

IFCS VI HIGHLIGHTS TUESDAY, 16 SEPTEMBER 2008

The sixth session of the Intergovernmental Forum on Chemical Safety (IFCS Forum VI) continued on Tuesday with a plenary session throughout the day focusing on nanotechnology and manufactured nanomaterials. In the evening, two working groups met to discuss the future of the IFCS and nanotechnology.

IFCS PLENARY

NANOTECHNOLOGY AND MANUFACTURED NANOMATERIALS: On Tuesday, delegates convened in a plenary session facilitated by Georg Karlaganis, Switzerland, who explained that the objective was to exchange information on opportunities and challenges of nanotechnology and manufactured nanomaterials.

Opportunities and Challenges: Germ Visser, Royal DSM Innovation Center, discussed the evolution and potential of nanotechnology, outlining examples from nature and ancient cultures. He explained that the market for nanotechnology is growing rapidly and that nanotechnology may help in responding to major societal challenges, including energy, water and food. On the energy challenge, he highlighted that nanotechnology can contribute to, *inter alia*: more powerful batteries; improved energy storage; use of lighter materials; and improved solar cells. He identified the need to consider risks and public perception on nanotechnology.

Vyvan Howard, University of Ulster, discussed the health effects of nanoparticles. He said studies have suggested that small particle size is correlated with high levels of inflammatory response in the body, and explained that if nanoparticles are internalized, they may be able to travel around the body via evolutionary pathways and cross the blood/brain barrier. Howard stated that their effects on the central nervous system are of particular concern as these particles may increase the incidence of protein misfolding diseases. He noted that while the characteristics of and risks posed by nanoparticles are not fully understood, they do exhibit characteristics of long-range transport. He raised concerns about containment, highlighting that very small particles act like gases and are difficult to control.

Peter Gehr, University of Bern, presented on the interaction of manufactured nanomaterials with human organisms, highlighting that nanoparticles have the potential to penetrate into human tissue, deposit on the lung surface and be distributed throughout the whole body. He warned they may transmit to other organs, be dangerous to cells, and cause cancer and damage DNA.

Pieter van Broekhuizen, University of Amsterdam, discussed possible challenges and risks to workers posed by nanotechnologies. He highlighted the importance of the precautionary approach, including: taking measures

to prevent exposure to nanoparticles; improving workers' access to information on chemicals and products in the workplace; and using nontoxic chemicals. He also emphasized: workers' involvement in risk assessment, monitoring and risk management; nanoadapted occupational health surveillance; data and knowledge transparency; formalizing the role of workers' representatives in designing and monitoring a safe workplace; and compliance with legislation.

Pat Mooney, Action Group on Erosion, Technology and Concentration, emphasized that the way in which a technology is introduced is critical for its socioeconomic impact, especially on marginalized people. Pointing out that the impact of nanotechnology is likely to be vast, both in terms of monetary value and economic sectors affected, he highlighted the lack of risk awareness among scientists and expressed concern about governments' abilities to develop appropriate regulation in a timely manner.

Claudia Neubauer, Citizen Sciences Foundation, emphasized that science and technology are situated in a specific historical context and subject to human choices. She lamented the small budgets for research on social implications of nanotechnology and for products beneficial to marginalized people. She emphasized that technological innovation cannot resolve all problems facing the world today since many of them are rooted in social and environmental injustices.

Andreas Bachmann, Switzerland, discussed the possibility that advances in nanotechnology could exacerbate the divide between developing countries without access to such technology and those countries which are able to invest in research and development. He said this is a question of distributive justice, and suggested that if advances in nanotechnology could help people meet their basic needs, developed countries would have a moral obligation to provide this technology to others. Bachmann also noted that patents preventing the distribution of nanotechnology which could help meet basic needs would be unjust and morally unacceptable.

In the ensuing discussion, one participant asked if the environmental and health effects of nanotechnology were being fully examined and understood, to which Howard responded that each project has a safety toxicology aspect to it. Regarding the proposal for an international convention for evaluating new technologies, Mooney said he supported a streamlined process within the UN rather than a proliferation of protocols. Karlaganis explained that the International Organization for Standardization was dealing with the definition of "nano." One participant asked whether the discussion should be broadened from manufacture of nanotechnology to nanopollution, citing the problem of diesel exhaust production. Participants also raised issues relating to effects of nanotechnology on children, the role of the precautionary principle, and the provision and dissemination of information to the public.

Delegates then agreed to establish a working group on the draft decision on nanotechnology and manufactured nanomaterials, to be chaired by Georg Karlaganis, Switzerland.

Relevant Activities in International Organizations: In the afternoon, the plenary continued, focusing on relevant activities in international organizations.

Robert Visser, Organization for Economic Cooperation and Development (OECD), outlined OECD's activities on nanotechnology, focusing on the Working Party on Nanotechnology and Manufactured Nanomaterials. He explained that some non-OECD members participate in the work together with other stakeholders. He emphasized that experiences are already available from eight projects, and outlined, *inter alia*, a project on testing nanomaterials.

Francoise Roure, OECD Working Group on Nanotechnology, highlighted that nanotechnology is an area reaching beyond chemicals management, and said the EU has identified four key areas for nanosciences: information technology; energy; medical and neurosciences; and security. She noted nanotechnology's potential contribution to the Millennium Development Goals and stressed the need to balance risk and opportunities. Roure suggested strengthening intergovernmental dialogue on nanotechnology and creating a system for formal coordination among UN agencies.

Science and Policy Challenges in Developed and Developing Countries: In the afternoon, the plenary also considered science and policy challenges in developed and developing countries.

Jane Stratford, UK, explained her country's approach to governing the development and application of nanotechnologies. She emphasized that because nanomaterials have different characteristics and therefore pose different risks, they should be evaluated on a case-by-case basis.

Lerson Tanasugarn, Chulalongkorn University, discussed developments in nanotechnology in Thailand, noting that the country is working to be an informed consumer and socially-responsible manufacturer. He said growth of the nanotechnology industry in Thailand could be hampered by the public's concerns about risks, and said the government must educate people about the safety of nanotechnology products.

Adeniyi Fasasi, National Agency for Science and Engineering Infrastructure of Nigeria, presented on the status of nanotechnology in Nigeria. He stressed the need for capacity building, awareness raising and funding for nanoresearch in Africa, and called for, *inter alia*, linkages between universities, research institutions and industry. He cited potential dangers of nanotechnology such as cheap manufacture and duplication of designs leading to economic upheaval, overuse of inexpensive products causing widespread environmental damage, and smuggling of nanoreactors.

Kyung-Hee Choi, Republic of Korea, said her country is a leader in nanotechnology research and use, and emphasized that research on the safety of manufactured nanomaterials has the highest priority. She discussed international cooperation on nanosafety and her country's involvement in the OECD's working groups, and said future plans include cooperation and coordination with relevant stakeholders, and an upcoming OECD workshop on safety testing of manufactured nanomaterials.

Thomas Epprecht, Swiss Reinsurance Company, discussed how the insurance industry manages risk from the emergence of nanotechnology and profits from such activities. He said information is always a prerequisite for risk analysis and that regulatory, social and economic adjustments should be considered in predicting risk. He stressed the need for a precautionary approach, risk assessment and early action, and called for comprehensive risk governance, including reassessment, communication, appraisal and valuation.

Noppawan Tanpipat, National Nanotechnology Center of Thailand, presented on the role of the center and code of conduct for responsible nanotechnology in her country. She explained that with funding of less than €100 million,

the center has been building capacity, strengthening human resources and infrastructure, and undertaking research in areas relevant to and important for Thailand. Tanpipat outlined the center's goals, which include conducting risk assessment and developing a nanosafety framework for industrial applications of nanomaterials and nanoproducts.

Babajide Alo, University of Lagos, lamented the limited participation of developing countries, especially those at the bottom of the Human Development Index, in the development of nanotechnology. Warning that this could increase the technological divide between North and South, he called for establishing a global fund to help developing countries cope with the challenges posed.

Discussion focused on research about workers' protection from the exposure to nanoparticles and the need for a labeling scheme. WHO stated that it is coordinating several projects addressing the health implications of nanotechnologies, including policy recommendations for countries, and information materials for raising awareness among the public. PAN AP questioned whether people affected by nanotechnologies had been consulted and emphasized the need for independent review committees to conduct risk assessments.

WORKING GROUPS

FUTURE OF THE IFCS: The working group on the future of the IFCS convened in an evening session. Some regional groups expressed support for the first option, which would maintain the IFCS as an independent body. One group stated it supported the third option of subsuming the IFCS under ICCM as a subsidiary body. Delegates then discussed the functions of the IFCS, with delegates generally supporting the three proposed functions identified by the Working Group on the Future of the IFCS (IFCS/FORUM-VI/05w). Additional functions were also proposed on enhancing a common understanding of issues of shared concern, and providing openness, frankness and communication among all relevant stakeholders. Delegates began discussing the role of the IFCS, with some suggesting that the structure should be discussed before the role. Deliberations continued late into the evening.

NANOTECHNOLOGY: The working group on nanotechnology met on Tuesday evening. Chair Karlaganis presented a draft text for a Dakar Declaration on Nanotechnology and Manufactured Nanomaterials. Delegates first addressed the meaning of the word 'declaration,' the objective of the text and whether such a declaration was within the IFCS's mandate. They also discussed whether the text should distinguish between nanotechnology and nanomaterials. Delegates then began working through the text and discussions continued late into the evening.

IN THE CORRIDORS

Tuesday's "nanoday" was lauded as a success by many as it provided a forum for learning about nanotechnology through a diversity of "enlightening" presentations and interventions. Many felt that the session exemplified the strengths that are attributed to the IFCS by its supporters. While some delegates continued to discuss nanotechnology and the related draft declaration into the evening, others rolled up their sleeves and got down to work in the first meeting of the working group on the future of the IFCS. Some reiterated that the negotiations will be "difficult" and that an agreement must be reached this week in order to keep the Forum alive. Others expressed concerns over the absence of countries such as the US, Canada, Australia and some Nordic states, indicating that any decision on the future of the IFCS that involves ICCM will have to be considered at ICCM2, where the absent countries might oppose the decision reached at this meeting.