

# Control Banding

## An Industrial Hygienist's View

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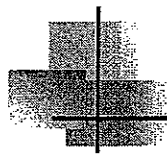
National Institute for Occupational Safety and Health



## "A journey through the 1990s"

### Objective

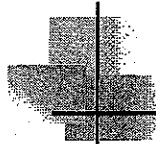
- Share some experiences
  - Describe the thought process used
- Perspective: Not exactly jumping in cold.
- Formal training: Science
  - NIOSH-trained in Industrial Hygiene
  - Board Certified IH



## Practice

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- Mixed: Consulting and Corporate
- Similar Experiences and Challenges
  - Supporting multiple processes
  - Varying scales: lab, pilot plant, manufacturing
  - New chemical entities
  - Not always an OEL

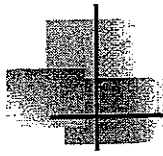


## Objective

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- Understand the Process
- Evaluate the Materials/Agents
- Estimate the Risk
- Communicate the Hazards
- Reduce Exposure
- Use the Hierarchy of Controls

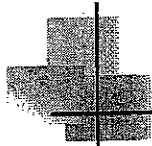
Understand, Communicate and Manage the Risk



## Risk-Based Approach

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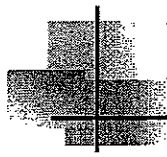
- Initial hazard assessment of material
  - Tox. data or exposure guidelines
  - Flammability or reactivity
  - Physical nature: powder, liquid, etc.
  - "Red Flags"
- Assessment of the process
  - Open, closed, energetic, etc.
  - Volume and form of material



## Risk-Based Approach

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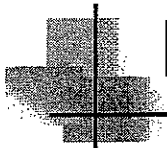
- Exposure potential
  - Task analysis
    - Material flow
    - Interface points
    - Frequency
  - Qualitative exposure evaluation
    - Will the nature and quantities of materials used in the process lead to a possible exposure?



## Risk-Based Approach

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- Use available information to estimate level of control.
  - OELs, if any
  - NFPA or HMIS ratings
  - EU R and S phrases
  - Analogy to "known" materials



## Hazard, Risk and Control

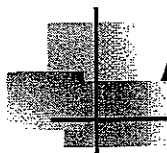
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Material "A": A fine powder

- Mixed in large quantities
- No OEL
- NFPA: H3, F1, R1 – By manufacturer
- EU: R23 'toxic by inhalation'

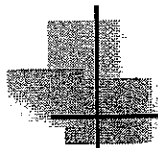
Do not want open handling or mixing.

Controls: LEV for dispensing, enclosed mixing, handle as slurry(?)



## Any Guidance at the Time?

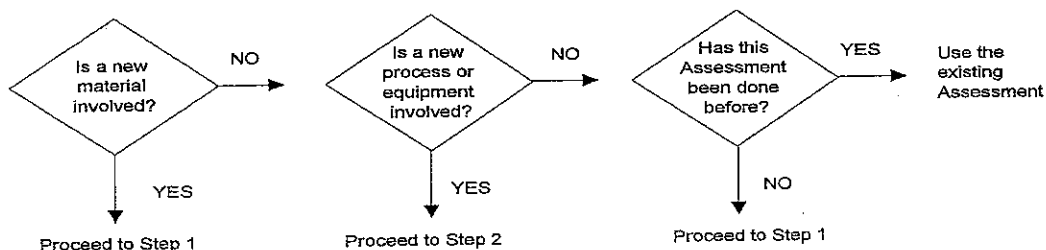
- Pharmaceutical Industry "Control Levels"
- UK Risk Assessment Approach: COSHH
- Internal Processes



## Some Tools I Used

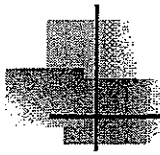
### BENCH SCALE WORK: RISK ASSESSMENT TOOL

#### 0. DECIDE IF THIS TOOL NEEDS TO BE USED



#### 1. DETERMINE INHERENT HEALTH HAZARD

For each chemical assign an inherent health hazard as low, medium or high.



# Some Tools I Used

To make an assignment for a chemical proceed as follows:

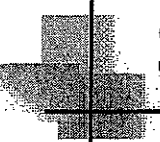
- Use Company Health rating if available. 0 or 1 = low, 2 = medium, 3 or 4 = high
- If a Company rating is not available use your judgment to assign a rating from the Supplier's MSDS. If in doubt ask your Chemical Hygiene Officer for help.
- If this is a novel chemical with no MSDS ask your Chemical Hygiene Officer to assign a hazard.

Assign an overall hazard for the work in line with the most hazardous chemical.

LOW	MEDIUM	HIGH

Chemical on which Assessment is based: \_\_\_\_\_

Note: If inherent health hazard is high, forward this Assessment (when completed) to your Chemical Hygiene support and site health services.



# Some Tools I Used

## 2. DETERMINE LIKELIHOOD OF EXPOSURE BY INHALATION

### a) solid materials

LOW	MEDIUM	HIGH
Pellet like, doesn't break up during use. Eg. waxed flakes, pills.	Crystalline, granular solid. When used dust is seen but settles quickly. Dust left on surfaces after use.	Fine light powder. When used dust can be seen and takes several minutes to settle. Examples, cement, carbon black, chalk dust.

### b) Liquids worked at room temperature:

LOW	MEDIUM	HIGH
Boiling pt. > 150C	Boiling pt. 50 - 100C	Boiling pt. < 50C

## 3. DETERMINE RISK TO HEALTH BY INHALATION

LIKELIHOOD OF EXPOSURE	High	RISK TO HEALTH BY INHALATION		
	Medium	HIGH	HIGH	HIGH
	Low	LOW	MED/HIGH	HIGH
		LOW	LOW	MED/HIGH
		Low	Medium	High

INHERENT HEALTH HAZARD

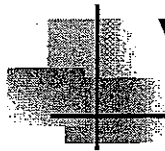
# Some Tools I Used

MARK THOSE CONTROLS THAT APPLY FOR YOUR WORK

CONTROLS	NEEDED Y/N
<p><b>ENGINEERING</b></p> <ul style="list-style-type: none"> <li>• Class A fume hood</li> <li>• Class B fume hood</li> <li>• Biological safety cabinet</li> <li>• General laboratory ventilation</li> <li>• Enclosure</li> <li>• Local Exhaust ventilation</li> <li>• Deluge system</li> <li>• Perspex shields</li> <li>• Fire extinguisher</li> </ul> <p>(Note: high risk bench scale work is normally to be done in a class A fume hood or equivalent)</p>	
<p><b>ADMINISTRATIVE</b></p> <ul style="list-style-type: none"> <li>• Good personal hygiene</li> <li>• Clean spills immediately</li> <li>• Is a special spill kit needed ?</li> <li>• Is special storage of materials needed?</li> <li>• Is special disposal of materials needed?</li> <li>• Netting or tapes on glass ware (explosion/implosion hazard)</li> <li>• Area roped off &amp; posted</li> </ul>	
<p><b>PERSONAL PROTECTIVE EQUIPMENT</b> (Specify PPE where needed e.g., PVA gloves)</p> <ul style="list-style-type: none"> <li>• Safety glasses</li> <li>• Face shield</li> <li>• Gloves</li> <li>• Respirator (if required specify type)</li> </ul>	

## What Does this Approach Allow? "Extend the IH"

- Teach the risk assessment process
  - Make it part of the work
- Provide guidance and interpretation
  - Using the MSDS and other tools
  - Know when to call the expert
- Provide the tools
  - Control guidelines
  - Training
- Demonstrate effectiveness of controls
  - Make the measurement



## "Facts of Life"

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- There are not enough OS&H professionals to go around.
- We all use a similar flow of logic and intuition.
- The 'tools' are getting better.
- Putting some structure in the process is good.
- A hybrid 'OEL and Risk' approach will be needed for some time.