

Accident Investigations -- Digging for Root Causes

ISRI Safety Council

May 12, 2009



Getting Started

- Housekeeping
- Workshop Rules
- Zero Accident Consulting LLC
- Zero Accident Culture[®]



ZERO ACCIDENT CULTURE[®]



"Awareness is sobering... Once we know, avoidance is no longer an option"

**ZERO
ACCIDENT**
CONSULTING
LLC

- <http://www.youtube.com/watch?v=MwCyVku1HvI&NR=1>



This did have to happen...

WSIB Ontario (Workplace Insurance Safety Board)

1. **The Restaurant “Accident”**
2. **The Construction “Accident”**
3. **The Factory “Accident”**
4. **The Retail Store “Accident”**
5. **The Electrical “Accident”**

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Learning Objectives

During this session we will cover:

- Components of a Zero Accident Culture
- How conduct an accident investigation
- How and when to apply causal factor and root cause analysis for investigating incidents
- How to develop appropriate recommendations to address root causes at various levels to avoid future incidents



Let's get ready to scrap around!

- Topic can relate to any accident.
- What would you like to learn today
- What are some negative consequence of improper AI
- What are some positive consequences of good AI
- How “competent” is your organization in AI



Accident Investigation and Zero Accident Culture®

- 1) TRAINING & COMMUNICATION
- 2) SAFETY TEAM
- 3) JOB SAFETY ANALYSIS
- 4) SAFETY PROCEDURES
- 5) SELF-INSPECTIONS & AUDITS
- 6) RECOGNITION AND REWARD
- 7) ACCIDENT REPORTING & INVESTIGATION



Accident Reporting & Investigation

Step 1 - Reporting the Accident

Step 2 - Gathering the Facts

Step 3 - Determine the Accident Cause(s)

Step 4 - Develop a Corrective Action Plan

Step 5 - Follow-up for Completion



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Reporting an Accident

- Timing is critical – immediate
- Emergency response
- Family notification
- Insurance carrier notification
- Communications plan
- Safety committee agenda



Incident or Accident?

- An **incident** or **near-miss**
 - is any unplanned event that **does not** result in loss due to personal injury or damage to property; however, given different circumstances could have resulted in a loss.
- An **accident**
 - is any unplanned event that **does** result in personal injury or damage to property. A detailed analysis of any accident/incident will normally reveal several causes – question the word ***unforeseen***



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Gathering the Facts

- Timing is important – ASAP!
- Isolate accident scene
- Agree on assignments
- Use investigative techniques – collect facts and evidence
- Interview injured worker and witnesses
 - Assure positive intent
 - Explore personal injury possibilities
 - Ask open-ended questions
 - Ask how could this have been avoided?



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Surface vs. Root Causes

Surface causes are:

the hazardous conditions or unsafe work practices that directly or indirectly contributed to the accident.

Root causes are:

the safety or loss control system weaknesses that allow the existence of hazardous conditions and unsafe work practices. Most accident investigations only identify the surface causes of accidents.



General principles of RCA

- Aiming performance improvement measures at root causes is more effective than merely treating the symptoms of a problem.
- To be effective, RCA must be performed systematically, with conclusions and causes backed up by documented evidence.
- There is usually more than one root cause for any given problem.
- To be effective the analysis must establish all known causal relationships between the root cause(s) and the defined problem.
- Root cause analysis transforms an old culture that reacts to problems to a new culture that solves problems before they escalate, creating a risk avoidance mindset and a Zero Accident Culture.



Root Cause Analysis (RCA)

- **Root cause analysis** is a class of problem solving methods aimed at identifying the root causes of problems or events. RCA is often considered to be an iterative process, and is frequently viewed as a tool of continuous improvement.
- RCA, initially is a reactive method done **after** an event has occurred. By gaining expertise in RCA it becomes a pro-active method. This means that RCA is able to **forecast** the possibility of an event even **before** it could occur.
- Root cause analysis is comprised of **many** different tools, processes, and philosophies.



Root cause analysis techniques

- Cause and effect analysis
- **5 Whys**
- Kepner-Tregoe
- Failure mode and effects analysis
- Pareto analysis
- Fault tree analysis
- **Ishikawa diagram**
- **The 6 M's**
- Cause Mapping
- Barrier analysis
- Change analysis
- Causal factor tree analysis
- Event and Causal Factor Charting
- TapRootT
- RPR Problem Diagnosis
- Common cause analysis (CCA)

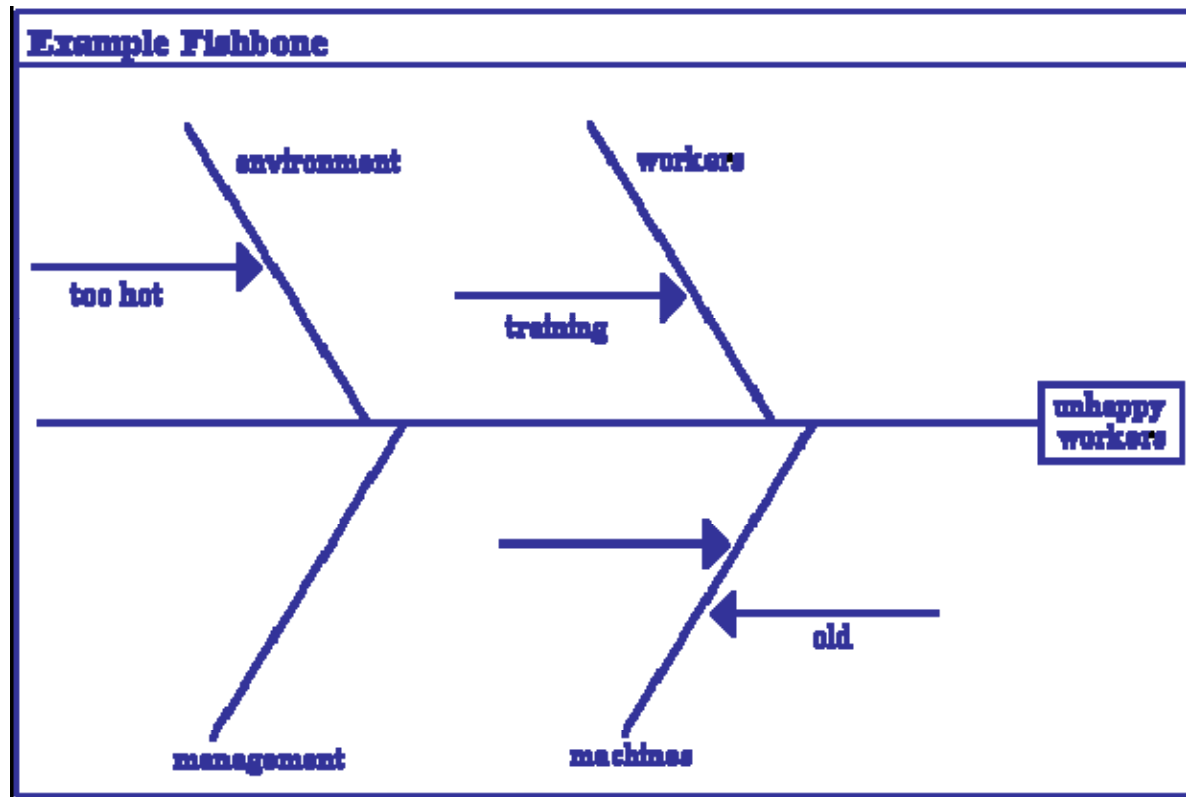


5 Whys – be a “whys guy”

- “Why” -- continue to ask this. It can be annoying, but is critical to RCA
- Push beyond surface causes / symptoms
- Many can participate
- Pushes beyond basic symptoms
- Example – driver took down an overhead line while leaving a customer location with a roll-off box...



Ishikawa / Fishbone Diagram



6 M's

- Machine
- Method
- Materials
- Measurements
- Man
- Mother Nature



RCA Exercise

- Use either 5 whys or fishbone or both
- Break into groups and assign a group spokesperson
- Receive assignment of video example
- Take 10 minutes to do your RCA
- Spokesperson list causes on paper
- Present Ideas to Group and ask for additional ideas



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Recommend & Implement Corrective Action

Elimination/Substitution -- removing the root cause or substitute with a less hazardous material or equipment.

Engineering Controls -- physically changing equipment or the work environment (i.e. guards, anti-slip paint, etc.).

Warnings (audible or visual) -- adding labels, signs, lights, or horns to warn employees.

Training -- new/refresher training or safe operating procedures like JSA's.

Procedures/Rules -- also includes administrative controls such as changing how & when employees do certain jobs thru scheduling and/or rotating. Dealing with rule breakers.

Personal Protective Equipment -- last line of defense -- should focus on elimination/substitution and engineering controls to prevent injuries. PPE should be the last resort if other controls are not feasible.



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Follow-up for Completion

- Obtain management commitment
- Assign accountability
- Secure financing
- Add to procedures
- Implement self-inspection
- Communicate as appropriate
- Celebrate success



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Handouts and Questions

- Workshop materials and handouts available:

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- Final Questions / Comments
- Did we accomplish the learning objectives:
 - course learning objective
 - participant expectations

