Worker Participation In Nano PtD Activities

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Two Key Questions

- Why Prevention-through-Design?
- What Value Does Worker Participation Bring To The Table?

Why Prevention-through-Design?

- What's Been Our History?

  "Prevention <u>Maybe</u> After The Fact"

  - Asbestos
  - Lead
  - Silica
  - Nano??

Can We Reverse Our History?

- Possible With Emerging Technology
- If Wait For Epi Studies – We've Failed
- Our Best Chance –
  - PtD
  - Precautionary Approach
- Jury's Out On Nano

Prevention-through-Design

- Simple Idea
- Logical
- Proactive
- Effective
- Execution Is Key

Prevention-through-Design

Design Throughout Product Life Cycle

- Conception
- Synthesis – Raw Product
- Mfg. of Nano Articles
- Construction
- Installation/Use
- Maintenance/Repair/Renovation
- Disposal/Recycle

Nano Life Cycle Problem

- *"What Are We Working With?"*
- As Move Through Life Cycle – Question Is Harder To Answer
- Hazard Communication Doesn't Apply To Articles
- No Labeling Requirements
- How Do We Protect Workers?

Identify Likely High Risk Exposure Activities For PtD

- Synthesis/Manufacturing
- Maintenance/Repair
- Process Upsets/Emergencies
- Unintended Uses
- Demolition/Disposal/Recycling

Approach To Hazard/Risk “Uncertainty”?

- Emerging Technology
- Information Is Incomplete
- How Should We Respond?
- What Are The Default Positions?

Follow Precautionary Approaches

- Protect Workers Where Information Is Incomplete
- PtD – It's Precautionary/Proactive
- Apply The Control Hierarchy For Risk Management

Problems With Executing Precautionary Approaches

- No Nano-Specific H&S Standards

  " I Don't Have To Do Anything"

- EPA Carbon Nanotube SNUR And Worker Protection
  - Require Respirators Only
  - Ignores Control Hierarchy Altogether

Why Should Workers Participate In Nano PtD?

They Do Stuff

Why Should Workers Participate In Nano PtD?

They Know Stuff

What Do Workers Bring To The Table?

- They Know Their Jobs
    - Intimate Knowledge
    - Tasks They Perform
    - Problems They Encounter
    - Hazardous/Risky Situations
- They Know How To Solve Problems

Worker Input Into Nano PtD

- Ignoring Worker Knowledge Is Foolish
- Capture Knowledge At Design Phase
- Cover Entire Life Cycle

Worker Input Important At Many Levels

- Performance of Control Systems
- Work Methods
- Work Layout
- Training

Worker Input Important At Many Levels

- Management Systems
- Routine Tasks
- Non-Routine Tasks
  - Process Upsets
  - Emergencies
- Periodic Tasks
  - Maintenance
  - Cleaning

Examples Of Valuable Worker Design Input

- Location/Access To Equipment/Process
  - Installation
  - Maintenance/Repair
  - Emergencies
- Location Of Emergency Shutoff Devices
- Ergonomics Issues
  - Repetitive
  - Forceful
  - Awkward

Examples Of Valuable Worker Design Input

- Work Load/Time To Complete Tasks
- Lighting/Temperatures
- Waste Handling/Removal
- Design Worker Training
  - Tailored To Life Cycle Stage
  - Effective Work Practices
  - Topics To Emphasize
  - Training Techniques That Are Effective

Summary

- Nano Is An Emerging Technology
- Opportunity To Get H&S Right – Or At Least Better Than Our History
- Use PtD And Precautionary Approach Throughout Life Cycle
- Worker Participation Brings Value To PtD Activities