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

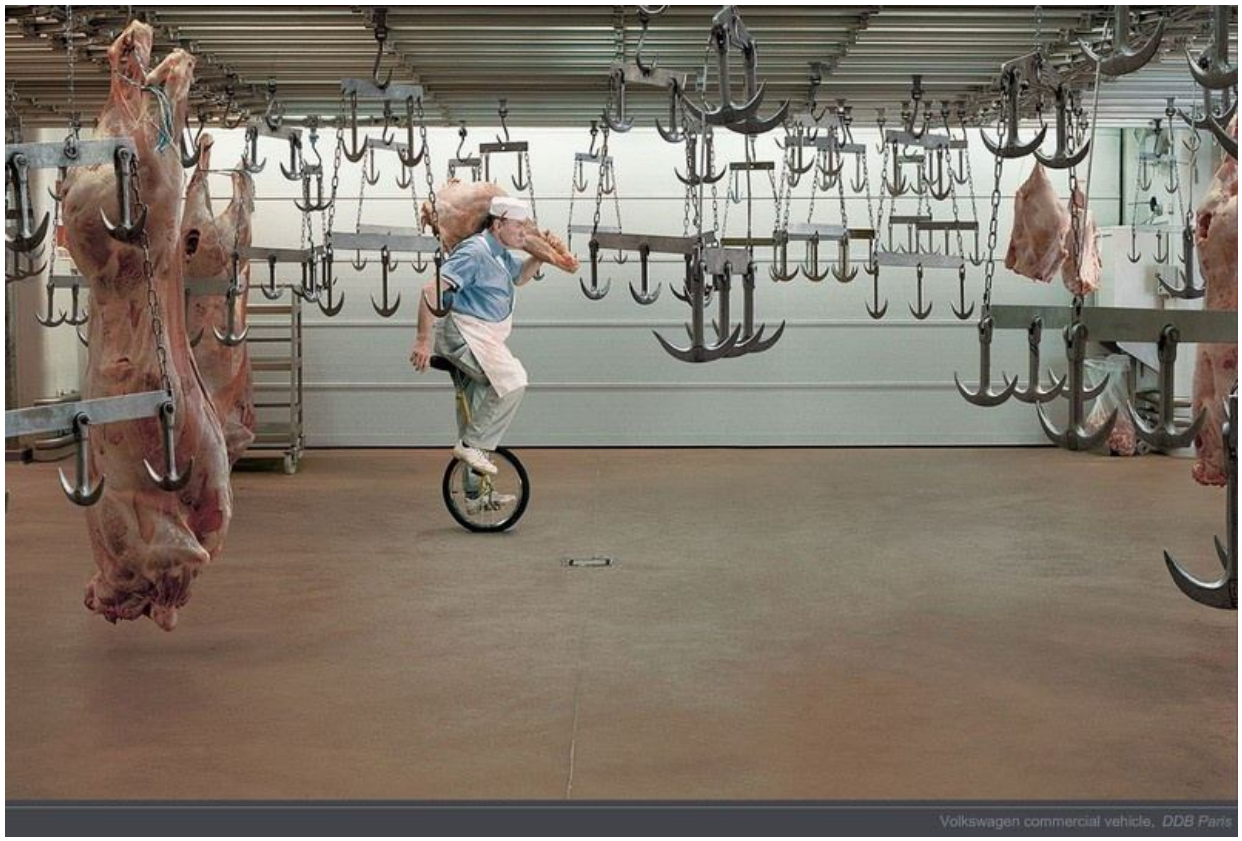
VPP Element: Worksite Analysis

- 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 x Severity
- Exposure – Contact with a chemical, physical, radiological, and/or biological agent
- Assessment – A process of gathering, analyzing, and documenting; evaluation

Definitions

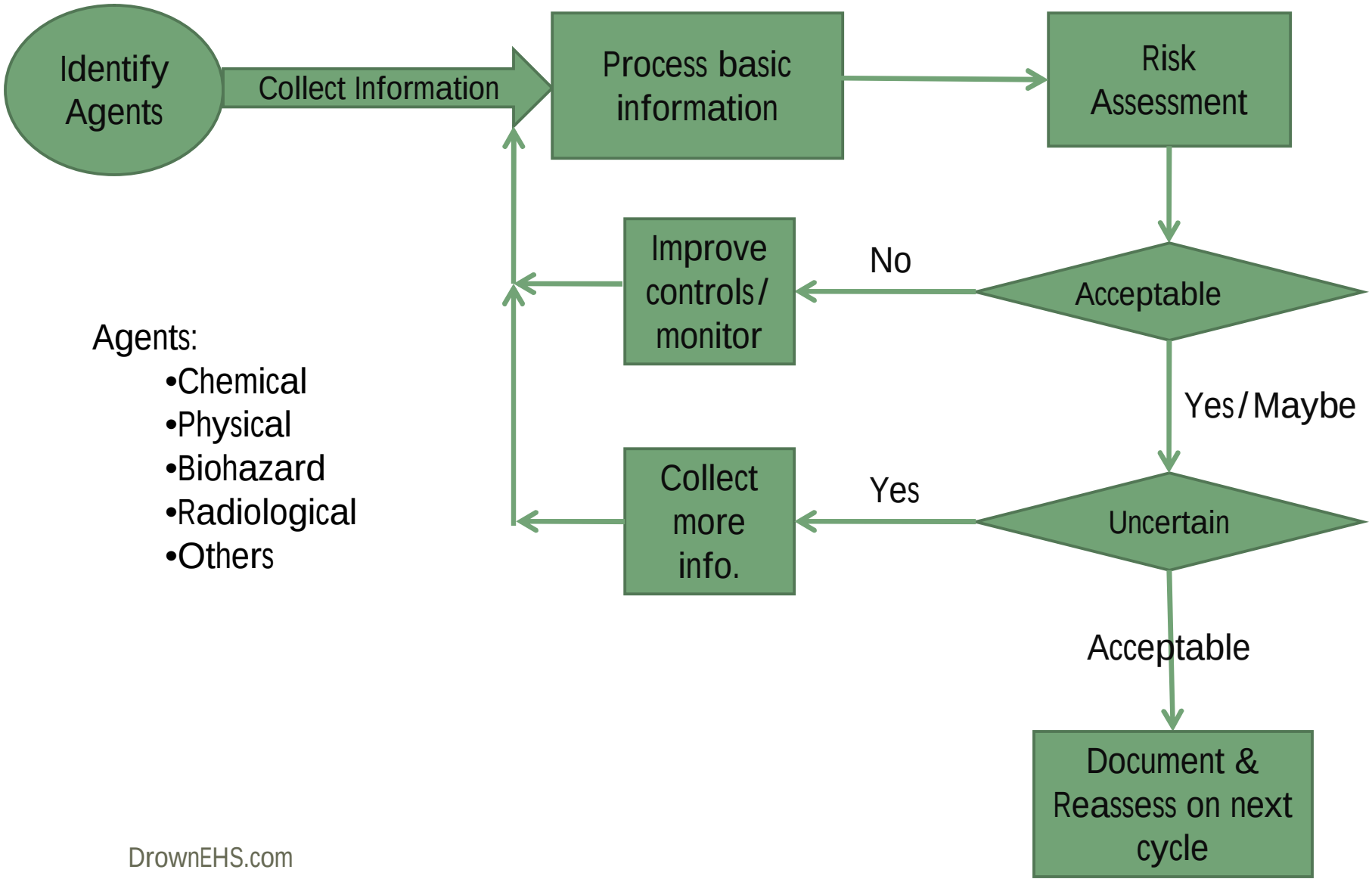
- Qualitative IH Assessment - Evaluation of ***potential*** personal exposure to workplace chemicals, physical, radiological, and/or biological agents based on personal experience and professional judgment

- 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



Agents:

- Chemical
- Physical
- Biohazard
- Radiological
- Others

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

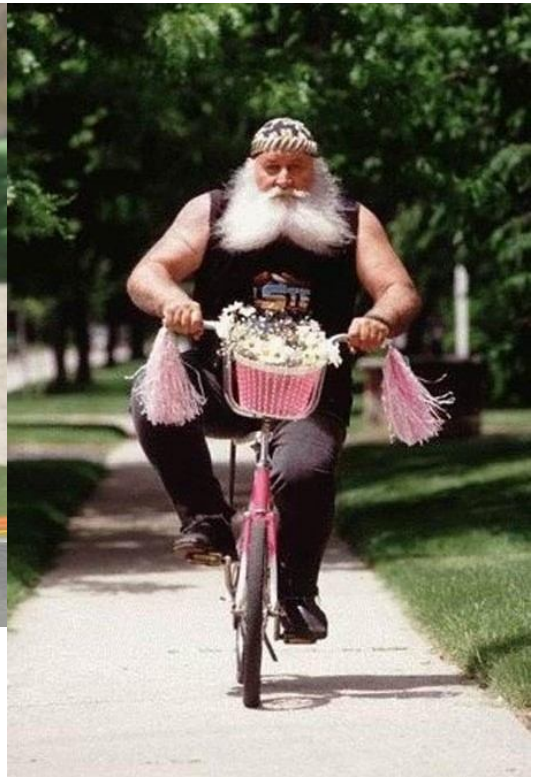
Similar Exposure Groups

- 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

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 (JSAs, 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

Sim…	Level …perator	24 …rators (8 h… r shifts, o… ional OT of 4… urs)
Exposu… …oup 1	May ru… …s 1,2, or 3	

Hazardous Agent	Task/Activity	Freq. of Exposure	Exposure Duration	Primary Exposure	# of Workers Exposed	Charact. of Risk	Charact. of Exposure	Control Method	Concerns or Problems
noise over 85 dBA	DCS monitor	Daily	<15 minutes	Physical	1	3	B	Engineering	
	case packer	Daily	>2 hours	Physical	3	1	B	PPE	
	forklift operation	Daily	>2 hours	Physical	1	1	B	PPE	
	clean up	Daily	15 min-1 hr	Physical	8	2	B	Admin./proc.	
	filler	Daily	>2 hours	Physical	3	1	B	Engineering	
	sampling	Daily	<15 minutes	Physical	6	3	B	PPE	
	assist maintenance	Weekly	>2 hours	Physical	2	2	B	PPE	Grinder
Isopropanol	DCS monitor	Daily	<15 minutes	Inhalation	1	3	C	Engineering	
	case packer	Daily	>2 hours	Inhalation	3	2	C	Admin./proc.	Freq. leaks
	forklift operation	Daily	>2 hours	Inhalation	1	3	C	Admin./proc.	
	clean up	Daily	15 min-1 hr	inhl/derm	8	2	C	Admin./proc.	Open encl.
	filler	Daily	15 min-1 hr	inhl/derm	3	2	C	Admin./proc.	
	sampling	Daily	<15 minutes	inhl/derm	6	3	C	PPE	
	assist maintenance	Weekly	>2 hours	inhl/derm	2	2	B	PPE	
	spill	Monthly	>2 hours	inhl/derm	4	2	A		
I… …valent Cr	assist maintenance	Monthly	15 min-1 hr	Inhalation	1	3	A	Engineering	welding

	Serious and permanent physical harm, death or reproductive effects
	Serious but likely not permanent physical harm
	Other than serious effect

1	long frequent exposure
2	medium frequency, medium duration
3	short infrequent exposure

A1	A2	A3
B1	B2	B3
C1	C2	C3

Priority:	
	HIGH
	MEDIUM
	LOW

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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