

Implementation of Personal Sampling in UK Coal Mines

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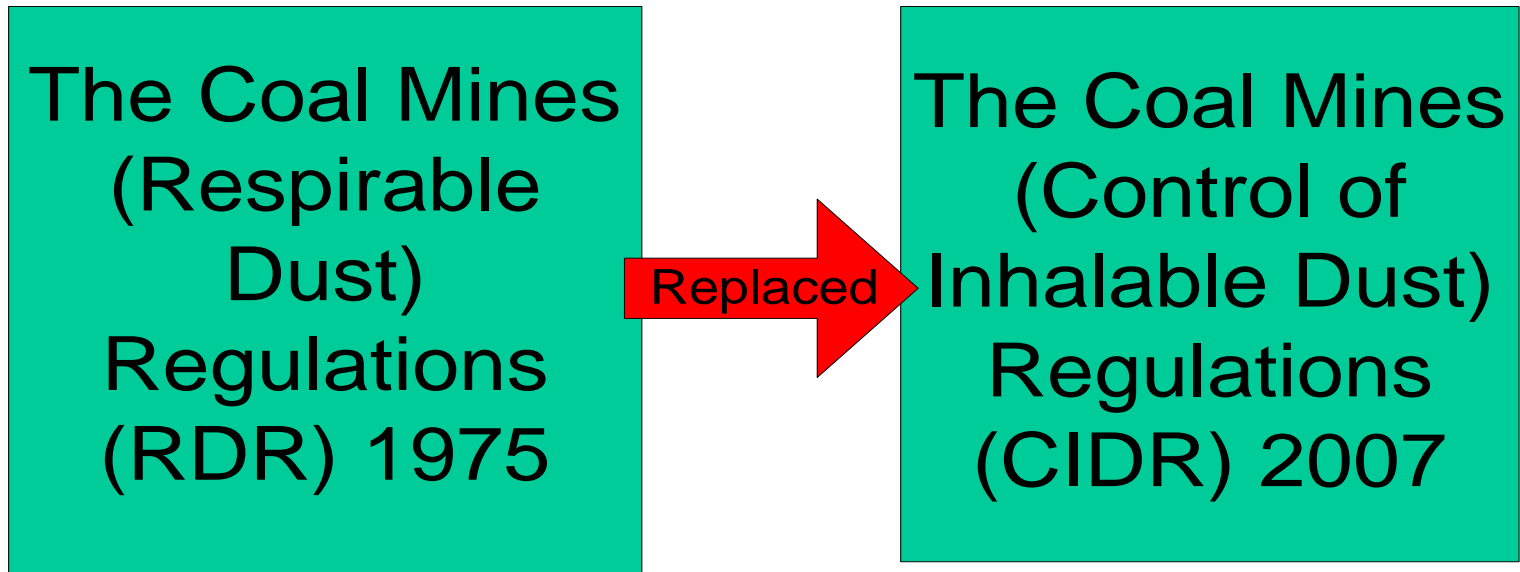


Dust in Coal Mines

- Dust in mines known to be hazardous
 - Dust Explosions
 - Health Hazard
- Main health effect is:
 - Lung disease - Pneumoconiosis
- Health effects caused by
 - Respirable coal dust, Respirable Crystalline Silica
- In 2006/2007 one case of pneumoconiosis reported

Mine Dust Regulations

- COSHH does not apply underground



CIDR Assessment



- Utilised a standard questionnaire
 - Based on CIDR framework requirements
- User comments sought
 - On practicalities of personal dust sampling
- Assessed CIDR compliance at 6 mines
 - Coal production from 2000 to 1.4 million tons/year
 - From 4 to 537 miners employed

1975 Dust Regulations



- Fixed point sampling
- Sampler heavy
- Sampling performed in limited locations
 - Dust not measured in other areas
- Staff mistrusted results
 - ‘Placed in a bag’

CIDR 2007

- Introduced personal dust sampling
- Dust to be measured in all areas of the mine
- Specified a framework to be followed
 - Risk assessment
 - Use and maintenance of dust control measures
 - Sampling regime for respirable dust
 - Evaluation of results
 - Action to be taken in the event of excessive dust
 - Health Surveillance

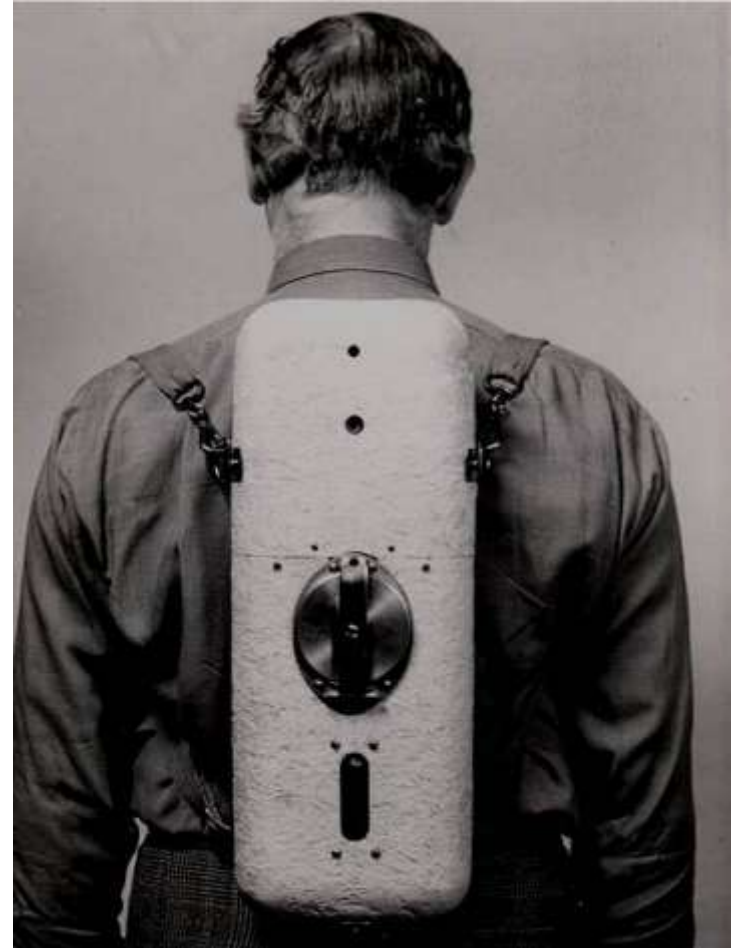
Dust Sampler



- Cyclone located on
 - Clavicle, helmet
- Worn for entire shift
- Use 'push fit' connectors
- Only one pump certified for use underground

Worker Acceptance

- Generally new system welcomed by miners and management
 - ‘it measures my dust’
- **Problem: Sampling train issues**
 - Tubing catching on equipment
 - Pump failures



Static Sampling Needed?



Exposure groups

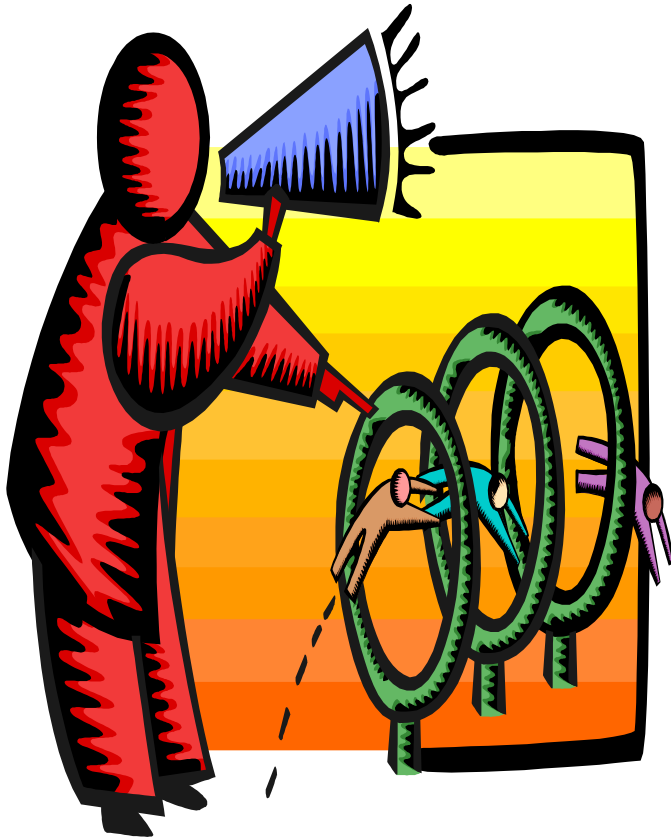
- CIDR Risk Assessment process places miners into exposure groups
- For each exposure group CIDR indicates the
 - sampling frequency
 - health surveillance requirements
 - Need for RPE
- **Problem: At one mine**
 - A medium exposure group carried out a weekly high exposure job

Exposure Control Limits



- 40 hour Exposure Control Limit (ECL) set at
 - 0.3 mg/m³ Respirable silica
 - 3 mg/m³ Respirable dust
- Normal weekly shift pattern used to calculate
 - Time Weighted Exposure Control Limit (TWECL)
- **Problem: What if a miner works overtime?**
 - CIDR - Stated a procedure to be followed
 - Each mine had adopted their own system – none followed CIDR

Sampling Frequency



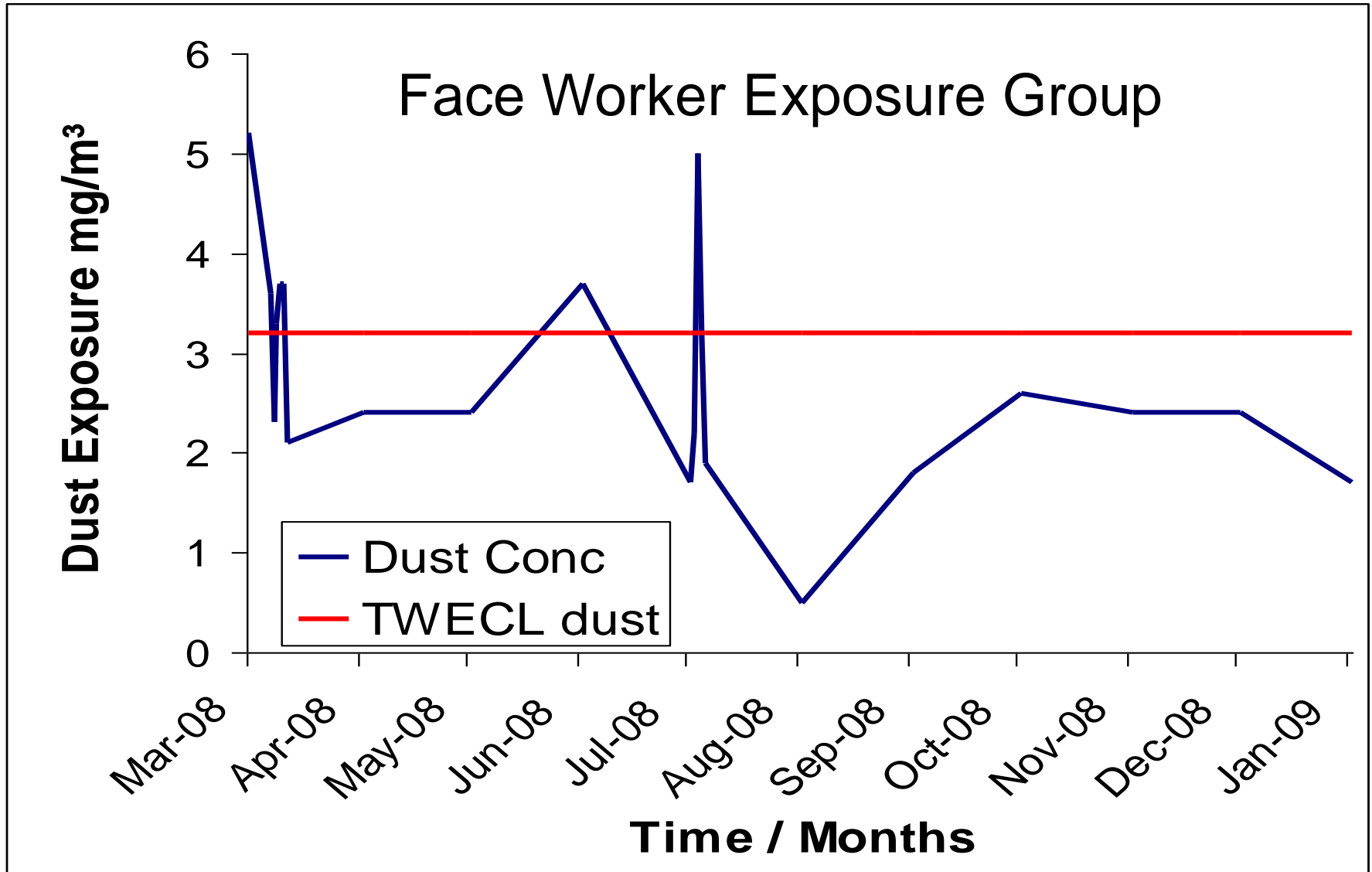
- Sampling frequency set by exposure group
 - High = monthly sample
- Up to 770 samples collected
 - But only 1 at one mine
- If exposure limit exceeded then:
 - 5 samples to be collected in 15 days

Representative Samples

- If pump fails then not representative
- CIDR
 - Only valid if $> 50\%$ normal production is achieved
 - No criteria set at 4 of the 6 mines
- **Problem:** What if production varies ?

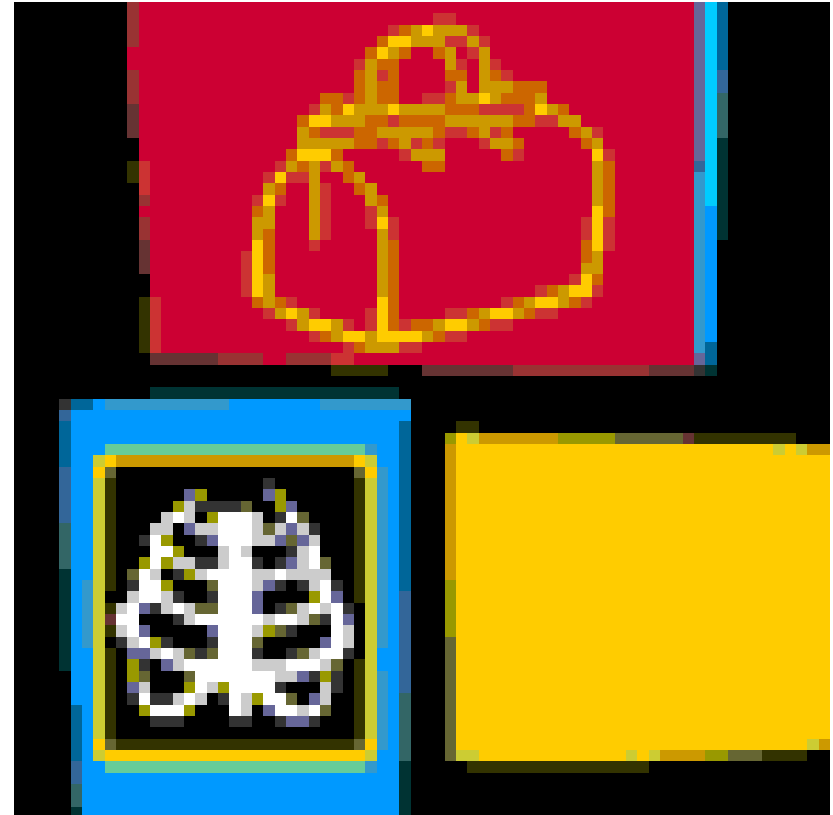


Example Dust Results



Health Surveillance

- Required for medium and high exposure groups
- Two mines expressed concern that X-rays not compulsory
- **Problem**
 - Not performed at two mines



Findings (1)

- Most aspects of CIDR have been successfully implemented
- Personal sampling has been widely accepted
 - Fixed point samples are still required
- Issues with the sampling train have been identified and mainly overcome
- One mine identified a regular work practice causing high exposures in a medium exposure group

Findings (2)

- Main issues
 - Representative sampling criteria not set
 - Widespread uncertainty on management of exposure for miners working overtime
- Health surveillance
 - not carried out at two mines
 - Two mines thought that X-Rays should be compulsory

Future Actions

- Findings presented to industry
- Help inform
 - Future review of CIDR
 - Inspection policy



A photograph of a tunnel under construction. The tunnel is supported by a complex network of metal ribs and beams. The floor is uneven and appears to be dirt or concrete. In the distance, several workers wearing hard hats and safety vests are visible. The lighting is dim, with a bright light source in the center of the tunnel. The text "ANY QUESTIONS" is overlaid in the center of the image.

**ANY
QUESTIONS**