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## Word on Safety

### >> Workers overcome by Perchloroethylene (a degreasing solvent) in an enclosed space

Six workers were affected by Perchloroethylene (PCE) on 6 Mar 2008 onboard a vessel undergoing repairs at a local shipyard. PCE was used for cleaning a bow thruster motor which was located in a compartment of the vessel. Air-supplied respirators were used during the cleaning. Half an hour later, two workers went into the compartment to carry out post cleaning inspection. One fainted and the other managed to climb out to seek help. The other four workers experienced giddiness when they attempted the rescue. Fortunately, all had since recovered.

#### Advisory Note

##### a) Health Hazards of PCE

PCE can be absorbed into the body by ingestion, inhalation and skin contact. The most common route of exposure to PCE is through inhalation of its vapour. The health hazards of acute exposure to PCE include:

- Irritation of the eyes, nose and throat
- Dizziness, headache, nausea and incoordination
- Liver and kidney damage
- Coma and death with high exposure

##### b) Risk Assessment

Risk assessment should be carried out whenever PCE is used. Risk assessment should be comprehensive, covering all work activities, such as cleaning and post cleaning inspections. PCE-in-air monitoring must be carried out to determine the level of risk and the extent of control measures.

##### c) Control Measures

###### • Substitution

Substitute whenever practicable with less harmful substances. A list of suppliers of safer solvents substitutes can be found on the [Ministry of Manpower's website](#).

###### • Engineering control

Provide local exhaust ventilation (LEV) at the point of usage to remove the solvent vapour at source where practicable. Introduce adequate fresh air to dilute the solvent vapour to below the permissible exposure level, if the use of LEV is not practicable.

###### • Administrative control

Restrict the area where solvents are used to authorised workers. Workers should be trained on the health hazards of solvents, safe handling, preventive measures and emergency response procedures.

###### • Personal protection

Workers should wear organic vapour cartridge respirator if the concentration of PCE exceeds permissible exposure limit (PEL, 25ppm). Air-supplied or self contained breathing respirators should be used if the concentration of PCE exceeds ten times the PEL or where the exposure level is unknown. All workers should be trained in the proper use and maintenance of respirators, including fit-testing.



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