



## Issue 18E

# Watertight Integrity

Analysis of commercial fishing vessel casualties have shown that 75 - 80% of "stability related" sinkings are caused by either overloading, or flooding through deteriorated systems or boundaries, non-tight closures, or other openings added for operational convenience. 70% of fatalities involving commercial fishing vessels are related to vessel stability.

A vessel's form, construction, and subdivision provide stability and resistance to flooding. These design features are defeated if the skin of the vessel and the integrity of bulkheads are not maintained watertight. Proper maintenance to ensure that integrity is a vital part of any ship's preparations to resist unintentional flooding and should be checked by the crew periodically.

Common watertight integrity problems which have led to vessel losses include:

- Leaking deck hatches leading to flooding of the lazarettes;
- Flooded lazarettes flooding adjacent spaces due to bulkheads that are not watertight;
- Open doors allowing water to enter the deckhouse leading to flooding below decks; and
- Excessive leaks through packing glands or corroded through hull penetrations.



### Prevention

Prevention is the most effective strategy for avoiding flooding problems. Successful prevention strategies include:

- Ensuring water on deck does not accumulate and all hatches are properly maintained and dogged;
- Ensuring doors to the deckhouse are watertight or weathertight, properly maintained, and kept closed;
- All below-deck fittings are free from corrosion and excessive leakage; and
- Bulkhead penetrations are watertight.

### Detection

As a measure against undetected flooding, unmanned below-deck compartments on vessels 36 ft. or more in length are required to be fitted with high water alarms. These should be kept clear and tested frequently.

### Preparedness

The last measure to help prevent vessel loss from unintentional flooding is to ensure that when the unexpected occurs, the crew is prepared to quickly deal with the situation. This means being familiar with and practicing damage control procedures. At the web site [www.Fishsafe.info](http://www.Fishsafe.info) examples of damage control kits can be viewed.

The Coast Guard has multifaceted small vessel damage control trainers that are available through your Fishing Vessel Safety Examiner and can be used in preparing crews to take effective action in flooding situations ([www.uscg.mil/hq/g-m/nmc/alert/portland/damcont2.pdf](http://www.uscg.mil/hq/g-m/nmc/alert/portland/damcont2.pdf)).

### Recommendations

The following measures are recommended for maintaining your vessel's watertight integrity.

1. All openings in the hull and deckhouse should be fitted with watertight or weathertight closures.
2. All watertight doors, hatches, windows, and other closure devices must be maintained in good working condition. Institute a regular inspection program onboard the vessel to check their condition.
3. Train your crew as to the location and operation of all watertight and weathertight closures.
4. Keep all watertight and weathertight closures secured except when in use, even in good weather. Remember, an unexpected wave or wind gust can swamp the vessel as easily as a severe storm.
5. High water alarms should be fitted in all hull compartments potentially subject to flooding.
6. If the vessel is fitted with large fish processing spaces that can trap water, they should be fitted with high water alarms.

### Resources for further study

Several publications include expanded discussion of the above topics such as The North Pacific Fishing Vessel Operators Association's *Vessel Safety Manual* (<http://www.npfvoa.org>). The Coast Guard's *A Best Practices Guide to Vessel Stability* is electronically available at: <http://www.uscg.mil/hq/g-m/cfvs/Stability%20Book%202nd%20Ed%202004.pdf>.

**It's Your Mark, Get Set, Go**  
[www.FishSafe.info](http://www.FishSafe.info)