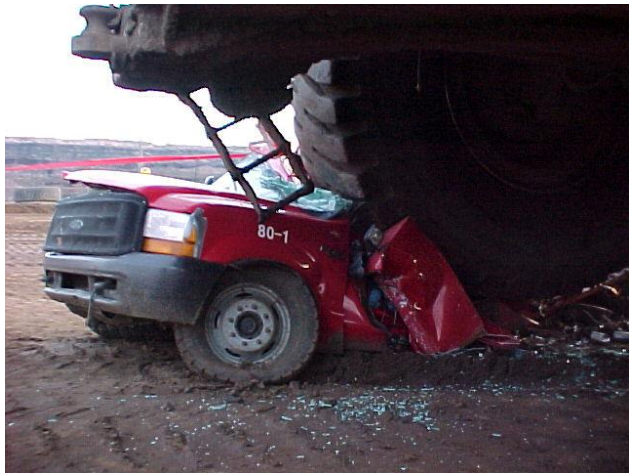
Health & Safety for Managers and Supervisors

Module 6

Accident Investigation Basics

Module 6

Accident Investigation Basics



Objectives..

- What is an **incident**?
- What is an **accident**?
- Why should you **investigate** both?
- **How** should you investigate?
- What **results** are you looking for?
- What are you **required** to do for an investigation?

Accident / Incident Causation

- Studies have shown that the majority of accidents and incidents are due to ***lack of management control.***

- They determined that in 75% of cases investigated, site management were regarded as ***wholly or partly responsible*** for failing to take reasonably practicable precaution to prevent the accident.

What Is An Incident?

Unplanned and unwanted event which **disrupts** the work process and has the potential of resulting in injury, harm, or damage to persons or property.

An incident disrupts the work process, does **not** result in injury or damage, but should be looked as a “wake up call”.

Example of an incident: A 50 kg carton falls off the top shelf of a 2m high rack and lands near a worker. This event is unplanned, unwanted, and has the potential for injury.

What Is An Incident?

- An incident disrupts the work process, does not result in injury or damage, but should be looked as a “wake up call”.
- It can be thought of as the first of a series of events which could lead to a situation in which harm or damage occurs.
- Employers should investigate an incident to determine the ‘basic’ cause and use the information to stop process and behaviors that could just as easily have resulted in an accident.

What Is An Incident?

- **Example of an incident:**
- A subcontractor's Site Safety Officer was serving as the Spotter for re-roofing activities being conducted in a Scissor lift. An unescorted visitor entered the work zone where the subcontractor's Site Safety Officer was located, in violation of the visible postings and barrier tape.
- This situation resulted in a temporary distraction to the Spotter causing him to lose visual contact of the Scissor basket which led to the work crew getting within the 10 foot limit for working near electrical lines, thereby violating the established Site Safety Rules

What Is An Accident?

Unplanned, unwanted, but controllable event which disrupts the work process and causes injury to people.

Almost everyone would agree that an accident is unplanned and unwanted. The idea that an accident is controllable might be a new concept.

An accident stops the normal course of events and causes property damage, or personal injury, minor or serious and occasionally results in a fatality.

What Is An Accident?

- An accident is not “just one of those things”.
- Accidents are predictable and preventable events.
- They don’t have to happen.

What Is An Accident?

- Most workplace injuries and illness are not due to “accidents”. The term accident is defined as an unexpected or unintentional event, that it was “just bad luck”. More often than not it is a predictable or foreseeable “eventuality”.
- By “accidents” we mean events where employees are killed, maimed, injured, or become ill from exposure to toxic chemicals or microorganisms (TB, Hepatitis, HIV, etc.).

- A systematic plan and follow through of investigating incidents or mishaps and altering behaviors can help stop a future accident.
- Let's take the 50 kg carton falling 2m, for the 2nd time, only this time it hits a worker, causing injury. Predictable? Yes. Preventable? Yes. Investigating **why** the carton fell will usually lead to solution to **prevent** it from falling in the future.

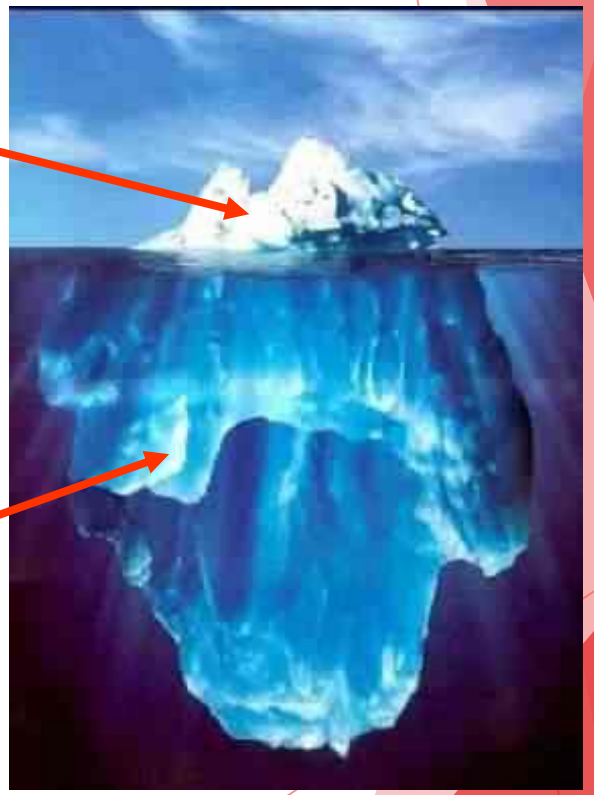
“The Tip of the Iceberg”

Accidents

Accidents or injuries are the tip of the iceberg of hazards

Investigate incidents since they are potential “accidents in progress”

Incidents



“The Tip of the Iceberg”

- All accidents and incidents should be evaluated for risk potential.
- Those events having a HI-PO (high potential for loss) should be investigated fully – regardless of the severity of the actual loss which has occurred.

“The Tip of the Iceberg”

Don’t just investigate accidents.

Incidents should also be reported and investigated.

They were in a sense, “aborted accidents”.

Criteria for investigating an incident:

What is reasonably the worst outcome, equipment damage, or injury to the worker?

What might the severity of the worst outcome have been?

If it would have resulted in significant property loss or a serious injury, then the incident should be investigated with the same thoroughness as an actual accident investigation.

“The Tip of the Iceberg”

We are reminded that:

- ✓ There are many more Incidents than Accidents
- ✓ Lessons learned from near-misses are **FREE**
- ✓ The causes and potential are exactly the same.

The boulders that were dislodged from the pile prior to the fatal accident were a wake up call. The outcome of an investigation might include correction of sloppy work arrangements at the site, including regular site inspections to ensure that the site was safe from boulders being dislodged due to vehicular movement.

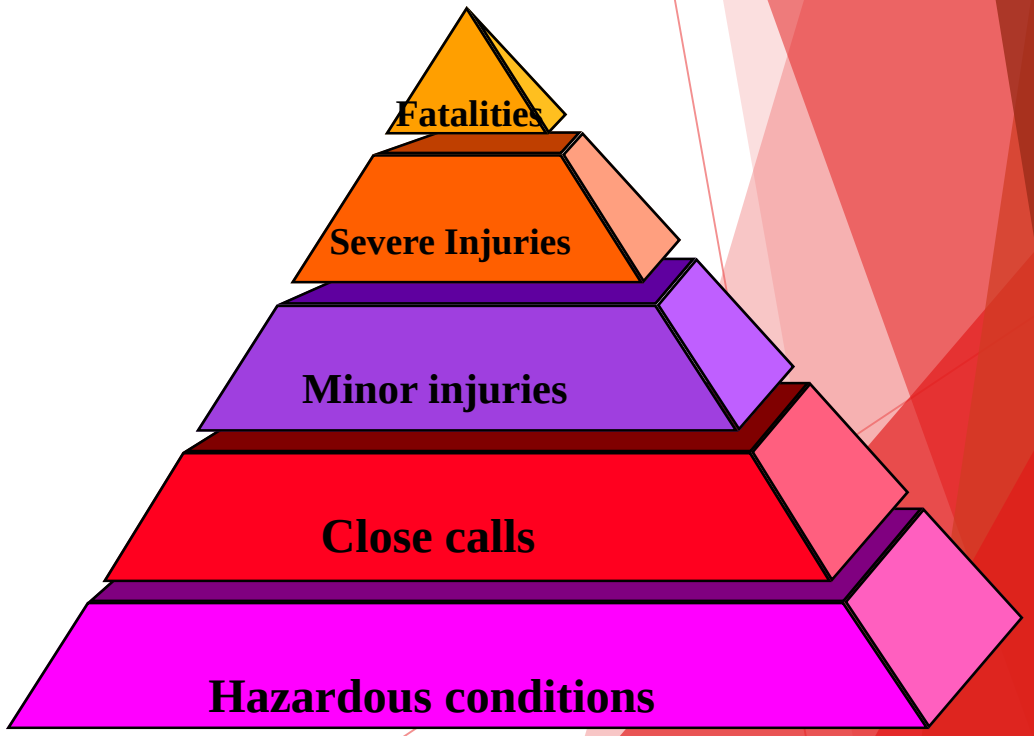
What Is An Accident?

By dictionary definition: “an unforeseen event”, “.chance..”, “unexpected happening..”, formerly “Act of God”

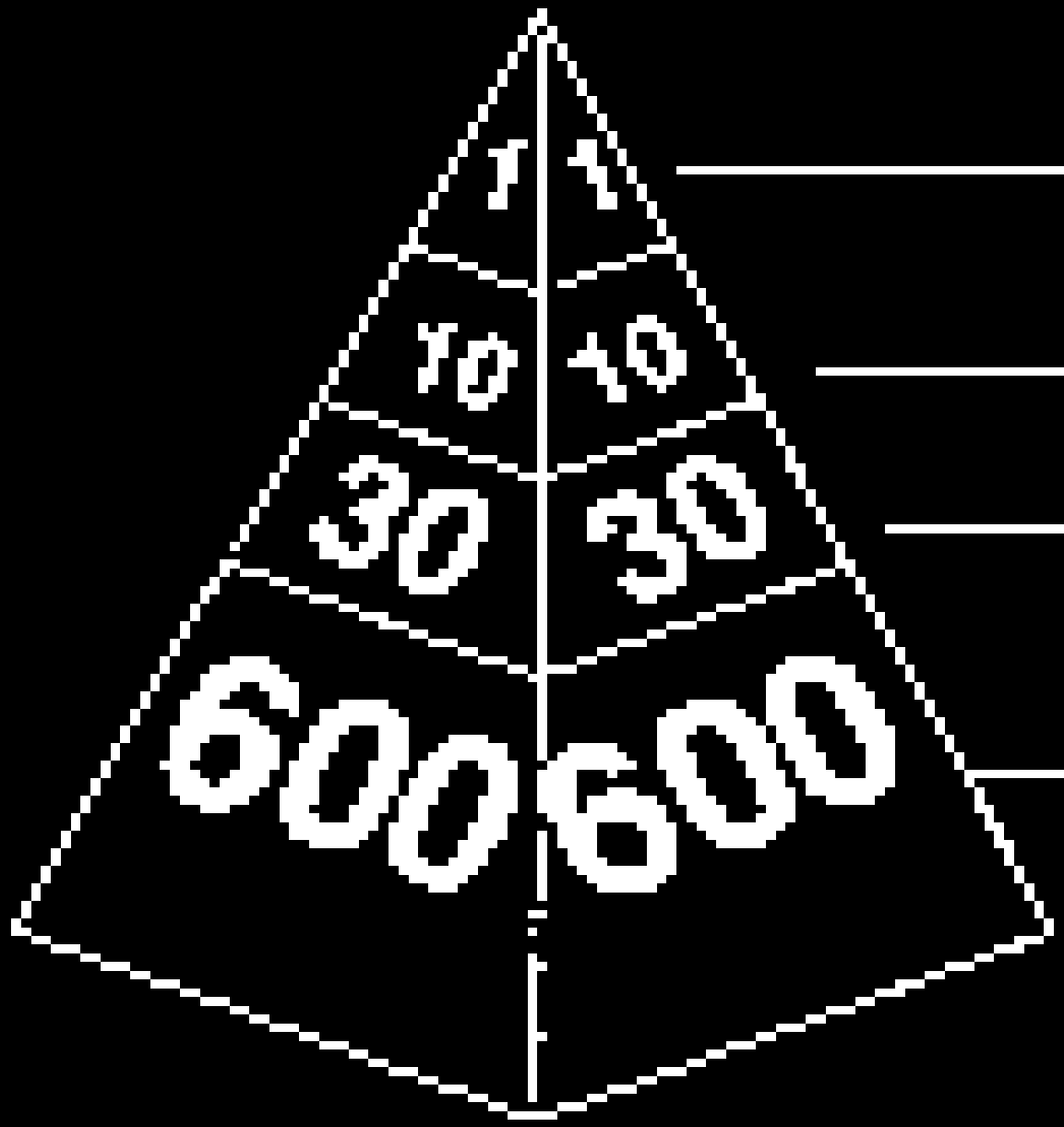
From experience and analysis: they are “caused occurrences”

Predictable: the logical outcome of hazards

Preventable and Avoidable: hazards do not have to exist. They are caused by things people do -- or fail to do.



ACCIDENT RATIO STUDY



SERIOUS OR MAJOR INJURY

Includes disabling and serious injuries

MINOR INJURY

Any reported injury less than serious

PROPERTY DAMAGE ACCIDENTS. All types

INCIDENTS WITH NO VISIBLE INJURY OR DAMAGE.

Near – accidents or close calls.

Why Investigate?

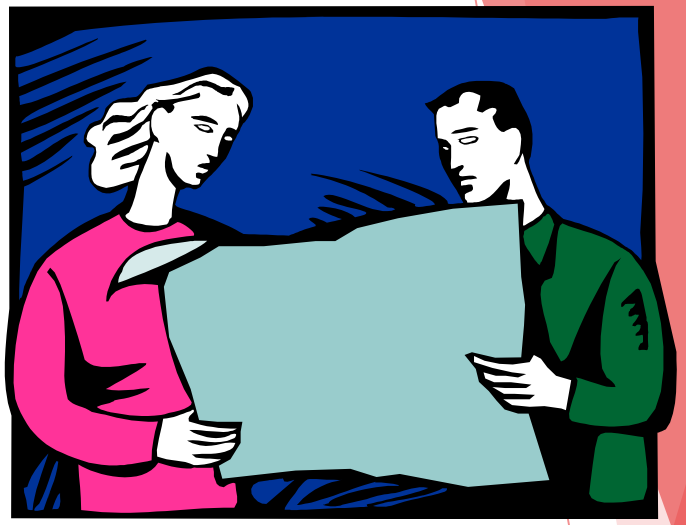
- Prevent future incidents (leading to accidents).
- Identify and eliminate hazards.
- Expose deficiencies in process and/or equipment.
- You lose money when regular work stops.
- Maintain worker morale.
- The rule requires you to investigate serious accidents.

Accident / Incident Investigation

Personnel who may be involved in an investigation:

- ✓ Injured person
- ✓ Witnesses
- ✓ First-line supervisors
- ✓ Senior Manager
- ✓ Middle Manager
- ✓ Safety Specialists
- ✓ Safety Representatives
- ✓ Experts
- ✓ External Agencies

How To Investigate



- **Develop a plan**

The time to develop your company's Accident Investigation Plan is before you have an incident or an accident.
The who, when, where, what and how should be developed before the incident.
Accident Investigation Training, investigation tools and your policies and procedures should be developed before the incident or accident.
One size will not fit all. Your company's motor vehicle investigation reports will differ from your warehouse investigations, as will your off-site investigations.

Tips for Developing A Plan

- Develop your action plan ahead of time.
- Your plan might include:
  - Who to notify in the workplace?
  - How to notify outside agencies?
  - Who will conduct the internal investigation?

Preplanning will help you address situations timely, reducing the chance for evidence to be lost and witnesses to forget. All procedures, forms, notifications, etc. need to be listed out as step-by-step procedures. You might wish to develop a flow chart to quickly show the major components of your program.

Tips for Developing A Plan

- What level of training is needed?
- Who receives report?
- Who decides what corrections will be taken and when?
- Who writes report and performs follow up?

Some expansion questions on the above points are:

Who will be trained to investigate?
Who is responsible for the finished report and what is the time frame?
Who receives copies of the report?
Who determines which of the recommendations will be implemented?
Who is responsible for implementing the recommendations?
Who goes back and assures that fixes are in place?
Who assures that fixes are effective?

Begin Investigations Immediately

- It’s crucial to collect evidence and interview witnesses as soon as possible because evidence will disappear and people will forget.

How To Investigate

- Investigate all incidents and accidents immediately
- Collect facts

It is important to begin your investigation immediately. Evidence disappears, the 50 kg carton of material was cleaned up and memory fades…the employee was not encouraged to report the near-miss incident and forgot about the whole thing.

When investigating incidents or accidents be thorough in your capture of all available facts. You might discover that many other items were also improperly stored and that when employees were questioned there had been several other “near misses”

How To Investigate

- Interview witnesses

Interview witnesses and victims in a timely manner. LISTEN
Don't blame, don't point out poor judgment, be sympathetic…LISTEN
If you know for a fact that someone broke a rule it is not important to point that out to them at this time. Verify with them the training they have received and ask them if they know what happened to cause the accident. Again, it doesn't do anyone any good at this juncture to be told "it was your fault" or "you knew better"

CONDUCTING INVESTIGATIONS

- Effective investigations are the product of planning, organising and training.
- A lot of information is available on every accident and incident, the investigator's problem is to find and concentrate on the most important.
- Collection of evidence can be classified under four main headings;

1. People Evidence
2. Position Evidence
3. Parts Evidence
4. Paper Evidence

CONDUCTING INVESTIGATIONS

1. People Evidence : Interviewing Witnesses

The first details from witnesses give the investigator the symptoms of the problem. They are the starting point on the path to basic causes.

CONDUCTING INVESTIGATIONS

1. People Evidence : Interviewing Witnesses

The first details from witnesses give the investigator the symptoms of the problem. They are the starting point on the path to basic causes.

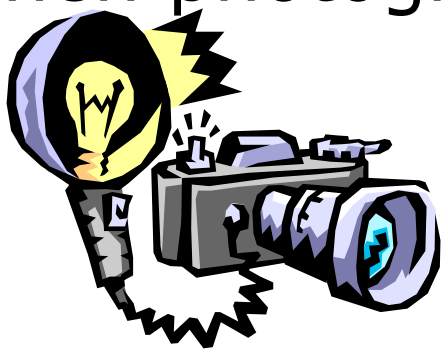
CONDUCTING INVESTIGATIONS

2. Position Evidence

Drawings and sketches help other people visualise what happened. They also document important information.

Photos and video tape of accident scenes can reveal much about an accident and save hours of note-taking and drawing.

When photographing:



- ☞ Photograph from all sides,
- ☞ And use long / medium / close-up sequences.

Actions At The Accident Scene

- Check for danger
- Help the injured
- Secure the scene
- Identify and separate witnesses
- Gather the facts

First, make sure you and others don't become victims! Always check for still-present dangerous situations. Then, help the injured as necessary.
Secure the scene and initiate chains of custody for physical evidence.
Identify witnesses and physical evidence. Separate witnesses from one another
If physical evidence is stabilized, then begin as quickly as possible with interviews.
REMEMBER, BE A GOOD LISTENER

Fact Finding

- Take notes on environmental conditions
- Note housekeeping and general working environment
- Note floor or surface condition
- Take many pictures
- Draw the scene

Some scenes are more delicate then others. If items of physical evidence are time sensitive address those first. If items of evidence are numerous then you may need additional assistance. Some scenes will return to normal very quickly. Are you prepared to be able to recreate the scene from your documentation?
Consider creating a photo log. The log should describe the date, time, give a description of what is captured in the photo and directionality. Link to sketch of accident scene.

CONDUCTING INVESTIGATIONS

3. Parts Evidence

- A good investigation requires a look at the tools, equipment, materials and facilities involved.
- Often, people's actions are prompted by worn or improper equipment.
- Sometimes part of the problem is in the failure or equipment or structures, i.e. Overloading, material defects, improper construction, inadequate servicing and other forms of abuse leave clues.

CONDUCTING INVESTIGATIONS

4. Paper Evidence

Logs, schedules, personnel training records and other files have information that can be used to identify the basic causes of problems.
These are seldom at the scene of an accident, so investigators often overlook them.
There are many possible sources of information;

- ✓ Training records,
- ✓ Maintenance Logs / Schedules,
- ✓ Task Procedures,
- ✓ Permits,
- ✓ Licenses,
- ✓ Certificates,
- ✓ Minutes of meetings, and
- ✓ Statements.

Investigate All Incidents/Accidents

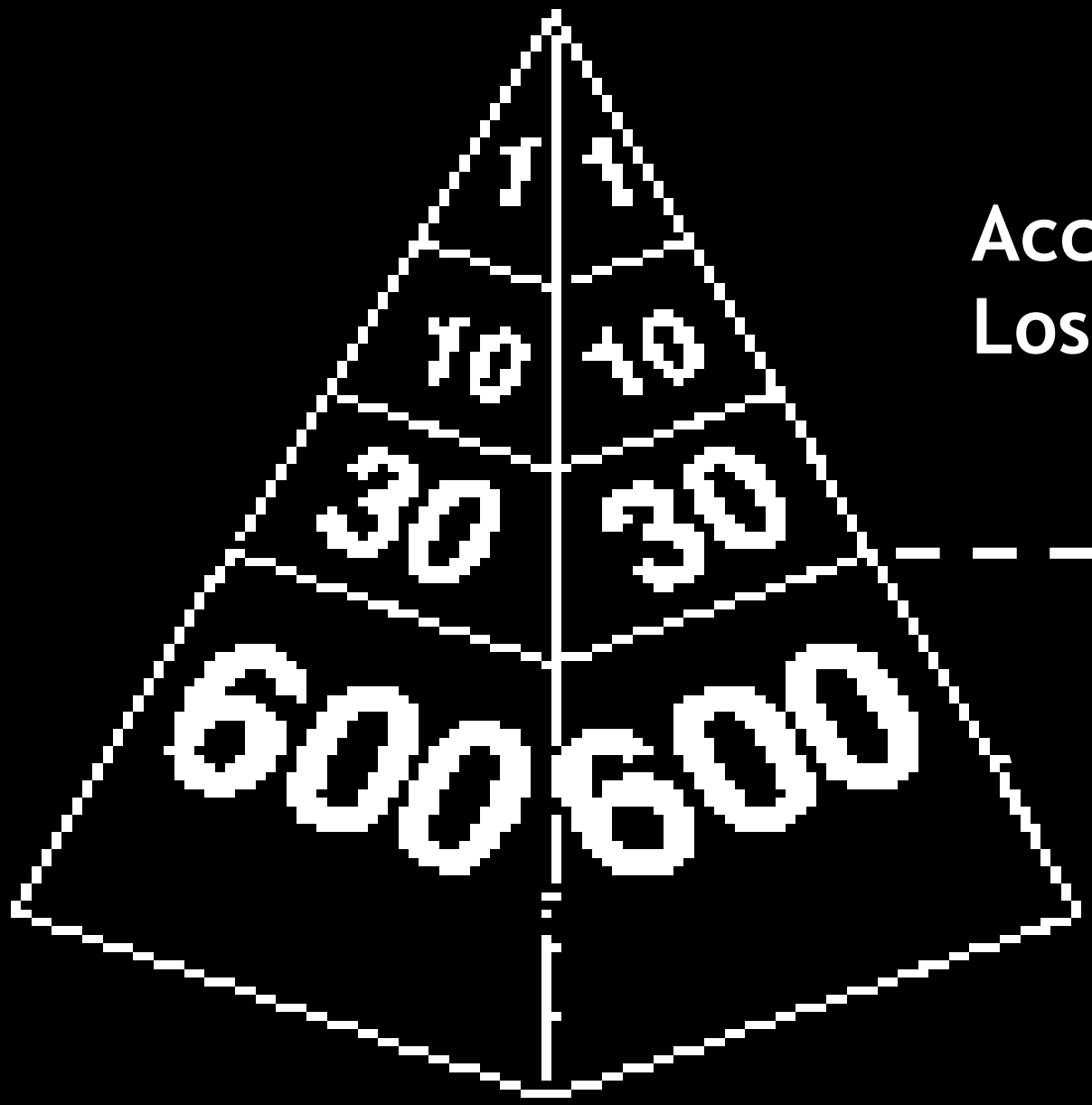
- Conduct and document an investigation that answers:
  - Who was present?
  - What activities were occurring?
  - What happened?
  - Where and what time?
  - Why did it happen?

Basic causes should be determined. Example: An employee gets cut. What is the cause? It is not just the saw or knife or the sharp nail. Was it a broken tool and no one reported? Did someone ignore a hazard because of lack of training, or a policy that discourages reporting? What are other examples of root causes? *Enforcement failure, defective PPE, horseplay, no recognition plan, inadequate labeling.*

Investigate All Incidents/Accidents

- **Also answer:**
  - Is this a company or industry-recognized hazard?
  - Has the company taken previous action to control this hazard?
  - What are those actions?
  - Is this a training issue?

ACCIDENT RATIO STUDY



Accidental Losses

No Loss Incidents

Same Causes

Accident Causation Model

Same Causes

Lack of Control	Basic Causes	Immediate Causes	Incident	Loss
Inadequate •Systems •Standards •Compliance	Personal Factors Job/System Factors	Substandard Acts / Practices Substandard Conditions	Event	Unintended Harm or Damage

Working back lets look at each step of the Causation Model

Same Causes

Lack of Control	Basic Causes	Immediate Causes	Incident	**Loss**
Inadequate •Systems •Standards •Compliance	Personal Factors Job/System Factors	Substandard Acts / Practices Substandard Conditions	Event	Unintended Harm or Damage

Loss

- **Unintended Harm or Damage**

The result of an accident is loss. The most obvious losses are harm to people and property damage.

Implied and important related losses are performance interruption and profit reduction.

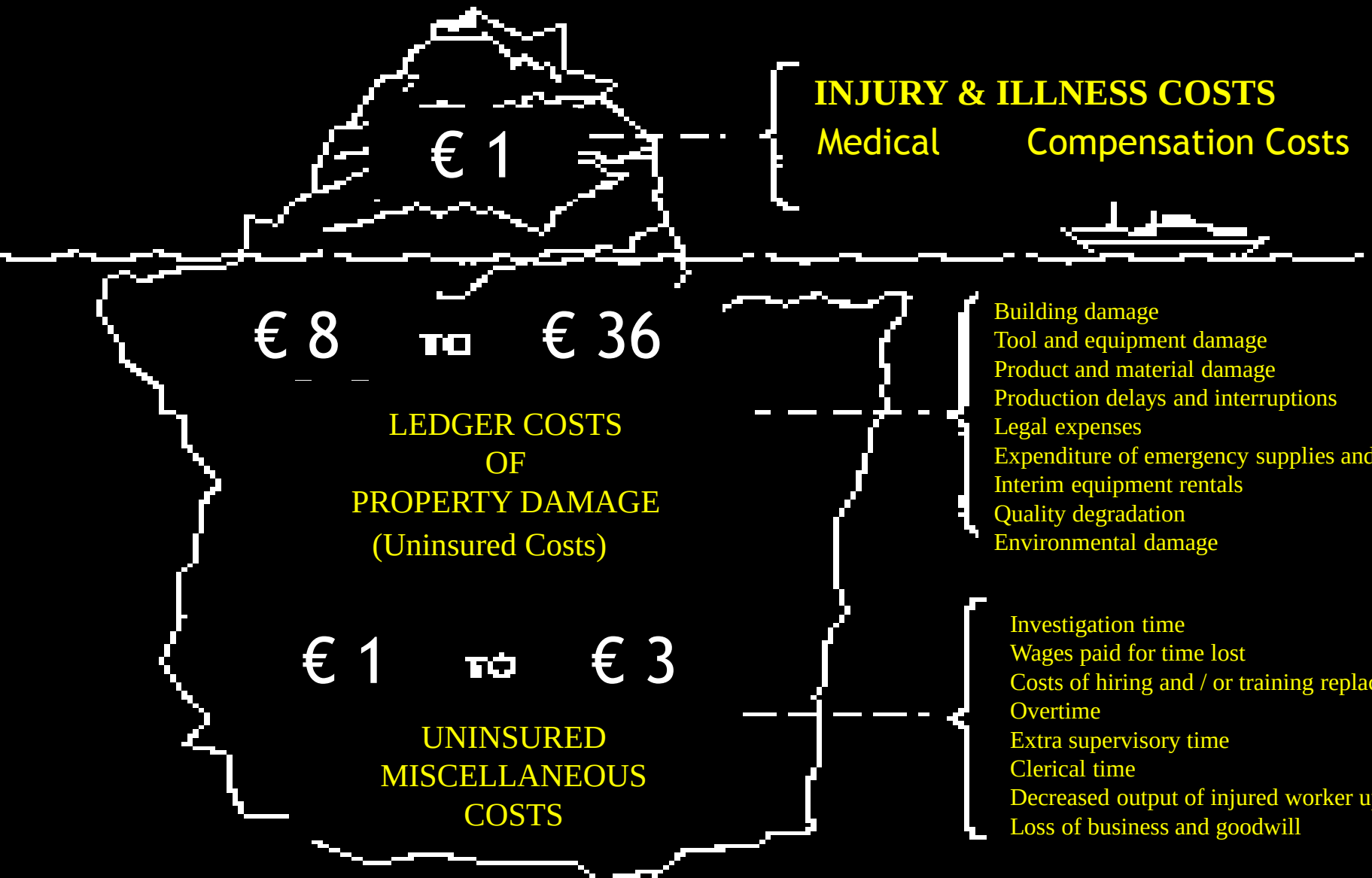
Once the sequence has occurred, the type and degree of loss are somewhat a matter of chance. The effect may range from insignificant to catastrophic, from a scratch to a dent to multiple fatalities or loss of plant.

Loss

- **Unintended Harm or Damage**

The type and degree of loss depends on fortuitous circumstances and partly on the actions taken to minimise loss.

ACCIDENT COST ICEBERG



Building damage
Tool and equipment damage
Product and material damage
Production delays and interruptions
Legal expenses
Expenditure of emergency supplies and equipment
Interim equipment rentals
Quality degradation
Environmental damage

Investigation time
Wages paid for time lost
Costs of hiring and / or training replacements
Overtime
Extra supervisory time
Clerical time
Decreased output of injured worker upon return
Loss of business and goodwill

Same Causes

Lack of Control	Basic Causes	Immediate Causes	Incident	Loss
Inadequate •Systems •Standards •Compliance	Personal Factors Job/System Factors	Substandard Acts / Practices Substandard Conditions	**Event**	Unintended Harm or Damage

Incident: An Event

As discussed earlier;

Unplanned and unwanted event which disrupts the work process and has the potential of resulting in injury, harm, or damage to persons or property.

Same Causes

Lack of Control	Basic Causes	**Immediate Causes**	Incident	Loss
Inadequate •Systems •Standards •Compliance	Personal Factors Job/System	Substandard Acts / Practices Substandard Conditions	Event	Unintended Harm or Damage

Immediate Causes

- The immediate causes of accidents are the circumstances that immediately precede the contact.

- They are called –

  - ☞ **unsafe (substandard) acts or practices** (behaviours which could permit the occurrence of an accident) and
  - ☞ **unsafe (substandard) conditions** (circumstances which could permit the occurrence of an accident).

Immediate Causes

- **Substandard Acts or Conditions** may be seen in one or more of the following forms:

SUBSTANDARD PRACTICES	
Operating equipment without authority	Improper loading
Failure to warn	Improper placement
Failure to secure	Improper lifting
Operating at improper speed	Improper position for the task
Making safety devices inoperable	Servicing equipment in operation
Removing safety devices	Horseplay
Using defective equipment	Failure to follow procedures
Using equipment improperly	
Failing to use personal protective equipment properly	Under the influence of alcohol and or other drugs

Immediate Causes

- **Substandard Acts or Conditions** may be seen in one or more of the following forms:

SUBSTANDARD CONDITIONS	
Inadequate guards or barriers	Noise exposures
Inadequate or improper protective equipment	Radiation exposures
Defective tools, equipment or materials	High or low temperature exposures
Congestion or restricted action	Inadequate or excessive illumination
Inadequate warning systems	Inadequate ventilation
Fire and explosion hazards	Poor housekeeping or disorderly workplace
Hazardous environmental conditions; gases, dusts, smokes, fumes, vapours	

Immediate Causes

- It is essential to consider these practices and conditions only as immediate causes or symptoms, and to do a through job of diagnosing the basic causes behind the symptoms. If you treat only the symptoms, they will occur again and again.
- You need to ask the essential question, '**Why**?':
  - ☞ Why did that substandard practice occur?
  - ☞ Why did that substandard condition exist?
  - ☞ Why did our loss control system permit that practice or condition?
- If your investigation is through, the answers will point the way to more effective control. To solve loss control performance problems, you must get to the **basics** (or fundamental) causes.

Same Causes

Lack of Control	**Basic Causes**	Immediate Causes	Incident	Loss
Inadequate •Systems •Standards •Compliance	Personal Factors Job/System Factors	Substandard Acts / Practices Substandard Conditions	Event	Unintended Harm or Damage

Basic Causes

- The basic causes are the diseases or real causes behind the symptoms; the reasons why the substandard acts and conditions occurred.
- Often these are referred to as root causes, real causes or underlying causes.
- While immediate causes (the symptoms; substandard acts and conditions) are usually quite apparent, it takes a bit of probing to get at the basic causes and to gain control of them.

Basic Causes

- Just as it is helpful to consider two major categories of immediate causes (*substandard acts and substandard conditions*), so it is helpful to think of basic causes in two major categories:
  - Personal Factors
  - Job Factors

Basic Causes

- Basic causes help explain why people perform substandard practices - **Personal Factors**.
  - It is logical that poor quality of work and substantial waste will result from placing a person with faulty eyesight on a job where good vision is critical for proper performance.
  - Similarly, a person who is never told the importance of a job is unlikely to be motivated to a high degree of pride in his or her work.

Basic Causes

- **Personal Factors.**

PERSONAL FACTORS
1 LACK OF SKILL OR KNOWLEDGE
2 CORRECT WAY TAKES MORE TIME AND/OR REQUIRES MORE EFFORT
3 SHORTCUTTING STANDARD PROCEDURES IS ACCEPTED OR REWARDED
4 PERSON THINKS THERE IS NO PERSONAL BENEFIT TO ALWAYS DOING THE JOB ACCORDING TO STANDARDS

Basic Causes

- Basic causes also help explain why substandard conditions exist - **Job Factors**.
  - Unsafe structures and work process layouts will be designed and built if there are not adequate standards and compliance for design and construction.
  - Equipment will wear out and produce a substandard product, create waste or break down and cause accidents if that equipment is not properly selected, properly used and properly maintained.

Basic Causes

- **Job Factors**

JOB FACTORS
5 LACK OF OPERATIONAL PROCEDURES OR WORK STANDARDS
6 INADEQUATE COMMUNICATION OF EXPECTATIONS REGARDING PROCEDURES OR STANDARDS
7 INADEQUATE TOOLS OR EQUIPMENT

Same Causes

Lack of Control	Basic Causes	Immediate Causes	Incident	Loss
Inadequate •Systems •Standards •Compliance	Personal Factors Job/System Factors	Substandard Acts / Practices Substandard Conditions	Event	Unintended Harm or Damage

Lack of Control

Inadequate Systems, Standards and/or Compliance

- Control is one of the four essential management functions: **plan, organise, lead/direct and control**.
- These functions relate to any manager's work, regardless of level, title or managed activity.
- The person who manages knows the loss control programme; knows the performance standards; plans and organises work to meet the standards; leads people to attain the standards; measures performance of self and others; evaluates results and needs; commends and constructively corrects performance.
- This is **MANAGEMENT CONTROL**.

Lack of Control

- Without it, the sequence of events begins and triggers the continuing causal factors that lead to loss.
- Without it adequate management control, the accident cause and effect sequence is started and, unless corrected in time, leads to losses.
- There are three common reasons for '**Lack of Control**':

1. **Inadequate system**
2. **Inadequate standards. And**
3. **Inadequate compliance with Standards**

Lack of Control

1. **Inadequate System**

A safety / loss control system may be inadequate because of too few or improper system activities. While the necessary activities vary with an organisations scope, nature, type and risk potential, research and experience show that there are common elements for building an adequate safety / loss control management system.

Example Elements: Leadership Training
Planned Inspections and Maintenance
Accident / Incident Investigation
Emergency Preparedness
Accident / Incident Analysis
Knowledge and Skill Training

Lack of Control

2. **Inadequate Performance Standards**

A common cause of confusion and failure is standards that are not specific enough and/or not high enough.

Standards let people know what is expected of them and permit meaningful measurement of how well they perform in relation to the standards.

Simply put, standards specify who does what and when and how often.

Adequate standards are essential for adequate control.

Lack of Control

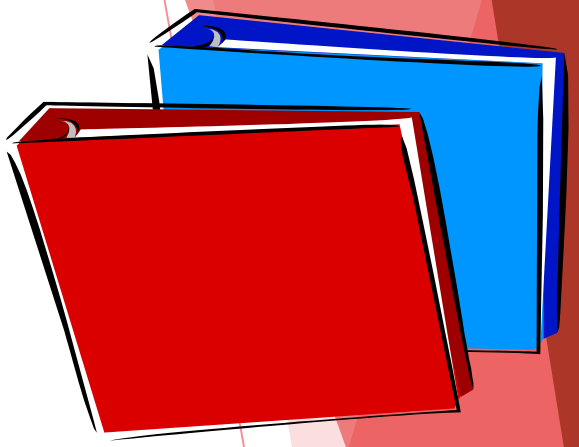
3. **Inadequate Compliance with Standards**

Lack of compliance with existing standards is a common reason for lack of control.

In fact, many managers feel that this is the single greatest reason for failure to control accident loss (although studies have shown that failure is more often associated with inadequate standards, not compliance).

Correcting these three common reasons for lack of control is a critical management / leadership responsibility. Developing an adequate system and standards is an executive function, aided by supervisors.

How To Investigate



- Write a report

The report should include:
An accurate narrative of “what happened”
Clear description of **UNSAFE ACT or CONDITION**
Clear description of **PERSONAL Factors or JOB Factors**
Recommended immediate corrective action
Recommended long-term corrective action
Recommended follow up to assure fix is in place
Recommended review to assure correction is effective.

Write The Report

- How and why did the accident happen?
  - A list of suspected causes and human actions
  - Use information gathered from sketches, photographs, physical evidence, witness statements

Remember that your report needs to be based on facts. All recommendations should be based on accurate documented findings of facts and all findings and recommendations should be from verifiable sources.

Write The Report

Answer the following in the report:

- When and where did the accident happen?
- What was the sequence of events?
- Who was involved?
- What injuries occurred or what equipment was damaged?
- How were the employees injured?

Taking Remedial Action

Temporary Actions

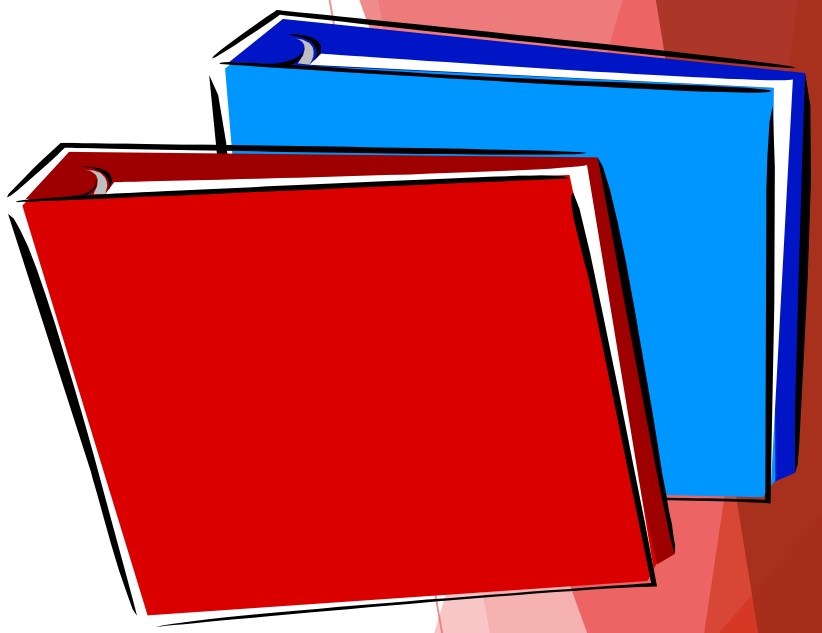
Most temporary actions correct only the symptoms – the substandard **actions and conditions.**

They do not remedy the basic problem.

Permanent Actions

Permanent actions are needed to truly solve the problem. These remedy the **personnel factors** and the **job factors** of the basis causes..

Report Conclusions



- ✓ What should happen to prevent future accidents?
- ✓ What resources are needed?
- ✓ Who is responsible for making changes?
- ✓ Who will follow up and insure implementation of corrections?
- ✓ What will be future long-term procedures?

Conclusions must always be based upon facts found during your investigation. If additional resources are needed during the implementation of recommendations then provide options. Having a comprehensive plan in place will allow for the success of your investigation. Success of an investigation is the implementation of viable corrections and their ongoing use.

Notification of Accidents and Dangerous Occurrences

- ✓ Accidents must be reported in the approved form – Form No.IR 1
- ✓ Dangerous occurrences must be reported on Form No.IR 3
- ✓ Records must be kept for 10years, of any notifiable accident or dangerous occurrence, usually at the place of work and supplied to HSA upon request.

Notifiable accidents include:

- ➲ A fatal accident to any employed or self employed person
- ➲ An accident which prevents an employee or self employed person from doing their work for more than three consecutive days excluding the day of the accident but including the days which are not working days;
- ➲ An accident to a person not at work which was caused by a work activity resulting in the loss of life or requiring medical attention
- ➲ A dangerous occurrence

Notification of Accidents and Dangerous Occurrences

- ✓ The 12th schedule to the regulations contains a list of sixteen headings containing various occurrences, which must be notified, regardless of whether any injury occurred.
- ✓ Where a notifiable accident has occurred and causes loss of life the scene of the accident should not be disturbed until after investigation by an inspector or until expiration of three clear days after notification.

Reporting to the HSA

An employer must –

Report to the H.S.A. any notifiable accidents and diseases and dangerous occurrences - *Any accident or incident which results in an employee being absent or sick for more than three (3) calendar days or injury to a member of the public requiring medical treatment must be reported to the H.S.A. – Forms IR1 or IR3*

Accident Report Forms

- Many varieties of Accident Report Forms are available and should match with your own organisations needs:
- **Your accident book should include the following information:**
- Name and address of the person 'injured' or involved in the incident;
- What happened, when & where?
- Who witnessed the incident
- Any other relevant details

ALL ACCIDENT REPORT FORMS SHOULD BE CONSIDERED LEGAL DOCUMENTS

Example of the True Cost of an Accident

- A small engineering firm employs 15 *staff. A* workers sleeve is caught on a rotating drill resulting in both bones in his lower arm being broken. He spends 12 days in hospital and is off work for 3 months. When he returns he is on light duties for 5 months and cannot operate machinery.
- The Managing Director is prosecuted under the Safety, Health & Welfare at Work Act 2005, fined €10,000 and legal costs.

Accident Cost Calculator – The True Cost

Details	Costs
Wages for injured worker over period	€10,000
Lost production/remedial work required	€8,000
Overtime wages to cover lost production	€3,000
Wages for replacement worker	€5,000
Loss of time of manager/MD	€15,000
Legal expenses	€9,000
Fines and court costs	€10,000 + €2500
Increase in Insurance Premiums	€5,000
TOTAL	**€67,500**