TITLE: How to carry out a root cause analysis

This How To Carry Out a Root Cause Analysis Guide should be read in conjunction with the Accident Incident and Near miss poilcy and Guidance Note

Introduction

The following guidance is intended for you to be able to complete Root Cause Analysis on any accident or incident you may experience in your workplace. This is intended to provide additional guidance and explanation of this process to aid you in readily finding root causes of incidents/accidents to prevent recurrence.

Following this guidance should also enable you to remove individual blame from the incident/accident as it focuses on the reasons why actions or behaviours occurred rather than individual failings. Individual errors and accountabilities may need to be addressed but they are better dealt with by a separate HR process than by accident investigation or Root Cause Analysis.

Definition – Root Cause Analysis

Root Cause Analysis, also often referred to as Fault Tree or Event Tree Analysis, is a process to enable the user to readily identify the root causes of an incident/accident.

Purpose

The purpose is to provide a swift and effective way to prevent incident/accident recurrence which can potentially be extremely damaging to a business. It can also provide a great support focussing attention away from individual blame or equipment failure and re-direct focus onto how the safety management system "allowed" these deficiencies to exist.
If used well it can provide an extremely useful method of learning from incidents/accidents and ensuring employees and the business are better protected in the future.

Application of Root Cause Analysis

It is a systematic process which can form part of an incident/accident investigation and which focuses on 3 main aspects:

- **Immediate Causes**
- **Underlying Causes**
- **Root Causes**

All 3 stages of the analysis are important to build up a picture of how and why the incident/accident occurred and what can be done to prevent recurrence.

Immediate Causes
These are aspects of the incident/accident which directly influenced the outcome (damage or injury) and are often referred to as "direct causes". They are the features of an incident/accident which immediately contributed to harm or damage being caused.

Example - if an employee is injured by items falling off shelving, the items falling and striking the employee is an immediate cause.

This may sound strange but it is always useful to work back from the very point of harm when identifying immediate causes. All too often we assume that these are known and confuse these with underlying causes and move too swiftly to a judgement.

Underlying Causes

These aspects of the incident/accident are effectively contributory breaches which in themselves did not cause harm but made a significant contribution to the incident/accident. They are often referred to as "in-direct causes"

Example - poor maintenance of the shelving could be an underlying cause.

It is generally when identifying underlying causes you may discover more than one reason why a problem exists. In the example above this could be a faulty shelf or incorrect stacking of materials. This means you now have 2 lines of enquiry or another branch to your "Event" or "Fault" tree.

Root Causes

These are effectively the purpose we are doing Root Cause Analysis to discover the root cause of our incident/accident. Generally these are aspects of our safety management performance which have in some way failed. You may have identified in Immediate and Underlying causes that there have been individual, equipment or structural failings which directly or in-directly contributed to the incident/accident.

Example – the failure to supervise the shelving/racking maintenance programme is a root cause

By addressing root cause you effectively remove the key reason why the events were allowed to develop for the incident/accident to occur. By only addressing Immediate and Underlying causes you allow the fundamental management deficiencies to remain and therefore make recurrence more likely.

Root Cause Analysis – Worked Example

You will see in Annex 1 of this guidance an accident report from the MentorLive Incident/Accident Register. This is a good example of an incident which would benefit from Root Cause Analysis. In this case the analysis is in the form of a flow diagram (Annex 2) where you can see how the "causal tree" has been developed.

The Immediate Causes have been identified as:-
- Load from fork lift truck struck employee
- The fork lift truck skidded and the load tipped
- The fork lift truck was going too fast
- The driver had to brake sharply

The Underlying Causes were indentified as:-
- A patch of oil on the warehouse floor
- The unexpected appearance of the pedestrian in a truck zone
- Employee took a short-cut across warehouse
- The driver was rushing to finish a job
- Poor maintenance of the fork lift truck

The Root Causes were identified as:-
- Poor work practice and supervision of the admin employee
- Poor work practice and supervision of the driver
- Lack of supervision of the company maintenance programme
- Poor implementation of company Health and Safety policy and procedures

Employee Errors or Breaches

One of the major problems with any incident/accident is the temptation to "blame" an individual or individuals for their failings and shortcomings, concluding that that is solely where any fault lies. This is too simplistic a way of looking at incidents and although makes for simple, clean, efficient and cheap accident investigation, it does not fully address the reasons for the incident/accident.

If employee "blame" was applied in the worked example the investigator would have merely recommended disciplinary action against both Admin Employee and the Fork Lift Truck Driver and there would not have been any review or improvements to the following areas:-

- Maintenance
- Health and Safety Policy
- Supervision of staff
- Supervision of maintenance programme.

All of these items, if left un-addressed, could lead to swift recurrence of the incident with potentially more serious consequences.

This DOES NOT mean that companies cannot complete separate disciplinary enquiries outside of the accident investigation where measures could be taken to address breaches in company rules.

Application of Root Cause Analysis

This type of accident analysis is not suitable for all types of incident/accident. The investigator (or lead investigator if in a team) should decide if a detailed root cause analysis would be justified. Generally the following aspects should be considered before applying Root Cause Analysis:-

- The nature of the incident and its consequence or potential consequence
- How many people are at risk
- What are the chances of recurrence
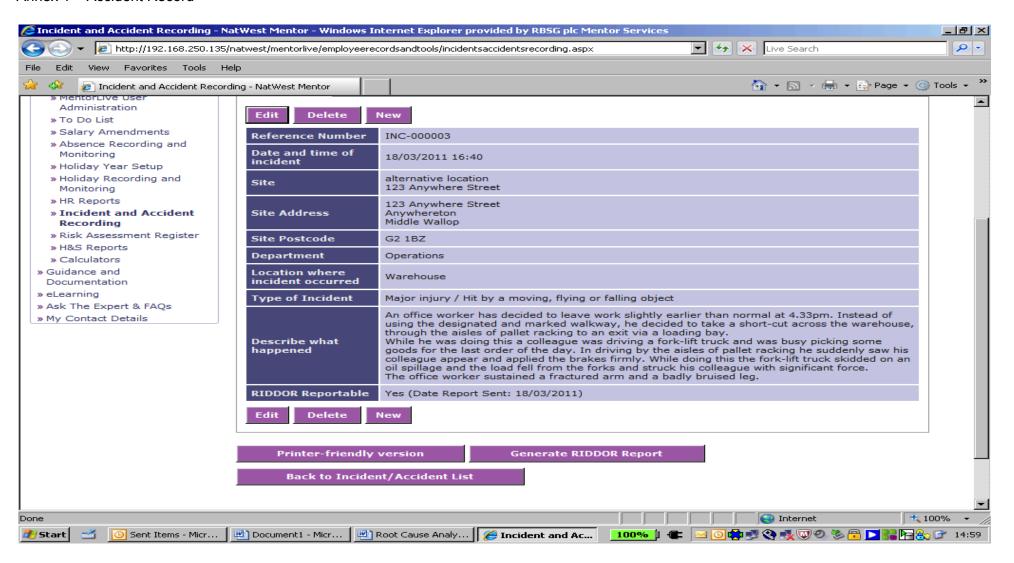- What is the future potential of any incident/accident.

Clearly "simple" incidents where there are only a few causes, where the consequences were low and there is little problem with recurrence, would not need the kind of detailed analysis we have outlined here. The investigator could make a swift conclusion on causation from the incident without the need for more lengthy analysis.

Reference

Investigating accidents and incidents: A workbook for employers, unions, safety representatives and safety professionals (HSG245) www.hse.gov.uk.

Root Cause Analysis for Beginners – James J Rooney and Lee N Vanden Heuvel - Quality Progress

Annex 1 – Accident Record

Annex 2 – Root Cause Flow Diagram

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Employee Struck by load from fork-lift truck → Why? → Forklift skidded and tipped load → Why?

    → Hard Braking → Why? → Unexpected appearance of pedestrian → Why? → Left work early and took shortcut through warehouse → Why? → Poor Work Practice & Supervision

    → Going too fast → Why? → Rushing to finish job → Why? → Poor Work Practice & Supervision

    → Oil patch → Why? → Poor Maintenance → Why? → Lack of supervision of maintenance
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