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Dear Rick

Thank you for the opportunity to review the NIOSH draft document entitled "Criteria for a Recommended Standard: Occupational Exposure to Respirable Coal Mine Dust".

I have had Dr Jim Leigh, Head of our Epidemiology Unit, and an authority on coal miners' health review this document on my behalf. I endorse his comments generally and have attached them.

Generally we would have quite serious reservations about the practicability of these standards. We believe our industry is quite advanced in technology, and that the experience is that it could be unachievable and therefore there would not in fact be compliance. Present data also indicates that CWP is virtually not occurring at levels of exposure in Australian mines.

Sincerely

*Ted*

EDWARD A EMMETT  
CHIEF EXECUTIVE

27 August 1993

MINUTE



WORKSAFE AUSTRALIA  
NATIONAL OCCUPATIONAL  
HEALTH & SAFETY  
COMMISSION

TO: DR TED EMMETT  
FROM: DR JIM LEIGH

COMMENTS ON NIOSH DRAFT DOCUMENT

CRITERIA FOR A RECOMMENDED STANDARD: OCCUPATIONAL EXPOSURE TO  
RESPIRABLE COAL MINE DUST

General Comments

In general, this is a very thorough document. Most of the relevant literature has been accurately reviewed. It is somewhat ironic, however, that the USA who only recognized the existence of coal workers' lung disease about thirty years after the UK and Australia had set dust standards to control it, and learnt a lot from Australia as far back as the 1950's (Sydney ILO Pneumoconiosis Conference) and via subsequent exchanges in the sixties and seventies, give so little acknowledgement to Australian work in this review, which now authoritatively proposes an exposure standard for coal dust < 1/3 of the existing Australian standard of 3mg/m<sup>3</sup> (which is incorrectly stated to be 5mg/m<sup>3</sup>, p.199).

At the very least, the papers Glick M, Outhred KG, McKenzie HI (1972), Pneumoconiosis and respiratory disorders of coal mine workers of New South Wales, Australia, Ann NY Acad Sc 200: 316-334, and Clark T (1972) Australian experiences in coal dust suppression. Ann NY Acad Sc, 200: 797-807 should be cited.

These papers document minimal progression of radiographic pneumoconiosis and no PMF at a standard equivalent to 3mg/m<sup>3</sup>. Other important papers on this point are included in the Proc 1st Australian Pneumoconiosis Conference (1968) and the Proc 2nd Australian Pneumoconiosis Conference (1978). More recent publications containing much relevant information are Phillips HR (1984), Sampling of respirable dust in coal mines. The Coal Journal 37: 193-197; Martin CH, (ed.) (1986), Monograph 12, Australasian Institute of Mining and Metallurgy. Australasian Coal Mining Practice; Wiles N, Fairclough F (1985), Prevention and prevalence of pneumoconiosis in New South Wales coal mines, Proc 5th Int Pneumoconiosis Conference (Caracas, 1978): 871-884.

Specific comments

p.4 The standard of  $0.9\text{mg}/\text{m}^3$  would be very difficult to achieve in practice in Australia, and I suspect also in the USA.

Currently, in NSW, where the best data is obtained, (sampling is personal sampling crib-room to crib-room), no long wall mines achieve  $< 1\text{mg}/\text{m}^3$  (highest of five crew members) and only 26% achieve  $< 2\text{mg}/\text{m}^3$ . 40% are greater than  $3\text{mg}/\text{m}^3$ .

In continuous mine operations 20% achieve  $< 1\text{mg}/\text{m}^3$ , 71%  $< 2\text{mg}/\text{m}^3$ , and 90%  $< 3\text{mg}/\text{m}^3$ . In surface mines 73% achieve  $< 1\text{mg}/\text{m}^3$ , 90%  $< 2\text{mg}/\text{m}^3$ .

Since the US compliance figure is the upper 95% confidence level, comparing this with the maximum of the group sampled, as in NSW, is not unreasonable, given the vagueness of the US directive for individuals to be sampled and the lack of control over sampling. Australian figures would be about 30% lower if sampled portal to portal, but would still be considerably higher than US.

p.6 Repeat sampling of high levels is consistent with Australian practice.

p.7 Australia has recently gone from three year to five year radiography on the basis of progression rates in the highest exposed long wall workers.

p.9 The use of 'approved organizations' for medical surveillance is similar to Queensland practice, which is, however, inferior to the centralized, standardized monitoring carried out in NSW by the Joint Coal Board.

p.12 The quartz standard of  $0.05\text{ mg}/\text{m}^3$  (95% UCL) will also be difficult for Australia, which by world standards has very low seam quartz in coal mines. 75% of NSW samples exceeded 0.05 and 25% exceeded  $1.0\text{ mg}/\text{m}^3$  respirable quartz (arithmetic mean).

The following references should be inserted:

p.26 Leigh J, Wiles AN, Glick M (1986), Total population studies of factors affecting chronic bronchitis prevalence in the coal mining industry of New South Wales, Australia, Br J Ind Med, 43: 263-271.

Leigh, J (1990) 15 year longitudinal study of FEV1 loss and mucus hypersecretion development in coal workers in New South Wales, Australia. DHHS (NIOSH), Publication 90-108, Proc 7th Int Pneumoconiosis Conference (Pittsburgh USA) 1: 112-121.

These papers document very large studies showing impaired lung function and chronic bronchitis in coal workers in relation to dust exposure.

- p.36 FEV1 loss - Australian studies as well as US, UK.
- p.42 3.2.1.1  
The point should be made that the recovery fraction in room-and-pillar is about 50% on average.
- p.52 US compliance figures a little hard to believe.  
cf. NSW 1987 - 1988.  
(mg/m<sup>3</sup> respirable dust) (crib-room to crib-room)

District	long wall	R & P	Surface
Newcastle	2.4	1.5	0.3
Singleton	4.2	2.6	1.0
South	3.6	2.3	1.9
West	2.3	1.2	2.4

These are after implementation of intensive dust control programs in excellent mining conditions by world standards.

The US quartz figures are more believable.

p.73, p.92, p.95 Quote Australian Study on FEV1 loss given above.

p.95 Misinterpretation of Leigh et al (1982). As indicated in the discussion to this paper, we had little fear that smoking histories had been falsely minimized in order to seek compensation. The smoking histories are taken at routine screening medicals throughout life, not at the time of seeking compensation, which is not dependent on smoking, in any case.

A non-smoking group was separately studied and showed clear coal-emphysema relationships.

Although the selection of post-mortems was to some extent biased towards those with lung disease the post mortem data was much less biased and much better prepared than the British data which was nearly all from compensation authorities and of poor inflation quality.

The following recent papers should be cited:

Leigh J, Beck R, Cole B (1993), Relationship between emphysema severity, pneumoconiosis histopathology and lung coal and silica content in coal workers, *J Occ Health & Safety (ANZ)* 9: 137-146.

Leigh J, Beck R, Cole B (1992), Relationship between emphysema severity, histologic type of pneumoconiosis and lung mineral content. *Proc 8th Int Cong Occ Lung Disease, (Prague), (in press)*.

Leigh J, Relationship between emphysema and histologic type of pneumoconiosis in coal workers (1992), *Europ Resp J*, 5: 519S.

These relate quantified emphysema to quantified lung dust content and show a clear relationship between emphysema and lung coal content, after taking smoking into account. They also document silica-coal interactions.

p.98       The Australian papers above should be cited in relation to smoking also.

The UK Department of Social Security document CM2091 (1992), 'Chronic bronchitis and Emphysema' should be included in the review as it bears directly on the issue of bronchitis and emphysema in coal miners.

p.199       The Statutory levels of respirable coal dust in NSW and Queensland are  $3\text{mg}/\text{m}^3$  (not 5).

(Coal Mines Regulation Act 1982 [NSW], Coal Mines Regulation, Respirable Dust 1978 [Qld]).

P.200       As noted above, the  $0.9\text{mg}/\text{m}^3$  standard will be difficult to achieve in practice.

p.203       I agree that a silica standard independent of coal content should be applied.


p.213       The recent Australian work on dust burden and disease should be cited. Indeed, earlier Australian work, (eg. Outhred KG, McKenzie HI (1966), Post mortem studies of deceased New South Wales coal miners. Joint Coal Board [Sydney]) showed this effect clearly, and this report should be known to some of the older US investigators.

p.216       Agree that implementation of the proposed standard will be very difficult.

p.324       Misspelled. The 1983 Leigh et al reference is Quantified Pathology... (etc.).

Answers to specific questions (also see above general comments)

- 1 Yes, on evidence presented. No, if Australian experience also considered.
- 2 Doubtful, if Australian experience considered.
- 3 Yes.
- 4 Best to keep single sampler but research into improved sampling techniques should not thereby be inhibited.
- 5 Statistically valid but reservations are expressed as to practical implementation.
- 6 Spirometry essential.
- 7 Transfer is a reasonable approach in theory but practical difficulties re bonuses, availability of positions, economic factors, company policy, psychological effects, are foreseen.
- 8 More recognition of the Australian experience would improve the document.



Dr J LEIGH

18 August 1993