Incident Investigation – Root Cause Analysis (RCA) and Reality Charting (Intermediate)

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Example Dwight's Emergency Management Charting

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Byron Beattie - Background

- + 30 years in EHS
  - Environment Health Safety Consultant
  - Completed over 330 EHS incident investigations
  - HAZWOPER trainer
  - Mgmt. System Auditor EHS Management
  - Training includes Apollo RCA Superuser, Incident Investigation Analysis
  - Registered OSHA Industry Outreach Trainer (10/30 hour), Forklift, HAZWOPER trainer
  - ISO14001/9001 Lead and Internal Auditor
  - Industry Experience
    - Chemical, coatings and paint process mfg.
    - Automotive parts mfg. (stamping, assembly, painting, welding, rubber mfg., electronics)
    - Metal fabricating / enhancement (shot and laser peening, sanding, drilling, grinding, thermal spray, etc.)
    - Plastic bottle mfg. (injection and blow mold operations, packaging)

FIND YOUR SAFETY

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Agenda
Keeping it simple

A. Importance of a effective incident investigation program

B. Securing the evidence

C. Identify investigative team

D. Reviewing and utilizing the 5 why problem-solving process as a structured investigation tool for multiple uses (hands on demonstration)

E. Be able to utilize and analyze several types of sub investigative methods to support such a process

F. Best ways to identify hazard control measures, appropriate responses to prevent reoccurrence and follow up

G. Communicate to key leaders

H. Celebrating the Win!
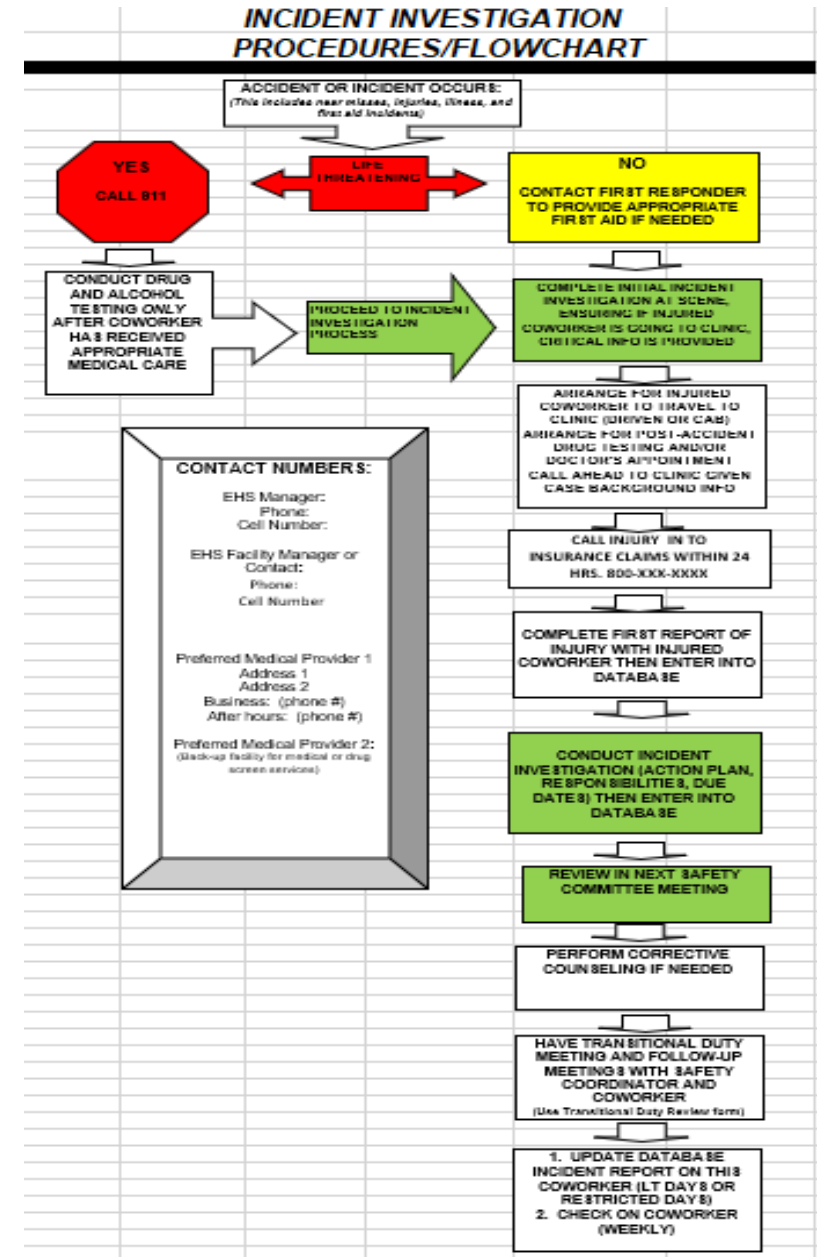
INCIDENT INVESTIGATION PROCEDURES/FLOWCHART

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Investigative dept
How is your Incident investigation awareness?

➢ Organizational culture is seen as a critical factor in achieving corporate performance and safety goals, such as the reduction of recordable and lost-workday injury rates.

➢ Incident investigations is one element of that effective safety culture. Including the process of documenting, analyzing, and addressing an incident that results in a near miss or first aid as well as recordable injuries or fatalities.

- AWARENESS EXERCISE 1

Investigative depth
Why have a great (not good) investigative process

➢ It is a conduit supporting your 4 primary pillars of your safety program:
  ➢ **People, Exposure Control, Mgmt. System, Promotion (***Embracing Change***)**

➢ Reduce or eliminate events that need to be investigated fully including:
  ➢ Injuries (First aids, recordable and lost time injuries) and Illnesses
  ➢ Near Misses
  ➢ Cost of Losses
  ➢ Ignitions
  ➢ Property Damage
  ➢ Demonstrates the company's commitment to health and safety
  ➢ Promotes positive workplace morale

➢ Needing to complete an effective accident investigation, to reduce or eliminate that event from reoccurring

➢ Completing the investigation - ***being consistent***

➢ Establishing an attainable, viable and closeable corrective action plan

➢ Engaging facility group to complete the investigation

➢ Getting your safety committee(s) involved in the process and or the follow-up

Isolate and neutralize threats
Initial Response

➤ After an accident occurs, the initial response should be as follows:
  - ➤ Get treatment for individuals that may be injured.
  - ➤ Secure the site
    - ➤ initiate interim controls
  - ➤ Assure the safety of others
  - ➤ Initiate chemical spill release control and containment plan
  - ➤ Initiate the investigation

Team involvement – Facilitator's responsibilities

Reviewing The Illusion of a single reality

Reviewing the illusion of a single reality

- Belief is a single reality cause most arguments
  - Learn to appreciate understand all perspectives
- A single reality is an illusion
  - Effective problem solvers must recognize this illusion
  - We are view the world differently
  - Identical perspective ae not physiologically possible
- Common sense is an illusion
  - The notion of "common sense" is the product of known and repeatable cause and effect relationships
  - Sense is only "common" when we are share an understanding of the effect of the same cause relationships

Avoid going directly to solutions!

- What
  - Primary Effect(s)
- When
  - Chronological Timing
  - Relative Timing
- Where
  - Specify location
  - Relative "Where"
- Significance
  - Question the process
  - Be specific
  - Relationship to Primary Effect
- Why not ask WHO?

Team involvement

➢Dependent on the severity
  ➢Person involved
  ➢Witnesses
  ➢Supervisor (s)
  ➢Contractors (if involved in incident) and or maintenance staff
  ➢Operators with similar jobs
  ➢Safety committee members
  ➢Environmental Health and Safety contact

➢Management involvement and support

➢ All employee engagement - post communication posting / discussion

➢Establish the baseline – reduce / eliminate (failure) events from initiating

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Team involvement

Information Gathering - Equipment and items to support the investigation

- Good things to have and use
  - Camera
    - Take pictures
    - Ensure all items in the area are review for involvement
  - Measuring tape
  - Barricade tape
  - Plastic vials with caps
  - Graph paper
  - Batch or job tickets
  - SDS (if chemical related)
  - Accident investigation forms – first report of injury, witness statements, incident investigation form
  - Others(?)

NEW SDS FORMAT

By June 1, 2015, chemical manufacturers, importers, or other employers preparing a safety data sheet (SDS) must format it using consistent headings in the following 16-section sequence.

Section 1 **Identification**—includes product identifier, manufacturer or distributor name, address, phone number, emergency phone number, recommended use, and restrictions on use

Section 2 **Hazard(s) identification**—includes all hazards regarding the chemical and required label elements

Section 3 **Composition/Information on ingredients**—includes information on chemical ingredients and trade secret claims

Section 4 **First-aid measures**—includes important acute or delayed symptoms or effects and required treatment

Section 5 **Fire-fighting measures**—lists suitable extinguishing techniques, equipment, and chemical hazards from fire

Section 6 **Accidental release measures**—lists emergency procedures, protective equipment, and proper methods of containment and cleanup

Section 7 **Handling and storage**—lists precautions for safe handling and storage, including incompatibilities

Section 8 **Exposure controls/Personal protection**—lists OSHA's PELs, threshold limit values (TLVs), appropriate engineering controls, and PPE

Section 9 **Physical and chemical properties**—lists the chemical's characteristics

Section 10 **Stability and reactivity**—lists chemical stability and possibility of hazardous reactions

Section 11 **Toxicological information**—includes routes of exposure, related symptoms, acute and chronic effects, and numerical measures of toxicity

Section 12 **Ecological information***

Section 13 **Disposal considerations***

Section 14 **Transportation information***

Section 15 **Regulatory information***

Section 16 **Other information**—includes date of preparation or last revision

*Notation concerning Sections 12 to 15: OSHA will not enforce the information requirements in Sections 12 to 15; however, the SDS must include at least the heading names for those sections.

Team involvement

Information Gathering - Attention to the Detail –

➢Inspect the accident site and note information such as:
  - ➢Positions of injured workers
  - ➢Equipment and materials being used
  - ➢Safety devices in use
  - ➢Position appropriate guards
  - ➢Positions of controls of machinery
  - ➢Damage to equipment
  - ➢Housekeeping of the area
  - ➢Weather conditions
  - ➢Lighting levels
  - ➢Noise levels

➢ Gather information:
  - ➢On procedures and rules for the area
  - ➢On maintenance records and equipment involved
  - ➢By taking photographs and making diagrams
  - ➢From employees
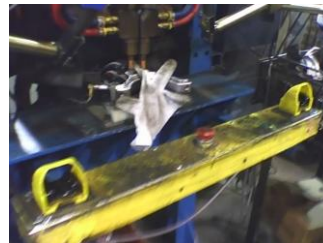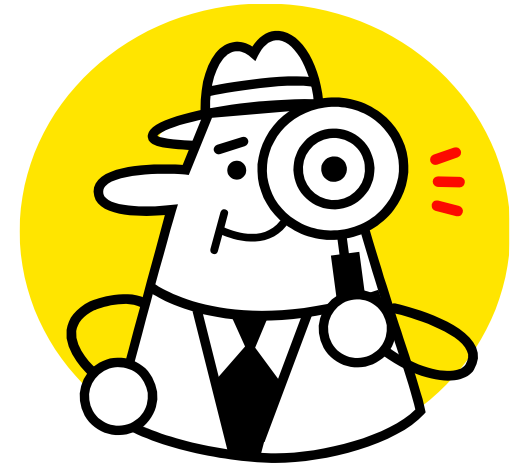
Team involvement
Information Gathering – Interviews (Key Ingredient!!)

➤ Injured Employee and Witness Interviews
- ➤ Put the employees, who are probably upset, at ease
- ➤ Emphasize the real reason for the investigation, to determine what happened and why
- ➤ Let the employee talk, you listen
- ➤ Confirm that you have the statement correct
- ➤ Try to sense any underlying feelings of the employee
- ➤ Make short notes only during the interview
- ➤ Ask open ended questions (NOT "yes" or "no" answers).
- ➤ Use probing questions to get more information (FILL IN THE GAPS).
- ➤ Ensure robustness – repeat back lines to reduce the gaps in the story or subevents which are not clear/vague
- ➤ The fuller the story line the better the understanding of the timeline and the process that caused the incident
- ➤ ***Make the employees feel that they are part of the solution***

➤ Individual vs. Group Think Discussion – *what's best*?
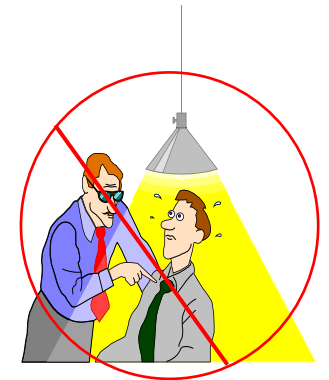
Team involvement
Information Gathering - Group Facilitation / Think Primary Steps *"Strength in #s"*

- Be Familiar with the RCA Method

- Manage the Group – *Keep team members and discussion on track !*

- Starting the Meeting

- Facilitators Responsibilities

- Performing the Analysis
  - *Suspend judgment of all input*
  - *Maintain a positive bias about the all statements*
  - Place all proposed causes on the chart – do not filter what is stated
  - Collect all the information the chart requires
  - Put up a lot of causes (USE THE *PARKING LOT* ☺)
  - Don't skip the baby steps – look for causes between the causes
  - If you can't place a cause ask "what did it cause?"

Team involvement

Common Traps - Obstacles to Group Facilitation / Think

➢ Consensus
  ➢ Build it
  ➢ Plan for it
  ➢ Or if the question is one of risk, or a better solution then vote might be appropriate

➢ Experts
  ➢ Great to effective problem solve BUT ALWAYS ASK FOR EVIDENCE
  ➢ ….~~In my expert opinion~~ = ask for examples

➢ Narrow Minded Thinking
  ➢ As a facilitator = Avoid challenge the group
  ➢ The common belief is that if no one in the group knows the answer, then ere is no answer

➢ Groupthink = relinquishing individuality = look for it and mitigate it

Team involvement

Gathering Information - Group facilitation – primary steps

➢ ***Complete the Story Line***

➢ The Chart will Determine Value

➢ Ensure there is appreciative understanding at each step
  - ➢ List all primary effects
  - ➢ Create the chart – list all stated causes
  - ➢ Identify effective solutions list all stated solutions

➢ Solution criteria will sort out most effective solutions
  - ➢ Appreciate, but challenge Solution Killer statements
  - ➢ Appreciate who has control and include them in the problem-solving process

➢ Review the facilitation guidelines before every meeting
  - ➢ Share relevant and appropriate guidelines with the team

Make sure the incident storyline is full – _eliminate the gaps_!! (OK to go back and fill gaps)

- Review storyline with the affected employee and witnesses
  - Repeat / review key points to ensure all gaps are filled in
- Repeat storyline through and including result of incident, confirming with affected employee and witness that account in factual
- Define the problem statement, ,such as eliminate spill or injury
- Ask the first "Why"?
- Aske "Why" at least 4 more times.
- Determine the countermeasures for each "Why"
- Assignment responsibilities
- Assign due dates of possible – close out meeting
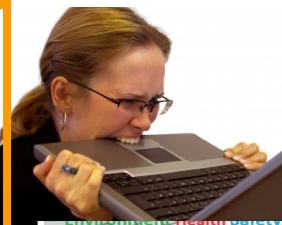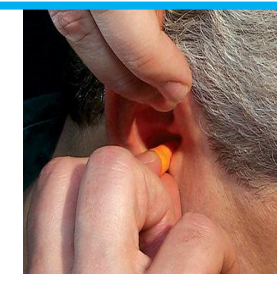- Monitor progress

c. Team involvement
Reviewing Causes & Contributing Factors of Accidents to ensure completeness
Simplify – see form

Accident Causation Model

1. **Tasks**
2. **Material**
3. **Environment**
4. **Human Factors**
5. **Management**

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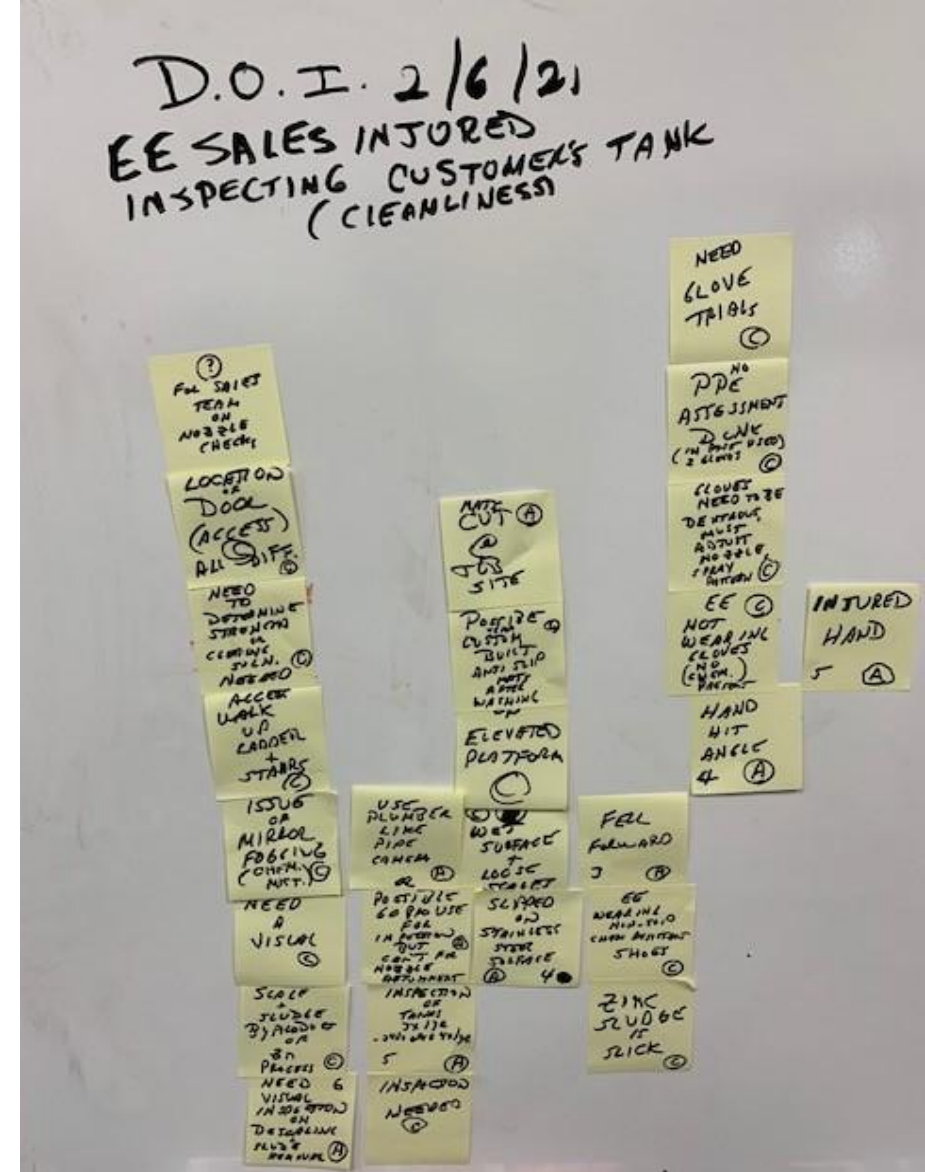# c. Team involvement – Facilitator's responsibilities

Effective Event Based Problem Solving

- Appreciative Understanding
  - Involve all stakeholders
  - Abandon the Right Answer mind set
  - Embrace our ignorance
- Know What We Are Solving
  - Agree on the problem
  - Understand our goals
  - Align your goas with the problem
  - Write down the problem statement
- Create a Common Reality
  - Manage storytelling
  - Manage categorial thinking
  - Ask why util we reach our point of ignorance
  - Create chart or graphic representation (post it notes)

- Solution Based on Known Cause and Effect Relationships
  - Align solutions with causes
  - Fix the cause not the blame
  - Stick to your graphic representation as your solution platform!!
- Event based Problems
  - Problems of the past such as an unacceptable event
  - These have no right answer – good, better, best
  - The purpose of event-type problem solving is to move om the current unacceptable state of condition to a desired condition of state
  - To ensure effective solutions analysis is required

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Reality Charting
Post it note Example

Reality Charting - Components

•**Define the Problem:** Clearly the state the issue you are investigating, ensuring everyone involved understands the scope involved understands the scope.

•**Gather Evidence**: Collect all relevant data—facts, timelines, observations, and supporting materials.

•**Identify Causes**: Analyze the chain of events and determine contributing factors using tools like cause-and-effect diagrams.

•**Develop the Reality Chart**: Construct a visual representation linking causes and effects logically.

•**Evaluate the Findings**: Assess the root causes and their relationships to prioritize
•Implement Solutions: Recommend actions to mitigate or prevent reoccurrence of the problem.

•**Review and Follow up**: Monitor the effectiveness of solutions and refine them as necessary

Reality Charting – Primary Effect Goals!!

Enhanced Problem-Solving:

- Structured analysis.

- Identifying true root causes instead of symptoms.

Improved Decision-Making:

- Data-driven insights.

- Systematic evaluation of options.

- Definitions
  - Caused by – fundamental set of cause(s) need at least one condition and one action for a given effect
  - Condition – causes that exist in time prior to an action bringing the together to cause an effect
  - Action – causes that interact with conditions to cause an effect
  - STOP
  - Primary Effect – any effect of consequence that we want to prevent from occurring

"Using the surveillance drone proves that mice do have problem-solving skills."

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Reality Charting
Action Causes & Condition Causes

Action Causes

- Definition: Immediate causes of an event (direct actions or omissions

- Definition: Underlying conditions or situations that contribute to the occurrence of action causes.

- Characteristics:
  - Often systemic or environmental in nature.
  - Example: Lack of adequate training for technicians.

Condition Causes

- Definition: Underlying circumstances that allow or promote action causes.

- Examples: Insufficient training, poor maintenance, unclear instructions.

- Characteristics: Often systemic and less obvious.

Slide 5: Interaction Between Action and Condition Causes

- Explanation: Action causes stem from condition causes, creating a chain of events.

- Visual Representation: Diagram showing condition causes leading to action causes, and eventually the problem.

Accident Causation Model

1. Tasks
2. Material
3. Environment
4. Personnel (Manpower)
5. Management

Reality Charting
Caused Connection "Caused By"

The principle of "Caused Connection" emphasizes the relationships between events and conditions, focusing on the concept of "Caused By" to create a clear, logical map of cause-and-effect relationships.

Event (Subevent) then Action

 Techniques to refine analysis:
•Asking "Why?" multiple times (Five Whys method)

Reality Charting - Evidence

- **Evidence-Based Analysis**: Focuses on factual evidence rather than assumptions.

- **Why Evidence Matters**: Ensures conclusions are based on facts.
  - Reduces bias and assumptions.

- **Types of Evidence**:
  - Observations
  - Data
  - Documentation

Cause Path Ending Reason for Stopping

- **Criteria for stopping the path:**
    - Lack of further actionable causes.
    - Identification of root cause(s).
    - Avoiding incomplete or superficial endings.

- **Common reasons:**
    - Practical limitations (time, resources).
    - Misjudgment of root causes.
    - Organizational factors.

Cause Path Not Stopping More Info Needed

- **Definition:** A cause path that ends without identifying the root cause.

- **Risks:**
    - Leads to incomplete understanding of the problem.
    - May result in temporary or ineffective solutions.

- **Explanation:** Indicates gaps in data or knowledge about the problem.

- **Highlights** areas requiring further investigation. Examples:
    - Missing details about a process failure.
    - Inadequate documentation of a critical incident.
- **Tools for Filling Information Gaps Examples**:
    - Interviews with involved personnel.
    - Review of historical data or records.
    - Observational studies or experiments.

Cause Path Stopping:
Go to Other Causers on the chart

- **What is Cause Path Stopping? Identifying when to stop exploring a particular cause path.**
  - Key considerations:
  - Is the cause fully understood?
  - Has the cause provided actionable insights?
  - Is it beyond the scope or control of the analysis?

Guidelines for Stopping Cause Paths

- Questions to ask:
  - Does this cause directly impact the issue?
  - Is this a contributing factor, not the root cause?

- Examples of stopping points: Natural phenomena that cannot be controlled. Causes with no further significant impact on the outcome.

Going to Other Causes

- What does "Going to Other Causes" mean?
  - Exploring alternative cause paths when the current one ends.

- The purpose:
  - Ensuring a comprehensive analysis.
  - Avoiding fixation on a single cause path

Cause Path Stopping
Go to Other Causers on the chart

Identifying Other Causes

- Techniques to uncover alternative causes:
    - Brainstorming sessions.
    - Group discussions or team analysis.
    - Using tools like the 5 Whys and Fishbone Diagrams.

Integrating Cause Path Stopping and Other Causes

- Demonstrating the flow of analysis:
    - When and how to switch between cause paths.
    - Keeping the bigger picture in mind.

- Examples: A manufacturing defect in a product.
    - Chart the cause paths.
    - Highlight where a cause path stops and why.
    - Show the transition to another cause path.

- **Recap:**
    - Importance of stopping cause paths appropriately.
    - Ensuring thoroughness by exploring other causes.

Identify Effective Solutions

- **Once root causes are identified:**
  - Brainstorm potential solutions for each cause.
  - Use criteria like feasibility, cost-effectiveness, and sustainability.
  - Link solutions directly to root causes on the chart.
- **Tools and Techniques for Solutions**
  - Prioritization methods (e.g., Pareto analysis).
  - Risk assessment for proposed solutions.
  - Group decision-making techniques like SWOT or multi-voting.

Identify Effective Solutions

- **Example:**
  - A manufacturing defect increases returns.
  - Root Causes: Material issue, improper training, outdated equipment.
  - Effective Solutions:
    - Switch to higher-quality material.
    - Develop a staff training program.
    - Upgrade equipment.

- **Benefits of Identifying Effective Solutions**
  - Solves problems at the source.
  - Prevents recurrence.
  - Saves time and resources.
  - Improves processes and outcomes.
  - Best Practices
    - Always base solutions on verified root causes.
    - Engage stakeholders during solution brainstorming.
    - Monitor and evaluate solution effectiveness post-implementation.

- **Conclusion**
  - Reiterate the importance of reality charting in identifying effective solutions.
  - Encourage consistent use for sustainable problem-solving.

Reality Chart Exercise
Role play for use of Reality Charting format

1. Review storyline supplied by class teacher
2. Select the following personnel
   1. Facilitator
   2. Involved Worker
   3. Supervisor
   4. Maintenance personnel
   5. Witness
   6. Material handler
   7. Machine operator
   8. Operations manager
   9. EHS manager

1. Develop reality chart for supplied storyline including
   1. Conditions
   2. Actions
   3. Stop activity
   4. Primary effects

Implement and Track Solutions Incident Investigation Reporting Corrective Actions

Corrective actions are the written action plans to eliminate the causes of an incident, to prevent it *and similar incidents* from re-occurring.

- To be effective, corrective actions must include all of these components
    - A responsible person [competent for the task(s)]
    - Schedule / target date for completion
    - Specific actions to eliminate gaps between what happens now & what needs to happen in the future.

OWNERSHIP AND ACCOUNTABILITY

- Corrective Actions must have ownership and due dates
- Do not assign ownership to departments

What is Hierarchy of Controls?

- The hierarchy has **five levels of control.**
- Most effective level of control is at the top of the hierarchy
- Least effective is at the bottom.
- The controls from a higher level always have priority and should be considered first during the selection process.
- If the proposed measures are not realistically feasible, **one should go a step below and decide on possibilities at the next level of control.**

THE HEINRICH LEGACY

Heinrich's triangle or pyramid suggests that, on average, for every major incident, 29 minor incidents and 300 incidents with no injuries occur. This ratio has been misinterpreted and misused to the point of abuse.

- 1 major injury
- 29 minor injuries
- 300 near hits

Most Effective

Remove the hazard physically	ELIMINATION
Replace the hazard to reduce risk	SUBSTITUTION
Isolate people from hazard by equipment design	ENGINEERING
Influence the way people work	ADMINISTRATION
Use PPE as last and/or additional hazard barrier	PERSONAL PROTECTION

Least Effective

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What are Hierarchy of Controls?

Elimination -Physically removing the hazard is the most effective
Examples:
- Bring objects from the height to the ground to work on them
- Remove objects parked in pathways
- Ban any toxic substance in work areas
- Eliminate hazardous substance by changing chemical process
  (difficult to implement in existing processes, look for opportunities during process development)

ELIMINATION
Remove the hazard physically
Effectiveness ★★★★★

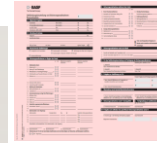Administration - Strive to change the way people work
- Influence their behavior
- Administrative controls cant remove hazards
Examples: Completing work at night when fewer people are on site
Procedure changes, Employee Training, Warning signs and rules to limit exposure

ADMINISTRATION
Influence peoples´ behavior
Effectiveness ★★

Substitution means to replace something that produces a hazard (similar to elimination) with something that does not produce a hazard or produces a significantly lower hazard.

SUBSTITUTION
Replace the hazard - reduce risk
Effectiveness ★★★★

PPE - Least effective level of control
- High potential for damage could render PPE ineffective
- Danger of improper use
- Need for sufficient training
- Poses a burden to it´s user that may cause additional health risks

PPE
Effectiveness ★

Engineering - rather isolate people from hazards.
- Separate people from hazards
- Physical barrier between personnel and hazards
- More expensive than the next lower levels
- Very effective and sustainable.
- Examples: Fume hoods, machine guards,

ENGINEERING
Isolate people from hazard by equipment and construction design measures
Effectiveness ★★★

ELIMINATION
SUBSTITUTION
ENGINEERING
ADMINISTRATION
PERSONAL PROTECTION

Most Effective

Least Effective

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Step 4 - Incident Investigation Reporting
Implementing and Tracking Solutions
The importance of contributing factors and root causes

- **Place in a traceable location**

    - Action tracker for facility or investigations
        - % completion (SMART)
    - Safety committee meeting minutes
   - Summary in monthly reports

- **Keep action and status front and center** – status keeps everyone in the loop

    - Also may need short term resolutions

S Specific
- State what you'll do
- Use action words

M Measurable
- Provide a way to evaluate
- Use metrics or data targets

A Achievable
- Within your scope
- Possible to accomplish, attainable

R Relevant
- Makes sense within your job funcion
- Improves the business in some way

T Time-bound
- State when you'll get it done
- Be specific on date or timeframe

Attention to detail

Need to be able to transfer into a facility investigative form and develop action plans to support (reduce or eliminate subevent)
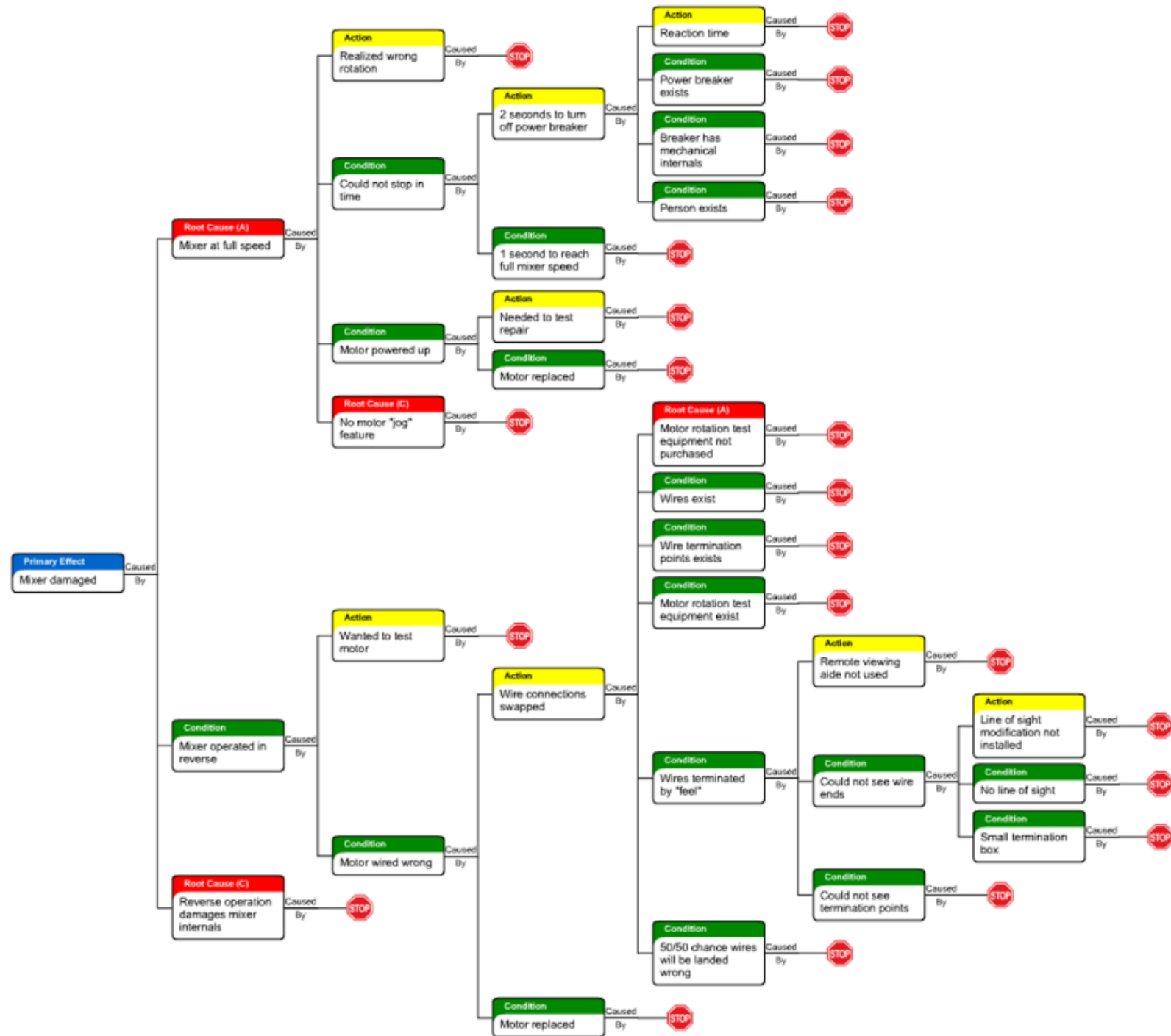
Analysis and Conclusion – Reality Charting

1. Draw conclusions and make recommendations based on contributing factors and causes

2. Implement corrective actions and set a time table to complete them.

3. Actions and outcomes to consider in your investigation conclusions:

   ➤ ***Contributing Factor*** - Conditions or actions that, if removed, would likely prevent (reduce or eliminate) the incident or hazard from happening, or reduce the severity of its consequences.

   ➤ ***Root Cause Myth*** - the false belief that a root cause is found at the end of a cause chain or identified with a set of predetermined cause factors. *Without identifying complete cause relationships it is obvious which causes Reporting Corrective can be controlled to prevent recurrence*; therefore we need to understand the causal relationships first, then what can be removed or controlled, focusing instead on the solutions

   ➤ ***Solution Killers*** –Judgmental statements used to kill an idea for a solution (such as "We already tried that once, it will never work . We're too busy to do that"

   ➤ ***Story Tellin****g* – Communication describing an event relating people, places and things in a *linear time frame* from past to present

6 Effective Steps to a Strong Accident Investigation

(ID the problem, clarify the problem, break down the problem, ID contributing factors
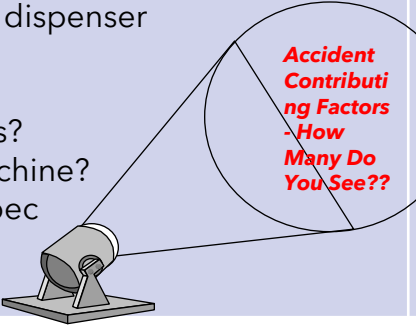
1. ISOLATE THE AREA

a.   Make sure you have all the items, activities and personnel that were involved in the incident.

b.   Get treatment for individuals that may be injured. Assure the safety of others, (live wires, etc.) . Stop added hazards.

c.   Secure the site, prevent tampering with evidence. Initiate interim controls. Initiate the investigation.

d.   Determine the depth of investigation the particular incident warrants.

2. GATHER THE INFORMATION – TELL THE STORY

a.   Identify and document the steps leading up to and including the incident (include issues or conditions that might have influence, breakfast, checking in, emotional stability, etc.).

b.   Put in times of sub events, product numbers, machine numbers, temperature, pressure, speed, amperage, to assist in _filling in the information gap – read the story back to the employee to fill in those gaps – similar accidents?_

c.   Interview witnesses. Take photos. Review machine logs. SDS. PM OK? If you looked at this in 6 mos.-same result?

3. COMPLETE A 5 WHYS TO ESTABLISH CAUSE AND EFFECT

| Example 1 – Tape dispenser lacerated employee behind machine	Example 2 - Tool cart contusion on employee
Why was employee behind machine? Retrieve fallen tape dispenser Why did tape dispenser fall? Not enough shelf space Why employee trip? Tripped over cord on floor Why was cord on floor? Cords were too long for machines? Why was cords too long for machines? Came with the machine? Why did it come with the machine? Part of the machine spec	Why tip over? Caster diameter too small What wheels too small? They were made in maintenance Why maintenance made small wheels? Followed engineering specs Why did engineering spec small wheels? Didn't ID it as a hazard Why didn't engineering ID it as a hazard? No risk assessment training

Accident Contributing Factors – How Many Do You See??

6 Effective Steps to a Strong Accident Investigation

4. IDENTIFY THE CORRECTIVE (COUNTER) MEASURES

a. Remember – you are trying to reduce and eliminate the injury or event from reoccurring.

b. Should be action / verb oriented.

c. Not uncommon to have 4-6 corrective measures for the injury.

d. Make sure to include human factors (fatigue), unsafe procedures as well as unsafe conditions to correct.

5. ESTABLISH RESPONSIBILITIES AND DUE DATES

a. Ensure you have enough steps – especially if you need to further investigate (research design, develop training, etc.).

b. Ensure the right person to complete the task, and there is supporting resources.

c. Ensure enough is available to complete steps.

d. Review similar operations, different shifts, different operators – can the event/injury repeat itself? Setup lessons learned and communicate to all employees (*summarize and post investigation results*).

4:1 Direct Costs Indirect Costs
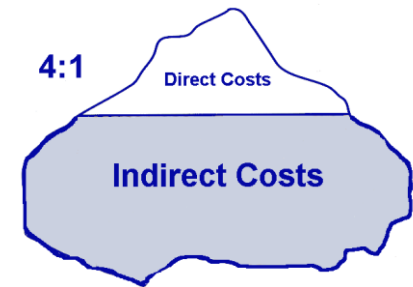
6. THE SAFETY COMMITTEE IN POST INVESTIGATION ACTIVITIES & MONITOR RESULTS UNTIL CLOSURE

#1 Add corrective measures to safety committee meeting minutes until complete. #2 *In 30 days*, Safety Committee reviews recordable investigations,

#3 Reviewing / updating related safety process maps or other flow docs   #4 Reviewing / updating related risk assessment documents

Questions ??
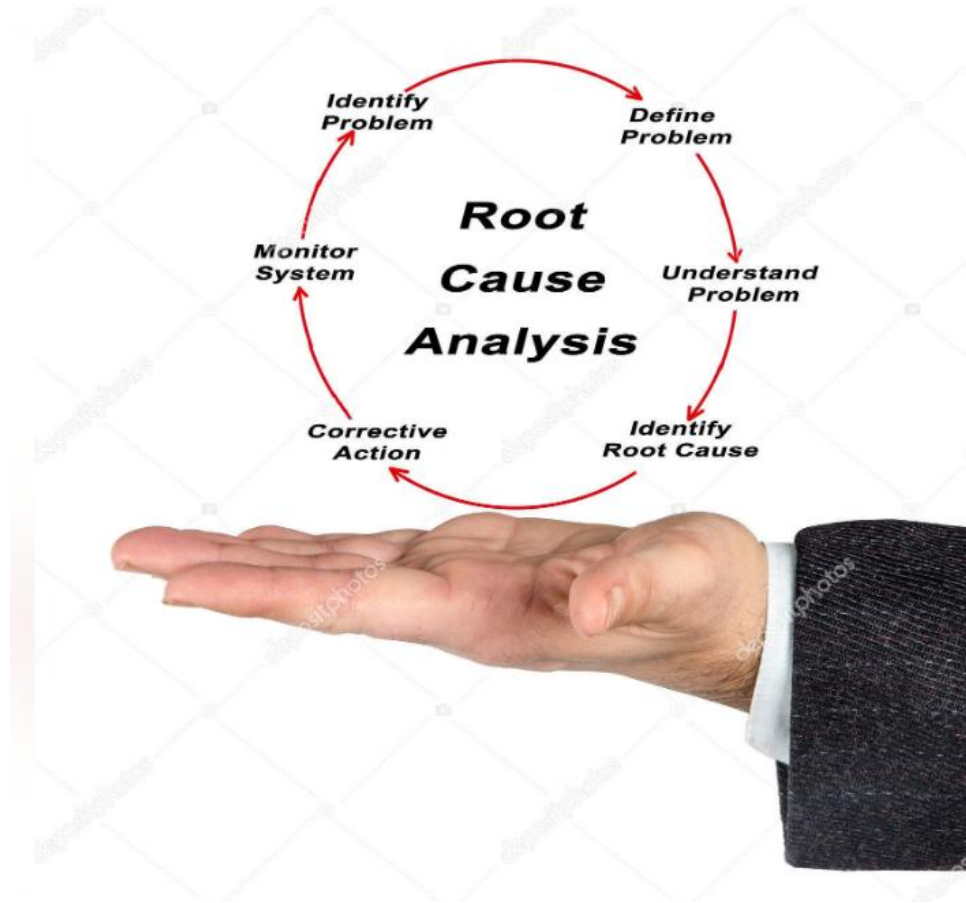
**Techniques to Improve Your
Incident Investigation Process**

Thanks for your participation!

Is your awareness better now?

(Awareness exercise 3)