

Industrial Hygiene for the Telecommunications Professional



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Objective

- Provide information that will enable you to decide how to proceed with Industrial Hygiene related issues.
- Even though most IH's would like you to believe what they do is rocket science, it is not. There are resources to help make the decisions necessary for you to run an IH program.

Plan of Attack

- Begin Traditional Chemical Hazards
- Move to Specific Hazards such as Noise, Lead, and RF
- Wrap up with my favorite- MOLD



What is Industrial Hygiene?

- Recognize, Evaluate, and Control workplace exposures
- Identify employee exposures to:
 - Chemical Agents
 - Physical Agents
 - Biological Agents
 - Ergonomic Stressors



Common Telecommunications Hazards Requiring Sampling

- Chemicals- solid, liquid, fume, mist, vapor, gas
 - Construction dust
 - Asbestos
 - OSP Solvents
 - Lead
- Noise
- Radio Frequency
- Indoor Air Quality

Basic IH Principles

#1 – “It’s the dose makes the poison”-

Paracelsus

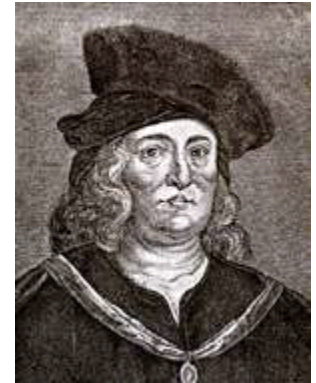
Theory of Hormesis

#2 - Effects Can Be Local or Systemic

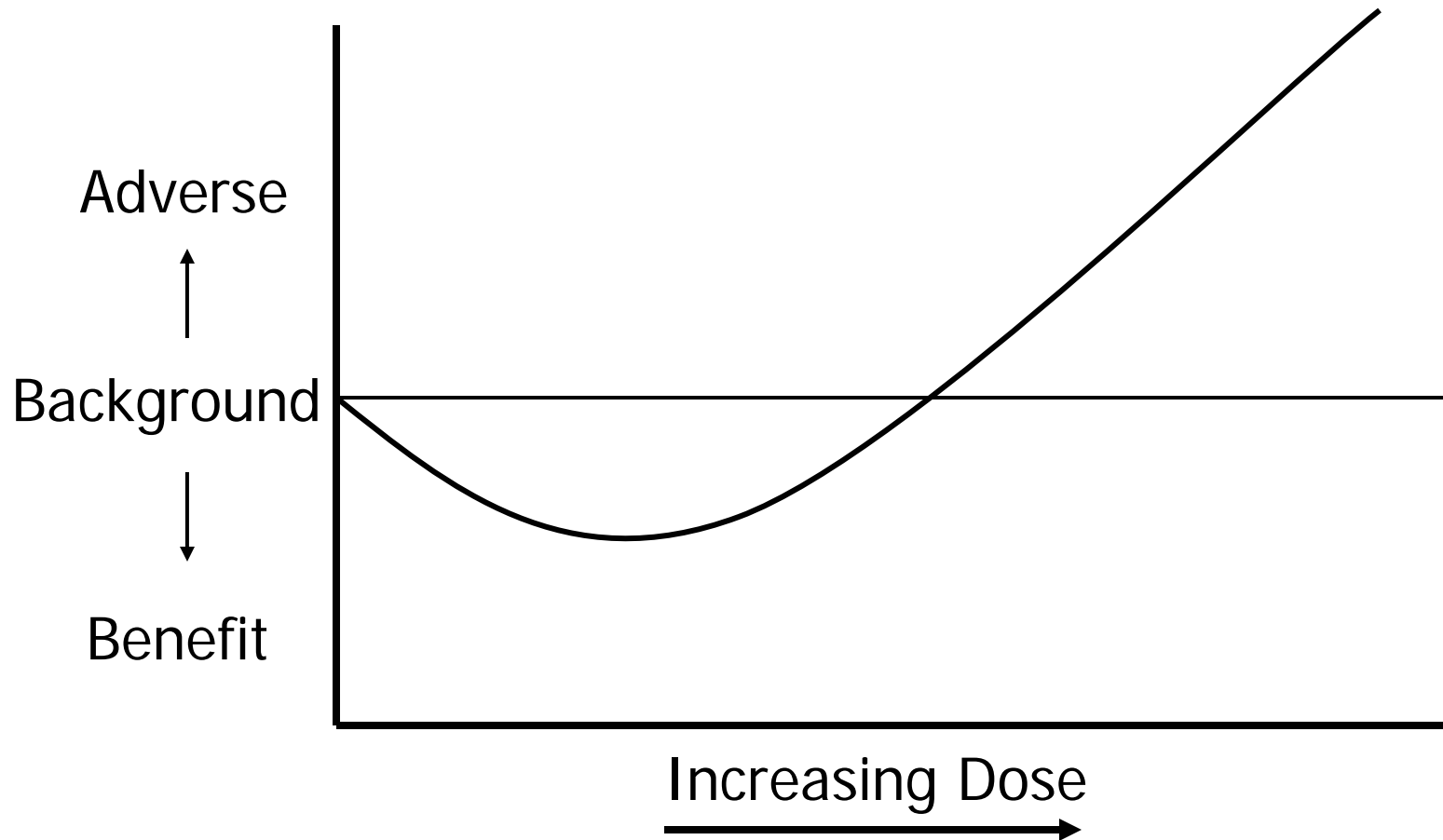
#3 - Handing out PPE is the least desirable control method

#4 -Humans Are Variable

Allergies, metabolism, PEL’s focused on healthy person



General Form of the Hormesis Curve



PEL

Concentrations that healthy individuals can normally tolerate for eight hours a day, five days a week without harmful effects



PEL

- Permissible Exposure Limit
- OSHA's legally allowed concentrations in the workplace
- Three types:
 - 8-hr TWA – PEL
 - Ceiling – PEL
 - STEL – PEL
- ACGIH TLVs



Recognition

- Smell and Taste
- Common sense
- Employee complaints shouldn't drive sampling program
- It is our jobs as safety professionals to recognize the introduction of potentially harmful conditions in the workplace.



Recognition and Evaluation Hazard Assessments

- An alternative to expensive air sampling
- Risk assessment
 - List hazards
 - Characterize exposure
 - High/low
 - Frequent/rare
 - Many/few
 - Prioritize sampling
 - Implement controls

The Process of Risk Assessment in a Nutshell

- Hazard Identification: IS THIS STUFF TOXIC?
- Dose-Response Assessment: HOW TOXIC IS THIS STUFF?
- Exposure Assessment: WHO IS EXPOSED TO THIS STUFF, HOW MUCH, HOW OFTEN, AND FOR HOW LONG EACH TIME?
- Risk Characterization: SO WHAT?
- Risk Management: SO WHAT ARE YOU GOING TO DO ABOUT IT?

(Don Barnes, 1993)

Evaluation-

To sample or not to sample

1. Can hazard be eliminated without sampling?
2. What are you sampling for?
Which components of chemical compounds
3. How will you sample for it?
4. Who/ When to sample?
5. How long to sample? Limit of detection
6. Potential Employee Exposures
7. Direct Reading or Lab Analysis
8. Ball-park or Exact



Expect Results

- Before ever sampling-

Anticipate potential
results and responses

What are You Going to Do If?

- None detected
- Just below action level
- Just below PEL
- Above PEL

Are you prepared to STOP operations?

Equipment Maintenance and Calibration

- Maintenance vs. Renting
- Annual Factory checks
- PRIMARY vs. SECONDARY calibration methods (Soap-bubble meter vs. rotameter)
- NIST Traceable calibration
- Pre/ Post calibration



Sampling Methods- Online Resources

- NIOSH Manual of Analytical Methods- The Bible of Chemical Sampling
- NIOSH Pocket Guide
- Laboratories- Many will provide media and guidance on collecting samples. A list of laboratories by state is located at www.aiha.org
 - Liberty Mutual

Evaluating Results of Sampling

- Do you need to prove it is statistically relevant?
If so, there are tools available to perform calculations for you.
 - Lognorm software available at www.lognorm.net

Let's assume a potential hazard is discovered-----→



Control of Health Hazards

- Hierarchy of Controls
 - Engineering -
 - » Substitution with less harmful material
 - » Enclosure
 - » Isolation
 - » Ventilation
 - Work practices
 - Administrative
 - Personal Protective Equipment



Personal Protective Equipment

- Myths

- Cheaper than engineering controls
- Can achieve nearly 100% effectiveness
- Fits the same everyday
- Training will increase use

- Truths

- Requires a Hazard Assessment
- Requires a written program
- Requires training
- Requires proper selection
- Requires proper fitting
- Requires frequent replacement
- All PPE leaks or fails



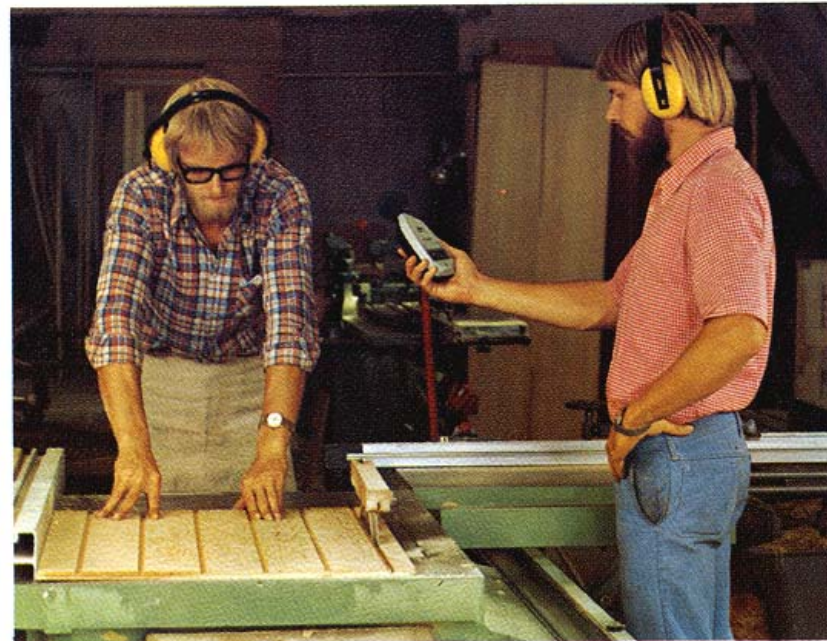
Specific Hazards

- Now let's take a look at some specific hazards commonly encountered in the Telecommunications industry



NOISE

- Can noise be reduced without sampling
- Noises below those regulated by OSHA can cause employee complaints and inefficiency.



Noise Basics

- Logarithmic
- Tree falling in woods theory
- Doubling of Sound energy results in 3dB increase
- In general a 10dB increase is perceived as twice as loud.
- Similar to radiation:
 - Time, distance, shielding

Lead

- OSHA considers LBP to be paint with any amount of lead in it. CPSC has set threshold for residential purposes at 600 ppm, does not apply to industry
- OSHA LBP policy covers any disturbance of LBP
- 2 issues
 - Customer premises
 - Company facilities

Radio Frequency

- Not cumulative
- Not carcinogenic
- Causes heating of the body
- Microwave oven
- Heating occurs internally, heat sensors in body on the exterior



Construction Dust

- Can contain a high amount of silica
- Can normally be contained with proper enclosures and ventilation

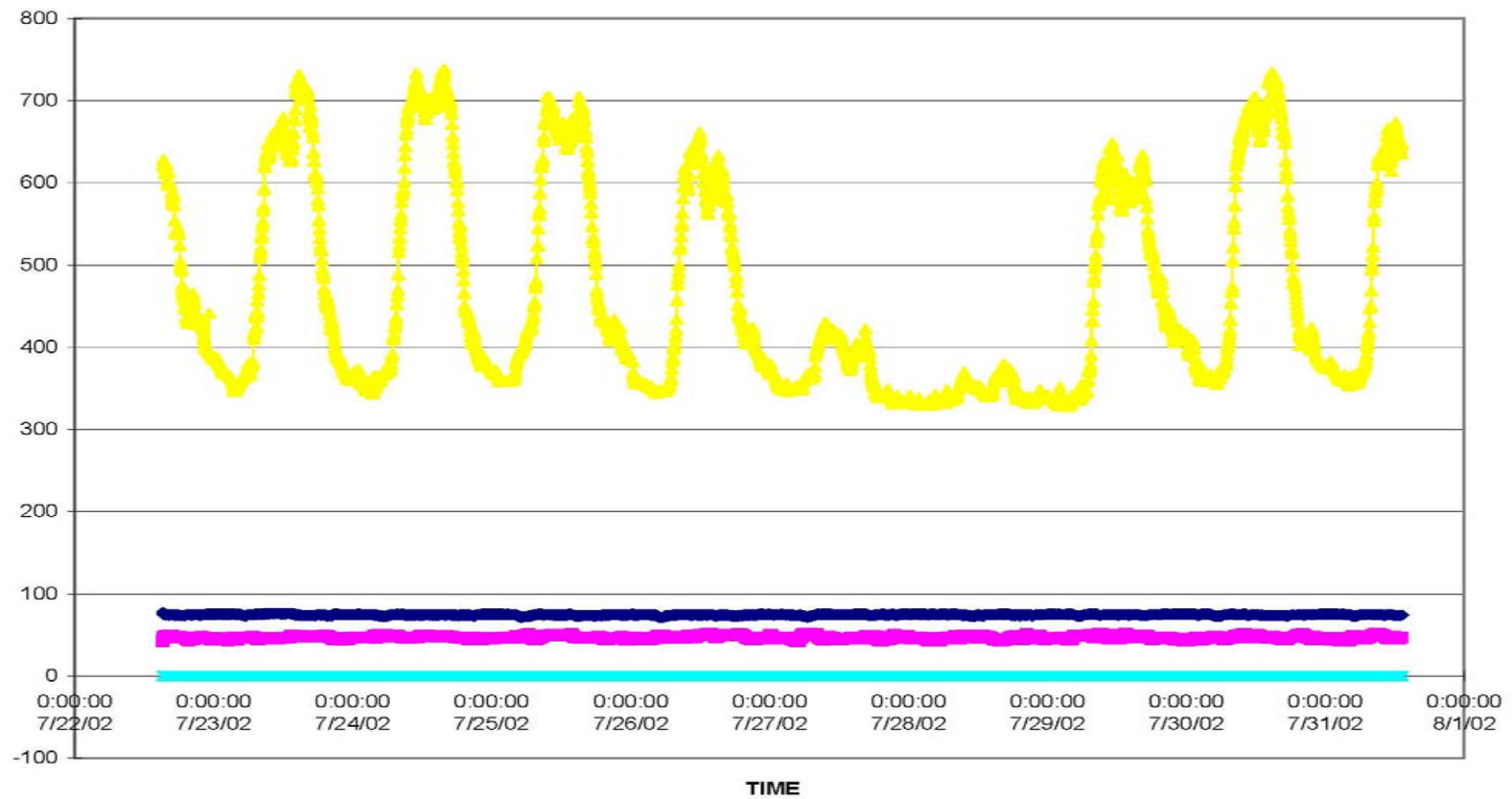


IAQ- Inadequate Ventilation

- In approximately 500 indoor air quality investigations in the last decade, the National Institute for Occupational Safety and Health (NIOSH) found that the primary sources of indoor air quality problems are:

Inadequate ventilation	52%
Contamination from inside the building	16%
Contamination from outside the building	10%
Microbial contamination	5%
Contamination from building fabric	4%
Unknown sources	13%

CO2 can tell you a lot



Mold- Don't Believe the Hype

- Believe the Science
- No such thing as toxic mold
- Only Scientifically proven effect of mold-
ALLERGIES
 - 1/5 of people will demonstrate allergic reactions to allergens.

Mold- Real Risks vs. Even Realer Liability

- No scientific evidence required
- Contract workers vs. company employees



Mold- To Sample or not to Sample

- Tape lift
- Air Samples
- Mold standards or lack there of



Mold- Prevention Best Solution

- Mold needs food and water to exist.
- The food is everywhere, therefore the moisture must be controlled.
- Dry wet materials within 24-48 hours







Other Good Links

- NYC Mold Guidelines
<http://www.nyc.gov/html/doh/html/epi/moldrpt1.shtml>
- OSHA Technical Manual
http://www.osha.gov/dts/osta/otm/otm_toc.html
- EPA Mold Guidance
http://www.epa.gov/mold/mold_remediation.html
- www.aiha.org

Questions

