative intake flammable vapour into accommodation and engine room



- Checkup compartments and rooms to find out availability of injures
- Together with the captain of another vessel to examine damages of both ships, to make bilateral list of damages, to estimate menacing danger and possible consequences at disjointing of the ships
- To make record of the ships log book about the place and time of the collision, navigating conditions and circumstances at which collision has taken place, name of the vessel, flag, port of registry, name and address of ship owner, port o destination, kind of cargo
- Transfer message on the emergency case to the company with complete information on character and circumstance of collision, to maintain constant communication with the company
- To notify ships in vicinity and to request the help if necessary
- At threat of the vessel flooding to estimate the opportunity to proceed to swallow waters or the announcement (life boat) alarm. To work according to circumstances
- In case of threat discharge oil or NSL start procedures to control discharge
- After separating the ships changed the course to make the ship from wind side by the oil stain
- Make sure that air intake into accommodation and engine room from wind side, stop ventilation if it is necessary
- When it is possible to maneuver, the master, in conjunction with the appropriate shore authorities, should consider moving his ship to a more suitable location order to facilitate emergency repair work or lightening operations, or to reduce the threat posed to any sensitive shoreline
- Inform all interested contacts according to section 2 of this plan

#### 3.3.2.4 Hull failure

When the hull failure caused by age wear and tear, weariness or excessive pressure, and also after collision, grounding or other casualties resulted honeycombs, cracks, holes the master carry out their duty according to the master list on the general alarms as follows:

- Sound the emergency alarm and initiate emergency response procures for response vessel and vessels personal
- Estimate the weather and the extent of damage
- Inform all interested contacts according to section 2 of this plan
- Change over for manual reserve control by rudder, slower vessel speed or stop for decreasing hull stress
- Switch off power of electric equipment on the damage area if possible
- Check the closing of watertight and fire prevention doors
- Switch on illumination at dark time
- Switch on VHF radio station on channel 16, if it is necessary on channel 13
- To estimate the weather condition obtain latest weather forecast and assess its impact the present situation
- In case of flooding start fulfilment necessary water fighting measures required by situation
- Prepare life boats of necessary

Furthermore, the following questions should be considered and should be asked:

- If the ship is in any immediate danger of sinking or capsizing?
- If YES
  - Send distress message
  - Immediately abandon ship
- If No, initiate damage control measures as found necessary by considering the following points:
  - Can the vessel maneuver on its own or lost floating
  - If the ship has a list due to loss of ballast, cargo/bunker or buoyancy, it is possible necessary to rearrange the bunker or ballast by internal transfer operation in order to bring the ship to an even keel?
  - Can this operation wait till another ship/barge can receive that cargo?
  - Can the change in the ship's stability and stress situation be monitored and calculated on board? If not, the master should seek assistance according to section 3 of this plan
  - Does the ship need assistance or escort to nearest port of refuge or repair port?
  - Might it be prudent to salvage part of the new members in case the situation should worsen, or it is necessary to abandon the ship totally?
  - Inform all interested contacts about all damages mitigating activities according to section 2 of this plan

### 3.3.2.5 Excessive list

Should the ship for some reasons be suddenly start to list excessively during discharging/loading operations, or bunkering, all ongoing operations should be stopped immediately until the cause has been determined. The officer on duty should inform the master and/or chief officer without delay. The master should try to stabilize the ship's condition:

- Stop all cargo/bunker procedures and close all valves
- If underway reduce speed or stop the vessel
- Estimate the reason(s) for list:
  - Hull damage
  - Grounding, collision
  - Reception of water into engine room
  - Shift cargo, bunker, ballast resulted incorrect loading, bunkering
- Sounding all tanks
- Prepare bunker/ballast/cargo pumps
- Consider measures to minimize list in transferring liquid from one compartment to another
- Ensure water tightness of empty spaces
- Secure vent to avoid ingress of water
- If bunkering: change to corrective tank for rectifying the situation
- If ballasting/de-ballasting: change to corrective tank for rectifying the situation
- If there is a reason to believe that the list, may cause any spill, notify as per section 2 of this plan

- If the situation is brought under control, inform all parties interested

### 3.3.2.6 Containment system failure

If there has been an internal failure of the bunker oil or cargo containment system, other than pipeline leakage, it is leakage, it is likely that it will be detected by another symptom such as an excessive list, a tank overflow or external hull leakage, often preceded or accompanied by a loud or unusual noise. The master is obliged to arrange the measures on correction and stabilization of situation.

However, once a failure of the internal containment system has been identified, there may be additional responses that can be taken to avoid or mitigate a spill or oil a noxious liquid substance

The following actions must be carried out:

- Sound the emergency alarm and initiate emergency response procedures for response vessel and vessel personal
- Stop all cargo/bunker procedures and close manifold valves
- If under way reduce speed or stop the vessel
- If in port, consider evaluation on non-essential personal
- Inform all interested contacts according to section 2 of this plan
- Make sure that air intake into accommodation and engine room from wind side, stop ventilation if it is necessary
- In the case of leakage a noxious liquid substance, to take of protection from vapour or liquid substance of emergency response team and other crew members.

Further actions:

- Estimate the reason of leakage, identify penetrated tanks, decide what measures can be taken in the situation
- If threat of pollution from leakage of oil or noxious liquid substances occur, carry out mitigation procedures
- If the failure has occurred to a system containing a noxious liquid substance, consider what safety precautions are necessary to protect the crew from vapours or contact with the liquid
- If for maintain stability necessary to jettison cargo, such as oil or NSL, inform the appropriate parties in accordance with section 2 of this plan
- If for salvage of the ship or human life necessary to jettison cargo, such as oil or NSL, inform the appropriate parties in accordance with section 2 of this plan
- At jettison cargo member to consider the effect on hull stress and stability of the vessel

If the spilled liquid is contained on board and can be handled by the pollution prevention team then:

- Use sorbents and permissible solvents to clean up liquid spilled on board



- Ensure that any residues collected, and any contaminated absorbents materials used in the clean-up operation are stored carefully prior to disposal

### 3.3.2.7 Dangerous reaction of cargo (for vessel certified as chemical carrier)

On tankers carried various chemical cargoes and NSL, the occurrence of dangerous reaction of cargo is possible. At occurrence of dangerous reaction is necessary to accept all measures for providing safety of vessel and crew, and also coastal personnel near the vessel. At threat of discharge and actual discharge of chemical substance it is necessary to accept the following measures and actions:

- Stop all cargo, bunker or ballast operation and close manifold valves
- To estimate all probable sources of ignition
- If vessel in port, consider evacuation of non-essential personnel
- If oil or a NSL has spilled, inform the appropriate parties in accordance with section 2 of this plan
- If for salvage of the ship or human life necessary to jettison cargo, such as oil or NSL, inform the appropriate parties in accordance with section 2 of this plan
- If vessel in port (canal), immediately inform coastal or terminal personal, moored vessel

Then:

- Estimate the reason of dangerous reaction cargo
- Whenever possible to accept all measures for control situation:
  - Reduce level in tank
  - Cooling tank at which dangerous reaction occur
  - At ignition used stationary firefighting means (insert gas, fixed foam station)
- For proving safety or vessel consider the transfer operation of oil or NSL to other vessel or barge
- Consider whether it is possible to transfer the noxious liquid substance to another tank, taking into account of the effect on hull stress and stability of the vessel and the compatibility of NSL with tank type, material of construction and tank coating
- Carry out continuously for the stress and hull stability. If necessary request help according to section 3
- Master bears responsibility for the safety of vessel, crew, cargo and is obliged to undertake all measures for localization and limitation of consequences of emergency spillage and prevention of pollution of an environment, if necessary to request the help of coastal authorities

If the spilled liquid is contained on board and can be handled by the pollution prevention team then:

- Use sorbents and permissible solvents to clean up the liquid spilled on board
- Ensure that any residues collected, and any contaminated absorbents materials used in the clean-up operation are stored carefully prior to disposal

### 3.3.2.8 Other dangerous cargo release (for vessel certified as chemical carrier)

Concerning safety both vessel and ship personnel the captain should arrange precautions and reduce to a minimum threat of pollution of the sea by oil or NSL

In case of spillage of NSL cargo on deck, in a cargo through penetration in bulkheads of the tank, through pipelines and also it is necessary to consider danger of discharge in the sea, there is a threat of formation of dangerous mix and occurrence of the further dangerous reaction.

Promptly consult the Marine Safety Data Sheet (MSDS) available for the cargo shipped on board about possible hazard and necessary precaution/actions to be take according to the information provided.

The following measures and actions need to be carried out:

- Stop all cargo, bunker or ballast operation and close manifold valves
- To eliminate all probable sources of ignition
- Control and take all measures for non-essential air intake into uncontrollable spaces to prevent formation of dangerous mix
- If oil or a NSL has spilled, inform the appropriate parties in accordance with section of this plan
- If vessel in port (canal), immediately inform coastal terminal personal, moored vessel

Then:

- Estimate the reason for formation of dangerous reaction mix
- Whenever possible to accept all measures for control situation:
  - Reduce level in tank
  - Cooling tank at which dangerous reaction occur
  - At ignition used stationary firefighting means (insert gas, fixed foam station)
- For proving safety or vessel consider the transfer operation of oil or NSL to other vessel or barge
- Consider whether it is possible to transfer the noxious liquid substance to another tank, taking into account of the effect on hull stress and stability of the vessel and the compatibility of NSL with tank type, material of construction and tank coating
- Carry out continuously for the stress and hull stability. If necessary request help according to section 3
- Master bears responsibility for the safety of vessel, crew, cargo and is obliged to undertake all measures for localization and limitation of consequences of emergency spillage and prevention of pollution of an environment, if necessary to request the help of coastal authorities

If the spilled liquid is contained on board and can be handled by the pollution prevention team then:

- Use sorbents and permissible solvents to clean up the liquid spilled on board
- Ensure that any residues collected, and any contaminated absorbents materials used in the clean-up operation are stored carefully prior to disposal

#### **3.3.2.9 Loss of tank environment control (for vessel certified as chemical carrier)**

Many NSL carried as cargo by sea required to have the atmosphere above the liquid controlled in order to ensure safety. Loss of this control can result in a hazardous situation that may lead to marine pollution. If loss of control occurs in tanks containing such cargoes, the following measures can avoid or mitigate the effect and the possibility of spill.

Steps to take immediately:

- Ensure necessary precautionary safety measures for crew, ship and shore are taken
- If vessel in port (canal), immediately inform coastal or terminal personal, moored vessel
- Establish the reason for the loss of tank environmental control, and if possible take corrective action
- Establish a continual monitoring process to compare liquid levels, tank pressure or cargo temperatures
- By reference to the cargo information sheet, determine whether a dangerous situation is likely to arise. If a spill is probable or jettison of the NSL may become necessary
- Of oil or a NSL has spilled, inform the appropriate parties in accordance with section 2 of this plan
- Consider whether it is possible to transfer the noxious liquid substance to another tank, taking into account of the effect on hull stress and stability of the vessel and the compatibility of NSL with tank type, material of construction and tank coating
- At the inert gas failure the critical atmosphere condition in tank can be formed and following measures need to be carried out:
  - Consider any hazard arising out of loss of environmental control in view of possible explosion dangers by contacting the data sheets of the cargo concerned
  - Avoid any intake of air uncontrolled tanks to avoid a dangerous mixture to be built up
  - Estimate the reason of failure and to arrange elimination activities with fulfilment all safety measures
  - Take all measures and steps to ensure safety of vessel and crew

#### 3.3.2.10 Flooding

The reason of receipt of dangerous quantity of water into the hull of the vessel can be:

- Washing in stormy conditions
- Ice damages
- Occurrences of honeycombs and cracks in the hull, tanks, pipelines, owing to age wear and tear and excessive pressure (tension)
- Damages from grounding
- Damages from collision

At the detection of sea water penetration the general alarm is announced and the crew work according to the master list at the alarm.

The following actions are taken:

- Sound the emergency alarm and initiate emergency response procedures for response vessel and vessel personal



- Close watertight doors if it is available, secure sidelights
- Close down the hull
- Inform all interested authorities according to section 2 of this plan
- Start eater pumping equipment
- Prevent receipt of water into spaces
- Make calculations of seawater penetration, emergency draft and trim and stability
- Slower speed or stop the vessel
- Determine the variants of fighting with water penetration and begin their realization
- Eliminate all avoidable sources of ignition and ban all smoking on board
- Switch on deck lights
- By approval of the master switch of electrical power at the flooding area
- At the receipt the sea water in quantities, which can be pumped out by the ship's bilge pumps:
  - Stop the vessel
  - Secure a collision mat and stop a leak
  - Make even a list
  - Dump out the water
- In case of threat of oil or NSL discharge into the sea to carry out all measures to control discharge
- Make sure that air intake into accommodation and engine room from wind side, stop ventilation if necessary.
- In the source of the leaking tank is not identifies on deck above the waterline, consider the use of a river to assist in locating the leak.
- If the source of the leaking tank is not identified reduce the level of cargo or bunker oil in all tanks near leak, remember to consider the effect on hull stress and stability of the vessel.
- In the case of leakage a noxious liquid substance, to take of protection from vapour or liquid substance of emergency response team and other crew members.
- Reduce the head of cargo in tank lower sea level
- For the limitation results of spillage to transfer cargo, bunker into empty tanks
- At the threat intake vapour of oil or NSL into engine room make up preventative measures
- Collect more detail information about vessel damage
- Determine and reduce the pressure in the tank to zero of it's necessary
- Take sounding of all cargo, ballast and bunker tanks and check all other compartments adjacent to the hull. Compare present tank and soundings against departure soundings. Ullage plugs should not be opened indiscriminately as loss of buoyancy could result.
- Request help of other vessels, coastal authorities if necessary, inform all interested contact according to section 2 about all mitigating activities

At the impossibility of sea water penetration elimination and receipt of large weights of water, threatening the vessel with flooding:

- Make continuous pumping the water out
- Proceed to place of shelter or shoal (shallow water)

- Request the help from nearest ships or salvors
- Announce “life boat (vessel abandon)” alarm

#### **3.3.2.11 Destroy the vessel/vessel on bank**

When the vessel on a bank and measures described in item 3.3.2.1 are carried out and present a threat of vessel destroy the master should analyze the situation and try to refloat the ship by own means or remaining aground until professional assistance has been obtained.

The following should be taken into account:

- Is the vessel in such size damaged that it can flood, break, and turn after refloat from the bank?
- Will vessel be able to maneuver clear of the danger area under her own power?
- Is machinery, rudder, or propeller damaged or may they be damaged while refloating?
- Should the vessel be trimmed in order to avoid further damages when attempting to get off the ground?
- Have the present and forecast weather conditions been evaluated?
- Inform all interested authorities according to section 2 about grounding and undertaken measures

If the master considers that it is inadvisable to attempt to refloat the vessel without assistance, due to severe damage or the risk of causing further damage or pollution, the vessel should be secured as well as possible

The following should be considered:

- By dropping anchors (adequate water depth and anchor ground provided)
- Trying to reduce longitudinal strain on the hull by transferring ballast or bunkering internally
- Close water tight doors, secure accommodation ports
- Expose lights and signals, use sound signals, switch deck lights at dark time
- Take firefighting measures
- Close all valves on tanks and pipelines
- Secure all measures to locate pollution of sea
- Accept all measures to locate pollution of sea
- Inform all interested authorities according to section 2 about grounding and undertaken measures

#### **3.3.2.12 Dangerous reaction of cargo/contamination yielding a hazardous condition (vessel certified as chemical carrier)**

At transportation of oil and NSL are necessary to keep carefully measures, precautions and to execute a proper service, behind transported cargo and tightness condition of bulkhead cargo and ballast tanks.

The loss of tightness of bulkheads can result to not control dangerous reaction of cargo in tanks and as a result can cause a pollution of the environment. If those have taken place, it is necessary to undertake all measures for the safety of the crew and to reduce a minimum injury to an environment, namely:

- Sound the emergency alarm and initiate emergency response procedures for vessel and vessel personal
- If vessel in port (canal), immediately inform coastal or terminal personal, moored vessel
- Establish a damaged area in the tank and provide a constant control, accept all measures and activities for stabilization of a rule (situation, position)
- Continuously to control the rising of temperature, level of cargo in the tank, condition of atmosphere in the tank comparing with initial parameter
- Promptly consider Safety cargo Data Sheet and on the basis of the obtained information to arranged precautions/activities and in case the reaction of cargo in the tank(s) will be out of control to determine a capacity of jettison of cargo with the purpose of safety control of a vessel, crew
- In case of jettison of oil or NSL or chemicals matters to inform all interested parties according to section 2 of this plan
- Consider whether it is possible to transfer the noxious liquid substance to another tank, taking into account of the effect on hull stress and stability of the vessel and the compatibility of NSL with tank type, material of construction and tank coating
- At the inert gas failure the critical atmosphere condition in tank can be formed and following measures need to be carried out:
  - Consider any hazard arising out of loss of environmental control in view of possible explosion dangers containing the Data Sheets of the cargo concerned.
  - Avoid any intake of air into the uncontrolled tanks or avoid a dangerous mixture to be built up
  - Estimate the reason of failure and to arrange elimination activities with fulfilment all safety measures
  - Take all measures and steps to ensure safety vessel crew

#### 3.3.2.13 Release of Dangerous vapours

In case of release of dangerous vapours make up preventive measure for the crew and nearby shore personnel.

The following actions should be carried out:

- All cargo, bunker or ballast operation and close manifold vessels
- Make up measures to prevent distribution of NSL or dangerous vapours on vessel
- consider evacuation of non-essential personnel
- vessel in port (canal), immediately inform coastal or terminal personal, moored vessel and take measures of safety
- estimate the source of vapour release
- consider firefighting measures
- Inform the appropriate parties in accordance with section 2 of this plan



- Make sure that air intake into accommodation and engine room from wind side, stop ventilation if it is necessary
- At the threat intake vapour of oil or NSL into engine room make up preventative measures
- Turn superstructure of a vessel on the wind side
- Emergency protective team use self-protected means and locates the source of discharge
- Inform all interested contacts according to section 2 about undertaken measures

### **3.4 Calculation of Stability and strength of hull**

#### **Responsibility and authorities of PRISCO damage stability calculation group**

##### **3.4.1 General provisions**

- 1.1 The instruction determines duties and responsibility of PRISCO calculating group in case of dangerous distress situation arising on PRISCO Group vessels
- 1.2 Calculating group are the specialist assigned for the activity in a structure of PRISCO operative staff and responsible for fulfilment of demanded calculations for vessels of company, operating 24 hours case of emergency
- 1.3 The function of calculating group is the fulfilment of calculations of stability, hull stress for vessels of company located a dangerous or emergency situation, and any other cases, as in case of presence of the justified doubts in safety of a vessel
- 1.4 The calculating group is included in a structure of operative staff of PRISCO and its members, in a work-time of operative staff, submit to the chief of staff or to alternate person

##### **3.4.2 Structure of PRISCO calculating and technical support**

Staff of PRISCO calculating group are actuated by specialist having a higher education and possessing the applicable proficiency, trained to activity with the software used for fulfilment of operating calculations and having applicable certificate, verifying their proficiency. Minimum quantity of PRISCO calculating group is two persons.

Calculations of damage stability, unsinkability and the hull stress for vessels are executed on the computer with the software having approval of a classification society on fulfilment of these calculations. For provision of the 24 hour call and universal notification of members of calculating group they are provided with means of mobile communication.

##### **3.4.3 Duties calculating group staff**

The staff of calculating group should execute necessary calculations to check stability, unsinkability and the hull stress for vessels of company in distress.

The calculating group also should execute necessary calculations on the captain's request or fleet managers in the special cases non-standard loading of a vessel, temporally repair of a vessel etc... at presence of the justified doubts safety of a vessel.

The group, based on calculations, should give the necessary recommendations on the correction or improvement of a distress situation, and as, whenever possible to forecast the probable development of a situation. About all obtain result of calculations and recommendations to inform the PRISCO operative staff.

The calculating group also should execute necessary calculations of all recommendations of operative staff directed on correction of emergency or dangerous situation, and as to participate in developing of such measures.

The staff of calculating group should support in stand by condition computer and software. In case of its fault to inform concerned, chief of operative staff and to accept all possible measures to recovery of functionality of the system.

To create and support good condition mathematical models of vessels (hull, cross section), and also all information, data and documentation demanded for fulfilment of calculations.

Readiness of calculating group for fulfilment duties and activities is in a structure of operative staff 24 hours

The members of the calculating group are obliged to arrive on a working place of operative staff under the maiden requirement of the chief of operative staff or alternating person. In case of obtaining the information about an emergency or dangerous situation with a vessel of shipping company from other sources, the members of the calculating group should contact operative staff receive the order on the operating.

In case of suspected absence in a contact sea, staff of calculating group notify should the chief of operative staff and receive his permission. The chief of operative staff should be sure of the second member of the group is in place and the capability of operation of calculating group is ensured.

#### **3.4.4 Duties and responsibility of PRISCO department subject the development of base and equipment of calculating group**

PRISCO information Centre supports functionality of all computers hardware operative group. The communication service provides continuous communication of members of calculating group with operative staff, and also communication with vessels of shipping company.

The operating division of fleet department provides in the real time information of vessel's condition as establish by.

The technical department provides all necessary documentation and information for creations and updating of mathematical models of vessels and demand for fulfilment of calculations.

The master of the vessels should submit to operating division the information regarding condition of ship by established form. In case of actual an emergency of dangerous situation, the master of the vessels should operatively and veracity transmit the greatest possible state information of a vessel, arisen situation, available hull damage or equipment of a vessel.

Responsible person of departments should ensure fulfilment of those conditions, the master is responsible for accurate transmission of vessel condition and change in vessel particulars.

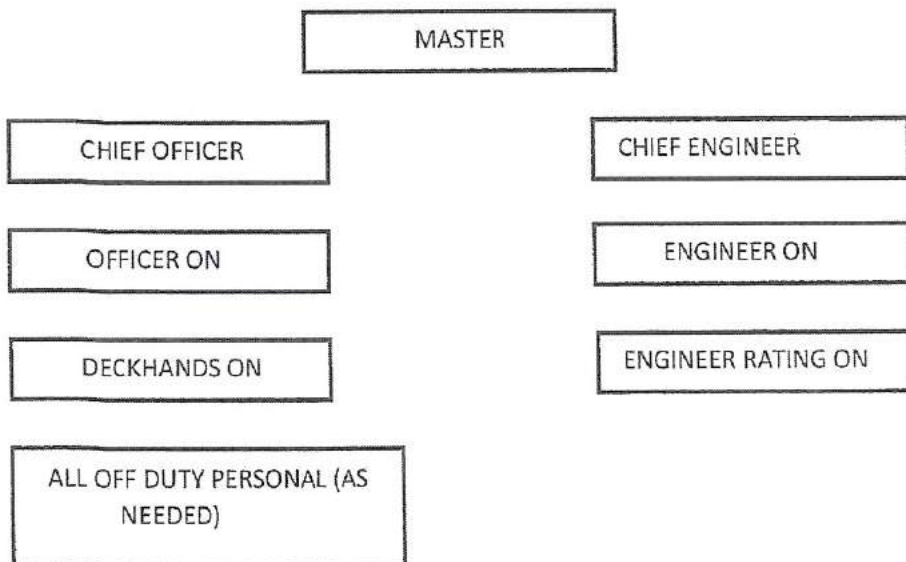
### 3.4.5 Other conditions

The necessity of engaging persons of calculating group for fulfilment of calculations in each particular emergency or dangerous situation is determined by the chief or operative staff or alternate person.

All creatures, mathematical models, the calculations and other information obtained as a result of activity of calculating group is the private property of shipping company and the right reserved.

The members of the calculating group have no rights to divulge and to transmit any data and information obtained as a result of activity in a structure of calculating group, to the third parties without the permission of the chief of operative staff or management of shipping company.

### 3.5. General responsibilities of the master and designated officers/crew members





### 3.5.1 General responsibility

The following crew members are in the event of a spill actual or probable to bring the accident under control, limit outflows, organize onboard clean-up procedures and determine the additional manpower needed.

Ranking	Duties
Master	Overall in charge of operation on board dealing with spill. Responsible for all steps to be taken, especially for the two main categories (reporting and action). Keep log of all events and progress of actions.
Chief Officer	In charge of deck/cargo operation. Should keep the master informed and updated on the situation and the results from actions taken to stop or minimize any outflow.
Chief Engineer	In charge of bunker operation. Should keep the master informed and updated on the situation and the results from action taken to limit oil outflow.
Deck Duty Officer	Alert and inform chief officer/chief engineer on situations. Mobilize off duty crew as necessary.
Duty Engineer	Assist chief engineer. Prepare for firefighting. Ensure sufficient power and water to deck. Organize on board clean up equipment.
Duty Rating (s)	If any leakage is detected alert immediately by all possible means. Inform officers on duty immediately. Position sorbent material/clean-up material to prevent any escaped fluid from reaching the railing. Commence the clean-up by using as far as available on board the clean-up equipment. Care for personal protection material.

### 3.5.2 Responsibility of crew members involved in mitigation oil/NLS spill

Responsibility of crew members involved in the spill of crude oil/oil and/or NLS are appointed into the working log book (or muster list) and cabin card of each crewmember.