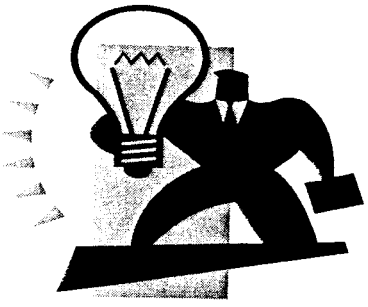
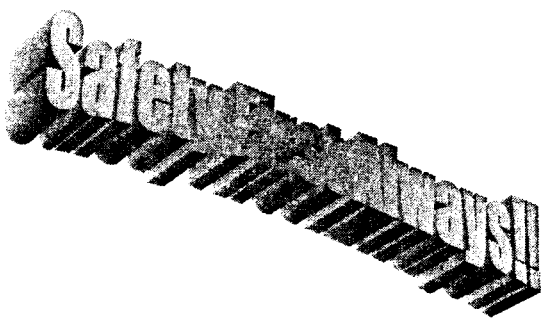
HCS 3000/3010 Part 1 Name: _____

Key Ideas

Fact Sheet 1: Safety: From Past to Present

- Safety is the control of accidental injury, damage, and/or loss.
- When workers are injured, there is loss and costs:
  1. Direct costs include:
     - Cost of medical treatment, benefits
  2. Indirect costs include:
     - Cost of property damage
     - Loss of production
     - Loss of profits
- In the past, safety was said to be "freedom from injuries."
- Safety programs now focus on:
  1. What management does.
  2. How workers do their work.
- Health and safety management systems (HSMS) are designed to prevent:
  1. Loss due to injuries
  2. Loss of production
  3. Damage to property.
- Today, effective HSMS have three levels of loss control:
  - Engineering Controls
  - Administrative Controls
    - management supports and encourages safe work practices
  - Basic/Point-of-Contact Controls (i.e., Personal Protective Equipment)





Unit 1: Safety: From Past to Present

Fact Sheet 1

Safety programs have come a long way. Companies have studied the mistakes of the past and have used these lessons to improve safe practices.

These improvements help to decrease the number of workplace injuries and deaths.

Learning from the Past

In the past, safety programs were designed to protect workers from injuries. ***"Safety"*** was defined as ***"freedom from injuries."***

Accidents were considered to be an undesired event that resulted in harm to people. ***"Incidents"*** were seen as ***a near accident or a near miss.***

Most people believed that injuries were caused by workers performing unsafe acts. Therefore, safety programs focused on training workers to practice safe work habits, to reduce the number of unsafe acts.

The focus was on workers and the solution was often to find someone to blame. For this reason, workers did not report incidents because they did not want to be blamed.

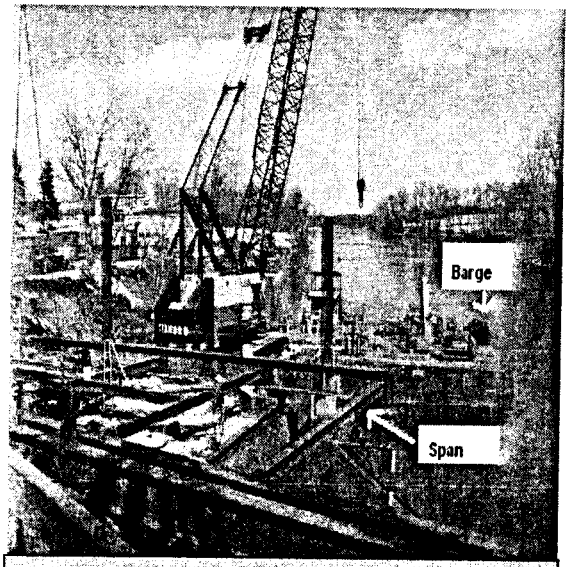
Managers would provide safety programs but were not responsible for the outcome. They provided the program for the worker; it was now up to the worker to work safely.

Key Terms

- ***Direct Costs:***
  Costs related to injuries (e.g., medical and benefit costs to worker)
- ***Indirect Costs:***
  Costs related to property damage, equipment damage, loss of productive work time, investigation time, hiring and training replacement workers, and loss of any business.
- ***Safety:***
  Control of accidental loss.
- ***Safety Management System:***
  A problem-solving approach to safety.

Organizations often viewed safety programs as an expense... with the key outcome being a reduction in worker injuries.

Based on this view, employers saw only the costs of providing safety programs and not the costs of having workers injured or killed on the job.



Due to injuries this workplace is closed for inspection. Ironworker Foreman Crushed when Bridge Support Element Broke during Dismantling (Case Report: 05NY013)
– Occupational Health & Safety

The definition of ***"accident"*** and ***"incident"*** changed to mean an ***undesired event that results in unintended harm or damage to people, property, environment, and/or loss of process/production.***

Incidents are also still recognized as a near miss but if the near miss could have caused harm, then it is investigated as an accident.

The definition of ***"safety"*** also changed from ***"freedom of injuries"*** to ***"control of accidental loss."*** In this definition, accidents/incidents are caused not only by unsafe acts but also by unsafe conditions.

The term ***"unsafe act"*** has also been replaced by the terms ***substandard practices*** and ***substandard conditions***.

The focus on safety moved away from worker to management.

This way of viewing safety becomes a safety management system — a problem-solving approach to safety.

Safety Today

Industries now work very hard to have a safe workplace. This reduces the number of accidents. It also helps a company run better.

A worker who cannot work because of injuries is hard to replace. The tasks done by this worker may not be done until the worker returns. This lowers a company's productivity. That is, its ability to make profit.

Workplace safety has three basic steps:

- ***Hazard Identification:***
  Knowing the things and actions that may lead to accidents.

- ***Hazard Evaluation:***
  Being able to judge the risk of each hazard.

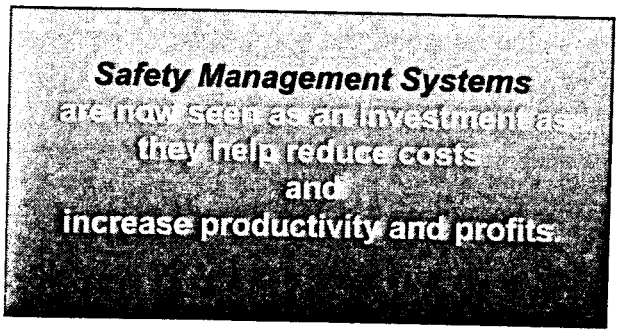
- ***Hazard Control:***
  Finding ways to reduce or get rid of each hazard.

Direct/Indirect Costs

Organizations could now include the direct and indirect or hidden costs of injuries and deaths.

Direct costs are related to injuries (e.g., medical and benefits to workers including compensation costs.)

Indirect costs include property damage, equipment damage, loss of productive work time, investigation time, hiring and training replacement workers, environmental and insurance costs, and loss of any business.



Safety management systems have now become an essential part of many organizations and have greatly improved workplace safety.

Loss Control

Loss control is the term now used to describe actions taken in an organization to help prevent:

- Injury to people
- Damage to property
- Loss of productivity and profit

There are 3 levels of loss control:

1. ***Engineering Controls:***
   - Seeks to create a culture of safety in an organization.

2. ***Administrative Controls:***
   - Includes the setting up of safety committees and ongoing safety training.

3. ***Basic Controls:***
   - Includes the use of personal protective equipment (PPE).

More information on Loss Control methods is contained in the following units.

Regardless of the method of control used, each control method should be checked regularly to be sure that it is effective.

Employers and Workers' Responsibilities

The *Alberta Occupational Health and Safety Act* states:

2 (1) Every ***employer*** shall ensure, as far as it is reasonably practicable for the employer to do so.

a) the health and safety of

i) workers engaged in the work of that employer, and
ii) those workers not engaged in the work of that employer but present at the work site at which that work is being carried out, and

b) that the workers engaged in the work of that employer are aware of their responsibilities and duties under this Act, the regulations and the adopted code.

(2) Every ***worker*** shall, while engaged in an occupation,

a) take reasonable care to protect the health and safety of the worker and of other workers present while the worker is working, and

b) co-operate with the worker's employer for the purposes of protecting the health and safety of

i) the worker,
ii) other workers engaged in the work of the employer, and
iii) other workers not engaged in the work of that employer but present at the work site at which that work is being carried out.

Unit 1: Safety: From Past to Present

Test 1

Use **Unit 1: Safety: From Past to Present – Fact Sheet 1** and other resources.
Answer the following questions:

1. Define the following terms using a) their past meaning, and b) their present meaning.

Term	Past Meaning	Present Meaning
Accident		
Safety		

____/4

2. The following terms: ***"unsafe acts"*** and ***"unsafe conditions"*** were used in the past.

   a) What two terms tend to be used today?

   1. _____

   2. _____

   b) Why is each of the new terms more appropriate?

   _____

   _____

____/6

3. Describe the meaning of the indirect costs of accidents.

_____

_____

_____

____/4

4. Why would safety programs that focus on reducing unsafe acts tend to place the blame on workers?

_____

_____

_____

____/4

5. Why would safety programs that focus on substandard practices and substandard conditions tend to place the focus on management instead of workers?

_____

_____

_____

____/4

6. How may accidents affect productivity?

_____

_____

_____

____/3

7. a) Why might some employers see safety management systems as an investment rather than a cost factor?

_____

_____

b) Why might some employers see safety programs as a cost factor rather than an investment?

_____

_____

____/4

8. a) Describe the safety programs of the past, their advantages and disadvantages.

____/3

b) Describe the purpose of safety management systems, their advantages and possible disadvantages.

____/3

9. Describe each of the following types of controls:

a) Engineering Controls _____

_____

b) Administrative Controls _____

_____

c) Basic/Point-of-Contact Controls _____

_____

___/15

Total: Safety: From Past to Present Test 1: __/50

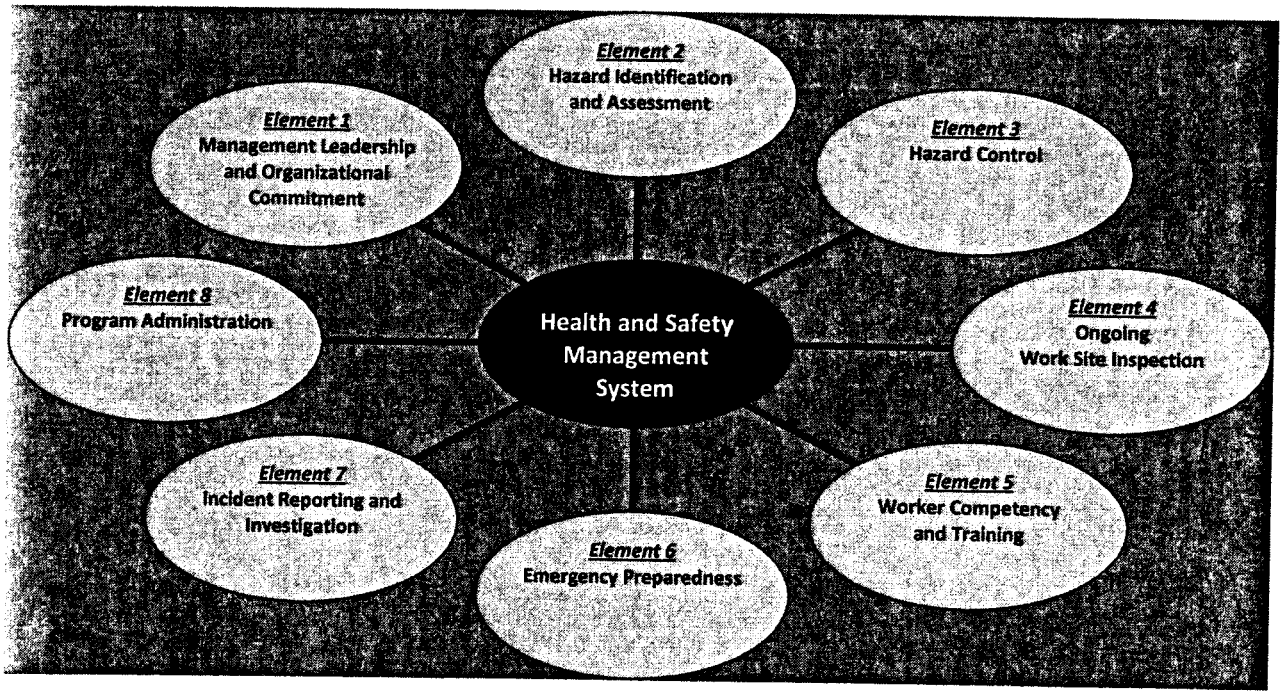
Key Ideas

Unit 2: Health & Safety Management Systems: The 8 Elements

- A health and safety management system (HSMS) is a series of processes put in place to protect workers and others.
- A HSMS includes the following elements (processes/documents):

1. Management commitment or policy
2. Hazard identification and assessment
3. Hazard controls
4. Ongoing inspections
5. Qualifications assessment and training
6. Emergency Response Planning
7. Incident Reporting and Investigation
8. HSMS Administration.

- An effective HSMS must include each of the 8 elements.



Unit 2: Health & Safety Management Systems: The 8 Elements

(The following information has been accessed and modified from http://employment.alberta.ca/SFW/996.html)

Fact Sheet 2

A health and safety management system is a process put in place by an employer to minimize the incidence of injury and illness to workers involved in their working operations. This is accomplished through identifying, assessing and controlling risks to workers in all operations of work. The scope and complexity of a health and safety management system will vary according to the type of workplace and the nature of operations carried out.

To be effective, the following 8 components are considered to be essential and form the basis of the health and safety management system:

1. *Management Commitment and Policies*

A written health and safety policy stating the company's commitment, the overall goals and objectives for their health and safety program and the responsibilities of management, workers, visitors and contractors.

The policy should be dated and signed by the senior operating manager and/or CEO for the work site.

2. *Identify and assess hazards*

Evaluate all equipment, machinery, work areas and work processes to identify and analyze all potential sources of harm to workers. A record of all hazards should be kept, along with the degree of risk and level of potential exposure for workers.

Key Terms

- ***Hazard control:*** *Things done to avoid or stop injury or loss.*
- ***Hazard evaluation:*** *Judging the level of risk for each hazard.*
- ***Hazard identification:*** *Being able to recognize things that could cause injury or loss.*
- ***Lost-time claim:*** *A report sent to the WCB when a workplace injury causes lost time.*

3. *Hazards and Risk Controls*

Control measures should be developed for each hazard identified.

Typical control methods include:

- Engineering,
- Administrative and
- Basic Point of Contact - Personal Protective Equipment.

Records of safe work practices and procedures for hazardous operations should be readily available and all workers trained.

4. *Workplace Inspection Program*

To ensure that hazard control measures are in place and effectively protect workers, a regular inspection program is important.

Inspection tours provide important information, including information about hazards or potential hazards that have not been noted before and a check that controls to eliminate or reduce risks of known hazards are in place and working.

Records of all inspections should be kept, including the checklist used.

5. *Worker competency and training:*

Worker training is an essential phase of an effective health and safety program. Workers need to know how to do their jobs safely and without risk to their health.

New and/or young workers need special consideration. New worker orientation should be completed within the first week on the job and critical information must be covered on the first day. All training should be documented.

6. *Emergency Response Planning*

A serious emergency, such as an explosion, fire or flood could put any company out of business.

Even the best health and safety program cannot protect from all natural or unexpected disasters. However, a good emergency response plan that is in place and practiced regularly can reduce the risk of injury and loss.

7. *Incident Reporting and Investigation*

When an incident occurs, it is important to report it to a supervisor. The supervisor should:

- Investigate cause
- make sure previously uncontrolled hazards do not remain a risk
- prevent the recurrence of similar incidents
- determine if training or changes in control methods, such as personal protective equipment and procedures, need to be changed to make the workplace safer or healthier.

All incidents must be investigated as soon as possible.

8. *HSMS Program Administration*

HSMS program administration ensures that all parts of a health and safety management system are properly documented and communicated to employees. Records help to ensure that the program is effective in reducing the risk of injury and ill health at the workplace.

Evaluation/Audits

A comprehensive review of the employer's health and safety management system is carried out through a workplace safety audit.

Alberta Employment and Immigration's *Partnerships* recognizes the efforts of employers who meet provincial standards by issuing of a Certificate of Recognition (COR).

To qualify for a COR, a safety audit must be carried out by a qualified auditor. The auditor must use an audit instrument that is approved for *Partnerships* use and is acceptable to a Certifying Partner.

The audit will cover the basic elements of a health and safety management system and will include interviews, documentation review and observation technique.

Unit 2: Health & Safety Management Systems
The 8 Elements

Test 2

Use **Unit 2 – Health & Safety Management Systems: The 8 Elements** – Fact Sheet 2 and other resources. Answer the following questions:

1. Describe the purpose of a Health and Safety Management System (HSMS).

_____

_____

_____

____/5

2. Explain the purpose of each of the following HSMS elements.

1) Management Commitment and Policies

_____

_____

_____

____/5

2) Hazard and Risk Identification and Assessment

_____

_____

_____

____/5

3) Hazard and Risk Controls

_____

_____

_____

____/5

4) Workplace Inspections

_____

_____

_____ ____/5

5) Worker Competency Assessment and Training

_____

_____

_____ ____/5

6) Emergency Response Planning

_____

_____

_____ ____/5

7) Incident Reporting and Investigations

_____

_____

_____ ____/5

8) HSMS Program Administration

_____

_____

_____ ____/5

3. Using the Template I: "HSMS – Elements Identification" found on next page, identify the HSMS elements found at a selected workplace. ____/

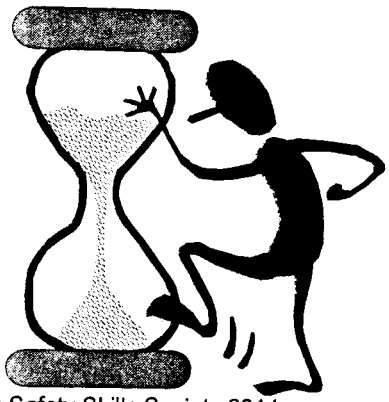
Do not complete

Total: Health and Safety Management Systems: The 8 Elements Test 1: ____/45

Key Ideas

Unit 3: Hazards: What Are They?

- A safe place would have no hazards.
- Hazards can be found everywhere: at home, in school, in all workplaces.
- Hazards in the workplace can cause:
  - injuries/death
  - loss of income
  - property damage
  - environmental damage
  - loss of production and profits.
- Most hazards can't be removed. They can only be controlled and the risk of injury reduced.
- Types of hazards include:
  - Physical
  - Chemical
  - Biological
  - Ergonomic
  - Psychological/Mental Health.
- "Hazard control" means reducing risk of injury, damage or loss.
- If a hazard is not controlled, it's only a matter of time before someone is injured.



Make the time to be safe!!!

Unit 3: Hazards: What Are They?

Fact Sheet 3

A safe workplace would have no ***hazards***. There would be no machines, equipment or materials that could harm people.

However, there are no safe workplaces.

An important part of workplace safety is being able to identify hazards before someone gets injured.

Identifying hazards is the first step in ***reducing*** risk or injury.

Incidents/Accidents

An incident may be a ***"hit"*** or ***"near miss."*** It is an event that has or could have caused an injury.

Accidents are incidents that have caused one or more of:

- Injuries to workers
- Property damage
- Environmental damage
- Loss of product

Reducing the number of accidents and incidents improves workplace safety.

Key Terms

- ***Environmental Damage:*** *Damage to the air, trees or plants, etc.*
- ***Hazard:*** *An activity, event or condition that could create an incident that causes damage, injury or illness.*
- ***Paramedic:*** *Persons trained to give basic medical aid.*
- ***Reducing:*** *Making less.*

If a hazard is not controlled,
it's only a matter of time before someone is injured.

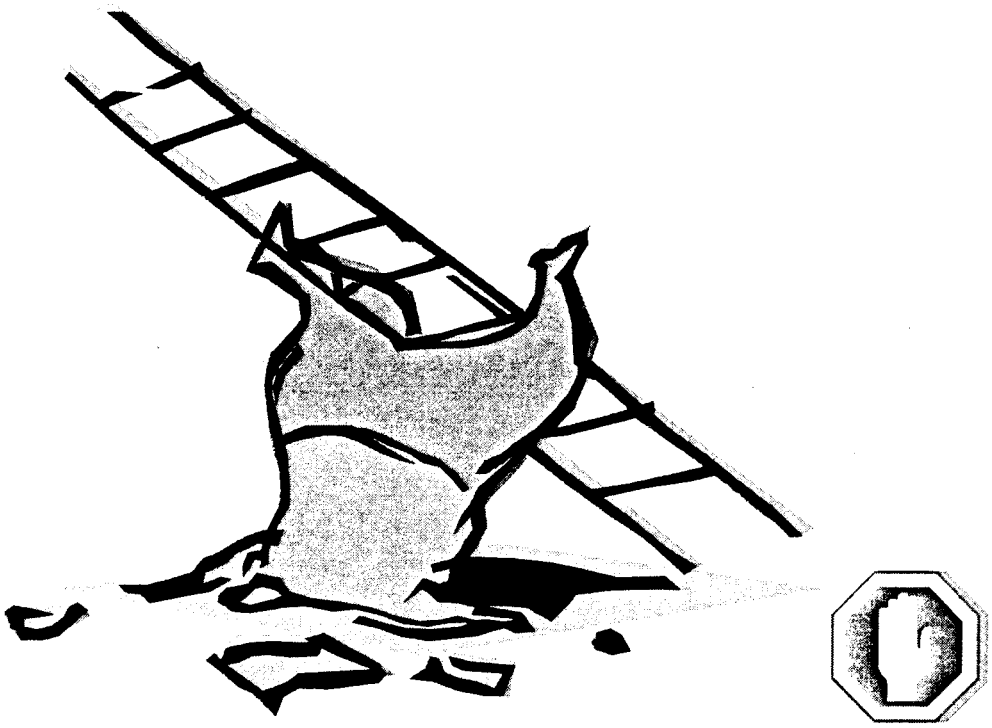
Hazards: What Are They?

A hazard is an activity, event or condition that could cause an accident or incident that results in injury or illness to people and/or damage to property.

Remember

To prevent an accident or incident, hazards must be identified and controlled.

A hazard can be something as simple as a ladder left lying around. It can also be something like a chemical substance used in a workplace.



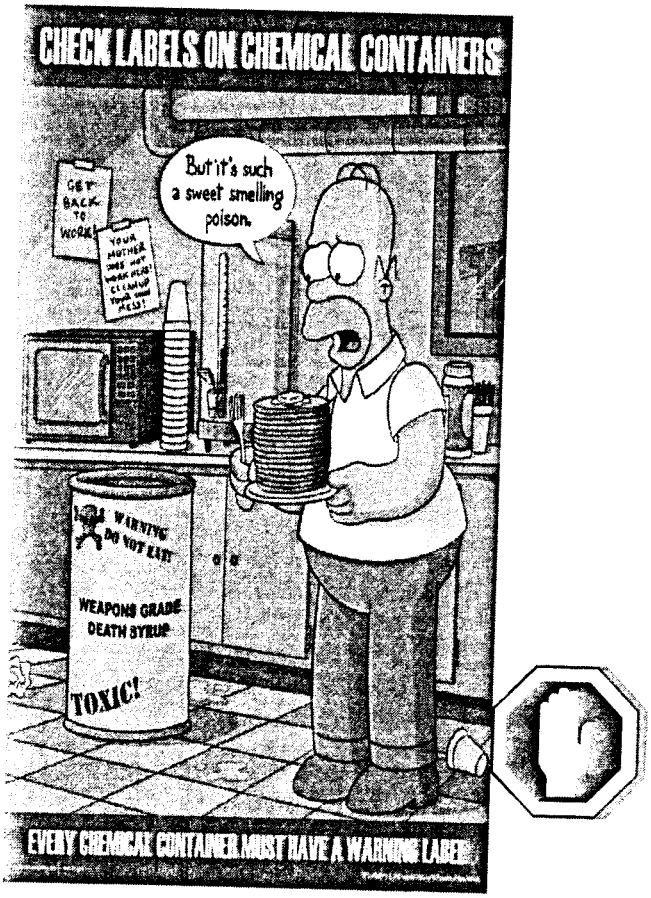
Types of Hazards

Hazard types include:

- Physical
- Chemical
- Biological
- Ergonomic
- Psychological/mental health

Ergonomic and psychological/ mental health hazards are described in Unit 4 Ergonomics: Fitting the Workplace to You, Fact Sheet 4 and Unit 5 Hazard Risk and Assessment and Controls, Fact Sheet 5.

Each industry has its own hazards. Industries often use labels to describe different types of hazards.



Physical Hazards include:

- Using equipment, machines and tools
- Working in extreme temperatures
- Personal movement and moving things

Types of physical hazards:

- **Noisy equipment**
- **Vibrating equipment – jack hammers, driving vehicles**
- **Being run over, crushed, or pinned.**
- **Being caught in equipment, machinery**
- **Using the same tool in the same position all day long**
- **Working in extreme cold or hot conditions**
- **Frayed electrical cords**
- **Overhead power lines**
- **Items lying on the floor**
- **Working from heights**
- **Falling objects**

Chemical Hazards include:

- Chemical mists, vapors, gases, dusts or fumes

Types of chemical hazards:

- **Using strong cleaning products**
- **Oil-based paint**
- **Working in area with lots of dust**
- **Being exposed to asbestos**
- **Using hazardous materials**

Biological Hazards include:

- Insects, fungi mold viruses, and
- Working with plant material

Types of biological hazards:

- **Insect stings**
- **Some plants, fungi or mold, e.g., poison ivy**
- **Wet or damp materials that could grow fungi or mold, e.g., greenhouses, granaries**
- **Contact with other people or things carrying viruses or bacteria**

Ergonomic Hazards include:

- Inappropriate job and workstation design
- Improperly adjusted work benches, desks, keyboards.
- Harvesting crops by hand.
- Poor lighting
- Repetitive Strain, i.e., operating machinery for long periods of time, i.e., combines, tractors, jackhammers

Psychological (mental health; psychosocial) include:

- Workplace-induced and other stressors
- Excessive work hours and/or shift work
- Challenging personal /Interpersonal relationships
- Discrimination and harassment

Can this person improve his safety?

Yes!! Remember -- Wear Personal Protective Equipment (PPE)!

(See Recommended Unit 12: Personal Protective Equipment (PPE).

Unit 3: Hazards: What Are They?

Test 3

Use **Unit 3– Hazards: What Are They?** – Fact Sheet 3 and other resources. Answer the following questions:

1. Complete each sentence:

   - A hazard is _____

     _____.
   - An accident is _____

     _____.
   - An incident is _____

     _____.
   - An injury occurs when _____

     _____.

____/4

2. List 3 types of hazards and a workplace where each hazard may be found.

Hazard	Workplace

____/6

3. A worker can't find the small step ladder used to place supplies on a high shelf. The worker uses a chair instead. What type of hazard is this?

   _____

____/2

4. A greenhouse worker has to clean up a pile of bags. They have been there for a long time and are damp and moldy. What type of hazard is this?

   _____

____/2

5. A worker has to take material to an office on the other side of the building. To save time, the worker walks through an area of the building that is being rebuilt. A piece of wood falls and hits him. What type of hazard is this?

_____ ___/2

6. A janitor uses a very strong floor cleaner that has a very strong smell. What type of hazard is this?

_____ ___/2

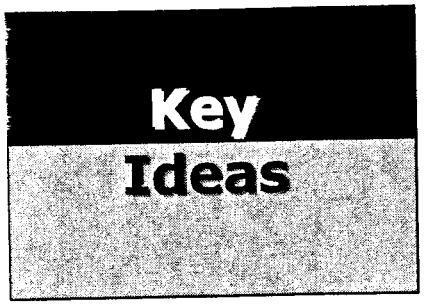
7. A worker uses the same tool in the same position all day? What type of hazard is this?

_____ ___/2

8. Using Template 2: Hazard Identification, identify hazards and controls found in a selected workplace.

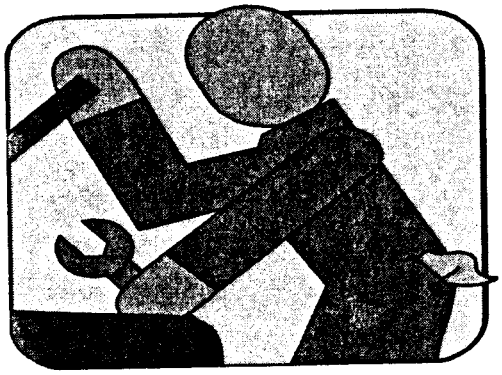
Do not complete ___/

Total: Hazards: What Are They? Test 3: ___/20



Fact Sheet 4: Ergonomics: Fitting the Workplace to You

- A good fit between worker and workplace improves worker health and safety.
- Ergonomics is concerned with:
  - how work is done e.g. sitting standing,
  - what work is done e.g. lifting, typing
  - using proper tools and equipment for the job
  - work area shape, size and space
  - lighting (dark, light, glare)
  - temperature (hot or cold)
  - reducing stress.
- Tasks done many times during the work day can cause a "repetitive strain injury".
- Breaks from work can help stop repetitive strain (ergonomic) injuries.



Use the right tools in the right way

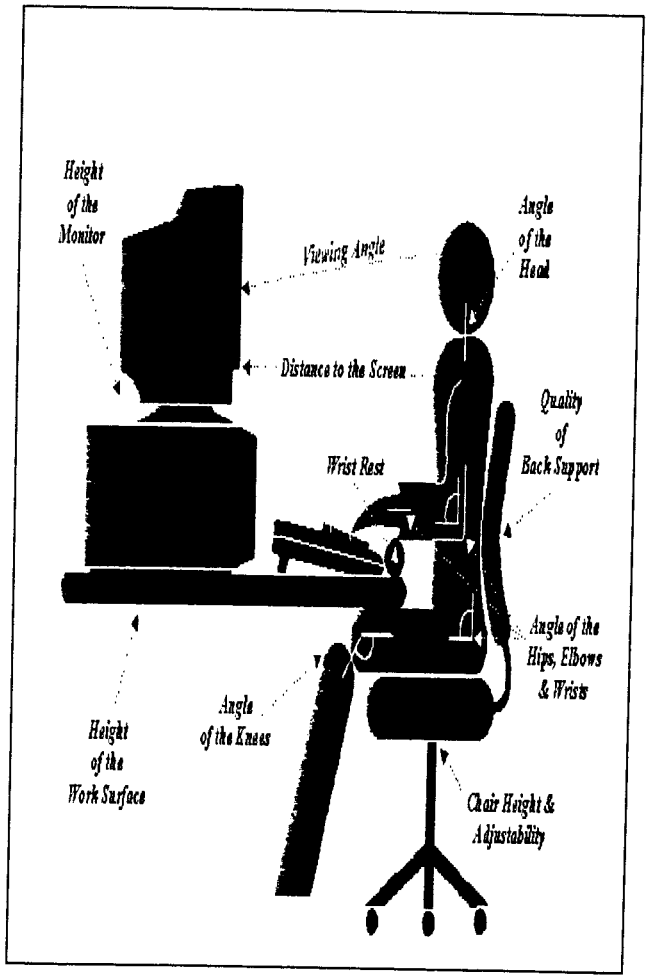
Unit 4: Ergonomics: Fitting the Workplace to You

Fact Sheet 4

Ergonomics is the study of the fit between people and their jobs.

The main goal of ergonomics is to improve:

- the well-being of workers
- the activity of workers
- reduce risk of injury.



Key Terms

- ***Adjustable:*** *Something that can be made to fit or be used in many different ways by many different people.*
- ***Designers:*** *People who make things to fit tasks and to meet people's needs.*
- ***Ergonomics:*** *Fitting the workplace to the worker.*
- ***Ergonomic Hazard:*** *Any hazard that can cause injury or harm to a body part or system.*
- ***Focusing:*** *Keeping your mind and eyes on what you are doing.*
- ***Repetitive Strain Injuries:*** *Injuries caused by doing the same task over and over again each and every day.*

When setting up a workplace, this question should be asked and answered:

> ***How can the workplace be set up so that each worker can do the job well, with the most comfort, and with the least risk of injury?***

The Goal of Ergonomics

The goal of ergonomics is to improve the workers' health and comfort.

Workers who feel well work better.

Worker well-being can be improved by:
- having a healthy and safe workplace
- reducing worker stress
- increasing job satisfaction
- enhancing the quality of work life
- reducing repetitive strain injuries.

Ergonomics looks at how:
- people work with people
- people work with equipment
- people use furniture
- people work in different workplaces.

How People Function

Because each person's body is shaped differently, it is important to make workplaces that will fit (***are adjustable***) to any worker.

Most new equipment and furniture can be adjusted so it can fit people with different sizes, shapes and needs.

Ergonomics measures:
- body sizes and shapes
- body functions (muscle and sensory systems -sound, sight, smell, etc.)
- mental activity (problem solving, decision-making).

Work can be checked to see which of these measures has the most effect on a worker.

Checking for Ergonomic Fit

To check workplace fit ask:
- What task(s) needs to be done?
- What tools and equipment are needed?
- Is a lot of physical work needed?
- Is a lot of mental work needed?
- Is paying attention important to the work?

Fitting the Workplace to:

People

How can workplaces meet the needs of all workers?

Ergonomic specialists divide people into three height and size ranges:

- low
- average
- high.

This information is used in designing the workplace. This ensures that equipment, fixtures, and furniture are usable by as many people as possible. The best design is one that can be adapted to fit everyone.

Lighting

Ergonomic specialists try to put in proper lighting for the job.

Just like furniture and equipment, lighting should be adjustable.

A workplace that is too light or too dark can cause eye strain and headaches.

Workspace

Each workspace must be large enough for larger as well as smaller sized workers.

Furniture

Office furniture can be made to fit different body sizes.

Furniture designers now make chairs that can be adjusted. These chairs can be used by people of all shapes and sizes.

Chairs can also be custom-made to fit unusual body sizes. However, custom-made chairs are much more expensive to buy.
Office furniture and equipment should adjust to fit most body shapes and sizes.

People's Abilities

People differ in how their muscles work and how their senses work. That's how eyes see, ears hear, and noses smell.

Some people:

- are stronger than others.
- are more flexible.
- have a stronger sense of smell.
- have better hearing.
- have good eyesight.

Knowing the limits of most physical and sensory systems can help in fitting a workplace to its workers.

For example:

- In a factory where heavy objects must be moved, a conveyor belt or trolley could be used to reduce lifting hazards.

- If a workplace needs workers to hear a danger signal, then the sound should be loud enough for all workers to hear.

In some cases, special needs can be met. For example:

- If a worker needs a quiet work area, special screens can be put around the work area.

- If a worker requires more lighting, then a desk lamp may be added to the work area.

Mental Tasks

Many jobs involve a lot of mental activity. For example, jobs that require workers to:

- Receive information
- Quickly assess it
- Make a decision
- Take action.

These jobs can be very stressful as the mental work may affect lives (e.g., air traffic controllers, pilots.)

Ergonomic specialists plan workplaces and systems that lessen the chance of mental errors. To do this, they have to know how people get information and what they do with it. These specialists help workers get information and make decisions as quickly and as easily as possible.

For example:

- People hear a danger signal better if there is no background noise. People react better if they recognize different workplace sounds.
- People react quickly to symbols that they see and recognize. This is why road signs use symbols.
- Regular work breaks help people relax and be more focused when they return to their work.

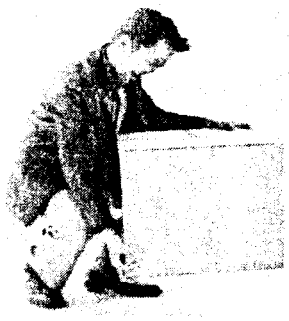
The Workplace –

If it Doesn't Fit

There can be a number of signs that a workplace is not fitted to a worker.

For example:

- Aches in the same area of the body during or after each work day.
- Stress headache from focusing too long and too hard on a specific job.
- Backache or pain that is constant from lifting objects at work.



Many ergonomic type injuries are called ***Repetitive Strain Injuries*** (RSIs).

RSIs are caused by work needing long hours of the same movement (e.g., typing). They can also be caused by work that requires holding a body in a fixed position for long periods (e.g., holding shoulders in a fixed position while painting overhead).

RSIs: What To Do

RSIs, such as, pains in the same body part every day should be reported. If the pain is a result of an ergonomic hazard, the employer must try to control the ergonomic hazard.

- The workplace should be adjusted to fit the worker.
- A desk or table may not be the right height for the worker.
- Workers can also be given breaks more often or asked to perform other tasks for short periods.

Unit 4: Ergonomics: Fitting the Workplace to You

Test 4

Use **Unit 4 – Ergonomics: Fitting the Workplace to You** – Fact Sheet 4 and other resources. Answer the following questions:

1. What is ergonomics?

_____

_____ ____/2

2. Why is ergonomics important?

_____

_____ ____/2

3. What does ergonomics try to do?

_____

_____ ____/2

4. Describe three ergonomic factors used to measure people:

a) _____

b) _____ ____/3

c) _____

5. What areas of a workplace does ergonomics usually study?

_____

_____ ____/2

6. What changes should be made to a workplace to fit a tall worker's needs?

_____

_____ ____/4

7. A factory worker is 1.6m tall. For most of the day, the worker is at a table packing boxes for shipping. At the end of the day, the worker complains of aching shoulders and an ache in the neck.

a) What ergonomic principle was not used in designing this workplace?

_____

b) What should be done to control this hazard?

_____

___/5

8. A control room operator has sat and watched controls for five hours. The operator didn't get a break because one of the other workers was away sick. The operator gets tired and makes a mistake reading one of the controls.

a) What ergonomic principle was not followed?

_____

b) What should be done to control this hazard?

_____

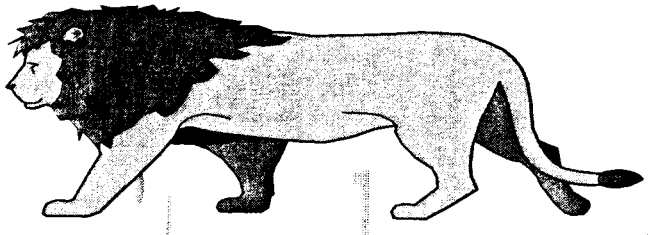
___/5

Total: Ergonomics: Fitting the Workplace to You Test 4: ___/25

Key Ideas

Fact Sheet 5: Hazard and Risk Assessment and Controls

- A hazard is anything that can cause injury or loss.
- To reduce accidents, injuries and loss:
  - be able to identify hazards.
  - know if a hazard is a high, medium or low risk.
  - know what to do to control the hazard.
- Hazard identification, assessment and control can help prevent injuries.
  - ***Identification*** is seeing a hazard and knowing what it is.
  - ***Assessment*** is knowing the risk of each hazard.
  - ***Control*** is what may be done to limit the hazard from causing harm or loss.
- Types of hazards:
  - chemical, e.g. gas, acid,
  - physical, e.g. noise, electricity
  - biological, e.g. animals, viruses, bacteria
  - ergonomic, e.g. tools, equipment, work area
  - psychological, e.g. stress.



Keep it under control!!

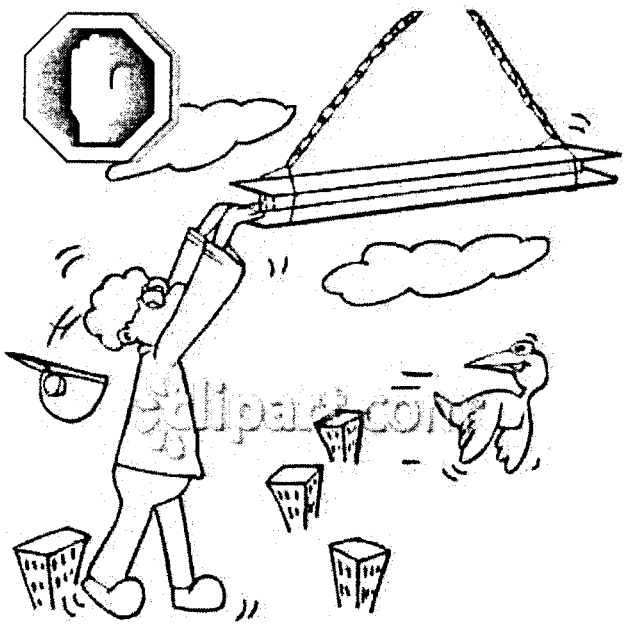
Unit 5: Hazard and Risk Assessment and Controls

Fact Sheet 5

Wouldn't it be great if we were warned before an injury occurred?

For example, if we knew that a worker was going to be badly cut while using a saw, we could give the worker safety training before the incident. However, we don't always know when incidents are going to happen.

But we can ***reduce*** the number of ***incidents*** by assessing hazards and reducing the risk of injury.



Key Terms

- ***Allergic Reaction:***
  When the body doesn't like the touch or smell of something, it may result in a rash, sneezing, spots (e.g., poison ivy, dust, mold).
- ***Environment:***
  The space around us. An environment can be good or bad, hot or cold, light or dark...
- ***Incident:***
  Something that has or could have caused harm, injury or loss. If no one is injured, it's a "near miss."
- ***Psychological:***
  How your mind works.
- ***Reduce:***
  Make less.
- ***Risk Factor:***
  Amount of danger.
- ***Stress:***
  The way your body reacts to things it doesn't like.
- ***Toxic:***
  Harmful, poisonous.
- ***Viruses and bacteria:***
  Types of germs that can affect your health.

Hazard assessment includes:

- ***Hazard identification***: finding hazards that could cause accidents in the workplace.
- ***Hazard assessment:*** judging the degree of danger that the hazard poses to workers (the risk factor)
- ***Hazard control:*** developing a plan to reduce or remove a hazard before it causes accidents

An ***incident*** is often referred to as a ***near miss*** or an event that could have led to an accident.

Accidents may result in injuries to:
- Workers
- Property damage
- Environmental damage
- Loss of process.

Accidents include minor injuries (e.g., cut finger) as well as fatalities (death).

Hazards Defined

A hazard is an act or condition that could cause an incident that may end in injury, illness or loss.

A hazard can be a ladder or tool left lying on the ground and not returned to its proper place.

It can also be chemicals that a worker may have to use.

Reporting all incidents is important for reducing hazards. It helps improve the safety of all workers doing similar jobs.

Reporting incidents, including near misses, is just as important as reporting injuries.

The next time, the same hazard that once caused a near miss could result in an injury or fatality if it goes unreported.

Identifying and Monitoring Hazards

New hazards can appear at any time... even after hazards have been identified, assessed, and controlled.

For example, equipment and Personal Protective Equipment (PPE) will wear out over time. Workers may not return equipment to its proper place. So, checking for hazards must be ongoing.

Types of Hazards

Some examples for each of the five types of hazards include:

Physical Hazards

Most injuries are the result of physical hazards, such as:

- ***Noise*** – Noisy equipment or a noisy workplace can lead to hearing loss.
- ***Temperature extremes*** – Working in cold or hot conditions can lead to freezing/ loss of heat or burning/too much heat.
- ***Radiation*** – The rays from the sun or other radioactive materials can cause cancer and other illnesses.
- ***Vibration*** – Shaking movements from equipment, such as jack hammers, can lead to many kinds of injuries.
- ***Pressure*** – Changes in air pressure, such as working with power tools, or working as a diver, or mountain climbers can result in injury.
- ***Mechanical*** – Any type of equipment, machine or tool can be a mechanical hazard. Workers can be caught in, pinned between, or run over.
- ***Electrical*** – Any type of electrical equipment can become a hazard and cause injury or death.
- ***Gravitation*** – Objects or people falling and being pulled to the ground by gravity (the earth's pull).

Biological Hazards

Biological hazards include:

- ***Insects***– may cause allergic reactions.
- ***Plant material*** – may cause an allergic reaction.
- ***Fungi and mold*** – may cause allergic reactions or infections. Wet or damp materials that grow, for example, in greenhouses or granaries.
- ***Viruses and bacteria*** – may cause viral or bacterial infections or illnesses, e.g., the flu is a viral illness.

Chemical Hazards

Chemical hazards include chemical mists, vapours, gases, dusts of fumes. Chemical hazards may be in:

- Cleaning products.
- Paint materials.
- Dust/dirt.
- Asbestos.
- Hazardous chemicals.

Ergonomic Hazards

Ergonomic hazards are things in the workplace that do not fit with a worker's needs, such as:

- Desks, chairs, and tables that do not fit the worker's body shape and size.
- Equipment and tools not adaptable to a worker's shape and size.
- Workplaces that are not suited to the task (e.g., trying to answer the phone in a very noisy area.)

Psychological Hazards

Psychological hazards include:

- Work-related stress.
- Deadlines or sales targets.
- Harassment in the workplace.
- Stress from personal life (e.g., divorce, moving, death)

Each person may react in a different way to different psychological hazards.

Risk Factor

Risk is the chance of injury, harm or loss.

Once a hazard is identified, the risk factor or level for that hazard can be assessed by figuring out:

- ***How likely is it that the incident will occur?***
- ***If the incident occurs, how bad will be the injury, harm or loss?***

The risk factor is greater when a hazard is known to have caused harm, injury or loss in the past.

Knowing how often a worker is in contact with a hazard helps to identify the risk factor.

If a worker is exposed to a hazard several times a day, then the risk factor is probably high.

Worksite should be kept clean and free of debris, trip hazards and fire hazards.

Also, there is no fire extinguisher on this site.

If the result of an injury incident needs only minor First Aid, then the risk factor is low. If it leads to a serious injury or death, then the risk factor is high.

A graph below shows how the risk factor can be assessed.

How often are workers exposed to the hazard? NEVER → FREQUENT

How severe are the consequences? FATAL → MINOR INJURY

Probability of Occurrence of Harm	Severity of Harm			
	Catastrophic	Serious	Moderate	Minor
Very Likely	High	High	High	Medium
Likely	High	High	Medium	Low
Unlikely	Medium	Medium	Low	Negligible
Remote	Low	Low	Negligible	Negligible

Hazard Elimination and Control

"***Hazard Elimination***" means to remove the hazard so that it no longer is a hazard.

"Hazard control" means having a plan to reduce the risk of a hazard causing injury, harm or loss.

Knowing a hazard's risk factor can lead to the control of the hazard.

There are 3 main types of hazard controls:

- Engineering controls.
- Administrative controls.
- Basic controls (Personal protective equipment).

Engineering controls includes changing the working conditions.
Examples:

- Improve ventilation (more air flow) to remove bad air.
- Set up signs and/or barriers to keep workers from going into harmful areas.
- Adjusting work areas to fit workers.

Administrative controls direct the tasks of workers, but do not remove a hazard. They may reduce the worker's contact with the hazard.

Examples:

- Training workers to work safely.
- Training workers to properly use equipment, tools and materials.

Basic controls (Personal Protective Equipment (PPE) does not reduce or get rid of hazards. They reduce the risk of injury from certain hazards.

Examples of PPE are:

- Hard hats
- Eye goggles
- Hearing protection
- Air-filter mask
- Steel-toed boots
- Specialty coveralls.

> ***NOTE:***
>
> ***PPE is a control of last resort.***
>
> ***Engineering and administrative controls are essential to making a workplace safer.***

A good control meets four standards:

1. It prevents the hazard from causing harm, injury or loss.
2. It protects those who could be harmed by the hazard.
3. It must not create new hazards or problems.
4. It must not create a hazard to the environment or public outside the workplace.

Types of Hazard Controls

1. **Control at the Source**
   - Gets rid of or changes the hazard, e.g., replacing an older, unsafe machine.
   - Change the layout of the workplace or job to reduce an ergonomic hazard.
2. **Control along the path from the hazard to the worker**
   - Barriers or equipment guards protect workers from contact with moving parts. Screens to block welding flash.
   - Baffles to block or absorb noise.
   - Proper ventilation to remove toxic gases or dust.
3. **Control at the level of the worker**
   - Provide proper training in:
     - Safe work practices and procedures
     - Emergency procedures (how to handle fires or chemical spills)
   - Proper support and supervision.

Unit 5: Hazard and Risk Assessment and Controls

Test 5

Use **Unit 5 – Hazard and Risk Assessment and Controls** – Fact Sheet 5 and other resources. Answer the following questions:

1. Define the following terms:

   1) hazard _____

   2) risk _____

   3) incident _____

   4) injury _____

   ____/4

2. What must be done to assess hazards?

   _____

   _____

   _____

   ____/3

3. What two factors are used when checking a hazard's risk factor?

   _____

   _____

   ____/2

4. List 3 types of controls used to reduce or get rid of hazards.

   _____

   _____

   _____

   ____/3

5. List 5 types of hazards and give a workplace example for each type.

Hazard	Workplace Example

____/5

6. For each statement below, name the hazard type and the control that can be used to reduce or get rid of the hazard.

   1. A worker has been moved to a new office. After sitting at the desk all day, the worker has back pains at the end of the day.

Hazard	Control

   2. An office worker is always under pressure to meet deadlines. The worker has not been feeling well and is taking more sick days.

Hazard	Control

   3. A warehouse site has a steep set of stairs leading up to a storage room. A number of workers have tripped on the stairs.

Hazard	Control

   4. A beekeeper is stung by a bee and has an allergic reaction.

Hazard	Control

   5. A carpet installer has to use strong and toxic carpet glue when laying carpets.

Hazard	Control

___/10

7. ***"PPE is the control of last resort."*** What does this mean?

_____

___/3

8. Inspect an area of the school and:

   a) Identify hazards: _____

   b) Identify controls in place: _____

___/10

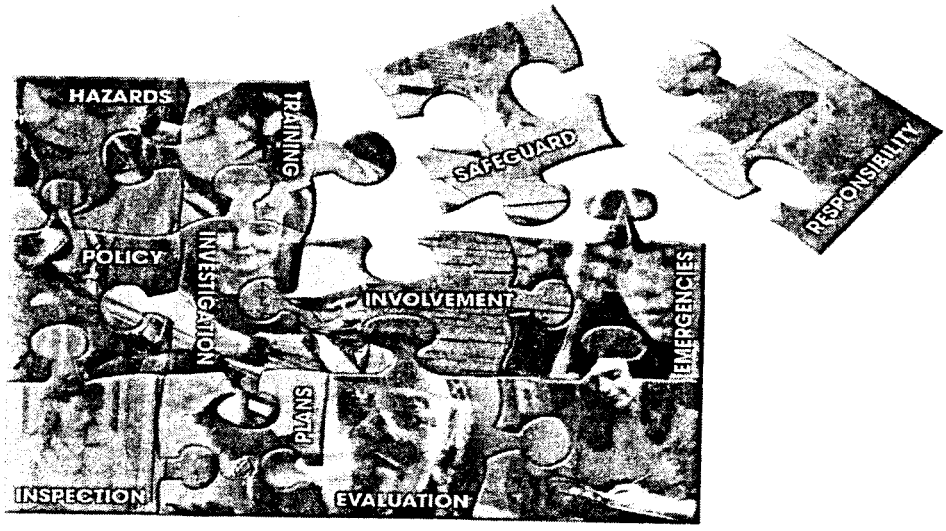
Total: Hazard and Risk Assessment and Controls Test 5

__/4

Key Ideas

Fact Sheet 6: Incident Investigation and Injury Prevention

- Every injury or incident should be investigated.
- Investigations help:
  - identify the causes of the injury incident.
  - prevent a similar incident in the future.
- Management and trained staff should conduct each investigation.
- The investigation procedure should include:
  - Collecting information.
  - Analyzing causes of the incident.
  - Recommending actions to prevent similar incidents.
  - Following up to check that recommended actions were put in place.
  - Writing an incident report.



You need to collect all the pieces to solve the puzzle.

Unit 6: Incident Investigation and Injury Prevention

Fact Sheet 6

Incident investigations are an important part of any health and safety management system. All incidents that occur on a worksite should be investigated.

The purpose of an incident investigation is to help an organization make changes to prevent a recurring incident.

Certain reports must be submitted to the Workers' Compensation Board and to Alberta Employment and Immigration's Workplace Health and Safety.

A 15-year-old trainee (Newnan GA) was killed when the forklift he was operating suddenly went into reverse, ran through the loading-dock gates, flipped over and plunged four feet onto a concrete floor.

The submitted information is used to record the type of injuries and fatalities that occur in various industries and to improve worker health and safety regulations.

Key Terms

- ***Investigation:***
  Search for reasons.
- ***Incident:***
  An unintended event that has or could have caused injury, damage or loss.
- ***"Near Miss":***
  An unplanned event that could have caused an incident or accident.

All incidents, including "near misses" should be recorded, reported and investigated to eliminate and/or control the identified hazard.

Effective Investigations

An incident investigation should include:

- Describing what happened – witnesses may provide conflicting evidence.

  After receiving the information, an investigation will provide a detailed statement of what really happened.

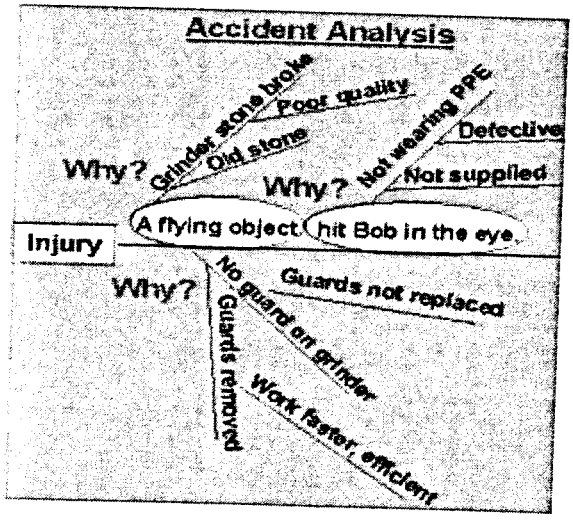
- Identifying or supposing the causes of the incident.

- Determining the risks – some basis for establishing whether the incident will occur again and the potential for major loss must be included.

- Identifying controls – new or improved controls must be identified and put in place to reduce or eliminate the chance of the incident happening again.

- Defining trends – there should be enough detailed information in the report so trends can be identified by looking at all injury reports.

- Demonstrating concern – for other workers, incidents threaten their well-being.



Who Should Investigate?

Management has the primary responsibility for completing each investigation.

Management knows the workers and the conditions they work in, therefore, much of the information can be provided by the supervisor. Management also knows the workers who would be able to provide the pertinent information. Management will be responsible for implementing any recommended changes.

Management must be involved with all investigations, especially those that result from a major loss or a high potential incident.

If it is a high loss situation, government, the public, and the owners will also be involved.

Key decisions on new or improved controls and work practices may need to be made by higher levels of management.

Investigation Procedure

There are many tasks to completing an investigation. While the tasks may vary with each situation, investigations should include:

- Responding to the emergency promptly and positively – a management representative/ supervisor should go to the scene immediately upon being notified of an incident.

  Incident or Emergency Response instructions should be given to specific people. Keep unneeded workers out of the area.

  Management/supervisor must decide whether emergency personnel are required and whether workers should return to work or evacuate the site.

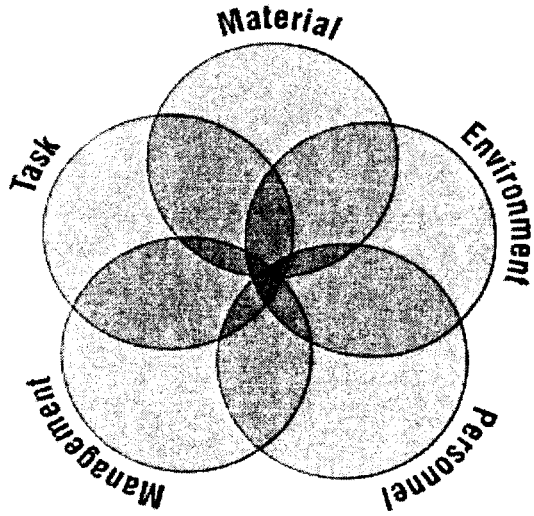
- Collecting information about the incident – management/supervisor needs to ask questions to collect required information.

Investigation Questions

- √ **What has happened?**
- √ **Who should be interviewed?**
- √ **What is missing that should be at the scene?**
- √ **What is at the scene that should not be there?**
- √ **What things might have failed or malfunctioned?**
- √ **What information is needed about training, repair, maintenance, and other things that are kept on record?**

Causation Model

The following model attempts to illustrate that the causes of any incident can be grouped into five categories - task, material, environment, personnel, and management. When this model is used, possible causes in each category should be investigated.



- ***Analyze significant causes***:
  - Determine the injuries or losses,
  - Define the energy transfers,
  - Identify substandard practices or conditions, and
  - Identify the basic causes.

- ***Develop and take safe actions***:
  - Management/supervisor identifies what immediate actions are required to ensure another incident does not occur.
  - Barriers, clean-up, or lock-out procedures are used, if required?
  - The investigation may also identify changes required to provide new and/or better controls to ensure the incident does not occur again.

- ***Review findings and recommendations*** -
  Every investigation report should be reviewed by the next higher level of management. This is to ensure that nothing has been overlooked and to identify other people who should read the report.

- ***Follow-up*** -
  Follow-up ensures that the recommendations are being acted upon and that these actions are having the desired results.

Investigation Reports

The incident report details the total investigation and recommends new and/ or better controls.

Most organizations have a standard incident reporting form. Using a standard form:

- ensures that key procedures are followed.
- ensures key questions are answered.
- provides consistent reporting, and
- helps follow-up on recommended actions.

Writing the Report

All information requested on the report should be completed.

The report should include:

- Name of worker(s) involved.
- Department and job titles.
- Location, date and time of incident.
- Description of incident.
- Identification of substandard practices and conditions.
- Identification of causes.
- What worked well in the emergency response plan.
- Recommended actions to prevent a similar incident from occurring.

Injury Prevention

Knowledge of the causes and consequences of past incidents, including near misses, help to prevent future injury incidents.

SAMPLE
Incident Investigation Report

SUPERVISOR INCIDENT INVESTIGATION REPORT

(Please Fill Out Form Completely)

NAME OF INJURED WORKER: John Jones

Date of Injury: August 15, 2011 11:45 am

Department/Area Name: vehicle servicing

Co-worker(s): Katherine Brown

1. WORKER'S USUAL OCCUPATION
Mechanic

2. LENGTH OF EMPLOYMENT
[ ] Less than 1 mo.
[X] 1-5 mos.
[ ] 6 mos. to 5 yrs.
[ ] More than 5 yrs.

3. TIME IN OCCUPATION AT TIME OF INJURY/INCIDENT
[ ] Less than 1 mo.
[ ] 1-5 mos.
[X] 6 mos. to 5 yrs.
[ ] More than 5 yrs.

4a. EMPLOYMENT CATEGORY
[X] Regular, full time
[ ] Regular, part time
[ ] Student
[ ] Temporary
[ ] Seasonal

4b. EMPLOYMENT CATEGORY
[X] 1st shift
[ ] 2nd shift
[ ] 3rd shift

5. NAMES OF OTHERS INJURED in SAME INCIDENT
Katherine Brown

• TIME OF INJURY/INCIDENT

A. ***Time within shift***
[ ] Before 1st Break
[X] Before Lunch
[ ] Before 2nd Break
[ ] After 2nd Break

B. ***Length of shift***
[ ] <8 hrs [ ] 12 hours
[ ] 8 hrs [ ] 16 hours
[X]10 hrs [ ] ____ Other

7. PHASE OF WORKER'S WORKDAY AT TIME OF INJURY/INCIDENT
[ ] During rest period
[ ]Working overtime
[ ]Entering or leaving work
[X] Performing work duties
[ ]Other, specify

8. SPECIFIC LOCATION OF INJURY/INCIDENT
Service Bay 3

9. TASK AND ACTIVITY AT TIME OF INJURY/INCIDENT
A. General type of task: __engine repairs_____
B. Specific activity _____
C. Worker was working:
[ ] Alone [X]With co-worker(s)
[ ] Other, specify:
_____

10. Accident Reported to:
Joe MacDonald, Supervisor

11. Accident Reported to:
Larry James, Regional OH&S Officer

12. DESCRIBE HOW THE INJURY/INCIDENT OCCURRED John Jones, 20, was in his second month at this job, with some experience. His duties included servicing engines. John received no orientation or training, and had a minimum of experience working in an automotive repair shop. At 10:30 am, Joe asked John to clean some grease from an engine block. Joe gave John an unmarked five-gallon pail and told him to pour some gasoline from an approved container into the pail and use that to clean the engine block.

Katherine Brown, a licensed mechanic, was working on a truck in the stall closest to where John was working. Katherine turned on a cutting torch to remove a rusted bolt from the truck. An explosion ensued, engulfing John in flames. Katherine's overalls started on fire, but she quickly put out the flames, and then turned off the cutting torch. Katherine put out the fire with a fire extinguisher and administered first aid to John. Joe called an ambulance, which arrived within five minutes and took John to the hospital. John received second degree burns to his face, neck and hands, and third degree burns to his lower arms.

13. Conditions at time of accident (weather, status of job, housekeeping, etc.) Working space was quite clean. Tools were well organized and kept clean. A number of dirty engine parts were sitting in one corner waiting to be cleaned (see diagram). All three hoists were occupied and trucks were being serviced. Overhead doors were closed. Ventilation was turned on. Cold, windy, rainy day (6° C).

14. What were the causes of the accident?

Immediate:

- Substandard practice: failing to warn workers, using equipment/material improperly
- Substandard condition: inadequate warning system, fire and explosion hazard.

Basic:

- Lack of knowledge and skills (training)
- Inadequate supervision
- Inadequate purchasing – handling and storing of materials
- Inadequate work standard – no standards for working with flammable material
- Inadequate ventilation

15. Recommended Actions:

Immediate

- Additional training for supervisor and training for worker
- Switching materials used to clean parts
- Proper containers and labeling for all flammable materials

Long-term:

- Installation of barrier isolating welding equipment
- Improved ventilation
- Additional monitoring by supervisor of new standards

Person(s) responsible for implementing corrective action(s) Joe MacDonald

Injuries – Person Injured John Jones, 155-15 Street, Buckwheat, AB T0Z 0Z3 DOB: June 13, 1991

Witnesses

Henry Battle (mechanic), Joe Fixes Trucks (555-8992)
Susan Fisher (customer), Delta Super A Foods (555-7722)

Was First Aid given? Yes. By Katherine Brown, co-worker.

Was injured transported to medical aid? Yes by Delta Response Ltd. to Cornpatch County Hospital. Seen by Dr. Marianne Mitchell (Emergency Room)

ADDITIONAL SPACE FOR COMMENTS and/or DIAGRAM
(IF MORE SPACE IS NEEDED, PLEASE ATTACH A SHEET OF PAPER)

SUPERVISOR'S NAME: Joe MacDonald

SUPERVISOR'S SIGNATURE	DATE
Follow-up re: recommended actions	By: Larry James, Regional OH&S Officer

Joe Fixes Trucks
134 Industrial Way, Delta, AB T0Z 0Z0 555-8992

TO SUPERVISOR: KEEP A COPY FOR YOUR RECORD

09/2011

Unit 6: Incident Investigation and Injury Prevention

Test 6

Use **Unit 6 – Incident Investigation and Injury Prevention** – Fact Sheet 6 and other resources. Answer the following questions:

1. In an organization, who should investigate incidents? Why?

_____

_____

_____

____/2

2. List the steps in an incident investigation.

_____

_____

_____

_____

_____

_____

____/6

3. What information should be included in an incident investigation report?

_____

_____

_____

_____

____/5

4. What are the benefits of proper incident investigations?

_____

_____

_____

_____

____/3

5. How do incident investigation reports help other organizations to improve their safety programs?

_____

_____

_____

_____

____/5

6. Refer to the sample completed ***Incident Investigation Report*** and answer the following:

   a) Briefly describe the incident.

_____

_____

_____

_____

____/3

   b) What were the injuries and property damage?

_____

_____

_____

_____

____/3

   c) What is the chance of this incident happening again?

_____

_____

_____

_____

____/3

   d) What is the severity of loss potential from this type of incident?

_____

_____

_____

_____

____/3

e) List the immediate causes.

_____

_____

_____

_____

____/3

f) List the causes. After each cause, identify if it is a personal or a job factor.

_____

_____

_____

_____

____/3

g) Identify the action (immediate or long-term) that will be taken to provide better controls for the identified causes.

_____

_____

_____

_____

_____

____/6

7. Develop a plan to control hazards in a selected workplace. Use Template 3.

Do not complete

__/

__/45

Total: Incident Investigation and Injury Prevention Test 6: