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Exemptions:

WATCH COMMITTEE

How to progress the identified “emerging issue” of reviewing appropriate levels of control and associated terminology for “nuisance dusts”

Issue

1. In the “new and emerging issues” session at the November 2006 WATCH meeting, the highest priority issue was deemed to be the submission titled “nuisance dust”. The issue for this paper is the appropriate course of action from hereon.

Timing

2. No particular timing issues.

Recommendation

3. WATCH is invited to consider this paper and its annexes; and to develop its thinking on an appropriate future course of action.

Background

4. In its “new and emerging issues” session at the November 2006 meeting, WATCH (expanded with additional Community of Practice and Interest [COPI] members) identified as the highest priority issue the submission titled “nuisance dust”.

5. The issue was characterised as follows:

There is ongoing concern about dust exposure and COPD (Chronic Obstructive Pulmonary Disease), in particular the role of so-called “nuisance dust”. We should consider whether it should be looked at carefully. Specifically:

- a) what is the evidence for the association between general dust and COPD?
- b) how adequate is the “nuisance dust” standard ($10/4 \text{ mg.m}^{-3}$)?
- c) some people consider “nuisance” an inappropriate label – can we find a better name?
- d) what is the adequacy of existing control guidance for nuisance dust?
- e) what is the state of play in relation to this issue and the COPD element of the Disease Reduction Programme?

6. Concerns have also been expressed at recent ACTS meetings about the need to secure adequate control of dust exposures.

7. Such issues have been encountered repeatedly in the last 10-15 years in HSE’s work on chemicals, arising in business involving the previous (pre-2004) WATCH committee and/or individual members thereof. During the 1990s and early 2000s WATCH considered occupational exposure limits for a number of individual dusts (eg kaolin, talc, Portland cement, aluminium oxide,

pulverised fuel ash, carbon black, barium sulphate and coalmine dust) and for “low solubility, low cytotoxicity” dusts in general (including a detailed review of titanium dioxide). And in late 1997 the Institute for Environment and Health (IEH) organised a workshop for HSE under the title “Approaches to predicting toxicity from occupational exposure to dusts”, the proceedings of which were published by IEH in 1999. This can be downloaded from the following website: www.silsoe.cranfield.ac.uk/ieh/publications/iehpublications.html.

8. Although much understanding was gained from these activities, for almost all workplace dusts considered by WATCH there was found to be a dearth of reliable quantitative dose-response data for the development of respiratory symptoms (cough, wheeze, breathlessness) and for deficits in lung function associated with long-term occupational exposures. This has led to uncertainties concerning the health impact of exposures to “poorly soluble, low toxicity” dusts at concentrations at and around 4 mg.m^{-3} respirable dust. At an HSE commissioned workshop on COPD in June 2004 the suggestion was made to explore whether or not the wealth of data on the respiratory effects of coalmine dust in British workers might be used as a model for the effects of “poorly soluble, low toxicity” dusts in general. Coalmine dust may be viewed as a “low toxicity dust” as long as there is not significant contamination with crystalline silica, and this has usually been the case in British coalmines. Consequently HSE commissioned a report from the Institute of Occupational Medicine (IOM) with two aims; to characterise the dose-response relationship for the effect of respirable coalmine dust on FEV_1 ; and to compare the findings with data from other dusts for which comparable pulmonary function data were available. This was to see whether or not coalmine dust might be viewed as a model for “low toxicity, poorly soluble” dusts in general. This work was reported back to HSE in 2005.

Argument

9. There is potentially a huge amount of literature available that is relevant to this issue, including that pertaining to previous WATCH business referred to in paragraph 7. At this stage HSE has judged that it would be counterproductive to assemble and distribute to WATCH all of this material for this particular February 2007 meeting.

10. Rather, the annexes supplied here present the IOM work on coalmine dust including the report commissioned by HSE (Annexes I, II and III), HSE’s brief analysis of the IOM report (Annex IV) and HSE’s assessment of the background prevalence of COPD (Annex V). For information a table is presented as Annex VI to this WATCH package that briefly outlines the current occupational exposure limits for a number of dusts discussed at previous WATCH meetings. HSE and IOM consider that the database analysed, that of coalmine dust-exposed workers, is the best available within which to explore the issue referred to in paragraph 8. This is the largest and most comprehensive study available of a cohort of dust-exposed workers and is based on an extremely detailed exposure assessment that will probably never be rivalled in any other study. The dust measurements were not those taken for statutory monitoring purposes but were collected as part of the British Pneumoconiosis Field Research Programme. Respirable dust samples

(using the MRC respirable dust sampling devices) were taken for all representative job types at 3 monthly intervals over many years. HSE's only concern about this study is that the control 'non-dust exposed' group were surface workers who were assumed not to be exposed to dust. HSE is doubtful about this assumption and feels that the use of this control group may have caused an underestimate of the true effect of dust exposure. To help resolve this issue, HSE produced a review of the evidence on the background prevalence of COPD in non-smoking, non-dust exposed males aged 60 (Annex V to this WATCH package). This led to the conclusion that the background prevalence of COPD is between 6-8% in this age group, slightly lower than the background rate in the IOM control group (10%).

11. In relation to the question of terminology, the current COSHH Regulations and associated ACOPs do not use the term "nuisance dust". Rather, reference is made to a dust "*of any kind*" when present in the air at concentrations equal to or greater than 4 and 10 mg.m⁻³ (respirable and total inhalable respectively), provided the dust does not already have a Workplace Exposure Limit or is classified under CHIP. HSE's regulatory toxicologists have been using phrases such as "low toxicity" or "low solubility, low cytotoxicity" rather than "nuisance dusts". For comparison, ACGIH use the term "particles not otherwise classified" (PNOC).

12. HSE's brief assessment of the IOM research is outlined in Annex IV. Please note that in the Pneumoconiosis Field Research programme, respirable dust was measured using the MRC sampler. Hence, respirable dust values need to be reduced by 20% to equate them to measurements taken under the ISO/CEN respirable dust convention. Dust values presented throughout this cover paper have been converted to ISO/CEN measurements. Annex IV notes that on average, in workers exposed to 4 mg.m⁻³ respirable dust, there would be a negligible loss of lung function after a working lifetime (FEV₁ loss of 178 ml over and above that due to ageing). However, there is a distribution in response among workers. 37% of non-smoking workers aged 60 would be expected to suffer a moderately severe loss of FEV₁ (627 ml), with an associated doubling of the risk of respiratory symptoms, compared to 25% in "non-dust" exposed workers (a 12% excess). 17% of non-smoking workers would be expected to suffer a more severe FEV₁ loss of 993 ml with an associated 3-fold increased risk of respiratory symptoms, compared to 10% in "non-dust" exposed controls (7% excess). The concern remains that the "non-dust" exposed surface workers may well have had significant dust exposure leading to an underestimate of the true excess risk.

13. Current thinking within the long-term respiratory disease element of the DRP is that the modest degree of lung function change produced by exposure to 4 mg.m⁻³ coalmine dust (Annexes I-IV) and the shallowness of the dose-response curve (Figure 1 of Annex II) means that only limited health benefit would accrue from reducing the respirable dust exposure threshold to, say, 2 mg.m⁻³. Hence at present this is not a major thrust of planned long-term respiratory disease activity within the DRP.

Link to HSC Strategy

14. This is an important issue in relation to the long-term respiratory disease element of the DRP; and more generally, for HSE's statutory responsibilities under COSHH.

Consultation

15. There has been no consultation on this paper outside HSE, although IOM was obviously involved in delivering and discussing the research in Annex I.

European Context

16. There is no direct relationship with ongoing European activity although there is obvious relevance to the Chemical Agents Directive and to the setting of IOELVs.

Action

17. WATCH is invited to consider this paper and its annexes and to:

(i) express an opinion about the IOM research and HSE's assessment of the significance of the findings; and

(ii) recommend an appropriate course of action from hereon to derive a clear position on the issues raised in paragraph 5.

Contact:

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References / Attachments

Annex 1 Coal mine dust as a benchmark for standards for other poorly soluble dusts, Partial Position Report, Prepared by Institute of Occupational Medicine for the Health and Safety Executive, Research Report 470, 2006

Annex 2 Dust concentrations and respiratory risks in coal miners : key risk estimates from the British Pneumoconiosis Field Research, Soutar C.A. et al, Occup Environ Med 2004; 61: 477-481.

Annex 3 Dust related risks of clinically relevant lung functional deficits, Cowie H.A. et al, Occup Environ Med 2006; 63:320-325.

Annex 4 Assessment of the commissioned IOM Position Paper on coal mine dust as a benchmark for standards for other poorly soluble dusts

Annex 5 Prevalence of Chronic Obstructive Pulmonary Disease (COPD) in non-smokers

Annex 6 Current occupational exposure limits for a number of individual dusts