

WORKING GROUP ON ACTION TO CONTROL CHEMICALS

WATCH/MIN/2006/1

Meeting date: 1st February 2006**Open Gov. Status:** Fully Open

Final

Paper File ref:**Exemptions:****WORKING GROUP ON ACTION TO CONTROL CHEMICALS**

Minutes of the 6th meeting of the Working Group on Action to Control Chemicals held on 1st February 2006 at Rose Court, Health and Safety Executive, London.

Members Present

Steve Fairhurst (Chair)
Steve Bailey
Steve Binks
Robin Chapman
David Farrar
Tony Fletcher
Alastair Hay
Rosemarie Hutchinson
Len Levy
Steve Williams
Mark Nieuwenhuijsen

Invited Additional Experts Present

Jean Prentice (McCrone Scientific Ltd)
Jeff Friar (Jeff Friar Ltd)
Robin Howie (Robin Howie Associates)

Other Invited Parties Present

Michael Lees (item 3 only)
Richard Lees (item 3 only)
Sarah Lyons (item 3 only; NUT)

Apologies

Ted Smith
Bill Sanderson (Bureau Veritas Training)

Officials Present

Nicola Gregg (Secretariat)
Mike Costigan (Secretariat)
Katherine Fuller (Secretariat)
Rob Turner
Mike Wright
John Cocker
Damien McElvenny
Andrew Darnton (item 2 only)
Garry Burdett (items 2 and 3)
Kevin Walkin (items 2 and 3)
Martin Gibson (items 2 and 3)
Anne-Helen Harding (items 2 and 3)
Catherine Carroll (item 3)
Maureen Meldrum (item 4 only)
Susy Brescia (item 4 only)
Dave Dillon (item 5 only)
Peter Griffin (item 6 only)

1	Administrative issues
1.1	The Chairman welcomed everybody to 6 th meeting of the Committee.
1.2	WATCH secretary Dr Nicola Gregg went through some administrative issues relating to the running of the Committee: <ul style="list-style-type: none">– Declarations of Interest were requested from ad hoc members of the Committee by the end of the meeting.– She asked if expense forms with receipts could be sent to the Secretariat as soon as possible or at the latest within one month of the meeting.
1.3	The Chairman informed WATCH members that the following ad-hoc members, Jeff Friar (Jeff Friar Ltd), Jean Prentice (McCrone Scientific Ltd) and Robin Howie (Robin Howie Associates), had been invited to provide additional expertise to the discussions on exposure to asbestos in textured decorative coatings and from the use of drawing pins on asbestos-containing insulating board in a

	classroom setting. During these items, the status of the invited experts is identical to that of the permanent WATCH members. In addition, two members of the public, Michael Lees and Richard Lees together with Sarah Lyons (NUT) were present for the item on exposure to asbestos from the use of drawing pins in a classroom setting.
1.3	Adoption of agenda WATCH Members agreed to adopt the proposed agenda (WATCH/Agenda/2006/1), relating to the meeting.
1.4	Declarations of Interest No declarations of interest were made.
2	Potential asbestos exposure during the removal of textured decorative coatings (TDCs)
2.1	Background The Chairman began by formally welcoming Mr Jeff Friar, Miss Jean Prentice and Dr Robin Howie who were invited to the meeting as ad-hoc members with expertise in asbestos exposure assessment. The Chairman also introduced from HSE Dr Garry Burdett, the principal scientist involved in the two research reports given in Annexes 1 and 2, Dr Martin Gibson who has lead responsibility for asbestos occupational hygiene work in HSE and Andrew Darnton, one of the authors of the "Hodgson and Darnton" paper given in Annex 3.
2.2	He then drew the attention of the Committee to the error in paragraph 19 of the cover paper (WATCH/2006/1) noting that the values for the current and proposed future 10-minute control limits should read 0.9 and 0.6 f/ml respectively.
2.3	HSE's perspective An HSE representative then gave an introduction to this item. He began by saying that textured decorative coatings (TDCs) were included in the licensing regulations in 1983, under the category of "asbestos coatings", which included other coatings such as sprayed 'limpet' asbestos. HSC had previously consulted on the removal of TDCs from these Regulations in 1998, although at that time it was decided that they should remain within the scope of the legislation.
2.4	He then compared the percentage asbestos content of TDCs (2-4% chrysotile) to that of other licensed asbestos-containing materials such as sprayed coatings (55-85% amosite and crocidolite), blankets, felts and papers (100% chrysotile), loose fill mattresses etc. (100% crocidolite) and reformed thermal (15-85% amosite) and asbestos insulating board (15-40% amosite), demonstrating that in comparison to these other materials TDCs contain a relatively low amount of asbestos.
2.5	He went on to compare the percentage of asbestos in TDCs to that in some unlicensed asbestos-containing materials, demonstrating that TDCs have a lower concentration of asbestos than unlicensed materials such as bitumen and plastics. He said that evidence showed that during the removal of TDCs much lower airborne fibre concentrations were created (~0.1 f/ml under dry removal conditions with no controls and several times lower using current 'wet' removal practice) as compared to the removal of other licensed asbestos-containing materials such as spray coatings, which can give airborne fibre exposures in the region of 100s f/ml under dry conditions, reducing by 2-3 orders of magnitude to ≤ 1f/ml under wet conditions.
2.6	He then described the difficulties encountered when trying to measure airborne asbestos fibres during dusty removal operations. He noted that in using the regulatory method based on light phase-contrast microscopy (PCM) to count fibres, overloading of the filters with particles prevents accurate counts, as the fibres are too closely packed to be precisely differentiated. Therefore in dusty conditions, such as the dry removal of TDCs, the sampling period and/or the air flow rate must be reduced.
2.7	In decreasing the sampling period and the volume of air sampled, he noted that this results in an increase in the limits of detection (LOD) and quantification (LOQ).
2.8	He noted that sampling a low volume of air, resulted in a lower number of fibres being collected,

	hence the counting precision using PCM is subject to wide confidence limits.
2.9	He then compared the distribution of the results for the short term samples obtained in the HSL studies, in terms of fibre counts, with the established LOD for this methodology based on counts of blank filters. He noted that about half of the short-term fibre counts were below the LOD and only a few exceeded the LOQ.
2.10	He then advised the Committee that samples from the removal of TDCs contain variable proportions of calcium sulphate fibres and particles, due its presence in the TDC itself and the plasterboard on which the TDC is applied. In this study, the heavily loaded filters that were judged to be too dense for PCM counting were water-wicked to remove the soluble calcium sulphate particles and fibres. This treatment removed much of the particulate and allowed the filter to be counted by PCM and gave an average airborne concentration of insoluble fibres of 0.09 f/ml over the duration of the job.
2.11	He went on to say that a sub-set of the samples (mostly those with the highest PCM fibre counts) were chosen for identification and counting of the asbestos fibres using transmission electron microscopy (TEM). Initially, a few samples were analysed using a standard indirect analysis procedure where the collection filter was washed and the particles were re-suspended in water with limited ultrasonification to re-disperse the particles. This type of indirect procedure is well known to significantly increase fibre counts, due to the break up of agglomerates and bundles of chrysotile asbestos fibres; this would increase the number of countable fibres beyond that originally in the sample. Using both this method, and samples analysed directly after wet wicking, the average concentration for this "high biased" sub-set of short-term peak samples during active removal was below 0.08 f/ml.
2.12	He concluded that 4-h TWA samples cannot be taken directly during the process of TDC removal due to the high dust levels created. In the study conducted by HSL (Annex 1), samples taken for the duration of the job gave an average count of less than 0.1 f/ml. He noted that the average value for 4-h TWA exposures was likely to be significantly lower than the average for the peak exposure experienced during the act of TDC removal. Hence he considered that the 0.08 f/ml figure used in the risk assessment performed by HSL (Annex 4) as a cumulative exposure estimate for 8h per day for 240 working days for 5 years would be a large over-estimate of the actual exposure experienced by TDC removal operatives. He also pointed out that it was only theoretically possible for about 200 workers to receive an annual expose in this way, given the current rate of licensed TDC removal.
2.13	The Chairman then invited Robin Howie to provide his perspective.
2.14	Robin Howie's initial perspective He began by highlighting that his main concerns regarding the validity of the work done by HSE on this issue were in relation to experimental design, data analysis and risk assessment procedures. Many of his points were developed in more detail in Annex 6.
2.15	He felt that the results of the HSL study at Annex 1 were, in his opinion, likely to be biased towards representing conditions where operatives took more care than normal, as there was no attempt made within the study to ensure that the operatives were not alerted to the involvement of HSE as a regulatory body.
2.16	He added that in the HSC Consultative Document on the proposed revised Asbestos Regulations (Annex 5) the average duration of a TDC removal job is 3.8 days. However, he noted that in the HSL study (Annex 1) the average duration of TDC removal jobs sampled was less than 4 hours. He felt that the jobs studied in the HSL report were therefore not representative of most TDC removal jobs, although the processes that were carried out during these jobs may have been.
2.17	In addition, he felt that consideration should have been given to the possible spread of asbestos contamination outside of the work enclosure, given that many sites of TDC removal are in residential premises and that residents could include young children who are at most risk from a given exposure, because of the number of years available in their lifetime during which mesothelioma could develop.
2.18	He added that in terms of data analysis the study results were time-weighted. Using this approach meant that exposure information relating to specific processes was lost and because of a presumed absence of further exposure in the time outside of the sampling period for the removal task, resulted in a reduction in the numerical exposure values. He added a further concern, that the interpretation of the results in the HSL study was based on comparing fibre counts obtained using the European Reference Method with the proposed new occupational exposure limits for asbestos. However,

	counts obtained using the new WHO counting method, which should now be used, were a factor of 2 higher.
2.19	In relation to the risk assessment performed by HSL, this was based on a 5-year exposure from the age of 30, which differs from the HSC risk assessment assumption of a 5-year exposure from the age of 20. On this basis, the total risk for the HSL study was 28/million compared to 59/million using the HSC assumptions and the Hodgson and Darnton model described in Annex 3.
2.20	When calculating the exposure duration he also felt that there was an inconsistency in the approach used between the HSL and the HSC risk assessments. Both assessments are based on medical examination records, although the HSL study assumes that the average time in the asbestos industry is 3.09 years, with 90% of workers leaving the industry after 5 years or less. The average age at first medical was 32. However, in a survey of 1060 ARCA members 83% had served ≥ 2 years, 56% served ≥ 5 years, 34% served ≥ 10 years, 22% served ≥ 15 years and 11% served ≥ 20 years.
2.21	He also noted that there was an increase of approximately 4000 operatives in the asbestos industry between 1998 and the date of the data provided in the HSC consultative document (Annex 5) and from this noted that at least these 4000 operatives and their annual replacements (assuming a 25% staff turnover) could not have had more than 3 years service in the industry. However, a proportion of this group can be expected to go on into the future to have longer periods of employment in TDC removal.
2.22	He concluded by suggesting that if one assumes that the cumulative fibre dose is the critical index of risk, then an alternative risk assessment approach can be taken. For this he used the details of the ARCA survey: that the 1060 employees had a total service of 9055 man-years and of these 256 had length of service of ≤ 2 years (comprising 2.8% of the total man-years); 221 received half of the total cumulative inhaled dose for the entire group, and these operatives had an average of 19.6 years service with an average age at entry into the industry of 26.9 years. Based on this information he felt that the risk estimate should be based on a 20-year exposure from an age not older than 25 years.
2.23	Following this approach he estimated that the risk from exposure to 0.08 f/ml, based on an exposure pattern of 20 years from age 25, would be 88 per million using the Hodgson and Darnton model described in Annex 3. The corresponding HSL risk estimate of a 5-year exposure pattern from the age of 30 years was 28 per million.
2.24	WATCH discussion on potential asbestos exposure The Chairman then reminded members of the two Action Points within the cover paper (WATCH/2006/1): [1] To give a view on what is the most reliable estimate of the potential extent of occupational exposure that could arise during the removal of asbestos-containing textured decorative coatings. [2] To give its views on the robustness of the HSL work done to assess such exposure and the "conservative" estimate of the average airborne asbestos exposure level of 0.08 f/ml used in the published risk assessment in the consultative document.
2.25	He indicated that discussions should focus on these points; at this meeting WATCH was not being asked to consider how to interpret exposure in terms of quantifying the risk to exposed workers. He then invited all Committee members to give their comments.
2.26	A WATCH member stated that he was supportive of the research performed by HSL and that, in his opinion, it was performed to the best available standards, particularly in relation to the techniques used to separate fibres of different types. He added that, in his view, the value of 0.08 f/ml (4 h TWA) for asbestos exposure during TDC removal represented a worst-case scenario.
2.27	He added that in his experience, good practice techniques for dust suppression are generally employed when removing asbestos-containing TDCs. However, even under conditions of good practice dust is still generated. The use of steaming and stripping, the most obvious recommended method of wetting, is difficult to do in practice and therefore is not often performed.
2.28	In relation to the removal of TDCs on plasterboard, he noted that generally the first step in the procedure involves the removal of the plasterboard, rather than scraping off the TDC. In this way some of the problems encountered when trying to measure asbestos fibres in the laboratory, such as excessive dust production created by scraping then overloading the filters, would not occur in practice in such situations. He also felt that if all the plasterboard was removed with the TDC still attached, then extremely low concentrations of fibres in the air (below the LOD) would be expected in this

	scenario.
2.29	In terms of exposure to asbestos outside of the exclusion area he indicated that in his experience exposure to asbestos would be limited, as the removal area is cordoned off in such a way as to protect the external environment.
2.30	He also indicated that calculated time-weighted average exposures are used only for comparison with the published time-weighted average control limit and that this limit and comparison applies only to asbestos workers (<i>i.e.</i> those within the enclosures). He added that in his experience, many asbestos removal workers either had a long continuous career involving exposure to asbestos or are repeated returners to the asbestos removal industry. In his opinion it is also well known within the industry, including its emphasis in asbestos removal training courses, that exposure can be controlled to 1 f/ml even in the worst-case scenario.
2.31	Another WATCH member reiterated the problems of monitoring within an enclosure where TDCs are removed using a dry-removal spray technique.
2.32	She was also of the opinion that up until 1997 HSE did not enforce the necessity of licensing for the asbestos-containing TDCs. In her opinion there was a need to distinguish between TDC removal in residential properties that could result in exposures where children may be present and TDC removal as part of large demolition jobs.
2.33	A further WATCH member noted that with regard to demolition work, current modern day practice is to send concrete debris for grinding and subsequent recycling into aggregate. During such processes, exposure to asbestos fibres would then be combined in a general exposure to a silica-based dust. Such exposures should then be subject to other control measures aimed at limiting the risk to health posed by silica. He felt that in this scenario the total exposure problem is not necessarily solved, but that the concern about asbestos exposure is diluted by the presence of other issues.
2.34	Another WATCH member returned to the difficulty of measuring the exposure to asbestos in dust-generating situations such as TDC removal. Separating out asbestos fibres based on water solubility had, in his view, given plausible results. He then questioned whether any validation was available for the discrimination of asbestos fibres in this way; in particular he was interested to find out if the addition of water caused displacement of the fibres on the filter due to the movement of the water and whether there was any effect of water on the refractive index resulting in difficulties in identification and counting by PCM.
2.35	An HSE representative replied that validation of this technique has been performed. It demonstrated that the fibres penetrate and are trapped within the structure of the membrane filter. Observations have shown that there is no spread of fibres across or through the filter during the water washing stage. Once the water is taken up, the filter is then dried before analysis, thereby removing the concern regarding effects on the refractive index.
2.36	A further WATCH member asked whether any further details could be given of the sites that were sampled to indicate if they were a typical representation of those receiving the attention of the TDC removal industry today?
2.37	An HSE representative replied that in his opinion the survey was representative. The HSL study was performed 18 months ago using a selection of sites, including the removal of asbestos-containing TDCs from domestic premises and large-scale demolition jobs. The sites were selected from an overall list of notifications obtained from several British insurers and represented what was broadly being dealt with at the time. The survey was based on sampling 35 sites, with jobs lasting for 1-3 days (often at 1 day sites the period of active removal that was targeted for sampling was <4 hours). The majority of the samples taken were peak exposure samples during active removal and disturbance of the TDC. However, although 4-h TWA values had been calculated, his presentation and summary results only referred to the peak short-term individual sample measurements. He added that to avoid bias in the study an external contract laboratory was used to perform the sampling and interface with the contractor on-site. He said that there was no reason for the removal contractors to know or suspect any HSE/HSL involvement except at three sites where HSL field scientists carried out side-by-side QA sampling. In general sampling commenced when the TDC stripping began and continued until the stripping had stopped.
2.38	A WATCH member then enquired if the sampling included activities such as sweeping and clearing

	up of the rubble?
2.39	The HSE representative replied that the sampling strategy was to sample as soon as the TDC was disturbed and to carry on until the TDC was bagged up for disposal and cleaning up of any remaining rubble was completed. After this a four-stage certificate of re-occupation inspection would start which included a visual assessment of the area, undertaken to assess how "clean" it was.
2.40	The WATCH member then asked if the operators at the sampling sites were trained in the correct procedures for asbestos removal?
2.41	The HSE representative replied that by definition they were trained; training is a requirement in order to obtain a licence. He also noted that if, following HSC's consultation procedure, the removal of TDCs was to be unlicensed, the European Asbestos Worker Protection Directive which requires that workers receive appropriate training, would still apply.
2.42	A further WATCH member asked under what other asbestos exposure situations does dust affect the assessment of fibres by phase-contrast microscopy? Another WATCH member replied that there might well be other situations. He also stressed that all fibres of the correct size, such as carpet and cement fibres would interfere with counting methods. This is a common problem and the non-asbestos fibres cannot be distinguished from asbestos fibres by light microscopy. Instead TEM is necessary costing £300 per sample and requiring 3 days to complete the analysis.
2.43	The HSE representative added that asbestos fibres are likely to be the only particulate matter now assessed by light microscopy. If asbestos removal is performed under dry conditions, without measures aimed at the control of dust at source, then lots of dust particles are inevitably generated. If measures are taken to control dust at source (<i>i.e.</i> wetting) then it is likely that some of the sampling problems could be alleviated and a 4-hour sample could be taken. However he felt that in reality, TDC removal is usually performed using dry methods, as short-duration wetting processes are ineffective; wetting agents do not penetrate very far into the coating so an operator is always scraping against a dry layer. He added that it is possible to steam a room for 24 hours, thereby wetting the full thickness of the coating, although under these conditions measurements of airborne asbestos fibres cannot be taken.
2.44	The previous WATCH member then asked whether in the asbestos extraction and/or asbestos products manufacturing industries other fibres also interfere with exposure measurements leading to an over- or underestimate of asbestos exposure?
2.45	The WATCH member responded by saying that some industries, such as those concerned with asbestos cement will always have a problem with the presence of other materials.
2.46	A further WATCH member asked if the sampling performed in the HSL study took account of potential exposure by any lateral disturbance of the asbestos and whether the aerodynamic characteristics of the asbestos fibre (<i>e.g.</i> their potential to reappear in the breathing zone after the removal task has been completed) will affect extrapolation from peak to long-term exposure, leading to an underestimation of the exposure?
2.47	An HSE representative replied that airborne asbestos fibres settle out exponentially; disturbance of asbestos fibres leads to an initial, relatively high level of airborne fibres that are subject to exponential decay over time. Given this, in his view, peak measurements will equate well to the total asbestos exposure conditions experienced when removing a TDC-covered ceiling.
2.48	The WATCH member then clarified with HSE that its opinion was that during removal activity the highest asbestos exposure levels will occur from TDC during its immediate removal from a ceiling rather than during clearing up any resulting rubble.
2.49	Another WATCH member added that there is a long tail to the overall exposure profile with time following TDC removal and the use of protective clothing throughout the removal process, including clearing up, is aimed at limiting exposure during the entire period. He felt that having TDC removal activities, as a licensed procedure, was an advantage in this respect.
2.50	Another WATCH member then referred to point 5.1.2 of Annex 6, and asked if in the design of the HSL study, any consideration was given to assessing the removal of different types of TDCs from different underlying surfaces (<i>e.g.</i> plasterboard, brickwork). In particular, he asked whether there could be a removal scenario that could involve numbers and/or types of fibres being generated that would pose a greater threat to health than the results of the HSL study would indicate?

2.51	An HSE representative replied that the sample sites in the HSL study were weighted towards demolition sites (i.e. sites where the TDC and the underlying material were both removed). A summary of all available data from a wide range of sites was given in Annex 2. He added that recent HSL work undertaken at other sites of TDC removal has given similar exposure figures. His experience is that most licensed TDC removal work is performed in a very dusty environment.
2.52	The Chairman then drew the attention of the Committee to the two action points in the cover paper. He asked the Committee for its view on what tighter and more specific descriptors of occupational exposure need to be considered in relation to Action Point 1?
2.53	His initial thought was to specify that the exposure assessment was for operatives only, with and/or without the use of personal protective equipment. He added that WATCH might consider and offer a separate exposure assessment for others outside of the enclosure. He also asked what would be the most appropriate way of expressing the degree of exposure likely to be experienced by any specific group?
2.54	A WATCH member then asked if, in addition, the consideration should also include the method used for measuring the exposure?
2.55	A further WATCH member suggested, as an example, that the words 'controlled removal' should be included in Action Point 1 to clarify the overall conditions under which operatives would be working, for the exposure estimate offered by WATCH to be valid.
2.56	The Chairman replied that it was within the rights of the Committee to characterise the scope of any position that it developed.
2.57	Another WATCH member then expressed his concern if WATCH were to generate a position that was valid only for those workers that were licensed at present, if the position was not also to be valid for those that would be exposed in the future if licensing was not required. He added that he was concerned that workers who were unaware of the dangers of asbestos, for example domestic decorators working in small firms, would not be covered by any exposure assessment made by WATCH and therefore be excluded from considerations in any subsequent decision making.
2.58	An HSE representative replied that it is HSE's view that there is unlikely to be a situation during the removal of TDCs where exposure would exceed 0.08 fibres/ml for a 4h TWA, although extreme measures e.g. power sanding will be capable of generating higher exposures. However, the use of such extreme measures (power tools) is prohibited under the Control of Asbestos at Work (CAW) Regulations.
2.59	Another WATCH member then expressed his opinion that the work performed by HSL was as robust as possible in terms of representing the TDC removal scenario.
2.60	He felt that 0.08 fibres/ml (4h TWA) is an upper estimate of exposure for a person undertaking TDC stripping. He felt that achieving an exposure level of 0.1 fibres/ml (4 h TWA), although not impossible, was very unlikely. He added that the use of a respirator would also further decrease exposure of the operator.
2.61	He went on to note that licensing also covered the clean-up of asbestos-exposed areas and the exposure of building occupants. In his view, having such a low exposure during TDC removal would suggest that licensing was not required for this operation; this would be consistent with the position on work with asbestos cement. However, he felt that the occupants of the buildings, particularly residential buildings in which TDC removal is undertaken, should also be considered in relation to the scope of the licensing legislation.
2.62	He was of the opinion that if licensing remains required for TDC removal, then consideration should be given to how to regulate other asbestos exposure activities where exposure was greater than for TDCs e.g. work with asbestos-containing cement.
2.63	A further WATCH member then asked if a numerical value for the exposure experienced through <i>uncontrolled</i> TDC stripping activities could be given?
2.64	An HSE representative replied that the figure of 0.08 fibres/ml (4h TWA) has been derived for a "worst-case" scenario
2.65	He added that at this time TDC removal was licensed and so <i>uncontrolled</i> removal of TDCs should not be available to monitor. Data from simulations suggest that uncontrolled stripping of TDCs

	increases peak personal exposure by 25% which has no significant effect on the calculated value for a 4 h TWA exposure.
2.66	A WATCH member also asked if it would be possible to add a caveat into the position developed on Action Point 1 that the exposure assessment was for conditions of good practice?
2.67	The Chairman then asked the Committee to consider its view with regard to Action point 1, for an operative exposure experienced under conditions of best practice.
2.68	A WATCH member replied that there might be two types of “best practice” to consider; one that is occurring now, whilst TDCs are still contained within the licensing scheme and another if TDCs were no longer licensed.
2.69	Some WATCH members indicated that they were in support of the exposure assessment of 0.08 f/ml (4 h TWA). One commented that the HSL study represents the best available data and therefore this evidence should be used.
2.70	A WATCH member asked if the question in Action Point 1 referred to stating a numerical estimate for the exposure to asbestos during the removal of TDCs or to describing the scenario for which an estimate might be given? In his opinion, the most appropriate estimate of asbestos exposure to give is one that is based on the uncontrolled removal of TDCs, as this is the highest occupational exposure that could arise. The WATCH member continued that paragraph 20 of the cover paper (WATCH/2006/1) stated that “uncontrolled dry-hand scraping of chrysotile-containing textured coatings [creates an exposure that] is less than twice the conservative average used for the controlled removal”. This logic would lead one to an estimate for uncontrolled removal of 0.16 f/ml (4h TWA).
2.71	An HSE representative replied that paragraph 20 of the cover paper was an attempt at expressing that even under uncontrolled removal conditions exposure to asbestos fibres was very unlikely to exceed twice the average level measured for the controlled removal of TDCs. He added that it was also possible that an occasional peak sample might also exceed this level due to the poor counting precision and low volume of air sampled, but it is considered very unlikely.
2.72	Another WATCH member also suggested that the exposure to asbestos might be greater than the 0.08 f/ml (4h TWA) value as the evaluation was performed under ERM rules. Application of the WHO rules which will come into force later this year was reported as giving twice the count. He attributed this to potential limitations in the HSL study. In his opinion, a value of about double the 0.08 f/ml figure was appropriate.
2.73	The HSE representative noted that the counting rules for TEM included all asbestos fibres regardless of attachment to particles and TEM results were consistent with the reported data. He emphasised that it would be unlikely in practice for the exposure prediction of 0.08 f/ml (4h TWA) per day, every working day, to be exceeded, unless in an extreme situation.
2.74	On further reflection, the previous WATCH member then agreed with the value of 0.08 f/ml (4h TWA) as an upper estimate of the exposure of operatives under likely conditions prevailing during TDC removal.
2.75	Another WATCH member confirmed his view that information from the HSL study suggests that exposure to asbestos fibres would be unlikely to exceed 0.08 f/ml (4h TWA) in TDC removal.
2.76	The Chairman then reflected back to the Committee that it seemed to be coming to a consensus around something close to the following statement; that a reliable upper estimate of the potential extent of occupational exposure to an operative arising during the process of removing asbestos-containing TDCs under realistic good practice conditions is 0.08 f/ml (4h TWA). He suggested that possible modifications to the wording could include some or all of the phraseology: “a prediction of the upper end of the airborne fibre release created is 0.08 f/ml of chrysotile fibres using the WHO method”.
2.77	A WATCH member then wondered whether such statements related to licensed removal conditions, or those expected under non-licensed removal?
2.78	The Chairman responded that his interpretation of the views of WATCH members was that this statement applied to conditions of good practice. He felt that it would not be helpful to the broader considerations surrounding the licensing or otherwise of TDC removals if WATCH were to constrain

	the statement to only those working under licence.
2.79	Other WATCH members added that the statement required clear definition of the working conditions; "good practice conditions" should be those under which current licensees operate.
2.80	Another WATCH member questioned what conditions could be considered as best practice? He highlighted the problems discussed earlier surrounding the use of wet stripping to remove TDCs. Would wet stripping be considered "good practice" or "best practice" and if so, which form of wet stripping?
2.81	The previous WATCH member said that in reality when performing the conventional wet stripping technique the operators are scraping off the wet TDC against a layer of dry TDC, due to the difficulties of permeating the TDC discussed earlier. Overall, he had a concern that if TDC removal were de-licensed then the standard of "good practice" might decline, if future operators no longer received the necessary training.
2.82	An HSE representative indicated that the conditions for good practice are given in the CAW Regulations. The Chairman then suggested that this point could be used to better define the WATCH position.
2.83	A WATCH member then suggested adding something along the lines of the following sentence to the statement: "When complying with the CAW Regulations the exposure to airborne chrysotile fibres is unlikely to exceed 0.08 f/ml (4h TWA)".
2.84	A WATCH member then indicated that on pages 110-112 of the HSC consultation document (Annex 5) the conditions appertaining to the safe removal of TDC are clearly described.
2.85	<p>The Chairman then reflected back statements for members to consider. The Committee agreed that these statements seemed to be an appropriate portrayal of the consensus position of WATCH. The Chairman then said that members would have that opportunity to consider the precise wording of the conclusions during the process of clearing the draft minutes. The wording of the statements below now incorporates amendments and post-meeting considerations suggested by WATCH members during the post-meeting consultation round.</p> <p>[1] WATCH concluded that 0.08 f/ml (4h TWA), as chrysotile fibre, is the most reliable estimate of the upper end of the range of potential exposures that could arise for operatives engaged in the removal of asbestos-containing textured decorative coatings, under conditions compatible with the Control of Asbestos at Work (CAW) Regulations 2002. All but one member considered that this was also a valid exposure estimate for working conditions compliant with those in the ConDoc for the draft Asbestos Regulations 2006. *</p> <p>All but one member of WATCH considered that the research undertaken by HSL was appropriate to address exposure of operatives under such circumstances and that the results were reliable in this context; one member preferred to state that the research undertaken by HSL permitted assessment of exposure of operatives under CAW (2002) circumstances.</p> <p>[2] WATCH agreed that the HSL study was not designed to address the question of the potential spread of asbestos contamination into premises from which asbestos-containing textured decorative coatings were being removed.</p> <p>One WATCH member stated that he considered that a competent study should have been designed to address this gap in knowledge and that such a gap in knowledge was a critical omission, particularly as the HSL study was undertaken in residential premises which could be reoccupied by children and that under the proposed CAW Regulations enclosures for work with textured coatings would not be fitted with Negative Pressure Units and would be fitted only with two-stage airlocks.</p>
2.86	* The dissenting member wished to record his refusal to accept any consequences of what he regards as scientifically invalid conclusions arising from inadequate post-meeting discussions.
3	Asbestos exposure from use of drawing pins in asbestos insulating board (AIB)
3.1	Introduction

	The Chairman began the item by introducing Mr Michael Lees, his brother Mr Richard Lees and Ms Sarah Lyons (NUT). He then invited Michael Lees to provide the Committee with his perspective on this item.
3.2	Michael Lees' perspective Michael Lees said that, in his view, all aspects of the use of drawing pins in asbestos insulating board (AIB) in schools should be considered. He felt that citing the details of the case of his wife, a schoolteacher who died of mesothelioma, would reveal informative details of typical schoolteachers' practice in the classroom.
3.3	He informed the Committee that his wife was an infant and junior schoolteacher who worked in a variety and number (approximately 25) of schools over a 30-year career. He considered that during this time she was exposed to asbestos in a variety of ways, but that every day she would hang up displays that the children had made. He explained that his main concern is for teachers still alive today who performed similar tasks; and also for the children that were present in such classrooms. He felt that all concerned should be made aware of the level of asbestos exposure experienced and the potential risk incurred as a consequence.
3.4	Mr Lees stated that the WATCH cover paper, WATCH/2006/2, had given an incorrect statement of his concerns at paragraph 5 and hence he had provided, to the secretariat in writing, a more accurate description of his position. This is provided at annex 9, item 5.
3.5	He added that in a letter received from Mr Bill McDonald (the then head of HSE's Asbestos Policy Unit) it stated that within the UK, 13000 schools were built incorporating large amounts of asbestos and in addition many other schools have been refurbished with asbestos-containing materials. He said that today the majority of these schools still contain such asbestos, with a significant minority having inadequate asbestos plans.
3.6	He then expanded further on his wife's role as a schoolteacher, indicating that she would hang up children's work on a daily basis from the ceiling of the classroom using drawing pins. During this procedure her face was very close to the insertion site as she would stand on a chair to carry out the activity. On at least one occasion he had seen her brush off the resulting debris from her face, hair and clothes. He was aware that the debris was also present on the floor where schoolchildren would regularly sit.
3.7	Mr Lees contacted Mr Robin Howie (Robin Howie Associates (RHA)) who conducted research which indicated that putting drawing pins into AIB would result in the release of 6000 f/pin. In contrast, research conducted by HSL (Annex 2b) reported the release of asbestos as 30 f/pin, rising to 60 f/pin if the AIB was damaged. It was Mr Lees' opinion that if his wife had to brush debris from her face, hair and clothes after inserting pins into AIB then 30 or 60 f/pin was unrealistically low as a prediction of asbestos fibre release.
3.8	He felt that concerns he had raised regarding the methodology used in the HSL study, producing these low fibre release measurements, and resulting exposure assessments based on them had been ignored. He said that both he and Mr Howie had requested that if any further tests were carried out by HSE/HSL that they should be performed with parameters and methodology agreed by all parties. Despite this HSL carried out a second series of tests without such consultation. It was then frustrating that subsequent correspondence from HSE/HSL states that no further testing or meetings will be held.
3.9	Mr Lees then expressed his wish to obtain a definitive opinion from WATCH on the number of fibres to which teachers and children could be exposed and the likely risk of developing mesothelioma. If such agreement could not be obtained then he proposed an agreement to perform a new series of tests using a mutually agreed approach.
3.10	The Chairman thanked Mr Lees for these opening remarks. He drew the attention of the Committee to the photograph of the drawing pin and explanatory text describing the number and position of the drawing pin holes made in the second HSL study (WATCH/2006/2 annex 6) in a document tabled at the meeting. He then invited Robin Howie to provide his perspective to the Committee.
3.11	Presentation by Robin Howie <u>Study design</u> Mr Robin Howie informed the Committee that in the work he had done on this issue he was asked to

	determine the asbestos fibre emission from the insertion and removal of drawing pins into and from AIB and whether teachers, schoolchildren and other classroom personnel were at significant risk from this activity. In making his exposure assessments he worked on the basic premise that a known amount of contaminant emission into a given environment allows an estimation of the likely exposure concentration.
3.12	For his study he devised a cyclone micro-vacuum sampler that removed large particles of debris. He also performed studies using the standard conducting cowl method.
3.13	<u>Comparison of the studies</u> In the first study conducted by RHA, using the cyclone micro-vacuum method, fibre release was 6500 f/hole based on 75 well separated holes and 25 holes generated in close proximity. A second RHA study compared the cyclone micro-vacuum and conducting cowl methods of measurement. Using the cyclone micro-vacuum method, 3400 and 8000 f/hole were measured for well-spaced and closely spaced holes, respectively; while using the conducting cowl method 1300 and 3700 fibres/hole were measured, respectively.
3.14	Robin Howie said that these results compare favourably with the results in Table 2 of the first HSL study (Report No. MF2004/02; Annex 2b of the WATCH documentation) in which 5900 f/hole were measured using the cyclone micro-vacuum method, while 1300 f/hole were measured using the conducting cowl method. However, he could not understand the values of 30 and 60 f/hole being obtained in other studies within this HSL report and suggested that these were anomalous.
3.15	In the second HSL study (Report No. IF2005/06; Annex 6b of the WATCH documentation), airborne sampling was carried out using the cowl method in a relatively "large" exposure chamber. Two discrete tests were carried out measuring airborne fibre concentrations released from well-spaced holes. The exposure data from these tests had been extrapolated by Robin Howie to produce an estimate of the number of fibres released per hole. He calculated that the first test results equated to 4600 – 9400 f/hole, while the second test results equated to 14000 – 27000 f/hole. He felt that these figures compare well with data obtained in the study conducted by RHA.
3.16	Using the estimated results from the second HSL study, he concluded that the HSL cyclone micro-vacuum and conducting cowl sampling methods underestimated the fibre emission by factors of between 3 and 9, compared to the "large" chamber study where cowl sampling was used. He also concluded that the earlier "small" chamber study (Annex 2b) using cowl sampling underestimated fibre emissions by a factor of between 150 - 450 compared to the "large" chamber cowl study.
3.17	<u>Factors affecting the conduct of the studies</u> He then reminded the Committee that the air sampler collection efficiency varies as the inverse square of the distance between the sampler inlet and the point of source. Samples in the HSL "large" chamber study were taken on the shoulder of the operator, a factor of 2 further away from the breathing zone. Also, he felt that there was a possibility that exhaust air from the respirator worn by the operator may have had an effect on the sampler, creating an underestimate of exposure.
3.18	He also indicated that the possible contribution to total exposure of asbestos fibres from debris then being rendered airborne was not considered in the estimate of exposure in the HSL work. He felt that micro-vacuuming of the clothes and respirator of the operator should have been performed but was not.
3.19	Furthermore, because of the very high air flow rate used in the HSL "large" chamber test, 90 % of airborne fibres would have been extracted from the chamber during the 25-minute pin-sticking period; and of what remained, a further 90 % of this would have been lost to extraction in the no-activity period. These factors mean that in the HSL study there was little opportunity for fibres released from the pin holes to sediment and thereafter be resuspended.
3.20	Mr Howie then advised the Committee that in his opinion, resuspension of asbestos fibres from debris on the floor of the classroom is another possible source of exposure that should be considered, particularly for young children who spend a large proportion of their school day sat on the floor. He felt that a sampler set at the height of a child's breathing zone should also have been included in the HSL testing strategy.
3.21	<u>Robin Howie's initial conclusion</u> He then concluded by saying that, in his opinion, the results obtained in both his and the HSL studies

	suggest that the use of drawing pins in AIB create exposure to amosite asbestos and thereby poses a risk to people in the classroom.
3.22	The Chairman thanked Robin Howie for his presentation and invited all Committee members to give their views.
3.23	WATCH discussion: asbestos exposure assessments A WATCH member began by making a comparison. He noted that within the shipbuilding industry operators have been exposed to around 10 billion fibres per day. The use of a respirator could reduce this to 250 million fibres/day. Comparing exposures in the shipbuilding industry with those described here for a classroom setting in his opinion it could be concluded that the exposure is relatively low.
3.24	He confirmed that within the occupational hygiene field, by definition the breathing zone is measured at a distance of 20-30 cm from the mouth. He was not convinced that in this situation all debris and/or fibres released from the AIB would travel straight down and hence enter the breathing zone. There may be some dispersion sideways. His opinion was that it is difficult to know what the 'real' exposure might be. To address the point regarding debris he felt that one cannot calculate any reliable figure for airborne fibre exposure as a result of resuspension, because one cannot assess the full range of possibilities for what people might do to debris on the floor.
3.25	He added that in his experience AIB is widely distributed in schools and sometimes it is abused. In his view, it should be expected that headteachers would not be competent in terms of asbestos management.
3.26	Given that the measurements of airborne asbestos fibres due to the use of drawing pins in AIB were low, he felt that any risk assessment would contain a substantial degree of uncertainty. However, he felt that the exposure and the risk was an avoidable one and therefore the practice of using drawing pins in AIB board should be prevented.
3.27	Michael Lees then added that he agreed with the WATCH Committee member's statement that a precautionary approach should be taken. This issue was first raised 5 years ago with HSE and the relevant trade unions. In his opinion this issue should have been resolved then and action taken.
3.28	Another WATCH member then responded by agreeing that the exposure to asbestos fibres in this situation was low. In a room measuring 5m x 5m x 2.5m, 625 000 total fibres (the release from 100 drawing pin holes) calculates to 0.01 fibres/ml. However, it was felt that the activity resulting in exposure was avoidable and should be stopped.
3.29	Discussion on the different test methodologies used A WATCH member questioned whether in the HSL chamber study the respirator would have influenced the results as suggested in the presentation by Robin Howie? He felt that if this was the case, then the exposure value for the sample measured on the right should be greater than the left shoulder sample.
3.30	An HSE representative replied that there was good agreement between the samples taken on the left and right shoulders and from that he felt that the respirator did not have an effect on the sampling.
3.31	Another WATCH member commented that the description of the activity of the schoolteacher given by Mr Michael Lees was similar to his own knowledge. Some of the numerical data quoted by Mr Lees, together with his own experience, appeared to be at odds with the assumptions made in the HSE report at Annex 3. He was also unsure of the reason for the difference in the fibre measurements in the various annexes of this WATCH paper; figures quoted ranged from 60 – 6000 fibres/pin hole and he wondered if a clearer explanation for this wide range could be given?
3.32	An HSE representative replied that it was due to the different collection characteristics of the sampling apparatus used in the different studies. The apparatus used by Mr Howie vacuumed up dust and debris. The sampling and performance characteristics were unknown and it was difficult to relate measurements to occupational hygiene standards. The equipment developed by HSL monitored personal exposures to airborne asbestos fibres by collecting airborne fibres released close to the emission source.
3.33	A WATCH member noted that the method used in the study performed by RHA did comply with the ASTM-5755-95 technique.

3.34	The HSE representative replied that, ASTM-5755-95 is used to monitor surface dust concentrations of asbestos. The description of the method itself acknowledges its limitations as stated in section 5.1.2; "At present, a single direct relationship between asbestos-containing dust and potential human exposure does not exist. Accordingly, the user should consider these data in relationship to other available information in their evaluation". He felt that two questions regarding the potential contribution of debris to airborne fibre exposure should be considered: (1) what is the exposure from debris that isn't inhalable? and (2) what contribution would any respirable fibres from the debris make to the overall exposure? These were complex questions to resolve and had many variables, but would have a small influence on the personal exposure during the activity.
3.35	He added that the first HSL study (Annex 2b), initially used and tested Robin Howie's sampling equipment but in the first test, there was a problem with the equipment as supplied. After conversations with Robin Howie, a reducing diaphragm was removed from the apparatus and the test repeated; hence the two different sets of results when testing the supplied apparatus in the first HSL report. Further test sampling was based on an adaptation of the standard conducting cowl sampler that is used for airborne fibre measurement. This was used by HSL as this would give a more accurate estimate of the respirable airborne fibre concentrations released during the insertion and withdrawal of the pin. The HSE occupational hygienist who commissioned the work (Mark Piney) felt that in the study performed by Robin Howie using micro-vacuuming, much debris was also sucked into the apparatus, potentially releasing fibres that otherwise would not have been airborne. The HSE representative went on to explain that in his own opinion, the different bench type tests that had been carried out were difficult to interpret and did not really address the main issue – what was the "peak" personal exposure to the person while carrying out this activity. He had advised Dr Piney that a simulation should be carried out by HSL to determine the actual personal exposure. Therefore the second HSL study (Annex 6b) was a reasonable attempt to simulate and measure the peak personal airborne exposure from this type of disturbance and damage to AIB. The second HSL study had different objectives and limited analytical sensitivity when compared to the report and calculations performed by HSE's Mark Piney (Annex 3), which estimated the concentration of asbestos assuming the released airborne fibres were evenly distributed throughout the classroom. He also stated that in his opinion the first HSL tests did not fully assess the potential personal exposure of the teacher in the act of inserting and withdrawing drawing pins from AIB.
3.36	Another WATCH member expressed his opinion that variability in the age and physical state of the AIB, as well as differences in the teacher's behaviour, would influence exposure. He felt that the test chamber study represented a model situation and that wherever possible it is better to study real life exposures. He also considered that the debris could be important, as environmental studies have shown that any dust or fibres on floors could become airborne.
3.37	A further member then asked whether WATCH was right to assume that the HSL test using the micro-vacuum constructed by Robin Howie gave broadly similar results to the test carried out by Robin himself.
3.38	The HSE representative replied that this was broadly correct, as the emissions were low compared to many other types of disturbance activities. However, the number of fibres using the cowl technique (that did not collect debris), was lower. This was a more interpretable result, as this was a direct measure of the number of regulatory airborne fibres released, which is also the current index used for occupational hygiene control and risk assessment.
3.39	The WATCH member responded that, in his opinion, the practice of putting drawing pins into AIB should be stopped and asbestos management plans within schools should be the vehicle for this. He also agreed with the view that exposure to asbestos from this practice will depend on a number of variable factors such as ventilation rate, frequency of pinning, the technique used, the position of the face when performing the task and the fact that the ceiling will deteriorate over time.
3.40	A WATCH member said that, taking into account the different methodologies, he was not surprised that different studies produced different results. He was unsure of the relevance of the debris to total inhalation exposure but nonetheless felt that the debris could not be ignored. He added that staples are now used instead of pins in some areas and he thought that these might make even more mess when removed.
3.41	In terms of sampling he felt that there was no perfect technique and that all methods could potentially lead to errors. Of the two methods to be considered here, the cowl sampler has well known characteristics and weaknesses; the micro-vacuum technique is a less well-characterised sampling method. Both give an indication of the total number of fibres that could be released from pin holes to

	enable the number of fibres potentially available to be breathed to be modelled. He felt that sense could be made of all the figures in the WATCH paper by considering both an extreme worst-case situation and a more credible “real-life” situation.
3.42	<p>He offered two possible approaches to making an exposure estimate. [1] Using micro-vacuuming, fibre release ranges from 1000 – 8000 f/pin. He proposed to take the value in the HSL report of 6000 fibres/pin being released and assume that 100 pins were used each day over a period of 25 minutes, that this is a daily occurrence, and that it is a strenuous activity entailing a breathing rate of 10 m³ in 8h, which translates to 0.5 m³ of air being inhaled in 25 minutes. If all the fibres released are inhaled then 6000 f/pin x 100 pins x 25 min x 0.5 m³ air gives an exposure of 1.2 f/ml in 25 minutes. If there were no further exposure, then averaged over a 4-hour period this would be equivalent to 0.125 f/ml and averaged over an 8h working day it would be 0.063 f/ml (8h TWA).</p> <p>[2] Using the results from the cowl sampler and direct exposure under the simulated conditions in the HSL large chamber study (Annex 6b) assuming an airflow through the chamber in the region of 1-3 air changes/h (a likely classroom situation) and that dispersion of fibres within the room would not occur in this time frame then the measured value for exposure of 0.05 f/ml during a 25-minute period of active pinning is reasonable. This equates to an exposure of 0.005 f/ml (4 h TWA). He felt that these are ‘worst-case’ estimates, [1] for the calculated theoretic maximum and [2] for the “realistic worst case” situation.</p>
3.43	Another WATCH member then replied that he could accept the value of 0.05 f/ml from the HSL chamber study but, in his view, the total emission of fibres from AIB pin holes was a factor of 3 greater than the results obtained in the micro-vacuuming study.
3.44	Another WATCH member then asked if a reasonable assumption could be made for the likely fraction of asbestos fibres that might be inhaled following debris falling on a person’s head?
3.45	The WATCH member replied that it is not possible to say what fraction may be inhaled subsequent to falling debris.
3.46	The Chairman then reflected back to the Committee the proposed position: that a realistic worst case exposure could be 0.05 f/ml in a 25-minute period of pinning activity, which translates to 0.005 f/ml (4 h TWA) and that this represents the upper end of a potential real-life exposure distribution. An extreme case calculation, where every fibre released from the pin holes is inhaled (a theoretical extreme) gives an exposure of 1 f/ml in the 25 minute activity period, or 0.06 f/ml as an 8 h TWA. He then asked the Committee for its view on this statement.
3.47	A WATCH member agreed with this statement but suggested that it would be sensible to specify to whom this exposure assessment refers, i.e. to teachers or other classroom personnel performing the pinning activity.
3.48	The Chairman then asked the Committee whether from the data available it was possible to make a conclusion regarding the other people who may be exposed in the classroom setting. He suggested that the Committee felt it may be impossible to predict the likely exposure from debris, given the previous discussion.
3.49	A WATCH member replied that the cover paper referred to ‘the assessment of exposure of teachers and others’ in the title. Therefore he felt that in answering the action points any answer should specify to whom the exposure assessment relates. He felt that for action point [1] the answer given should relate to the teacher/person using the drawing pins and for action point [2] the answer should state that the available data are adequate to assess exposure to the teacher/operative but not others. He also wondered if the Committee should also make a statement about the children’s exposure from the debris on the floor.
3.50	Another WATCH member agreed with this viewpoint. He felt that in relation to others there were too many unknowns and not enough information to enable modelling of the likely exposure, except to say that there was potential exposure to debris for others within the classroom setting. He felt that the best way forward would be for HSE to send a clear message to the education field that if the practice of putting drawing pins into AIB is still occurring then it must stop.
3.51	Michael Lees then added that in a letter dated 21/1/06 from Mr Richard Daniels in the Department for Education it says that ‘it is still a common practice even in schools with good asbestos controls in place’

3.52	The WATCH member then suggested that any advice provided to the education field should indicate that the use of drawing pins on AIB is an avoidable act presenting an unknown risk; it should not be implied that the use of drawing pins on AIB is a high risk activity.
3.53	In response to a question from the Chairman, an HSE representative of asbestos Policy said that people are obligated to manage asbestos and to do so appropriately. So if the use of drawing pins on AIB represents a risk to health then there is an obligation on schools to manage that risk properly.
3.54	The Chairman then reminded the Committee that it should not stray too far beyond its remit into matters of organisational policy.
3.55	A WATCH member then added that some schools may not be aware of this potential exposure situation and so awareness may need to be increased.
3.56	An HSE representative replied that this issue is covered in the asbestos regulations and that asbestos must be managed. The regulations prescribe the need for asbestos-containing materials to be checked on a regular basis for signs of damage, so any practice causing damage to AIB shouldn't be happening under HSE's current powers of legislation.
3.57	A WATCH member then replied that in 2004, after the first series of HSE tests, HSE had written to the Department for Education and to the National Union of Teachers advising that there was no significant problem associated with the use of drawing pins in AIB. So in light of the Committee's discussion thus far he felt that this advice should be withdrawn.
3.58	The Chairman responded by saying that if the Committee arrived at an exposure assessment that was at odds with the message given in the letter from HSE to the Department for Education, then HSE will have to react appropriately.
3.59	A WATCH member then added that in his view, it was important to address the issue of the assessment of risk at low levels of asbestos exposure. He would also like to address how best to communicate a 'low risk' position to others.
3.60	The Chairman responded by indicating that WATCH could recommend that it should debate these issues in the future, but that WATCH had not been asked to address these points at this meeting, nor had all the papers relevant to the assessment of the risk associated with low level exposure to asbestos been made available to the Committee under this current agenda item.
3.61	A further WATCH member noted that some of the exposure figures cited in the proposed position for the use of drawing pins in AIB were not too far from those for the removal of textured decorative coatings (item 2 on this agenda), for which a licence and the use of personal protective equipment is mandatory. He felt that if the proposed exposure assessment was accepted by the Committee, then a clear policy on asbestos exposure for this scenario should be developed and debated at HSC's Advisory Committee on Toxic Substances, given that the letter from the Department for Education indicates a concern that this activity is still occurring.
3.62	Another WATCH member indicated that key the message from the Committee is that exposure is avoidable.
3.63	<p>The Chairman then reflected back statements for members to consider. The Committee agreed unanimously that these statements seemed to be an appropriate portrayal of the consensus position of WATCH. The Chairman then said that members would have that opportunity to consider the precise wording of the conclusions during the process of clearing the draft minutes. The wording of the statements below now incorporates amendments suggested by WATCH members during the post-meeting consultation round.</p> <p>[1] a "realistic worst-case" prediction for exposure of an operative under conceivable real-life conditions is 0.05 f/ml in a 25-minute period of drawing pin activity, which translates to an exposure of 0.005 f/ml as a 4h TWA (assuming that there is only one 25-minute period of pinning activity each day). A theoretical calculation based on an extreme assumption that every fibre released from pin holes during this period of drawing pin activity is inhaled gives an exposure value of approximately 1 f/ml in the 25-minute period, translating to 0.125 f/ml (4h TWA) or 0.063 f/ml (8h TWA), again assuming one activity period per day.</p> <p>The above estimates of a teacher's exposure exclude any further exposures to fibres released</p>

	<p>into the background classroom air (some WATCH members commented that this was a minor issue); or from any fibres released from asbestos-containing debris which might have become lodged on the teacher or their clothes.</p> <p>The Committee concluded at this meeting that it was not possible from the data available from the HSL study to make a reliable exposure estimate for any other adults or children in the classroom environment where pin insertion into AIB was occurring (see 3.67 for post-meeting action].</p> <p>[2] the results of the HSL chamber study, described in WATCH/2006/2 annex 6b provide a basis to assess the immediate exposure to airborne amosite asbestos fibres, specifically in relation to teachers or other operatives using drawing pins on AIB.</p> <p>[3] the insertion of drawing pins into AIB in a classroom setting releases asbestos fibres and is an avoidable activity; measures should be taken to communicate this message.</p>
3.64	In subsequent discussion, a WATCH member felt that the contribution to total exposure of asbestos fibres from the contamination of clothing could be significant. Another WATCH member felt that the contribution of fibres from debris on clothing or elsewhere could not be assessed.
3.65	A WATCH member suggested that the figures in the WATCH position could be used for illustrative purposes in order to achieve the desired impact of a message and behavioural change.
3.66	A WATCH member then indicated that she still had some concern for the exposure to asbestos of other personnel (<i>i.e.</i> apart from those performing the drawing pin activity) within the classroom environment.
3.67	<p>The Chairman then invited the Committee to give some thought after the meeting to what WATCH would like to articulate with regard to other classroom personnel including children. Any suggestions could be provided in writing. He would then reflect back to WATCH the views received and thereby see if WATCH could reach a consensus position.</p> <p>[ACTION: Members to think about what WATCH would like to articulate with regard to other classroom personnel including children and to send any such thoughts to the secretariat in writing.]</p>
3.68	He then invited Mr Michael Lees to give his concluding remarks.
3.69	Michael Lees thanked the Committee for its discussions and the overall conclusion that it had reached. He suggested that the other factor requiring consideration is the contribution of debris to the overall exposure of all classroom personnel. He felt that exposure to others within the classroom was a significant issue and suggested that HSE/HSL and Robin Howie Associates should agree a test procedure to address this issue. In terms of risk communication, he felt that if people were made aware of the likely risk of exposure to asbestos, rather than the actual exposure data themselves, that this would be sufficient to prevent them from using drawing pins in AIB. He added that sufficient openness in schools regarding the risks of asbestos is needed and that such information should be made available in the public arena.
3.70	The Chairman thanked Mr Lees for his contributions and reminded him that the minutes of the meeting when finalised, will be made available in the public domain.
4	Chronic respiratory ill health in construction workers
4.1	The Chairman began by introducing Susy Brescia, the principal author of the paper, and Maureen Meldrum (both regulatory toxicologists from HSE's Industrial Chemicals Unit).
4.2	He explained that HSE's provisional thinking on the basis of the draft document presented to WATCH is that the need for interventions aimed at improving the respiratory health of workers in the construction industry might be indicated. The view of WATCH was sought as to whether or not this is supported by the evidence; the answers to the Action Points would drive further thinking about an appropriate course of action.
4.3	The Chairman clarified to the Committee that the reference in paragraph 10 of the cover paper to "page 40" of Annex 1 should actually read "page 41".

4.4	Discussion on Action Point (i) The Chairman invited the views of WATCH members on Action Point (i) of the cover paper, ie, " <i>How accurately the review has characterised the available evidence</i> ".
4.5	WATCH members agreed that the document was well-written and presented an accurate reflection of the literature, showing that there was some excess risk of COPD in construction workers.
4.6	A WATCH member commented that several times in the document smoking is mentioned as a "confounder". However, it is actually a <i>potential</i> confounder and needs to be adjusted for accordingly in analysing epidemiological data. In addition, he noted that under the heading "Cross-sectional studies" there is actually a mixture of cross-sectional and case studies; it was suggested that these be separated out.
4.7	WATCH members agreed that one limitation of the value of the document is that it has not been able to associate the elevated risk of COPD with specific exposure situations. However, it was acknowledged that this is a consequence of there being relatively few studies available which have investigated this aspect (studies on tunnelling workers in Norway, and asphalt workers in Europe perhaps being exceptions). It was suggested that one way of producing more informative data concerning the specific causes of COPD among construction workers would be to undertake further longitudinal studies. This would subsequently help to inform on relevant intervention strategies. However, a WATCH member commented that conducting meaningful longitudinal studies in construction workers will be difficult, given the diverse nature and mobility of the workforce, the great variability in construction operations and the numbers of employers involved in each type of activity.
4.8	Another WATCH member suggested that more details of the search strategy used to gather the literature (page 7 of annex 1) should be included, so that future work in this area does not replicate what this review has done. He noted that a review had been undertaken by Leslie Rushton (Institute of Environment and Health, IEH) for the Industrial Injuries Advisory Council in which the risk of COPD in workers of different occupational groups was investigated. However, construction workers were not covered in the review. The Chairman reminded the Committee that Leslie Rushton's review was included in the "COPD Prioritisation" paper considered at the last WATCH meeting (October 2005). HSE commented that an early draft of the HSE review paper on COPD in construction workers had been sent to Leslie Rushton.
4.9	Overall, WATCH agreed that in response to Action Point (i): HSE had produced a thorough, well-written, well-presented review of the available literature relating to the risk of COPD in construction workers.
4.10	Discussion on Action Point (ii) The Chairman then invited WATCH members to consider the review in relation to Action Point (ii) of the cover paper, ie, " <i>What conclusions can be drawn and the strength of the evidence for such conclusions?</i> ".
4.11	The Chairman reminded the Committee that the paper concludes that overall, in relation to COPD, there was an excess risk or occurrence of COPD in construction workers; however, it appeared to be not possible to identify the specific causative agent(s). In addition, the perspective of the draft review was that there is no clear evidence about any associations between the increased risk and a particular trade(s) within the construction industry, with the possible exception of tunnelling construction work showing a clear excess. In relation to silicosis, the evidence did not reveal such a clear excess associated with the construction industry.
4.12	A WATCH member commented that in relation to the silicosis data, there is a low background prevalence of radiological change of score of 1/0 in the general population. He asked what the background prevalence was to put into context the prevalence data seen in construction workers? HSE responded that the background prevalence data are for a score of 0/1 rather than 1/0, and therefore such information did not help to interpret the findings in construction workers.
4.13	In relation to COPD, a WATCH member suggested that the review showed evidence for some excess risk, of a scale that is difficult to quantify, particularly given that the definition of COPD is likely to vary from study to study.
4.14	Another WATCH member questioned the appropriateness of the control populations used in some studies. He wondered whether it is necessarily a chemical which is producing the differences

	between groups? Generally office workers have been used as the control group. However, there are fundamental differences between construction workers and office workers in terms of social background. He asked whether there could be a non-chemical element to the elevated risk of COPD. HSE responded that construction work is physically demanding and therefore one might expect that this group of workers, if anything, should have better pulmonary function compared with office workers. HSE continued that in one study, respiratory function was still reduced in construction workers when compared with either white collar or blue collar non-construction workers as controls.
4.15	A different WATCH member commented that not much had been made of the silicosis data within the American study in which 14000 silicosis deaths had been reported (page 62 of annex 1), 10 % of which were in construction workers. HSE responded that these data related to deaths occurring 15 – 45 years ago, with exposures occurring even earlier, and therefore didn't represent conditions experienced by UK construction workers today. A further WATCH member commented that in relation to silica blasting there have been differences in enforcement between USA and UK over many years and so there have been significant differences in the way exposures to silica have been managed.
4.16	The Chairman then asked if the Committee agreed with the draft conclusions set out in Annex 1, specifically page 5, paragraph 2. Whilst there was general agreement with this paragraph, a WATCH member commented that there should be consistency within Annex 1 about how specific points are made. For example, while the overall conclusion is that there is no evidence as to what specific exposures cause the effect, in certain places in the review dusts and irritants appear to be highlighted as the causative agents.
4.17	A WATCH member commented that while it has not been possible within the construction industry to identify specific trades or workplaces posing particularly high risks of COPD, it should not be forgotten that there maybe specific high risk situations that are buried within the available data.
4.18	1. The Chairman accepted these points and proposed that members agree the final wording of a conclusion on this Action Point by correspondence when clearing the minutes. In response to Action Point (ii), WATCH agreed: Overall, the findings from numerous studies of different designs and in different countries are reasonably consistent in indicating that construction workers show moderate increases (2 to 3-fold) in the COPD morbidity and mortality compared to age- and smoking-matched reference groups. Although a number of studies consistently point to a role of dusts and irritants in general, given the diversity of sectors, trades, activities and workplaces investigated, the available data do not allow one to specify with sufficient reliability a particular causative agent or agents. Information on specific trades is limited. Tunnel workers clearly stand out as being at higher risk compared to outdoor construction workers. However, in general from the data available it is not possible to identify specific trades or workplaces where there are particularly high risks of COPD. Nevertheless it should be borne in mind that such situations might exist.
4.19	Discussion on Action Points (iii) and (iv) The Chairman then asked for the views of WATCH on Action Points (iii) and (iv), ie, " <i>whether or not the findings presented in this review are likely to be relevant to current working conditions in UK construction workers</i> " and " <i>whether or not the appropriate conclusions of this review justify a priority being given to the development and implementation of intervention activities aimed at combatting long-term respiratory diseases in this industry sector</i> "
4.20	A WATCH member commented that there had been a lot of change in construction workplace practice compared with the retrospective overseas dataset presented in the review; for example, on most construction sites there are now silos for cement.
4.21	Another WATCH member pointed out that there are many different types of construction work in any one country and considerable variability between countries overseas and so any read-across ideally should be scenario-specific. However, he did not feel that there was the evidence to do this type of read-across from the content of the review to current construction workers within the UK.
4.22	The Chairman suggested that a position on Action Point (iii) might be better informed if HSE elaborated on its thinking about possible intervention activity in the UK construction industry, referred to in Action Point (iv). HSE informed WATCH that an "Occupational Health Management Model" (OHMM) is being developed for the construction sector to try to ensure that risks of musculoskeletal disorders, hand-arm vibration syndrome, noise-induced hearing loss and dermatitis are adequately controlled. HSE's thinking had been that WATCH endorsement of the conclusions of this review could

	justify the inclusion of long-term respiratory disease within the model. The Chairman explained that the idea of the OHMM is to guide people working in the construction industry on what behaviour is appropriate to avoid harmful effects arising from a range of construction work activities. He asked the Committee whether it considered that the review provided enough evidence for a threat to the health of current workers in the UK construction industry to justify including long-term respiratory disease within the model?
4.23	Returning to Action Point (iii), a WATCH member commented that based on the huge diversity in the construction industry in the UK it is possible to draw some messages from the evidence from other countries. The Swedish study estimated that 10 % of cases of COPD were related to the construction industry. If it is assumed that this estimate is also relevant for the UK population then, based on the Labour Force Survey, this equates to 105 cases for every 10000 workers; which could be extrapolated to 17000 cases of COPD in the 1.6 million construction workers in the UK. Such figures suggest that there could be a substantial issue in the current UK industry. A different WATCH member commented that such figures don't take account of smoking-related COPD in construction workers, which would still be the dominant cause.
4.24	The Chairman asked the Committee whether the strength of evidence from this review suggested sufficient relevance for the current UK industry to justify including respiratory disease in the OHMM.
4.25	A WATCH member stated that respiratory disease should be included in the OHMM because of the evidence presented in the review. Another WATCH member felt that respiratory disease is worth a place in the OHMM when one considers the amount of potential dust exposures in construction. All other WATCH members signified their agreement
4.26	Overall, in response to Action Point (iii) the Chairman suggested and WATCH agreed that: There are general messages that can be taken from the review that may be relevant for the UK construction industry.
4.27	In response to Action Point (iv), WATCH agreed: The evidence within the review justifies the inclusion of respiratory disease within the OHMM being developed for the construction industry in order to combat any threat of long-term respiratory disease in this industry.
4.28	A WATCH member suggested that more might be needed to combat respiratory disease in construction workers than just the relevant aspect of the OHMM tool.
4.29	<u>Overall conclusion</u> Overall WATCH agreed, in response to Action Point (i): HSE had produced a thorough, well-written, well-presented review of the available literature relating to the risk of COPD in construction workers. In response to Action point (ii): Overall, the findings from numerous studies of different designs and in different countries are reasonably consistent in indicating that construction workers show moderate increases (2 to 3-fold) in the COPD morbidity and mortality compared to age- and smoking-matched reference groups. Although a number of studies consistently point to a role of dusts and irritants in general, given the diversity of sectors, trades, activities and workplaces investigated, the available data do not allow one to specify with sufficient reliability a particular causative agent or agents. Information on specific trades is limited. Tunnel workers clearly stand out as being at higher risk compared to outdoor construction workers. However, in general from the data available it is not possible to identify specific trades or workplaces where there are particularly high risks of COPD. Nevertheless it should be borne in mind that such situations might exist. In response to Action Point (iii): There are general messages that can be taken from the review that may be relevant for the UK construction industry. In response to Action Point (iv): The evidence within the review justifies the inclusion of respiratory disease within the OHMM being developed for the construction industry in order to combat any threat of long-term

	respiratory disease in this industry.
5	Introduction to the Cancer Project of the Disease Reduction Programme
5.1	This item was postponed to a future meeting.
6	Minutes of the 5th meeting
6.1	Members had agreed the minutes of the 5 th meeting (WATCH/MIN/2005/3) by correspondence.
6.2	<p>Secretary's report</p> <p>Dr Gregg brought the Committee's attention to the following minuted actions arising from the 5th meeting, on the 5 & 6th October 2005:</p> <ul style="list-style-type: none"> • In relation to information on the latest state of play on REACH, she advised the Committee that as yet there has been no decision on the agreed UK Competent Authority structure. At the request of Committee she agreed to inform WATCH members of the outcome as soon as it was known. • A paper describing the ongoing initiatives to improve exposure data assessments (WATCH/2006/4) was tabled at the meeting. WATCH members agreed to discuss this paper together with other issues identified in the item on "new and emerging issues" (WATCH/2005/19) at the next Committee meeting. • Prof. Len Levy and Dr Steve Williams (both WATCH members) are to provide an oral update of the work done so far in preparing a research specification for evaluating the effectiveness of Workplace Exposure Limits (WELs) and COSHH Essentials.
6.3	<p>Workplace Exposure limits (WELs)</p> <p>The Chairman asked Prof Len Levy (WATCH member) to introduce this item.</p>
6.4	Prof. Levy indicated that this item resulted from discussions on new and emerging issues at the 5 th WATCH meeting where WATCH members felt that a strategy should be developed for evaluating the effectiveness of WELs and the effectiveness of risk management achieved using generic control approaches <i>i.e.</i> COSHH Essentials (WATCH/MIN/2005/3). He presented to WATCH members a summary of the work he had done so far, together with Dr Steve Williams (WATCH member), in preparing a research specification to evaluate the effectiveness of Workplace Exposure limits (WELs) and COSHH Essentials.
6.5	He said that his presentation contained a series of suggestions relating to the scope of the research proposal. He then invited the Committee to consider the points made in the presentation and subsequent to the meeting, to provide comments in writing so that a detailed research proposal could be developed.
6.6	Prof. Levy began by noting that the WEL system was introduced in April 2005 following a HSE consultation exercise on a replacement for the existing Occupational Exposure Standard (OES)/Maximum Exposure Limit (MEL) system. It seemed to him that this consultation was performed using the basic premise that chemical exposure can be managed primarily by employing appropriate controls (e.g. utilising COSHH Essentials) rather than by primary reliance on measuring exposures in relation to an exposure standard (OES/MEL). On the basis of this consultation exercise the new system, based on good practice control advice backed by WEL values, was implemented via the COSHH (Amendment) Regulations 2005.
6.7	<p>He added that earlier, in helping to develop the new WEL system, seven key criteria for setting up and/or appraising any new OEL system were identified by HSC's Advisory Committee on Toxic Substances (ACTS/20/99). The seven criteria were that occupational exposure limits:</p> <ol style="list-style-type: none"> 1) Are needed to control risks to health 2) Should be readily understood and accessible 3) Should be legally enforceable 4) Should be comprehensive 5) Need to comply with EU legislation 6) Should be flexible and need to take on board new developments in science and technology 7) Must provide incentives to reduce exposure

6.8	<p>He added that to be able to evaluate the use of WELs effectively the following 4 questions should be asked:</p> <ol style="list-style-type: none"> 1) Why should the WEL system be evaluated? 2) From whom should we seek information and/or opinion? 3) What information do we need? 4) How should this information be collected?
6.9	<p>In terms of the first question, “why should the WEL system be evaluated?”, he indicated that there was a need to monitor the effectiveness of the new WEL system. In doing so he felt that any occurring misunderstandings and/or abuse of the system should be identified and a baseline established to determine the effects of any further initiatives on education, training and publicity. He also saw a need to understand how WELs can help with HSE’s Disease Reduction Programme work, particularly in relation to alleviating respiratory disease.</p>
6.10	<p>He then suggested that information and views should be obtained from a range of stakeholders including: HSE’s Inspectors, Environmental Health Officers, Trades Unions, employers (both large organisations and SMEs), non-unionised workers, self-employed workers, safety professionals, occupational hygienists and bodies such as the Chemical Hazard Communication Society.</p>
6.11	<p>He added that the following questions should be asked:</p> <ol style="list-style-type: none"> 1) Have you heard of WELs? 2) Do you understand the WEL system as opposed to the previous OES/MEL system? 3) How did you learn about WELs? 4) What would you do if there was no WEL listed for a substance? 5) Are WELs easy to use? 6) Are WELs easier to enforce?
6.12	<p>In order to obtain this information he suggested that a number of methods could be employed such as the use of questionnaires, a formal study conducted by HSE or an external contractor, eliciting general feedback and/or collating anecdotes and contributed comments.</p>
6.13	<p>He then invited the Committee to consider these points and, subsequent to the meeting, to provide comments in writing from which they could prepare a research proposal for discussion by the Committee at its next meeting.</p>
6.14	<p>The Chairman thanked Prof Levy and Dr Williams for the work done so far. He felt that it was important for the Committee to continue to develop the three priority “new and emerging issues” identified at the 5th WATCH meeting. He then invited the other Committee members to provide their comments by correspondence after the meeting.</p> <p>[ACTION: HSE to provide a copy of Prof. Levy’s presentation to WATCH members for consideration.]</p> <p>[ACTION: WATCH members to provide comments on this item to Prof. Levy, Dr Williams and the WATCH Secretariat within one month of receiving a copy of the presentation.]</p>
7	Date of next meeting
7.1	The date of the next meeting will be arranged with WATCH members by correspondence.
8	AOB
10.1	<p>There were no items of AOB</p> <p>The meeting closed at 4.05 pm.</p>