AUSTRALIA

Highlight of developments since the 2nd meeting of the WPMN (April 2007)

- Establishment of Australia's National Nanotechnology Strategy (NNS) and a Health, Safety and Environment (HSE) Working Group therein.
- Completion of an independent review into the suitability of Australia's regulatory frameworks to manage any risks posed by nanotechnology.
- Establishment of an Advisory Committee on Health and Nanotechnology (ACHN) under Australia's national medical research funding agency, the National Health and Medical Research Council (NHMRC).
- Development of an Occupational Health and Safety (OHS) Research and Development (R&D) Program by the Australian Department of Employment and Workplace Relations (DEWR).

Work completed, underway or planned

1. Any national regulatory developments on human health and environmental safety including recommendations or discussions related to adapting existing regulatory systems or the drafting of laws/ regulations/ guidance materials

The NNS, announced in May 2007 (http://www.industry.gov.au/nano) and administered by the Australian Office of Nanotechnology (AON), places a high priority on addressing the HSE impacts of nanotechnology. A key activity in the Strategy includes analysis of the impact of nanotechnology on regulatory frameworks. Funds are being provided under the Strategy to the Australian Federal Departments of Health and Ageing, DEWR, and the Environment and Water Resources to ensure regulatory systems adequately address the health, workplace and environmental implications of nanotechnology.

The HSE Working Group, established to help facilitate nanotechnology HSE work in support of the National Nanotechnology Strategy, commissioned an independent report completed in September 2007 entitled "A Review of the Possible Impacts of Nanotechnology on Australia's Regulatory Framework". The findings of the report are being considered by government agencies presently.

2. Developments related to voluntary or stewardship schemes

The data collected by Australia's industrial chemicals regulator, the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) in its voluntary call for information of December 2006 on the use of nanomaterials in the Australian industrial chemicals area, has been used to inform the focusing of metrology initiatives under the National Nanotechnology Strategy and the WPMN's HSE database.

3. Information on any risk assessment decisions - No developments since 2nd WPMN

4. Information on any developments related to good practice documents

Australia's Committee on Nanotechnology (NT-001), established under the national. standards authority, Standards Australia, continues to provide input to the International Standards Organisation (ISO) Nanotechnology Committee (TC229) for the development of international nanotechnology standards and good practice documents.

- NT-001 is contributing to development of the ISO Technical Report on "Health and safety practices in occupational settings relevant to nanotechnologies", and is represented on the ISO Steering Group for this project. This Technical Report will provide advice relating to health & safety issues when working specifically with nanomaterials.
- NT-001 is also represented on the ISO TC229 HSE Working Group, which coordinates the development of international HSE related nanotechnology standards.

NanoSafe Australia, which brings together HSE-related research organisations around Australia, has prepared a Position Paper on "Current OH&S Best Practices for the Australian Nanotechnology Industry", published as "Safe Practices for Australian Nanomaterials – September 2007" Journal of Occupational Health and Safety — Aust NZ 2007, 23(4): 315–331.

A State-based OHS authority, WorkCover NSW (New South Wales), published the document: "NANOTECHNOLOGY. Occupational Health and Safety Overview", indicating growing interest in good practice at the workplace level – see http://www.workcover.nsw.gov.au/NR/rdonlyres/3DCF2F55-9836-4097-820B-769D434301F2/0/nanotechnology_overview_may_2007_5309.pdf

5. Research programmes or strategies designed to address human health and/ or environmental safety aspects of nanomaterials

The NNS places a high priority on addressing the HSE impacts of nanotechnology. Key activities in the Strategy include:

- ensuring a whole of government approach by establishing a Nanotechnology HSE Working Group consisting of policy, regulatory and research funding agencies across the Australian Government. The Working Group will coordinate the assessment of existing regulations with all relevant agencies and non government bodies. Where appropriate it will liaise with research bodies on areas of potential scientific and policy research. The HSE Working Group will work closely with the Public Awareness and Engagement program of the NNS on the provision of balanced and factual information to the public, including industry.
- The HSE Working Group will coordinate international engagement activities to enable Australia to leverage off technical and policy developments in other countries and to influence the development of international regulatory guidelines and standards.

Various Australian Government departments and agencies are currently establishing strategies and research programs:

- In OHS, DEWR developed a Nanotechnology OHS R&D Program (**Attachment A**), to support the implementation of the NNS. This Program will be implemented over the period 2007-11.
- In the area of human health, and further to the Nanotechnology Roundtable hosted by the NHMRC in December 2006, the NHMRC has established the ACHN, which will provide expert advice regarding the health related aspects of nanotechnology. The ACHN's first meeting identified opportunities for future NHMRC activity, and it is most likely that the NHMRC will target specific research areas through a request for applications. Priorities for research will be identified by the ACHN and through consultation with the research community. Possible areas of research include:
    - Biomedical applications of nanotechnology (diagnosis, delivery, treatment and tissue regeneration, scaffolding, kinetics);
    - increasing the evidence base in regard to risk; and
    - life cycle analysis.
- Australia's premier industrial research organisation, the CSIRO (formerly called the Commonwealth Scientific and Industrial Research Organisation), is in the process of establishing a new research program into the health, safety and environmental effects of nanotechnology as part of its Niche Manufacturing National Research Flagship

(http://www.industry.gov.au/content/itrinternet/cmscontent.cfm?objectID=41600FC8-BE76-1714-7F4149588C1D143A).

6. Information on any public/ stakeholder consultation

As part of the AON, a coordinated Public Awareness and Engagement Program is to be developed and implemented over the next four years. The program is aimed to raise awareness and develop knowledge of the opportunities and potential of nanotechnology, and to encourage an informed debate based on balanced and factual information.

The objectives of the Public Awareness and Engagement Program are:

- to increase awareness and understanding among the general public about nanotechnology and its potentials;
- to enable an informed public debate through improved awareness and understanding of social and ethical issues regarding the use of nanotechnology;
- to provide the Australian public with timely updates on the Government's response to emerging nanotechnology issues; and
- to create public awareness and understanding of Australian regulatory bodies and practices concerning nanotechnology and related health and safety issues.

The Public Awareness and Engagement Program will arrange public forums, promotional materials, conference events and mobile exhibitions with targeted publicity in metropolitan, regional and rural media to support these initiatives. Industry surveys were undertaken in 2005 and 2006 to gauge the level of awareness and understanding of nanotechnology issues among targeted firms with a potential interest in nanotechnology; and public awareness studies undertaken in 2005 and 2007 surveyed the community on their understanding of nanotechnology related issues (http://www.industry.gov.au/nano).

For industrial chemicals, NICNAS is establishing a Nanotechnology Advisory Group comprising industry, the community and experts to assist it in ensuring that Australia's chemical assessment framework is able to address nanomaterials.

In OHS, DEWR consults widely on the proposed Nanotechnology OHS R&D Program, and on nanotechnology OHS generally.

ATTACHMENT A

DEPARTMENT OF EMPLOYMENT & WORKPLACE RELATIONS
OFFICE OF THE AUSTRALIAN SAFETY & COMPENSATION COUNCIL

NANOTECHNOLOGY OHS RESEARCH & DEVELOPMENT PROGRAM TO SUPPORT THE NATIONAL NANOTECHNOLOGY STRATEGY

1. In support of the National Nanotechnology Strategy, a Nanotechnology OHS Research & Development program (2007-11) has been developed. Specific projects will be developed over the life of the workplan to reflect national priorities.

2. The program will be Australia-focussed, and will also contribute to global efforts on nanotechnology OHS.

3. The program has federal government funding, and will be managed by the Department of Employment & Workplace Relations, Office of the Australian Safety and Compensation Council (ASCC).

4. A draft plan for the program has been defined in outline, covering:

- OHS support for Australian nanotechnology businesses and research organisations
- Research Coordination - covering Australian research projects and international collaborations
- Evaluation and Development of Workplace Controls
- Considering the OHS Regulatory Framework in relation to Nanotechnology – includes identifying the specific information and knowledge requirements to ensure the framework operates effectively

5. The program leader is:

Dr Howard Morris
Assistant Director, Research
Phone: (02) 6121 9127
Email: howard.morris@dewr.gov.au.

NANOTECHNOLOGY OHS RESEARCH & DEVELOPMENT PROGRAM TO SUPPORT THE NATIONAL NANOTECHNOLOGY STRATEGY

1. Business Support

PROGRAM 1.1

Work by an interdisciplinary field team to partner with employers and others in conducting field studies, to observe and assess OHS practices in facilities where nanotechnology processes and applications are used.

This initiative will help protect the health & safety of employees in the nanotechnology industry and nanotechnology research in the short, intermediate and long term, and will facilitate the development of guidance material and dissemination of best practices across the industry and research.

Assuming suitable measurement equipment is available, it will also enable increased understanding of the actual levels of workplace exposures.

PROGRAM 1.2

Development of guidance material for the management of nanoparticles to minimise **health** risks, and rollout of the information.

PROGRAM 1.3

Development of guidance material for the **safe** management of nanoparticles, and rollout of the information.

Support companies to evaluate potential unique safety risks (e.g. explosivity, flammability and catalytic properties) associated with engineered nanoparticles.

2. OHS Regulatory Framework in relation to Nanotechnology

PROGRAM 2.1

Considering the Australian OHS Regulatory Framework in relation to Nanotechnology.

Evaluating the ability of the OHS regulatory framework to deal with nanotechnology hazards.

Includes identifying the specific information and knowledge requirements to ensure the framework operates effectively.

3. Research Coordination

PROGRAM 3.1

This program aims to establish and participate in international collaborative research and development to optimise Australian nanotechnology OHS management.

It will not be possible for all research and development programs to be undertaken with rigour in Australia. Hence, Australian programs should be (a) Australia-focused, and (b) coherent with and complementary to work that is occurring globally.

It is necessary for Australia to be fully informed of international activities and to be involved in key international collaborative work, and to present our initiatives in key forums.

This work will be undertaken in close liaison with relevant Australian agencies.

PROGRAM 3.2

Watching Brief on current knowledge of OHS risks from nanotechnology – identified, actual OHS risks.

PROGRAM 3.3

Provide input and advice to help establish & manage research to understand the health effects associated with exposure to engineered nanoparticles.

This research should be applicable across health-related portfolios and agencies.

It is anticipated that this will be a cross-agency program.

4. Evaluation and Development of Workplace Controls

PROGRAM 4.1

Assisting the development of cost-effective and robust ambient air monitoring systems for nanotubes, nanopowders, quantum dots and similar materials in workplace environments, that can provide accurate information on worker exposures.

Link in with work at the National Measurement Institute (NMI).

Dependent on international advances in measurement

PROGRAM 4.2

Examining the effectiveness of control equipment, e.g. filters, respiratory protective equipment, gloves, and engineering controls.

PROGRAM 4.3

Research on preventing work-related injury and illness, by using engineered nanomaterials to produce, for example, sensing and communication nanodevices, and nanomachinery.