Safety Notice
21 July, 2016

Hazardous Areas Risk Assessment

Hazardous areas and ignition sources

Hazardous areas exist where an explosive atmosphere is likely to be present in quantities that would require special precautions for the construction, installation and use of equipment. Hazardous atmospheres associated with flammable vapours and combustible dusts may be found in facilities such as laboratories and chemical engineering pilot scale plants.

The Work Health and Safety Regulation [51(1)(2)] defines existence of a hazardous atmosphere if:

- the atmosphere does not have a safety oxygen level; or
- the concentration of oxygen in the atmosphere increases the fire risk; or
- the concentration of flammable gas, vapour, mist or fumes exceeds 5% of the LEL\(^1\) for the gas, vapour, mist or fumes; or
- a hazardous chemical in the form of a combustible dust is present in a quantity and form that would result in a hazardous area.

Where hazardous atmospheres are present in the workplace, special precautions for ignition sources must be used to manage the risk of explosion through work environment design\(^2\). Special precautions for ignition sources must be included in the construction, installation and use of equipment in the hazardous area.

Determining if a hazardous area is present at a UQ workplace

An OHS risk assessment must be conducted at the schematic-design phase of UQ Property and Facilities construction and refurbishment projects, to determine whether a hazardous atmosphere exists or is expected to exist under normal operations.

OHS advisors, architects, designers, PF construction project managers, space occupiers and end-users must inform the risk assessment.

Mitigation strategies of a range of risk factors during the risk assessment phase may reduce the risk sufficiently to eliminate the presence of a hazardous atmosphere. Risk factors to be mitigated include:

- Distance e.g. laboratory equipment with electrical connections within a potentially hazardous zone.
- Ventilation e.g. small room has potential to quickly fill up with gas from an outlet with undetected leak.
- Lighting (electrical, thermal) e.g. lighting banks that generate heat within a hazardous zone.
- Quantities of hazardous substances e.g. a histopathology tissue processor holding a quantity of flammable liquid as part of its working requirement.
- Use of hazardous substances e.g. decanting of flammable liquids
- Electrical sources e.g. non spark-proof electrical outlets, freestanding fridge with a potential ignition source lower than 300mm above the floor level.
- Work practices
- Operations
- Installation of air quality/atmospheric detectors.

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\(^1\) Lower Explosive Limit
\(^2\) Section 52, Work Health and Safety Regulation 2011, Department of Justice and Attorney-General, Queensland.
Storage volumes of hazardous substances must also inform the determination of whether a hazardous atmosphere exists or is expected to exist. In particular, AS/NZ60079.10.1 must be consulted for hazardous atmosphere zoning if the volume of flammable liquids exceeds:

a) 100L in closed containers  
b) 25L for decanting purposes;  
c) 5L in open containers for occasional use; or  
d) 1L in open containers for continuous use.

Hazardous-area classification

If the risk assessment indicates the presence of a hazardous atmosphere that cannot be eliminated, then a formal hazardous-area assessment and classification by a Certified person must be conducted to confirm project design requirements. In this case, building construction and equipment installation must comply with the Certified design requirements including installation of electrical equipment and circuitry by suitably trained electricians and verification that this has occurred by an independent auditor.

After construction or refurbishment, a verification dossier must be provided by the Principal Contractor, being either UQ or a construction company contracted by UQ.

UQ organisational areas responsible for keeping copies of the dossier are P&F, space managers and local operators of facility. This document must be a reference point for any subsequent alterations to the physical environment or changes to the work processes.

Contact for Additional Information

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Related UQ links:  
http://www.uq.edu.au/ohs/explosive-atmospheres

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