Current activities on Silica by the Senior Labour Inspectors Committee and GB

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Presentation Overview

• SLIC activity
• The Size and Scale of the Problem of occupational disease in GB
• Regulatory framework for respirable crystalline silica (RCS)
• Strategic health research programme
• Action on RCS in priority industries
• Approach to stone and artificial stone
A Collaborative Approach across NLIs

- SLIC Plenary agreement to development of proposals for a collaborative approach on Long Latency Diseases (Vilnius, November 2013)

- SLIC agreed to focus on Respirable Crystalline Silica [RCS] (Athens, May 2014)
  - Possibility of a second topic later – welding fume?

- SLIC CHEMEX WG to lead, liaising with SLIC Enforcement WG
What is SLIC hoping to achieve through the collaboration (1)?

Improve the prevention of occupational disease across EU MS, through:

• Greater access to learning from the successful ‘approaches’ used by NLIs and their partner organisations

• Having easy to use knowledge sharing arrangements, to enable such ‘shared information’ to be accessed and searched

• Potential to influence the supply of machinery standards/design of equipment

• Potential for a collaborative project on developing a particular ‘approach/product’
What is SLIC hoping to achieve through the collaboration? (2)

Particular interest in equipping inspectors to improve compliance and risk control, thereby reducing exposure via:

- Ways to promote sustainable behavioural change in workers/employers
  - This includes providing suitable guidance and training for inspectors to help improve control against risks from RCS exposure in the workplace and compliance

- Improving design of work processes and equipment
Membership RCS subWorking Group

From CHEMEX WG Group:

- Jens Ahman (SE)
- Darren Arkins (EI)
- Nathan Kuper (NL)

Joined by:

• Dimitri Deconinck (BE)
• Irena Dimitrova and Violeta Dobreva (BG)
• Diana Gagliardi and Piero La Pegna (IT)
• Chris Snaith (UK)
Initial thoughts (1)

• Primary need is to give general inspectors **confidence** to address RCS dust

• Emphasis on **control of exposures**
  (risk assess just to give controls to follow-up not as ‘end point’ - get away from ‘admin measures’ and unnecessary measurements **per se**)

  ……..“Hygiene without numbers”

• Focus probably on **construction**, using NEPSI’s work to support inspection in **other sectors**
Initial thoughts (2)

- **Short guidance sheets** for inspectors – and probably an overarching document giving background, including giving inspectors the compelling facts for “Why RCS?”

- **To address common problems** from inspector’s point of view.

- **Use of visual images** – to get attention and show what is ‘good’ & ‘bad’

- Include case studies, with costings

- Consider complementing with **inspector training materials**

- Lots of ideas and good materials to share
RCS WG: Knowledge Sharing

Created on CIRCA-BC: 
SLIC Long Latency Interest Community (SLIC LLIC)

• Initial folders (spaces) created:
  1. RCS Working Group Documents
  2. RCS Inspector Guidance
  3. RCS Useful Information

• Access as required; initially RCS subWG and CHEMEX WG.
Occupational ill health – GB Context

- **1.2 million** working people suffering a work related illness (estimated)
- **13,000 deaths** & **450,000 new cases** each year (estimated)
- Cost to society – estimated to be around ‘double figure’ billions
- Wide spread of diseases and industries
- HSE priorities: cancers and respiratory diseases
Cancers and respiratory diseases

8 bus loads
dying each month
from occupational cancer

96 bus loads
dying each year
from occupational cancer

another 50 bus loads
dying each year
from respiratory diseases
HSE’s ambition

Reduce the incidence of occupational disease through:

✓ Prevention and control

✓ Sustained HSE activity

✓ Focus on improving compliance with the law by supporting evidence based targeted interventions in high risk areas
Occupational cancer

- 2005 HSE commissioned Cancer Burden Study (http://www.nature.com/bjc/index.html)

- Prioritisation exercise:
  - knowledge of industry
  - strength of evidence of causal link
  - estimates of future cancer burden
  - number of workers potentially exposed
  - likelihood of successful intervention
# Cancers and Respiratory Disease Priorities

## Cancers

- Asbestos
- Shift work
- Welders
- Painters
- RCS
- DEEEes
- Solar radiation
- PAHs coal tars & pitches
- Tetrachloroethylene
- Radon

## Respiratory disease

- Industries / workplace activities that have high incidence and/or large number of workers potentially exposed:
  - Construction workers
  - Foundry workers
  - Welding
  - Quarry & stone workers
  - Agricultural workers
  - Vehicle paint sprayers
  - Bakeries
RCS in GB

• Over 1,000,000 workers are potentially exposed to RCS

• Health impacts – Chronic Obstructive Pulmonary Disease (COPD), Silicosis and Lung Cancer

• Cancer burden study estimates 800 deaths a year for past exposures to silica in GB

• Industries where highest exposures occur are: Construction, Stone work, Quarries, Brick making and Foundries
Regulatory framework for RCS

European Directives
- Chemical Agents Directive 98/24/EC
- Carcinogens and Mutagens Directive 2004/37/EC

Implementing Regulations UK
- Dangerous substances and explosive atmospheres (DSEAR)
- Control of substances hazardous to health (COSHH)
Requirements of COSHH for RCS

• Prevent or if not possible, adequately control exposure to substances hazardous to health

• Apply the ‘principles of good practice for the control of exposure to substances hazardous to health’ including the requirement ‘to control exposure by means proportionate to health risk’ (Regulation 7 (1), Schedule 2A (c)) and

• Control exposure below the Workplace Exposure Limit (WEL), which is 0.1 mg/m$^3$ for RCS.
Silica Hierarchy of Control

- Eliminate/Substitute
- Segregate Worker
- Engineering controls: Water suppression, LEV
- RPE/PPE

- Management
- Instruction
- Training
Health Impact Assessment and Health Surveillance Strategic Research Programme

- Strategic Research Programmes 5 + year multidisciplinary
- Looking at measuring the impact on health of interventions
- Using Silicosis and COPD caused by RCS exposure
Generating the evidence base

Longitudinal surveys in key sectors:
- UK levels of occupational exposure
- Extent of good-practice exposure controls
- Prevalence of symptoms, lung impairment and ill-health

Initial surveys:
- Stonemasons
- Brick manufacturers
- Foundries – linked to the Foundries Hygiene project

On-going survey:
- Wood workers – linked to the Woodworking Hygiene project

Health end points: COPD, asthma, silicosis
Stone working – occ. hygiene findings

- 40% of RCS measurements > WEL
- Mean RCS exposure 170% of WEL
- 94% RPE usage for measurements > WEL
- No engineering controls for 23% of measurements > WEL
- 6% per annum reduction in exposure over the last decade
Brick making – hygiene findings

- 21% of RCS measurements > WEL
- Mean RCS exposure 75% of WEL
- 28% RPE usage for measurements > WEL
- No engineering controls for 87% of measurements > WEL
- No reduction in exposure over the last decade
Symptoms, lung function and silicosis

- Work-related respiratory symptoms:
  - Brick 13.2%, Foundries 18.8%, Stone 14.1%
- Abnormal X Rays:
  - Silicosis: 3 (1%) (read to ILO standard)
  - Other minor abnormalities: 49 (as read by provider)
- AIRWAYS OBSTRUCTION:
  - 71 individuals of whom 23 are current smokers
  - Brick 7.5%, Foundries 9.6%, Stone 19.0%
COPD and silicosis simulation model

Mathematical lifetime simulation model for workers through time

- Stochastic and agent-based

Model used to forecast the long-term impact of an intervention in Dutch construction workers

- Improved use of technical control measures through behavioural and organisational change
- Exposure reductions >50% for Tuck pointers, Concrete drillers and Demolishers
- Approximately 6000 individuals in The Netherlands

Access to a database of lung function measurements on 18,000 Dutch construction workers with known work histories
Construction – Evidence base

• Cancer burden estimates 600 deaths from past exposures to silica

• Large number of workers over 1 million

• Research has identified high risk tasks
Construction - Enforcement

• Silica is routinely raised during construction division inspections – over 100 enforcement notices a year served

• Health Initiatives – 2 weeks of intensive inspection focused on health
Example of supply chain change initiative – Kerb cutting

Before

After
Construction Dust – High risk tasks

• HSE construction health website including **specific details on silica tasks together with embedded exposure videos.**

• Exposure videos show levels of exposure for specific tasks with and without the correct controls

Construction Dust – High risk tasks

• Changed industry practice on the control of silica risks associated with valley roof tile installation.
Construction Dust Partnership (CDP)

- Delivery of a campaign ‘brand’
- Rolling action plan developed
- Additional resources including toolbox talks for training the workforce
- Working with industry to produce a short DVD on managing construction dust on site
- Construction dust awareness road shows with SGUK
- Creation of a QR Code for smart phone use as direction tool to Website
- Visuals created and confirmed used by members to raise awareness
CDP Achievements

The CDP launched a website in 2014, hosted by CITB:

• Promoting the partnership

• Raising awareness of the health risks

• Providing simple, easy solutions for employers

• Educating the workforce

• A one stop shop for resources

www.citb.co.uk/cdp
Construction - improvements

• Areas of best practice emerging
  – Benefits being seen
• High health risk awareness amongst larger contractors
  – Wider focus than just silica
• Much greater appreciation / use of extraction systems
Quarries Partnership Team

- Partnership working with industry and trade unions
- Established brand within the quarry industry
Stop dust before it stops you

www.safequarry.com/qpt
QPT Achievements

Quarries Partnership Team
Dust Initiative

Purpose
- To reduce the incidence of respiratory disease in workers within the quarrying industry by further raising awareness of the risks of exposure via inhalation to hazardous dusts in the workplace.
- To improve workers' knowledge concerning exposure to dust in the workplace.
Quarries - Enforcement

• Inspection Initiative focused on quarries with high silica content stone

• 32 sites visited, enforcement action taken at 18

• Findings promoted to industry:
  – Respiratory Protective Equipment
  – Poor Housekeeping
  – Insufficient information instruction & training
Foundries

• **Foundry workers** - around 22,500 workers exposed to multiple harmful substances including fumes and dusts, nickel compounds and RCS.

• **Comprehensive Occupational Hygiene surveys** in 13 Foundries known to use good working practices to establish a baseline for exposure

• **Strong industry trade association backing** – committed to promoting improvements

• **Safety and Health Awareness Days** - included a specific section on the risks and control of RCS
Stoneworkers

- Development of a **vocational learning package** for new-entrant stoneworkers
- **Stone e-bulletin** was launched by HSE last year. Its 7th edition has just been published and has over 9500 subscribers. Each edition contains some information about silica dust and its common controls.
Stoneworkers

- Controls for processing stone are given in the COSHH Essentials sheets ST0-4

- **Stone industry Enforcement** – Silica discussed at majority of inspection visits and action taken in 1/3\(^\text{rd}\) of visits.

- Risk assessment, exposure control and health surveillance raised.
Stone and artificial stone

- Currently gathering evidence on stone industry, not yet aware of manufacture of artificial stone countertops in GB
- Pre-cutting of stone or artificial stone is important to avoid exposures at installation stage
- What is in the materials composition?
Cutting technology

• Methods for cutting stone (natural or artificial) are improving
  – High pressure water jet cutters
  – CNC (Computer Numerical Control) machines

• More accurate cutting and inherently less dusty
Recent BOHS Annals Paper

- *Respirable Silica Dust Suppression During Artificial Stone Countertop Cutting – Cooper, Johnson and Philips – USA*
  
  [http://annhyg.oxfordjournals.org/content/59/1/122.full](http://annhyg.oxfordjournals.org/content/59/1/122.full)

- Essentially each separate control reduced dust by a factor of 10 and they are multiplicative. So, water suppression and LEV together gave a reduction in exposure of 100 (measured on the operator).

- The water suppression has the advantage of cooling the blade, thereby increasing the life of the component.
A Community Site

Occupational disease Web community

This Occupational Disease Community site has been set up to encourage the promotion and exchange of ideas and initiatives for tackling occupational disease.

Its primary focus is on promoting initiatives aimed at reducing the incidence of occupational cancer (from all routes of exposure) and respiratory diseases (including asthma, COPD and silicosis). Information on activities and initiatives can be accessed through a specific folder for each priority topic.

The Community is open to anyone who has an interest in reducing the incidence of occupational disease and would like to promote their work or seek ideas. Information on activities and initiatives for other occupational disease areas is available on HSE's website.
What have we learned?

- UK Regulatory framework for RCS is strong
- Importance of leadership
- Housekeeping, Application of Controls and RPE issues across sectors
- Strategic research essential to answer big questions surrounding occupational disease
- Sustained commitment and continuous improvement required
- Open dialogue with dutyholders to ensure they accept responsibility for managing risk and support and endorse the regulatory programme
Thank you for listening