(Intro to)

Root Cause Analysis

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About Me

- Safety story
- Current work
- Distinctives
- Family
- Hobbies
- My why

Overview

- Have better understanding of RCA and how to use it
- 20+ minutes, not week-long workshop

- Incident investigation basics
- Root cause analysis
- RCA methods
- Common traps

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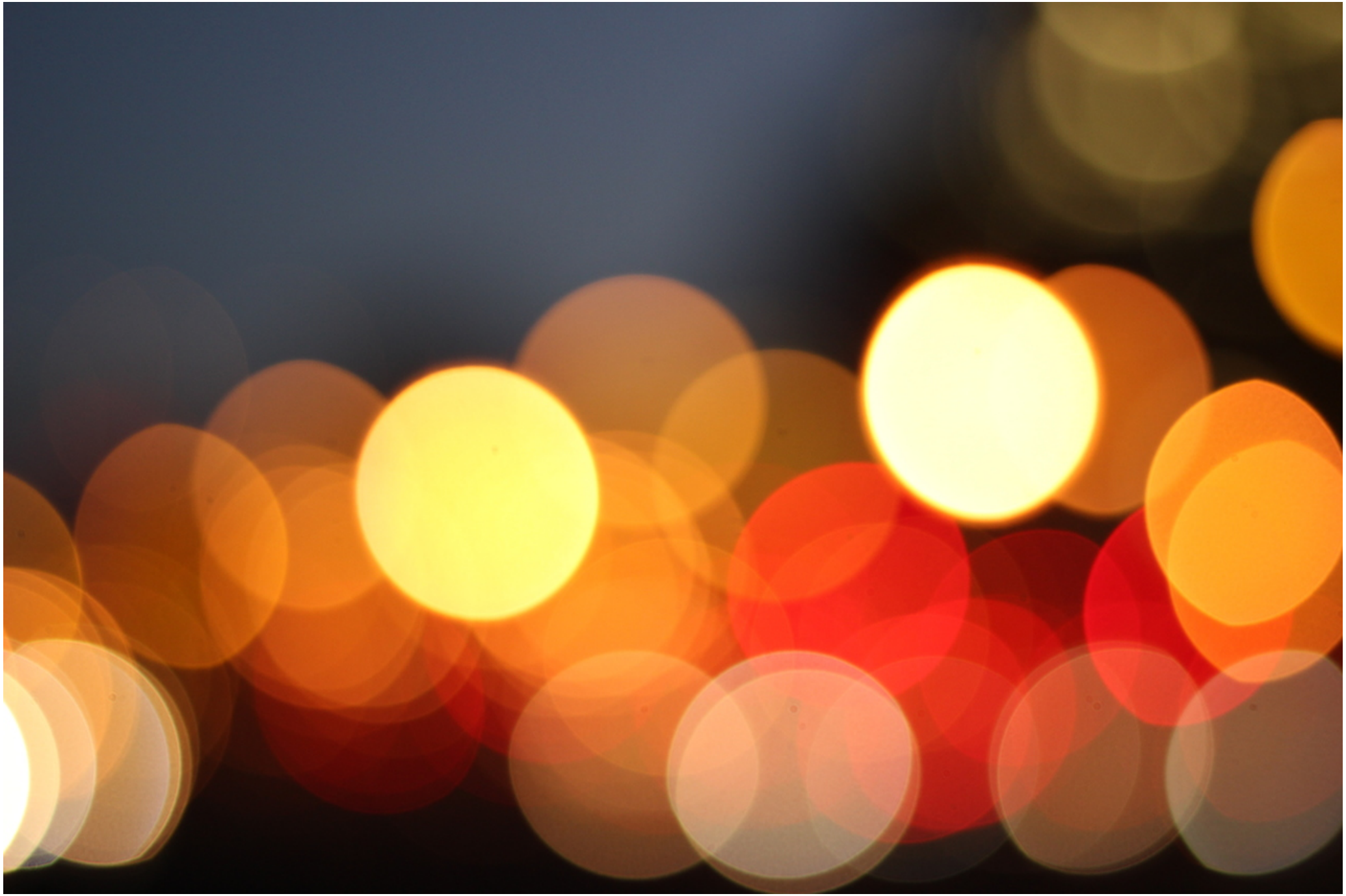
State	Title
NC	Sanitation worker struck by backing refuse truck - North Carolina.
ID	Logging processor lost traction and rolled down hillside fatally injuring operator - Idaho.
OH	City electric maintenance worker electrocuted while installing lines for security cameras - Ohio.
TN	Laborer, pipefitter, and utility foreman crushed by falling block wall - Tennessee.
WV	Two tower climbers fatally injured when a cellular tower collapsed while performing tower upgrades - West Virginia.
SC	Officer dies in motor vehicle crash at an intersection while responding to a shots fired call - South Carolina.
NC	Feller struck by dead locust tree while felling adjacent tree - North Carolina.
WV	Oil and gas delivery driver crushed between a dozer and a semi-truck while connecting towline - West Virginia.
NC	Feller struck by tree limb while felling adjacent tree - North Carolina.
KY	Trooper crashes on roadway while responding to reckless driver complaint - Kentucky.
TN	Officer struck by a motorhome while establishing temporary traffic control on interstate - Tennessee.

Incident Investigation Steps

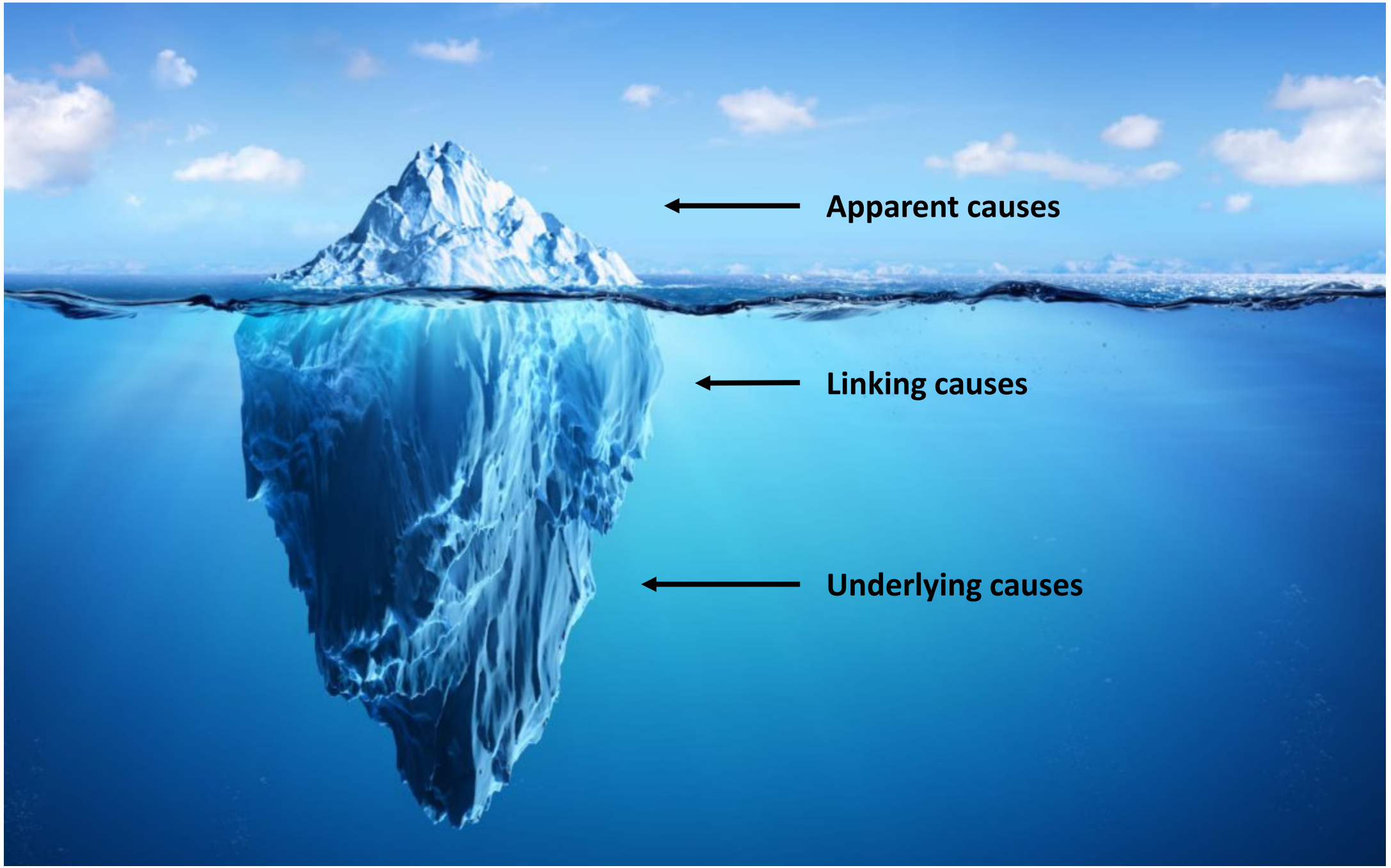
★Incident occurs

- Report incident?
- Investigate now?
- 1) Start investigation
- 2) Collect info
- 3) Interpret info
- 4) **Find root causes**
- 5) Make recommendations
- 6) Close out investigation



Causes

- Apparent causes (causal factors)
  - Performance gaps (deviation from desired performance)
  - Human error and/or equipment failure
- Underlying (root) causes
  - Task → process → systems → culture
- Multiple apparent causes per incident
- At least one root cause per apparent cause
- How deep to go?


Apparent causes
Linking causes
Underlying causes

Causal Analysis

- Informal vs formal
- ACA vs RCA
- Basic problem-solving vs structured analysis
  - E.g., only fix defective part vs correct maint. mgmt. system

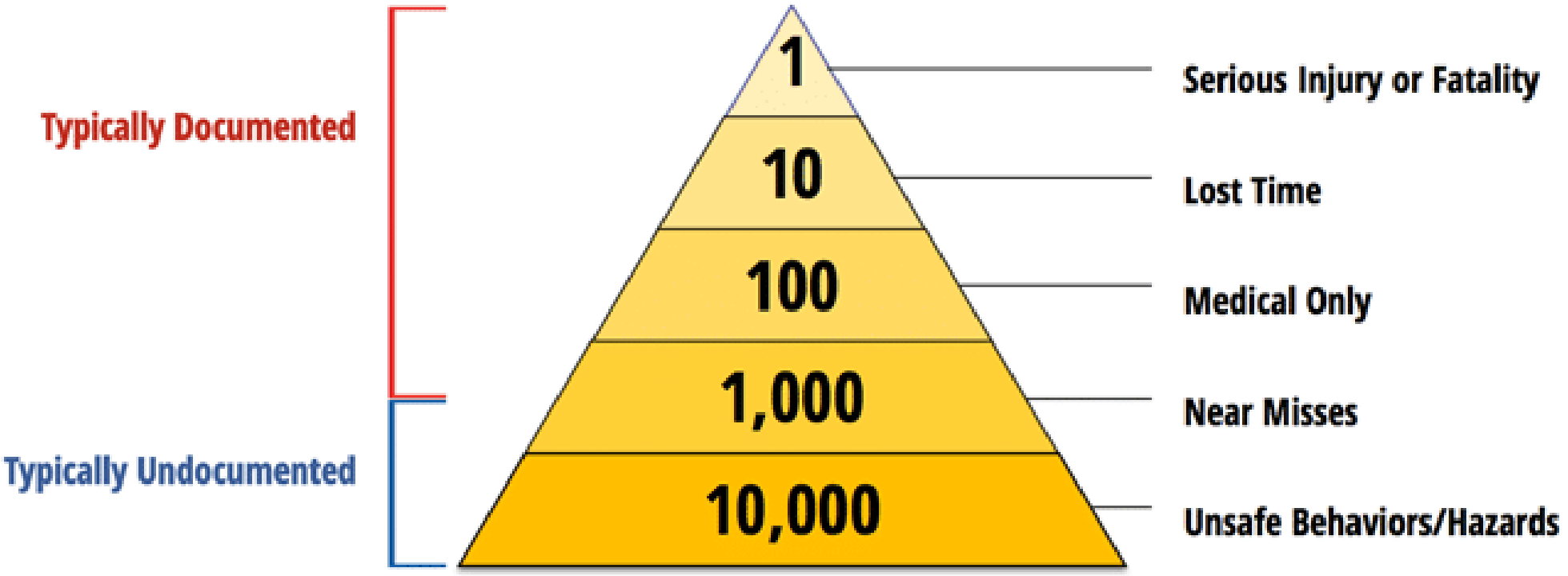
Example (large)

- Broken arm
- Fell forward onto concrete floor
- Tripped over cord in walkway
- Hazard identification & abatement ineffective
- Supervision/enforcement lacking
- Limited to no training & communication
- Policies and standards do not specify

Example (small)

- No injury (near-miss)
- Stumbled and nearly fell
- Tripped over cord in walkway
- ~~Hazard identification & abatement ineffective~~
- ~~Supervision/enforcement lacking~~
- ~~Limited to no training & communication~~
- ~~Policies and standards do not specify~~

Heinrich’s pyramid/triangle



What is RCA?

- Root cause = fundamental, underlying cause
- Reactive, not proactive
- RCA = formal, systematic process for ID'ing root causes
- Digs deeper than causal (contributing) factors
  - More than just putting out fires
- Systems based approach
  - Management
  - Employee
  - Equipment
  - Environment

Why RCA?

- Practical way to add value
- Increase learning
- Permanent solutions
- Prevent/reduce risk/harm
- Save resources (time & money)

Treating Symptom vs Cause

Goal

- All about finding the [root] causes…
  - What? → How? → Why? Why? Why?
- …so that proper corrective actions are made…
- …to prevent future occurrences.

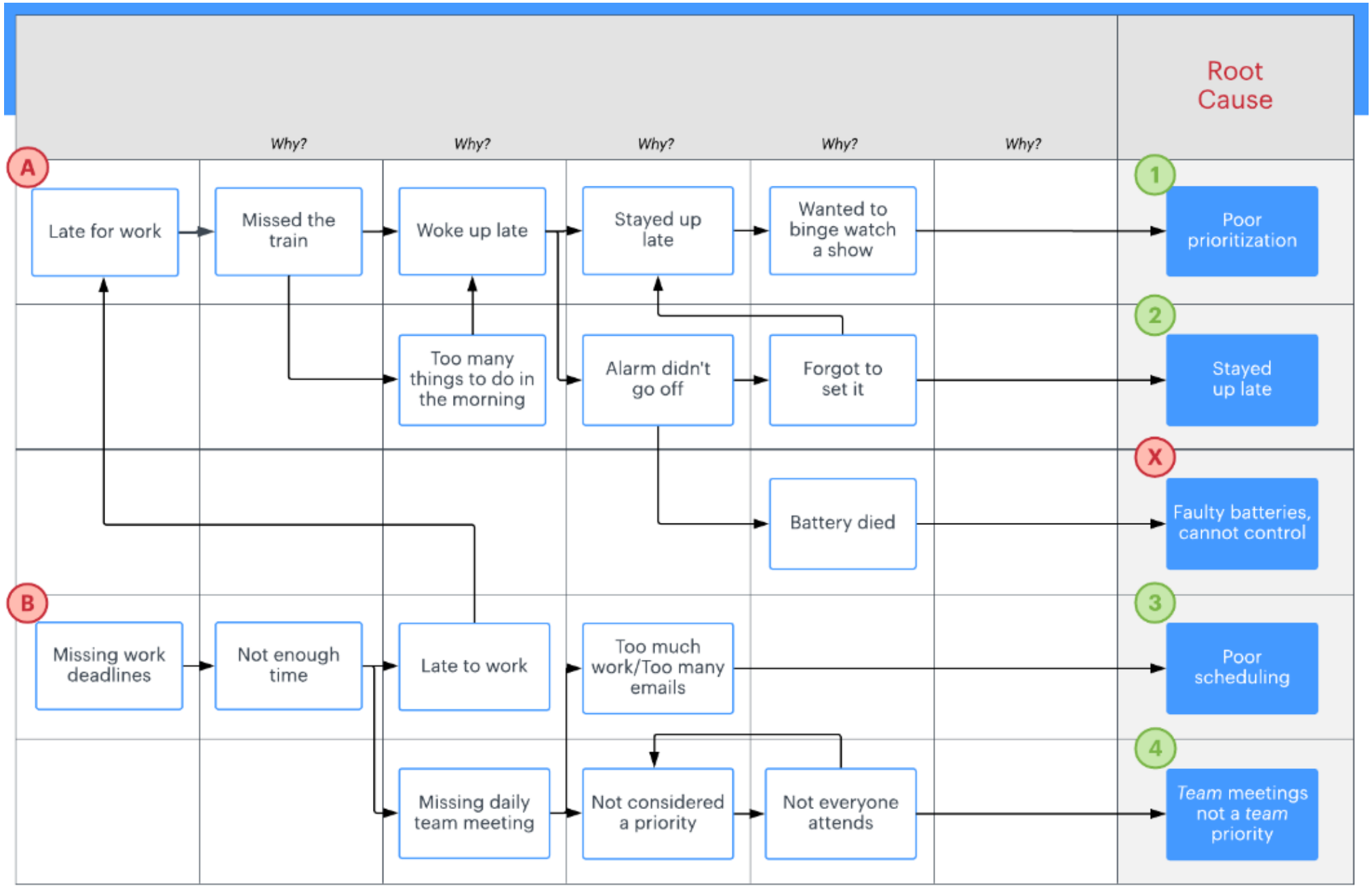
When to apply RCA?

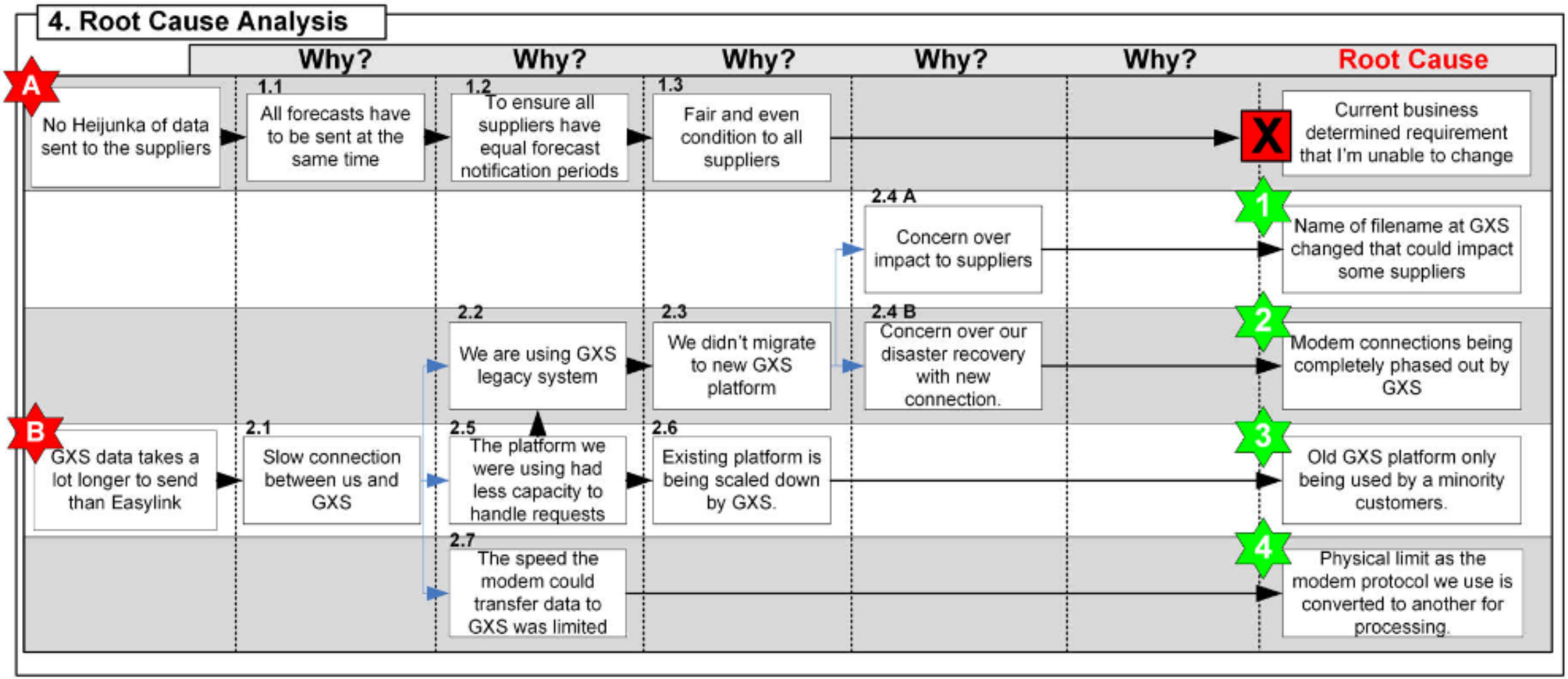
- Major/large incidents
  - Injury, property damage, enviro release
- Large incident near-miss
- Trending from small incidents

- Examples:
  - Major collision resulting in totaled vehicle and lost-time injury
  - Total rigging failure on 10-ton load (no injury/damage)
  - Single light bulb vs 500 light bulbs

Methods

- 5 whys
- MEEE
- Pareto principle
- Causal factor tree analysis
- Fish bone diagram
- Fault tree analysis
- Timeline


Root Cause
Why?
Why?
Why?
Why?
Why?
A
Late for work
Missed the train
Woke up late
Stayed up late
Wanted to binge watch a show
1
Poor prioritization
Too many things to do in the morning
Alarm didn't go off
Forgot to set it
2
Stayed up late
X
Battery died
Faulty batteries, cannot control
B
Missing work deadlines
Not enough time
Late to work
Too much work/Too many emails
3
Poor scheduling
Missing daily team meeting
Not considered a priority
Not everyone attends
4
Team meetings not a team priority


4. Root Cause Analysis
Why?
Why?
Why?
Why?
Why?
Root Cause
A
No Heijunka of data sent to the suppliers
1.1
All forecasts have to be sent at the same time
1.2
To ensure all suppliers have equal forecast notification periods
1.3
Fair and even condition to all suppliers
X
Current business determined requirement that I'm unable to change
2.4 A
Concern over impact to suppliers
1
Name of filename at GXS changed that could impact some suppliers
2.2
We are using GXS legacy system
2.3
We didn't migrate to new GXS platform
2.4 B
Concern over our disaster recovery with new connection.
2
Modem connections being completely phased out by GXS
B
GXS data takes a lot longer to send than Easylink
2.1
Slow connection between us and GXS
2.5
The platform we were using had less capacity to handle requests
2.6
Existing platform is being scaled down by GXS.
3
Old GXS platform only being used by a minority customers.
2.7
The speed the modem could transfer data to GXS was limited
4
Physical limit as the modem protocol we use is converted to another for processing.

Trending

- Used for all reported incidents
- Info stored in database
- Provides depth of information
- Guides future efforts

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Recommendations

- Where the rubber meets the road
- Thoughtful/artful approach
- Something **could** always be done
- What **should** be done?
- Must be reasonable and measurable
- Short-term vs long-term

Common Traps

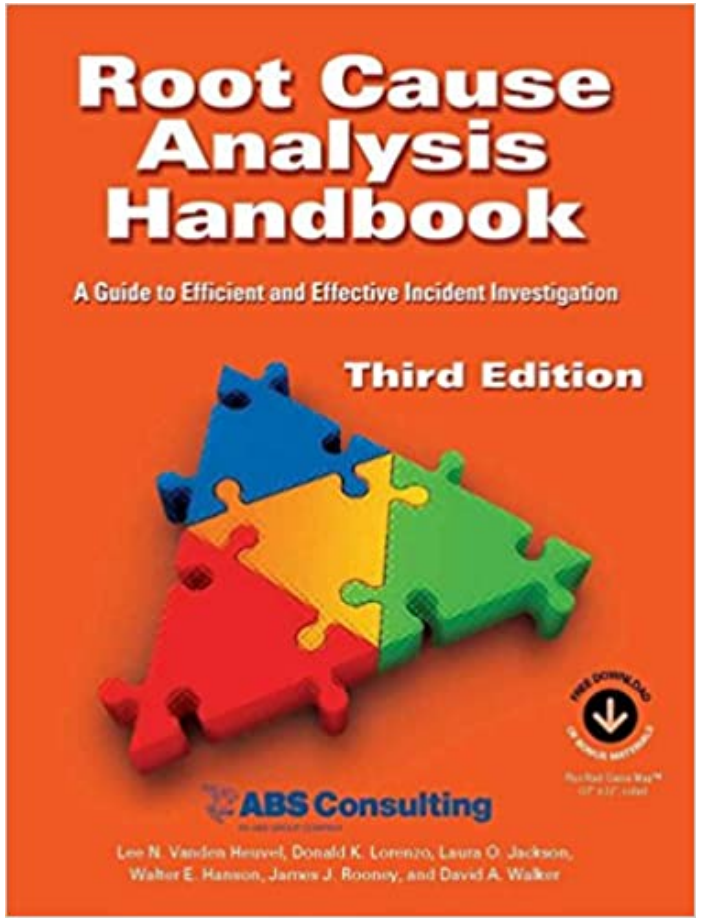
- It was just a fluke accident
- One off equipment failure
- Focus on person’s mistake (blame game)
- Apathy towards outside events
- Misguided effort
  - The greater the consequence, the greater the effort

Get Help!

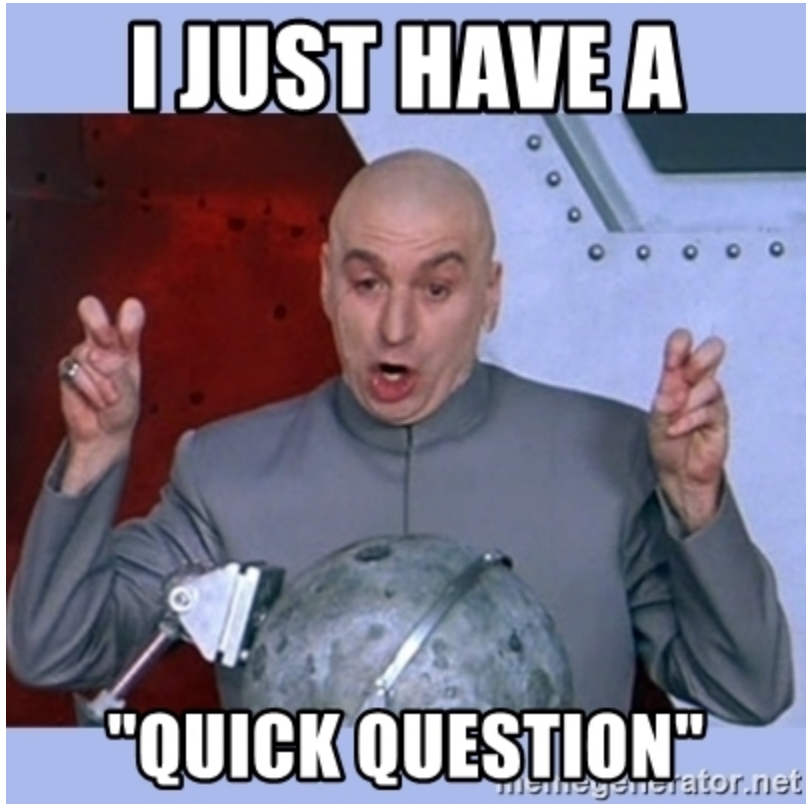
- Continuing education
- Within your org
- Approach - Amy & Julio
- Associations (ASSP, etc)
- OSHA consultation
- Paid consultation

Resources

- https://www.saif.com/safety-and-health/topics/be-a-leader/accident-and-incident-analysis.html
- https://www.osha.gov/incident-investigation
- https://des.wa.gov/services/risk-management/about-risk-management/enterprise-risk-management/root-cause-analysis
- https://www.abs-group.com/Training/



Questions?



Thank You!

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