INDUSTRIAL HYGIENE
QUALITATIVE RISK ASSESSMENT

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Objectives

- Discuss how industrial hygiene fits into VPP
- Highlight some common VPP assessment IH findings
- Define qualitative & quantitative IH assessments
- Discuss purpose of qualitative IH assessment
- Discuss a process for qualitative IH assessment
- Discuss how qualitative assessment fits into VPP
VPP Element: Worksite Analysis

- Job safety analysis (JSA)
- Operating procedure development
- Industrial hygiene
- Hazard recognition/control
- Employee involvement is important
Common VPP IH Findings

- Not much IH activity at site
- Site IH knowledge/planning is limited or inadequate
- Inadequate follow up on Corporate/consultant IH work
- IH element not in Annual Comprehensive Evaluations
- Ventilation is often overlooked
  - General—HVAC
  - Local exhaust
- Cal/OSHA standard-specific monitoring not complete or current...Cr(VI), lead, asbestos, etc.
Hazard Assessment is Often Easy
Definitions

- **Industrial Hygiene** – anticipation, recognition, evaluation, and control of occupational hazards

- **Risk** = Likelihood $\times$ Severity

- **Exposure** – Contact with a chemical, physical, radiological, and/or biological agent

- **Assessment** – A process of gathering, analyzing, and documenting; evaluation
Definitions

- **Qualitative IH Assessment** - Evaluation of potential personal exposure to workplace chemicals, physical, radiological, and/or biological agents based on personal experience and professional judgment.

- **Quantitative IH Assessment** - Evaluation of actual personal workplace exposure to chemical, physical, radiological, and/or biological agents using accredited numerical and mathematical analysis.
Purpose of Qualitative Assessment

- Assessing and managing occupational exposures to chemical, physical, radiological, and biological agents
- Use of a systematic, repeatable assessment approach involving knowledgeable employees
- Making best use of resources (people, time, & $)
- A means to target areas or tasks of greater risk for training, planning, & budgeting
- Help develop IH monitoring plans
- Satisfy expectation of the Annual Comprehensive Evaluation
Qualitative Risk Assessment Process

- Identify Agents
  - Chemical
  - Physical
  - Biohazard
  - Radiological
  - Others

- Collect Information
- Process basic information
- Risk Assessment
  - Improve controls/monitor
  - Collect more info.
  - Acceptable
  - Yes/ Maybe
  - Uncertain
    - Acceptable
      - Document & Reassess on next cycle
    - No
      - Collect more info.
Who is Involved?

- IH/ safety professionals
- Employees familiar with tasks
- Supervisors & managers
- Medical professionals
- Safety committee members
Information to Gather/Consider

- **Inventory**: chemicals, biological agents, physical agents (noise, radiation, thermal stressors)
- **Effects**: chronic & acute, local & systemic, toxicity, etc.
- IH data & exposure monitoring, exposure routes
- Injury/illness/incident experience
- Inspection/observation findings, process details
- Employee concerns, training, behavior
- Regulatory requirements (thresholds & action levels)
- Normal, upset, startup, & shut down scenarios
- Infrequent tasks
Similar Exposure Groups

- A group of workers having the same general risk profile for the agents being assessed
- Comparable tasks are performed in a like manner with the same materials and processes
- Referred to as SEG
- Employees may be in more than one SEG
Designating SEGs
Consider Unplanned & Infrequent Events
SEG?
SEG Examples

- Mechanic
  - Electrician
  - Welder
- Operator
  - Unit 1
  - Unit 2
- Warehouse worker
- Office employee
- Supervisor
- ERT member
- Delivery person
- Driver
- Lab Technician
  - QC
  - R&D
- Admin assistant

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If it Doesn’t Fit... Add another SEG
Which Comes 1st ... SEG or Qualitative Assessment?

- Easier to start with SEGs

- Base on observation & judgment

- Start with broad SEG categories and consider refining as part of your improvement cycle
The Number of SEGs Depends On

- The objective of the assessment
- Diversity of tasks
- Dynamics of the workplace
- Existing data or studies
- Characterization of agent(s)
- Resources available to complete assessment
- Professional judgment
Assessment

- Exposure and risk assessment is an art and a science
- Uses existing quantitative data (monitoring)
- Uses existing qualitative data (J SAs, SOPs)
- Considers controls
- Relies on professional judgment
- Relies on employee involvement
Assessment - Severity

- Characterize the agents (A-B-C or 1-2-3)
  - Serious permanent harm, death or repro. hazard
  - Serious harm but not permanent
  - Other than serious
- Scales used are typically 3-5 levels
- Be conservative in placing the agent into a category
Assessment - Likelihood

- Frequency of exposure
  - Daily, weekly, monthly

- Duration of exposure
  - <15 min
  - 15 min - 1 hour
  - 1- 2 hours
  - > 2 hours or continuous

- Route of exposure: inhalation, dermal, inhalation/dermal, physical, other
Assessment - Risk

- Using frequency and duration determine:
  - Long, frequent exposure
  - Medium frequency, medium duration
  - Short, infrequent exposure

- Characterize exposure (professional judgment)
  - Serious and permanent physical harm, death or reproductive effects
  - Serious but likely not permanent physical harm
  - Other than serious effect
Assessment Team Meets

- The assessment process is described very generally in a prior meeting.
- Task lists are developed for each SEG.
- Hazardous agents are matched to tasks.
- Frequency, duration, exposure routes are discussed.
- Characterization of risk is made.
- A record is kept of the team's determinations.
## Documentation

<table>
<thead>
<tr>
<th>Hazardous Agent</th>
<th>Task/Activity</th>
<th>Freq. of Exposure</th>
<th>Exposure Duration</th>
<th>Primary Exposure</th>
<th># of Workers Exposed</th>
<th>Charact. of Risk</th>
<th>Charact. of Exposure</th>
<th>Control Method</th>
<th>Concerns or Problems</th>
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<tbody>
<tr>
<td>Noise over 85 dBA</td>
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<td>Daily</td>
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<td>Physical</td>
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<td>3</td>
<td>C</td>
<td>Engineering</td>
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<td>Case packer</td>
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<td>3</td>
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<td>Forklift operation</td>
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<td>PPE</td>
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<tr>
<td>Clean up</td>
<td>Daily</td>
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<td></td>
<td>Physical</td>
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### Risk Priorities

- **A1**: Serious and permanent physical harm, death or reproductive effects
- **A2**: Serious but likely not permanent physical harm
- **A3**: Other than serious effect

### Frequency of Exposure

1. **Long frequent exposure**
2. **Medium frequency, medium duration**
3. **Short infrequent exposure**
Planning, Controls & Monitoring

- Use hierarchy of controls
  - Engineering
  - Administrative
  - PPE

- Plan for necessary resources
  - Capital, shutdowns, turnarounds
  - Procedure development & training
  - Substitution/elimination
  - Monitoring plans & resources
Questions?

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