

September 2003

Presentation on “Safe Procedures for Confined Spaces” by Bob Cole, Morgan EST plc.

The Chairman introduced BHSEA Management Committee Member, **Bob Cole**, although this was somewhat unnecessary, as he has played such a prominent role in the Association’s activities for so many years!

Bob started his presentation by showing us some examples of the varied forms that ‘Confined sources’ can take. According to the definitions in the **Approved Code of Practice**,

“confined space means any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk”.

This is wide enough to include heavy gases and vapours in even open topped spaces at ground level, as well as roofspaces at the top of buildings. Bob added that it was important to safeguard the entrance to any confined space and showed bad, and good, examples of how this had been done in the past.

Bob went on to list various legislation and codes which are applicable to this work:

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- **Confined Space Regulations 1997**
- Management of Health and Safety at Work Regulations 1999
- Construction (Design and Management) Regulations 1994
- Provision and Use of Work Equipment Regulations 1998
- Work in Compressed Air Regulations 1996
- Health and Safety at work etc. Act 1974
- Code of Practice for Safety in Tunnelling in the Construction Industry BS 6164:2001

“Specified Risk” means: -

- Injury from fire or explosion
- Loss of consciousness from heat
- Loss of consciousness/asphyxiation from
 - Gas
 - Fumes
 - Vapour
 - Lack of Oxygen
- Drowning in any rising liquid
- Entrapment/asphyxiation by free-flowing solids.

The Regulations do NOT apply to: -

- Sea-going Ships
- Below Ground in a Mine
- Diving Operations (Diving Regulations 1981 apply)

The Regulations impose specific duties on two classes of person, namely: -

- Employers who must ensure compliance by employees AND the work of others, in relation to provisions under his control
- Self-employed persons whose own work must comply and also that of others where they have control.

The over-riding requirement of the regulations is that a Risk Assessment is done and that the hierarchy of control measures to ‘eliminate the risk’ is followed by complying with **Regulation 4**: -

“No person at work shall enter a confined space to carry out work for any purpose unless it is not reasonably practicable to achieve that purpose without such entry”

Regulation 4 continues with a requirement to provide a ‘**Safe System of Work**’

Regulation 5 requires a suitable and sufficient ‘**Arrangement for Rescue**’, as part of safe procedures including: -

- Defined confined space categories
- Identification of a Person In Charge (PIC)
- A safe system of work
- Pre-entry checks
- Formal training
- Ensured provision of safety devices and PPE
- Emergency and rescue arrangements

In Morgan EST, types of space are categorised according to the risk and the level of precautions needed to work in them is specified by the Site Manager. The Person in Charge specifies the Rescue Person under the safe system of work authorised by the Site Manager. All persons carrying out the work are trained in the use of all safety devices and Personal Protective Equipment (PPE). This ‘Entry Training’ needs to be certificated and includes: -

- The use of a ‘tally’ system to monitor entry of persons is rigorously enforced.
- Gas monitoring throughout the work is also essential and Carbon Dioxide (CO₂) detection is additional to the normal Triple function monitoring. Training covers use, storage and charging of equipment.
- No smoking policy.
- Controls for ‘hot works’.
- Controls for substances which produce vapours and gas.
- Controls for internal combustion engines.
- The Rescue Services must also be given prior warning of the work and safety arrangements and carry out rescue trials. (Bob cited a trial where a hook did not fit an eye, and recommended that only locking hooks and shackles are used)

The Categories of Confined Space are: -

Class A

Clear on entry – unlikely to change – easy access – shallow manholes or chambers.

Class B

Clear on entry but could change – difficult access – rescue by safety line not viable

Class C

Contain Gas, vapour or fumes – very difficult access -rescue by safety line not viable

**Live Sewer Traversing
Tunnels under Construction**

As with so many safe-working procedures, Bob added, the Pre-entry Checks were essential and included: -

- Communications – to confined space and site office.
- Team composition – Top man
- Equipment and PPE
- Ventilation – remove all covers
- Barriers – guard rail opening
- Warning signs
- Electrical/Mechanical plant locked off
- Atmosphere checks – various levels – recorded
- Re-check atmosphere if alarm given
- Check operatives' training in date
- Entry in Highway – Chapter 8 of the Traffic Signs Manual

In addition to these procedural checks, it was important to carry out the following checks on safety equipment and PPE: -

- Communication system – check it functions
- Helmet, Overalls, Safety footwear, gloves, hearing/eye protection
- Lighting (intrinsically safe, with back-up system)
- Atmosphere monitors - Triple function
 - Hydrogen Sulphide
 - Flammable Gas – Methane
 - High/Low OxygenPlus Carbon Dioxide
- First Aid Kit
- Full Body Harness
- Life Lines
- Breathing Apparatus – self saver sets, plus spares for the rescue teams
- Air blowers for ventilation (with cut-out alarm)
- Means of access plus back up
- Mancages – Medical Mancages – stretchers

- Resuscitation equipment

Bob screened a slide showing himself about to be lowered into an old mine shaft and recalled how a vital lesson had been learned on that day. Whilst at the bottom, well over 150 feet below, the hoist failed and it took a long time to summon help. Altogether, he and his colleagues, spent 5 hours at the bottom waiting to be rescued – time enough to reflect on the benefits of back-up plant and mobile telephones.

The hazards faced underground are quite significant and Bob cited the following as the main examples: -

- Darkness
- Collapse – roof, side, face.
- Gases – fumes – vapour
Leaching, leaking, previous contents, ground condition, chalk, limestone, old tips, trapped in sludge, introduced by workers.
- Lack of Oxygen – displaced by other gases – rusting
- Oxygen enrichment Flooding
- Free-flowing solids – sand, grain, sugar
- Dust – inhalation and explosion
- Fire – explosion
- Heat
- Biological/ chemical contaminants
- Contact with Sewerage
- Falling or hit by falling equipment

Bob concluded by saying that with such demanding working conditions, it is vital to select the correct people to do the job. They: -

- **Must be**
 - Mentally and physically suitable
 - At least 18 years old and preferably under 60 years old
- **Must not have**
 - History of fits, blackouts or fainting attacks
 - Heart disease or Heart disorder
 - Asthma, bronchitis or shortness of breath on exertion
 - Deafness or Epilepsy or other disability which prevents normal duties.

Members' Questions

Secretary **Andy Chappell** started the questions by asking Bob if he could give any guidelines on the amount of ventilation need to clear hazardous atmospheres. Bob replied that the ventilation was done for comfort reasons, at the workplace, to

cool the area and it could not be used to remove toxic gases. If there were any indications of a toxic atmosphere building up, the job would be stopped.

Peter Condron asked what medical examinations were carried out. Bob told him that a special examination was done for workers who worked in compressed air. He added that there was an annual examination of lungs, Vibration White Finger, Hearing and Dermatitis.

Graham Stanford of Old House Group enquired about the use of Permit to Work (PTW) systems for trenches. Bob indicated that it was unlikely, unless there were specific gases anticipated. He went on to say that a trench was not Class A, but PTWs would be used for Classes B and C.

Mark Hoare of Birmingham University commented on the difficulty of entry defining a confined space. Bob agreed and quoted an example of a staircase controlled by locked fire doors whilst glue was being spread on the treads. He added that roofspaces apparently conflict with the definitions but could pose a risk in the same way as a sewer.

As there were no more questions, the Chairman closed the meeting and asked members to show their appreciation to Bob in the usual way.