Accident/Incident Investigation and Root Cause Identification

excellence

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Purpose of Incident Investigation

To fix blame or prevent the reoccurrence?

Prevent the reoccurrence

Prevent the reoccurrence

Prevent the reoccurrence!

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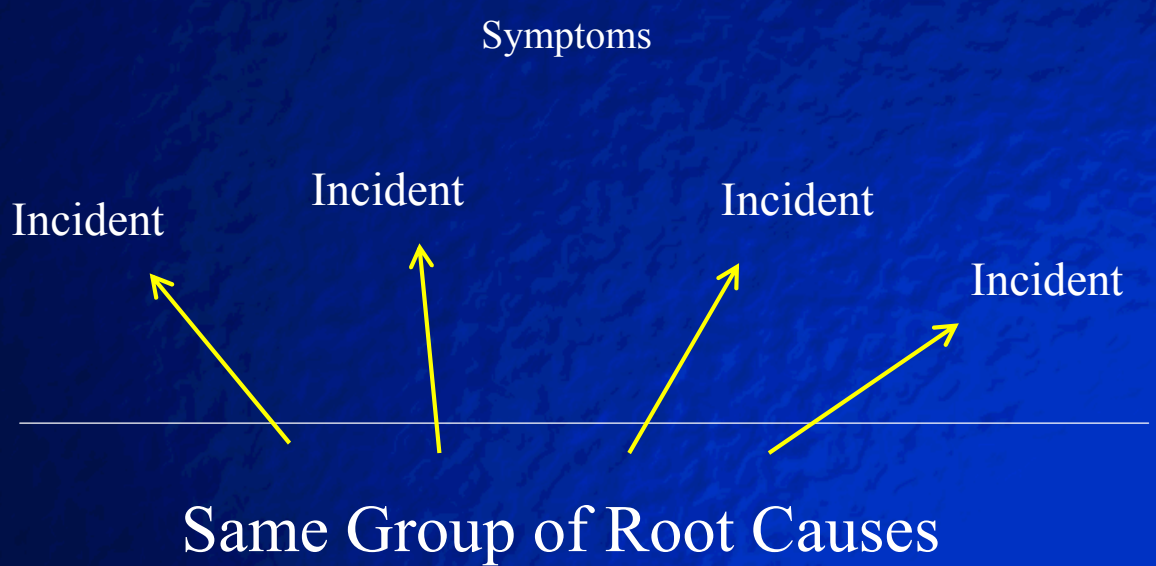
Root Causes will Resurface in Additional Incidents if left Unaddressed!



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Definition of Root Cause

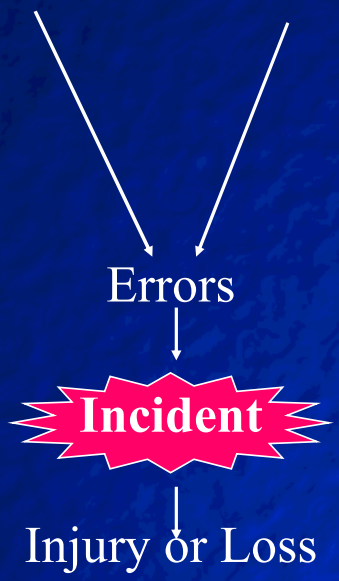
The most basic causes or reasons for the event

(that is within our control to prevent/fix)

Accident Causation

Things People Do

Decisions
Choices
Risk Taking
Abilities
Attitudes
Focus
…etc



Things The System Does

Physical Conditions
Production Pressure
Policies
Procedures
Training
Authority
…etc.

Accident Pyramid

Heinrich:

1 Major Injury

29 Minor Injuries

300 No-Injury Events

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The Game of Chances

1 Fatality

10 Serious Injuries

100 Minor Injuries

1,000 Near Miss Incidents

10,000 At Risk Behaviors

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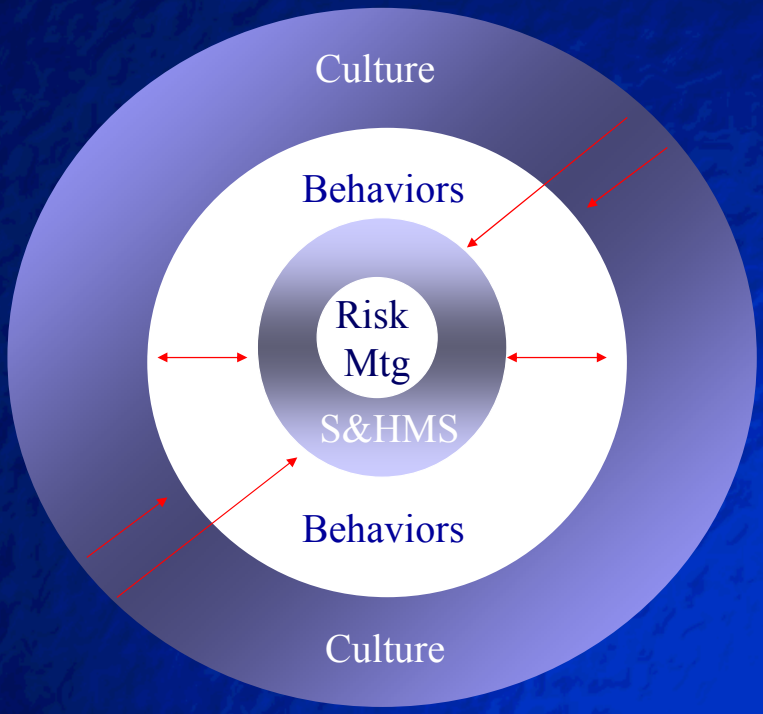
Exercise # 1 - M&M Game

M&M Score Sheet

✧ Red Peanut:	Fatality
✧ Green:	Lost Time Accident
✧ Blue:	Recordable Incident
✧ Yellow:	Near Miss Incident
✧ Orange, Red & Brown:	At Risk Behavior

Culture - Behavior - Management Systems



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Culture is all encompassing

- The atmosphere that sets the way we really do things around here
- Socializes newcomers
- Defines the organization's values

Comprised of:

Beliefs

Assumptions

Group Norms

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Cultural Barriers
Fear
Distrust
Us vs Them
Lack of Knowledge
Lack of Consistency
S&H Performance?
Lack of Systems
Poor Leadership
Past Betrayals
Negative & Limiting Beliefs
Lack of Responsibility
Poor Communication
Obsolete or Lack of SOP's
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Cultural Strengths
Trust & Respect
We: Win-Win
Contributing
Consistency
Knowledge
S&H Excellence
Positive Leadership
Systems & Continuous Improvement
Letting go of Past
Supportive & Empowering Beliefs
Personally Responsibility
Communication
Clear SOP's
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Interdependence of Culture-Behavior & Attitudes

What is your cycle driving? (Is it Positive or Negative?)

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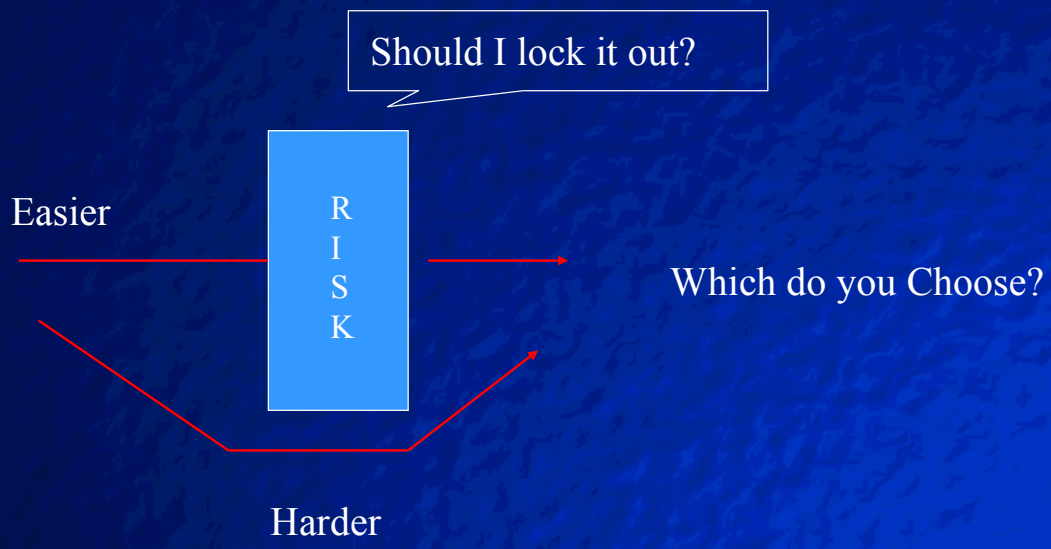
Barriers to Safe Performance - Ease



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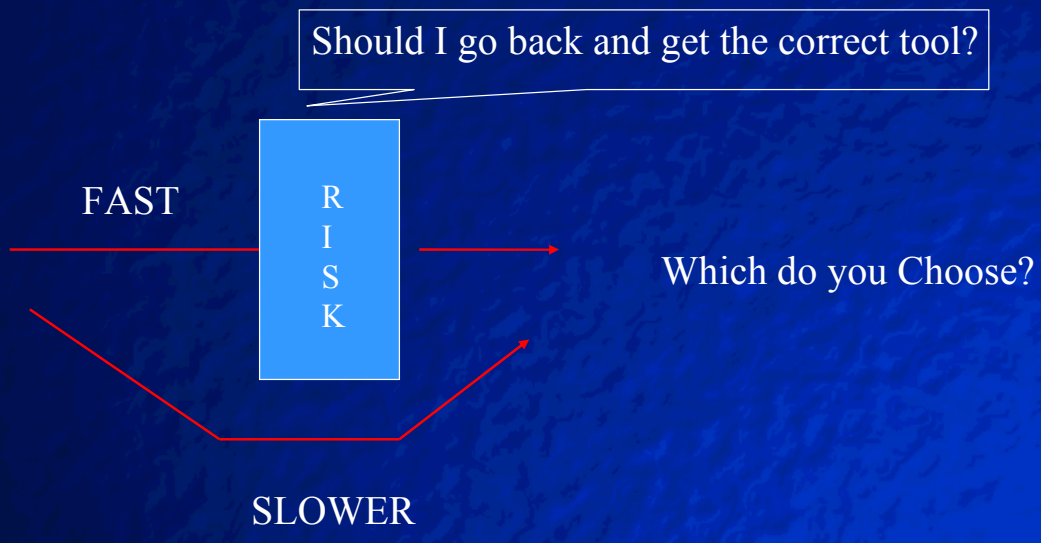
Barriers to Safe Performance - Speed



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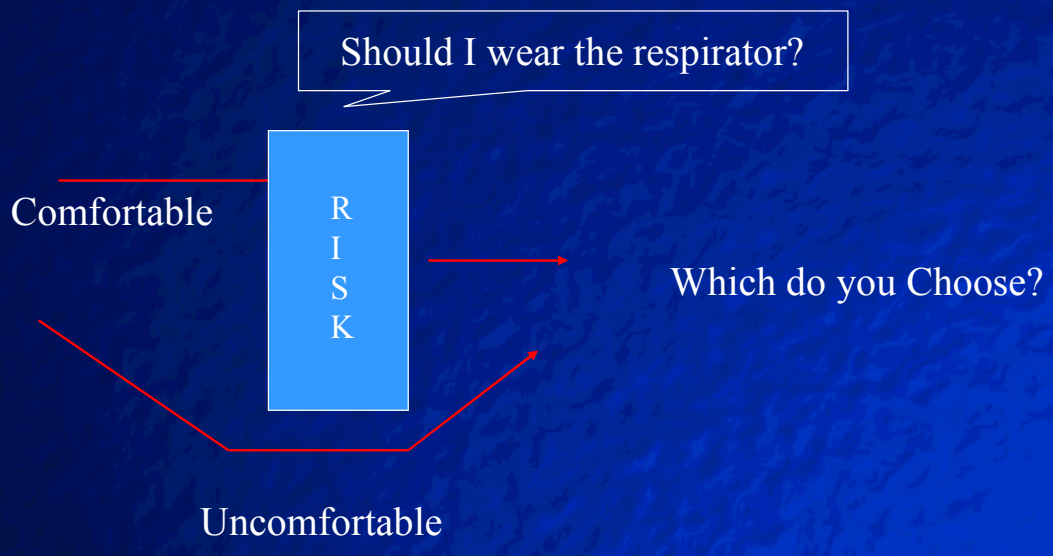
Barriers to Safe Performance - Comfort



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Risk Perception is a Barrier to Safe Performance

The problem is that it is part of our nature to accept these types of risks. All too often what we ask people to do for safety goes against human nature!

The exception is when our perception of the risk is high.

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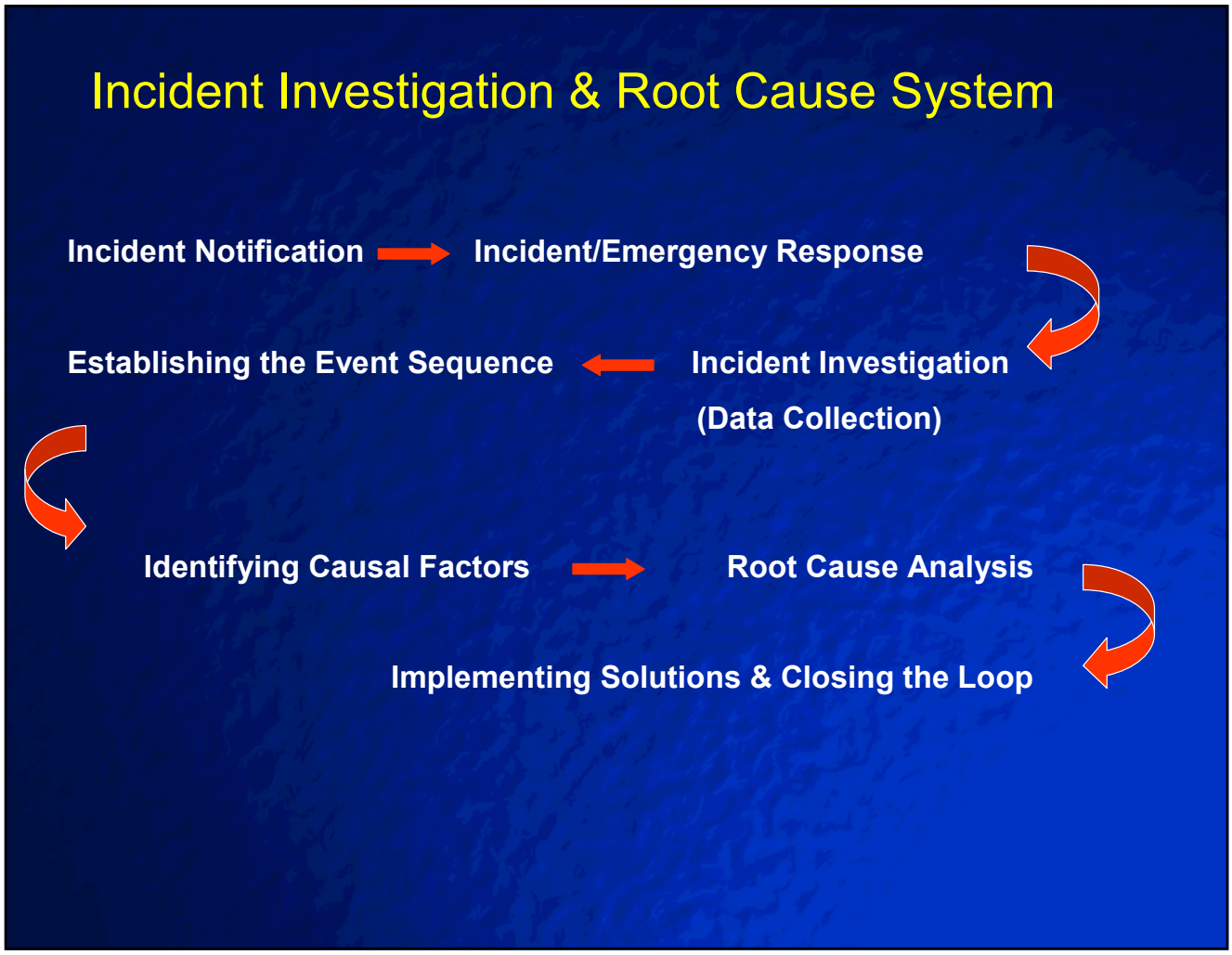
Incident Investigation & Root Cause System
Incident Notification
Incident/Emergency Response
Establishing the Event Sequence
Incident Investigation
(Data Collection)
Identifying Causal Factors
Root Cause Analysis
Implementing Solutions & Closing the Loop

Gathering Data

The goal is to obtain verifiable & objective data.

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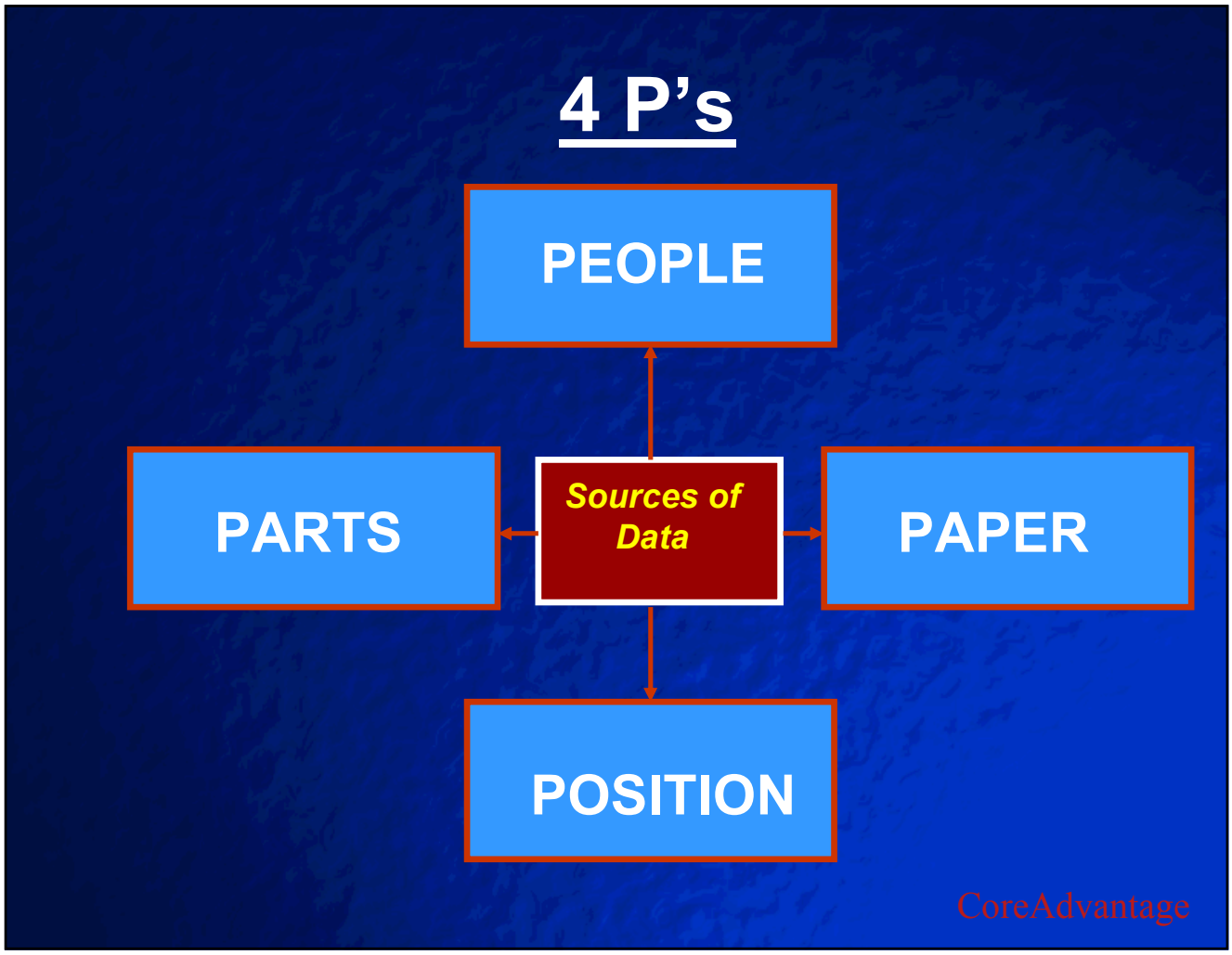
4 P's
PEOPLE
PARTS
Sources of Data
PAPER
POSITION
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People (all of us) Are Poor Observers
& we are Typically Biased

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What do you see?

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Describe Picture

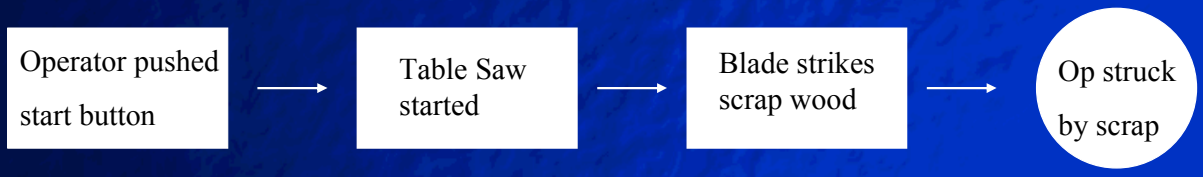
Event Sequence

Event Chain

Event & Causal Factor Charting

Events – These are ***action steps*** that occurred (verb & a subject), e.g., "*Operator pushed start button*". Placed in rectangle

Incident – Description of the incident being investigated. Placed in circle.



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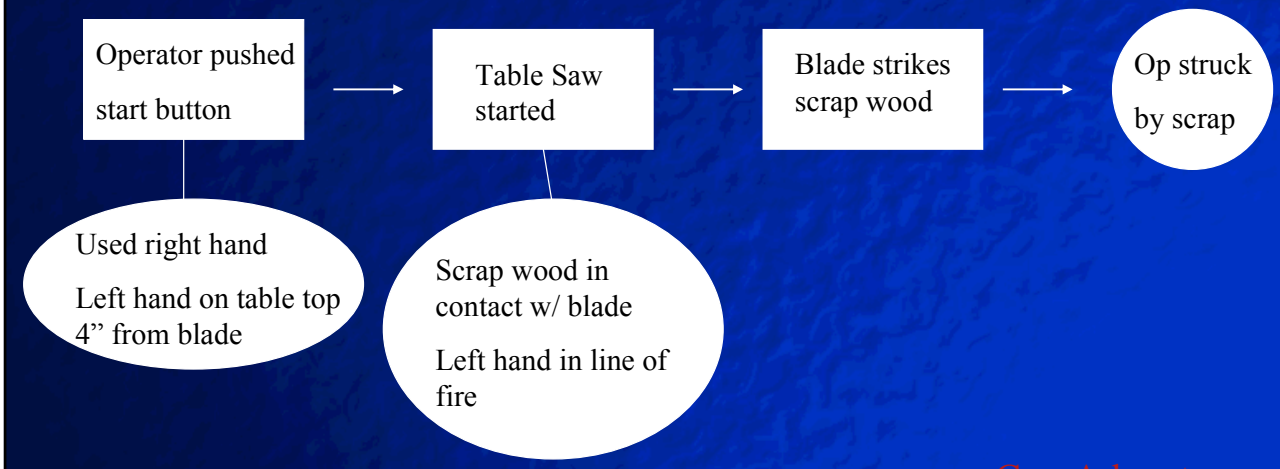
Event & Causal Factor Charting

Conditions – Descriptors that provide amplifying information about the event step. Place in Ovals, e.g., *"operator had never operated equipment before"*.



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Example

E&CF Chart

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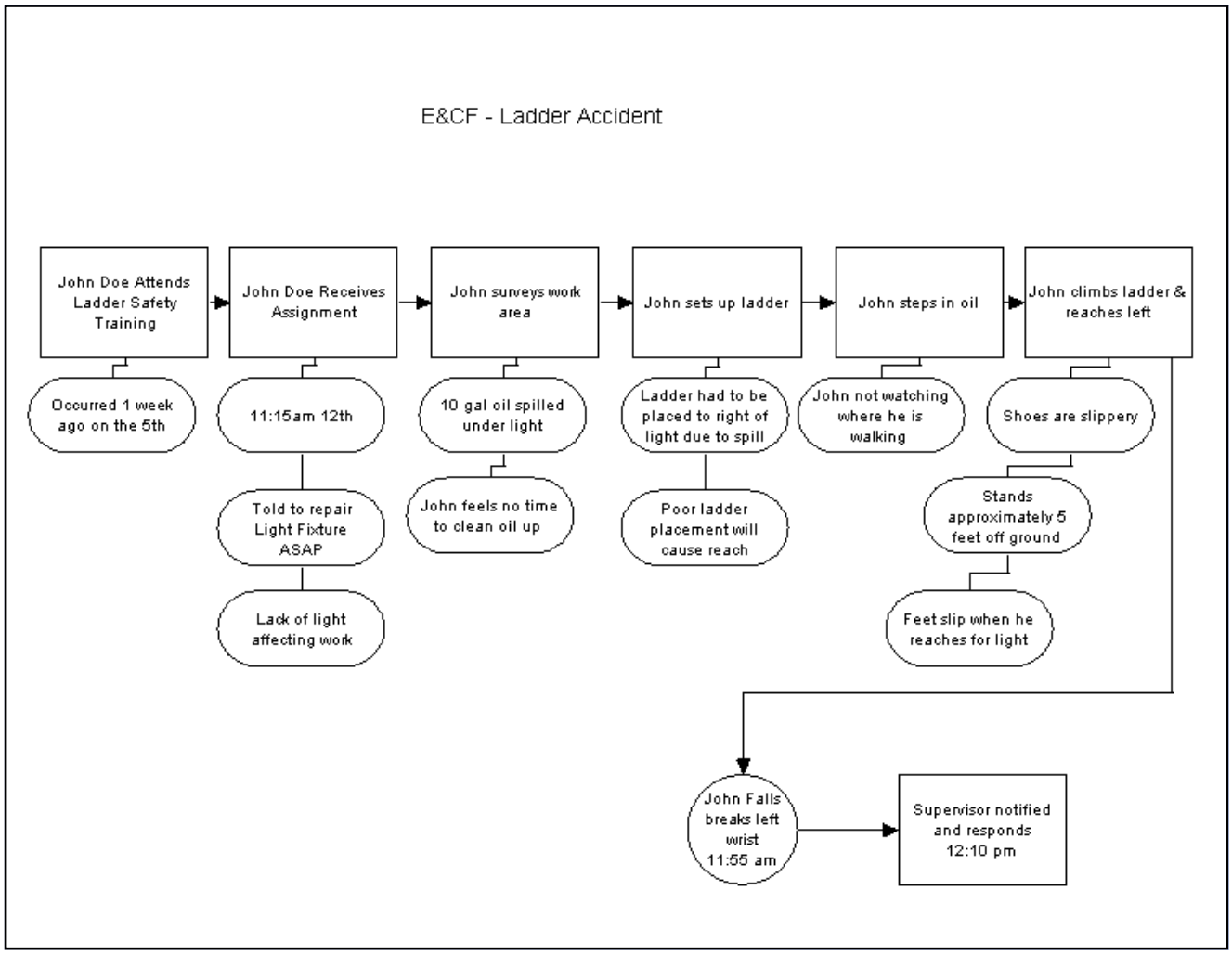
E&CF - Ladder Accident
John Doe Attends Ladder Safety Training
John Doe Receives Assignment
John surveys work area
John sets up ladder
John steps in oil
John climbs ladder & reaches left
Occurred 1 week ago on the 5th
11:15am 12th
10 gal oil spilled under light
Ladder had to be placed to right of light due to spill
John not watching where he is walking
Shoes are slippery
Told to repair Light Fixture ASAP
John feels no time to clean oil up
Poor ladder placement will cause reach
Stands approximately 5 feet off ground
Lack of light affecting work
Feet slip when he reaches for light
John Falls breaks left wrist 11:55 am
Supervisor notified and responds 12:10 pm

Identifying Causal Factors

- Causal Factors are conditions that could have prevented the incident
- Ask the question: “if this condition was controlled or did not occur would the incident have occurred?”

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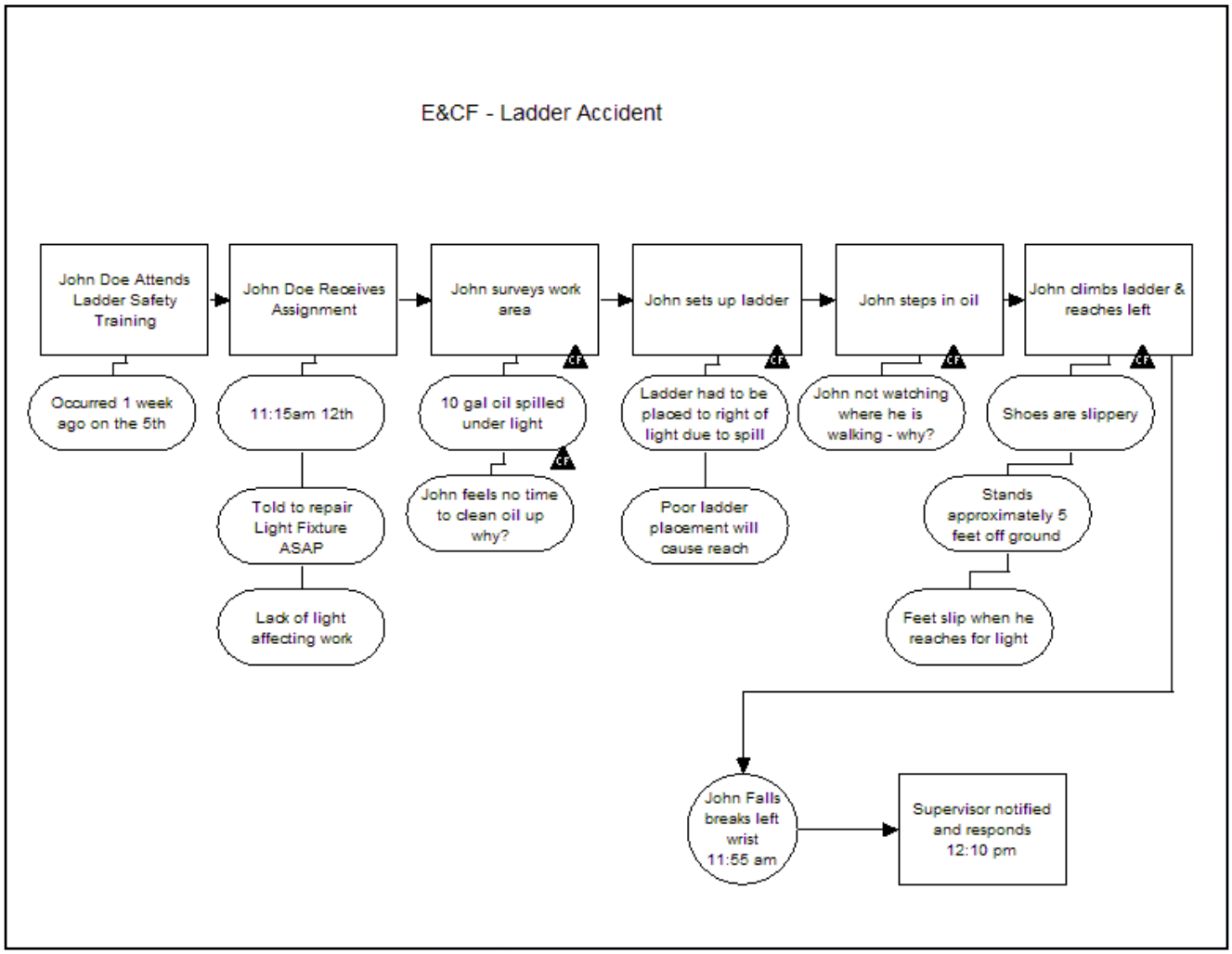
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11:15am 12th
10 gal oil spilled under light
Ladder had to be placed to right of light due to spill
John not watching where he is walking - why?
Shoes are slippery
Told to repair Light Fixture ASAP
John feels no time to clean oil up why?
Poor ladder placement will cause reach
Stands approximately 5 feet off ground
Lack of light affecting work
Feet slip when he reaches for light
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Identifying Root Causes

- Root Cause is the most basic source or origin of the Causal Factors
- Root Causes are the reasons “why” the Causal Factors existed.

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Root Cause

- Five Why's
- Cause & Effects Charts
- Behavioral Analysis

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Five Why's

- Ask "Why" at least Five times for each of the Causal Factors … Why? But Why…
- The Answer at each Level will Drive you Down Closer to a Root Cause

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Cause & Effects Chart

Structured way of charting 5 Why's

Start at causal factor ask "why" and/or "what was this caused by"

Each level may result in one answer or multiple answers

For each answer continue to ask why until there is no longer a useful answer.

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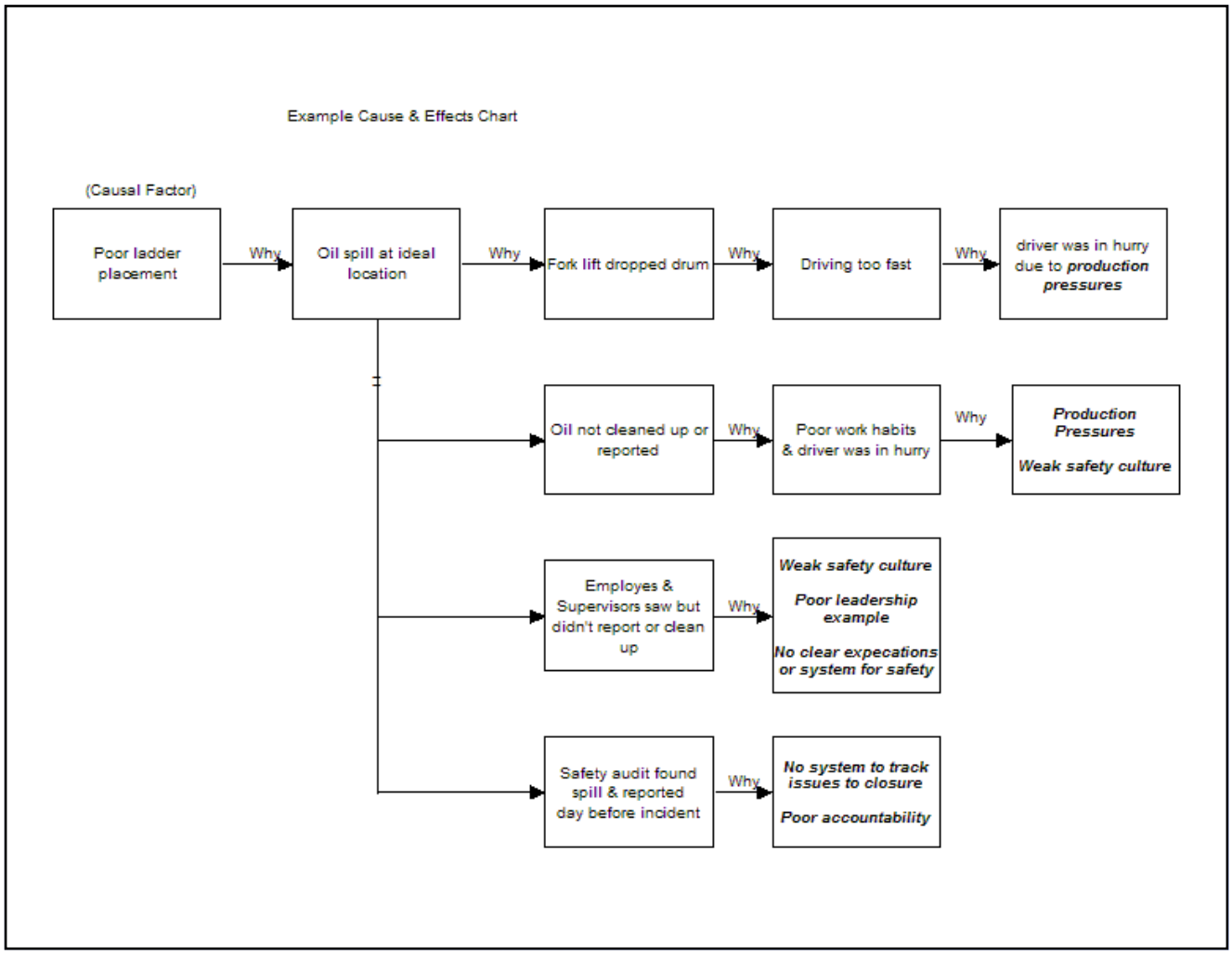
Example Cause & Effects Chart
(Causal Factor)
Poor ladder placement
Why
Oil spill at ideal location
Why
Fork lift dropped drum
Why
Driving too fast
Why
driver was in hurry due to production pressures
Oil not cleaned up or reported
Why
Poor work habits & driver was in hurry
Why
Production Pressures
Weak safety culture
Employes & Supervisors saw but didn't report or clean up
Why
Weak safety culture
Poor leadership example
No clear expecations or system for safety
Safety audit found spill & reported day before incident
Why
No system to track issues to closure
Poor accountability

Example

Behavioral Analysis

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Developing Interventions

Each Causal Factor and Root Cause must have a intervention identified that will fix the issue

Identify system failures – fix the system not the symptom. Link back to failures in the safety management system.

Generalize the lessons learned - Ask where else might these issues cause a problem?

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Pulling it all Together

- Don’t blame
- Seek to learn what happened
- If you stop at the employee you haven’t gone far enough
- Supervisors & managers need to look whether they contributed to the incident
- Go beyond blame!

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