An EU perspective on OSH issues and Emerging Risks

Irish Occupational Hygiene Society - 21st annual conference
"Navigating current and future challenges"
21-22 February 2012, Kilkenny

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Overview

- **The European Agency and its Risk Observatory**
- **Accidents and ill-health in the EU**
- **Identifying new and emerging risks**
  - Past, present and future
- **Chemical emerging risks**
  - Also in ‘green jobs’
- **21st century challenges for OSH**

European Agency for Safety and Health at Work

A network agency: Focal Points

Eurofound

Eurostat

HEALTH AND SAFETY AUTHORITY

- EU Focal Points
- Candidate & Potential Candidate Countries
- EEA/EFTA Focal Points

EU-OSHA's role

- **Identify OSH issues related to the changing world of work**
  - Board, Focal Points, staff, stakeholders, Topic Centre, others
- **Analyse the issues and help coordinate research**
  - European Risk Observatory (ERO)
- **Identify practical approaches to dealing with the issues**
- **Disseminate the information**
  - Pan-European 'Healthy workplaces' campaigns
- **Bring together interest groups to share information and promote a positive health and safety culture**
  - Networks include EFTA/EEA, candidate, pre-accession countries
- **Internet-based information exchange** www.osha.europa.eu

Estimation of work-related fatalities for the EU 27 (ILO estimates, 2010)

- **205 million people in employment**
- **167,000 fatalities attributed to work-related accidents and diseases in EU, and within that:**
- **159,000 fatalities attributed to work-related diseases**
- **7,460 fatalities caused by accidents at work**
- **74,000 fatalities attributed to hazardous substances at work (asbestos included)**
- **95,581 work-related cancer deaths annually (2002)**
  - 9.6% of all cancer deaths estimated to be attributable to work
  - Magnitude higher than previously thought
  - EU-OSHA's report: OELs for Carcinogens, Mutagens and Reprotoxic substances (CMRs) at EU Member States level

Magnitude of non-fatal work-related illnesses

- **Accidents at work**
  - 3.2% of workers in the EU-27 had an accident at work during a one year period, which corresponds to almost 7 million workers
  - Approximately 10% of these accidents were a road traffic accident in the course of work
- **Work-related health problems**
  - 8.6% of workers in the EU-27 experienced a work-related health problem in the past 12 months, which corresponds to 20 million workers
  - Bone joint or muscle problems and stress, anxiety or depression were most prevalent

The Community Strategy and the ERO

- The Community Strategy for **OSH 2002-2006** requested the creation of the Observatory

- Strategy **2007-12**: the ERO should contribute to enhancing “risk anticipation to include risks associated with new technologies, biological hazards, complex human-machine interfaces and the impact of demographic trends”

The Community Strategy and the ERO

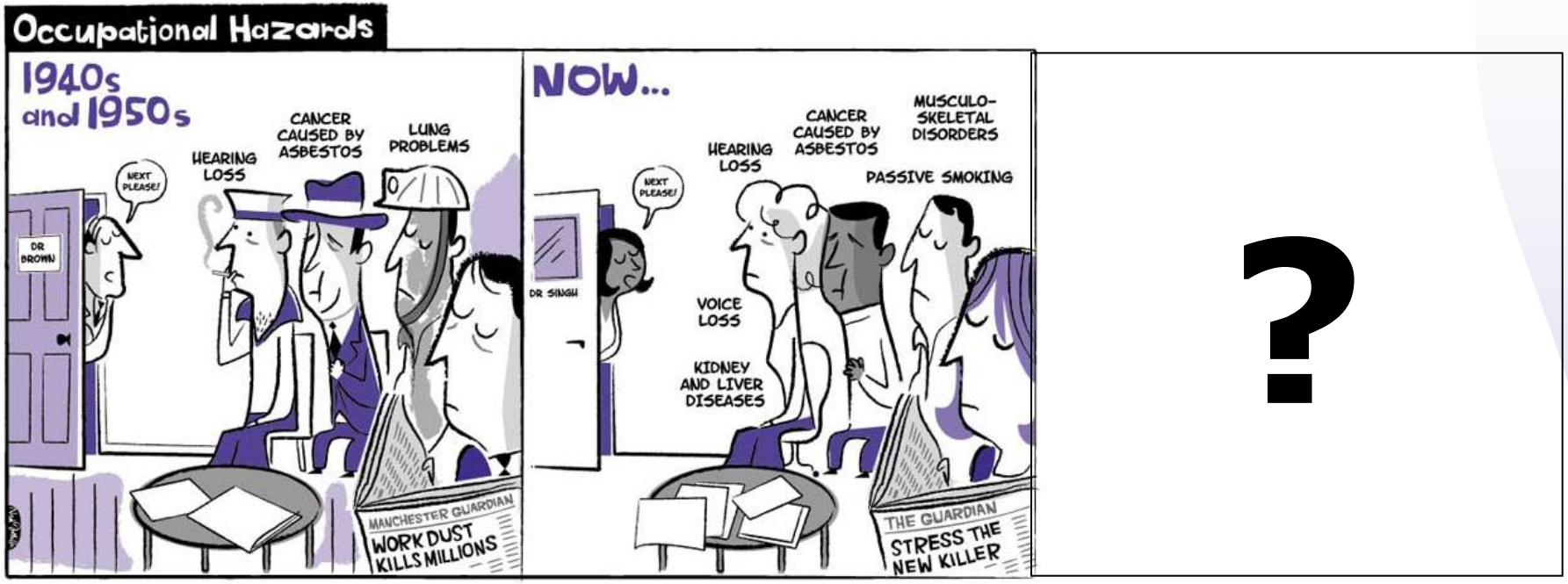
- Identifies several **priorities**, e.g., psychosocial issues, MSDs, dangerous substances, reproductive risks, OSH management, multifactorial risks (e.g. work organisation and workplace design issues, ergonomics, combined exposure to physical and chemical agents) and potential risks associated with nanotechnologies.
- It asks the Agency to “encourage **national OSH research institutes to set joint priorities**, exchange results and include occupational health and safety requirements in research programmes”

New challenges are giving rise to ‘emerging risks’ - as highlighted in the Community strategies

- **Technological development**
  - New tools and new ways of working, resulting especially from information and communication technology (ICT)
- **Tertiarisation**
  - Service sector growth leading to ‘new’ health and safety risks, particularly psychosocial and musculoskeletal
- **Changes in employment**
  - Shift towards outsourcing and increased specialisation, resulting in greater employment in SMEs
- **Demographic change**
  - Ageing working population, increased (im)migration
- **Women at work**
  - Increasing participation with specific risks and needs

Trends: then and now

Trends: then and now



Anticipating risks: how do we do it?

- **Gather data and other information (e.g. expert judgement) from as many sources as possible**
  - No single data source will give a complete picture
- **Focus not only on occupational safety and health, but on the relevant socioeconomic context, too**
- **Examine past trends, describe the situation at present, and explore future developments**

ERO's 3 dimensions: PAST

PAST

- Draw on past information through the collection and analysis of historical data: "OSH in figures"
- Explore evolution of past trends, relate them to the current data on new and emerging risks
- Watch out for trends that may have gone unnoticed (e.g., affecting specific groups), and which should be reported to improve monitoring or prevention of new and emerging risks

ERO's 3 dimensions: PRESENT

PAST

PRESENT

- Monitor OSH in 'real time' by collecting and analysing **current data**
- Literature surveys and policy reviews
- **ESENER**: Enterprise survey (management of OSH and psychosocial hazards)
- 'Stimulating **debate**' seminars and expert workshops
- Other sources of current data: through networks of OSH practitioners, researchers, social partners, occupational physicians, other observatories

ERO's 3 dimensions:
FUTURE

PAST

PRESENT

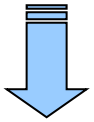
FUTURE

- Medium-term, Delphi-studies:
  - Four expert forecasts on: physical, biological, psychosocial & chemical emerging risks
  - Followed up with specific literature reviews
- Foresight:
  - 2011/12: a 10-year foresight: "impact of technological innovations on OSH": *green jobs*

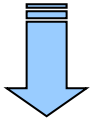
Expert forecasts of emerging risks: Delphi surveys

4 Delphi surveys
(physical, chemical, biological & psychosocial risks):

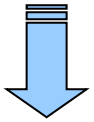
520 experts invited to participate



Round 1: Identification of issues



Round 2: Validation and prioritisation



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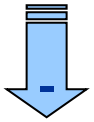
Round 3: Final consultation



Forecast by 188 experts (RR=35%):
prioritised lists of ERs

Examples of emerging risks

- **Musculoskeletal disorders (MSDs)**
  - ↑ PC use, static postures, repetitive work, physical inactivity
  - Combined exposures with psychosocial risk factors
- **Complexity of human–machine interfaces**
  - ↑ worker's mental/emotional strain, MSDs and accidents
- **New forms of employment and job insecurity**
  - Precarious contracts, fragmented working lives. multiple jobs, etc.
- **Work intensification and poor work-life balance**
- **The OSH risks for the ageing workforce**
- **High emotional demands, violence and bullying**
- **Poor risk management in SMEs and sub-contracted jobs**
- **Pandemics: workers are at the frontline of contamination**
- **Poor Indoor Air Quality, increase in mould-related diseases**
  - Poorly maintained AC, new building/insulation techniques, indoor pollutants (from detergents, solvents in furniture, flooring, etc.)

Chemical emerging risks: Five main groups identified

1. **Nanomaterials, ultrafine particles (e.g. diesel exhaust, metal welding fumes, silica), fibres (e.g. man-made mineral fibres)**
2. **Allergenic and sensitising substances, and in particular skin diseases and dermal exposure**
3. **Carcinogenic, mutagenic and reprotoxic substances**
4. **Sectors specifically highlighted**
   - Waste treatment, home nursing/caring, cleaning and wet work
5. **Combined exposures**
   - Combined chemicals (even when each taken separately is not toxic)
   - Dangerous substances in SMEs and sub-contracted activities
   - Ototoxic substances and noise

Nanomaterials

- **Used in more than 1,317 consumer applications (2011)**
- **75% of companies working with NMs are SMEs (NanoRoad 2005)**
- **Health effects:**
  - Animal studies: most important effects in the lungs: inflammation, tissue damage, oxidative stress, chronic toxicity, cytotoxicity, fibrosis, tumours
  - Epidemiological studies: also cardiovascular effects of ultrafine particles
- **Obligation to assess the risks and 'hierarchy of control' apply but risk assessment difficult**
  - Many uncertainties: health risks, characterisation of exposure
  - Lack of info on NMs down the user chain
  - Control-Banding: an alternative in the context of uncertainties
- **Control measures currently recommended:**
  - Closed systems, conventional ventilation, engineering control and filtration used against ultrafine dust and aerosols
  - Precautionary principle in the choice of control measures

Dermal exposure and skin diseases

- 2nd most common occupational disease in EU – after MSDs
- Contact dermatitis the most common
- Chemicals responsible for 80-90% of work-related skin disorders – incl. soaps, detergents, solvents, fragrances
- Not only hands exposed – other skin parts exposed to airborne substances, or contact with dirty hands
- No validated method to assess dermal exposure
- Need to consider combined exposures (incl. humidity factor), repeated exposure, exposure to diluted preparations, etc.
- Identification and control of risk factors very important

Reprotoxicants

- **Stigmatised as a 'women issue' but effects in both men & women**
  - Fertility reduction, hormonal troubles, menstrual cycle troubles, harm to foetal and human developments, miscarriages, structural malformations, functional deficits and trans-generational impact
- **Data are poor and partial:**
  - Information on reprotoxic effects of substances is still poor
  - Hazards and effects difficult to see and to correlate
  - Poor monitoring in public health and OSH
  - Lack of awareness (taboo)
- **Rarely considered in workplace risk assessment**
- **No specific legislation at EU level and in many Member States**

Waste treatment

- One of the most hazardous occupations
- Illness rate 50% higher than in other sectors
- Waste regulations primarily for environmental purposes
- Growing amount of waste in the EU – largest volume from manufacturing, construction, demolition, mining
- Complex mixtures of substances: high level of dust, up to 100 Volatile Organic Compounds (VOCs) found, airborne microorganisms, including mould, and endotoxins.
- Electrical/electronic equipment and end-of-life vehicles increasingly recycled: contain lead, cadmium, mercury, PCBs

Foresight of new and emerging risks associated with new technologies in green jobs by 2020

- **Method: scenario-building**
  - Does not assume that the future is pre-determined
- **Taking into account the demographic, societal & economic context**
- **Multidisciplinary and participative approach ⇒ new risks are more likely to be identified**
- **Timely focus on green jobs: large current & projected growth:**
  - potential to affect many workers
  - opportunity to anticipate potential new risks
- **Outcome: set of scenarios of possible and plausible futures to help policy-makers understanding long-term developments and what decisions needs to be taken to help avoid or happen these futures**
- **Aims to stimulate debate and provide insights into ways to shape the future**

Implementation: 3 phases February 2010 – January 2012

HEALTH & SAFETY LABORATORY

SAMI Consulting

technopolis |group|

- **Phase 1: 16 key drivers of contextual change that could shape green jobs over the next 10 years identified**
  - Government controls/incentives, climate change, economic growth, public attitude, energy security, demographics, etc.
- **Phase 2: key new technologies identified**
  - Nanomaterials; bioenergy; waste management; construction; transport; manufacturing; decentralised energy production & transmission; energy storage; wind energy
- **Phase 3 (on-going): Scenario-building**
  - Building scenarios combining phases 1 and 2
  - Workshops to identify emerging OSH risks and policy options through the use of scenarios









Wind energy

- **Access to remote areas with no/bad roads and no appropriate vehicles**
- **Going up in the tower: Falls from height, MSDs**
  - Tower height increases rapidly with innovation
- **Electrocution – from the switching installation, electrical arcs**
- **Fire - e.g. if tower struck by lightning**
- **Maintenance in very windy conditions, rappelling down the blade or inside the blade in confined space, exposure to e.g. carbon fibres**
  - Regular maintenance ⇒ workers may be regularly exposed
- **Blade failure: parts of up to 200kg thrown up to 1km far away**
- **Blades can also throw ice**
- **Structural failures - HSE investigated 2 turbine collapses in 2007**
- **Manufacturing: Exposure to e.g. epoxy resins, styrene; Work in confined space – ventilation, chemicals, MSDs**
- **Transport of big components**
- **Off-shore – additional risks: complex dives, cable laying, isolation, extreme weather, fall into water, splash from salty water**

Louisville-based Bella Energy worked with EMC Engineers on this photovoltaic installation for the Antonito School District in the San Luis Valley of Colorado.

- **"Construction" hazards combined with electrical hazards**
- **Greatest risks: manufacturing**
  - Involves large quantities of chemicals - many are highly toxic
    - solvents and acids for cleaning the semiconductor parts
    - gases for depositing the ultra-thin layers of material
    - metals, depending on the type of PV module being made
- **Leaching hazard, including at the waste treatment stage**

European Agency for Safety and Health at Work

Hazard Classification of Chemicals Typically Used in PV Module Manufacturing

Material	DOT Hazard Classification*
Arsenic	Poison
Arsine	Highly Toxic Gas
Cadmium	Poison
Diborane	Flammable Gas
Diethyl Silane	Flammable Liquid
Diethyl Zinc	Pyrophoric Liquid
Dimethyl Zinc	Spontaneously Combustible
Hydrochloric Acid	Corrosive Material
Hydrofluoric Acid	Corrosive Material
Hydrogen	Flammable Gas
Hydrogen Selenide	Highly Toxic Gas
Hydrogen Sulfide	Flammable Gas
Indium	Not Regulated
Methane	Flammable Gas
Molybdenum Hexafluoride	Toxic and Corrosive Gas
Oxygen	Gaseous Oxidizer
Phosphine	Highly Toxic and Pyrophoric Gas
Phosphorus Oxychloride	Corrosive Material
Selenium	Poison
Silane	Pyrophoric Gas
Silicon Tetrafluoride	Toxic and Corrosive Gas
Tellurium	Not Regulated
Tertiarybutyl Arsine	Pyrophoric and Highly Toxic Liquid
Tertiarybutyl Phosphine	Pyrophoric Liquid
Tetramethyl Tin	Pyrophoric and Highly Toxic Liquid
Trimethyl Indium	Pyrophoric Solid
Trimethyl Aluminum	Pyrophoric Liquid
Trimethyl Gallium	Pyrophoric Liquid
Tungsten Hexafluoride	Toxic and Corrosive Gas

*DOT, Department of Transportation

Bioenergy

- **Biomass material may not store well and produce hazardous VOCs, dusts, moulds and endotoxins**
- **Fire risks**
- **Increasing numbers of new entrants to the bioenergy sector (e.g. from the waste and agriculture sectors), incl. SMEs**
  - Many may lack expertise in operating biomass equipment
- **Collection of biomass material from woodland: forestry occupations have a high injury and fatal accident rate**
- **Handling biomass ashes, e.g. to put them back in forest (life-cycle approach): respiratory hazard (dust) and dermal hazard (alkali)**

Overall trend: a fragmented future

Fragmented working lives, workplaces and workforces

- Large impact on occupational health and public health

Overall trend: a fragmented future

Fragmented working lives, workplaces and workforces

- Longer working life, but no longer a job for life
  - A challenge for effective health surveillance → risk of weaker evidence base of harm to worker health
  - Working beyond 65 → effects of work-related diseases become more apparent
  - 'Atypical careers': harder to balance private & working life (particularly, still, for women)

Overall trend: a fragmented future

Fragmented working lives, workplaces and workforces

- Atomised industrial structure: MSEs
- Multiple worksites, especially in growth sectors (e.g., personal care)
- Teleworking
- “Mobile workers”
- Global workplace
- ICT: 24/7 availability, work → home spillover

How do we maintain effective prevention?

Overall trend: a fragmented future

Fragmented working lives, workplaces and workforces

- Diversity: more women, migrants, older workers, workers with disabilities, workers with chronic illnesses…
- New risks, and old risks in new guises
- How do we help enterprises to manage this increased complexity to ensure a sustainable working life and a healthy workplace for all?

Analogue prevention in a digital world of work?

Louisville-based Bella Energy worked with EMC Engineers on this photovoltaic installation for the Antonito School District in the San Luis Valley of Colorado.

Go raibh mile maith agaibh go leir!

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