



# Maintenance and safety and health at work

Healthy Workplaces – European Campaign  
on Safe Maintenance

Responsible Care Forum  
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Katalin Sas

<http://hw.osha.europa.eu>



European Agency  
for Safety and Health  
at Work



Healthy Workplaces

## Summary

- The European Agency for Safety and Health at Work and the European context
- The Healthy Workplaces European Campaign 2010-11 on Safe Maintenance
- Maintenance and safety and health at work
  - *Facts and figures*
  - *Maintenance-specific risks*
  - *Subcontracting and safety and health at work*
  - *Maintenance safety and design*
  - Trends in maintenance influencing safety and health
  - Maintenance and dangerous substances
- Success factors
- Good Practice examples
- European legislation relevant for maintenance

# The EU and safety and health at work

- The continuous improvement of safety and health at work is a key objective of European social and employment policy.
- In line with the Treaty of Lisbon, the EU defines at European level the minimum requirements in the field of health and safety at work (Article 153)
  - Directives
- The European Commission is constantly monitoring developments and presents legislative proposals to the Council and the European Parliament with a view to adapt the EU legislative framework to the state of art and changes in the workplace.



The European Commission's **Directorate-General for Employment, Social Affairs and Equal Opportunities** is responsible for EU policies among others in the areas of

- Employment
- Labour law
- Health and safety at work

# European Agency for Safety and Health at Work

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Established in 1996, located in Bilbao, Spain

To help improve working conditions in the European Union by providing technical scientific and economic information to people involved in safety and health at work



# The role of the European Agency for Safety and Health at Work

- To collect, analyse and provide knowledge and information on OSH-related issues
  - to
    - policy makers – European and national level
    - experts
    - the workplace (employers and workers) – good practice
    - intermediaries (those who go into the workplace)
  - through its
    - Website
    - Campaigns
    - Publications programme
- Networks
  - National focal points
  - European institutions
  - Social partners
  - International network

# The European Union: 500 million people – 27 countries



Member states of the  
European Union

Candidate countries



# 23 official languages

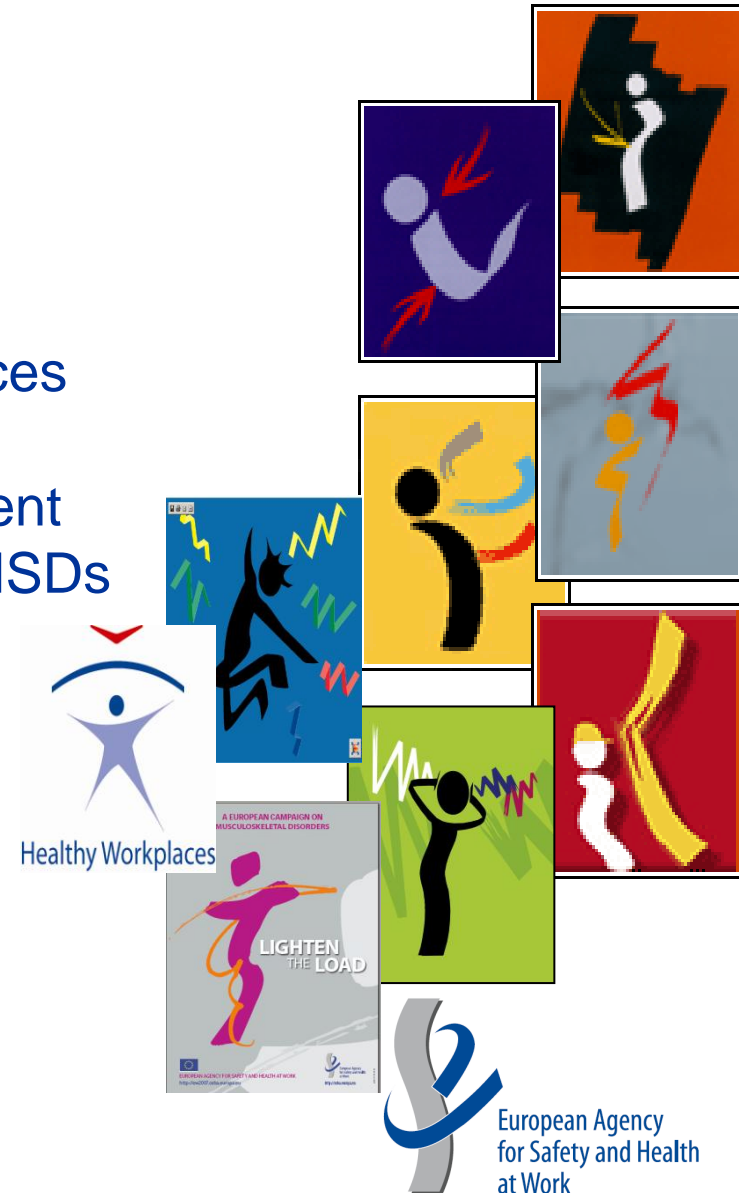


# Campaigns

- EU-OSHA runs Europe's largest campaigns
- Focusing on a single theme on a bi-annual basis  
"Healthy Workplaces. Good for you, good for business"
- Agency coordinates campaign activities and provides funding to stimulate activities
- Campaigns are decentralised to allow Member States to focus the campaign according to their needs
- Focal Points promote the Campaign and organise activities at national level
- Campaign materials prepared in 25 languages
- Good Practice Awards

# Campaigns

- 2008-09: Risk Assessment
- 2007: Lighten the Load
- 2006: Safe Start
- 2005: Stop that Noise!
- 2004: Building in Safety
- 2003: Dangerous Substances
- 2002: Working on Stress
- 2001: Success is no Accident
- 2000: Turn your Back on MSDs



## Healthy Workplaces European Campaign 2010-11 on Safe Maintenance

- Community strategy 2007-2012 on health and safety at work
  - by 2012, a 25% reduction in the rate of accidents at work
  - need for targeting the most common risks and the most vulnerable sectors of activity, enterprises and workers.
- The figures and major accidents show that maintenance is such an activity.
  - 10 – 15 % of all fatal accidents at work and 15 – 20 % of all accidents, are connected with maintenance.
- In the European Commission Guidance on risk assessment at work maintenance workers were identified as “workers who may be at increased risk”

(<http://osha.europa.eu/en/topics/riskassessment/guidance.pdf>)

## Campaign messages

- The EU-OSHA campaign has two main messages
  - Firstly, that maintenance is essential to keep the working environment safe and reliable - lack of maintenance or inadequate maintenance can cause serious accidents or health problems.
  - Secondly, maintenance itself is a high-risk activity and it has to be performed in a safe way, with appropriate protection of maintenance workers and other people present in the workplace.



**With the Campaign the Agency wants to raise awareness of**

- **the importance of maintenance for workers' safety and health**
- **the risks associated with maintenance**
- **employers' legal and moral duties to consider OSH aspects in maintenance**, and of the business case for doing so
- and to promote a **structured approach to OSH management in maintenance**, based on an appropriate risk assessment

# Network-based Campaigning

- Core strength: national focal points and tripartite networks
- But also ... engage other stakeholders / partners

- Official Campaign partners: pan-European and international organisations, including social partners; NGOs; sectoral federations and networks and private companies.
- EU institutions: relevant DGs; European Parliament; EU representations; EU Agencies; Enterprise Europe Network.



## Good Practice Awards Competition

- Part of the European Campaign – organised for the tenth time
- Recognised outstanding and innovative contributions to promote safe maintenance
- Two-stage process
  - selection procedure at national level
  - the two best national examples participate in the European level competition
- 40 good practice entries from 23 countries
- 8 winning examples, 15 commended

## Facts and figures (1)

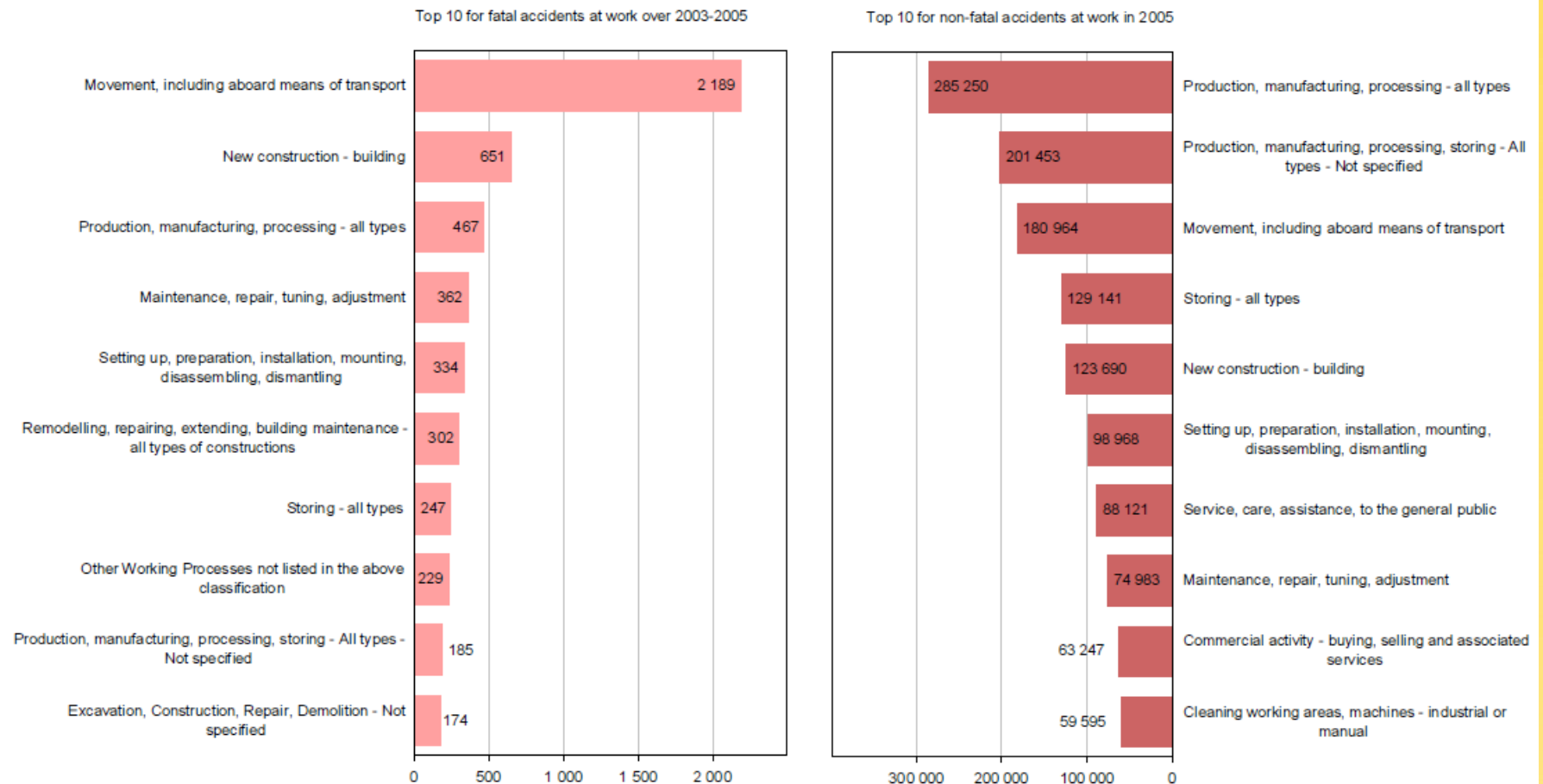
- High accident rates
  - EUROSTAT data show that
    - around **15-20%** (depending on country) of all accidents and
    - **10-15% of all fatal accidents** are related to maintenance operations
  - Most of the accidents happen **during corrective maintenance**



# “Causes and circumstances of accidents in the EU” (DG EMPL 2009)

**Figure 3.7**

**Top 10 working processes (two-digit level) accounting for the highest number of accidents at work, by severity, EU\_V**



Source: Eurostat – ESAW

## Facts and figures (2) - Occupational exposures



- Data from a recent survey of Spanish working conditions
  - higher exposure of maintenance workers to dangerous substances, vapour and fumes compared to other workers
  - higher exposure to noise, vibration and radiation
- Maintenance workers often perform physically demanding work which causes high strain on the limbs and the back.
- French SUMER 2003 survey
  - high exposure to physical load, particularly to postural and joint constraints
  - proportion of maintenance workers reporting exposure to such constraints is higher than in other professions (87% vs. 72%).

## Facts and figures (3) - occupational diseases



- Studies indicate that industrial maintenance workers might be at especially high risk of occupational diseases
  - According to a French study, industrial maintenance employees have a rate of occupational diseases **8 to 10 times greater** than the average population
  - A high percentage of reported cases of **musculoskeletal disorders** occur in maintenance workers – mechanics, electricians

## Hazards and risks

- Physical (noise, vibration, excessive heat and cold, radiation, high physical workload)
- Chemical
- Biological
- Psychosocial risk factors (time pressure, fatigue)
- High risk of all types of accidents
  - Many accidents are 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

## Maintenance and dangerous substances

- In many industries, such as the chemical industry, construction, and agriculture, and in many tasks, maintenance workers might be exposed to chemical hazards.
  - electric arc welding, lubrication and cleaning of machinery
  - working in car repair shops
  - waste treatment plants
  - maintenance of industrial installations where hazardous chemicals are present.
- Exposure to chemical hazards leads to diverse and sometimes severe health problems
  - Skin diseases, respiratory diseases, cancer

# Maintenance and dangerous substances

- Workers can be affected in various ways
  - Inhalation of the chemical (gases such as CO, H<sub>2</sub>S, SO<sub>2</sub>, various fumes and vapours, lack of oxygen in confined spaces, i.e. typically an excess of N<sub>2</sub> or CO<sub>2</sub>).
  - Direct exposure through the skin (caused by splashes, contaminated surfaces, etc.)
  - Physical effects (burns due to chemical fires or hot substances, injuries caused by pressure waves, e.g. as a consequence of explosions, impact by fragments caused by explosions, etc.)



A maintenance worker sustained 60% burns when a spark from a plasma cutter in a maintenance area ignited a quarter full 25 litre drum of thinners.

## Maintenance specific hazards and risks

- In addition to the risks associated with any working environment, maintenance operations involve some maintenance-specific risks.
  - Working alongside a running process and in close contact with machinery
  - Involves disassembly and reassembly of complicated machinery
  - Non-routine tasks
  - Exceptional conditions
  - Changing tasks and working environments
  - Working under time-pressure



## Trends in maintenance influencing safety and health at work

- From a 'fix it when it breaks' low-skilled activity, mostly *corrective*
- During the last twenty years - more *strategic* approach to maintenance
  - function contributing to productivity (Reliability Centred Maintenance, Total Productive Maintenance)
  - covering health and safety and environmental issues and training and competence of workers
  - *predictive* approach - condition monitoring - minimises the need for corrective maintenance and helps avoiding emergency interventions
  - maintenance is moving away from being an emergency job
  - more consideration is given to maintainability and reliability of new equipment

## Trends in maintenance influencing safety and health at work

- Increasing automation, while decreasing human involvement in routine operations, frequently increases the mental demands in terms of monitoring, supervision, and maintenance.
- Condition monitoring helps avoid emergency interventions, but on the other hand it results in increased operator decision making and monitoring requirements, which can increase the possibility of errors and accidents.

## Trends in maintenance influencing safety and health at work

- Strategic approach to maintenance facilitates the integration of OSH management into maintenance management
  - helps manage health and safety in a structured way
  - based on an adequate risk assessment
  - ensuring training and competence
  - involving workers in the risk assessment and maintenance management process.
- However, the 1950s approach of fixing it when it breaks is still frequently used, especially in small and medium size enterprises (SMEs).

## Subcontracting

- Maintenance is one of the most subcontracted functions in industry
- Aggravating factor in terms of safety and health
- Maintenance operations are often carried out on customer sites which are unfamiliar to the workers
- Workers carry out operations very independently, making decisions by themselves
- Working alone, working during the nights
- Many subcontracting companies to operate simultaneously on sites

# Safe maintenance and design

- Many typical risks in maintenance operations involve poor design - machine maintainability has an impact on safety
  - fluency and working postures
  - easy access to the components to be maintained
  - minimizing the number of components to be replaced, connected, disconnected
  - increasing maintenance intervals
  - making difficult or impossible to perform a maintenance task incorrectly or in an unsafe way.

A female employee lost two fingers cleaning a hopper dispensing oats to a screw conveyor at a biscuit factory. The isolator switches were on top of an unguarded platform that had to be accessed by a vertical hooped ladder, and they were not clearly labelled.

A night shift worker at an agricultural feed company had his arm sliced off when cleaning a rotary valve to avoid it getting choked with oat products. The Court heard that the machine had not been isolated because the isolation facilities were difficult to reach.

## Key success factors in the prevention of risks during maintenance operations

- Management commitment and safety culture in the organisation
- Involvement and participation of the workers
- A well-conducted risk assessment
- Preventive measures according to the prevention hierarchy, combination of preventive measures
- Safe work procedures and clear guidelines
- Effective and continuous communication
- Continuous improvement/development
- Safety and health training
- Maintenance included in the comprehensive health and safety management system

## Good practice example

### ● Good maintenance at BASF; chemical industry



- Guidelines for safety, health and environment
- Work permit
- Safety rules for skilled labour
- Consignment notes
- Safety, health and environment (SHE) quality standards in its contracts
- Advice, audits and training of contractors
- Information and training of workers
- <http://osha.europa.eu/data/case-studies/good-maintenance-at-basf-chemical-industry/view>

## European legislation creates the framework for good practice in maintenance

- **Council Directive 89/391 – the "Framework Directive"** on the introduction of measures to encourage improvements in the safety and health of workers at work
  - It is the employer's obligation to ensure the safety and health of workers in every aspect related to work
  - Lays down general principles concerning the prevention and protection of workers against occupational accidents and diseases
  - Sets out the obligation for the employers to carry out a risk assessment at work
- **Series of individual directives based on the Framework Directive**
  - specific provisions on maintenance and requirements for maintenance to eliminate workplace hazards.

# Chemical safety

- OSH Directives

- Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work
- Directives on indicative occupational exposure limit values, on exposure to carcinogens and mutagens, on asbestos

- OSH related aspects

- Council Directive 96/82/EC, so-called Seveso II Directive
- CLP Regulation, REACH

## Campaign publications

- Report on 'Maintenance and OSH – A statistical picture' (online)
- Factsheets general on maintenance – for workers and for employers, statistical picture in 22 languages
- A collection of good practice examples published in 2010
- E-facts on specific topics online
- Campaign website
- Maintenance thematic webpage
- NAPO on safe maintenance  
<http://osha.europa.eu/en/campaigns/hw2010/press-and-multimedia/multimedia/napo>

## Maintenance and dangerous substances

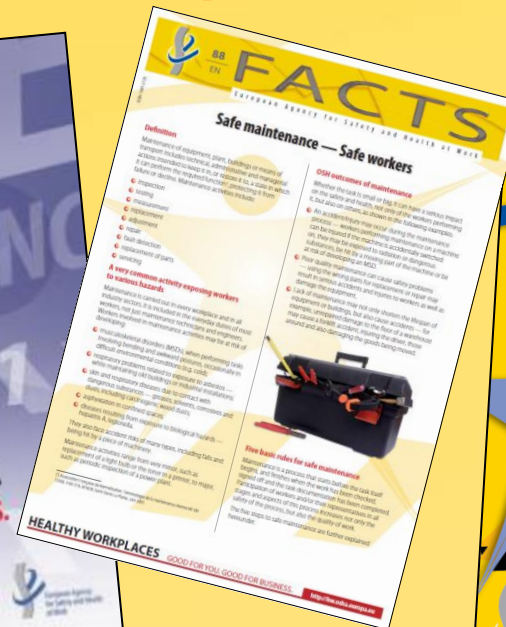
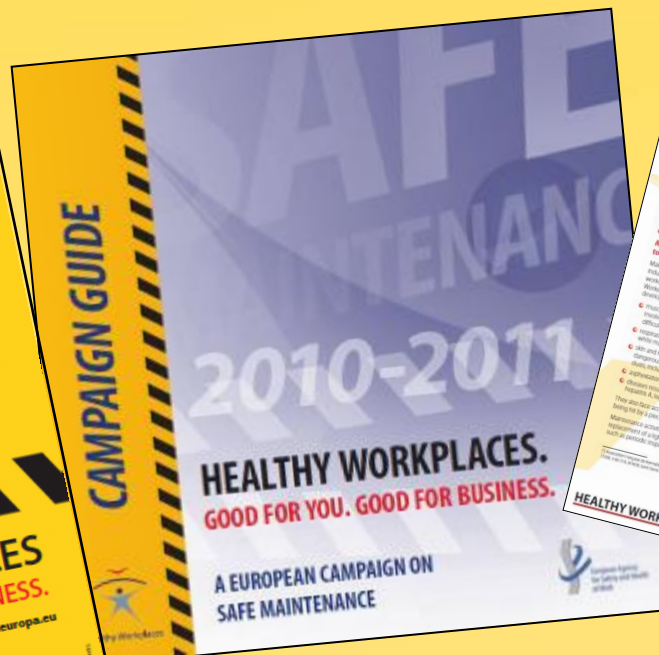
- Conference "Maintenance: Do It Safely"  
held on 25th of November, 2010, Brussels  
Workshop on "Maintenance and dangerous substances"
- In preparation two complementary e-facts :
  - Maintenance and hazardous substances - general
  - Maintenance and hazardous substances - maintenance in chemical process industry

## More about the campaign

- Visit the Campaign website  
<http://hw.osha.europa.eu>

- More about maintenance:

<http://osha.europa.eu/en/topics/maintenance>



# A EUROPEAN CAMPAIGN ON SAFE MAINTENANCE



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**GOOD FOR YOU. GOOD FOR BUSINESS**

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