

# Maritime New Zealand Guidelines

## MARINE GUIDANCE NOTICE ISSUE 03 - 2007

September 2007

### INBOARD MOUNTED OUTBOARD MOTORS

This guidance is for:

- safe ship management companies
- ship surveyors
- Maritime NZ Safety Inspectors (MSIs).

### Outboard motors venting to passenger and crew spaces

Maritime New Zealand has found outboard motors with vented exhaust gases to passenger and crew spaces.

The vessels were configured so that the outboard was mounted "inside" the vessel, instead of the more conventional transom mounting.



Figures 1 and 2 above show two different examples of outboards mounted inside the vessel.

The outboards, at low speeds, vented large amounts of carbon monoxide (CO) into the atmosphere of the cabin and passenger areas through the top of the internal engine box.

In one particular case, 19 people were taken to hospital for observation after CO inhalation.

### Characteristics of carbon monoxide

CO is a poisonous gas which is colourless, odourless and tasteless. It is produced by the incomplete burning of solid, liquid and gaseous fuels.

## Symptoms of carbon monoxide poisoning

- Headache
- Fatigue
- Shortness of breath
- Nausea
- Dizziness

## Levels of carbon monoxide that are dangerous to health

The effect of CO on health depends on the level of CO and length of exposure, as well as each individual's health condition.

- 1 to 70 ppm (parts per million) concentration in the air may not affect most people, although some heart patients may experience chest pains.
- 70 to 150 ppm concentration in the air will cause headache, nausea, fatigue.
- 150 to 200 ppm concentration in the air will cause disorientation, unconsciousness, and even death.

## Conclusions and recommendations

CO poisoning can be prevented by:

- installing forced ventilation or exhaust extraction fans in the engine box
- sealing the engine box so there is no leakage of gas to other spaces
- installing CO gas detectors in passenger and crew areas
- installing ventilation into passenger and crew areas
- moving the outboard to a transom mounting
- sealing the petrol tank storage area.

It is recommended that surveyors and MSIs refer to International Standard ISO 11105 *Small craft – Ventilation of petrol and/or petrol tank compartments* as noted in Maritime Rules Part 40A Design, construction and equipment of passenger ships which are not Solas ships.

The above Maritime Rule and its associated standard give clear guidelines on the petrol tank storage and petrol engine ventilation.

Surveyors and MSIs need to be aware of this safety hazard and take steps to remedy it in existing vessels and through the design verification process for new vessels.

### Further information

For further information please contact:

- your local MSI
- Maritime New Zealand in Wellington on free phone 0508 225522.