



**Put chemical management into practice**  
**UNDERSTANDING THE SITUATION**

# Understanding the situation



US railway gauge



4 foot 8.5 inch or  
1.4351 meters

**Why?**

# Understanding the situation

US railway gauge = 4 foot 8.5 inch or 1.4351 meters

- WHY** Because railways in US were built with the same gauge as the ones in UK.
- WHY** Because the same people, who built the railways also built the trams in UK.
- WHY** Because they used the same lathe and tools for trams as for horse carriage with the same wheel stand
- WHY** Because wheel stands had to be adjusted to existing rutes in the long-distance roads in UK
- WHY** The rutes were created by Roman chariots which had this wheelstand because to make space for horses towing the Roman chariots.



# Understanding the situation

But what could that have to do with the space shuttle?



Solid rocket booster (SRB) for the Space Shuttle are produced by M/s Thiokol in Utah. The engineers wanted bigger SRB, but could not.

Because the SRB had to be transported by railroad from the plant to the NASA launch base.

Railway passes through railway tunnel.

Tunnel size is a little larger than rail gauge

WHY?



**Answer:** Important feature of one of advance means of transport has therefore its root in the size of Roman horses' ass!



# Understanding the situation



Consider the following situation in the factory

What action do you suggest?

You see a worker handling a certain hazardous chemical without using personal protective equipment PPE. There is a high chance that the worker may suffer from immediate health problems.

# Understanding the situation

## Addressing the roots causes

Consider the following situation in the factory

**What action do you suggest?**

But did you ask yourself why did the worker not use any PPE?

You see a worker handling a certain hazardous chemical without using personal protective equipment PPE. There is a high chance that the worker may suffer from immediate health problems.

The immediate solution may be to provide PPE.



# Understanding the situation

## Group exercise



A worker is handling a certain hazardous chemical without using personal protective equipment PPE

Why?



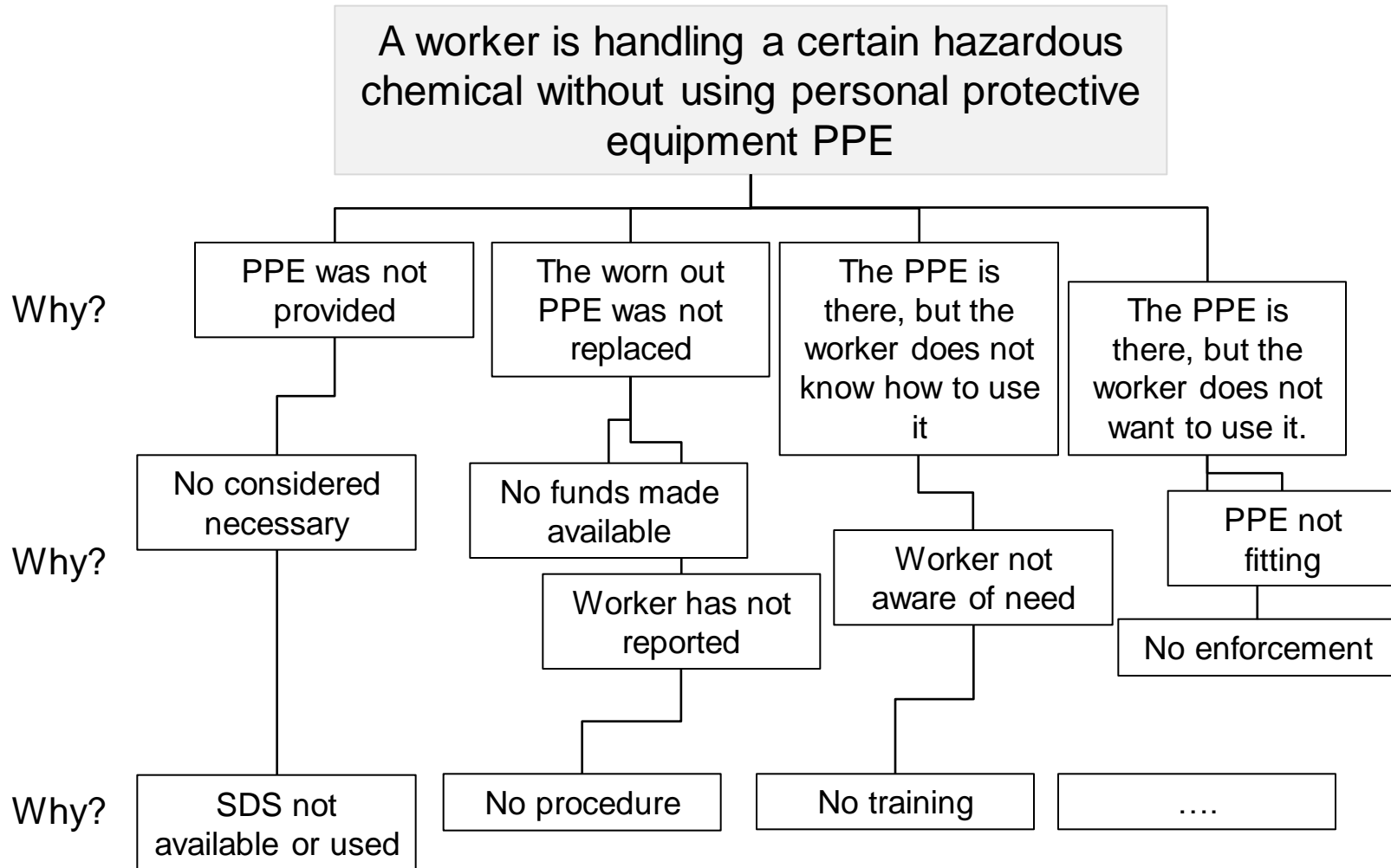
### Your task in groups:

- Look beyond the situation and try identifying the possible root causes why the worker is not wearing PPE.
- Visualise your finding and present to the other groups

Time: 30 minutes

# Understanding the situation

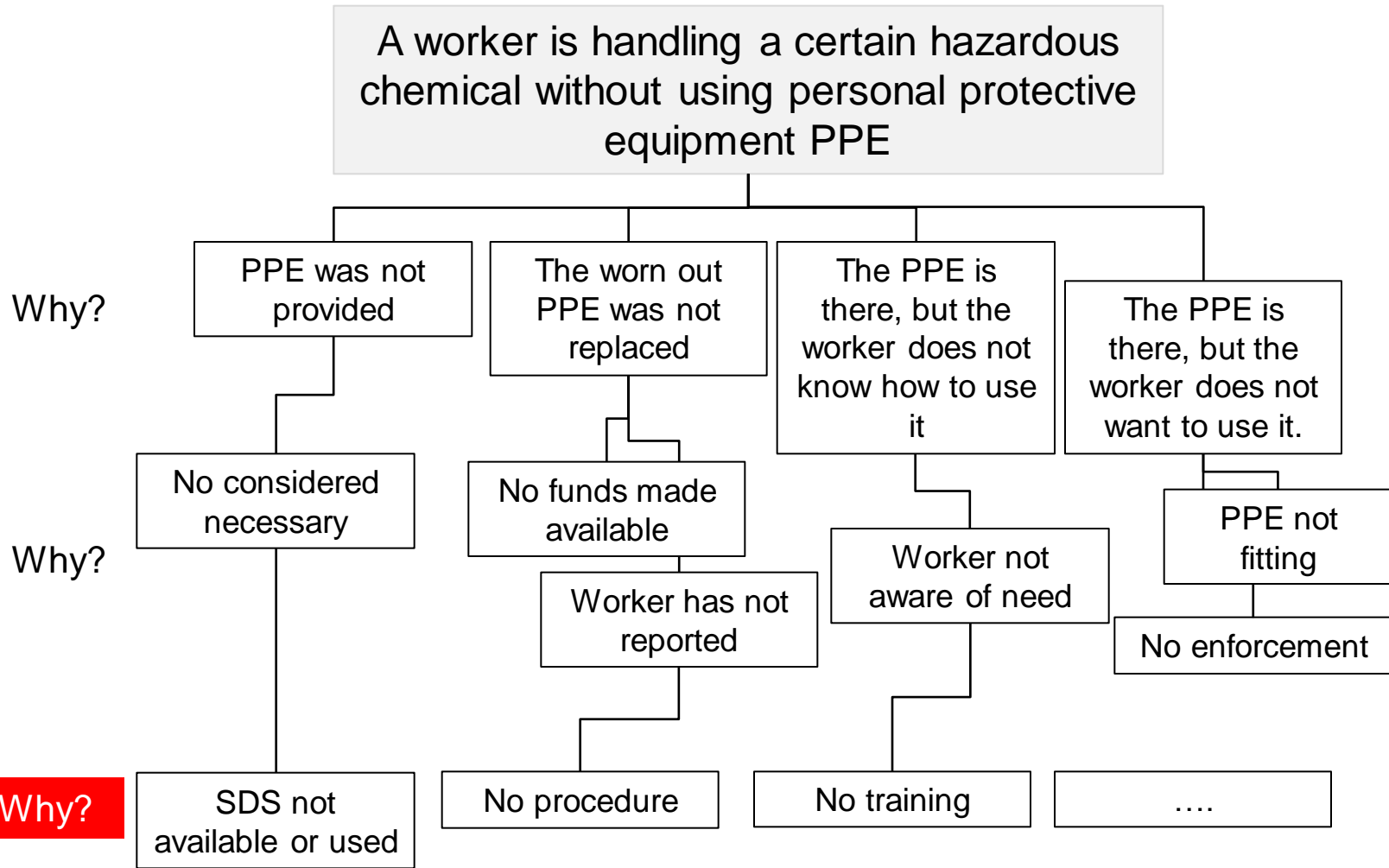
## Addressing the roots causes





# Understanding the situation

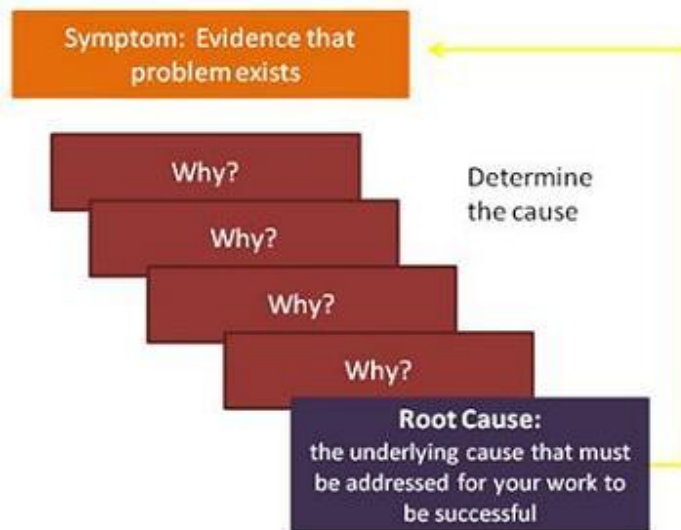
## Addressing the roots causes



Properly analyzing the situation will allow you to address the real causes in an effective and sustainable way.

# Understanding the situation

## Addressing the roots causes

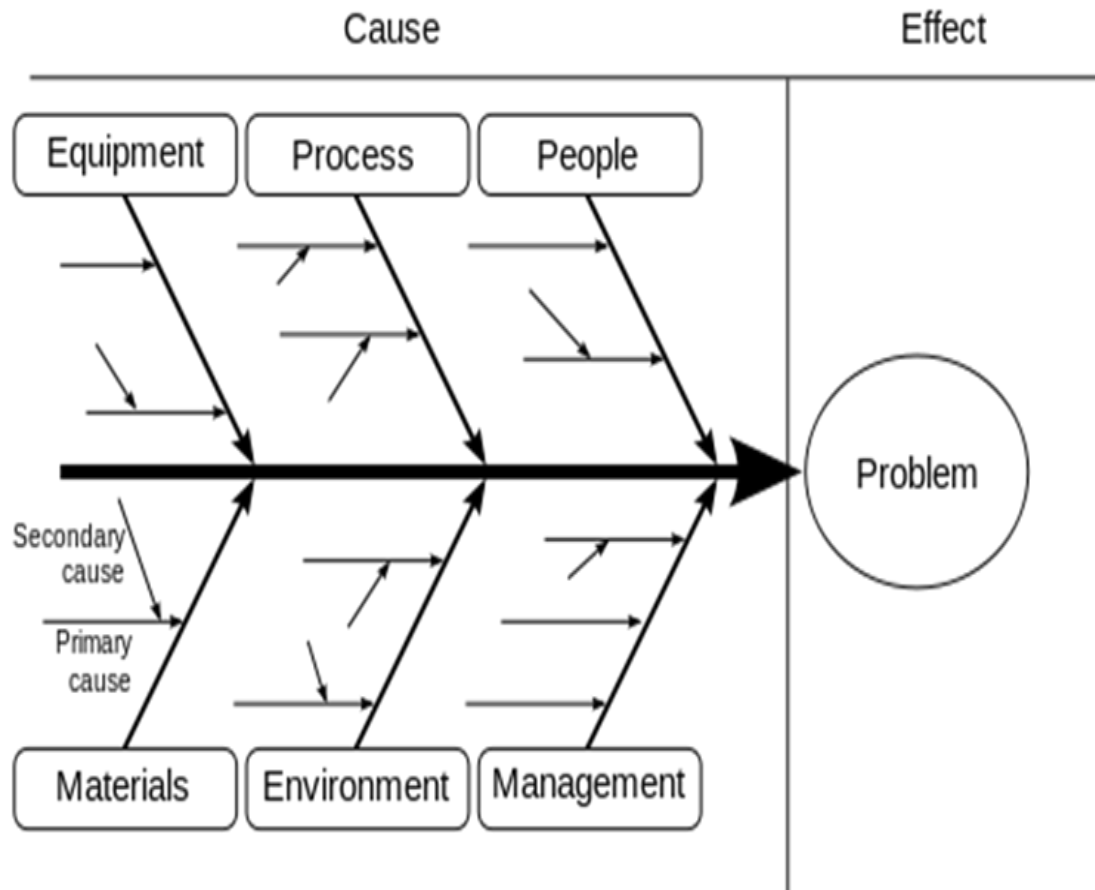


## Examples of common tools for root cause analysis

- Five Whys Analysis
- Failure Mode and Effects Analysis (FMEA)
- Fault Tree Analysis
- Fishbone or Ishikawa or Cause-and-Effect Diagrams

# Understanding the situation

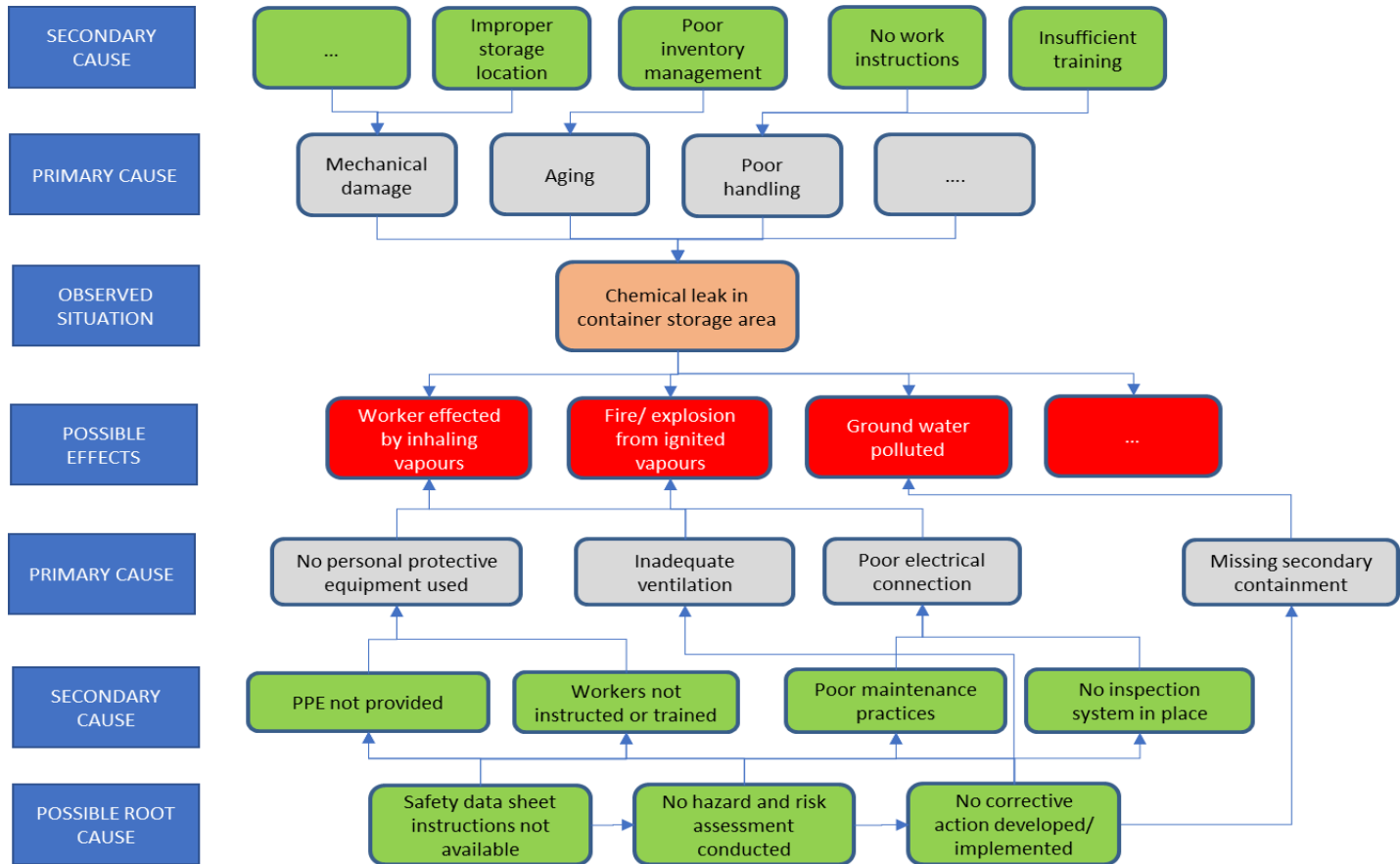
Addressing the roots causes



**Fishbone or Ishikawa diagram**

# Understanding the situation

## Addressing the roots causes



# Understanding the situation

Addressing the roots causes

**Next step**

**Moving towards  
action**

