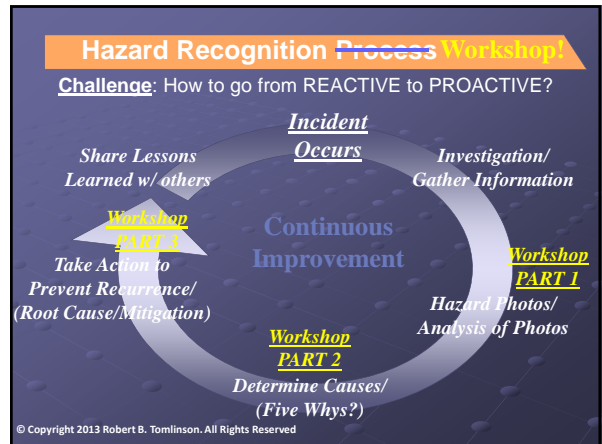


Why do we take them?

AHMP
ALLIANCE OF HAZARDOUS
MATERIALS PROFESSIONALS
ORLANDO 2013

Alabama
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Network

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PROBLEM: When analyzing hazards and risks, we all have a different *perception* of the risks we will take!

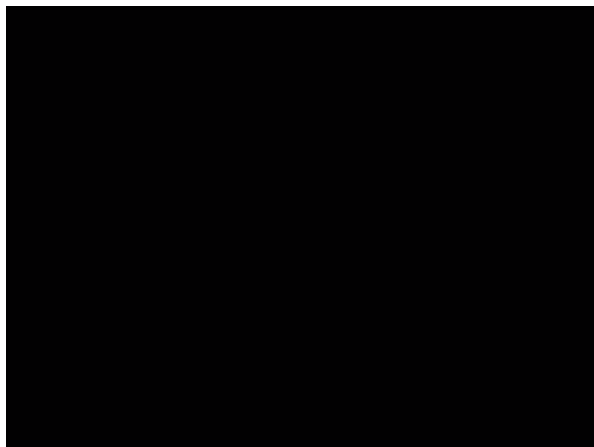
START WITH THE BASICS!

What is a hazard?

A source or a situation with a potential for harm in terms of human injury or illness, damage to property, damage to the environment, or a combination of these.

Let's take an *awareness* test!

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Identifying hazards is simple right?

Everyone sees every hazard they come across, right?

inattention
blindness

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Categorizing hazards

The obvious hazard

- ✘ (unguarded machinery, faulty electrical equipment, building defects)

The concealed hazard

- ✘ (electricity, presence of toxic vapors, high frequency noise)

The developing hazard

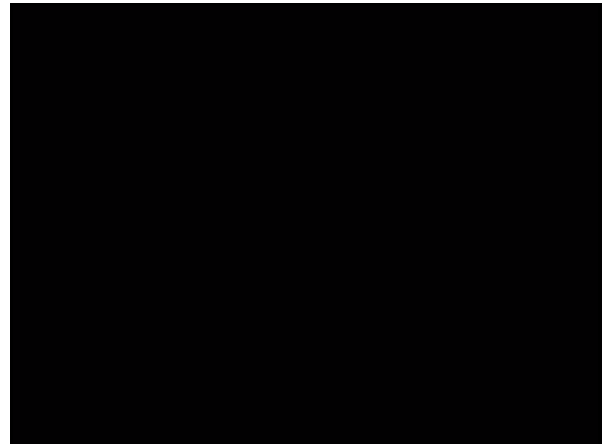
- ✘ (worn tire on a mobile crane, frayed steel cables)

The transient hazard

- ✘ (overload of machinery, sticking safety valve on a boiler, intermittent electrical defect)



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What are some reasons that we ignore hazards?

- Ignorance
- Familiarity
- Social acceptance
- Plain old human defiance



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General Duty Clause



Section Number 5 of the OSHA Act

- (a) Each employer –
- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
 - (2) shall comply with occupational safety and health standards promulgated under this Act.
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

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Recognized hazard

- Common knowledge in particular industry
- Detectable

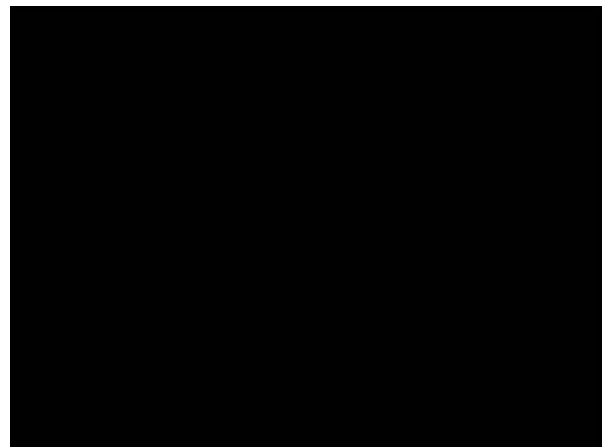
- ✘ By means of the senses
- ✘ Generally known



Let's look at RISK!



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What is risk?

Risk is the likelihood that a harmful consequence (death, injury or illness) might result when exposed to the hazard.

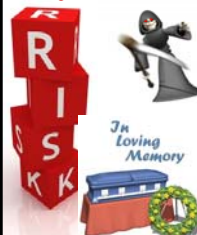
“Our lives improve only when we take chances – and the first and most difficult risk we take is to be honest with ourselves.” – Walter Anderson



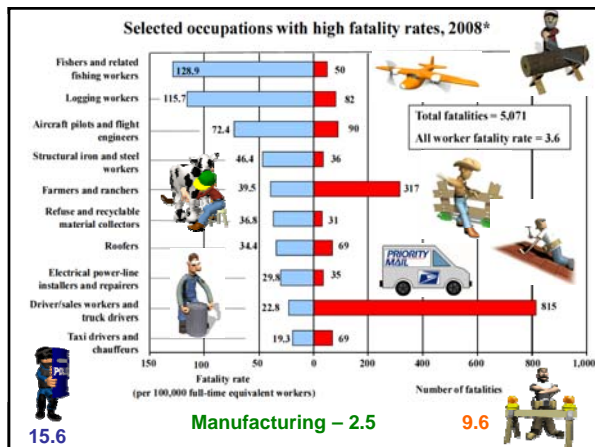
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There are differences:
 •in the way we each perceive risk,
 •in the way we each measure risk, and
 •between these perceptions and measurements

No matter what the cause, one thing is certain:
No one gets out of here alive.



Accidental Deaths - United States 1999-2003		
Type	5 Yr. Average	General Population Risk Per Year
Motor Vehicle	36,676	1 out of 7,700
Poisoning	15,206	1 out of 18,700
Work Related	5,800	1 out of 49,000
Large Trucks	5,150	1 out of 55,000
Pedestrian	4,846	1 out of 58,000
Drowning	3,409	1 out of 83,500
Fires	3,312	1 out of 86,000
Motorcycles	3,112	1 out of 91,500
Railroads	931	1 out of 306,000
Firearms	779	1 out of 366,000
Recreational Boating	714	1 out of 399,000
Bicycles	695	1 out of 410,000
Electric Current	410	1 out of 695,000
Air Carriers	138	1 out of 2,067,000
Flood	58	1 out of 4,928,000
Tornado	57	1 out of 5,015,000
Lightning	47	1 out of 6,061,000



Risk breaking it down...

Risk is the potential that a chosen action or activity (including the choice of inaction) will lead to a loss (an undesirable outcome).

- ✳ The notion implies that a choice having an influence on the outcome exists (or existed).
- ✳ Potential losses themselves may also be called "risks".
- ✳ Almost any human endeavor carries some risk, but some are much more risky than others.

RISK = Severity of Consequences **X** Likelihood of Occurrence

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Why take a risk?

The Chinese symbol for risk best captures the duality of risk, this Chinese symbol for risk is a combination of:

- ✳ danger (crisis) and
- ✳ opportunity

危險

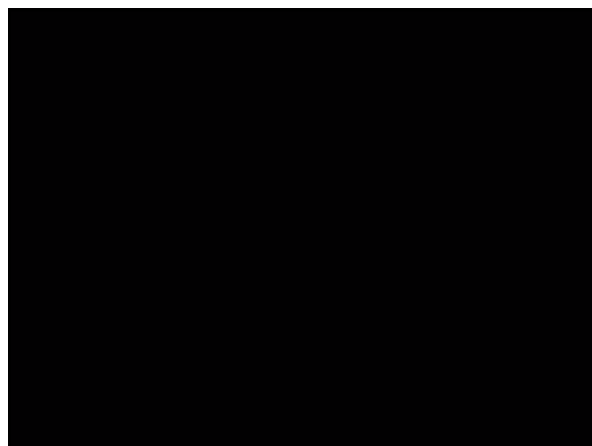


WARNING: Don't get a tattoo with this symbol unless you're an insurance salesman.



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How risky is the following race?...



How we perceive risk...

Time –

- ✳ Is the potential negative outcome related to the risk going to occur now, or sometime in the future?





Physical Distance –

- ✳ Is the risk nearby or far away?

Personal Distance –

- ✳ Will the risk affect me or my family?

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How we perceive risk...

Cost vs. Benefit –


- ✳ Which is greater, the benefit derived from taking the risk, or the cost associated with either reducing it or removing its effects?

Probability –

- ✳ Is the risk in question a rare event, or something that is likely to occur?

Magnitude –


- ✳ Is the resulting affect of taking the risk likely to be large or small?



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Probability

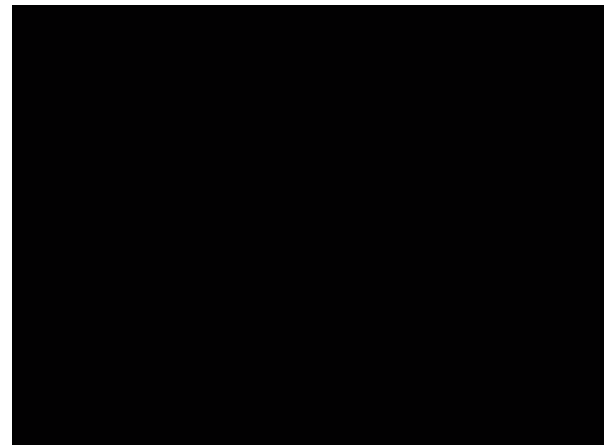
The probability of any outcome is the number of times that outcome can occur divided by the total number of outcomes.



PROBABILITY OF AN EVENT

$$P(A) = \frac{\text{The Number of Ways Event A Can Occur}}{\text{The Total Number of Possible Outcomes}}$$

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Factors Affecting Risk Judgment

Is it:

Controllable
Voluntary
Not Fatal
Observable
Known
Immediate Effects

OR

Uncontrollable
Involuntary
Fatal
Unobservable
Unknown
Delayed Effects

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Tolerable Risk or Acceptable Risk



“A risk within a range that society can live with so as to secure certain net benefits. It is a range of risk that we do not regard as negligible or as something we might ignore, but rather as something we need to keep under review and reduce it still further if and as we can.”



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Relative and Absolute Risk

The public often **overestimates** risks of **low-probability high-consequence** dangers,

But, they tend to **underestimate** risks of **high-probability low-consequence** events.

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The value of life

What's your life worth?

$$VSLY = r(VSL) / [1 - (1+r)^{-L}]$$

$$VSL = \frac{VSLY}{r} - \frac{1}{(1+r)^L} \left[\frac{VSLY}{r} \right]$$

VSLY = Value of Statistical Life-Year

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"If we truly thought our lives were priceless, we would never risk losing them. Yet we take such risks every day."

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Why assess the risks?

To determine which ones are the most serious

- (i.e. those with greater likelihood and most severe consequences); and

To plan the actions needed to control the risks in order of priority,

- From most serious to least serious risks to health and safety.

Like triage in the ER

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TABLE TOP EXERCISE: Calculate your personal hazard/risk tolerance

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What's your personal risk tolerance?

What is your personal risk perception of the following activities?

	TOLERANCE									
	1	2	3	4	5	6	7	8	9	10
1. Bungee jumping		✓								
2. Sky diving		✓								
3. Riding on the space shuttle						✓				
4. Traveling by plane (Commercial)								✓		
5. Traveling by plane (Small single engine)									✓	
6. Mountain biking				✓						
7. Traveling overseas (Europe)								✓		
8. Traveling overseas (South America)								✓		
9. Traveling overseas (Middle East)								✓		
10. Driving without a seat belt				✓						

Not for a million dollars
 You'd have to pay me a lot
 You'd have to pay me a little
 I could be talked into it
 Maybe not
 Maybe
 I'd try it once but won't do it again
 I'd be willing to pay a little to do it
 I'd be willing to pay a lot to do it
 I'd do it every chance I get

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What is your personal risk perception of the following activities?

	TOLERANCE										
	1	2	3	4	5	6	7	8	9	10	
11. Smoking		✓									
12. Skiing (Snow)		✓									
13. Skiing (Water)						✓					
14. Riding a motorcycle (with a helmet)						✓					
15. Riding a motorcycle (without a helmet)		✓									
16. Driving at 10 mph over the speed limit										✓	
17. Driving at 20 mph over the speed limit				✓							
18. Driving while talking on cell phone			✓								
19. Driving while texting		✓									
20. Disagreeing with your spouse					✓						
Total Count	0	8	1	1	3	3	0	4	1	1	
Factors	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	
Total Values	0	16	3	4	15	18	0	32	9	10	
Sum of Personal Risk Perception	107										

Questions?????

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