Simple Damage Control Aboard

By
Marc A. Barredo

Damage control aboard ship involves any prudent action that will; prevent or reduce expected damage to the ship, stabilize the situation caused by the damage, reduce or negate the effects of damage to the ship after is has occurred. The main purpose of damage control is to keep the ship afloat and to return to port for reparation with the minimal loss of property or life. The necessity for the practice of damage control aboard ship is not limited to just plugging and patching holes in the hull plating; an accident aboard ship demands an aggressive systematic response by the professional mariners aboard.

DAMAGE CONTROL

The damage control organization aboard ship must be able to meet the following objectives:

- Clearly defined damage control strategies
  1. Line of action before the damage occurs
  2. Reduce the effects of damage after it has occurred
  3. Emergency repairs to damage caused by accident
  4. Restoration of services to ship after damage has occurred

- Validated damage control tactics
  1. Trained personnel
  2. Available equipment
  3. Available materials
  4. Desired results

The crew’s ability to respond to damage caused by accident or intention will depend on the practical knowledge and skills of the damage control organization aboard ship. It is very important that all mariners understand their duties and responsibilities as part of the damage control organization aboard and that damage control must be aggressive and systematic to be effective.
Damage control involves all aspects of damage that a ship may encounter by accident, or by plan, in port or underway, such as:

1. Fire & Explosion
2. Collision
3. Flooding
4. Grounding
5. Hostile action directed at the ship

Mariners must be knowledgeable about all aspect of the ship on which they work and not just with their berthing space, mess deck, workstation, and the location of the disbursing office. When the emergency signal is sounded aboard, all crewmembers will be called upon to perform in areas outside their normal workstation. This will be determined by which zone aboard the perceived damage has initially occurred and the location and the extent of the actual damage, and if the damage is spreading to other parts of the ship.

The vital damage control systems aboard ship include:

1. Communications
2. Emergency power
3. Pumping system
4. Fire main
5. Drainage system

Crewmembers, to be effective damage control personnel, assigned to the ship’s emergency squad, must be able to find their way about the ship under adverse condition. This can be learned through specialized training, repetitive exercises, and unscheduled drills.

Emergency Lockers

When a ship is designed then built, emergency lockers are built into the ship at a specific location for numerous reasons. The number of lockers may be determined by the type and class of ship and the number of personnel assigned to the ship. A typical merchant ship may have one primary locker, labeled “EMERGENCY SQUAD EQUIPMENT,” that is well equipped and a secondary locker containing the bare necessities, but, still adequate for most emergencies aboard.
Each emergency locker is manned by members of the emergency squad comprised of various crewmembers that possess specific knowledge, skills, and training for any type of damage control work.

**Duties of Emergency Squad**

The emergency squad must have the ability to:

1. Accurately assess and report damage
2. Maintain emergency squad integrity
3. Maintain and restore ship’s vital functions
4. Isolate, control and extinguish fire
5. Isolate and control flooding of the ship
6. Make emergency repairs to the ships structures and hull
7. Remove water and unnecessary weight from the ship
8. Maintain ship’s seaworthiness
9. Administer first aid/CPR and move injured crew members

Each emergency locker has a “locker leader,” usually the first assistant engineer. The second person in charge of an emergency squad is, usually the third officer, who is the “squad leader” at the scene, and the boatswain is designated the “scene leader.”

**Assessment and Reporting Damage**

Initially, an investigator, make a quick assessment of any apparent damage to the ship’s hull, structures, and systems. The investigator must have a good working knowledge of the ship and be experienced in the principles of investigating damage, assessment of damage, and reporting damage. When in doubt, the investigator must report what is seen, heard, smelt and felt.

**Emergency Repairs**

Emergency repairs are repairs to the ship that are temporary in purpose, but, absolutely necessary to allow the ship to maintain seaworthiness to return to port for permanent repairs. Emergency repairs are made with materials specifically carried for such occasions or with material readily available and adaptable at the time of need to repair the damage. The primary objective is to keep the ship afloat by maintaining the ships watertight integrity and operational capabilities.
Damage Control Repair Bags

At the repair locker, small bags made of canvas or other durable material, are neatly packed with items necessary to make specific repairs that are easily moved to the location of need, yet, small enough to be carried to the scene and fit through deck scuttles and hatches with little effort. The following are typical gear bags and the contents of each kit may vary according to need:

1. Investigator’s gear bag
2. Electrical repair bag
3. Plugging bag
4. Pipe-patching bag
5. Shoring bag
6. Plugging and Patching bag

The two principles for effecting temporary repairs to a hole in the piping system or ship’s hull is to:

1. Decrease the size of the hole to reduce the flow of liquid or,
2. Cover the hole to reduce the flow of liquid

In both principles, the crewmember is simply reducing the size of the hole, the area, through which water can enter into the ship.

Temporary repairs do not require sophisticated “state of the art” tools and other expensive equipment which may be nice to have, but not necessary. They involve the practical application of the two principles of plugging and patching using wood, prefabricated patches and plugs, or other readily available materials aboard that are adaptable to the situation at hand.

Shoring

Shoring is primarily used to support and/or strengthen weakened ship’s structures. Shores may be either wood or metal, but primarily wood.

First Aid Station

These stations are usually manned by personnel with medical training and conveniently located so injured personnel may receive immediate medical treatment.
Emergency Communications

Communication is critical to the damage control organization. Without strict control of communication, the damage-control organization would quickly break down. The inability to communicate with the various responding personnel will directly impact the ability to coordinate operations.

Watertight Integrity

The single most important aspect of ship’s construction is the ability to maintain watertight integrity that will improve the ship’s chances to survive. The ship’s structure and hull may suffer damage from an accident or intentional damage to the vessel, but if sufficient watertight integrity is maintained, the ship will stay afloat.

Making Entry into A Closed Compartment

All watertight closures such as; watertight doors, hatches, and scuttles must never be opened until properly checked for signs of fire and flooding on the other side of the structure. This is to limit the unnecessary spread of fire or flooding to other compartment by the opening of intact watertight doors, hatches, and scuttles. Once watertight closures have been made, compartments should never be opened until the damage control officer has granted permission. Always be alert and cautious for sign that would contraindicate opening the compartment.

Closing and Opening Watertight Doors

Watertight doors, hatches, and scuttles must be properly dogged down to make the protected compartments watertight. Access plate to double bottoms must be properly fitted with a gasket and bolted down at all times, except when being tested, cleaned, inspected or preserved. When no work is being performed in the double bottoms, they must be bolted shut to preserve the ship’s watertight integrity.

All watertight closures must not be abused, damaged, or neglected in anyway. Periodic inspection and maintenance must be performed to insure that the closures function as designed. To properly seat a watertight closure, set the dogs opposite the hinges, with enough pressure to keep the knife-edge and the gasket material in contact. Then set the dogs on the hinged side of the closure to obtain uniform pressure all around the knife-edge and gasket material. To open a watertight closure, start with the dogs on the hinged side of the closure. This allows the special hinges to
lift away from the knife-edge if there is excessive pressure from air, or, water pressure and prevents the closure from blowing open. This prudent action allows for quick closure should adverse conditions be indicated.

The heaviest and strongest doors, normally located below the main deck, are designated as watertight doors (WTD). These doors are integral parts of watertight bulkheads of compartments. These doors may have 6-10 individual dogs, or, may have a single handle that closes all the dogs at the same time, known as single quick-acting watertight doors.

Hatchways are access opening in the decks and hatches are the coverings for the hatchways. Coamings, rise from the deck, encircle the hatchway to keep water and dirt from falling into the compartment when the hatch cover is left secured in the open position. Hatches may be secured in any number of ways such as securing bars or holdbacks. They may have quick-acting control wheels or may have individual dogs or drop bolts to firmly secure the hatch cover in the closed position. Quick-acting escape scuttles are provided for rapid egress or access through a hatch.

Manholes are the covers to the potable water tanks, ballast tanks, fuel tanks, and void spaces. They are secured by bolting steel plates with gasket material over the openings. Really old ships may have hinged manhole covers, dogs, or drop bolts. Manholes may also be found in bulkheads leading to void spaces or chain lockers.

**Summary**

If the interior of the ship was just one big open space, a small one-inch diameter hole, 10 feet below the waterline will eventually cause the ship to flood, fill with water, and sink. To prevent such flooding from occurring, the interior of the ship is divided into watertight zones and compartments utilizing specially designed structures such as; watertight bulkhead, decks, and doors.

By design, most large ships can be made unsinkable, if the watertight integrity of the ship is maintained. This single element of the ship’s design can easily make or break a damage control organization aboard ship. No matter how much talking, planning, training, and purchasing of expensive equipment takes place, the merits of damage control is lost simply by the failure of the ship’s crew to make all watertight closures at the sounding of the emergency signal.
Damage control aboard ship will never change from its original concept of responding to shipboard emergencies and making do with the available resources on hand. It’s all about “doing more with less,” in a time of need with the emphasis on “doing.” Not talking - “doing.”