

- select appropriate control measures
- ensure that control measures are properly used and maintained, and
- determine if air monitoring or health monitoring are required.

It may be necessary to engage external professional assistance to undertake a more detailed assessment.

#### STRUCTURING RISK ASSESSMENTS

Risk assessments can be simplified by evaluating the nature of the work in smaller, more manageable parts. You do not need to do a risk assessment covering each work activity in the whole workplace. Instead, evaluate the nature of the work by:

- **Dividing up the workplace** - If it is not practicable for the workplace to be assessed as a whole, divide it into smaller units (locations/areas or processes) to make risk assessment more manageable. Walking through the workplace and looking at floor plans or process plans will help you decide how to divide up the workplace.
- **Grouping similar work** - Workers performing similar work or using similar substances may be grouped together if it has been established that their exposures are representative of their group. These are referred to as similarly exposed groups. In this way, you can avoid having to repeat exposure assessments for each and every worker. If the work involves a large number of different hazardous chemicals, they may be grouped on the basis of their form, properties and the way they are used or handled. This kind of grouping may be appropriate for example, where:
  - a range of solvent-based paints containing a number of different solvents and additives are used in the same or similar way (for example, sprayed, brushed or applied with a roller)
  - solvent-based liquid pesticides are used in the same or similar way (for example, decanted, mixed or sprayed)
- **Examining work practices and conditions** - Once you have divided the workplace into manageable units, you should observe and consult with workers to find out how the job is actually done. Workers may sometimes not adhere strictly to standard operating procedures for certain tasks. This could be because they have devised a more efficient and/or safer method for performing that task, or because the control measures or PPE provided make it cumbersome and difficult. Workers should be encouraged to share their views and concerns on working practices and be involved in discussions on how to improve working methods. Also, it is good practice to find out what changes in workplace activities occur during cleaning, maintenance, breakdowns and during staff absences or shortages.

You should take account of any information about incidents, fires, spills, illnesses or diseases that may be related to the use of the hazardous chemical. Check your accident/incident records. Ask those doing the work if they have experienced symptoms listed on the SDS. This information will help you to determine if exposure has been significant.

#### CONSIDERING BOTH HEALTH AND PHYSICOCHEMICAL RISKS

Hazardous chemicals may present an immediate or long term risk to human health through their toxicological properties, or a risk to safety of persons and property as a result of their physicochemical hazards. In some cases, chemicals may present both health and physicochemical hazards, for example solvents such as benzene, toluene and xylene.

There are many common elements to assessing risks from health and physicochemical hazards, but also several key differences in the way these risks are assessed. As a consequence, the assessment of health and physicochemical risks are discussed separately in this chapter.

### CONTROLLING RISKS FROM COMPRESSED GASES

Key considerations for safe storage and handling of gas cylinders include:

- maintaining and regularly checking cylinders, regulators, hoses and pipes to cylinders to ensure that there are no leaks or dents
- storing cylinders in an upright position to ensure the safety device functions correctly
- securing cylinders to prevent dislodgement
- transport cylinders with appropriate equipment such as trolleys or gas cages
- keep the cylinder valve closed when the cylinder is not being used
- keep all sources of heat and ignition away from gas cylinders, even if the cylinders do not contain flammable material
- store cylinders outdoors or in very well ventilated areas.

Gas cylinders should be fitted with a bursting disc safety device and liquid petroleum gas cylinders should have an operational spring-loaded pressure relief valve.

If a small leak occurs, the cylinder valve should be closed if it is safe to do so. Appropriate personal protective equipment should be put on before attempting to locate the leak point. For toxic gases, self contained breathing apparatus may be required for emergency use. The area should be well ventilated and air conditioning systems should be turned off to avoid spreading gas. However, if a large amount of gas escapes, the area should be evacuated. If it is safe to do so, before evacuating, ventilate the area and remove or isolate ignition sources. Contact the gas supplier for advice, or in an emergency, contact the emergency services authority.

Potential risks associated with the transport and storage of small gas cylinders (e.g. acetylene and LPG) in vehicles must be also managed appropriately.

A range of Australian Standards provide further information relating to controlling risks from compressed and liquefied gases, such as AS/NZS 1596: *The storage and handling of LP Gas*, and AS 4332: *The storage and handling of gases in cylinders*.

### ASPHYXIATION HAZARDS

Key considerations in minimising the risk of asphyxiation include:

- avoiding work being carried out in oxygen-depleted (under 19 per cent) atmospheres - for example this could be done by testing the workplace atmosphere using an approved and intrinsically-safe gas monitor
- keeping the work area well-ventilated, particularly in low-lying areas and roof spaces where gases can accumulate- this could be done by ensuring windows are open where necessary and ventilation and extraction systems are on and are fully functional
- purging
- using an air-supplied respirator, particularly in confined spaces
- checking cylinders, cylinder fittings, hoses and connections to ensure that they are not damaged or in poor condition - this might include checking fittings and hoses for signs of corrosion or degradation or spraying them with a small amount of detergent solution or leak-detection spray and looking for bubble formations which may indicate the presence of a gas leak.