CNMS Operations/ESH Highlights

CNMS Operations/ESH continues to provide comprehensive oversight of R&D activities to ensure safe operations as well as compliance with all applicable ESH requirements including the Integrated Safety Management (ISM) program. ESH team research activities include measurement and characterization of airborne nanoscale particles aimed at refining the NSRC industrial hygiene (IH) monitoring protocol referenced by DOE. CNMS ESH continues to provide technical guidance and participates in nanoscale air monitoring assessments throughout ORNL.

Eight assessments were conducted this summer with work control recommendations. CNMS ESH collaborates with numerous entities including governmental agencies (NIOSH), academic institutions (Western Carolina University and University of Iowa), and private entities. Recent activities have included collaboration with the RJ Lee Group to evaluate a new personal, nanoparticle exposure sampler developed by RJ Lee Group in collaboration with Colorado State University. This sampler is based on thermal precipitation which is used to collect airborne particles for analysis by electron microscopy. Research at ORNL with this thermal precipitator sampler (TPS) is focused on the investigation of nanoscale particles produced by spark generation. Particles collected by the TPS are evaluated in an effort to relate their mobility diameters to physical diameters provided by TEM. Results obtained from this work will be provided to the scientific community through publication.

ESH Continued Outreach Efforts

- 2011 American Industrial Hygiene Association Tennessee Valley Section Fall conference Putting Approach to Safe Nanotechnology into Practice professional development course. Co-participate NIOSH, RJ Lee Group, and ChemRisk.
- 2012 Fall meeting of the Western Carolina University Student Chapter of the American Society of Safety Engineers Nanotechnology Health and Safety.
- 2011 Oak Ridge Institute for Continued Learning (ORICL) – Nanotechnology ESH.
- 2012 Certified Hazardous Materials Managers (CHMM) Local Chapter Nanotechnology an Environmental, Safety, and Health Overview.

ESH Peer Reviewed Presentation, Posters, and Publications

International Journal of Occupational and Environmental Hygiene (IJOEH) special nanotechnology edition (December 2010)
- Characterizing Aerosolized Particulate Matter of a Nanoparticle Exposure Assessment
- Particles Load on a Scanning Mobility Particle Analyzer Sampling Extension Tube
- Ambient Air Sampling Using Quantifoam® Spray Deposition

- A low-tech method for managing engineered nanoscale materials within fume hoods. Winner of student research competition, American Society of Safety Engineers, Professional Development Conference, 2013, Las Vegas, NV.
- Characterizing the potential use of ANSI class 287.1 safety glasses for the attenuation of UV excimer laser exposure. The American Society of Safety Engineers Region VI Professional Development Conference, Myrtle Beach, SC, September, 2012.
- 2013 summer internship presentation –
  - A Comparison of Physical Surface Area to Mobility Surface Area: Evaluating Industrial Hygiene Air Monitoring Equipment for R&D Laboratories.
  - Industrial Hygiene Sampling in Research and Development (R&D) Laboratories.