

**Association for Petroleum & Explosives Administration  
Guidance for Working in Underground Tank Access Chambers  
(Including dispenser sumps)  
August 2007**



## **CONFINED SPACES**

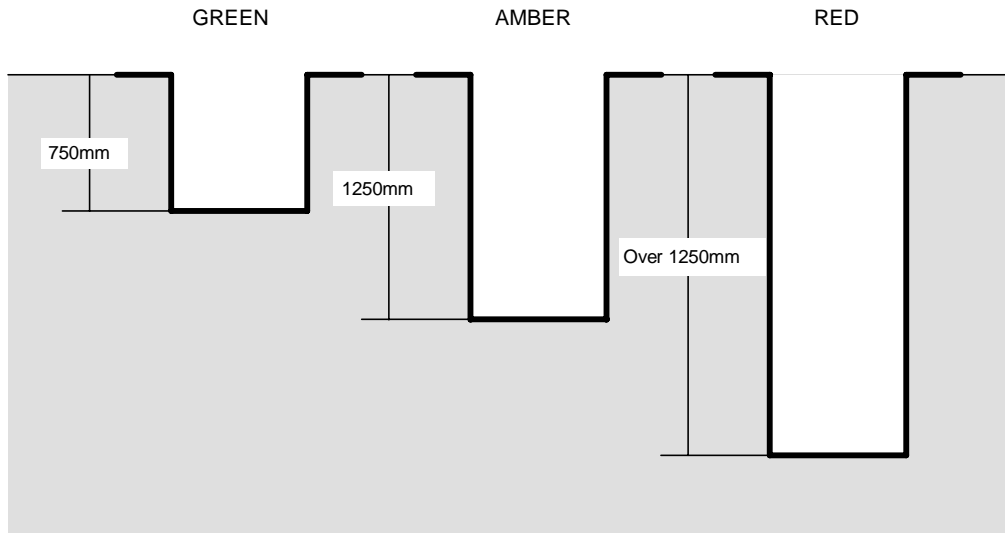
Any enclosed or partially enclosed area can be a confined space. Even rooms that are normally used for human occupation can become hazardous if their use changes or hazardous materials are introduced. While the most common reason for a confined space to be hazardous is insufficient oxygen, the presence of toxic fumes or the presence of flammable gases may also render an area hazardous. Be aware of unexpected changes in the atmosphere, in particular, where sludge, stagnant water or chemicals are present; be aware that disturbing them can release fumes.

Inert gas, toxic gas or vapour can displace the oxygen in the atmosphere where there is insufficient ventilation. Oxygen levels can be decreased by activities in confined spaces consuming atmospheric oxygen, for example, the operation of gas fired burning equipment or equipment producing fumes. Even the occupation of a confined space by workers can reduce the oxygen to dangerous levels. A decrease in oxygen levels will lead, over a time, to erratic judgement, increased risk of accident, difficulty in concentrating, tiredness and extreme case's unconsciousness and possibly death.

For the above reason's caution must be exercised before entering any enclosed space particularly those that are not normally used for human occupation. Certain spaces can be expected to be hazardous, such as the access chambers associated with fuel tanks on petrol stations, therefore procedures for entry into them should be strictly adhered to. Other confined spaces should be assessed for the risks involved and safety precautions put in place. If all circumstances the atmosphere should be tested before anyone enters.

## ACCESS PROCEDURES

To ensure that entry into access chambers may be undertaken safely the APEA have produced the following guidance that should be followed when access to a tank chamber becomes necessary. Access chambers are divided into three categories, as follows:



### Preliminary Actions

The engineer responsible for the work should discuss site safety procedures with the licensee, site manager or his authorised representative and an on site risk assessment carried out. Work that involves entry into the chambers should be planned in such a way as to incorporate frequent breaks. All those involved in the work should be made aware of the methods and processes involved, the anticipated duration of the job and any emergency procedures that may be invoked.

A safe working area should be created by the placement of barriers, and if necessary supplemented with traffic cones, warning signs, etc. These should be placed around the manhole before work commences. All tools and materials should be stored within this area but kept at a distance from the access opening to minimise the risk of being inadvertently kicked or knocked into the chamber

Arrangements should be made with the licensee for the safe disposal of any waste material, contaminated fuel, water or sludge that may be removed from the chamber.

Any water or spilt fuel should be removed from the chamber before commencing work. Particular attention should be paid to the disposal of large quantities of water from the chamber. An accumulation of water can occur where a high water table causes water to flow into the chamber and can only be removed by continuous pumping. Whilst under certain circumstances this may be pumped into the oil water separator, prior permission should be obtained from the appropriate authorities to avoid contravening any regulations.

All those involved in the work process should wear high visibility outer clothing and industrial footwear. A safety helmet or bump cap should also be worn by any person entering a chamber to prevent possible injury in the event of materials or tools being inadvertently dropped or kicked into the chamber from above.

### **Green Access Chambers (Those less than 750mm Deep)**

Carry out the preliminary actions previously detailed within this guidance.

The lid should be lifted and the chamber allowed to freely venting before an entry is made.

*HEAD FIRST ENTRY INTO THE ACCESS CHAMBER IS **NOT** PERMITTED. IF HEAD FIRST ENTRY IS REQUIRED, THE CHAMBER MUST BE CONSIDERED TO FALL INTO THE AMBER CATEGORY.*



The work within the chamber should be carried out speedily and in accordance with good working practices and the previously prepared risk assessment and safety method statement. The engineer responsible for the work should remain vigilant at all times to maintain the integrity of the safe area originally created.

Care should be taken to contain any spillage of product when disturbing liquid joints; any spillage should be cleared up in an appropriate manner.

On completion of the work, wet testing or pressure testing should establish the integrity of any liquid joints. Only when these tests have been satisfactorily completed and the results recorded should the chamber lid be replaced.

On completion of the work all tools, equipment and materials should be cleared away and stored appropriately before the removal of safety barriers and returning the work area to its normal working condition.

## **Amber Access Chambers (Those between 750mm & 1250mm Deep)**

Carry out the preliminary actions previously detailed within this guidance.

Before starting work within an amber category access chamber a second person should be present. This person should have had sufficient training and experience of this type of work to competently act as an assistant and rescuer.

Before entry into the chamber is permitted an appropriate extractor fan should be used to vent the chamber of any toxic or explosive gases that may be present.

Unless intrinsically safe, the use of electrically operated fans is not permitted, those operated by compressed air or nitrogen gas are generally considered to be suitable, providing that any air compressor is situated outside of the hazard area.

Place the extractor fan at a convenient point in a safe working area ensuring that the fan and its associated hoses and air source are protected by the placement of safety barriers etc. This area should be carefully selected and not be closer than 3 metres to the boundary of the site or any buildings, the exhaust should face away from the doors or windows of any adjacent property and the area should be clearly identified as being potentially hazardous by the placement of appropriate warning signs. After checking the condition of the air hoses etc, they should be connected to the extraction fan and lowered into the chamber to the lowest level possible whilst ensuring that the air inlet remains dry and is not obstructed or covered. Only when these checks have been completed should the extractor fan be switched on. The unit must be in use and extracting air whenever an engineer is in the chamber.

An appropriate intrinsically safe gas detector capable of detecting levels of Oxygen, flammable and toxic gases should be switched on and lowered into the chamber to a level where the work is to be carried out. If no audible or visual warning is detected the access chamber may be entered with caution. Should the gas monitor go into an alarm condition at any time the chamber must be exited immediately and the cause investigated. The chamber should be re-entered only when the gas monitor indicates that it is safe to do so.

The gas monitor should be calibrated and serviced at the prescribed intervals in accordance with the manufacturer's instructions. Calibration certificates and service records for this equipment should be available for inspection.

Whilst an engineer is in the chamber his assistant must remain in constant attendance within the work area He should maintain continuous verbal communication with the engineer in the chamber to ensure that he is confident that he is ok and his working condition comfortable. He should also remain vigilant at all times to maintain the integrity of the safe area originally created.

The work within the chamber should be carried out speedily and in accordance with good working practices and the previously prepared risk assessment and safety method statement.

Care should be taken to contain any spillage of product when disturbing liquid joints; any spillage should be cleared up in an appropriate manner.

On completion of the work, wet testing or pressure testing should establish the integrity of any liquid joints. Only when these tests have been satisfactorily completed

should the chamber lid be replaced.

All tools, equipment and materials should be cleared away and stored appropriately before the removal of safety barriers and returning the work area to its normal working condition.



Working like this  
inside a chamber is  
**dangerous!**

### **Red Access Chambers (Those Deeper than 1250mm)**

Carry out the preliminary actions previously detailed within this guidance. Before starting work within a red category manhole a second person should be present. This person should have had sufficient training and experience of this type of work to competently act as an assistant and rescuer, be competent in basic first aid and in the use of personal retrieval and resuscitation equipment.

Before entry into the chamber is permitted an appropriate extractor fan should be used to vent the chamber of any toxic or explosive gases that may be present.

Unless intrinsically safe, the use of electrically operated fans is not permitted, those operated by compressed air or nitrogen gas are generally considered to be suitable, providing that any air compressor is situated outside of the hazard area.

Place the extractor fan at a convenient point in a safe working area ensuring that the fan and its associated hoses and air source are protected by the placement of safety barriers etc. This area should be carefully selected and not be closer than 3 metres to the boundary of the site or any buildings, the exhaust should face away from the doors or windows of any adjacent property and the area should be clearly identified as being potentially hazardous by the placement of appropriate warning signs. After checking the condition of the air hoses etc, they should be connected to the extraction fan and lowered into the chamber to the lowest level possible whilst ensuring that the air inlet remains dry and is not obstructed or covered. Only when

these checks have been completed should the extractor fan be switched on. The unit must be in use and extracting air whenever an engineer is inside the access chamber.

An appropriate intrinsically safe gas detector capable of detecting levels of Oxygen, flammable and toxic gases should be switched on and lowered into the chamber to a level where the work is to be carried out. If no audible or visual warning is detected the chamber may be entered with caution. Should the gas monitor go into an alarm condition at any time the chamber must be exited immediately and the cause investigated. The chamber should be re-entered only when the gas monitor indicates that it is safe to do so.

The gas monitor should be calibrated and serviced at the prescribed intervals in accordance with the manufacturer's instructions. Calibration certificates and service records for this equipment should be available for inspection.



The correct use of extraction equipment to ventilate the chamber, the use of a harness and rescue tripod in a deep chamber

The use of an approved Rescue Tripod equipped with a recovery winch incorporating a suitable fall arrest device and harness should be used when entering a "Red" access chamber. Only personnel who have had the appropriate training should operate this equipment or act as an assistant or rescuer.

The rescue tripod, harness and recovery winch should be tested and serviced at the prescribed intervals, in accordance with the manufacturer's instructions. Test certificates and service records for this equipment should be available for inspection.

The rescue tripod should be assembled and placed in position over the chamber ensuring that it is situated on firm and stable ground. The person who is to enter the chamber should don the safety harness and make the appropriate adjustments to ensure that it is comfortable, all straps, buckles and fasteners should be checked by both the wearer and his assistant. Only when these checks have been carried out should the safety harness be attached to the hook of the safety winch.

The engineer who is to enter the chamber should be winched down by his assistant



and the work within the chamber carried out speedily and in accordance with the previously prepared risk assessment and safety method statement.

Care should be taken to contain any spillage of product when disturbing liquid joints; any spillage should be cleared up in an appropriate manner.

Whilst an engineer is in the chamber the assistant must remain in constant attendance adjacent to the rescue tripod. He should maintain continuous verbal communication with the engineer in the chamber to ensure that he is confident that he is ok and his working condition remains comfortable. He should also remain vigilant at all times to maintain the integrity of the safe area originally created.

If at any time he considers that the engineer within the chamber is in difficulty or becoming distressed he should immediately winch him to safety and carry out resuscitation or provide assistance in accordance with his previous training. If necessary the emergency services should be called to provide professional assistance.

On completion of the work, wet testing or pressure testing should establish the integrity of any liquid joints. Only when these tests have been satisfactorily completed and the results recorded should the chamber lid be replaced.

All tools, equipment and materials should be cleared away and stored appropriately before the removal of safety barriers and returning the work area to its normal working condition.

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Design, Construction, Modification, Maintenance and Decommissioning of Filling Stations 2<sup>nd</sup> Edition ISBN 0 85293 419 X

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