

**WORKING GROUP ON ACTION TO CONTROL CHEMICALS**

WATCH/MIN/2008/2

**Meeting date:** 17th June 2008**Open Gov. Status:** Fully open**Type of paper:** Draft**Paper File ref:****Exemptions:****WORKING GROUP ON ACTION TO CONTROL CHEMICALS**Minutes of the 13th meeting of the Working Group on Action to Control Chemicals held on 17<sup>th</sup> June 2008, Bootle Town Hall**Members Present**Steve Fairhurst (Chair)  
Robin Chapman  
David Farrar  
Rosemarie Hutchinson  
Steve Williams  
Steve Binks  
Martie van Tongeren  
Ching Aw  
Alastair Hay  
Tony Fletcher**Apologies**Len Levy  
Steve Bailey**Ad hoc members**Julian Peto  
Hilary Cowie  
Robin Howie**Invited speakers**Carol Houghton  
Steve Williams**Officials Present**Nicola Gregg (Secretariat)  
Hayley Keating (Secretariat)  
Anna Rowbotham (Secretariat)  
Andrew Darnton  
Rob Turner  
Gareth Evans  
John Unwin  
Dil Sen  
Rob Turner  
Gary Burdett  
Kevin Walkin  
Len Morris  
Robert Hadway  
Neil Davey  
Brian Crook

<b>1</b>	<b>Introductions and apologies</b>
1.1	The Chairman welcomed everybody to the 13 <sup>th</sup> meeting of the committee.
1.2	Apologies were received from Len Levy and Steve Bailey
<b>2</b>	<b>Administrative issues</b>
2.1	The Chairman asked for any declarations of interest related to the items on the agenda. Robin Chapman declared an interest in isocyanates. Martie van Tongeren and David Farrar expressed interests in mineral wool.
2.2	WATCH secretary Nicola Gregg reminded WATCH members to send in their Annual Declaration of Interests for 07/08.
2.3	<b>Dates for the 15<sup>th</sup> meeting</b> Members agreed to the 24 <sup>th</sup> February 2009 as the provisional date for the 15 <sup>th</sup> WATCH

	meeting to be held in London.
2.4	<b>Adoption of agenda</b> WATCH members agreed to adopt the proposed agenda (WATCH/Agenda/2008/1).
<b>3</b>	<b>Minutes of 12<sup>th</sup> meeting</b>
3.1	Members had commented by correspondence on the draft minutes of the 12 <sup>th</sup> meeting. As a result a few small editorial changes needed to be made to the version presented here (WATCH/Min/2008/1). Members agreed that the Secretariat would make these changes and then the minutes would be deemed to be finalised.
3.2	<b>Matters arising/Secretary's report</b> The Secretary informed members that in relation to WATCH's horizon-scanning responsibility, there was now active consideration about how best to incorporate this into the October 2008 WATCH meeting.
<b>4</b>	<b>Mineral Wool : Proposal for a Risk Assessment</b>
4.1	The Chairman opened the item by informing WATCH that two representatives from the mineral wool manufacturers association, Eurisol UK, were attending the meeting to provide members with an overview of key issues relating to insulation mineral wool, and to present a proposal for commissioning a new risk assessment. The Chairman welcomed: Carol Houghton (CJHconsult Associates) and Steve Williams (Knauf Insulation Ltd), attending on behalf of Eurisol UK. He invited Carol Houghton to give a presentation on insulation mineral wool and asked WATCH members to give consideration to a proposal by Eurisol UK for further work on this theme.
4.2	<b>Presentation : An overview of insulation mineral wool.</b>  Carol Houghton informed WATCH that as the mineral wool manufacturers association, Eurisol UK represented 100% of production and >95% of the total UK market. Eurisol UK's primary functions were to promote greater knowledge on mineral wool fibres and the associated health issues; produce guidance and promote safer working practices across the sector. To this end, Eurisol UK liaised with numerous other organisations.  She gave a review of information on mineral wool, covering in brief: fibre types; current health hazard classification; exposures; occupational exposure limits; an update of some of the key scientific evidence; market issues; and potential changes to legislation.  <b>Fibre types</b> Within the generic definition of 'machine made mineral fibres' (MMMF), Carol Houghton differentiated between 'mineral wools' (glass, rock and slag wools) which tend to be generally very biosoluble; 'ceramic and high temperature fibres' which tend to be more durable and biopersistent; and 'continuous filaments' which are usually too large in diameter to be respirable. In respect of 'continuous filaments', there are some special purpose applications where these fibres are made in an atypically fine form, and as such, would be respirable and also very durable.  <b>Current health hazard classification</b> Under EU Classification and Labelling (C&L) legislation, mineral wool fibres (glass, rock and slag wools) are included as part of the category of MMMF that contain >18% alkali and earth alkali oxides. Fibres in this category carry a default classification position of category 3 carcinogen, with the associated phrase R40 ( <i>limited evidence of a carcinogenic effect</i> ), unless exonerated by one of a number of tests (such that they meet the 'nota Q' requirements specified in C&L legislation), and R38 ( <i>irritating to skin</i> ). In practice, all mineral wools manufactured by Eurisol UK members were excluded from classification as

category 3 carcinogens because they had data meeting the 'nota Q' exoneration criteria.

Concerning the classification of mineral wool as a skin irritant, Carol Houghton indicated that it is now widely accepted the fibres cause mechanical, rather than chemical, irritation on contact with skin. As a consequence there is an initiative under way to remove the R38 classification.

#### ***Exposure control and occupational exposure limits***

The existing UK Workplace Exposure Limit (WEL) for mineral wool is either  $5 \text{ mg.m}^{-3}$ , when expressed as a gravimetric limit, or  $2 \text{ fibres.ml}^{-1}$ , when expressed as a fibre-based limit, neither limit to be exceeded. Carol Houghton reminded WATCH that the HSE guidance document EH46, prior to withdrawal, had clearly stated that for mineral wools gravimetric measures of airborne fibre should always be carried out first. However, in common applications employing mineral wool, particularly loft insulation work, workers would also be exposed to a range of other dusts. These dusts are usually included in air samples taken for these workers and contribute to the gravimetric measure. Adherence to the gravimetric WEL in such circumstances conveys additional exposure control in terms of fibre exposure.

Carol Houghton then showed a graph from Head & Wagg (1980), of the correlation between airborne fibre concentration (expressed as number of  $\text{fibres.ml}^{-1}$ ) and the corresponding gravimetric measure (the total mass concentration in  $\text{mg.m}^{-3}$ ), when measured simultaneously, for mineral wool and superfine fibres. Using the graph, it could be observed that the gravimetric UK WEL of  $5 \text{ mg.m}^{-3}$  would not be the appropriate leading control standard for superfine fibres, as the corresponding fibre count could be  $>6 \text{ f.ml}^{-1}$  the fibre-based WEL of  $2 \text{ f.ml}^{-1}$  would therefore be more appropriate leading measure for the control of exposure to superfine fibres. In contrast, a fibre-based WEL of  $2 \text{ f.ml}^{-1}$  was not the appropriate leading control standard for mineral wool, as the gravimetric concentration at this fibre limit would be considerably higher than the gravimetric WEL.

Carol Houghton argued that these considerations were important in relation to the recent proposal from the European Commission's (DG Employment) Scientific Committee on Occupational Exposure Limits (SCOEL) for an EU Indicative Occupational Exposure Limit Value (IOELV) of  $1 \text{ f.ml}^{-1}$ . If implemented across the EU, she considered that this was problematic; at  $1 \text{ f.ml}^{-1}$ , undesirably high gravimetric concentrations of mineral wool particulate could occur. Using the Head and Wagg (1980) graph, she indicated that at a fibre concentration of  $1 \text{ f.ml}^{-1}$ , total dust levels in the region of  $25 \text{ mg.m}^{-3}$  could occur. She added that fibre-counting techniques were more expensive to employ than gravimetric measures and tended to be more time-consuming. Lastly, she considered that the proposed SCOEL IOELV, expressed in terms of exposure to counted fibres and compared to occupational exposure limits for other fibre types expressed in the same manner, implied that mineral wool exposure poses a greater health risk than is evident from the available science.

#### ***Carcinogenic potential***

It was reiterated that the category 3 (or category 2) carcinogenicity classification applies to the more biopersistent types of MMMF, whereas all commercially available mineral wools in the EU are not classified because they meet the exoneration criteria. Furthermore, workers' exposures to mineral wool fibres are well controlled. Carol Houghton suggested that these two points, in combination, indicate that the risks to health posed by mineral wools are low. She considered that control to the current UK gravimetric standard entailed a high margin of safety, for all current commercial forms of mineral wool fibre.

She discussed the role of fibre durability in terms of its impact in humans and in experimental animals. The biopersistence of different fibres types varies considerably.

For example, in humans, the number of days taken to dissolve a long 1 micron fibre has been estimated to be 25,000, 12,500 and 1700 for amphibole, chrysotile and ceramic fibres respectively. In contrast to these biopersistent fibres, a mineral wool fibre (rock, glass and slag wools) of similar dimensions dissolved in 25-250 days.

Observations from animal studies indicate that disease incidence can be predicted from the fibre durability or, conversely, its dissolution rate. The dissolution rate,  $K_{dis}$ , provides a measure of the rate of weight loss per unit surface area of fibre in unit time, normally expressed as  $ng.cm^{-2}.hr^{-1}$

Carol Houghton discussed an animal model based on the type of chronic inhalation study on fibres conducted in the 1990s by Research and Consulting Company (RCC), involving exposures to airborne concentrations of fibres at  $300 f.ml^{-1}$ . Such studies have been used to predict the likelihood of fibrosis and lung tumours arising from exposure to a range of fibre types, taking into consideration their dissolution rate. From the results of such studies, a glass fibre known as MMVF 11 fibre, having a dissolution rate of  $100 ng.cm^{-2}.hr^{-1}$ , was identified as having a dissolution rate that was set as the 'minimum standard' (ie the lowest dissolution rate) for which one could be confident that little fibrosis and no tumours would be produced in a chronic inhalation study. Data for other fibres such as 'E-glass' (a durable continuous filament fibre) and '475 glass' (a special purpose glass fibre) could be considered in the context of this model. The model predicts that '475 glass' had a low probability of inducing lung tumours, but a high probability of inducing fibrosis, whereas the model indicates that 'E-glass' would produce both fibrosis and tumours.

On the basis of chronic inhalation to a defined dose of  $300 f.ml^{-1}$ , the model predicts that that:

- (i) A  $K_{dis} = 11 ng.cm^{-2}.hr^{-1}$  or greater is required to avoid lung cancer
- (ii) A  $K_{dis} = 84 ng.cm^{-2}.hr^{-1}$  or greater is required to avoid fibrosis

Fibres possessing a  $K_{dis}$  of  $100 ng.cm^{-2}.hr^{-1}$  has been adopted across the industry as the minimum standard (i.e. minimum  $K_{dis}$ ) for commercial mineral wool fibres. In terms of fibre half-life, this corresponds to a  $t_{1/2}$  of < 15 days. Carol Houghton also indicated that analysis of the behaviour of fibres in the lung following exposure to different airborne concentrations in a chronic rat inhalation study indicates that the minimum  $K_{dis}$  required to avoid fibrosis decreases as the airborne concentration of fibres decreases (i.e. with lower fibre burdens, a slower rate of dissolution can be accommodated without adverse consequences).

Carol Houghton also reminded WATCH that in 2001, the International Agency for Research on Cancer (IARC) carried out a review (IARC Monograph vol 81, 2002) that concluded that glass wool, rock wool and slag wool should be reduced in its carcinogenicity classification scale from Group 2B to Group 3 "*Not classifiable as to its carcinogenicity to humans*". This review considered that in relation to evaluating carcinogenic potential the available human evidence was inadequate and the experimental animal evidence was limited.

#### **Market concerns and Eurisol UK's position**

Carol Houghton informed WATCH that the classification in the EU of mineral wool as a "dangerous substance" and ongoing activity in relation to EU occupational exposure limits imply that exposure to mineral wools could pose a significant threat to health. She argued that this has led to negative perceptions about the use of mineral wool and creates market concerns; companies are tending to adopt a very cautious approach, fearful of litigation and there have been greater demands for exposure monitoring and the use of a high level

	<p>of personal protective equipment at sites where mineral wools are used. Eurosil considers that mineral wool is a sustainable material that has numerous potentially beneficial uses and is therefore looking to address the current market concerns.</p> <p>Key points central to Eurisol UK's position on mineral wool are:</p> <ul style="list-style-type: none"> <li>(i) The level of risk posed by present-day exposure to mineral wool is very low</li> <li>(ii) Existing controls are more than adequate</li> <li>(iii) There is no clear evidence that a change in the occupational exposure limit metric from gravimetric measurement to fibre counting would be beneficial</li> <li>(iv) Current mineral wools pose no greater threat to health than many other particulates, including materials formerly regarded as "nuisance dusts".</li> <li>(v) Simple and practicable guidance should be available to explain the regulatory position for mineral wools</li> </ul> <p>Carol Houghton explained that Eurisol UK, on behalf of the industry was considering investing in a new study to update exposure data for common mineral wool applications and to develop a risk assessment based upon current exposure. Eurisol UK was trying to gauge whether or not the potential benefits to be gained from such work justified the expenditure that would be involved in commissioning it. Eurisol UK's primary objectives were to develop new UK guidance and to put the UK/EU occupational exposure limit position for mineral wool on a par with other materials of similar hazard. Carol Houghton asked whether Eurisol UK's proposal seemed sensible to WATCH and if the committee would agree to consider the output of the proposed work at a future WATCH meeting.</p>
4.3	<p><b>General discussion</b></p> <p>The Chairman thanked Carol Houghton for the presentation and asked members for their views on the proposition.</p>
4.4	<p>A WATCH member commented that the approach proposed by Eurisol UK appeared to be sensible but reserved making any judgements until the data became available and could be properly evaluated. He reminded the committee that the issue of appropriate control of exposure to dusts in general was currently being considered by ACTS in light of concerns about the appropriateness of the current reference levels for airborne concentrations for these dusts (10 mg.m<sup>-3</sup> inhalable dust and 4 mg.m<sup>-3</sup> for respirable dust). He considered there to be merit in the proposed project and in WATCH considering the outcome.</p>
4.5	<p>Steve Williams of Eurisol UK commented that in relation to occupational exposure limits, although the absolute numerical value of a limit applying to mineral wool was important, there were also concerns about what any value, relative to limit values for other materials, implied about the risks to human health posed by exposure to mineral wool. Establishing an appropriate limit value that is not specific to mineral wool fibres is a goal of paramount importance to the industry.</p>
4.6	<p>A WATCH member expressed an interest in seeing at a later stage the range and precision of available toxicological data on mineral wool, for example the number of test species examined, to assess how reliable the available data were for assessing the hazards of mineral wool. He added that consideration of practical approaches that could be applied to the control of exposures to these fibres and their effect on exposure levels was also an important issue for later.</p>
4.7	<p>Another WATCH member noted Carol Houghton's assurance that 95% of mineral wool fibre products marketed in the UK were of the type meeting the exoneration criteria for classification as category 3 carcinogens. He asked what types of mineral wool were imported into the UK and with what specifications did they need to comply? Carol Houghton replied that all mineral wools used in the EU met with the 'nota Q' requirements in respect of exoneration from classification for carcinogenicity, and this standard was increasingly being adopted across the world. The WATCH member expressed concerns</p>

	that some UK market penetration of mineral wools not meeting this standard could occur. Steve Williams representing Eurisol UK replied that under EU legislation, Safety Data Sheets for any mineral wools imported into the EU and not meeting the 'nota Q' criteria would need to indicate the category 3 carcinogen classification.
4.8	A WATCH member commented that the presentation had provided useful insights into several issues including the implications of using analytical methods and exposure standards based on gravimetric and/or fibre-based counting. He considered that both metrics were important and should be maintained. Steve Williams representing Eurisol UK agreed; he emphasised that a major concern is the market perception of, and reaction to SCOEL's proposed limit of 1 f.ml <sup>-1</sup> which, if adopted in the UK and other EU member states, would represent a reduction from the existing national occupational exposure limit. It might be inferred from this that mineral wool presents more of health risk than previously thought; this is not justified by the evidence.
4.9	A WATCH member commented that from his experience, defining particular types of MMMF and identifying descriptors that clearly differentiate between different types presents a difficult challenge to regulators seeking to establish appropriate and discriminatory exposure limits. He could not see WATCH being able to resolve this issue; he asked for clarification of what WATCH's role would be in relation to the envisaged work on mineral wool?
4.10	The Chairman clarified that Eurisol UK intended to place a contract for the work, and the outcome, in the form of a detailed report, would be presented to WATCH at a future meeting. WATCH would be asked to provide an opinion on the study outcomes. Eurisol UK clearly considered that an opinion provided by WATCH could influence decision-making processes, for example those involving DG Employment and SCOEL. Steve Williams representing Eurisol UK affirmed that, in progressing this issue and gathering further information, Eurisol UK was establishing to work in partnership with other relevant organisations and bodies, which would include HSE and the WATCH committee.
4.11	A WATCH member suggested that DG Employment and SCOEL would follow a formal process for establishing an EU occupational exposure limit for mineral wool; given this, he questioned, what if any influence Eurisol UK or WATCH could exert on such a process. Carol Houghton replied that the industry considered that, in its evaluation of mineral fibres SCOEL had largely considered evidence from one fibre type (special purpose types of fibres) to inform conclusions across a broader range of fibre types. Industry was questioning the validity of this assumption; however, her perception was that SCOEL appeared to derive its positions by way of a relatively closed process, in which there was little scope for industry to provide input during the deliberations. She clarified however, that the intention of the proposed initiative was not to advise SCOEL on how to go about establishing proposed occupational exposure limits for mineral fibres, but to assemble a view based on consultation with a range of organisations and bodies, to present to DG Employment and SCOEL in response to the current proposals as they relate to mineral wool.
4.12	Two WATCH members expressed disagreement with the notion that SCOEL operated in a closed manner, stating that there was opportunity for comments from industry and other stakeholders to be received and considered by SCOEL. One member highlighted that SCOEL used fully documented, publicly available scientific evidence in its deliberations and that it would expect to see all of the supporting evidence and data for any counterarguments to its proposals.
4.13	The Chairman asked the representatives from Eurisol UK to give an indication of the timescales associated with the study. Steve Williams clarified that a 3-phased project had been agreed, comprising: data-gathering: filling data gaps: and carrying out a risk assessment.

	Phase 1 had already been commissioned. Activities to be carried out under Phases 2 and 3 had yet to be agreed.
4.14	<b>The Chairman thanked members for their comments. He confirmed with WATCH that the committee was interested in the proposed study on mineral wool to be commissioned by Eurisol UK and was supportive of the plan to return to WATCH with a fully documented report of the outcome. He requested that the Eurisol UK representatives liaise with the WATCH secretariat regarding timelines for the work, anticipated outputs and progress. WATCH agreed that it would be appropriate to consider at a future meeting the outcomes from the proposed study, together with supporting information, in a comprehensive package of papers that would enable the committee to conduct a fuller evaluation of all of the available evidence.</b>
<b>5</b>	<b>Isocyanic Acid and other Monoisocyanates: Potential for Respiratory Sensitisation and Irritation</b>
5.1	<p>The Chairman opened the item on the potential for exposure to isocyanic acid (ICA) other low molecular weight monoisocyanates (LMW mono-IC) to cause respiratory irritation and sensitisation by referring WATCH to the cover paper and supporting papers. He thanked Dr Anna Rowbotham (HSL, Health Exposures Section) and Dr. Peter Ridgway (HSE, Chemical Assessment Schemes Unit) for preparing background information in Annexe 1 and 2 to the item. He referred the committee to paragraph 13 of the cover paper and invited WATCH to arrive at positions on:</p> <ul style="list-style-type: none"> <li>(i) the potential for ICA and other LMW mono-IC to cause respiratory sensitisation and irritation in the workplace</li> <li>(ii) whether it is appropriate to apply an equally stringent regime to all isocyanates, based on the assumption that all isocyanates have potential to cause respiratory sensitisation and are potent respiratory tract irritants</li> </ul>
5.2	<p><b>General discussion</b></p> <p>A WATCH member pointed out that since analytical techniques to measure airborne concentrations of ICA had only recently been developed, it was difficult to determine retrospectively the extent to which exposure to this substance had occurred, or whether any potential exposures had resulted in adverse health outcomes. From information reported by clinicians to the Surveillance of Work-related Occupational Respiratory Disease (SWORD) database, it would not be apparent whether or not workers had been exposed to ICA and hence standard interrogation of the database had not provided any helpful insights. This given, he suggested the approach of further examining cases in the SWORD database to determine the associated exposure circumstances, for example whether workers were involved in tasks where thermal degradation of polyurethane may have occurred. He felt that such lines of enquiry might reveal more about the possibility of a link between exposure to ICA and respiratory disease.</p>
5.3	<p>A WATCH member commented that the findings of immunological studies on LMW-mono-IC suggested that these substances could interact with the human immune system on a number of levels. In the sense that one thinks of the immune system functioning to encounter foreign substances and eliminate them from the body, studies of antibody responses to mono-IC suggest some ability to trigger this type of immune system response. But one must also consider the body's ability to be 'self-tolerant', ie. to tolerate its own molecules and not mount an immune response against them. Studies suggested that mono-IC could modify proteins in the body and this might be a route to interference with self-tolerance. One consequence of the breakdown of 'self-tolerance' is that the body might become more susceptible to being sensitised to substances that the immune system would otherwise be able to deal with effectively.</p>

5.4	<p>Another WATCH member commented that although there is some suggestion that di-isocyanates, with two reactive –NCO groups, may be more potent inducers of asthma than mono-isocyanates with only one reactive group, there was no strong evidence to substantiate this theory. On the basis that mono-IC also contain the reactive –NCO group, and in the absence of robust evidence to the contrary, one might take the view that mono-isocyanates also possess the potential to cause respiratory ill-health and a precautionary approach should be adopted in their exposure control and risk management. He asked whether HSE could consider conducting a study of workplaces where mono-isocyanates are used or produced, to determine whether or not any causes of asthma or respiratory disease have been observed? The Chairman clarified that HSE had searched the literature and had found no reported cases of asthma linked to exposures to ICA or other LMW mono-IC. The WATCH member commented that the lack of published information might reflect the fact that people have not been aware of exposure situations and/or potential problems associated with LMW mono-IC. To determine whether there is link between exposure and ill-health, he suggested that HSE would need to proactively visit workplaces in order to gather more evidence.</p>
5.5	<p>A WATCH member suggested that car-repair shops may not be good examples of workplaces where data could be gathered in respect of the consequences of exposure to LMW mono-IC, despite the fact that these substances have been found to occur as degradation products of a number of tasks. This is because many of the workers were likely to have also had exposures to di-isocyanates, to which they may already be sensitised and because of which might have experienced respiratory ill-health. He proposed that if new data were to be gathered, other types of workplaces should be explored. Another WATCH member commented that the processes by which LMW mono-IC were produced in the workplace appeared to be random and, as such, exposure situations would be difficult to pin down and characterise. He thought that HSE should consider if there is sufficient awareness within the relevant industrial sectors of processes that can potentially generate LMW mono-IC? There was perhaps a case for awareness-raising activities? Rob Turner (HSE, Corporate Health Specialist Division), replied that materials containing precursors that will release LMW mono-IC on heating can be readily determined, allowing one to characterise the major industrial processes of relevance.</p> <p>Gareth Evans (HSL, Health Exposures Section) informed WATCH that the Group of Occupational Respiratory Disease Specialists (GORDS) network, co-ordinated by HSL's Centre for Workplace Health, could be approached for any experience they might have in relation to this issue.</p>
5.6	<p>Another WATCH member agreed that a precautionary approach should be taken to managing the potential health risks of LMW mono-IC until more is known about these substances. He considered that it was possible that more information could become available on mono-IC if any of these substances are captured by REACH. He asked why WATCH had been approached to examine this issue at the current time?</p> <p>The Chairman replied by giving some background to the issue and how the concerns had emerged. In the absence of data to inform a valid evaluation of the respiratory effects of mono-IC, the control of risks arising from exposure to these substances is currently informed by evidence derived from di-isocyanates. According to the criteria of the EU hazard classification system for dangerous substances, all isocyanates (mono- or di-) should be classified for the hazardous property of respiratory sensitisation unless there is evidence to the contrary. This notion of treating all isocyanates similarly is also reflected in the approach adopted in GB for setting the Workplace Exposure Limit. However, in setting an occupational limit for methyl isocyanate (MIC), SCOEL adopted a different approach in which the lack of supporting human evidence was taken to indicate that MIC did not pose a concern for respiratory sensitisation. Furthermore, the strategy presented for evaluating respiratory sensitisation data in the relevant piece of REACH technical</p>

	<p>guidance proposes that, in the absence of relevant human data, only di-isocyanates that meet the criteria for classification as skin sensitisers can be presumed to be respiratory sensitisers. In light of these discrepancies and a recent challenge to HSE's stance on the legitimacy of the isocyanate WEL covering ICA, the key questions are :</p> <ul style="list-style-type: none"> <li>(i) Should an equally stringent regulatory approach be adopted in which all isocyanates are considered to be respiratory sensitisers and irritants ?</li> <li>(ii) Is the approach in (i) too stringent and, if so, what alternative approach would be appropriate ?</li> </ul> <p>A WATCH member commented that the differences in opinion on MIC have been apparent for some time in the manner in which different pieces of EU chemicals legislation treat this substance. MIC is classified in the EU as a respiratory sensitiser, whereas SCOEL's risk assessment for MIC centred on irritant effects. He suggested that it would be interesting to revisit the basis for the EU classification and labelling decision. Despite the apparent lack of evidence, he pointed out that a lot was known about MIC due to the major chemical accident at Bhopal. Mortality and morbidity in Bhopal was associated, in the main part with the potent irritant properties of MIC rather than respiratory sensitisation. The Chairman suggested that because Bhopal had been a single exposure incident, it could not be readily deduced from the body of associated information whether or not MIC causes asthma.</p>
5.7	<p><b>Deriving a position on the potential for LMW mono-isocyanates</b></p> <p>Several WATCH members commented that due to the paucity of hazard and exposure data, the issue was particularly challenging; it would be difficult to substantiate any definitive statements about the potential for ICA and other LMW mono-IC to cause respiratory sensitisation or irritation or the appropriateness of different regulatory regimes.</p>
5.8	<p>Acknowledging that data was lacking in respect of both the irritation and asthmagenic potential of LMW mono-IC, the Chairman asked members whether they thought it appropriate to consider the toxicological hazard associated with each of these endpoints separately. With respect to the sensitisation potential of LMW mono-IC, he asked whether the evidence from the chemical properties and structure of these substances was sufficient to suggest that they have the potential to interfere with the human immune system and, in the absence of evidence to the contrary, they should be regarded as suspected respiratory sensitisers? WATCH agreed this position and a similar stance regarding respiratory irritancy. From this position, members considered it sensible to continue to maintain the existing precautionary approach to the risk management of these substances, until more data become available.</p>
5.9	<p><b>The Chairman thanked members for their comments and brought the item to a close. He confirmed with WATCH its position, that the issues were challenging because of a lack of hazard and exposure data on substances within this group. WATCH expressed a consensus view that LMW mono-IC should be regarded as suspected respiratory irritants and sensitisers, and that the current precautionary approach to the exposure control and risk management of these substances should be maintained.</b></p> <p><b>WATCH made a number of suggestions for how further insights into the potential for LMW mono-IC to adversely affect respiratory ill-health could be gained :</b></p> <ul style="list-style-type: none"> <li>i. <b>From the possibility of further information on LMW mono-IC generated in the future under REACH</b></li> <li>ii. <b>From further assessment of data in the SWORD scheme relating respiratory ill-health outcome to industrial processes of relevance to mono-IC generation</b></li> <li>iii. <b>From the possibility of conducting further research surveying workers in workplaces where these substances are used or generated</b></li> </ul>

<b>6</b>	<b>Risks of Lung Cancer and Mesothelioma from Relatively Low-Level Exposures to Different Forms of Asbestos: Report of Progress</b>
6.1	<p>The Chairman opened the item by reminding WATCH that an initial exploration of what is known about the dose-response relationships for lung cancer and mesothelioma caused by exposure to different forms of asbestos was made at the November 2007 WATCH meeting. At the following meeting in February 2008, WATCH had agreed a proposal for progressing this work based on four approaches :</p> <ol style="list-style-type: none"> <li>1. Strengthening the evidence about historical exposures in the cohorts studied.</li> <li>2. In the light of more recently published studies and an updated perspective on all the available information, to revisit the Hodgson &amp; Darnton (H&amp;D) analysis of 2000.</li> <li>3. Assessment of specific occupational circumstances that might allow one to more accurately link the level of exposure to the degree of risk.</li> <li>4. Reality checks comparing the observed mesothelioma incidence in population subgroups receiving relatively low exposures to asbestos to what is predicted by the H&amp;D (2000) model.</li> </ol> <p>As agreed at the February 2008 WATCH meeting, HSE had now provided a report of progress of work that had been carried out in respect of approaches 1 and 2. The Chairman referred members to Annexes summarising progress: Annexe 2 provided an update and assessment of airborne exposure data used in HD2000 and Annexe 1 provided a re-appraisal of the HD2000 analysis. He invited Andrew Darnton (HSE, Statistics Unit) to provide members with an introductory overview of the work that had been done and the key findings.</p>
6.2	<p><b>Asbestos : Revisiting the overall “H&amp;D” analysis - “approach 2”</b></p> <p>Andrew Darnton gave a short overview presentation on the analysis that had been carried out in the reconsideration of the original HD2000 analysis and highlighted a number of key points. He informed WATCH that the HD2000 analysis had been re-appraised in the context of :</p> <ol style="list-style-type: none"> <li>(i) identification of which were likely to be the more, and the less reliable individual studies, in relation to the exposure information they contained</li> <li>(ii) incorporation of additional studies and updates to studies that had appeared since the HD2000 analysis.</li> </ol> <p>He reminded WATCH that in the HD2000 analysis, both linear and non-linear models had been applied to the data from cohort studies to investigate the relationship between exposure to different types of asbestos fibre and incidences of mesothelioma (pleural and peritoneal) and lung cancer. Referring to the summary linear risk coefficients in Table 2 of Annexe 1, he reminded WATCH that in the original HD2000 study, the % mesothelioma risk per unit exposure (<math>R_M</math>) had been determined to be 0.5, 0.1 and 0.001 for crocidolite, amosite and chrysotile respectively. The % excess lung cancer risk per unit exposure (<math>R_L</math>) had been determined to be 5 for crocidolite and amosite and 0.1 for chrysotile.</p> <p>When the different sites of mesothelioma (pleural and peritoneal) were examined separately, there was evidence for a non-linear relationship between cumulative dose and risk. Non-linear models were therefore considered for mesothelioma, in which risk was proportional to a power of cumulative exposure; and separate power function components were incorporated to reflect differences in pleural and peritoneal mesothelioma data. Based on the best fitting model, pleural mesothelioma risk is proportional to a power of cumulative exposure less than 1 whereas peritoneal mesothelioma risk is proportional to a power greater than 2. This means that pleural cases dominate over peritoneal cases at</p>

	<p>low asbestos exposures, with peritoneal mesotheliomas becoming more important with increasing exposure levels. In the range of exposures relevant for cohorts that have been studied, if both sites of mesothelioma are considered together, the overall dose-response relationship observed looks broadly linear – but if true, the non-linear relationship for pleural mesothelioma leads to higher risks at low exposures than predicted by the linear dose-response relationship.</p> <p>The main focus of the “revisit” analysis was the 11 ‘pure fibre’ cohorts (Table 1, Annexe 1) included in the HD2000 study and an additional five new ‘pure fibre’ cohort studies (Tyler amosite insulators; Libby vermiculite miners; Wittenoom environs; Quebec environs and Libby miners) that have emerged since the HD2000 work was done. Linear and non-linear models had been fitted to the data from the 16 cohorts.</p> <p>Andy Darnton referred WATCH members to Figures from Annexe 1 showing graphically the outcomes of the revised analysis. Figures 2, 3 and 5 showed the relationship between cumulative exposures to different types of asbestos fibre and pleural mesothelioma; peritoneal mesothelioma and lung cancer respectively. He drew WATCH’s attention to the division between cohorts rated as ‘more reliable’ and ‘less reliable’. He informed members of that the following issues had emerged during the assessment of the reliability of the cohorts :</p> <ul style="list-style-type: none"> <li>(i) The re-evaluation of the exposure data used in HD2000 (Approach 1) had helped to identify the cohort studies with relatively less uncertainty associated with their exposure data, however no cohorts emerged as being particularly robust with respect to exposure assessment. Thus using a subset of reliable cohorts or a ‘best study’ approach to provide a more robust view about the dose response was not possible. Instead, judgements have to be based on the generality of the evidence with all its associated uncertainties.</li> <li>(ii) Further consideration of the exposure data doesn’t suggest any obvious approach which would provide a rigorous basis for adjusting the relative magnitude of the exposure estimates. Any adjustment would simply be based on subjective judgments.</li> </ul> <p>Andrew Darnton concluded his introductory presentation by highlighting the key observations from the revised analysis of HD2000:</p> <ul style="list-style-type: none"> <li>(i) An analysis based only on the results from the more reliable studies produced a pattern of results that fall along the same relationship as that in HD2000, derived from all the studies covered at that time.</li> <li>(ii) New studies, some of which are arguably less susceptible to bias in the average exposure calculations, appear to support the values for mesothelioma and lung cancer risks per unit exposure (<math>R_M</math> and <math>R_L</math> values derived in HD2000)</li> <li>(iii) The original conclusions of the HD2000 analysis about the non-linear relationship between cumulative exposure and pleural mesothelioma risk are supported by the updated analysis. However, the extent to which this non-linearity reflects a regression-to-the-mean effect, due to not accounting for the variability in the cumulative exposure estimates, rather than a genuine relationship has not been assessed.</li> </ul>
6.3	<p><b>Considering whether the further analysis supports the validity of Hodgson &amp; Darnton dose-response relationship</b></p>

	<p>The Chairman thanked Andrew Darnton for the presentation. He reflected to WATCH the HSE position that it had progressed as far as possible in respect of Approaches 1 and 2. He drew WATCH's attention to paragraph 12 of the cover paper and asked members to consider the proposition that the further analysis conducted under Approaches 1 and 2 supports the HD2000 dose-response relationships derived for lung cancer and mesothelioma produced by crocidolite; amosite and chrysotile, within the window of the observed data (extending from 5 f.ml<sup>-1</sup>.years to 600 f.ml<sup>-1</sup>.years on the dose axis). He asked WATCH whether, on the basis of outcomes from Approaches 1 and 2, the committee considered that it should now endorse the Hodgson and Darnton dose-response relationships?</p>
6.4	<p>He opened the item for general discussion by suggesting that the focus should initially be on the amphiboles fibres, as the dose-response data for these fibres was less variable than that for chrysotile.</p>
6.5	<p>A WATCH member agreed with giving most attention to the amphibole forms. Given the much lower potency of chrysotile, relative to the amphiboles, he questioned whether the dose-response characteristics for relatively low exposures to chrysotile fibres were of great interest in themselves; however, knowledge about chrysotile could be used to reinforce broader understanding of the dose-response relationships for all asbestos fibre types. Although crocidolite is no longer in use and a large proportion of installed crocidolite has now been removed in the UK, he deemed crocidolite to be an important fibre type in the context of exploring dose-response relationships from historical exposures, since large amounts were used in products in the 1950's and 60's.</p>
6.6	<p>A WATCH member pointed out that in his view the most important outcome from HD2000 was the statement that chrysotile asbestos is at least 100 times less potent than amphibole forms of asbestos, in terms of producing mesothelioma. This supported a concentration on the amphibole forms. He wondered whether it would be more productive to focus on better characterisation of specific contemporary potential exposure scenarios (such as carpenters unwittingly encountering amosite boards within buildings) rather than the validity and utility of the HD2000 predictive models?</p> <p>The Chairman clarified that the key question for WATCH to consider is how to make predictions about the level of health risk posed by different degrees of exposure to different forms of asbestos in different sets of circumstances. Acknowledging that the data from the cohort studies might be limited, in terms of the reliability of the exposure information, and essentially a reflection of the circumstances under which the data were gathered, the general issue for WATCH to address is whether the existing observed data can be used to make predictions for other circumstances and scenarios. In this context, a key question is: Is the Hodgson and Darnton model the best available predictive model? A more fundamental question is: Is it possible to make reliable extrapolations from one set of asbestos exposure circumstances to another, given the number of variable factors involved?</p>
6.7	<p>The WATCH member commented that based on current predictions, 10% of workers who in recent times have been in the carpentry sector and 2% those who in recent times have been general building workers are expected to develop cancer due to exposure to asbestos. Looking beyond these occupational groups, he asked: what other circumstances or scenarios are of most interest or concern, and what exposure data, if any, are available (or can be generated) in respect of these scenarios?</p> <p>The Chairman reminded WATCH of two such specific scenarios that in recent years had been brought to the committee for consideration: exposures arising from asbestos insulation boards used in school buildings and exposures arising from removal of textured decorative coatings from ceilings. He emphasised that questions or concerns relating to specific scenarios of this type arose regularly within HSE's work. Addressing such challenges was the reason why WATCH had been asked to consider what levels of risk</p>

	might be associated with relatively low levels of exposure to different forms of asbestos and whether confident predictions of risk can be made for a range of contemporary potential exposure scenarios.
6.8	A WATCH member pointed out that there was no clear basis for determining cumulative exposures for current populations who potentially might be experiencing exposure to asbestos and therefore no means of making accurate estimates of risk. This given, he suggested that it might be more worthwhile to reinforce the message to workers that buildings may contain asbestos and raise general awareness that any work that may disturb asbestos carries the potential to create exposure. Dr Gary Burdett (HSL, Fibres Section) informed WATCH had HSL had carried out surveys in which plumbers had been asked at random to wear passive, electrostatic sampling devices on their outer clothing over the course of a week. The majority had received some measurable exposure to asbestos; in some cases even when having returned to buildings from which asbestos had been professionally removed.
6.9	<p>Dil Sen noted that the three lines in Figure 2 of Annexe 1 appeared in parallel. He asked whether there could be a threshold associated with the lower end of the exposure spectrum, above which the dose-response relationship would be expected to display linear characteristics. Andy Darnton pointed out that the relationship between low-level exposures and effect (e.g. the shape of the bottom end of the curve) was not known.</p> <p>A WATCH member referred to the line in Figure 2 representing the dose-response relationship for mesothelioma associated with cohorts predominantly exposed to chrysotile. He observed that the excess mesothelioma mortality for cohorts associated with the lowest cumulative exposures were lower than the background incidence of mesothelioma observed in the general population today. The background rate of mesothelioma in the general population has increased significantly over the last 50 years, perhaps due to asbestos in the general environmental and unreported exposures to asbestos. In light of this, he questioned the validity of using the dose-response curves in Figure 2 to extrapolate to lower exposure scenarios.</p>
6.10	A WATCH member considered that the dose-response relationships presented in Figure 2 indicated that the HD2000 model is robust. The new work had not yielded further insights into the dose-response relationships in the low-level range. He suggested that in reinforcing the outcomes of the HD2000 study, the updated analysis was highly useful and there were clearly merits in making the findings available publicly.
6.11	A WATCH member was concerned that in some historical cohorts, a high rate of asbestosis deaths might have masked what would have been a significant rate of longer-latency mesotheliomas. For example, in a well-studied Quebec cohort 300-450 workers had died of asbestosis. He wondered if the “true” risk of mesothelioma in such a cohort was substantially higher than that apparent from the number of mesothelioma deaths. He suggested that when considering the risk of mesothelioma at relatively high levels of exposure, a correction should be applied to allow for the potential masking effect of other forms of asbestos-induced death occurring earlier in life. He offered the hypothetical assumption that 10% of 300–450 workers who died from asbestosis would (had their life been longer) have developed mesothelioma, this would effectively double the risk of mesothelioma compared to that observed for that cohort. In this respect, in his opinion the HD2000 model under-estimated the true lung cancer and mesothelioma risks in those cohorts studied that had received high exposures and had a high incidence of asbestosis. He added that it was also important to think about life-expectancy; that associated with each cohort, in comparison with current life-expectancy for the UK population. The average lifespan in the Quebec cohort was 67 years for men, whereas life expectancy for males in the UK is currently 77. An extra 10 years of life expectancy might double the risk of mesothelioma by allowing more time for this long-latency disease to develop. He considered that there is a case to move the HD2000 curves upwards on the risk axis to

	take account of this effect.
6.12	<p><b>Accounting for age and exposure duration in risk estimates</b></p> <p>A WATCH member asked how time parameters used in the analysis (e.g. 'time since first exposure' or 'duration of exposure') had been determined and standardised in order that comparisons could be made across the cohorts? This is important because age (eg age at first exposure) seems to be a particularly important determinant of risk, independent of dose. He asked whether there was sufficient data from the cohort studies to explore the effects of different dose <i>rates</i> and whether such an analysis would provide a more pertinent measure of dose than cumulative dose. Andy Darnton replied that the exposure estimates had been standardised with respect to workers age, assuming first exposures occurred at the age of 30. He did not recall whether there was sufficient data for each cohort study to look specifically at time parameters in more detail.</p>
6.13	<p>A WATCH member sought clarification as to whether the lifetime cumulative risk estimates for each cohort look into consideration the available follow-up period, given that in some cases the period between first exposure and the detection of mesothelioma is very long. Andrew Darnton clarified that all the cohorts included in the original HD2000 analysis and in the updated assessment now presented had substantial follow-up periods. The WATCH member also emphasised that age at the time of first exposure seems to be very important and reminded members that this issue had been discussed at the November 2007 WATCH meeting.</p>
6.14	<p>With reference to Table 9 of Annexe 1, a WATCH member asked whether the use of age-adjustment factor described in Annexe 1 could be used to explore predictions of risk in those having particularly long exposure periods, for example if asbestos exposure were to start at an early age. Gary Burdett commented that the cohorts in which workers had received exposures at an earlier age and over a longer time period (Quebec and Carolina) were most likely to be informative in this respect.</p>
6.15	<p>A WATCH member commented that the HD2000 dose-response model might not be reliable in determining, for example, the risk associated with exposure to a specified level of asbestos over a lifetime from 0 to 70 years, because the effect of shifting the age of first exposure (to well before age 30) on cumulative lifetime risk was not known. He asked what additional data would be required to determine the consequences of exposure commencing at an early age; and whether such data might then be used in combination with the HD2000 model to make predictions for situations outside of the range of scenarios covered by the cohorts in HD2000? Andrew Darnton confirmed that the risk predictions derived in HD2000 were based on estimates of the cumulative dose acquired over a relatively short time period and assuming that exposure to asbestos first occurred at the age of 30. He considered that it might be possible to further explore the effects of varying exposure-duration and age-at-first-exposure parameters on estimates of cumulative lifetime risk, using other available models and adjustment criteria. For example, it is possible to use the H&amp;D models to predict risks for extended exposure periods by partitioning the exposure cumulative exposures accrued over shorter periods and applying age adjustment factors based on models of risk in relation to time since first exposure. The WATCH member commented that if this type of analysis was carried out, it would be interesting to ascertain whether a change in the dose-response relationship and consequent risk predictions would occur. However, another WATCH member commented that the underlying data he had used to derive models of risk in relation to time since first exposure were limited.</p>
6.16	<p>The Chairman noted that it was apparent that there were many variables involved in different asbestos exposure scenarios; he had formed the impression that members considered that predicting risk for a particular exposure situation, or making general statements about risks for low-exposure scenarios was extremely challenging. Having addressed this issue over several WATCH meetings, he asked members whether, having</p>

	collectively considered the available evidence, they considered that any valid assessments of risk could be made?
6.17	<p><b>Several WATCH members commended the efforts that HSE had put into revisiting the HD2000 analysis and re-evaluating the exposure data. WATCH considered that the work was thorough and admirable.</b> The difficulties were inherent in the quality of the original data available for analysis and in the number of important variables that might be involved in any particular exposure situation. These factors severely impeded the derivation of reliable risk estimates for any specified exposure scenario.</p> <p>A WATCH member commented that the outcomes of the new analysis could still be used to inform the assessment of risk with low-level exposures to asbestos, provided the uncertainties associated with any predicted risk estimates were presented and discussed in an open and transparent manner. An appropriate presentation of uncertainties associated with risk predictions was particularly important where such predictions would be used to direct advice and guidance intended for the general public or consumers.</p>
6.18	<p>Another WATCH member highlighted that quantified risk estimates are needed to prioritise which potential exposure situations most demanded action on control; and also to inform on the potential relative benefits of different risk management options for any particular situation. For example, the predictive HD2000 models indicated that exposures to amphiboles carry a substantially greater risk of disease than similar exposures to chrysotile, thus informing where most exposure control effort should be targeted. In light of the challenges the committee had encountered in attempting to derive a clear position from which to predict risks associated with low level exposures to asbestos, based on the available body of evidence, he proposed that WATCH might consider adopting one of three positions:</p> <ol style="list-style-type: none"> <li>1. Risks associated with low-level exposures to asbestos cannot be predicted using the existing evidence-base (ie <u>no</u> estimates).</li> <li>2. Reliable absolute predictions about risks associated with low-level exposures to asbestos cannot be made using the HD2000 dose-response model, but it can be used to make predictions about the level of risk of one situation relative to another, in order to prioritise exposure control needs and risk management options (ie <u>relative</u> estimates).</li> <li>3. The HD2000 linear dose-response relationship is considered to be valid, based on the consideration of the existing evidence-based, and can be used to make reliable predictions of risk for low-level exposures (ie <u>absolute</u> estimates)</li> </ol>
6.19	<p>The Chairman thanked the WATCH member for that very useful portrayal of the options available to WATCH. He said that he would return to this later in the discussion. He then asked WATCH to consider whether or not work that might be done to pursue Approaches 3 and 4 might help? He reminded WATCH that under Approach 3 there was the idea of trying to assess amosite exposure in carpenters and to relate the exposure assessment to the observed incidence of mesothelioma in this employment group, to determine where the derived exposure-risk data point lay in relation to the HD2000 dose-response model for amosite.</p>
6.20	<p>In terms of assessing exposure, a WATCH member questioned whether carpenters today were likely to encounter materials containing asbestos. Kevin Walkin (HSE, Policy Group) commented that maintenance workers were more likely than carpenters to be exposed to asbestos, given that there was the possibility that maintenance workers could disturb materials containing asbestos in buildings. WATCH members asked if it would be possible to quantify the potential exposures that might be experienced by maintenance workers nowadays? Another WATCH member pointed out that such monitoring work was problematic from an ethical perspective, as there is a duty to prevent any work likely to result in exposures to asbestos. A suggestion was made for an approach that would</p>

	involve maintenance workers being fitted with a personal sampler for a week, which would inform on whether or not any unsuspected exposure to asbestos had occurred. However, it was felt that evidence of any asbestos exposure having occurred would reflect that involved in one or two tasks where exposures had occurred, plus exposure arising from general background air; this would still pose difficulties in that pinpointing where exposures might have occurred would rely on the accuracy with which workers were able to recall tasks they had worked on during the week of monitoring.
6.21	Rob Turner (HSE, Corporate Specialist Division) commented that it might be possible to determine asbestos exposures in maintenance workers using simulation and modelling techniques, rather than by a measurement study. A WATCH member suggested that typical tasks carried out by carpenters could be simulated. Another WATCH member suggested that for construction workers a large random sampling approach could work better than using simulation methods to get reliable estimates of asbestos exposure.
6.22	Another WATCH member questioned the merits of randomly sampling workers to determine their exposures. In his opinion, there was sufficient data available about tasks involving construction workers and this could be used to inform the derivation of exposure estimates. In his view the asbestos surveys that are carried out on buildings would provide insights into the typical background levels and types of fibres commonly encountered. These surveys would help to identify whether exposure to asbestos in such situations is a genuine problem.
6.23	A WATCH member pointed to a different approach, that of ongoing research examining biopsy samples from the lungs of construction workers to count retained asbestos fibres. He considered that this approach would yield valuable data reflecting asbestos exposure during the preceding 10-year period.
6.24	Referring back to the Chairman's comments in point 6.17 on the arduousness of the task, a WATCH member summarised progress to date as: <ul style="list-style-type: none"> <li>(i) Annexes 1 and 2 provided good papers addressing Approaches 1 &amp; 2.</li> <li>(ii) A need to gather more exposure data has been identified</li> <li>(iii) A need to carry out further modelling work has been identified</li> </ul> He considered that WATCH had advanced the project significantly, although clearly there was more to do.
6.25	<b>The Chairman thanked members for their comments and brought the discussion to a close. He proposed that the WATCH Secretariat would prepare a draft conclusion from this discussion, to be circulated to WATCH members for comment. All comments received would then be circulated to all members in a second stage of the consultation, the ultimate aim being to derive a draft proposition to put to the October 2008 WATCH meeting.</b>
6.26	<b>ACTION : WATCH Secretariat to prepare draft conclusions that reflect the discussion from the June 2008 meeting, circulate to members, and then in a second phase of consultation circulate all comments received to all members. Then to put a draft proposition to the October 08 WATCH meeting.</b>
<b>7</b>	<b>Poultry Dust: A Control Approach</b>
7.1	The Chairman introduced this item by informing WATCH that HSE had been investigating the risks of respiratory disease amongst workers on poultry farms and had derived an approach for reducing these risks. Some poultry farm workers are currently exposed to relatively high concentrations of organic dusts. The approach has involved working with industry stakeholders to explore reasonably practical measures to achieve adequate exposure control. He welcomed HSE/HSL officials involved in the work: Bob Hadway (HSE Policy Group – Agriculture and Food Sector, Project Leader); Len Morris (HSE, Chemical Risk Management Unit); Brian Crook (HSL, Health Exposures Section); and Neil

	Davey (HSE, Chemical Risk Management Unit). He referred members to the cover paper and package of associated papers and invited members to consider the issues described and take a view of points (i) to (v) in paragraph 18 of the cover paper. He opened the item for general discussion.
7.2	<p><b>General discussion</b></p> <p>In relation to paragraph 14 of the cover paper, a WATCH member asked if there were any reasons apparent as to why only limited direct evidence of respiratory ill-health amongst poultry workers had been found by HSE in its studies, despite the large amounts of information having been gathered about exposures to poultry dusts, some of which appeared to be very high. He asked whether health information had been difficult to gather from poultry workers, perhaps because many tended to be employed on a casual basis? Bob Hadway replied that whilst large numbers of migrant workers are employed in some of the poultry processing plants in parts of the country, there is not the same level of employment of migrant workers on the poultry farms. However, one of the reasons why ill health statistics are poor may be that many of the tasks that give rise to high dust exposures on farms are carried out by gangs of contractors who repeatedly move from site to site. Some of the gang members may be casual workers. Dr. Dil Sen (HSE, Senior Medical Advisor) added that poultry farms also tended not to have routine health surveillance schemes in place and hence health data did not emerge readily from this sector.</p>
7.3	A WATCH member referred to data provided in Table 9 (page 28) of the HSE Research Report (RR370): <i>Baseline incidence of ill-health in agriculture in Great Britain</i> (Annexe 1) on the prevalence of respiratory symptoms observed in workers exposed to organic dusts. From the total body of data available from all reported studies he noted that, whilst a total prevalence of chronic bronchitis of 6.5% had been observed across all agricultural occupations, a higher prevalence rate of 15% had been associated with poultry workers. He asked whether this observation provided evidence that occupations involved in poultry farms were more at risk of developing respiratory disease than other agricultural occupations?
7.4	In relation to this point, the Chairman invited the WATCH member who had been involved in RR370 to discuss the strength of the evidence presented in the report and to what extent this indicated that there may be a substantially greater health problem specifically within the poultry industry. The member informed WATCH that at the time of the investigation the overall body data available from a number of different studies had been sparse. Data had been available to determine the prevalence of respiratory disease for a given agricultural occupation, but the associated exposure data had not been available.
7.5	A WATCH member expressed surprise that in the particular study reported in RR370 no ill-health had been identified, given the evidence that workers were encountering high exposures to organic dusts. He asked whether this was because workers in the sector were casually employed and in moving between workplaces frequently, would be difficult to pin down in terms of assessing their health status. Len Morris pointed out that many of the contractors employed by the sector worked across a number of different farms, often doing particular tasks for 7 hours per day, for up to 7 days per week. As such, this group of workers represented as a 'well-exposed' cohort. Nevertheless, there was a broad range of workplaces and workforces within the industry, such that it was difficult to make generalisations about poultry farm conditions and their workers.
7.6	Several WATCH members noted that the high levels of dust and poor hygiene standards that have apparently been encountered within poultry farms during the RR370 study were causes for some concern and should be taken up with the industry as a matter of priority, even if frank ill-health data are not available. Bob Hadway informed WATCH that a risk-based approach had been adopted to convince the industry that there is a genuine cause for concern. In discussions with this industry sector the message had been conveyed that

	<p>the dusts encountered in poultry houses were complex mixtures consisting of a numbers of different substances that could present health hazards individually or in combination. As high concentrations of such dusts could be encountered in poultry work, the level of associated risk was both high and unacceptable.</p>
7.7	<p>A WATCH member asked whether antibiotics, after their administration to animals, were likely to be present in the complex mixtures of dusts found in poultry farms? If so, could exposure to poultry dusts lead to respiratory sensitisation to such antibiotics? In relation to exposure to dusts from poultry feed, another member informed the committee that the preparation of animal feed involved highly technical processes in which a broad range of substances were added (e.g. trace minerals and metals, medicines etc). Given that these substances could enter the human food-chain, as residues in meat and other animal products, they where tightly regulated in the UK by the Veterinary Medicines Directorate.</p> <p>Post meeting comments : Following further enquiries with the poultry industry, HSE has confirmed that antibiotics are not included in poultry feeds. Antibiotics are only used under the direction of a veterinary practioner, as and when necessary to deal with specific conditions. They are normally administered in the drinking water and so should not present a respiratory risk to poultry farm workers.</p>
7.8	<p>In light of the health concerns associated with poultry farms and the complexity of the dusts involved, a WATCH member raised the question of what are the best approaches for addressing the problem of workers who already have asthma and are taking on tasks in the poultry sector? What role does health surveillance have in this respect? Dil Sen pointed out that the purpose of health surveillance schemes was to provide evidence on the adequacy of exposure control.</p>
7.9	<p>A WATCH member asked whether the issues associated with poultry dusts were similar to those involved in working with research laboratory animals? Another member commented that, in respect of work with laboratory animals, a key issue is exposure to materials contaminated with rat urine, since this is highly allergenic. He made the general observation that poultry houses appear to be a lot dirtier in comparison to conditions commonly encountered in experimental animal facilities.</p>
7.10	<p><b>Deriving positions on poultry dusts</b></p> <p>The Chairman referred WATCH back to the points (i) – (v) in Paragraph 18 of the cover paper and asked members to take a view on each point in turn.</p> <p><i>(i) Consideration of HSE’s approach to reducing the risk of respiratory disease amongst workers on poultry farms.</i> WATCH endorsed HSE’s proposed approach for reducing the risk of respiratory disease amongst workers on poultry farms.</p> <p><i>(ii) Consideration of HSE’s proposal to extend the approach to other relevant agricultural occupations</i> WATCH considered that it would be appropriate to extend the approach taken to reduce the risks of respiratory disease in poultry workers, to other groups of agricultural workers, as deemed necessary.</p> <p><i>(iii) Consideration of the ‘Statement of Evidence’</i> WATCH members discussed the ‘Statement of Evidence’ (Annexe 5). A WATCH member asked who was the intended target audience for the ‘Statement of Evidence’. Bob Hadway informed members that HSE needed to work with the poultry industry in order to convince them that exposures to poultry dusts could potentially affect the health of their workers, and the Statement of Evidence would be particularly useful in this respect. The WATCH member considered the format of Statement of Evidence to be too technical for the poultry industry and suggested that a more simple summary document be compiled.</p>

	<p>Another WATCH member agreed that the ‘Statement of Evidence’ was too technical for the industry. In particular, he thought that it would be helpful to provide the industry with further clarification of what ‘high levels’ of poultry dust entailed, possible by providing numerical estimates that could help inform assessments of dust levels. He asked whether it was realistic to expect the poultry industry to effectively carry out health surveillance schemes, given the casual nature of work involved. Dil Sen pointed out that given the potent nature of hazards involved, health surveillance <i>should</i> be carried out. The WATCH member agreed, but suggested that any schemes were more likely to be effective if developed as part of a broader framework of initiatives for the sector. Bob Hadway added that since many aspects of poultry work involve exposures to allergens, health surveillance is required under the COSHH regulations.</p> <p><i>(iv) Consideration of good control practice and the effectiveness of interventions</i></p> <p>The Chairman invited WATCH members to make suggestions on good exposure control practices and how the effectiveness of interventions could be assessed. A WATCH member commented that work-spaces in poultry houses were often small and, as such, made the wearing of respiratory protective equipment difficult. Could pressure be applied to the industry to re-design poultry houses to avoid this problem? Bob Hadway commented that teams of 6 or 7 workers would typically be involved in catching chickens. In this task, the 1 or 2 workers actively involved in catching would tend to receive the highest exposures to dusts, whereas exposures in other team members involved in passing the chickens along the line would be considerably less. Rotation of tasks amongst the catching team would help ‘disperse’ the exposure and alleviate especially high exposures being experienced by particular individuals.</p> <p>A WATCH member proposed that three criteria were necessary in respect of good practice and effective interventions: demonstration of compliance with accepted standards; reduction in exposure and reduction of ill-health.</p> <p>The Chairman asked WATCH members to forward to the Secretariat after the meeting any other suggestions in respect of points (iv) and (v).</p>
7.11	<p><b>The Chairman thanked WATCH members for their comments and brought the item to a close. He confirmed with WATCH that in considering the issue of poultry dusts and approaches for reducing respiratory ill-health in poultry farm workers, it had reached the following conclusions in respect of points (i) to (v) of paragraph 18 of the cover paper :</b></p> <ul style="list-style-type: none"> <li>• <b>In relation to Points (i) and (ii), WATCH endorsed HSE’s proposed approach for reducing the risk of respiratory disease amongst workers on poultry farms and agreed that it would be appropriate to extend this approach to other groups of agricultural workers as needed.</b></li> <li>• <b>In relation to point (iii), WATCH members considered the ‘Statement of Evidence’ as a useful and valuable document, subject to the following provisions :</b> <ul style="list-style-type: none"> <li>i. <b>A more simplified summary should be compiled for the poultry sector.</b></li> <li>ii. <b>Careful consideration should be given to how health surveillance schemes can be effectively implemented in the sector, given the nature of the disease and characteristics of the workforce.</b></li> <li>iii. <b>Levels of poultry dusts described as being ‘high’ should be defined using numerical values. These numbers could assist the industry in making more effective assessment of ‘dustiness’ levels.</b></li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• <b>WATCH members made suggestions in respect of point (iv); good control practice :</b> <ul style="list-style-type: none"> <li>i. <b>Re-designing poultry houses to enable respiratory protective equipment to be more easily worn.</b></li> <li>ii. <b>Sharing work tasks amongst poultry catching teams to avoid especially high-level exposures in particular individual workers</b></li> </ul> </li> <li>• <b>On point (v) the effectiveness of interventions: WATCH members were invited to forward any further thoughts about this point [and point (iv)] to the WATCH Secretariat</b></li> </ul>
7.12	<b>ACTIONS : WATCH members to forward additional suggestions in relation to points (iv) and (v) of paragraph 18 of the cover paper to the WATCH Secretariat.</b>
8.	<b>Issues raised at ACTS for WATCH consideration (Exposure standards for lead; strength of evidence for an association between welding and COPD)</b>
8.1	The Chairman informed WATCH that the issues of exposure standards for lead and the strength of evidence for chronic obstructive pulmonary disease (COPD) occurring in welders had been raised at the last ACTS meeting in May 2008 as items worthy of attention by WATCH. He invited a WATCH member who is also a serving member on ACTS to provide WATCH with further insights into the thinking on these two topics.
8.2	On lead, concerns had been raised at ACTS about recent evidence that blood levels of lead of the order of 10 $\mu\text{.dl}^{-1}$ may be associated with cardiovascular disease. Given that all of the recent published literature relating to this issue had not been fully surveyed, ACTS considered that a systematic literature search was needed and suggested that this could be carried out by HSE. It was envisaged that such a review would inform on the need to pursue a revision of exposure limits for lead.
8.3	The Chairman provided WATCH with initial feedback from HSE in respect of this issue. This was that lead is now regulated by EU legislation and that within this regulatory framework it is not possible for the UK to adopt a different unilateral position. Hence any initiative to revise occupational exposure standards on lead should come from the EU and would be expected to be orchestrated by DG Employment, probably using SCOEL as the primary source of an expert opinion. The Chairman recalled that in recent years SCOEL had developed a position on appropriate air and blood lead exposure standards.
8.4	A WATCH member commented that if stakeholders and regulators in the UK considered there to be concerns about exposure standards for lead, a mechanism should be available by which these concerns could be communicated to the EC. He considered it appropriate that WATCH gave the issue some consideration.
8.5	Dil Sen reminded WATCH that at the time ACTS had last reviewed lead (in 2002), an undertaking had been given to re-visit the issue in 4 years, but this had not yet happened. He pointed out the blood lead suspension levels in some EU countries (e.g. France and Germany) are lower than in the UK and this had come about by national regulatory initiatives. He highlighted that the issue of health risks posed by exposure to lead was an important, high profile issue that had received some media attention. For example a case had recently been reported of a young man who had received large financial compensation in respect of reproductive ill-health he had experienced following exposures to lead.
8.6	<b>The Chairman proposed that a brief paper on the topic, reviewing the current position and regulatory situation, should be prepared for the October 2008 WATCH meeting. This was agreed.</b> A WATCH member added that the issue of how SCOEL can resource its activities was an on-going concern. Although each EU member state also had groups of regulatory toxicologists and other experts within its authorities, it is unclear whether it is appropriate for SCOEL members to seek to utilise these resources to help

	them.
8.7	Regarding the strength of evidence about welding being a potential cause of COPD, the WATCH member informed the committee that ACTS had expressed concerns that within the Disease Reduction Programme, HSE had now indicated that welding work was not associated with the occurrence of COPD. The TUC had challenged HSE on this point and asked what is the evidence for this position.
8.8	<b>The Chairman proposed that HSE should draft a brief paper setting out the basis for its position, to present to WATCH at its October 2008 meeting. WATCH agreed.</b>
8.9	<b>ACTION : The WATCH Secretariat to organise the preparation of papers on both of these issues, to be presented to the October 2008 WATCH meeting</b>
9	<b>Date of next meeting</b>
9.1	The Chairman thanked everybody for their contributions. The Secretary reminded members that the next meeting would be held at the NEC Crowne Plaza in Birmingham NEC on the 23 <sup>rd</sup> and 24 <sup>th</sup> October 2008.  The meeting closed at 15.45