



# Maritime New Zealand Guidelines

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SAFETY BULLETIN ISSUE 26 – May 2011

## Passenger injuries caused by vessels slamming into waves

### This safety bulletin is for:

- Safe Ship Management (SSM) passenger vessel operators, owners and masters
- SSM companies
- SSM surveyors
- Maritime New Zealand (MNZ) Maritime Safety Inspectors
- MNZ auditors

### Purpose

There have been a number of passenger injuries sustained on high speed passenger vessels offering “thrill-rides”. This bulletin is issued to highlight the hazard that passengers and crew are exposed to when a vessel is travelling at speed in waves.

### Key issues

The impact of boats slamming into waves when travelling at speed can be sharp and hard enough to cause personal injury, including injuries to a seated person’s back, spine or neck.

The size of these impacts, and how hard they feel to the passengers, are directly proportionate to the shape of the vessel’s hull, the speed and direction the vessel is travelling, and the size of the waves the vessel is exposed to.

The cushioning or impact absorption provided by seating is important to assist in softening the ride for those on board.

The position of passengers on board the vessel and how they are restrained and protected are also of critical importance. An airborne vessel can easily launch a person who is not firmly restrained, or holding on, into the air. The slamming of the vessel on the next wave and the relative movement between the boat and the unrestrained person can result in a dangerous impact and may also risk, in some vessels, the passenger being lost overboard.

### Legal responsibility

Any person who operates a ship in a manner which causes unnecessary danger or risk to any person, irrespective of whether or not in fact any injury occurs, may be prosecuted under section 65 of the Maritime Transport Act 1994 (“the MTA”). Similarly, a holder of a maritime document may also be prosecuted under section 64 of the MTA if he or she, in respect of any activity or service to which the maritime document relates, causes unnecessary danger or risk to any other person irrespective of whether or not in fact any injury occurs.

Likewise, the Health and Safety in Employment Act 1992 places responsibilities on the employer to maintain a safe environment for persons employed or engaged on a ship, in accordance with section 3B of the Act, and passengers on that ship as a place of work under the Act.

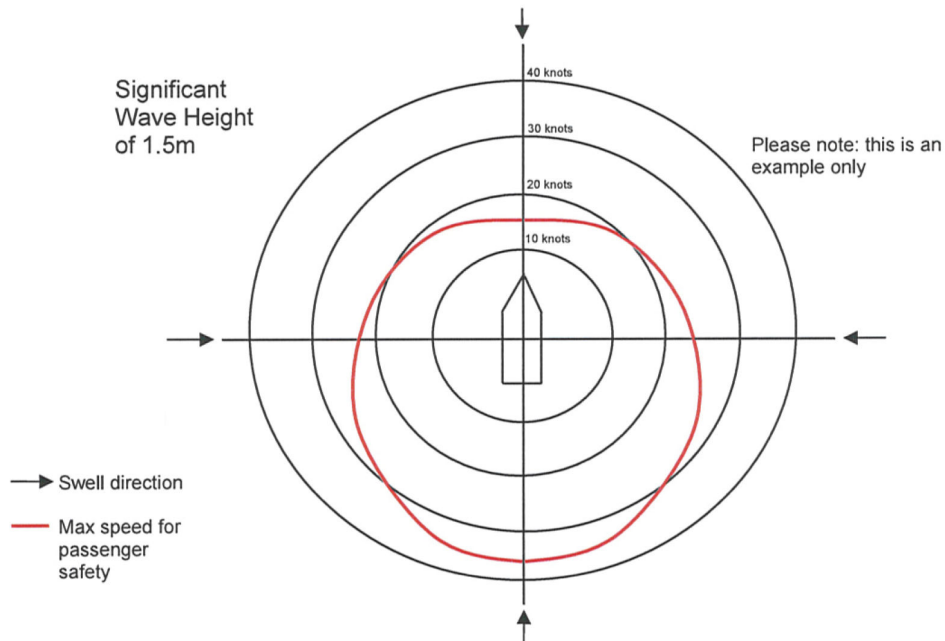
## Maximum speed, wave height and direction

It should be noted that the speed and structural limitations of the vessel, as set by its designer or naval architect, may not be the same as the maximum speed at which it can safely carry passengers.

The hull and structure of the ship may be able to take the loadings and impacts involved but the impacts may be excessive for passenger safety. The owner, operator and master must be aware of this and select appropriate speed limits for given wave heights and swell directions in order to protect passengers and crew from harm.

## Key recommendations

- Owners, operators and masters of passenger ships must ensure that impacts on board their vessels are within limits that will ensure the safety of passengers and crew.
- The design of the vessel must be appropriate to the operational conditions it is exposed to. If the vessel is not adequately designed to soften the ride for a specific speed, wave height and direction of swell then the operator must avoid those specific conditions.
- For a given vessel, the owner or operator should prepare documented safety procedures stating the maximum safe speed for a given wave height and swell direction. Operators of passenger vessels operating in conditions where vertical impacts are likely to cause injury (or damage to the vessel) should prepare maximum speed/swell direction diagrams or equivalent written descriptions for each incremental increase in sea-state.
- Owners, operators and masters of vessels offering thrill-rides must take all practicable measures to ensure the personal safety of the persons on board their vessel.
- Masters and helmsmen of vessels offering thrill-rides must ensure that the speed of the vessel is appropriate to the sea-state conditions, the course of the vessel and the wave slamming impacts on board the vessel.
- Passenger safety briefings before departure of the vessel should highlight the hazards involved and explain the need for equipment such as seat-belts, how to use them and when they should be worn.



**Figure 1** Example of a vessel speed to swell direction diagram for a given wave height

## Further Information

For further information please contact our Wellington office:

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