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HORIZON SCANNING INTELLIGENCE GROUP

UPDATE ON NANOTECHNOLOGY

A paper by Tim Fry (CoSAS)

Issue

1. As requested by the HSIG in February 2006, an update of the progress on nanotechnology issues in HSE/HSL.

Background

2. HSE's Corporate Science & Analytical Services Directorate (CoSAS) has oversight of science within HSE and has responsibility for taking forward science issues that cut across industry sectors. In discharging this function we have identified, and reported to the HSC (April 2004, HSC/04/42), that nanotechnology could have a substantial impact on health and safety in the workplace.

3. Our work has focused on free engineered nanoparticles, e.g. titanium dioxide and carbon nanotubes, rather than those bound in matrices because making and manipulating these particles brings with it the greatest potential for exposure.

Activities

4. HSE has taken an oversight on nanotechnology in relation to workplace health and safety over the last three years. It has critically reviewed the available information on physicochemical and toxicological hazards of nanomaterials of relevance to the workplace and the likelihood of occupational exposure.

5. In addition, HSE has co-funded research with Defra to review the use of nanoparticles in the UK. The Landscaping study showed that nanoparticle use is largely confined to research laboratories and spin off companies. This is supported by the Woodrow Wilson database[1], which shows that only around 200 consumer products contain nanoparticles.

6. Overall, given the paucity of information available and the concerns raised by some of the data that do exist, a cautious approach to risk management has been recommended in an information note by HSE aimed at researchers and developers potentially exposed to nanomaterials.

[1] http://www.nanotechproject.org/index.php?id=44

7. The HSE reviews were submitted to the Royal Society and Royal Academy of Engineering for their report "Nanoscience and nanotechnologies: opportunities and uncertainties[2]". HSE has contributed to the Government response to this report. In this context HSE has reviewed the adequacy of the regulatory framework in relation to potential concerns for health and safety in the workplace arising from supply, use and production of nanomaterials. The review concludes that:

"… the principles of the existing regulations and the interconnections between them are appropriate and applicable to nanomaterials. We perceive no need to fundamentally change the regulations themselves, nor to introduce new regulations. However, there are important issues which require attention if, in reality, the current and foreseeable future general regulatory framework is to operate effectively in relation to nanomaterials."

8. As Other Government Departments complete their reviews a comprehensive UK regulatory review will be compiled that will inform on potential regulatory change.

9. In response to the Royal Society and Royal Academy of Engineering report, a cross-Government group (Nanotechnology Research Co-ordination Group - NRCG) to co-ordinate research efforts in nanotechnology has been formed and HSE is a key contributor to this group. A diagramatic representation of the groups set up by central government to address nanotechnology issues is appended as Annex 1.

10. As well as contributing knowledge and experience to the NRCG, the HSE/HSL multi-disciplinary team is taking the lead on research efforts on exposure control and fire and explosion. Over the next 3 years, we are committed to spend £1100k on exposure control and £306k on fire and explosion research (committed to first year spend). We have also funded HSL to conduct a literature-based review of *in vitro* assays to aid the development of a tiered and strategic approach to investigating the potential health hazards of novel nanoparticles. Total cost was approximately £20k.

11. We also contribute, via the Nanotechnology Issues, Dialogue Group, to discussions on the strategic direction of other research areas; environmental issues, human health issues, metrology and societal issues, as well as maintaining an oversight on further developments in nanotechnology of relevance to the workplace.

12. Our research work involves significant external UK stakeholder and international collaboration in the fields of physicochemical and toxicological hazards of nanomaterials of relevance to the workplace and the occupational exposure situation.

13. Part of the work the HSE/HSL NanoTeam is to disseminate information and interim guidance. We do this through our web page (http://www.hse.gov.uk/horizons/nanotech/), Infoline (HSE's public contact centre), a dedicated email address for internal use and through our contacts in Industry and Academia. Our work is outlined in the HSC Annual report (http://www.hse.gov.uk/aboutus/reports/0506/ar0506.pdf) and covered by an article in

[2] http://www.nanotec.org.uk/finalReport.htm

the May 2006 edition of the Royal Society for the Prevention of Accidents' Occupational Safety and Health Journal.

14. Our current interim advice is contained in HSIN1 and this is scheduled to be updated in January 2007. Our long-term goal is to work with Industry and Academia to develop formal good practice guidance when a clearer understanding of the risks is available from both our and others' research.

15. The inclusion of nanotechnology in the next stage of the Disease Reduction Programme is being considered.

Action:

16. The Group to note the activities above.

Tim Fry (Corporate Science and Knowledge Unit, CoSAS)
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A joined up approach