Construction OS&H
Safe & healthy working environment

SUMMARY

Causes of OS&H incidents and injuries
Diversity of the workforce
Safety of workplaces
Health hazards
Inspection and maintenance

“You might think that the active, outdoor life in the construction sector would keep you fit and healthy. Quite the reverse is true and the construction industry has a deservedly notorious reputation as being dirty, difficult and dangerous.”

“More than 100 000 people suffer fatal injuries on building sites every year. That means that one person is killed in a site accident every five minutes. Many hundreds of thousands more people suffer serious injuries and ill-health because of bad, and often illegal, working conditions.”

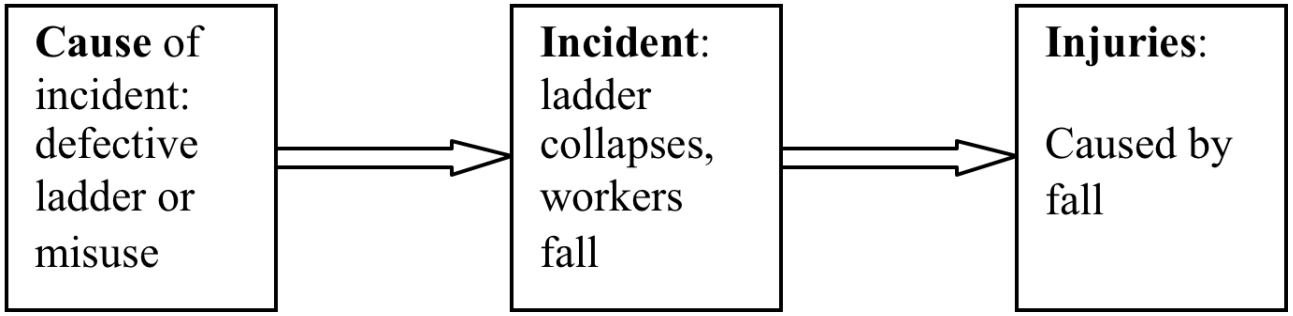
[Fiona Murie, BWI]

Deaths on Site - Predictable but not Prevented

"The real tragedy behind the statistics is that deaths are preventable. Most people are killed whilst carrying out perfectly routine work, where the hazards are well known. Deaths from these causes can and should be avoided by the use of collective prevention measures."

[Fiona Murie, BWI]

Causes, OS&H incidents and injuries



'Accidents' or 'Incidents' are not caused by impersonal events, such as 'falls', but by poor OS&H practices and procedures. Most of the 'causes' as reported are in fact the consequences not the causes.

‘Accident prevention’ is often misunderstood

Most people believe wrongly that the word ‘accident’ is synonymous with ‘injury’. This assumes that no accident is of importance unless it results in an injury.

On a construction site there are many more ‘incidents’ than injuries. A dangerous act can be performed hundreds of times before it results in an injury, and it is to eliminate these potential dangers that managers’ efforts must be directed. They cannot afford to wait for human or material damage before doing anything.

So safety management means applying safety measures before accidents happen.

Some typical and common forms of incident

Falls from heights	Falls from scaffolding, maintenance cradles, mobile access towers, ladders, roofs, etc.
Slips	Slips from roofs, into trenches, over handrails, on oil. Include trips over materials, badly fitting scaffold boards, etc.
Being struck by moving objects	Materials falling from a height (e.g.: off scaffolds) Materials being handled by cranes, etc.
Electrical hazards	Excavating live cables, misuse of electrical power tools, demolition, etc.
Confined spaces – Asphyxiation	Drainage works especially maintenance, basement excavations, large diameter piles (inspection), underground storage tanks, etc.
Machinery	Excavation plant, cranes, hoists, etc.

Reasons to study the causes of incidents

To determine the adequacy of the plant and equipment used and to improve its performance if found to be defective

To investigate the materials and components used, to review their suitability for future use and, if defective, to determine how they may be improved

To review the management and OS&H systems to determine where they were deficient, with the aim of ‘continuous improvement’

Legal investigations to apportion blame and assess compensation for those injured

Discussion

What are the hazards?

What is the risk?

If someone falls off, would the cause be a ‘fall from height’?

Workers erect scaffolding in Shenyang in NE China
(From The Guardian 24 March 2009)

The general **hazard** is ‘working at height’

Specific **hazards** include:
Potential to fall from the scaffold
Collapse of the un-braced scaffold

The **risk** is very high, because this is a very dangerous activity and the potential is high; and severe, because a fall would almost certainly be fatal.

If a worker is killed or injured as a result of working on this scaffold, the **cause** will be a failure to control the hazard and risks, it **will not be a ‘fall’**

A **risk assessment** should endeavour to reduce the risks. This would include:

Completing the scaffold as it is erected, lift-by-lift, by installing bracing, decking, handrails, toe-boards, ladders etc. In this way, each lift will provide a solid basis for the erection of the next.

Providing personal protective equipment (PPE). An example is the safety harness shown in the picture in the next slide (note also from this picture the positive effects of government action to protect workers).


19/09/2006

The Construction OS&H system to eliminate ‘preventable OS&H incidents’ (1)

- Senior management commitment
- Strong policies
- Comprehensive participatory processes and procedures
- A systematic way of assessing and managing hazards and risks
- Well-developed preventative safety culture
- Good project briefing
- Strong contract clauses in all contracts
- Effective OS&H plans by all parties involved
- Effective OS&H processes and procedures

The Construction OS&H system to eliminate ‘preventable OS&H incidents’ (2)

- Safety through design of the permanent works
- OS&H as a central part of project planning and organisation
- Design of the temporary works
- Competent management and supervision
- Safe materials and components
- Safe plant and equipment
- Good workplace design
- Good welfare facilities

Diversity of the workforce

One of the key requirements of good OS&H practice is to ‘match the task to the person’. Human beings range widely in physical and mental characteristics, and to take a ‘one size fits all’ approach to allocating tasks to workers will cause problems

The ILO Code of Practice states:

2.2.7. Employers should provide such supervision as will ensure that workers perform their work with due regard to their safety and health.

And

2.2.8. Employers should assign workers only to employment for which they are suited by their age, physique, state of health and skill.

The ILO Code also refers to ‘ergonomics’:

2.2.6. When acquiring plant, equipment or machinery, employers should ensure that it takes account of ergonomic principles in its design and conforms to relevant national laws, regulations, standards or codes of practice and, if there are none, that it is so designed or protected that it can be operated safely and without risk to health.

‘Ergonomics’

An illustration of the use of new technology to protect workers is shown in the photo. The two workers are using a lifting device, all of which is ergonomically very sound, for lifting the heavy paving slabs.

‘Ergonomics’

Close up of the slab lifter

Is this a safe workplace?

Think about it then list FOUR examples of bad practice

Safety of workplaces

Discussion on previous slide

Chaotic

Lots of material lying around to trip over and fall

No edge protection

No safe means of access to the beam formwork

No personal protective equipment

“Housekeeping

Should include provisions for the proper storage of materials and equipment and the removal of waste. Loose materials obstruct means of access to and egress. Causes of slips or trips should be avoided.”

ILO Code on safety of workplaces

Generally

All appropriate precautions should be taken:

to ensure that all workplaces are safe and without risk of injury to the safety and health of workers;

and to protect persons present at or in the vicinity of a construction site.

ILO Code on safety of workplaces

Means of access and egress

Adequate and safe means of access to and egress from all workplaces must be provided, indicated where appropriate and maintained in a safe condition

A very good example of a safe access tower. The rubble at the base could cause trips and falls, but the OS&H on this project was exemplary and this was removed very quickly.

Precautions against the fall of materials and persons

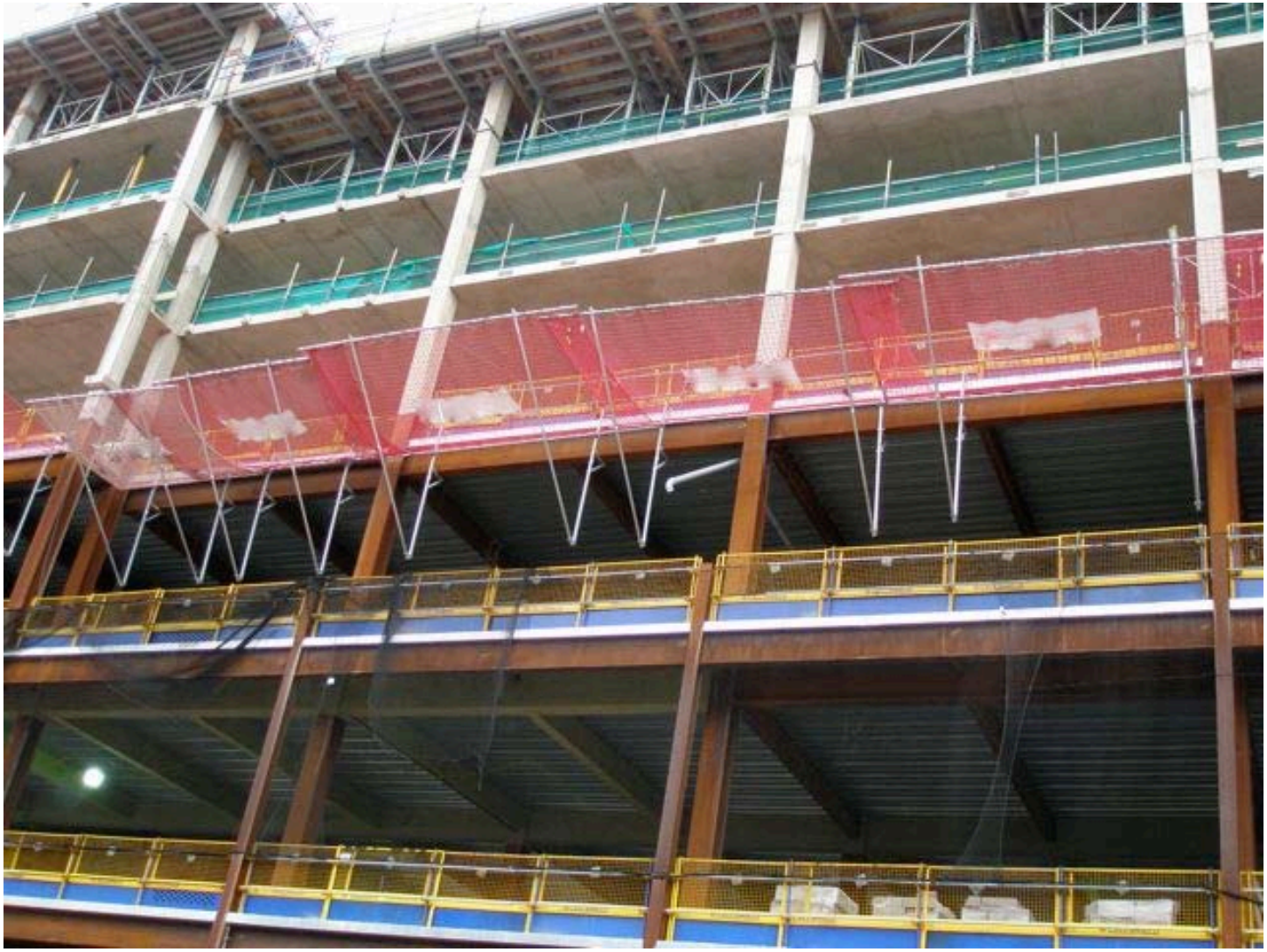
Adequate precautions should be taken to protect any person who might be injured by the fall of materials, tools or equipment.

All openings through which workers are liable to fall should be kept effectively covered or fenced.

Edge protection: guard-rails and toe-boards should be provided to protect workers from falling from elevated work places.

Wherever the guard-rails and toe-boards cannot be provided adequate safety nets or safety sheets should be erected and maintained or adequate safety harnesses should be provided and used.

Protective fan to catch falling objects, good edge protection and a securely fenced site to exclude the public and protect the workforce from road traffic



More ‘fans’ and a metal edge protection system.

“Protect the public”

Fire prevention & firefighting

All appropriate measures should be taken by the employer to avoid the risk of fire; control quickly and efficiently any outbreak of fire; and bring about a quick and safe evacuation of persons.

Sufficient, secure and suitable storage must be provided for flammable liquids, solids and gases. Precautions must be taken to avoid ignition of all combustible materials and regular inspections should be made of places where there are fire risks.

Places where workers are employed should be provided with suitable and sufficient fire-extinguishing equipment, which should be easily visible and accessible, and which must be properly maintained and inspected at suitable intervals by a competent person.

Fire prevention & firefighting

All supervisors and a sufficient number of workers must be trained in the use of fire-extinguishing equipment.

Suitable visual signs should be provided to indicate clearly the direction of escape in case of fire.

Sufficient and suitable means to give warning in case of fire should be provided.

There should be an effective evacuation plan so that all persons are evacuated speedily without panic and accounted for and all plant and processes shut down.

Notices should be posted at conspicuous places indicating the nearest fire alarm and how to contact the nearest emergency services.

Lighting

Where natural lighting is not adequate to ensure safe working conditions, adequate and suitable lighting, including portable lighting where appropriate, should be provided at every workplace and any other place on the construction site where an employee may have to pass.

Health hazards

1. Where a worker is liable to be exposed to any chemical, physical or biological hazard to such an extent as is liable to be dangerous to their health, appropriate preventive measures shall be taken.

2. The preventive measures shall comprise:
(a) the replacement of hazardous substances by harmless or less hazardous substances wherever possible; or
(b) technical measures applied to the plant, machinery, equipment or process; or
(c) where it is not possible to comply with sub-paragraphs (a) or (b) above, other effective measures, including the use of personal protective equipment and protective clothing.

Health hazards

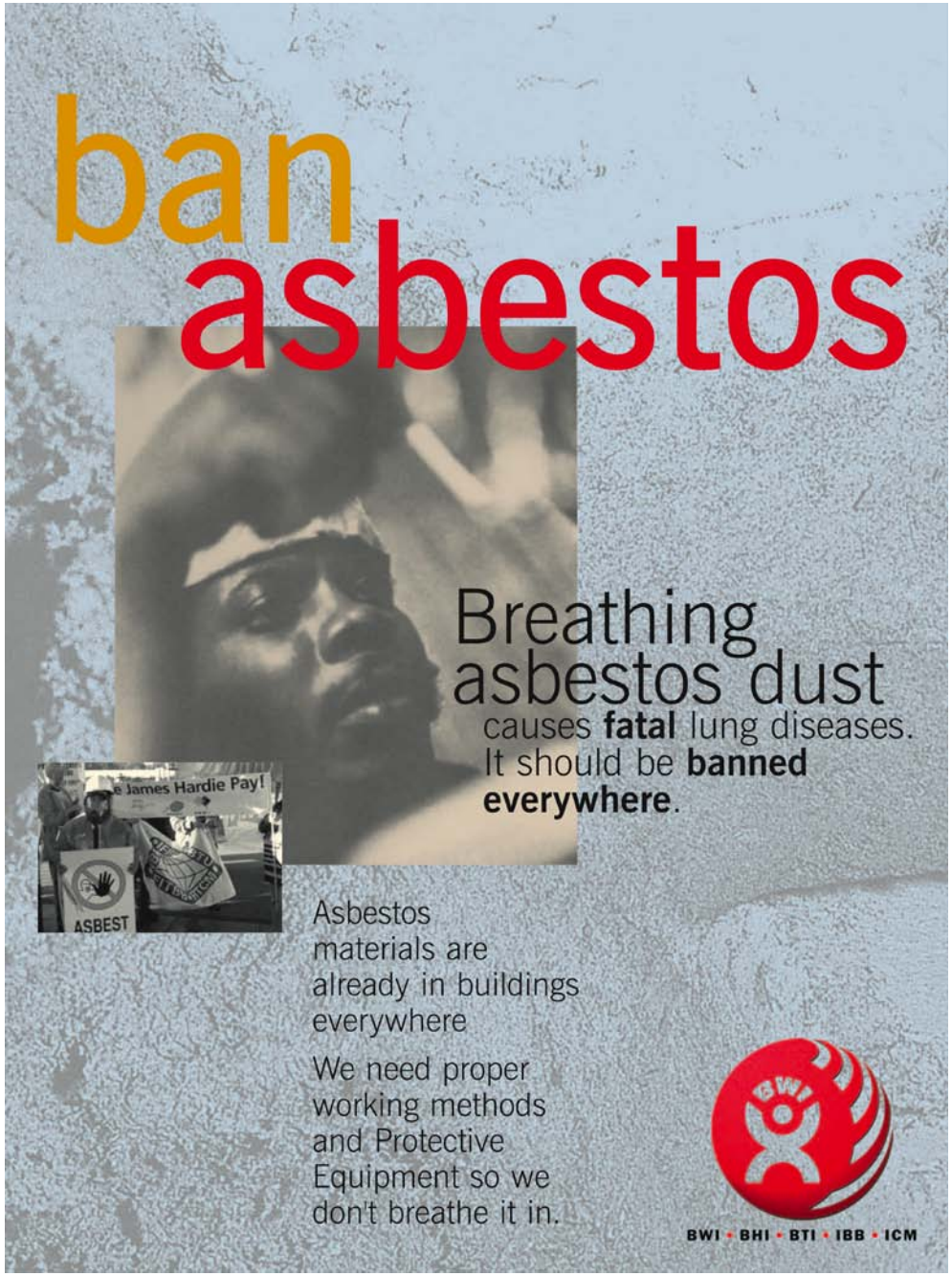
3. Where workers are required to enter any area in which a toxic or harmful substance may be present, or in which there may be an oxygen deficiency, or a flammable atmosphere, adequate measures shall be taken to guard against danger.

Asbestos

BWI offer good guidance on their Internet site:

http://www.bwint.org/default.asp?Issue=asbestos&Language=EN

and a comprehensive PowerPoint presentation is included in the ‘Theme PPPs’ as Theme PPP 3a - BWI - Asbestos’.



Inspection & maintenance

Regular OS&H inspections are required to ensure that safe workplaces are maintained. These inspections will be part of the **Construction OS&H** "Active OS&H management" system and should follow the principles given below.

All workplaces must be inspected, and the results recorded by a 'competent person':

Before being taken into use

At periodic intervals thereafter as prescribed in the OS&H plan

After any alteration, interruption in use, exposure to weather or any other occurrence likely to have affected their suitability

Inspection & maintenance

Inspection by the ‘competent person’ should more particularly ascertain that:

- The workplace is suitable and adequate for the proposed work and method statement
- Materials, components and equipment to be used are sound and do not present a hazard to the employees
- The working platform is of sound construction and stable
- That all the required safeguards are in position and their use is understood by the employees

‘Proper person’ on site in Dar es Salaam

Inspection & maintenance

Non-compliance must be reported to the line manager immediately, and where non-compliance represents an immediate danger the ‘competent person’ should have the power to order work to cease and the employees to be evacuated urgently.

Note also:

“Article 34
Reporting of accidents and diseases
National laws or regulations shall provide for the reporting to the competent authority within a prescribed time of occupational accidents and diseases.”
[C167]