

Institute of Environmental Sciences and Technology

IEST-RP-NANO205.1

Contamination Control Division, Nanotechnology Committee
Recommended Practice 205.1

Nanotechnology Safety: Application of *Prevention* *through Design* Principles to Nanotechnology Facilities



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1 SCOPE AND LIMITATIONS

1.1 Scope

This Recommended Practice (RP) provides facility design information intended to minimize risks for personnel associated with nanotechnology research and production. Using “Prevention through Design” principles disseminated by the National Institute for Occupational Safety and Health (NIOSH), issues related to incoming materials, products, processes, and byproducts are addressed and methods of risk mitigation suggested [NIOSH (2011a)]. Facility design and response systems for conditions including normal operation, external emergency, and internal emergency are described. Information is provided to assist in the development of an effective nanotechnology environmental health and safety program. This document is useful to all those involved in facilities that develop or use nanomaterials.

This Recommended Practice (RP) is intended to complement IEST-RP-NANO200: *Planning of Nanoscale Science and Technologies Facilities: Guidelines for Design, Construction, and Start-up*.

1.2 Limitations

CAUTION: Use of this RP is voluntary. It is the responsibility of the user to establish appropriate safety, security, and health practices and to determine the applicability of regulatory limitations prior to use of this RP. It is beyond the scope of this RP to cover all of the potential safety issues associated with the design and operation of nanotechnology facilities. Relevant safety standards, national and local regulations, and building codes must be consulted in designing facilities and developing safety plans and training programs.

Additionally, the following limitations apply:

1. This RP does NOT address toxicity and other hazards of specific nanomaterials. Use of this RP is limited to the design principles that prevent exposure to hazardous and potentially hazardous materials. This RP is intended to work in parallel with guidance documents for determining hazard levels for nanomaterials.
2. This RP is limited to operational issues as they apply to the design of the facility. A subsequent document will address specific operational safety practices.
3. This RP does not address animal facilities.
4. Fugitive emissions from a process or a delivery system of airborne molecular contaminants (AMCs) and surface molecular contaminants (SMCs) are not addressed within this RP. This RP does not address safety implications of AMCs and SMCs. However, such emissions and safety implications should be considered in any facility.
5. This RP does not address ambient nanomaterials. However, ambient nanomaterials may need to be considered in the overall internal environment of the facility and in the overall risk assessment of the facility operation.