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# Nanomaterials in the Workplace

Policy and Planning Workshop on  
Occupational Safety and Health

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Prepared for the National Institute for Occupational Safety and Health



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## Summary

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Over the past few years, various organizations inside and outside of government have focused attention on the lack of understanding of the human health and environmental consequences of nanomaterials. Reports on the human health risks of nanotechnology frequently mention the importance of managing the occupational health risks associated with exposure to nanomaterials. Workers involved with the manufacture or handling of nanomaterials are viewed as being especially susceptible to receiving high exposures to those materials.

The chemical and physical properties of engineered nanomaterials can vary dramatically from those of the bulk forms of the same materials. Nanomaterials represent new substances that require research, analysis, and testing to determine whether they pose health risks and, if so, how those risks can be managed.

On October 17, 2005, the RAND Corporation hosted a workshop on nanotechnology and occupational safety and health. The workshop focused on the policy and planning issues (as opposed to scientific issues) required to understand the options available to NIOSH in formulating and implementing its strategic objectives to protect the safety and health of workers exposed to nanoscale materials. While the workshop discussions ranged over a broad series of topics, there were four problem areas that were repeatedly raised during the course of the meeting:

1. Knowledge gaps related to health risks and worker protections are raising concerns regarding liability that may stymie the development and introduction of new nanomaterials.
2. Efforts to address the occupational risks associated with specific nanomaterials are being impeded by shortfalls in fundamental scientific knowledge common to broad classes of nanomaterials.
3. Public and private resources and funds being allocated to understanding the occupational, health, and environmental risks of emerging nanomaterials are not commensurate with the pace of development of new nanomaterials.
4. Cooperation among federal agencies and between the public and private sectors is essential for progress.

Based on the proceedings of the workshop, presentations at the Second International Symposium on Nanotechnology and Occupational Health and discussions with NIOSH researchers in preparation for the workshop, key components of the overall federal effort for managing the occupational risks of nanotechnology need to be reconsidered:

- Because of other demands on their expertise and resources, NIOSH and agencies that have a role or interest in managing the occupational hazards of engineered nanomaterials can bring only limited funds and personnel to the table. The limited resources that are available should be directed to critical federal roles, such as establishing toxicology fundamentals and providing near-term assistance to protect workers from currently in-use and emerging nanomaterials.
- Greater interaction and cooperation is needed between the nanotechnology development and user communities and NIOSH and related agencies that are responsible for advancing worker safety and health.
- The federal government's efforts to develop the knowledge base required to manage the occupational risks associated with nanomaterials should be undertaken by way of a unified federal strategy that assures appropriate safety and health research, testing, and assessments for managing the risks of occupational exposures.
- The level of federal resources devoted to the safety and health risks associated with nanotechnology in the workplace needs to be reexamined, including the currently planned level of investments in workplace-risk management.