



RISK MANAGEMENT in OHS

Murat Can Ocaktan, PhD

26th February 2019

INTRODUCTION

Etymology of Risk*

- 危険 : Hazard
- 机会 : Chance, opportunity

Combination...

- 风险 : Risk



* Özkılıç, Ö. Risk Değerlendirmesi.

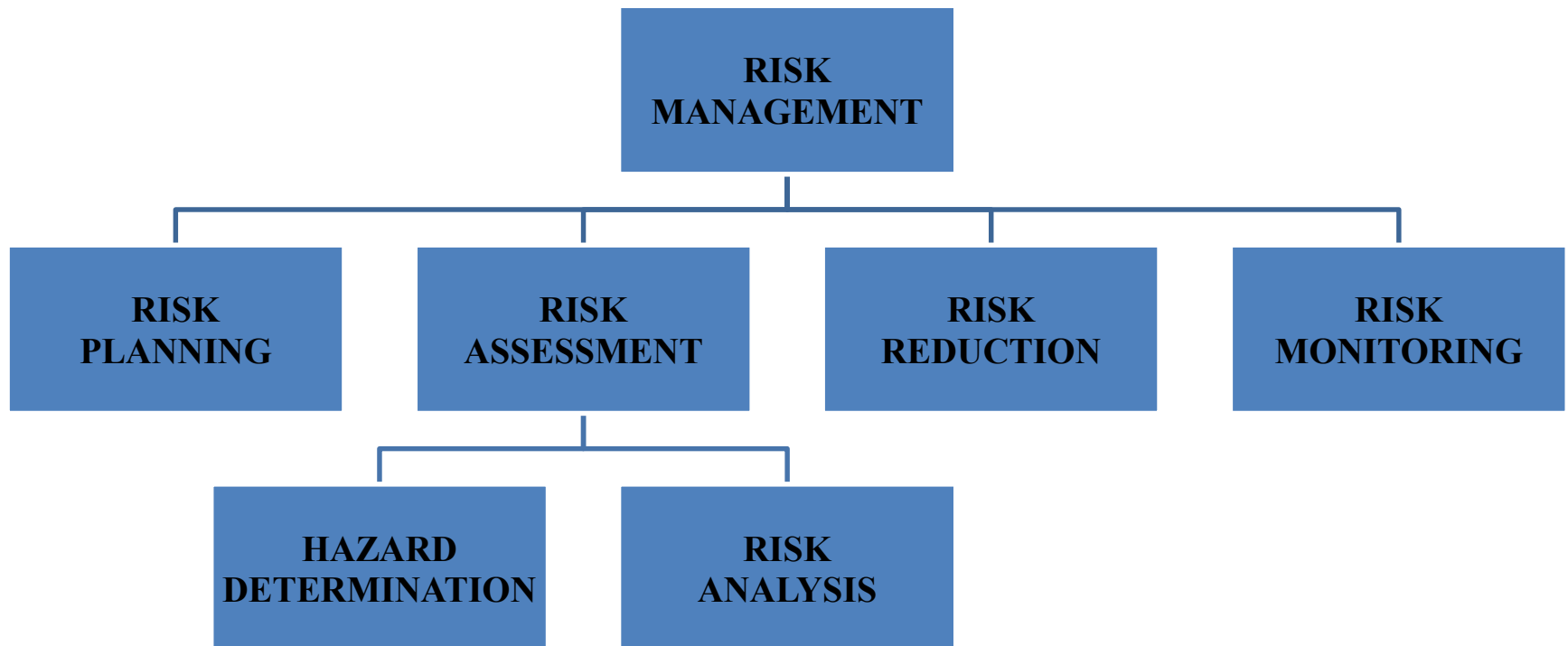




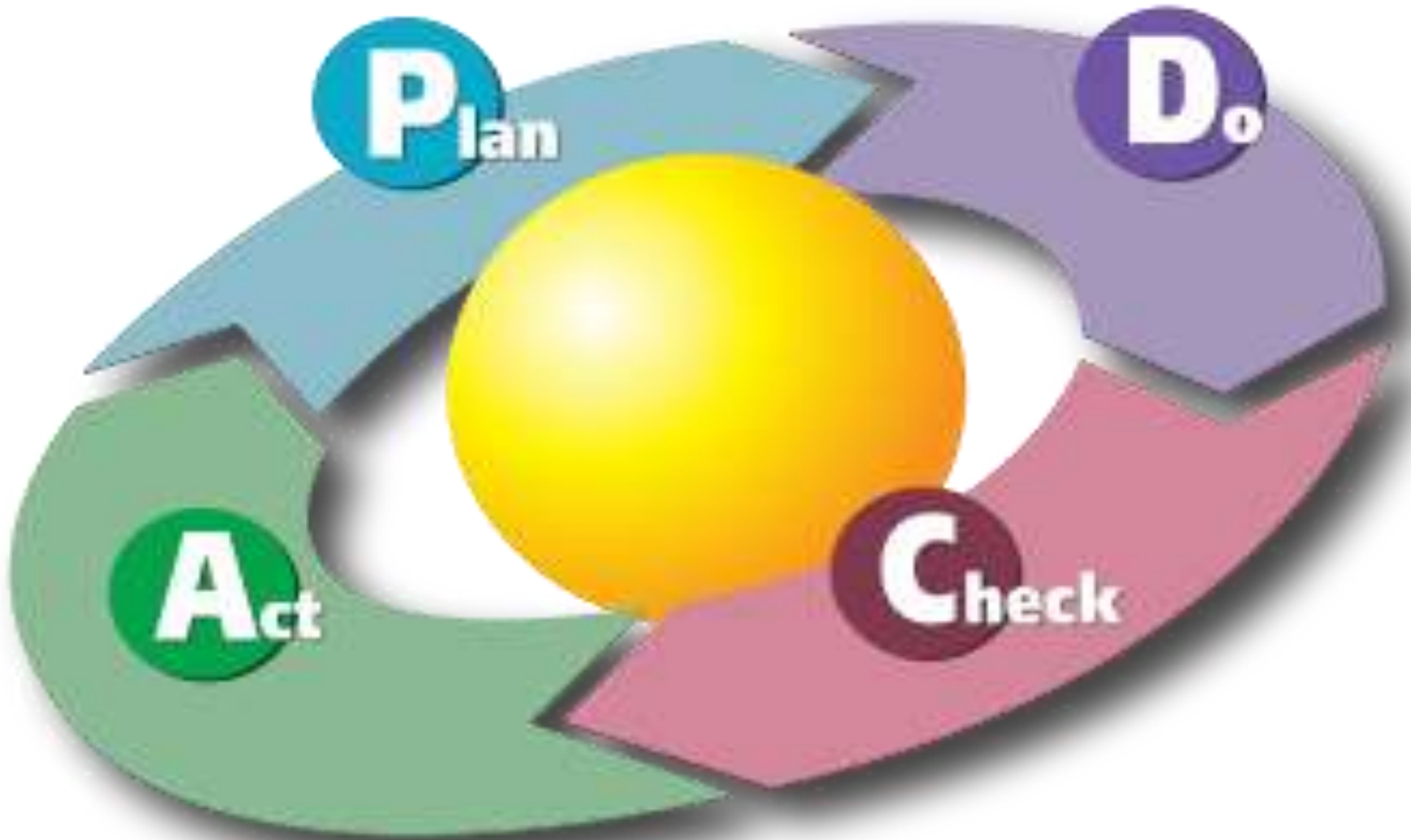
A systems view for Risk Management

- A ***system*** is a regularly interacting or interdependent group of units forming an integrated whole.
- There are natural and human-made/designed ***systems***.
- In engineering, we have physical systems, in computer science, a software can be a system, in management science; an ***organization*** or a project can be identified as a ***system***.

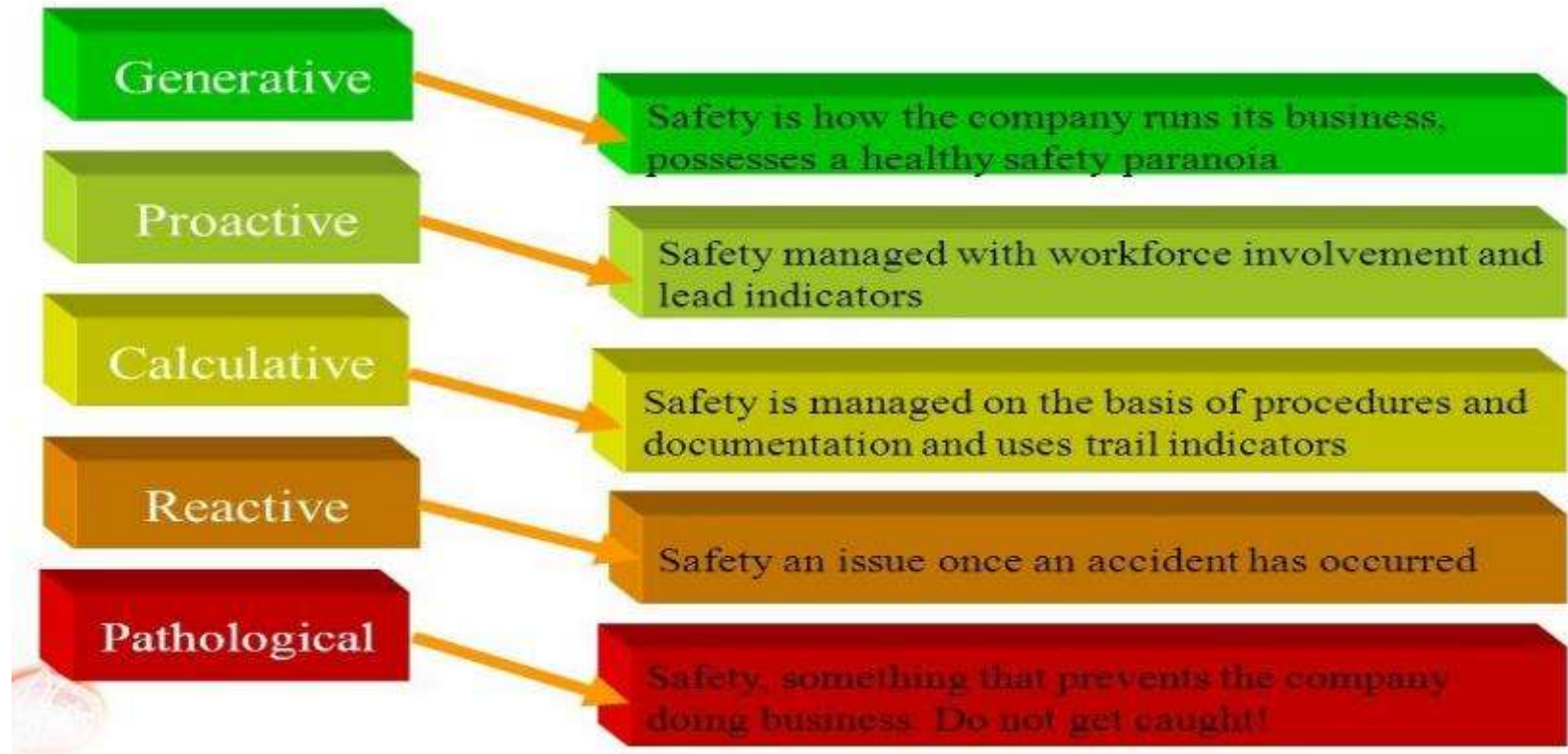
INTRODUCTION



SYSTEM APPROACH



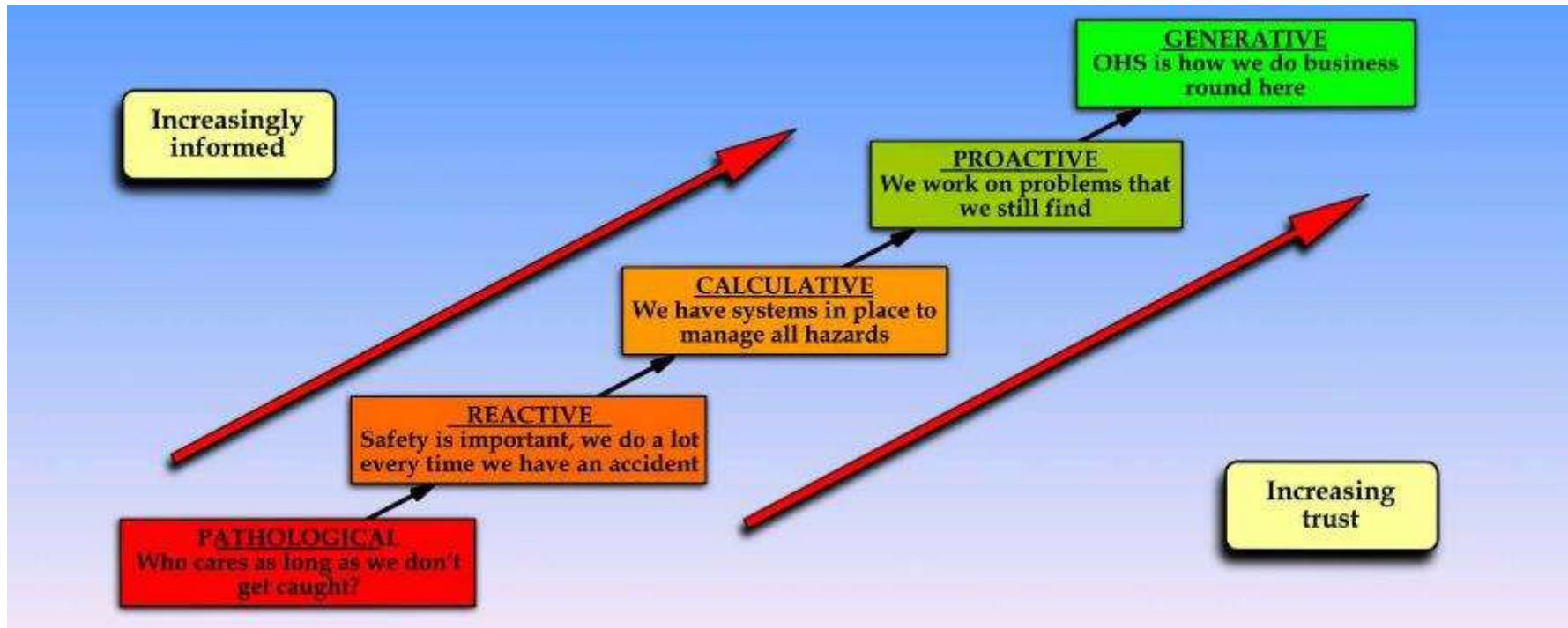
MATURITY OF ORGANIZATIONAL CULTURE*



https://www.google.com.tr/search?q=james+reason+safety+culture&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjp8leM5_ZAhXDYIAKHUTXAP4Q_AUICigB&biw=1366&bih=573#imgdii=WjwEwF0NvMC-MM:&imgsrc=avB-Ain6r_WpM:

INTRODUCTION

Why Risk Management ????



DEFINITION

haz·ard

- hæzərd/ haz-erd]
- noun 1. an unavoidable danger or risk, even though often foreseeable:
The job was full of hazards.



WHAT IS HAZARD?

- Source, situation or act with a potential for harm in terms of human injury or ill health, or combination of these. (OHSAS 18001 Article 3.6.)
- Source with a potential to cause injury and ill health (ISO45001 Article 3.19)
- Potential which exists at the workplace or may arise from outside the workplace to cause harm or damage which could affect the worker or the workplace; (OHS Law #6331, Article 3 (1), p)



Hazard vs. Risk

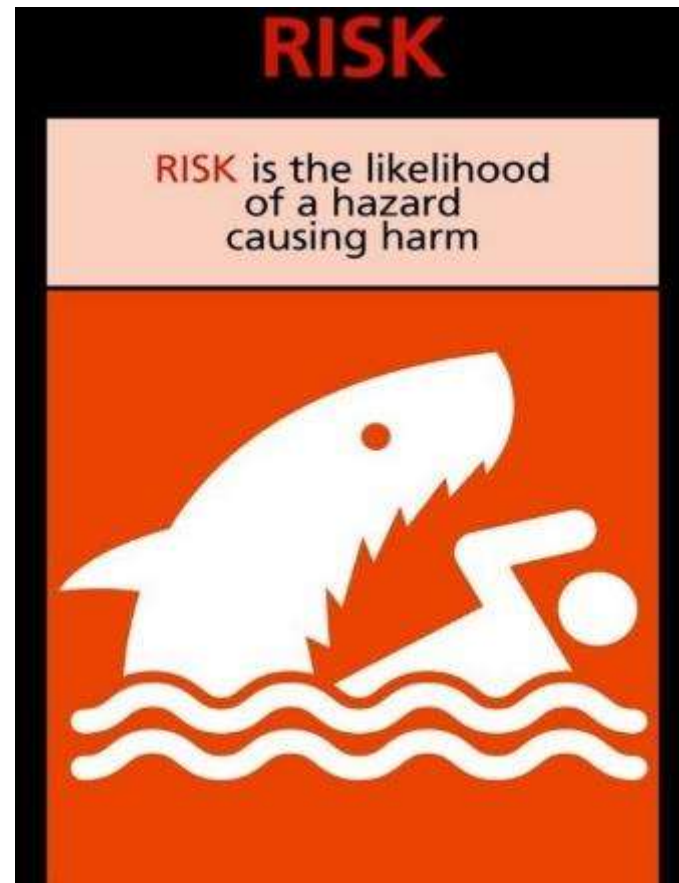
Are risk and hazard synonyms?

These two terms are often used to describe the same or **similar things, but this isn't entirely accurate as risk and hazard relate to very distinct concepts. Not all hazards represent a risk; it is exposure which makes all the difference.**

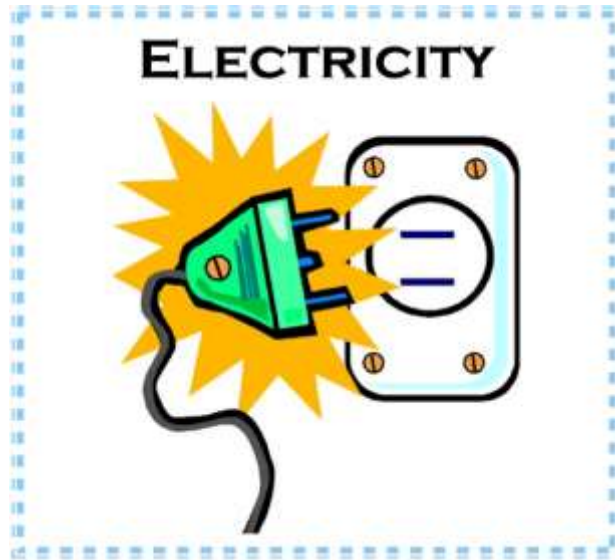


Hazard vs. Risk

When does a hazard become a risk?



Hazard vs. Risk



DEFINITION

risk

- noun 1. a situation involving exposure to danger
- verb expose (someone or something valued) to danger, harm or loss



WHAT IS RISK ?

Combination of the likelihood of an occurrence of a hazardous event or exposure(s) and the severity of injury or ill health that can be caused by the event or exposure(s) (OHSAS 18001, Article 3.21)

Effect of uncertainty (ISO 45001 Article 3.20)

Probability of loss, injury or other harmful result arising from hazard; (OHS Law #6331, Article 3 (1), o)



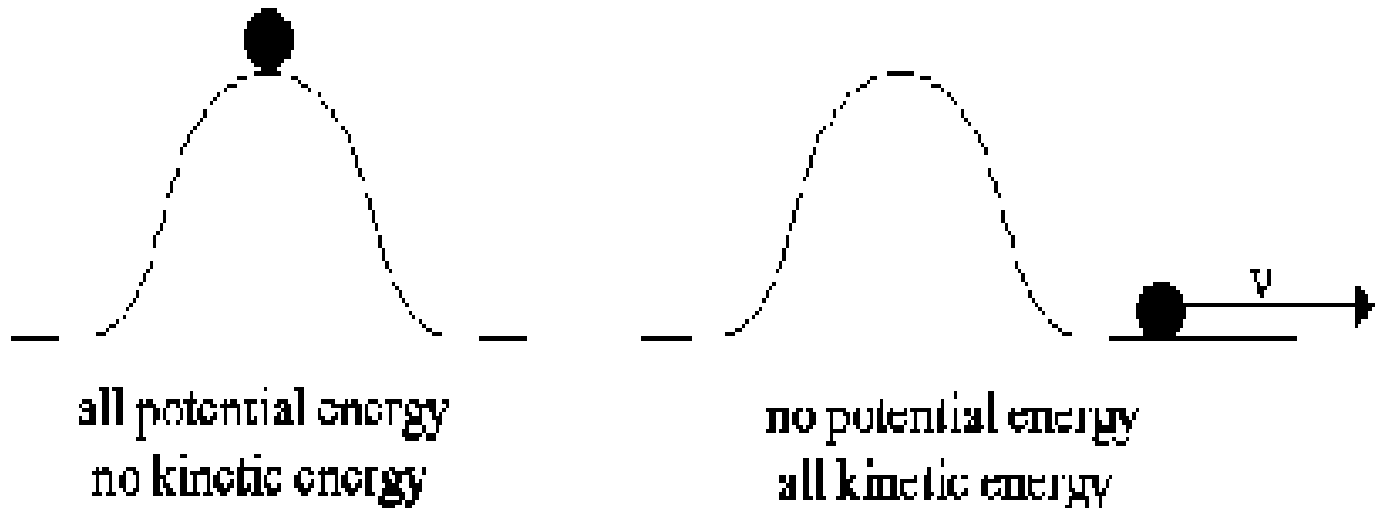
HAZARD & RISK

Hazard and risk relationship likes potential energy vs kinetic energy relationship...

Kinetic energy versus Potential energy

kinetic energy = energy of motion/momentum

potential energy = stored energy/energy from gravity

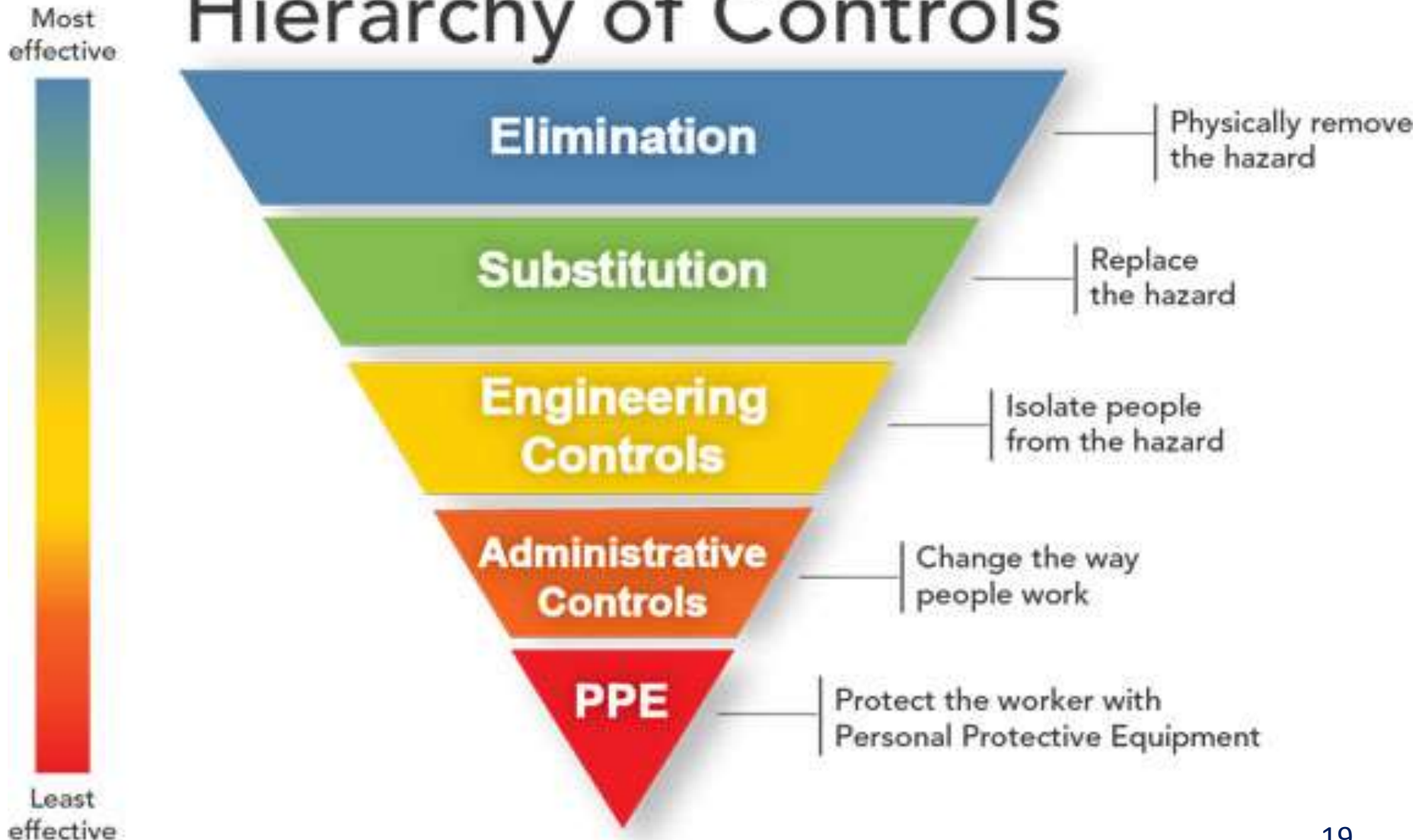


INTRODUCTION

- Controlling exposures to occupational hazards is the fundamental method of protecting workers.
- Traditionally, a hierarchy of controls has been used as a means of determining how to implement ***feasible*** and ***effective control solutions***.

RISK CONTROL HIERARCHY

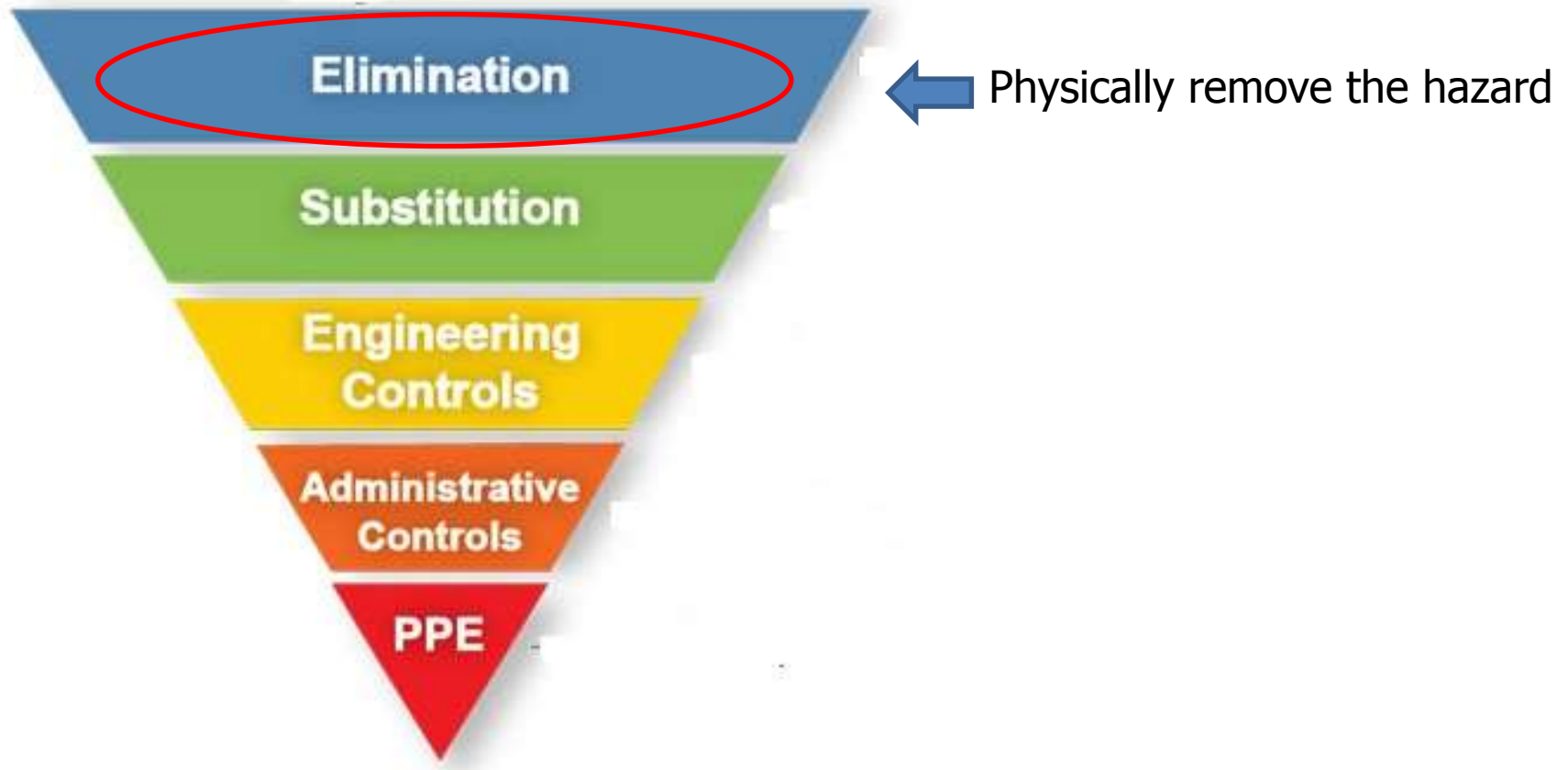
Hierarchy of Controls



INTRODUCTION

- The idea behind this hierarchy is that the control methods at the top of graphic are potentially more *effective* and *protective* than those at the bottom. Following this hierarchy normally leads to the implementation of inherently safer systems, where the risk of illness or injury has been substantially reduced.

RISK CONTROL STEPS/ELIMINATION



RISK CONTROL STEPS/ELIMINATION

- While the complete *elimination of all risk* is *rarely possible*, a risk avoidance strategy is designed to deflect as many threats as possible in order to avoid the costly and disruptive consequences of a damaging event.



RISK CONTROL STEPS/ELIMINATION

- A risk avoidance methodology attempts to minimize vulnerabilities which can pose a threat.
- Risk avoidance and mitigation can be achieved through policy and procedure, training and education and technology implementations.

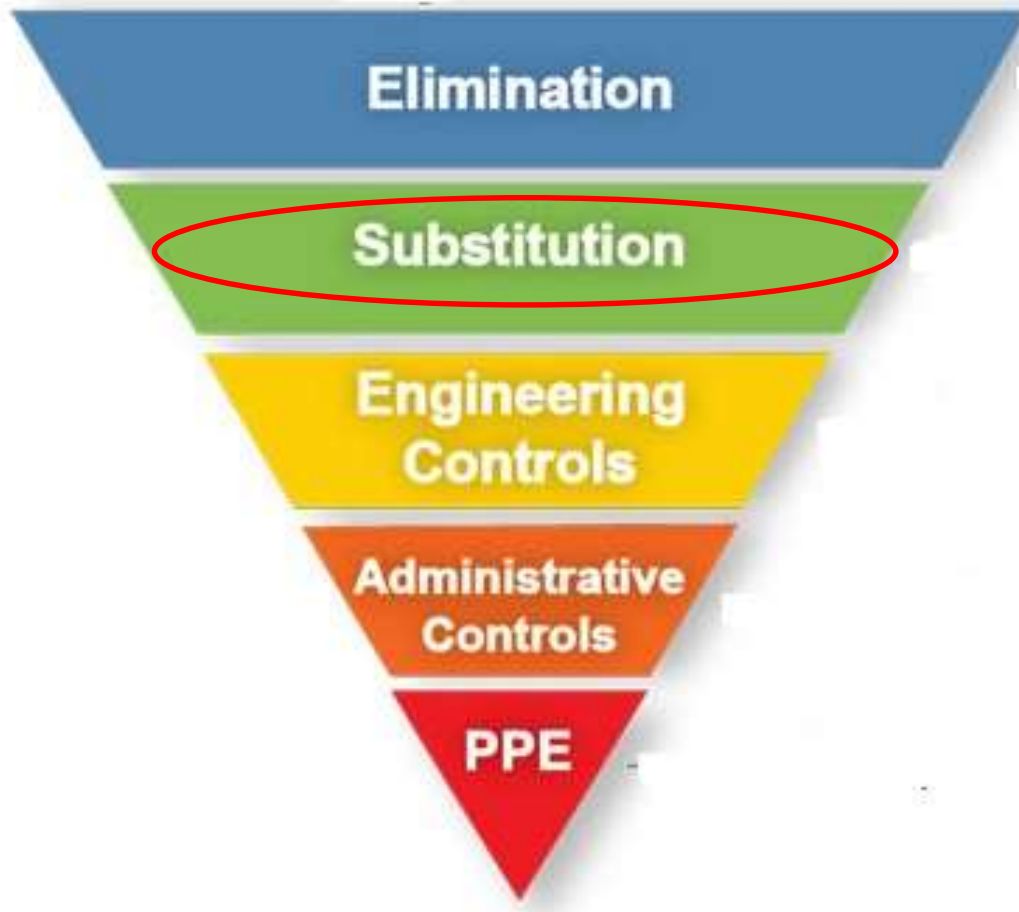


RISK CONTROL STEPS/ELIMINATION

- **Risk Avoidance:** This strategy involves a conscious decision on the part of the organisation to avoid completely a particular risk by discontinuing the operation producing the risk e.g. the replacing (*or substituting*) a hazardous chemical by one with less or no risk potential.



RISK CONTROL STEPS/SUBSTITUTION



Replace the hazard

RISK CONTROL STEPS/SUBSTITUTION

- Like elimination, substitution (*replacement*) is also most effective at reducing hazards, also tends to be the most difficult to implement in an existing process.



RISK CONTROL STEPS/SUBSTITUTION

- If the process is still at the design or development stage, elimination and substitution of hazards may be inexpensive and simple to implement.
- For an existing process, major changes in equipment and procedures may be required to eliminate or substitute for a hazard.

RISK CONTROL STEPS/SUBSTITUTION

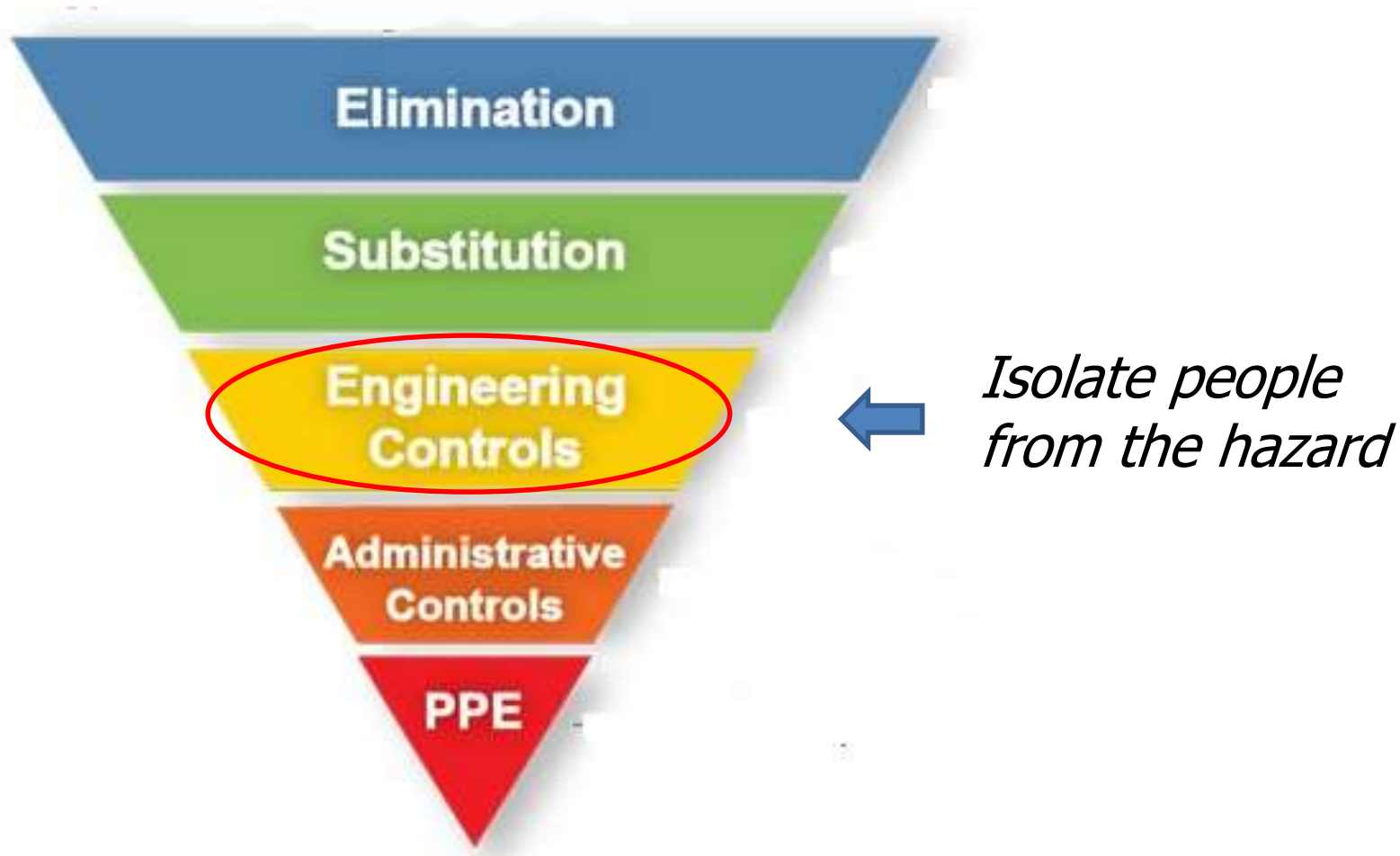
- Substitution of a hazard is the second effective way due to risk control hierarchy pyramide. Substitution of a hazard means that replace one hazard with another hazard with lower harmful level.
- Use of an acyrylic paint instead of lead based paint is given as an example for substitution.



LEAD
BASED
PAINT

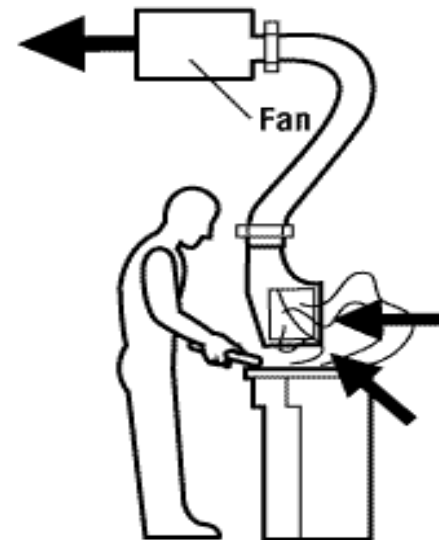


RISK CONTROL STEPS/ ENGINEERING CONTROL



RISK CONTROL STEPS/ ENGINEERING CONTROL

- Engineering controls *protect workers* by *removing* hazardous conditions or by *placing a barrier* between the worker and the hazard.
- For instance, applying *local exhaust ventilation* to capture and remove airborne emissions.



RISK CONTROL STEPS/ ENGINEERING CONTROL

- Implementing a *machine guard* avoids splashing of metal chips to worker.. (into eye!)



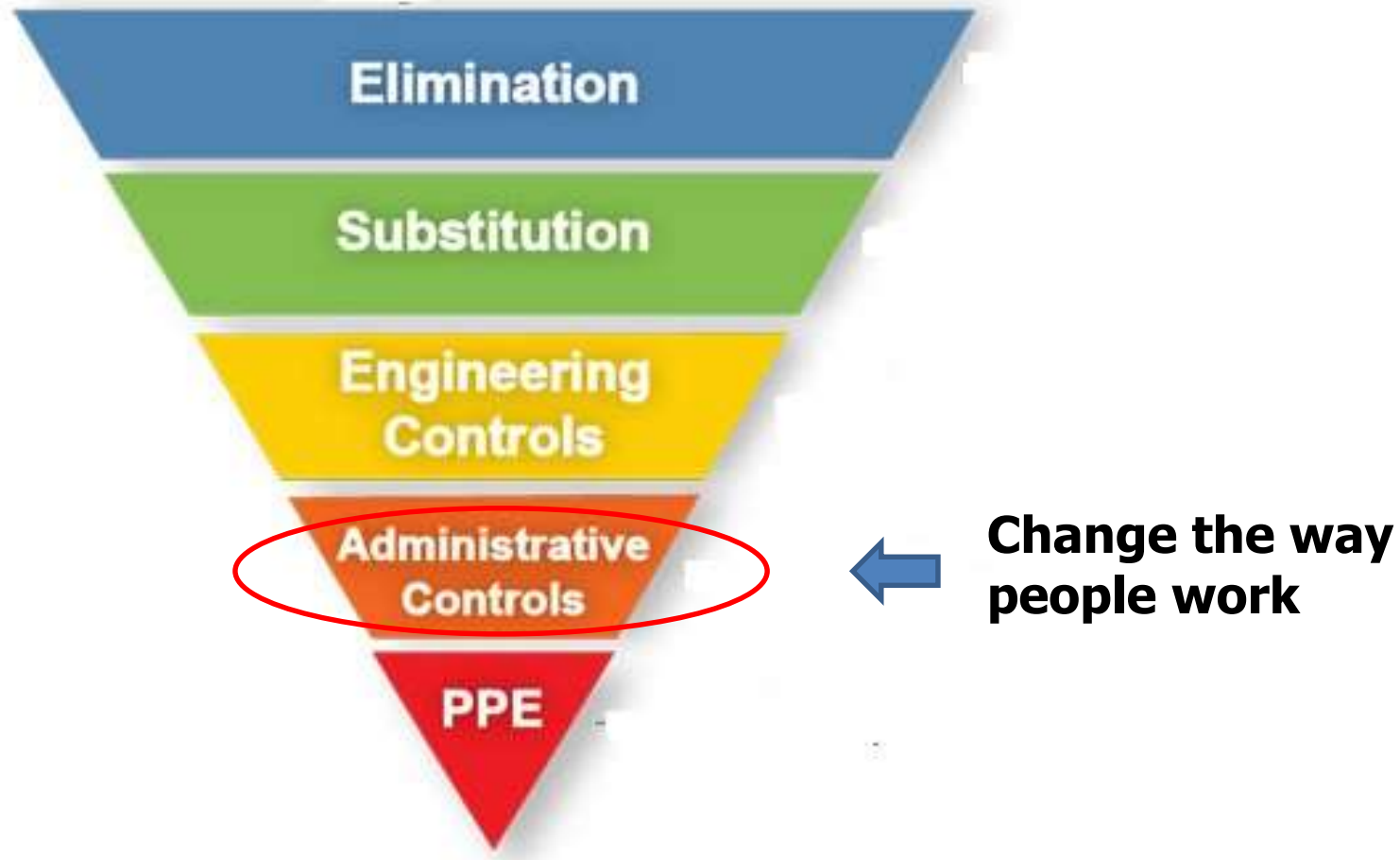
RISK CONTROL STEPS/ ENGINEERING CONTROL

- Well-designed engineering controls can be highly effective in *protecting workers* and will typically be independent of worker interactions.
- They typically do not interfere with worker productivity or personal comfort and make the work easier to perform rather than more difficult.

RISK CONTROL STEPS/ ENGINEERING CONTROL

- The initial cost of engineering controls can be higher than some other control methods, but over the longer term, operating costs are frequently lower, and in some instances, can provide cost savings in other areas of the process.

RISK CONTROL STEPS/ ADMINISTRATIVE CONTROL



RISK CONTROL STEPS/ ADMINISTRATIVE CONTROL

- Administrative controls include *policies* and *procedures* that result in providing proper guidance for *safe work practices* and set the *standard for behavior* within work.



RISK CONTROL STEPS/ ADMINISTRATIVE CONTROL

- Once developed, administrative controls must be implemented and adhered to by ***all personnel working in the field.***



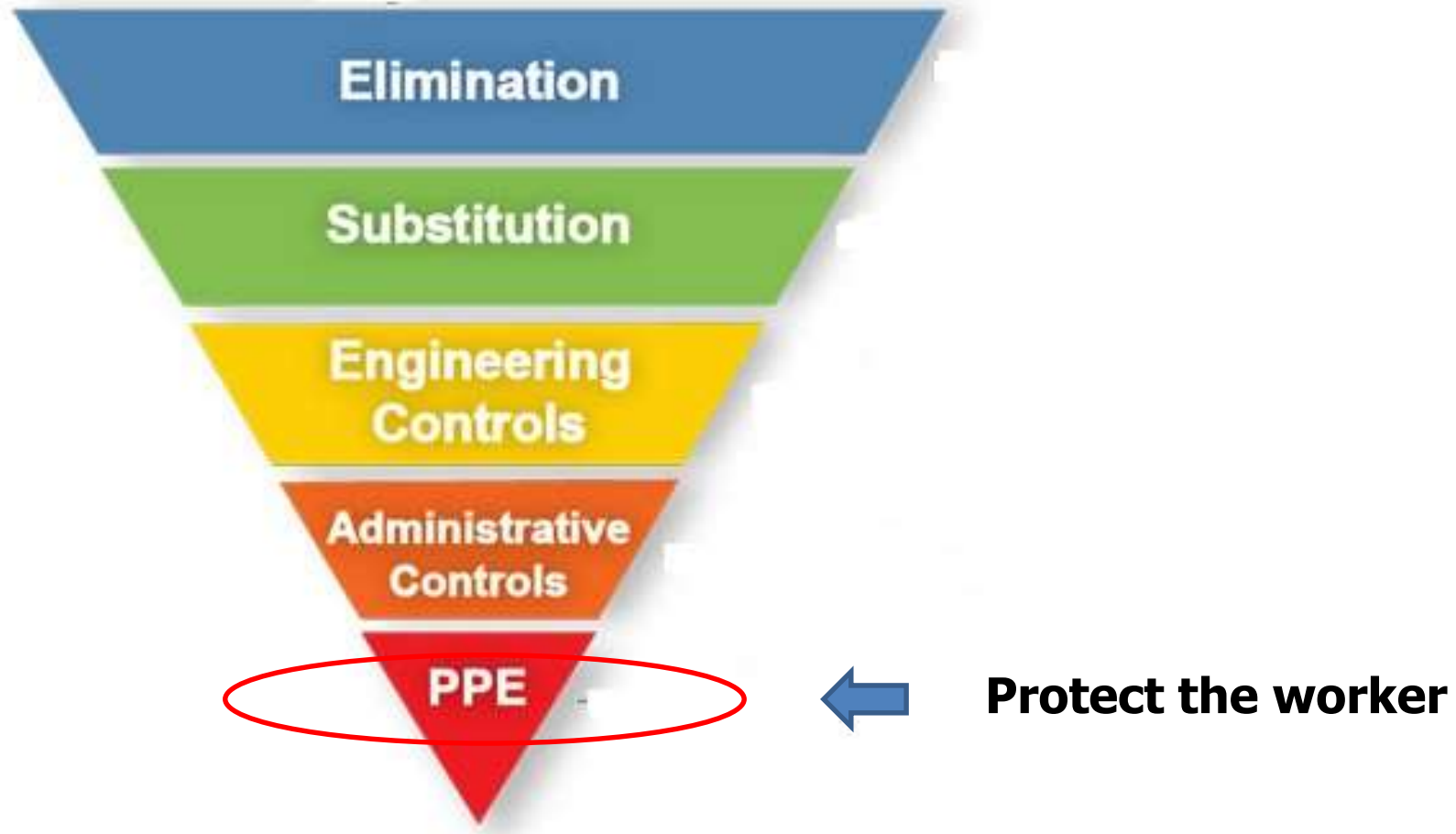
RISK CONTROL STEPS/ ADMINISTRATIVE CONTROL

- Administrative controls are modifications or changes to work practices intended to ***reduce the severity or impact of a hazard.***

Administrative controls include:

- Safe work practices
- Scheduling
- Training
- Preventative health measures
(immunizations, monitoring, periodical exams etc.)

RISK CONTROL STEPS/ PERSONAL PROTECTIVE EQUIPMENT



RISK CONTROL STEPS/ PERSONAL PROTECTIVE EQUIPMENT

- Personal protection is the ***last barrier*** existing between the ***hazard*** and the ***worker*** and the last technology to use when dealing with occupational risks.
- Before proceeding to use Personal Protective Equipment, the ***hazards must be assessed*** and suitable safety measures adopted, using elements of ***collective protection*** that avoid the risk.



RISK CONTROL STEPS/ PERSONAL PROTECTIVE EQUIPMENT

- According to your risk assessment results, if a **worker is under a risk** while he/she is working, the first response is ***to apply collective control*** measures like elimination, substitution etc.
- Collective control measures ***avoid*** the ***occurrence*** of the accident !



RISK CONTROL STEPS/ PERSONAL PROTECTIVE EQUIPMENT

- If collective control measures *can't be applied*, then **personal protection** must be applied.
- Personal control measures *can't avoid* the *occurrence* of the accident but *protect* the worker.



RISK CONTROL STEPS/ PERSONAL PROTECTIVE EQUIPMENT

