Safety Bulletin:
Safe bunkering practices

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Setting the standard
for service and security

The Standard

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The club has seen an increase in recent months in the number of pollution related incidents during routine bunkering operations. Bunkering, like a number of shipboard activities, carries risk. However, managing the risk and putting the relevant control measures in place will ensure that any operation is carried out in the safest possible manner.

Special thanks go to Andy Morris for the original draft of this article and his efforts in making members aware of this important issue.

Background

When we talk about safe bunkering practices, we are referring directly to the possibility of uncontrolled spills and the pollution that may result. Most bunkering operations are conducted and completed without any incident, but in a small number of cases something does go wrong.

Frequently we are told that the incident was due to excessive pumping rate by the bunker barge, but our investigations reveal that the root cause is more often due to poor on-board practices, and permitting the operation to proceed at an excessive rate would be indicative of this. Also, it is important to remember that careful risk assessment and implementation of effective control measures can, in the event of an overflow occurring, contain the spill on board and prevent, or at least minimise, any environmental impact.

Bunker planning

It is important to understand and plan any operation and being pro-active in the management is essential. It is necessary that a bunker plan is produced, which should be detailed and carefully considered.

A good bunker plan should include:

- an accurate summary of the different quantities and grades of fuel to be supplied
- a plan of which bunker tanks are to be filled, which must include the type and quantity assigned to each tank and the maximum filling volumes
- a schematic diagram of the bunker system and proper valve line-up
- the filling sequence and the required pumping rate, including initial, maximum and topping off rate
- an indication of the safety margin or 'slack' space to be left in each tank. For example, no tank is to be more than 90% full
- soundings of each tank prior commencement of bunkering and the expected soundings/ullages on completion
- the method of sounding and or ullaging, which can be stipulated to avoid confusion
- details of who is in overall charge of the operation, this is usually the chief engineer and it should also indicate who else is involved and their respective duties
- emergency procedures and contacts

– procedure of line draining and blowing after completion of bunkering
– if a common line is used for multiple grades then the line flushing volumes and procedures
– testing of High level alarms setting in the fuel oil tanks or a substitute means incase alarms are not provided
– proper identification and markings of the valves on the bunker lines
– procedure for changing over tanks during the bunkering
– vessel stability drafts, trim and list during the various stages of bunkering
– manning requirements to execute the operation safely.

The chief engineer should formalise the bunker plan by holding a 'tool-box talk' with Deck and Engineering department personnel involved. The plan should be discussed and confirmation sought that all of the team fully understand the contents and their role in the operation. The meeting should also review the bunker checklist and risk assessment to ensure that all the identified controls are in place. Operations should only be undertaken by personnel familiar with the ship's bunker system and procedures. Newly joined personnel or those not familiar with all aspects of the operation should be accompanied as part of on-going training and familiarisation.

It is vital to remember that bunkering systems and other associated equipment should be kept well maintained, inspected and tested at all times.

Pre-Bunkering Checks

Upon arrival of the bunker barge, it is critically important that the engineer in charge and the barge master meet to discuss the intended operation. This meeting will include:

– the bunker procedures, checklists and relevant risk assessments are reviewed and kept updated. These should be accurately followed and completed, prior to any bunkering operation
– confirmation of the bunkers being supplied, including all the various grades, densities and quantities. Sounding and ullages of all fuel tanks should be checked on-board the supply barge and on-board the ship. This should be done by both parties. the Ship Oil Pollution Emergency Plan (SOPEP) equipment should be checked and confirmation should be sought that regular drills have been conducted. The oil spill equipment should always be kept in readiness prior to any bunkering operation
– the chief engineer and engineer officer of the watch must personally satisfy themselves that the control measures detailed on the checklist are effectively in place and must not rely totally on advice from others
– all bunker manifold blank flanges confirmed in place, all valves closed and pressure gauges in place and operational
– save-alls are clean, fit for purpose and drain plugs in place, prior to bunkering
– deck scupper plugs are well maintained fit for purpose and confirmed as securely in-place prior to bunkering
– all bunker tank valve positions confirmed and valve operation double-checked
– all bunker sounding pipes confirmed as closed/capped and air vents visually inspected for blockages and or damage
– fuel oil overflow tank to be checked, including the sight glass and both flow and high level alarms tested
– fuel oil service tanks are full and fuel purification equipment is switched off
– the bunker system should be set up in preparation for the intended bunkering operation and then double-checked
– effective communication (Primary and Back up) and emergency stop signals have been established between the responsible officers on the vessel and the bunkering facility
– fire fighting system is in readiness
– sampling method and point to be agreed on
– sighting relevant checklists as completed correctly by both parties
– making mooring arrangements and the continuous monitoring of such
– a thorough visual examination of the loading hose for damage and if necessary certification witnessed. Once the hose is attached, the engineer in charge should inspect the hose to ship's manifold connection to ensure the gasket is fitted correctly and that ALL bolts are tightly in place
– checking the waters around the ship and barge for any signs of existing pollution or any other hazards

– ensuring that the relevant fire safety notices and equipment are posted at sensitive areas and that any signals required by port or international regulations are displayed.

Summary and Conclusion

To reduce the possibility of a spill occurring, or to minimise the effects of any spill, it is important to:

– always ensure sufficient people familiar with the bunkering system and operation are allocated to the ship's team. Insufficient personnel have been the cause of numerous spills particularly when topping off tanks
– always start the bunkering operation at a low pumping rate. Once the system has been checked for leaks and free-flow, the rate can be increased to the agreed pumping rate. When checking for leaks always remember to include the opposite manifold that is not being used. Check all bunker tanks to ensure that the fuel is only being received into the correct tanks
– continuously monitor tank levels, including tanks not in-use and remember to keep to the agreed tank capacity safety margin
– keep accurate and regular records to monitor pumping rates and check gauges to ensure that line pressures are not too high
– make regular checks on the bunker overflow tank sight glass and tank level
– continuously check primary and back up communication methods
– make regular checks on the mooring arrangement. Keep a 'good eye' on passing traffic
– make regular inspections of the manifold and hose. The operation must halt if any small drips are seen and the leak be rectified immediately
– make regular inspections of the bunker tank sounding pipes and relevant vents. Remember to close and cap sounding pipes at all times, when not in use
– change over tanks in a timely manner and allow enough ullage space in tanks to verify valve positions. Remember always open the next designated tank valve first before shutting the current tank valve
– remember to monitor tanks that are completed and to double check that valves are properly closed. Consider visually inspecting remotely operated valves to verify their open and closed positions when 'topping-off' tanks, inform the bunkering facility and reduce the pumping rate. Remember to maintain the tank capacity safety margin at all times
– drain off rain or other water

accumulated on deck to keep the scuppers dry and prevent the free flow of oil over board in the event of a spill
– keep watch handovers to a minimum and, if they are necessary, they should be detailed, accurate and fully informative of the on-going operation
– remember to manage the operation in conjunction with the barge. Do not allow the barge to dictate how the operation is managed
– make sure that the MARPOL drip sample is functioning correctly and the relevant samples are drawn. Double check the delivered temperature and carry out compatibility tests, where required
– stay alert throughout the full bunkering operation and investigate changes or discrepancies immediately. If in doubt do not hesitate to suspend the operation.

Ships safety management systems identify bunkering operations as special tasks and as such detailed procedures are normally available of how they should be performed by the ship's crew. Ensuring that these procedures are strictly adhered to is essential in minimising the risk. Add to this the sound planning, detailed communication, thorough monitoring, competent execution and safety margins/ control measures all as discussed above, and the risks associated with bunkering operations can be managed accordingly.

For further and more detailed information on the safe handling, management and storage of fuel oil on-board your ships, remember the ***'Master's guide to using fuel oil on board ships'*** which is available through the club's website.

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