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SAFETY ALERT

BULK LIQUID CO_2 STORAGE INSTALLATIONS AT THE USERS' PREMISES

The SACGA has discovered that there are numerous government buildings in Pretoria that have bulk CO_2 storage installations in the basement of the building, one prime example being the National Archives building which has two horizontal 11-ton storage tanks installed.

We are perturbed concerning the safety of personnel within these buildings in the event of an uncontrolled release of product. This practice is totally against national and international standards and must be discouraged by all companies who carry out this type of installation. Open-air locations are preferable in all instances.

Installations should be sited to minimise risk to personnel, local population and property. Consideration should be given to the location of any potentially hazardous processes in the vicinity that could jeopardise the integrity of the storage installation.

An installation may, because of its size or strategic location, come within the scope of specific planning controls. If so, the siting of any proposed installation must be discussed and agreed with the local authority.

CO_2 is nearly twice as heavy as air and, consequently, will collect at low points if leaks occur due to this characteristic. Attention should be given when siting a bulk liquid CO_2 storage installation that it is well clear of basements, pits and trenches which could enable CO_2 to enter and accumulate below ground level.

The physiological effect of CO_2 is entirely independent of the effects of oxygen deficiency. These effects are listed below for your information, concentrations are by volume:

1-1,5%	Slight effect on chemical metabolism after exposures of several hours.
3%	The gas is weakly narcotic at this level giving rise to deeper breathing, reduced hearing ability, coupled with headache, an increase in blood pressure and pulse rate.

4-5%	Stimulation of the respiratory centre occurs resulting in deeper and more rapid breathing. Signs of intoxication will become evident after 30 minutes exposure.
5-10%	Breathing becomes more laborious with headache and loss of judgement.
10-100%	When the carbon dioxide concentration increases above 10%, unconsciousness will occur in under one minute and, unless prompt action is taken, further exposure to these high levels will eventually result in death.

The recommended exposure limit for carbon dioxide is 5.000 parts per million (0,5%) by volume, calculated on an 8 hour time weighted average concentration in air.

Depending on regulations in individual countries, carbon dioxide concentration peaks up to 30000 parts per million (3%) in air are allowed whereby the duration of exposure is between 10 minutes and 1 hour.

Cardiac or respiratory defects are likely to increase the hazards of inhalation.

Wherever any doubt exists, the recommended exposure limit of 5000 parts per million carbon dioxide in air should be regarded as the maximum level for any individual.

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