

## Memo

To Safety Co-ordinators (for onward transmission to schools with responsibility for laboratories)

From Dr Melanie Taylor, University Safety Advisor

Date 17<sup>th</sup> February 2005

Distribution Mr J Duffy, Mr M Bailey, Estates

Reference Safety Circular 2/2005

### Transportation of liquid nitrogen in lifts

It has come to my attention that, across the campus, there are inconsistent methods of moving containers of liquid nitrogen (LN) in lifts. Please note that in the event of any spillage or containment failure of a vessel containing LN, the expanding gas will very quickly displace the oxygen in a confined space such as lift car. The gas expansion factor for LN is 683, ie a small spillage of 1cm<sup>3</sup> of liquid will expand to 683cm<sup>3</sup> of nitrogen gas. Accidental tipping of an unpressurised 25 litre vessel, or failure of the bursting disc on a larger pressurized vessel, will quickly deprive any occupant of the lift car of oxygen, and death is the likely outcome.

For this reason, containers of LN transported in lifts **should not** be accompanied, by the technician responsible for the transportation, nor by casual users of the lift.

Many goods lifts have already been adapted for this purpose (the specific adaptation depends on the type and age of lifts, so there are a number of different ways in which this can be achieved). The objective is to allow key operation by an authorized individual, who loads the lift and sends it to the destination floor without traveling with it. This instruction overrides signals from other users. On reaching the correct floor, the lift car doors can be opened and remain open until the authorized user removes the vessel and returns the lift to normal use.

However, there are a number of buildings where remedial work is being investigated. Any enquiries about operating a specific goods lift should be directed to Mr Mike Bailey (Directorate of Estates, telephone 275 7539). In the short-term, schools should introduce methods of working to reduce the risk of people traveling in the lifts with any LN vessel. This might include provision of information to staff and students, use of a suitable sign on the vessel, etc.

Please note also that LN used and stored in laboratories presents similar risks, and these must be properly assessed. LN vessels should not generally be used in small rooms with poor ventilation, unless oxygen detection and alarm systems are also installed – the need for these will depend on a number of factors. Methods of calculating the risk are available from the Faculty Safety Co-ordinators.

Dr Melanie Taylor

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