

# Control Banding- what is it, how to use it, and what are the limitations?

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Advancing Chemical Safety in the 21st Century

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# Presentation Outline

- Definitions
- Changes in workplace and scope of problem
- Control Banding (aka Occupational Risk Management Toolbox) – brief history
- NIOSH and International Activities
- Challenges to Application in U.S.
- U.S. National CB Workshop – Critical Review
- Benefits, Future, and Conclusions
- Resources

# CONTROL BANDING

All truth passes through three stages:

- ▶ First, it is ridiculed
- ▶ Second, it is violently opposed
- ▶ Third, it is accepted as being self-evident

*Arthur Schopenhauer (1788-1860)*

# What is CONTROL BANDING?

## “Risk Management Toolbox”

1. a process in which a single **control** technology is applied to a range or **band** of exposures to a chemical that falls within a given hazard group.
2. an occupational risk assessment and management tool for use **without** on-site technical experts and expensive exposure measurements.
3. a simple matrix of toxicological endpoints (**risk or hazard bands**) and material use (**exposure bands**) to determine which principles in the hierarchy of controls can be used to provide guidance for controlling exposures to hazards (**control bands**).

# CONTROL BANDING

## Focus on SMEs

### ▶ United States

- 7.1 million businesses
- 98% (6.3 million establishments) with fewer than 100 workers
- More than half (56%) of workforce in these establishments
- > 5 million with less than 10 employees

### ▶ U.K.

- 3.8 million businesses
- 99% have less than 200 workers; 69% are self-employed; 20% have 1-4 employees
- 34% use chemicals
- 47% uncertain of how to get applicable compliance information

### ▶ European Union

- 99% of all businesses with fewer than 50 workers

# SME Problem

Small and medium enterprises have barriers to assessing and managing chemical (and other) risks in the workplace due to:

***lack of expertise, technology, finances and time***

and

***need an adapted risk assessment approach.***

They want to be told what to do.

They do not understand legal requirements.

They do not receive or read safety materials.

They consider distinctions between government environmental, health and safety regulations to be irrelevant.

# Characteristics of SMEs

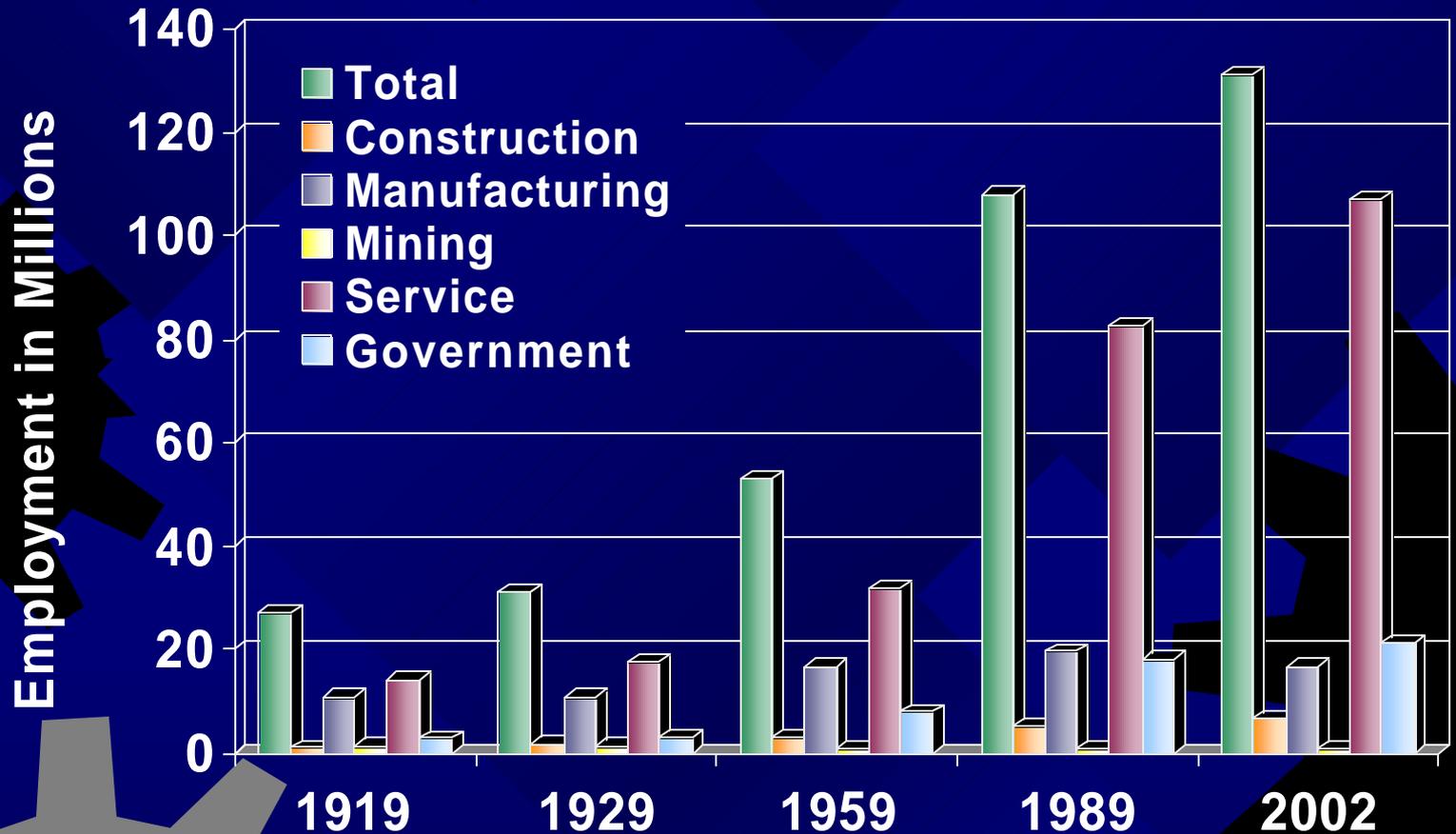
- ▶ Non-hierarchical
- ▶ Stable
- ▶ Oral not written
- ▶ Dependent on suppliers for information
- ▶ Literacy generally poor
- ▶ Belief that their chemicals are not dangerous
- ▶ Poor knowledge of health effects (better for acute than long term)
- ▶ Controls decided by custom and practice - not risk assessment

# Scope of the Chemical Problem

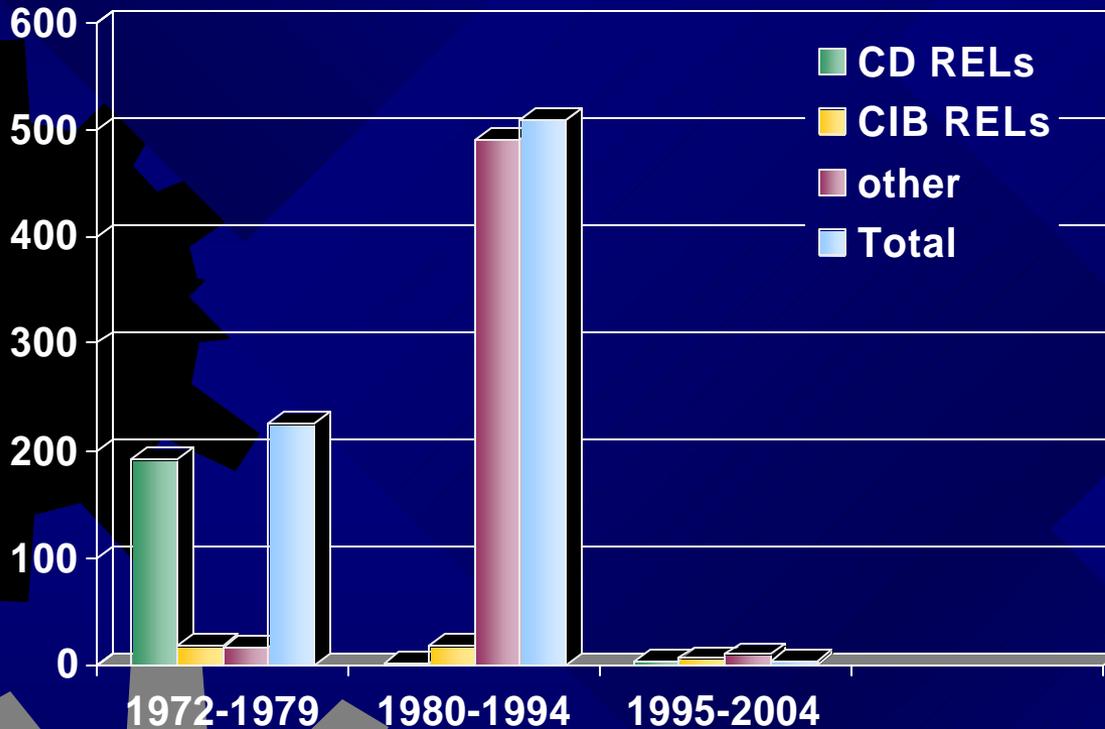
- ▶ 17.7 million organic and inorganic substances CAS Registry\*
- ▶ 1.3 million commercially available chemicals\*
- ▶ 225,000 inventoried and/or regulated substances\*
- ▶ >5000 OECD High Production Volume (HPV) chemicals (>1000T/yr)\*
- ▶ 2,500 chemicals / classes of chemicals shipped in North America\*
- ▶ 170,000 chemicals may require registration under the EU REACH regulations
- ▶ Surveys have indicated that most SMEs are not able to comply with the regulations, mostly due to insufficient knowledge and resources

\*Source: International Task Force 40 Final Report. Industrial Chemicals – Operational and Medical Concerns, April, 2003. US/UK/CA MOU on Research Development and Acquisition of Chemical, Biological and Radiological Defence Materiel

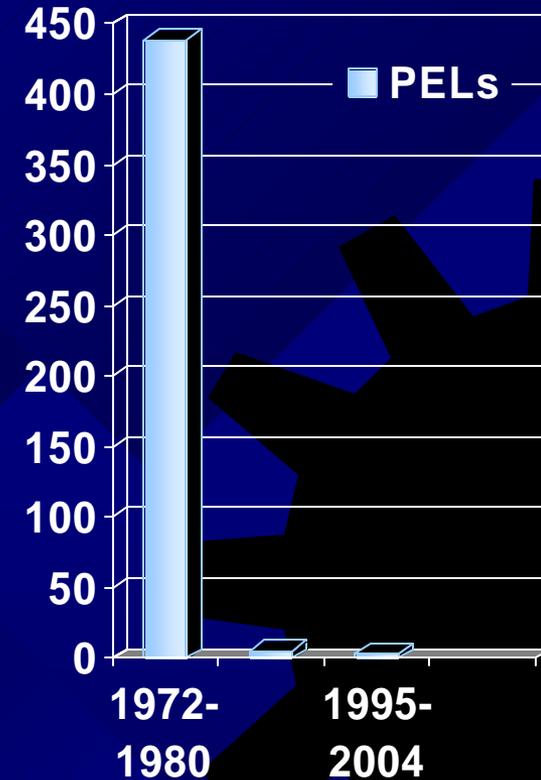
# How is the Workplace Changing?



# U.S. OELs since 1972



**NIOSH**



**OSHA**

# Brief History

- ✦ Sweden (Miljobanken) – 1974
- ✦ Early efforts (pharmaceutical, chemical industry)
- ✦ Australia (SHARE - Else) – 1988
- ✦ SolBase (Can., Aust., Netherlands, Germ., Spain, Italy, U.K.) – 1989
- ✦ COSHH (HSE) – paper copy 1999; internet version April 2002
- ✦ France (INRS – Vincent, et al.) – 2000
- ✦ NIOSH (engineering control & Workplace Solutions DB) – 2001
- ✦ 3 International Control Banding Workshops – 2002, 2004, 2005
- ✦ WHO/IPCS and ILO – International Technical Group – 2002
- ✦ WHO/IPCS ILO Toolkit –testing stages in 17 countries – 2002
- ✦ Union des Industries Chimique (UIC) Health Risk Matrix, CEFIC and ECETOC – 2003
- ✦ NIOSH National Strategy Workshop and Critical Review – 2005
- ✦ AIHA and IOHA commitments – 2005

# *Two Things Make Control Banding Possible*



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graph TD; A["Two Things Make Control Banding Possible"] --> B[""]; A --> C[""];
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# CORE CONSIDERATIONS

- ◆ simple approach, easy to read and understand, step by step process – requires minimal training
- ◆ easily accessible
- ◆ practical control measures with wide applicability and regulatory agreement
- ◆ acceptability by workers and management
- ◆ adaptable to local conditions
- ◆ real solutions – better environmental and occupational safety performance
- ◆ cost savings – assurance of benefits
- ◆ consistent and transparent process
- ◆ specific control methods – not OELs, measurements or risk assessment
- ◆ organizational improvements (participatory occupational hygiene)
- ◆ provides information for worker education
- ◆ points to experts when help is needed

# CONTROL BANDING is **NOT** a **NEW** CONCEPT or APPROACH

Used worldwide for the transport of dangerous chemicals - classified with United Nations codes that are used for:

- identifying safe storage rules
- permitted types of transport containers
- the action to take in an emergency

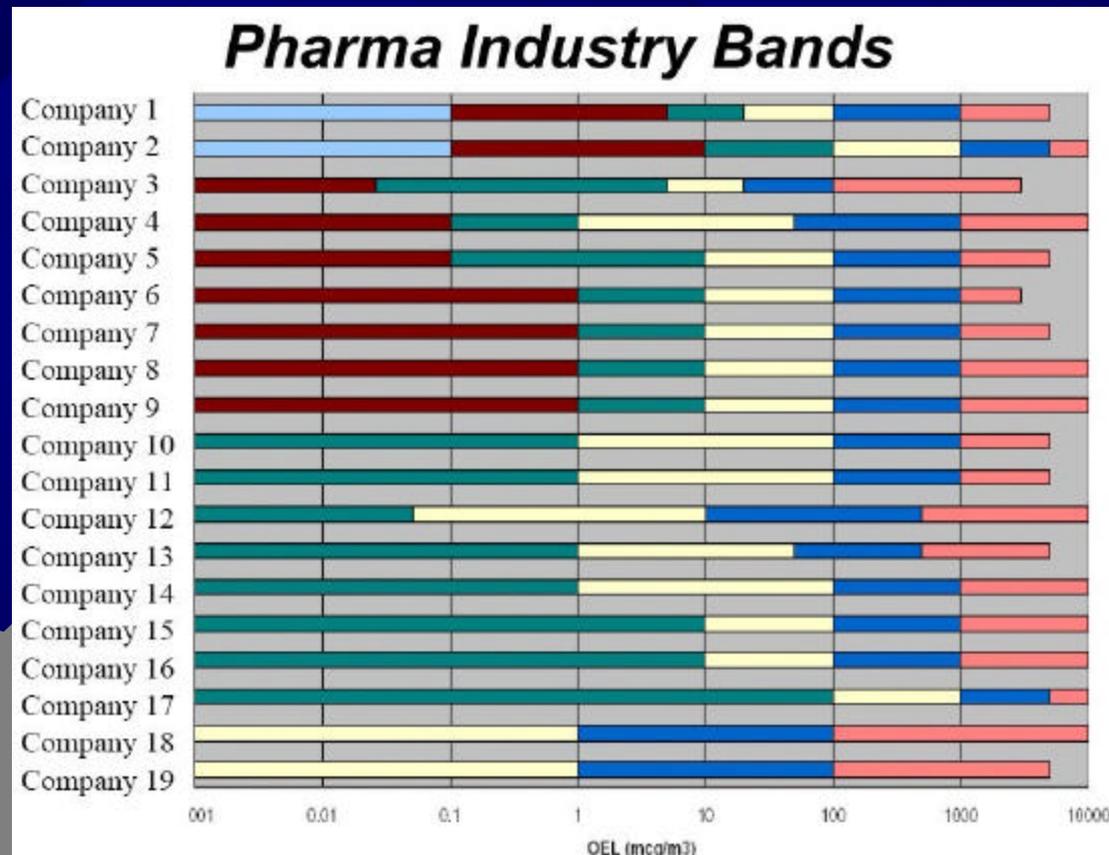
# Risk Assessment / Management Paradigms\*

## *Traditional*

1. Risk = ( Hazard → Exposure → Control )

## *Pharmaceutical Industry*

2. Risk = ( Hazard → Control → Exposure )



\* Sources: Keith Tait, Corporate Health & Safety, Pfizer - National Control Banding Workshop, Washington, DC March, 2005 and David Eherts, Purdue Pharma - Control Banding from the Pharma Perspective: Staying Ahead of the Regulations, Oct. 2004

# Why Use Control Banding?

- A hazard classification and control focused approach (tool-kit)
- A complementary approach to traditional industrial hygiene which supplements OELs
- Focuses resources on exposure controls rather than exposure assessments
- Task based guidance in absence of OELs (new and existing)
- Provides technical expertise to chemical users through a simple interface
- Special Cases: encourages use of experts
- Particularly useful to SMEs
- Supports **Globally Harmonized System** for Hazard Communication (R- and S-phrases)

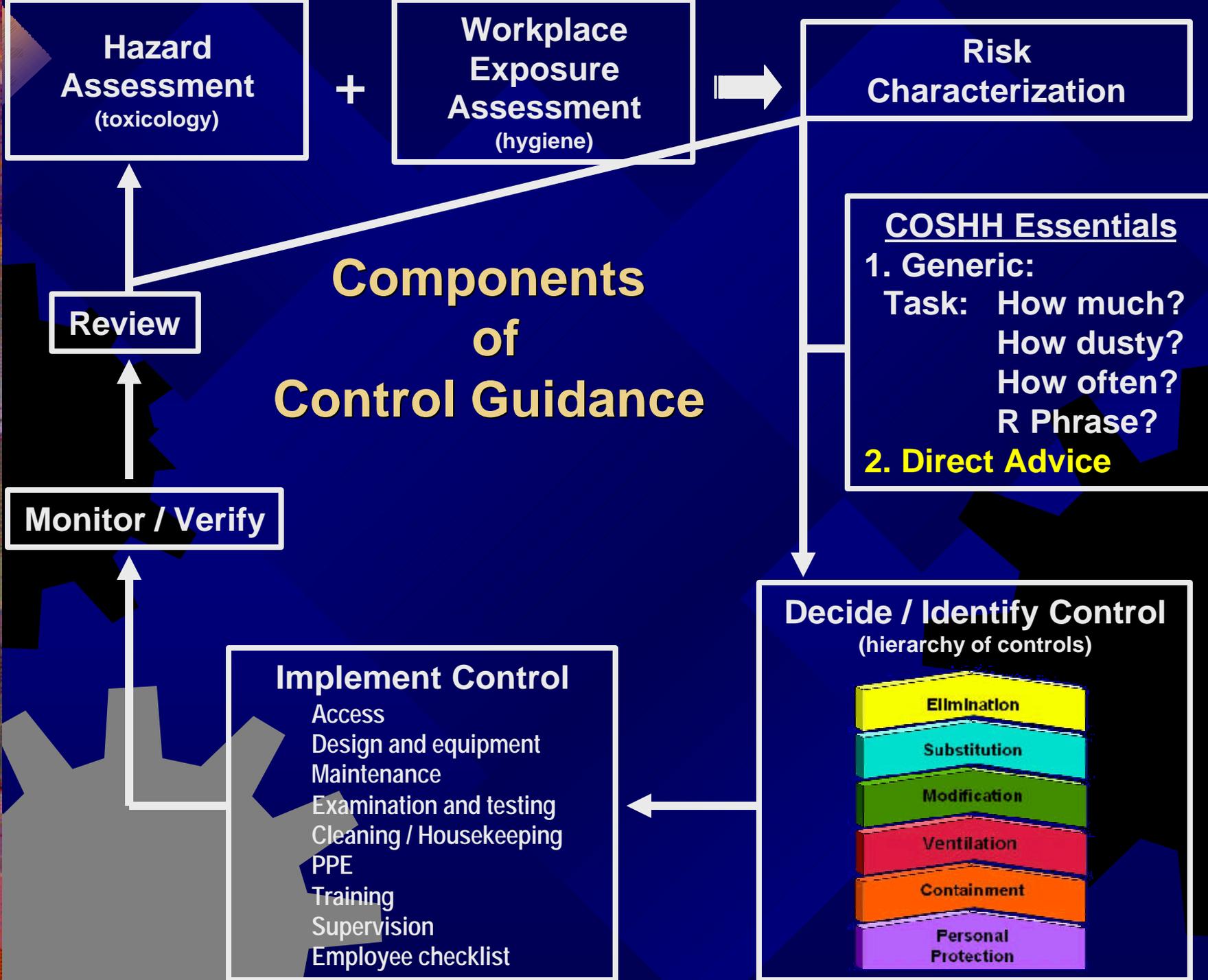
# UK Approach to Control Banding COSHH Essentials

Control of Substances Hazardous to Health Essentials

-  ... an instrument designed by the UK HSE
-  ... for small and medium sized enterprises
-  ... to do qualitative exposure assessments
-  ... which lead to a recommended control approach



(<http://www.coshh-essentials.org.uk/>)



# COSHH Essentials

## How is it used?

The SME operator uses a single-page check-list to determine ..

- hazard rating from MSDS or IPCS card (R-phrases)
- quantity used (small, medium, large)
- physical form / characteristics (dust, vapor)
- target control level
- specific control guidance
- an action plan

# CONTROL BANDING

## How to Use COSHH Essentials

- Step 1 – Getting started (substance name, supplier, tasks or process)
- Step 2 – Factors that decide your control approach
- Step 2A – What is the health hazard?
  - Obtain **R-phrase or R-phrase combination** from the MSDS
  - Determine the appropriate **hazard group**

low to high hazard      A–D

special cases              E (carcinogens, mutagens, reproductive hazards)

skin and eye hazard      S

# CONTROL BANDING

## Key concept: Risk phrases

### Hazard groups A-E (chemicals causing harm when breathed in)

A	B	C	D	E
R36 R36/38 R38 <hr/> And all substances that don't have R-phrases in groups B-E	R20 R20/21 R20/21/22 R20/22 <hr/> R21 R21/22 <hr/> R22	R23 R23/24 R23/24/25 R23/25 <hr/> R24 R24/25 <hr/> R25 <hr/> R34 <hr/> R35 <hr/> R36/37 R36/37/38 <hr/> R37 R37/38 <hr/> R41 <hr/> R43 <hr/> R48/20 R48/20/21 R48/20/21/22 R48/20/22 R48/21 R48/21/22 R48/22	R26 R26/27 R26/27/28 R26/28 <hr/> R27 R27/28 <hr/> R28 <hr/> Carc cat 3 R40 <hr/> R48/23 R48/23/24 R48/23/24/25 R48/23/25 R48/24 R48/24/25 R48/25 <hr/> R60 R61 R62 R63	Muta cat 3 R40 <hr/> R42 R42/43 <hr/> R45 <hr/> R46 <hr/> R49

*Least hazardous substances*

*more hazardous substances*

*Special cases*

## ***Step 2B – How much is used?***

<b>AMOUNT</b>	<b>SOLID</b>	<b>LIQUID</b>
<i>Small</i>	grams	milliliters
<i>Medium</i>	kilograms	liters
<i>Large</i>	tons	cubic meters

## ***Step 2C – How dusty or volatile\* is the chemical?***

<b>LOW</b>	pellet-like solids that don't break up, little dust is seen during use, e.g., PVC pellets, waxed flakes, prills
<b>MEDIUM</b>	crystalline, granular solids, Dust settles quickly, e.g., soap powder
<b>HIGH</b>	fine, light powders, dust clouds remain in air for several minutes e.g., cement, carbon black, chalk dust

*\*Similar matrix for categories of volatility based on the boiling point of substances and process operating temperatures.*

## Step 3. Find the Control Approach

### 1 – GENERAL VENTILATION

A good standard of general ventilation and good working practices.

### 2 – ENGINEERING CONTROL

Typically local exhaust ventilation ranging from a single point extract close to the source of hazards, to a ventilated partial enclosure. It includes other engineering methods of control, eg cooling coils for vapours, but not complete containment.

### 3 – CONTAINMENT

The hazard is contained, or enclosed, but small-scale breaches of containment may be acceptable. Often used where a substance is very hazardous or a lot of it is likely to get into the air.

### 4 – SPECIAL

Expert advice is needed in selecting control measures and you should seek further help.

Least reduction  
in exposure

Greatest reduction  
in exposure

Special help  
needed

For some activities, processes, tasks, or jobs, specialists can identify that respiratory protective equipment (RPE), in combination with other control approaches, is always necessary. This makes a “fifth” approach.

## 3

### Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on sack emptying, and can be applied to tasks involving medium quantities of solids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.



Control guidance sheet

## Sack emptying

### Containment

304

#### Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

#### Design and equipment

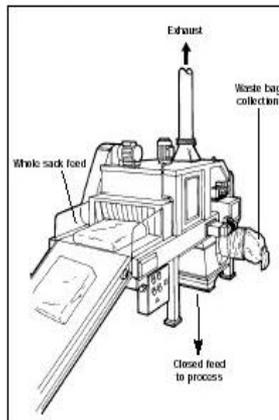
- ✓ Provide arrangements to strip and vacuum or wet clean the conveyor belt.
- ✓ Enclose the slitter as much as possible - see diagram.
- ✓ Ensure an inward airflow of 1.0 metre per second at any opening into the enclosure.

- ✓ Keep all openings as small as possible - while allowing enough room for safe working. Use see-through panels and plastic strips to reduce the open area.
- ✓ Consider additional ventilation at the bag disposal point.
- ✓ Provide good lighting. Select lighting equipment suitable for the nature of the substances and processes, eg dust tight or flameproof, if needed.

- ✓ Design the system to allow easy maintenance.
- ✓ Where operational factors permit, keep the process equipment under negative pressure to prevent leakage.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

#### Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.



Control guidance sheet 304

#### Examination and testing (if a ventilation system is provided)

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

#### Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store packages/containers in a safe place (see CGS 101).
- ✓ Dispose of empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air, use a vacuum system or wet cleaning.

#### Personal protective equipment (PPE)

- ✓ Chemicals in hazard group 5 can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what PPE equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) shouldn't be needed for routine tasks. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills. Be aware that some maintenance activity may involve entry into confined spaces. Decide if supplied air is needed when RPE is used.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

#### Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

#### Supervision

- ✓ Have a system to check that control measures are in place and being followed.

#### Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Avoid manual handling - use handling aids.
- Any damaged or leaking bags should be repacked away from the main storage area or disposed of safely. A responsible person should be involved to ensure this process is carried out safely.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials: easy steps to control chemicals HSE193 May 1999

Printed and published by the Health and Safety Executive

# Not a Bright Line!

## Hazard Group vs. Target Exposure Range

Hazard group	Target airborne concentration range	R phrases
A -Skin and eye irritants	>1-10 mg/m <sup>3</sup> dust >50-500 ppm vapor	R36, R38 All substances that do not have R phrases in groups B - E
B - Harmful on single exposure	>01-1 mg/m <sup>3</sup> dust >5-50 ppm vapor	R20/21/22, R40/20/21/22
C -Severely irritating & corrosive, skin sensitizers	>0.01-0.1 mg/m <sup>3</sup> dust >0.5-5 ppm vapor	R48/20/21/22, R23/24/25, R34, R35, R36/37, R37/38, R36/37/38, R37, R39/23/24/25, R41, R43
D -Very toxic on single exposure, reproductive hazard	< 0.01 mg/m <sup>3</sup> dust < 0 5 ppm vapor	R48/23/24/25, R28/27/28. R39/26/27/28, Carc Cat 3 R40, R60. R61, R62, R63
E - Carcinogen, occupational asthma	<i>Seek Specialist Advice</i>	Muta Cat 3 R40, R42, R42/43, R45, R46, R49
S: Skin and eye contact	<i>Prevention or reduction of skin and/or eye exposure</i>	R21, R24, R27, R34, R35, R36, R38, R41, R43, R48/21, R48/24, plus R -phrase combinations containing these. Sk

Control Guidance Grouping Assigned for Level of Risk				
Amount Used	Low Dustiness or Volatility	Medium Volatility	Medium Dustiness	High Dustiness or Volatility
<b>Hazard Group A</b>				
SMALL	1	1	1	1
MEDIUM	1	1	1	2
LARGE	1	1	2	2
<b>Hazard Group B</b>				
SMALL	1	1	1	1
MEDIUM	1	2	2	2
LARGE	1	2	3	3
<b>Hazard Group C</b>				
SMALL	1	2	1	2
MEDIUM	2	3	3	3
LARGE	2	4	4	4
<b>Hazard Group D</b>				
SMALL	2	3	2	3
MEDIUM	3	4	4	4
LARGE	3	4	4	4
<b>Hazard Group E</b>				
For all hazard group E substances, choose control approach 4				

# Validation Results for Control Banding

<i>Level of Control</i>	<i>Number of Substances (%)</i>
scheme equivalent to OEL	52
scheme more stringent than OEL	46
scheme less stringent than OEL	2
scheme equivalent or more stringent than OEL	98

# What do users of *COSHH Essentials* think of it?

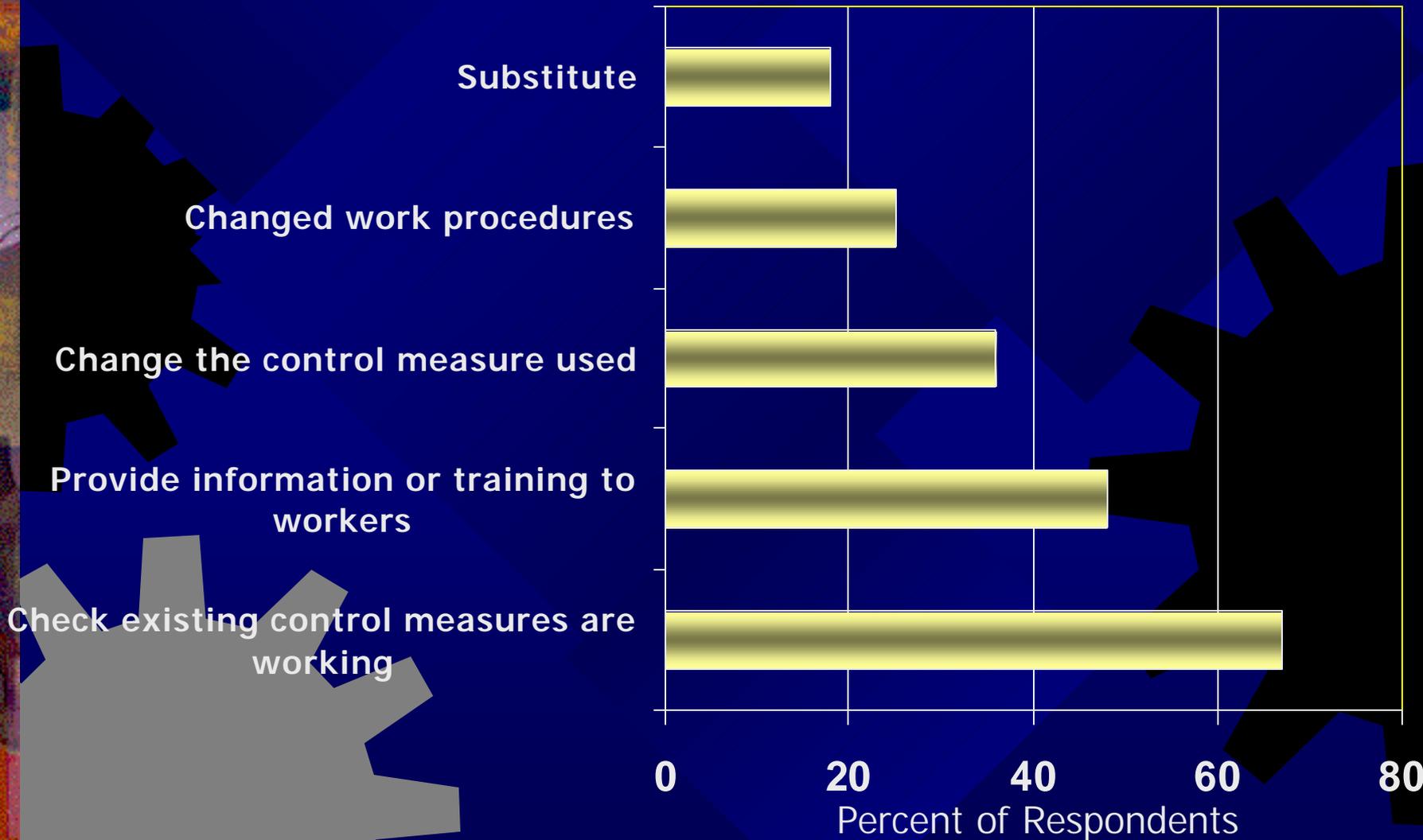
## Telephone Survey - 500 purchasers of paper version

- 80% of the people buying the guidance had used it.
- 75% of those who had used it took action of some sort (including substitution).
- 95% would recommend it to other businesses.
- Fewer than 5% found it fairly difficult to use.

## Internet Version

- ✦ >500,000 visits
- ✦ >130,000 visitors
- ✦ >180,000 risk assessments

# Telephone Survey of COSHH Essentials Purchasers



# CONTROL BANDING

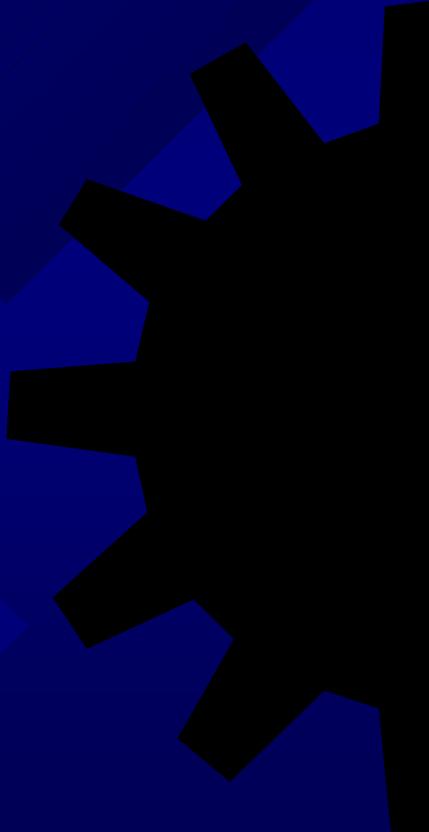
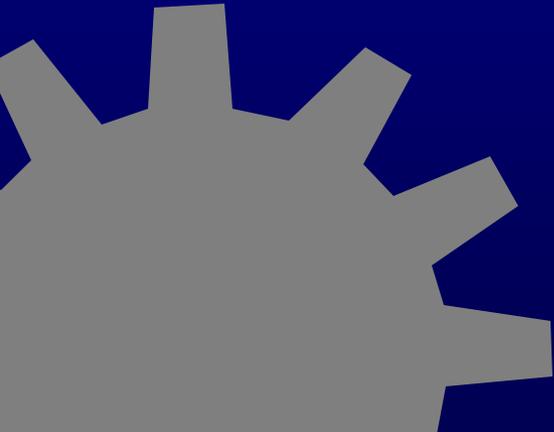
## NIOSH Activities



 FOSTERING COLLABORATION

 INVESTIGATING THE MERITS

 COMMUNICATION



# CONTROL BANDING – NIOSH Activities

## FOSTERING COLLABORATION

- NIOSH CB Internal Coordination Committee
- Partnering with industry, labor, government and academia
- Participation / Planning International Workshops
  - 2<sup>nd</sup> International Control Banding Workshop (Cincinnati, OH, 3/04)
  - 3<sup>rd</sup> International Control Banding Workshop (Pitaneberg, S. Africa, 9/05)
- National CB Strategy Workshop  
*ACGIH, AIHA, ASSE, CORPORATIONS, EPA, IOHA, Industry Representatives, Labor Organizations, MSHA, NSC, ORC, OSHA (3/05)*
- MOU - HSE / NIOSH / OSHA / German FIOSH
- International Technical Group (WHO/IPCS)

# CONTROL BANDING – NIOSH Activities

## ■ INVESTIGATING THE MERITS

- Critical Review of the state-of-the-art, validation and effectiveness of control banding
- Information Brochure: Control Banding - Does it really work?
- Demonstration projects (examples)
  - Independent Lubricant Manufacturers Association – MWF Greenspace
  - Dow Chemical Co. / Kaiser Permanente / Society of Gastroenterology Nurses and Associates / HSE / MediSHARE – glutaraldehyde in health care
  - WHO/ILO: India, Chile/PAHO, etc. - control of Silica Dust exposures
  - Commonwealth of Kentucky Safety and Health Network & GTZ
  - Univ. of Cincinnati & Ohio Polymer consortium - nanotechnology

# CONTROL BANDING – NIOSH Activities

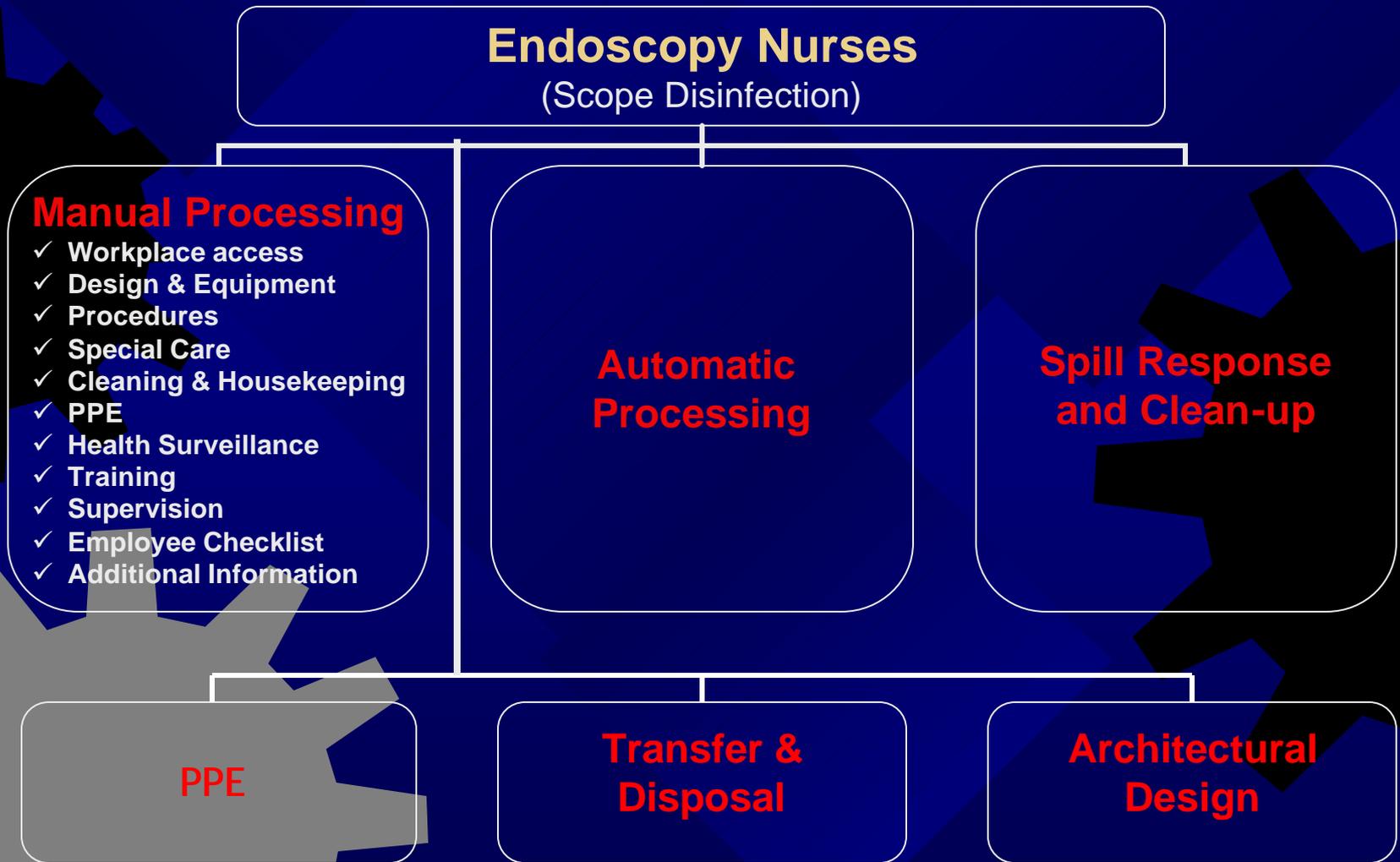
## COMMUNICATION

-  NIOSH Web Page
-  DVD
-  Workplace Solutions Database

# NIOSH Partnership

## Dow Chemical, Kaiser Permanente, Nurses

### Glutaraldehyde Example



# 4

**NIOSH**

Control approach 4

Control Guidance Sheet 403

## Manual Instrument Reprocessing

Special

403

This guidance sheet is intended to provide best practice advice. It is designed to help employers (including the self-employed and small businesses) address hazardous conditions in the workplace. The recommendations are intended to provide information for identifying hazardous substances or risk activities and simple precautions for minimizing risks to workers. This guidance was developed by the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention (NIOSH/CDC) through research in various work environments and industry sectors in partnership with stakeholders representing industry, labor groups, academia, and other government agencies.

**MSDS**  
Obtain (material) safety data sheet (MSDS) from your productsupplier. Use the information on these sheets to identify the hazards associated with specific chemicals and explore the possibility of using safer substitutes. If several products are equally hazardous, try to use the least hazardous product(s).

### Biohazard

All workers exposed or liable to be exposed to a substance that may cause adverse health effects during "normal" use should be under suitable medical surveillance. The extent and detail of the medical surveillance should be related to the degree of risk identified during an assessment. An occupational health professional should be consulted to determine the degree of risk and level of surveillance. Medical surveillance should include the maintenance of a medical record in a suitable form for each exposed worker. This guidance sheet can be used as part of the approach to control potentially adverse health effects from inhalation of airborne contaminants.

### Control

This guidance sheet recommends the use of local ventilation along with appropriate protective equipment.

See OSHA's Essential Control Guidance Sheets 400 ([www.osha-hhsc.com/en/ocgs/400.html](http://www.osha-hhsc.com/en/ocgs/400.html)) and 402 ([www.osha-hhsc.com/en/ocgs/402.html](http://www.osha-hhsc.com/en/ocgs/402.html)).

This guidance sheet is currently in DRAFT form awaiting review and approval. Please do not quote, cite, or distribute.

The Dow Chemical Company, Water Parkside, West Sussex Governmental Health and Safety Services, Society of Environmental Hygiene and Associates (SEHA), HSE, and Health and Safety Executive (HSE), United Kingdom.

### Workplace and access

- 1. Ensure that only trained workers have access to glutaraldehyde solutions. Training should include information about hazards, methods to control these hazards, and proper handling procedures.
- 2. Do not place the washing trays in the procedure room.
- 3. Establish a process flow. Use a physical barrier to separate a storage and handling area, a clean and dirty instrument (e.g., endoscopes).

### Design and equipment

- 1. Keep the area well ventilated: 12 air changes per hour with a through draft and negative pressure relative to adjacent areas.
- 2. Use ventilation cabinets or fume hood exhaust to control exposures.
- 3. Use a pump to transfer new and used disinfectant to and from appropriate containers. (Refer to Control Guidance Sheet 405).
- 4. Keep washing trays covered to avoid excess vapour generation and release.
- 5. Do not pour disinfectant from a container into another.
- 6. Keep spill clean-up kit nearby. Contain spills with spill pillows, plugs, socks, and/or absorbent. (Refer to Control Guidance Sheet 404).
- 7. Locate the washing tray near a sink.
- 8. Never decant disinfectant into an unlabeled container.
- 9. Never re-use an empty disinfectant container. Dispose of it safely in the solid waste trash or return it to the supplier.
- 10. Keep only limited amount of disinfectant available for immediate use.
- 11. Have hand-washing facilities readily available for decontamination after handling products, preferably near the exit.
- 12. Establish an emergency eye washing and deluge showers to be on close vicinity to the soaking trays and bins, preferably over the clean basin/wash sink and not the dirty equipment/sink.
- 13. Use steel flooring with welded seams and grinch coating to contain spills.
- 14. Do not use floor drains for water discharge. Use a tandem drain with their gaps to prevent back flow.



Control Guidance Sheet 403

### Procedure

- 1. Make certain the cleaning and disinfection process flows from dirty to clean, i.e., loading area, soak bin, pre-processing sink, AER washer, scope storage.
- 2. Use a paddle-actuated switch or latch, or swinging door with a sweep panel on the entrance door to the dirty side of the process so that workers can avoid using dirty hands to open door.
- 3. Always check the air extraction exhaust with filters tips or tell tale to assure proper operation.
- 4. Buy liquid chemicals in containers that are labeled and that pour easily without dripping, or trapping liquid in the rim.
- 5. Store containers so their labels face forward. Store heavier items on lower shelves. Store disinfectant and other eye irritants below eye level to avoid splashing in eyes.
- 6. Store products containing chemicals securely in a closed, dry, tank place capable of containing spills. Don't store excessive quantities of cleaning and disinfectant products.
- 7. Clean up spills immediately. Absorb liquids with the materials provided in the appropriate spill kit and keep these spill kits close to where glutaraldehyde is used or stored. Dispose in a marked secure container.
- 8. Never mix different waste products (e.g., acid, alkali, flammable solvent, chlorinated solvent, etc). Keep products with different chemical classifications separate.
- 9. Never enter an area where a spill has occurred without the proper personal protective equipment (PPE) and training.
- 10. Safely dispose of all products you no longer need.

### Special care

Contact with glutaraldehyde solutions can lead to skin irritation and itching, rashes, blistering (dermatitis), damage to the eyes, and difficulty in breathing.

### Cleaning and housekeeping

- 1. Keep the work area clean and well organized.
- 2. Clean up spills promptly; practice this at least 1 time per year. (Refer to Control Guidance Sheet 404).
- 3. Dispose of empty containers and wastes safely.
- 4. Wear appropriate PPE when cleaning up spills.

### Personal Protective Equipment (PPE)

- 1. Follow the instructions on product labels or safety data sheet.
- 2. Ask your safety clothing supplier to help you purchase the appropriate PPE.
- 3. You may need respiratory protective equipment (RPE) in case of a spill. Consult your safety manager or PPE supplier.
- 4. Make sure you know how to check that PPE is correctly. Seek advice from your safety manager or supplier.
- 5. Wear protective gloves: single-use nitrile gloves are acceptable. Latex gloves are not recommended for protection against exposure to glutaraldehyde.
- 6. Dispose of single-use gloves every time you take them off.
- 7. Use skin creams or skin protection and help in washing contamination from the skin. These are not barrier creams and do not protect the skin from glutaraldehyde exposure. After work, use creams to help replace skin oils.

Health surveillance - See Control Guidance Sheet 402.

### Training

- 1. Show your workers this sheet and make certain that they understand it.
- 2. Instruct workers about the risks of using the product see product labels or the (material) safety data sheet from your productsupplier.
- 3. Make certain everyone knows how to clean up spills promptly and safely.

### Supervision

- 1. Check that ventilation is working properly and that workers use PPE correctly.
- 2. Ensure that the health surveillance system is being carried out for those who need it.

### Further information

- 1. Consult the suppliers (material) safety data sheet for further information or contact phone numbers for emergency information. Obtain additional information from the NIOSH toll-free number (1-800-368-NIOSH [1-800-368-4674]) within the United States or 913-533-8322 outside the United States, or access the Web site at [www.cdc.gov/niosh/nc/nl.html](http://www.cdc.gov/niosh/nc/nl.html).

### Worker checklist

- Check that your personal protective equipment (PPE) works properly every time you put it on.
- Use, maintain and store your PPE according to instructions.
- If you find any problems, tell your supervisor. Do not continue working.
- Wash your hands after use, and before and after eating, drinking, smoking and using the toilet.
- Never clean your hands with concentrated cleaning products or solvents.
- Clean up spills immediately. Wear the appropriate PPE. Use absorbent granules for spill and put them in a waste container with a lid (Refer to Control Guidance Sheet 404).

- Cooperate with medical surveillance teams.

- Always follow the standard operating procedures.

- Immediately report skin irritation (itching, rashes, blistering (dermatitis), irritation to the eyes or difficulty in breathing) to your supervisor.

**NIOSH**

# Challenges in Applying Control Banding in the U.S.

- Compliance strategy vs. regulatory scheme
- R-phrases – Global Harmonization System
- Validation / verification of effectiveness
- Shift in thinking from “exposure assessment” to “exposure control”
- How to handle mixtures? Other gaps?
- Role of sampling / analysis?

# Purpose of U.S. Control Banding Workshop

1. present the concepts of CB to the wider occupational health and safety community
2. explore the feasibility of its application in U.S.
3. produce a critical review of the literature
4. partner with industry, labor, academia and government to develop a national strategy to make the best use of this tool
5. recommend actions and programs to facilitate the implementation of CB in U.S.

# National Strategy Recommendations

## 1. Need to better define the scope of the model

- SMEs are principal audience and large industry when no OELs
- Partners & Stakeholders need to be involved
- part of flexible and established risk assessment / management strategy (simple/direct vs. full RA)
- a global tool for progressing to a safe and healthy work environment and managing scarce resources - not a substitute for experts
- melds with product stewardship and global trade priorities

# National Strategy Recommendations

2. Emphasize the need for hypothesis driven validation studies and verification of strategies for SMEs to install and maintain controls.
3. Establish an umbrella organization for CB in the US in order to...
  - identify partners, stakeholders, facilitators, project management, marketing, implementation strategies, goals/objectives, policy issues, and incentives, e.g., a National Control Banding Federal Advisory Committee.

# National Strategy Recommendations

4. Establish a clearinghouse for sharing the information
5. CB must be incorporated into NORA II and an RFA needs to be developed to further move the process
6. Coordinate with the WHO International Technical Group on CB

# Evaluation

- Gives the same advice as an expert
- Delivers target exposure ranges
- Users like it
- Used widely
- Is it used properly?
- Has it improved control of exposure?

# What are the benefits?

<b>Employer</b>	Knows what to do for compliance
<b>Trade Association</b>	Informed members, develop good practice
<b>Supplier</b>	Good practice limits liability
<b>Employee</b>	Knows health protected or when things are wrong
<b>Trade Union</b>	Trained, informed representatives
<b>Academic, Professional</b>	Expert input
<b>Regulator</b>	Common benchmark for compliance

**Consensus on Good Control**

# Future Developments

- Selecting respiratory protective equipment, e.g., infectious disease
- Improved advice for risk to skin
- Selecting protective gloves
- Emergencies – chemical health hazards
- Safety applications (physical hazards)
- Ergonomic and environmental applications

# Potential for Applying Control Banding

- The organization and logic of control banding provides an integrated approach to assessment of potential risk and effective use of control practices.
- Applying the hierarchy of exposure controls routinely as part of a toolbox, without expert advice, requires that the controls have been demonstrated to be effective under a wide variety of circumstances.
- Demonstration will require researchers, developers, manufacturers, and users to share and disseminate information.

# CONCLUSIONS

- Control banding is a complimentary, risk-management approach to protecting worker health that focuses resources on exposure controls and describes how strictly a risk needs to be managed.
- NIOSH considers control banding a potentially useful tool for SMEs.
- Control banding has been validated in various settings, particularly in Great Britain, Germany, etc.
- NIOSH is currently evaluating its utility for the United States.

# Selected References

- ◆ 1<sup>st</sup> International Control Banding Workshop  
<http://www.bohs.org/eventDetails.aspx?event=42>
- ◆ 2<sup>nd</sup> International Control Banding Workshop  
<http://www.acgih.org/events/ControlBand/>
- ◆ 3<sup>rd</sup> International Control Banding Workshop  
<http://www.saioh.org/ioha2005/Proceedings/SSI.htm>
- ◆ NIOSH Topic Page  
<http://www.cdc.gov/niosh/topics/ctrlbanding/>
- ◆ HSE COSSH Essentials  
<http://www.coshh-essentials.org.uk/>
- ◆ ILO SafeWork  
[http://www.ilo.org/public/english/protection/safework/ctrl\\_banding/index.htm](http://www.ilo.org/public/english/protection/safework/ctrl_banding/index.htm)
- ◆ R-phrases European Union  
[http://europa.eu.int/smartapi/cgi/sga\\_doc?smartapi!celexapi!prod!CELLEXnumdoc&lg=en&numdoc=32001L0059&model=guichett](http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELLEXnumdoc&lg=en&numdoc=32001L0059&model=guichett)

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