



Job Exposure Matrix

- for the Electrical Utility Industry

Presented by:
Eric Brown, MPH, CIH, CSP
Southern California Edison
Rosemead, CA



Outline

- Definitions
- Organization Value
- Hazard/Job Classifications
- Job-based Categorization
- Risk Assessment Basis
- Matrix Examples
- Projected Audience
- Future Plans/Limitations

What is a Job Exposure Matrix (JEM)?

- JHA

Identification of hazards and exposures utilizing job classifications and tasks.

Value Added

- To reduce hazards/exposures in the work environments through a systematic approach of identifying hazards, based on job classifications and job tasks.
- Education at numerous levels
- Prioritization/rationale for money and effort

Chemical Hazards

Acids/Bases

Ammonia

Arsenic

Asbestos

Sulfur Hexafluoride

Benzene

Cadmium

Carbon monoxide

Chlorine

Chromium

Dusts

Formaldehyde

Hydrogen sulfide

Lead

Mercury

Nitrogen oxides

PCBs

Sodium hydroxide

Solvents

Sulfur oxides

Welding fumes

Ethylene Glycol

Physical Hazards

Heat Stress

Cold Stress

Noise

Electric Current

Ionizing Radiation

Power Frequency EMF

UV (sunlight)

Laser

Biological Hazards

Fungal

Fungal Allergy

Fungal Infection

Valley Fever (Coccidio...)

Cryptosporidium

Viral

Hepatitis A,B,C

HIV

Tick-borne

Bacterial

Legionnaires

Sewage, Coliform

Food poisoning

**Common Infections (staph,
strep)**

Tetanus

Rabies

Ergonomic Hazards

Awkward posture

Static posture

Lighting

Vibration

Materials handling

Repetitive Motion

VDT

Tools

Trip and Fall

Psychological Hazards

Responsibility/Supervisory

Isolation

Extended Shifts/Fatigue

Occupational Categories (SEG)

- SCE/EPRI

Administrative

Apprentice Electrician

Auto/Plane Mechanic

Clerical Field Workers

Drivers

Electrician

Engineer

Equipment Operator

Field Service Reps

Field Supervisors

Groundmen

Line Workers

Lineman Apprentice

Machinist

Maintenance Workers

Manager, Mechanics

Meter Reader

Officer Supervisors

Other Technician

Plant and Equipment Operator

Porter

Representatives

Security

Technical/Professional

Welder

Task Breakdown

- Identified Job Tasks through interviews
- Reviewed tasks for significant hazards
- Meter Readers (confined spaces?)

Risk Assessment Basis

- Regulatory
 - OELs (PEL, TLV)
 - Carcinogens
- Known Illnesses
 - Workers Comp
 - OSHA Incidents
- Potential Exposure
 - Professional/Institutional Knowledge
 - Report of Exposure/Complaints

Rankings

(Health Effect Severity) (Exposure Potential) = Overall Risk

- Total Risk = Negligible, Low, Moderate, High (1-4)
- Assessed Individually, Highest risk used

Health Effect Severity Ranking

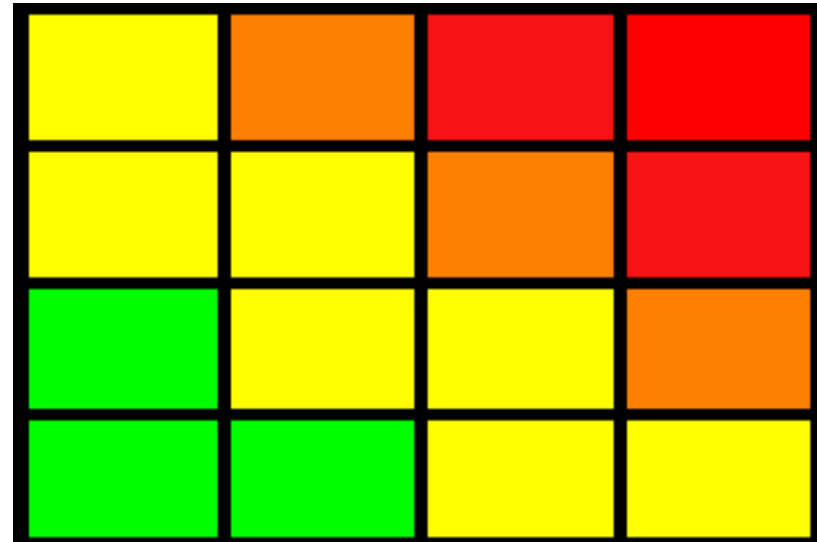
- 1 – Nuisance effects.
- 2 – Irritation, Discomfort, Possible sensitization.
- 3 – Possible/suspect Carcinogen, Severe short-term health effects.
- 4 – Toxicity (neuro-, organ-specific, etc), Known Carcinogen, Mortality.

Likelihood of Exposure

- Professional judgment, exposure sampling data (relative to the IAL), frequency of exposure
 - Internal Action Level (IAL) of 50% the PEL/TLV
- 1 – Exposure very unlikely: Exposure very rare, and/or NO data above IAL
 - 2 – Exposure unlikely: Exposure infrequent, or some data above IAL (shows possible need for re-sampling)
 - 3 – Exposure possible: Exposure infrequent, and some data above IAL
 - 4 – Exposure known: Exposure Frequent and some data above the IAL.
 - 4 - Known Worker's Comp Claim or OSHA Incident

Risk Rating

- 1 – 2 Negligible Risk
- 3 – 6 Low Risk
- 6 – 9 Moderate Risk
- 12 – 16 High Risk



Physical Hazards

<u>Physical Hazards</u>	<u>Meter Readers</u>
Heat Stress	Deserts
Cold Stress	Winter areas
Ionizing Radiation	
EMF	
Microwave/RF	
UV (sunlight)	Walking routes
Noise	
Electric Current	MR 1 change meters

Viral Factors

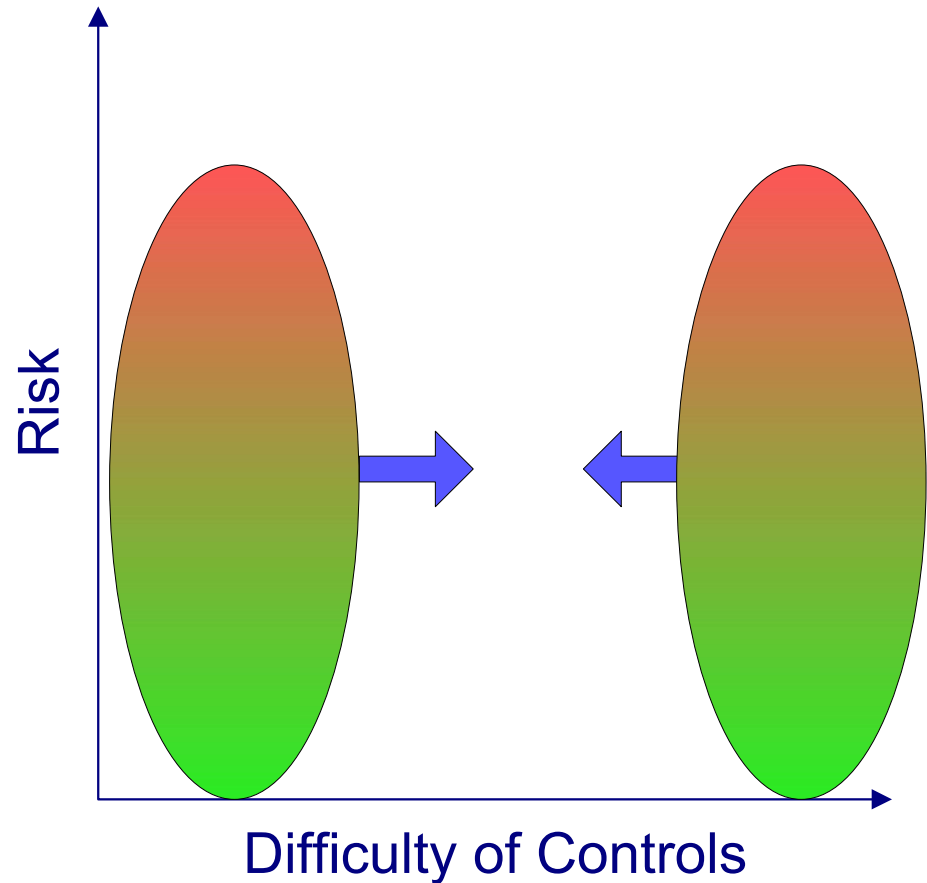
<u>Viral</u>	<u>Meter Readers</u>
Hepatitis A,B,C	
HIV	
Tick-borne	Wilderness areas
Rabies	Dog bites

Ergonomic Factors

<u>Ergonomic Factors</u>	<u>Meter Readers</u>
Awkward posture	Awkward access to meters
Static posture	
Lighting	
Vibration	
Materials handling	
Repetitive Motion	Meter usage, twisting meter seals
VDT	
Tools	Holding dog-stick or umbrella
Trip and Fall	Uneven yards and sidewalks, wet/icy surfaces

Prioritizing Efforts

- Using data (often incomplete), prioritize where efforts are needed.
- Given a Risk v. Difficulty of Controls, work from both ends of difficulty of controls.





Real Benefit

A value-decision tree, a basis to either:

- Change or not change Programs
- Check to verify that effective corrective measures are implemented

Sequence of Change

1. ID hazards and exposures
2. Prioritize
3. Learn, gather additional info
4. Change Situation; Incorporate Controls into Programs
5. Train to the change
6. Self-Audit

Limitations

- Level of Detail is an issue
- Limited List
- IH only, will incorporate Safety
- Synergistic, Additive effects not considered
- IH database limited

Future Plans

- Standardize - Set the uniformity/format
- Refine techniques
- Collaborate through EPRI
 - Share experience and knowledge
 - Pool data industry-wide
 - Create an industry focus group
- Possibly influence future regulation through empirical data (e.g. hex chrome)

Acknowledgments

Contact

Eric Brown

Southern California Edison

Corporate EHS, Corporate Safety

eric.brown@sce.com

(626) 221-3183