Office of Health, Safety and Security
Operating Experience Level 3

OE-3: 2012-06 August 2012

Safe Practices for Working with Nanomaterials in Laboratories

OVERVIEW

The purpose of this Operating Experience summary is to make the Department of Energy's (DOE) nanotechnology community aware of a new publication as it relates to DOE's nanoscale safety policy and engineered nanoparticles requirements. In June 2012, the National Institute for Occupational Safety and Health (NIOSH) released *General Safe Practices for Working with Engineered Nanomaterials in Research Laboratories*, Department of Health and Human Services (HHS), NIOSH, Publication Number 2012-147. By means of this document, NIOSH seeks to raise awareness of the occupational safety and health practices that should be followed during the synthesis, characterization, and experimentation with engineered nanomaterials in laboratories and some pilot scale operations.

The publication opens with NIOSH noting the growing body of evidence indicating that exposure to some engineered nanomaterials can cause adverse health effects. It continues with several relatively short sections dealing with risk management, hazard identification, and exposure assessment of nanomaterials. The remainder of the document addresses nanomaterial risk management program elements such as methods of controlling exposure in research laboratories and methods for validating control effectiveness.

REQUIREMENTS

DOE Order 440.1B, *Worker Protection Program for DOE (Including the National Nuclear Security Administration) Federal Employees* and title 10, Code of Federal Regulations, part 851, *Worker Safety and Health Program*, define the Department's overall worker protection expectations for Federal offices and contractors, respectively. DOE's detailed expectations relating to nanomaterials and nanotechnology are found in:

- DOE Policy 456.1, *Secretarial Policy Statement on Nanoscale Safety.*
- DOE Order 456.1, *The Safe Handling of Unbound Engineered Nanoparticles.*

The Order requires that both DOE and DOE contractors (contractors when the Order is in the contract) "Review the recommendations and best practices of the available national standards and guidance documents for applicability to their work scope."

The Policy makes the following commitments:

- DOE will adopt and implement, as appropriate, both existing and future environment, safety and health best practices, "National Consensus Standards," and guidance relating to nanotechnology developed by recognized standard-setting organizations.
- DOE organizations working with nanomaterials will stay abreast of current research and guidance relating to the potential hazards and impacts of

nanomaterials and will ensure that this best current knowledge is reflected in the identification and control of these potential hazards and impacts at their facilities.

HHS (NIOSH) Publication Number 2012-147, *General Safe Practices for Working with Engineered Nanomaterials in Research Laboratories* meets DOE's expectation for the guidance referred to in the Policy and Order.

The Department has adopted a performance-oriented approach to defining nanomaterial safety expectations because:

- There remains considerable uncertainty about hazards and control effectiveness; and
- The performance-oriented approach provides flexibility in adapting programs to reflect newly emerging information.

This approach relies heavily on the diligence of DOE organizations in monitoring safety developments and updating documents defining their safety management systems.

IMPACT

Practices described in the NIOSH document should be considered examples of "best practices," that is, appropriate means of identifying and controlling nanomaterial potential hazards and impacts at DOE facilities. These best practices can be incorporated into safety management system components such as chemical hygiene plans.

The new NIOSH document complements, but does not replace, earlier NIOSH guidance, including:

- *Approaches to Safe Nanotechnology: Managing the Health and Safety Concerns Associated with Engineered Nanomaterials* (HHS (NIOSH) Publication 2009-125)
- *Interim Guidance for Medical Screening and Hazard Surveillance for Workers Potentially Exposed to Engineered Nanoparticles* (HHS (NIOSH) Publication No. 2009-116)

Note: *Approaches to Safe Nanotechnology: Managing the Health and Safety Concerns Associated with Engineered Nanomaterials* is listed in DOE Order 456.1 as a reference.

ADDITIONAL INFORMATION

NIOSH nanotechnology Web site:
http://www.cdc.gov/niosh/topics/nanotech/

General Safe Practices for Working with Engineered Nanomaterials in Research Laboratories (NIOSH Publication 2012-147)
http://www.cdc.gov/niosh/docs/2012-147/pdfs/2012-147.pdf

Approaches to Safe Nanotechnology: Managing the Health and Safety Concerns Associated with Engineered Nanomaterials (NIOSH Publication 2009-125)
http://www.cdc.gov/niosh/docs/2009-125/pdfs/2009-125.pdf

DOE Industrial Hygiene/Office of Safety Special Interest Group (SIG) Nanotechnology home page
http://orise.orau.gov/ihos/Nanotechnology/nanotech_DOE_Nanoscale_SC.html

Questions regarding this OE(3) document can be directed to Dr. Bill McArthur at (301) 903-9674 or **Bill.McArthur@hq.doe.gov**.

This OE(3) document requires no followup report or written response.

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