

## Damage Control Afloat

What? Fire, flooding, rig, hull, mechanicals, electrical

Preparation: Good checklist in booklet. DO IT YOURSELF!

Basics of DC: Like medicine: *Do no harm!*

1. Hold what you've got.
2. Communicate on distress freqs.
3. Act quickly and decisively.
4. Adapt and prevail.

Specifics:

Fire: Most dangerous. 2min rule.

Doubles every min, and is geometric progression in intensity.

High potential for injury/death = MAYDAY appropriate.

Fire Causes: Bilges, stoves, electrics, batteries, fuel, other. Like POB, easier to prevent than to remedy.

Good housekeeping

INSpect, don't EXpect!

Fuel lines, filters, chafe points, fittings.

Propane installation.

Electrical gear and installation

Safe usage (no smoking below, attend stove at all times, keep boat neat with trash contained, no flammables below deck or in lockers.

Maintenance: Particularly switchboard, circuit breakers and engine compartment.

Type of fire and appropriate extinguishers:

A: Leaves an ash: use water, drychem, CO<sub>2</sub>, Halon or equivalent.

B: Fuels and other flammable liquids: use Halon, foam, CO<sub>2</sub> or water fog (generally not available on yachts)

C: Electrical: Shutoff power first, then deal with the A fire remaining: CO<sub>2</sub> or Halon preferable to reduce damage to equipment by the agent.

D: Metal (like flares): Can't extinguish. Throw overboard.

Extinguishers: USCG requirements are minimal. Put them where you think they might be of use. Be able to fight a fire in the galley from both sides and the cockpit. Internal extinguisher in engine compartment gets you an insurance credit—for good reason.

Sizes: B1 = about 5sec of discharge; B2 = about 20sec.

FIRE: Action phase

On scene: Fight fire with whatever you have available, and yell for help.

On deck: Crew safety + MAYDAY + initialize Abandon Ship

After fire is out:

Overhaul the fire site, set reflash watch for 2hr minimum, canx Mayday call, investigate and remedy cause.

FLOODING:: Facts: 1.5" seacock = 31gpm; 5" hold 2' under water = 430gpm; 8" hold 4' under water = 1500gpm. Obvious tactic—reduce the size of the hole as quickly as possible.

Causes: Collision, grounding, plumbing failure, hull/deck joint failure, loss of keel, hatch failure, shaft or rudder post failure.

Prevention: INSpect, double clamp hose connections where you can, keep bilges clean (so pumps don't foul on debris), test pumps, avoid collisions, grounding and impacts with underwater or floating objects.

ACTION Phase:

At site: Slow or stop leak.

On deck: adjust attitude of boat, ensure safety of crew (lifejackets on), consider methods of pumping, DC kit use, Notify USCG as to status and outlook—establish communications schedule), initialize abandon ship procedures, repair the damage.

REMEDIES: Slow or stop influx and get the water out.

Plugs, shoring, fothering, new epoxies.

**RIG PROBLEMS:** Prevention easier than remedy here, too.

INSpect closely annually and follow up with a trip up and down before the race.

+ Daily from on deck (using binocs)

Observe seamanlike practices (no crash jibes, use preventers, etc.)

Sturdy rigs preferred.

Develop a replacement policy for standing and running rigging.

Damage to the rig:

- a. Shroud parts: Tack immediately to take stress off, and use halyard to take its place. Try to avoid sailing on the tack where the shroud is missing
- b. Stay parts: Relieve stress and reinforce with spare halyard.
- c. Many cruisers carry a spare halyard which can be used to make a temporary stay or shroud.

Jury rigs: If the mast goes, consider how you can get a replacement spar rigged to accept a small sail (trysail or storm jib hoisted sideways?) so you can continue to sail to port. Spinnaker pole or boom may be available.

**HULL PROBLEMS:** Loss of keel most serious, and not uncommon on newer boats (with small attachment areas). Generally leads to capsize quickly unless sail power can be immediately reduced—ease sheets, turn slowly into the sea and maintain heading with engine while sails are dropped.

Communicate while you can. Maintain continuous comms if possible.

Get rafts and personnel on deck in survival gear, prepare to abandon quickly if boat rolls. May have to move about the boat to maintain the condition.

**MECHANICALS:** Specific areas to be considered, and sufficient spare parts, tools and instruction books should be cared to deal with problems in these specific areas: Sanitation systems, propulsion and charging, water, winches, hydraulics and pumps.

For engine: It needs clean fuel, adequate air and cooling. Transmission is rarely a problem, check linkages first. Propeller can't be fixed at sea, so check it before.

**ELECTRICAL:** Batteries getting loose or flooded is most serious problem. Make sure they are firmly anchored in place, and sea-going batteries should be gel-cel or AGM types that will not spill. Other problem areas:

Switches and circuit breakers. Back of switch panel is subject to water leaks and corrosion. CRC will keep that "sweet."

Alternator and inverter systems power your comms and nav systems and must be understood, and maximized.

*Gremlins.* Salt water and 12vdc are not compatible, and shorts, grounds and such must be discovered and fixed. A good digital VOM (volt ohmmeter) is required.

## SUGGESTED CREW DRILLS IN DAMAGE CONTROL

**Fire:** Use your extinguishers ashore in a controlled drill with fire department (often can come to your club or marina to conduct this training).

**Flooding:** Try each of your pumps by measuring water you pour into the bilge and seeing how long it takes to remove it. Repair pumps or systems as required.

**Abandon Ship:** Get raft to cockpit in simulated emergency, assign (by posted "bill") other items to be brought by crew: EPIRB, Flares, Waterproof VHF, grab bag, medical kit, extra water and food.

**Communications drills:** Have each member make a distress call using a tape recorder instead of a radio. Use the form provided and have them demonstrate how they would use the communication equipment.

**Going Aloft:** Practice in smooth water at sea, and develop techniques for working aloft in rough seas (helmet, bulky lifejacket, hold-down lines for climbing harness, necessary tools).

Replace filters, belts, impellers on engine before the race, inventory spare parts, tools and instruction manuals (on thumb drive for compact storage?).

End