

Safety Alert



SA 014

Cargo Damage due to Water Ingress from Ballast Tanks and Bilge Lines

Incidents resulting in damage to dry cargo following water ingress into the holds from ballast tanks and bilge lines continue to arise. Such claims are usually costly, and separating damaged goods from the rest of the cargo can often cause delay. Moreover, when cargo has been damaged by salt water, the salvaged value may be minimal and disposal may be necessary, adding to the magnitude of the claim.

Water Ingress from Ballast Tanks

Water from ballast tanks may enter adjacent cargo holds via a number of different routes:

- Damage to the hold structure. This may be caused by cargo operations, for example, due to grab damage to tank top plating or hold pipework on vessels carrying dry bulk cargo. Similarly, container vessel tank tops may be damaged by containers which are landed heavily or if lashing material becomes trapped between tank top and the container base.
- Severe corrosion of ballast tank steelwork. This may involve plating where localised corrosion is so severe that holes have appeared, or ballast tank air and sounding pipes in holds where the blind side of pipework close to the adjacent steelwork has corroded



This fertilizer cargo was damaged by sea water migrating from an adjacent holed ballast tank

- unchecked due to the difficulty of examining this area and removing rust scale. Where inspection of the pipework within a hold is problematic this should be conducted during each dry docking period.
- Leaking ballast tank manhole covers. This may be due to failure of the gaskets or the presence of debris preventing a suitable seal when manhole covers are refitted, or when manhole cover securing nuts and bolts have not all been replaced or properly tightened.
- Cargo hold heavy weather

ballast filling/suction arrangements. This may be due to valves between the ballast main and hold or overboard drop valves not being closed, or when blanking plates have not been properly fitted to the suction/filling arrangements within the hold when the system is not in use.

When the Club carries out condition surveys of dry cargo vessels, the ballast tanks surrounding the cargo holds are tested hydrostatically. The test will only be conducted when shipboard operations and local regulations allow and when the

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cargo holds in question are empty. The ballast tank is overflowed to deck and the cargo holds adjacent to the tank inspected for leaks. However, such a practice only confirms that the tank is not leaking at the time of the test. It is therefore recommended that, as far as is safe and practicable, ballasting operations are only undertaken when the adjacent cargo holds are empty of cargo, recognising that this may not always be possible due to operational reasons.

If a ballast tank manhole within a cargo hold has been opened for a routine inspection, to carry out maintenance or while in dry-dock, the manhole cover should be refitted carefully on completion so that the tank is ready for use. Checks should be made to ensure that sealing arrangements are free of debris, that the gasket is in satisfactory condition and renewed if necessary, and that all nuts and bolts are in place and correctly cross-tightened in order to achieve a watertight seal. Provided no cargo is present in the hold, it is recommended that the tank is then checked by means of hydrostatic testing at the earliest opportunity to confirm that the manhole cover does not leak.

Periodic hydrostatic testing of ballast tanks should also be considered as part of a vessel's planned maintenance system, conducted at suitable intervals when the holds are cargo free. In addition, if a sounding or remote monitoring of a ballast tank reveals an unexpected reduction or increase in the tank's contents, a thorough investigation should be carried out to ascertain the cause of the change.

Water Ingress from Cargo Hold Bilge Lines

Cargo hold bilge systems are fitted with a non-return valve on each bilge line, normally within the bilge well above the strum box/strainer. The non-return valve can become blocked, either by cargo residue or by rust or debris such as rags, preventing it from closing properly. Non-return valves can also seize open or partially open; a lack of an audible clanking of the

non-return valve in operation should be investigated. If the screw down valve between the bilge line and the bilge pumping system/eductor is not closed and bilge/general service/ballast pumps are subsequently operated, sea water may flood back along the bilge line, past the non-return valve and into the cargo hold.

It is recommended that the inspection, maintenance and testing of cargo hold bilge line non-return valves are incorporated into the vessel's planned maintenance system, including checks for backflow past the non-return valves when bilges have been pumped dry. Non-return valves and bilge line isolation screw down valves should also be opened periodically and inspected for obstructions and the build-up of cargo residues to ensure that they remain effective. Where bilge suction lines pass through ballast tanks, the pipework should be checked for excessive corrosion during routine ballast tank internal inspections.

Crew members engaged in pumping cargo hold bilges should ensure that all valves isolating the bilge lines from bilge/general service/ballast pumps and eductors are closed upon completion of pumping bilges. Consideration may be given to posting warning notices next to

bilge line isolation valves reminding crewmembers that they should be shut once the pumping of bilges has been completed.

In order to prevent debris and cargo residues from entering the bilge line and affecting the operation of the non-return valve, a strainer/strum box should be fitted to the end of the bilge suction pipe. When carrying dry bulk cargo, suitable protective measures should be taken to prevent cargo migrating past the bilge well plate into the bilge well. When cleaning holds after the discharge of dry bulk cargo, bilge well plates should be removed and all traces of cargo residue and debris cleared from the bilge well.

If bilge high level alarms are fitted, they should be tested periodically to confirm that they will operate correctly if water accumulates in the bilge well. Regardless of such alarms, bilge well soundings should be taken and recorded twice daily as a matter of routine as there have been many cases of water building up in a hold undetected due to the sudden and unexpected failure of a bilge high level alarm. Any activation of a bilge high level alarm or build-up of water in a bilge well should be investigated immediately.

Members requiring further guidance should contact the Loss Prevention department.



Rust and debris blocking this bilge well non-return valve allowed sea water to migrate into the hold during ballasting operations, causing cargo damage