Deck General – Safety

Damage Control

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A tank with internal dimensions of 40 feet X 20 feet X 12 feet is pressed with fuel oil weighing 54 pounds per cubic foot. What is the weight, in short tons, of the liquid?
259.2 short tons

Illustrations: STABILITYFORMULAS

Reserve buoyancy is the _____.
the watertight part of a vessel above the waterline
See REF160

With damaged floating vessels, the most important consideration is the preservation of _____.
reserve buoyancy

Your vessel is damaged and on an even keel. There is no trim. The freeboard is reduced to less than 1 foot. The rolling period is very long, and the vessel is sluggish in returning from a roll. Which action would you take FIRST to improve stability?
In calm seas lower the lifeboats to the water and keep them alongside.

You must shore up a bulkhead due to solid flooding forward. The bulkhead approximates a rectangle. The center of pressure of the shores on the bulkhead should be located _____.
approximately one-third of the way up the bulkhead

A wooden plug fitted tightly in the vent of a damaged tank may prevent the tank from _____.
filling completely

Aboard damaged vessels, the MOST important consideration is preserving _____.
reserve buoyancy
See REF160

Intact buoyancy is a term used to describe _____.
an intact space below the surface of a flooded area

Damage stability is the stability _____.
after flooding

You must shore up the collision bulkhead due to solid flooding forward. The bulkhead approximates an inverted triangle. The center of pressure of the shores on the bulkhead should be located _____.
approximately halfway up the bulkhead
See REF162

The wooden plug inserted in the vent of a damaged tank should be removed if you are going to _____.
pump from the damaged tank
See REF163

Your vessel has been loaded in a sagging condition. Enroute you encounter heavy weather and notice buckling in the midships deck plating of your vessel. To relieve the strain you could _____.
take a course which most eases the vessel
reduce speed
pump fuel oil from midships to the ends of the vessel
All of the above.

To increase the extent of flooding your vessel can suffer without sinking, you could _____.
increase reserve buoyancy

The stability which remains after a compartment is flooded is called _____.
damage stability

The objective of shoring a damaged bulkhead is to _____.
support and hold the area in the damaged position

The two factors which make underwater hull repair difficult are accessibility and the _____.
pressure exerted by the water

You are fighting a fire in a cargo hold on your vessel. Which action is most important concerning the stability of the vessel?
Draining fire-fighting water and pumping it overboard

Your vessel has been holed in #1 hold and partially flooded. The hole is plugged against further flooding. In calculating the effect of the flooding on your transverse stability, you should use which method?
Added weight method

When flooding occurs in a damaged vessel, reserve buoyancy _____.
decreases
See REF161

When shoring a damaged bulkhead, effort should be taken to spread the pressure over the _____.
maximum possible area

When patching holes in the hull, pillows, bedding, and other soft materials can be used as _____.
gaskets

Free communication will adversely affect transverse stability only when the flooded space is _____.
off-center

A vessel is described as a two compartment vessel when it _____.
will float if any two adjacent compartments are flooded

You are fighting a fire in a watertight compartment using hoses and salt water. Stability may be reduced because of _____.
increase in free surface which reduces the metacentric height

Strengthening damaged bulkheads by using wood or steel is called _____.
shoring

When plugging holes below the waterline you should _____.
reduce the entry of water as much as possible

Free communication effect is in direct proportion to _____.
length and width of space

If the cause of a sudden severe list is negative initial stability, counterflooding into empty tanks may _____.
cause the vessel to flop to a greater angle

Your vessel was damaged and initially assumed a significant list and trim; however, further increase has been slow. Based on this data, what should you expect?
The vessel can probably be saved if further flooding can be stopped.

Your vessel has been damaged and you must shore a bulkhead. You should cut the shore _____.
approximately 1/2 inch shorter than the measured length to allow for wedges

In plugging submerged holes; rags, wedges, and other materials should be used in conjunction with plugs to _____.
reduce the water leaking around the plugs

The greatest effect on stability occurs from loose liquids flowing _____.
in and out of a vessel that is holed in a wing tank

Your vessel is damaged with no list, but down by the stern. There is progressive flooding and trim by the stern is increasing. What is the effect on transverse stability after the deck edge at the stern is submerged?
BM decreases from loss of water plane and greater volume.

To prevent loss of stability from free communication flooding you should _____.
close any opening to the sea in an off-center tank

A crack in the deck plating of a vessel may be temporarily prevented from increasing in length by _____.
drilling a hole at each end of the crack

The two courses of action if the underwater hull is severely damaged are to plug the openings or to _____.
Establish and maintain flooding boundaries
See REF164

The most detrimental effect on initial stability is a result of liquids _____.
flowing in and out of a holed wing tank

A continual worsening of the list or trim indicates _____.
progressive flooding

Jettisoning weight from topside _____.
lowers the center of gravity

Progressive flooding is controlled by securing watertight boundaries and _____.
pumping out flooded compartments

Your vessel has grounded on a bar. What should you do?
Switch to the high suction for condenser circulating water, if it is submerged.

Many vessels are provided with flume tanks, which also have a dump tank located under the flume tanks. In the event the ship is damaged, you could dump the flume tanks into the dump tank which would _____.
reduce the free surface effect and lower the KG

Your vessel is damaged, listing to port and on occasion flopping to the same angle to starboard. It has a long, slow, sluggish roll around the angle of list. There is excessive trim by the stern with little freeboard aft. What action should you take FIRST to correct this situation?
Press up any slack double-bottom tanks forward of the tipping center, then fill the forepeak if empty.

The volume of a vessel's intact watertight space above the waterline is its _____.
reserve buoyancy

What must be accurately determined to assess the potential for progressive flooding after a vessel has been damaged?
The integrity of the water tight boundaries

Which statement about damage control is TRUE?
A hole in the hull at the waterline is more dangerous than a hole below the inner bottom.

The percentage of the total surface area or volume of a flooded compartment that can be occupied by water caused by damage is known as _____.
permeability

During counterflooding to correct a severe list aggravated by an off-center load, your vessel suddenly takes a list to the opposite side. You should _____.
immediately stop counterflooding

Which is an indication of reserve buoyancy?
Freeboard

Which type of hull damage should be repaired FIRST?
Damage at or just above the waterline

Your vessel has been damaged and is partially flooded. The first step to be taken in attempting to save the vessel is to _____.
establish flooding boundaries and prevent further spread of flood water

Your vessel is damaged and is listing to port. The rolling period is short. There is sufficient freeboard so that deck edge submersion is not a problem. What corrective action should be taken FIRST in regard to the vessel's stability?
Shift any off-center weights from port to starboard

Your vessel has run aground and is touching bottom for the first one-quarter of its length. What is the LEAST desirable method from the standpoint of stability to decrease the bottom pressure?
Pump out the forepeak tank.

Repairing damage to the hull at or above the waterline reduces the threat of _____.
continued progressive flooding

The wooden plug fitted tightly in the vent of a damaged tank may prevent the tank from _____.
filling completely
See REF163

Your vessel has been in a collision. After assessing the damage, you begin down flooding. This will cause the KB to do what?
Rise

You are on the SS American Mariner and involved in a collision. Your draft has increased uniformly and there is about 4 feet of freeboard remaining. The vessel is on an even keel and has a long rolling period. The roll is sluggish, and the vessel hangs at the ends of a roll. Which of the following actions would you take First to correct the situation?
Pump out flooding water in the cargo holds to reduce free surface.

Your vessel has run hard aground in an area subject to heavy wave action. Backing full astern failed to free her. Which action should be taken next?
Flood empty tanks to increase bottom pressure and prevent inshore creep.

Control of flooding should be addressed _____.
following control of fire

If a vessel takes a sudden, severe list or trim from an unknown cause, you should FIRST _____.
determine the cause before taking countermeasures

How do you determine the weight of the vessel that is supported by the ground when a vessel has run aground?
This requires extensive calculation and is usually performed only by a naval architect not by a ship's officer.
Determine the point where aground and the draft at that point, then calculate it using the grounding formula.
Use the inclining experiment formula and substitute the change of trim for the angle of list.
Use the hydrostatic tables and enter with the mean draft before grounding and the mean draft after grounding.

Your vessel is listing 4° to port and has a short rolling period. There is loose firefighting water in the hull. The ship is trimmed down by the head with one foot of freeboard at the bow. Which action should you take FIRST?
Pump out the forepeak tank.

Your ship of 12,000 tons displacement has a center of gravity of 21.5 feet above the keel. You run aground and estimate the weight aground is 2500 tons. The virtual rise in the center of gravity is _____.
5.66 feet

Progressive flooding may be indicated by _____.
a continual worsening of list or trim

Addition of weight to a vessel will ALWAYS _____.
reduce reserve buoyancy
See REF159

If your vessel is aground at the bow, it would be preferable that any weight removals be made from the _____.
bow

Your vessel is damaged and partially flooded. It is listing 12° to port and trimmed 8 feet down by the head. It has a long, slow, sluggish roll. Which action should you take FIRST?
Press up an after, slack, centerline double bottom tank

What would have the greatest affect on a vessel's longitudinal strength?
Grounding damage to the bilge strake, just aft of midships

The order of importance in addressing damage control is _____.
control fire, control flooding, repair structural damage

Reserve buoyancy is the _____.
volume of intact space above the waterline
See REF160

Your vessel is damaged and listing to port. There is a short rolling period around the angle of list. The port side freeboard is reduced to 1 foot. There is no trim and the weather is calm. You should FIRST _____.
pump out a slack marine portable tank located on the portside amidships

Your vessel is damaged, and there is no list or trim. The rolling period is short. The freeboard before the damage was 12'02" (3.7 meters). It is now reduced to 3'00"(1 meter). Which action would you take FIRST?
Pump out an amidships centerline ballast tank

Small hull leaks can be temporarily repaired by _____.
caulking

After an explosion, repair of emergency machinery and services should be accomplished _____.
after control of fire, flooding, and structural repairs

Reserve buoyancy is the _____.
the watertight portion of a vessel above the waterline
See REF160

A vessel aground may have negative GM since the _____.
displacement lost acts at the point where the ship is aground

Your vessel is damaged and listing to port. The rolling period is long, and the vessel will occasionally assume a starboard list. Which action should you take FIRST?
Press up a slack centerline double bottom tank

Damaged bulkheads often take a permanent set which is independent of the panting or bulge caused by water pressure. To control this, you should _____.
install shoring so the shoring supports the damaged bulkheads without pushing on them

The BEST information on the nature and extent of damage to the vessel is obtained from _____.
personnel at the scene of the damage

REF159
Initial Stability: Stability of a vessel for small angles of inclination (up to 15 degrees). Reserve Buoyancy: The volume of all intact space above the waterline.

REF160
Reserve Buoyancy The volume of the watertight portion of the ship above the waterline is known as the ship's reserve buoyancy. Expressed as a percentage, reserve buoyancy is the ratio of the volume of the above-water body to the volume of the underwater body. Thus reserve buoyancy may be stated as a volume in cubic feet, as a ratio or percentage, or as an equivalent weight of seawater in tons. (In tons it is 1/35 of the volume in cubic feet of the above-water body.) Freeboard, a rough measure of reserve buoyancy, is the distance in feet from the waterline to the weather deck edge.

REF161
Reserve buoyancy can be defined as the volume of the enclosed spaces above the waterline. It can be expressed as a volume or as a percentage of the total volume of the vessel. The volume of the enclosed area above the waterline are not providing buoyancy but are being held in reserve. If some extra weights are loaded to increase the displacement, these spaces above the waterline are there to provide the extra buoyancy required. Enclosed spaces, which provide buoyancy in addition to that required by a vessel to float. It is always considered in the assignment of freeboard to a ship.

REF162
The collision bulkhead is the forward-most bulkhead.

REF163
Plugging a tank vent with a wooden plug may prevent the tank from filling completely.

REF164
Flooding boundaries are the bulkheads and decks restricting the partially flooded area from the flooding boundary.If partially flooded compartments become completely flooded, the flooding boundaries may not hold. There may be hidden cracks or leaky stuffing tubes or the bulkheads may not be able to withstand the pressure put on them.In other words, just because a flooding boundary seams safe one minute is no sign that it will besafe the next.Therefore,repair party personnel should keep on reinspecting and should make sure the boundaries holds (even so for as to add shoring if bulkhead or overhead strength is in question.)