DBEST Integrated Facility Management

Maintenance and Safety and Health at Work

Beijing, August 2014

DBEST Safety Works Campaign

SAFETYWORKS!

Zero is possible – every accident is preventable

Why is maintenance important for safety and health at work?

- Regular maintenance is essential to keep equipment, machines and the work environment safe and reliable –
  it helps to **eliminate workplace hazards**
- **Lack of maintenance or inadequate maintenance** can lead to dangerous situations, accidents and health problems
- Maintenance is a **high-risk activity**

Eliminating hazards through maintenance (1)

- Maintenance of working and walking surfaces and traffic routes is crucial to prevent accidents
  - Slips, trips, falls, fork-lift accidents
  - The surface of any traffic route must not be uneven, potholed, sloped or slippery
- Accidents happen because lifting equipment is not inspected and not maintained regularly
  - Lifting chains may become dirty/corroded and fail, causing heavy loads to fall

Eliminating hazards through maintenance (2)

- Accidents at work due to contact with electricity cause a significant number of fatalities
- Faulty electrical installations (cables, plugs, equipment) can cause shock and burns, fires, and even explosions

Around 25% of all electrical injury accidents are caused by portable electrical equipment.
Faulty leads to equipment cause around 2000 fires each year.
A major cause of such accidents and fires is the failure to carry out inspections and maintenance.

Maintenance – a high-risk activity

- Some maintenance-specific hazards:
  - Non-routine tasks and exceptional conditions (entering confined spaces)
  - Changing tasks and working environment
  - Working in close contact with machinery, working at a running process
  - Time pressure
- Maintenance is carried out in all sectors and all workplaces – it is associated with a great variety of hazards

Hazards, risks and health outcomes (1)

- Physical hazards
  - noise, vibration
  - excessive heat and cold
  - radiation (ultraviolet radiation, x-rays, electromagnetic fields)
  - high physical workload, strenuous movements, working in confined spaces
- Outcome: Hearing problems due to noise, musculoskeletal disorders

Typical tasks:
- working outdoors, maintenance of industrial assets, working in chilling units
- welding, inspection of pipes

Ergonomics-related risks – due to poor design of machinery, process and work environment from the point of view of maintenance – difficult to reach the objects to be maintained

Hazards, risks and health outcomes (2)

- Chemical hazards
  - Asbestos, glass fibre
  - Vapours, fumes, dust (e.g. diesel exhaust, crystalline silica)
  - Solvents
- Outcome: Respiratory symptoms, occupational asthma, allergies, asbestosis, cancer

Typical tasks
-building maintenance
-carrying out work in confined spaces
-maintenance of industrial installations and assets where hazardous chemicals are present

Hazards, risks and health outcomes (3)

- Biological hazards
  - Bacteria (e.g. legionella, salmonella)
  - Mould and fungi
- Outcome: Respiratory symptoms, asthma, allergies, Legionnaires' disease

Typical tasks:
-maintenance where biological agents are handled
-maintenance in places where bacteria, moulds, and fungi are likely to proliferate, such as air-conditioning systems

Hazards, risks and health outcomes (4)

- Psychosocial risk factors
  - Time pressure
  - Shift work, weekend work, night work, on-call work and irregular working hours
  - Working together with staff from contractors / several contractors – communication issues
- Outcome: Work-related stress, fatigue, increased accident risk

Hazards, risks and health outcomes (5)

- High risk of all types of accidents
  - Many related to work equipment and machine maintenance, e.g. crushing by moving machinery, unexpected start-up
  - Falls from height, accidents involving falling objects
  - Electrocution, electrical shocks, burns
  - Confined spaces, asphyxiation
  - Explosion, fire

Subcontracting

- Aggravating factor in terms of safety and health – numerous accidents and incidents relate to subcontracting maintenance
- Working away from one's usual place of work (employees working at customer's premises) and having to adapt
- Frequent changes of working environments
- Several subcontracting companies operating simultaneously on sites – communication issues

Facts and figures (1)

- High accident rates
  - EUROSTAT data show that
    - around **15-20%** (depending on country) of all accidents and
    - **10-15% of all fatal accidents** are related to maintenance operations
  - About **38% of chemical accidents** are caused by dangerous materials released during maintenance
  - Most of the accidents happen **during corrective maintenance**

Facts and figures (2)

- Occupational exposures
  - The data indicates higher exposure of maintenance workers to dangerous substances compared to other workers
  - High exposure to heavy physical load
  - Higher exposure of maintenance workers to noise, vibration and radiation
  - Maintenance workers are also more exposed to heat in summer, as well as to very humid and very dry atmospheres

Framework Directive

- Since 1989, a number of directives have been adopted, laying down a general framework of minimum requirements for the protection of workers.
- These directives **also apply to maintenance activities**, first and foremost the framework directive, including the obligation for employers to carry out a **risk assessment** at work.
- Lays down the general principles concerning the prevention and protection of workers against occupational accidents and diseases
- Lays down employers' obligations concerning the assessment of risks, the elimination of risks and accident factors
- Contains provisions on informing, consultation and balanced participation and training of workers and their representatives.

Guidance on risk assessment

- The European Commission produced a Guidance on risk assessment at work to help employers and employees to implement the risk assessment requirements of the Framework Directive
- Maintenance workers were identified as “workers who may be at increased risk”
- Need to conduct a separate risk assessment for maintenance activities
  (http://osha.europa.eu/en/topics/riskassessment/guidance.pdf)

  Previous Campaign on risk assessment promoted a stepwise approach to risk assessment:

  Step 1. Identifying hazards and those at risk
  Step 2. Evaluating and prioritising risks
  Step 3. Deciding on preventive action
  Step 4. Taking action
  Step 5. Monitoring and reviewing

Common principles of safe maintenance

- Integration of H&S management into maintenance management
- Structured approach based on risk assessment
- Clear roles and responsibilities
- Safe systems of work and clear guidelines to follow
- Adequate training and equipment
- Involvement of workers in the risk assessment and maintenance management process

Specific details of maintenance vary between industry sectors and depend on tasks, but there are some common principles:

Five basic rules for safe maintenance

- Plan
- Make it safe
- Use the appropriate equipment
- Work as planned
- Final check

1. Collecting info, adequate risk assessment, sufficient time and resources, appropriate training and competence
2. Secure work area, safety signs, lock-off power, secure all parts, establish access and exit routes, ensure others can’t enter the danger area
3. Correct equipment and tools, PPE
4. No improvisation, no short-cuts
5. Check you have left item in a safe state, have removed all your equipment, tools and waste materials, sign off the work