Hazard Identification

Participant Workbook

Version 7.7.1
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CONTENTS

COURSE DESCRIPTION

Purpose

To provide the knowledge and skills required in executing a task analysis, hazard identification and risk assessment as part of the preparation required before any work begins in the field or shop. This training also provides the rationale for the Pre Job Task/Risk analysis.

Objectives

After completing this training you will be able to:

1. Describe why the Task/Risk Analysis is needed to improve Environmental Health and Safety performance.

2. Describe what the Task/Risk Analysis is, when it is done, and who does it.

3. Describe the process steps for doing the Task/Risk Analysis.

4. Identify the steps of a job

5. Describe the method used to identify hazards associated with each job step.

6. Demonstrate the method used to assess risk using the Risk Assessment Matrix.

7. List the appropriate controls that can be used to reduce risk to an acceptable level.

About This Course

This course is divided into five sections. Each section begins with a Learning Objective. The Learning Objective will tell you what you are expected to know or be able to do at the end of the section. There are also questions at the end of each section. These questions relate to the learning objective and provide the participant with the opportunity to demonstrate how well they have learned the section content.

The questions have been designed to provide a balance between identifying the "most appropriate" answers and using the theory material in the section to develop an informed opinion.

There are also skill practice exercises contained in several of the sections. These practice sessions are designed to allow each participant to acquire a base level of expertise in the associated skill set.

At the end of the course each participant will be asked to complete a STAC.

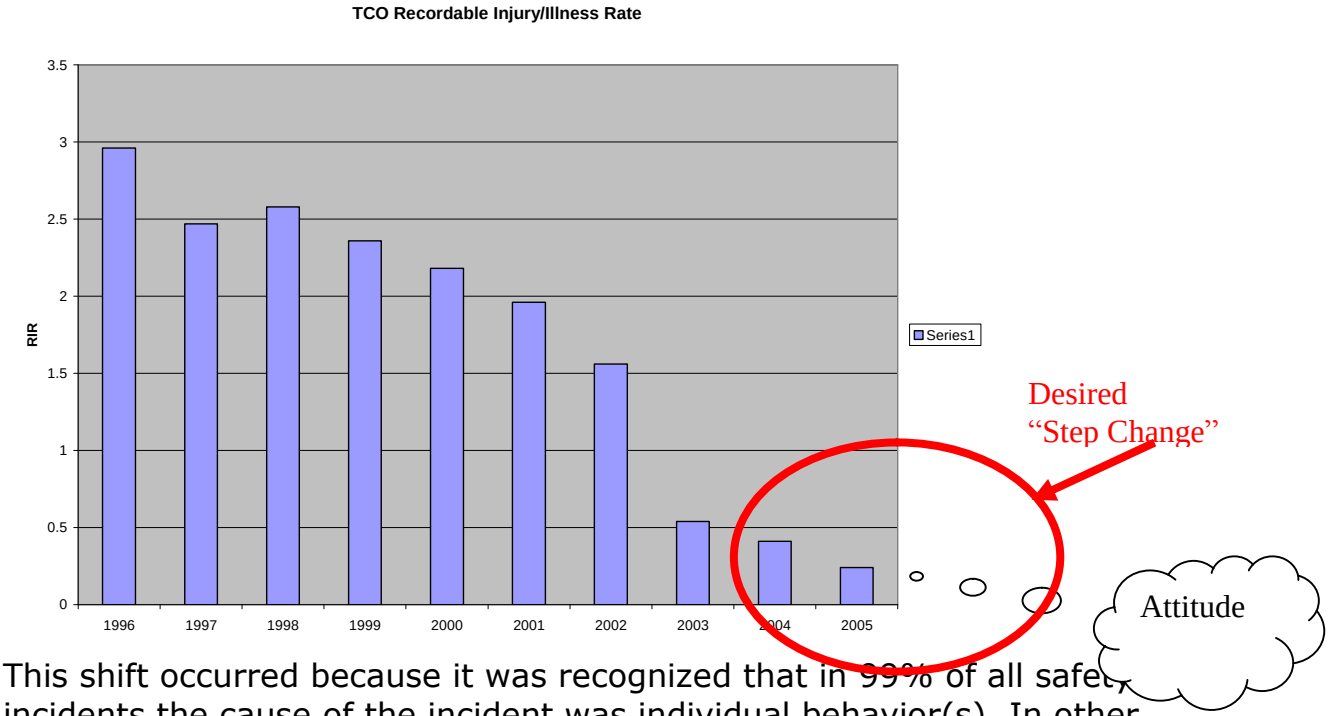
SECTION 1: THE PROBLEM

Learning Objective

At the end of this section the participant will be able to describe why the Task Risk Assessment Process is needed to improve EH&S performance and protect the employee from injury.

Introduction

Over the years TCO - Dow has seen several "step" changes in EH&S performance. Major changes in the approach to Safety have been introduced and there have been significant improvements in the results achieved. The most recent change in approach (2002) was an increased emphasis on individual behaviors as the most critical factor in reducing injuries in the work place.

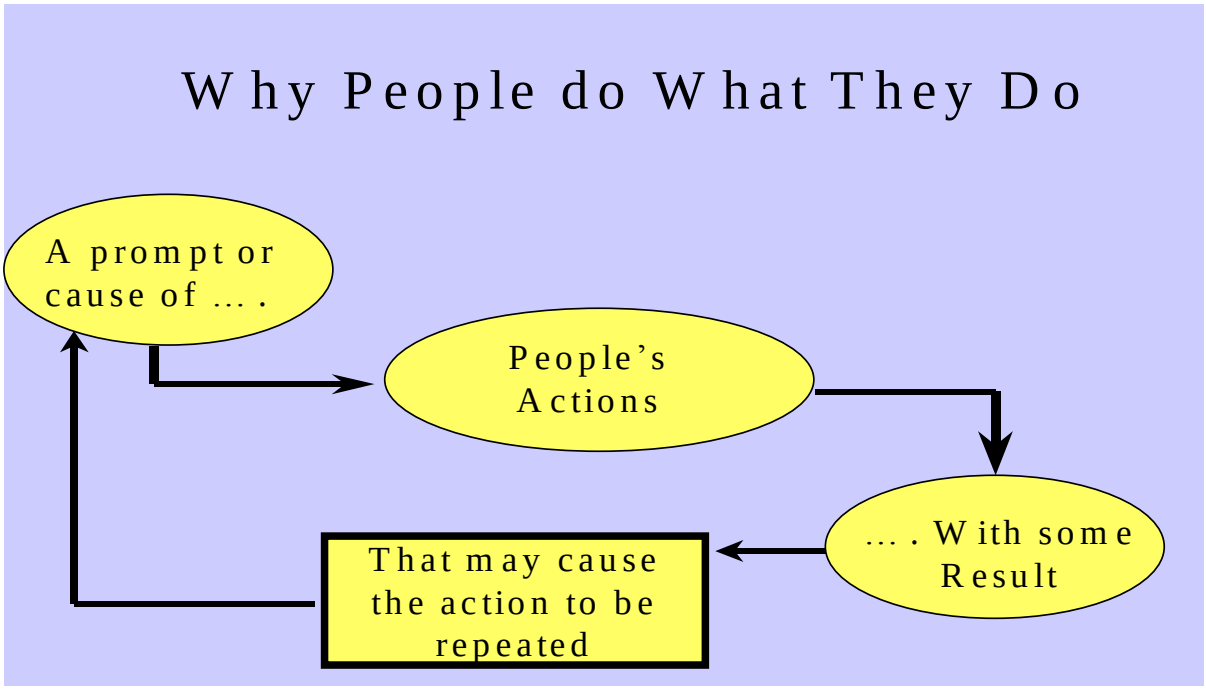


This shift occurred because it was recognized that in 99% of all safety incidents the cause of the incident was individual behavior(s). In other words, it is people's behaviors that cause these incidents or could have prevented the incident. More specifically, if the hazards had been identified and mitigated, injury could have been prevented. This is why the emphasis that will result in the next "step change" is believed to be hazard identification. This belief is based on our understanding of what causes people to identify and mitigate hazards.

What causes people to do the things they do?

Any discussion about people's behavior can be grouped in three general areas:

1. The Behavior – what a person does
2. The Cause – why a person acted in a certain way
3. The Result – what happened as a result of the person acting the way they did



People generally act a certain way (or behave) in order to either experience a positive feeling[1] (pleasure) or to avoid a negative feeling[2] (pain). Understanding this principle is extremely useful in gaining an appreciation for why Hazard Identification is so important to the reduction of injuries in the workplace.

[1] For Example: People generally seek approval or recognition from their peers or supervisors. "It feels good when the boss praises my work."

[2] For Example: People generally seek to avoid a reprimand from their peers or supervisors. "It is embarrassing when the boss tells me that I have failed to meet Company expectations or a peer ridicules my performance in front of my other peers."

A Case in Point

In March of 2003 an employee was turning a valve while standing on a wooden platform. He had been instructed to exercise valve in an attempt to completely shut it (this was a continuing effort to seal valve). The valve broke causing the valve wheel to free spin and the employee lost balance, fell backward onto handrail which broke. The employee fell to the ground, striking knee on concrete. Knee injury resulting in a Recordable Injury and work restrictions.

From the Investigation, that followed this incident, two causes were identified:

- LTA Hazard Recognition for Body Positioning
- LTA Hazard Recognition for High Force Used

Employee states that culture and prior oil field experience (15 yrs.) have driven him to use excessive force. Although it is well known that older valves can break under excessive force, it is common practice to use large valve wrenches and body weight to operate valves. However, this particular individual decided to "take that chance" and in this instance he was lucky that he didn't sustain greater injury (broken rib from breaking handrail). Why would he take that risk, would he take it if he were 100 ft. off the ground rather than 3 feet? Our ABC behavioral model provides some insight.

First we need to know that this operator was an experienced hand and that he had been operating valves for over 15 years. He also knew that several other operators had attempted to close this valve but were not successful. Because of his size and strength, he was asked to close this valve.

It is important to understand that all of this "decision making process" was not executed consciously. The employee likely did not understand that the prompt for his behavior was "acceptance of a physical challenge based on his job experience". Never the less, from our understanding of performance management it is reasonable to infer that this is what happened. In fact, the hazard of closing a stubborn valve became a "non-hazard" in light of his success with previous valves.[3]

[3] It is also reasonable to assume that after the employee experienced the valve bushing break, he was unlikely to miscalculate the risk of that particular hazard in the future.

SECTION 1: Skill Practice

In this skill practice we will have the opportunity to identify the three components of performance management. Through the exercise we will set the groundwork for the methods that can be used to increase our ability to identify and mitigate hazards in our workplace.

The following is a description taken from a real incident. Take a few minutes study the picture.. What hazards were present?

Review each of the additional pictures for additional discussion.

Study each of the pictures and have a group discussion. Need to discuss and agree on the answers to the following questions:

1. What hazard’s were present?

Hazards

In order to see an existing hazard, there must first exist a desire to look for the hazard. While the desire to look for hazards does not guarantee that you will identify 100% of all hazards it does increase the likelihood of "seeing" it. The next step of course is to do something about the hazard but that we will discuss in Section 2 of this training.

Another way to think about this desire to look for hazards is in terms of causes. If we ask the question; "What makes people want to look for hazards?" there are at least four possible answers:

1. The fear of getting hurt when the risk of doing a job is not minimized by mitigating the hazards.
2. The pressure applied by the Company to identify the hazards of a job and the thought that failing to do this will result in a negative performance review.
3. The desire to meet behavioral expectations because of consistent positive reinforcement by the Company when the desired behavior was demonstrated
4. Personal Integrity or the personal pride that one has in doing the job right.

In the first case this fear is often reduced in the presence of the significant number of times the task was performed without getting hurt – even without identifying the hazards – and it was done much quicker too.

In the second case this pressure is sufficient to prompt the correct behavior only when the person believes that there is a strong possibility that the Company will know that they did not look for the hazards. If there is no reason to believe this will happen (for example, the lack of an intense audit schedule) then, it is much less likely to cause the correct behavior.

In the third case the desire to perform as expected may have developed over time in light of a repeated favorable result. This occurs when the company or workgroup has repeatedly reinforced the desired behavior and this desire for this recognition now causes the behavior.

The fourth case has the potential for the greatest impact on achieving a new "step change". If every person would be motivated to look for and mitigate hazards simply because "it is the right thing to do" the EH&S results would definitely improve.

While all four possible causes exist there isn't one that appears consistently. The desire to look for hazards can be caused by one or a combination of all four. Regardless of the cause, one thing remains certain – before you can do something about a hazard you must see the hazard and the chances of seeing the hazard are greatly increased if you are committed to looking for the hazards.

SECTION 1: QUESTIONS

1. What might cause a person to identify the hazards associated with the job?

_____

_____

_____

2. What might cause a person to do the job without identifying the hazards?

_____

_____

_____

SECTION 2: TASK/RISK ANALYSIS

The value of identifying task hazards diminishes significantly if the hazards are only identified after an injury occurs. Although it often seems easier to see the hazards when analyzing the causes of an injury (Root Cause Investigation) the fact of the matter is that at this point it is too late to prevent the employee from being hurt. It may help some other employee from getting hurt but even that is debatable in the presence of the all too well known – "It won't happen to me" syndrome.

As illustrated in the chart below the most pro-active action that one can take to prevent an injury is to identify the hazard and then immediately do something to mitigate that hazard. The Near Miss Reporting Tool is design to help employees do just that. If you think about it, mitigating a hazard is caused by a need to reduce the risk of injury. If this act is self-initiated or self motivated it has the most positive influence on eliminating workplace injuries. As you move from left to right on the declining impact diagram you move from those activities that are effective over the long term because of your desire to take mitigating action and ends with those activities that have only a marginal short term effect because someone else is telling you what to do.

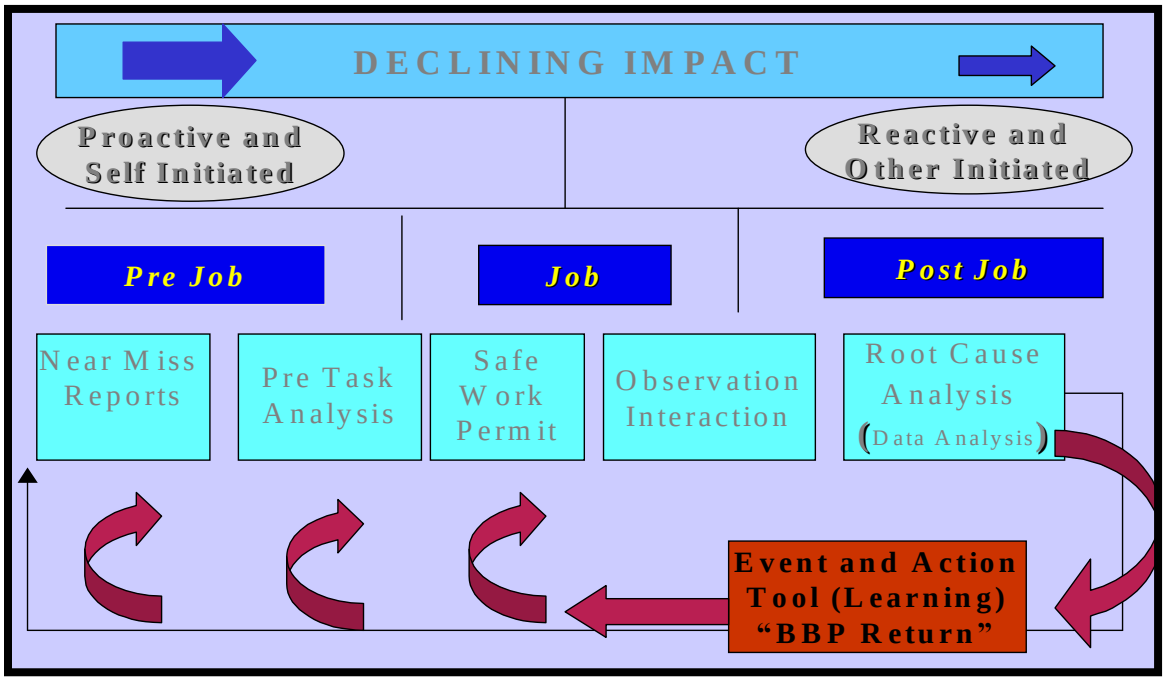


Figure 1

TASK/RISK ANALYSIS

Any effective risk analysis must start with a list of "tasks" or steps that make up the job to be done. The more detailed we are in our breakdown of tasks the greater the opportunity is to identify all the hazards that are associated with each task.

TASK BREAKDOWN EXERCISE –

EXAMPLE FROM HOME:

The Job – Hanging Christmas Lights on the house.
For this exercise the following conditions apply:

I. It is mid December with an ambient temperature of 35 Degrees F.
II. There is ice on the ground and house.
III. This is the first year that Christmas Lights will be on the house

List all the Possible Tasks Required to Complete the Job:

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.

Review Tasks:

Remember that the purpose of this exercise is simply to list the tasks.

Knowing the value of performing a risk analysis on each of the tasks associated with the job from the declining impact chart, it is reasonable to place a significant emphasis on the Pre-Task Analysis in order to help in our efforts to improve EH&S performance. It is for this reason that a separate tool has been developed to assist employees in their task/risk analysis. Again, in terms of impact it is absolutely critical that this analysis is performed before the job begins.

The STAC (Safety Task Analysis Card) is two sided. One side of the card is designed to allow for the identification of the tasks as well as a two-stage risk analysis for each of the hazards that are associated with the tasks of the job.

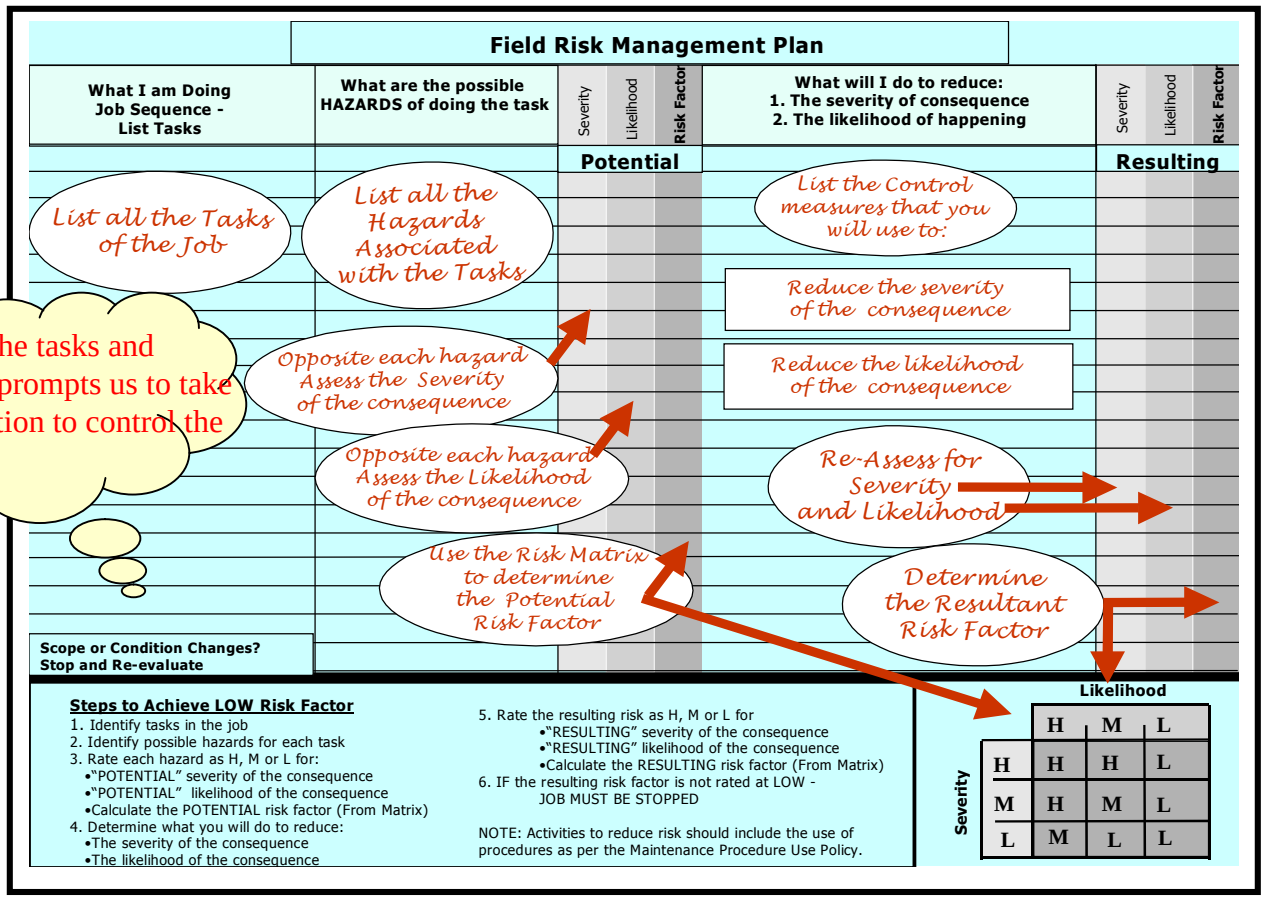


Figure 2

SECTION 3: HOW TO IDENTIFY HAZARDS

Learning Objective

At the end of this section the participant will be able to list the steps that are required to Identify the hazards associated with the task steps of a job.

Introduction

Since, by definition, hazards are the potential for an adverse effect, it is important to understand that the process of identifying hazards is one that always involves the anticipation of things that have not yet happened but could happen.

If you think about the number of possibilities that exist with the variety of different tasks included in the vast number of jobs in the workplace it is easy to see how difficult it would be to list all the hazards that exist in the workplace.

Because of this it is impossible to teach everyone all the hazards that exist and then expect him or her to remember these every time they perform a task. Having said that, it is also important to recognize that some hazards present themselves more frequently than others. These we could call the common hazards and these are more easily managed to a low risk. When exposed to these common hazards people generally know what to do to manage them because they have been repeatedly exposed.[4]

We can break hazards into two basic types. There are physical hazards and there are behavioral hazards. The Physical/Environmental type are usually the hazards we see first. On the other hand, the Attitude/Behavioral hazards are often more subtle and harder to actually "see"; these are associated with the acts, attitudes or habits of people.

Physical/Environmental – the potential for a physical adverse affect such as an injury resulting from pinching a finger when the wrench slips while tightening a nut. This might include such things as a nail sticking out of a piece of wood or the sharp edge of a piece of stainless cladding.

Attitudinal/Behavioral – the potential for a mental lapse in concentration or a conscious decision to "take a shortcut" motivated by a desire to complete a task sooner. Attitudes often drive behaviors that create hazards.
Consideration shall be taken for:

- physical capabilities (medication, past injuries, weight bearing limitation, etc.)
- level of skill or knowledge limitations (fork lift training, driver's license, etc.)
- individuals' capabilities (not fit tested to use respirator, afraid of heights, etc

[4] This does not necessarily mean that people will always mitigate these risks – in fact in many cases the familiarity of these hazards themselves pose an even subtler and perhaps dangerous hazard in the form of complacency.

Regardless of the method is used to identify hazards, it must provide the necessary triggers to include both physical and behavioral hazards.

Hazard identification is a thought process that requires self-discipline. It is not always a simple process although by following the steps in the TAIL-R method it does become easier to apply consistently.

The TAIL-R Method

1. **T**hink about all the tasks associated with the job you are about to perform. Focus on one of the tasks and…
2. **A**sk, "What could happen" while performing this task that would cause me to get hurt?
3. **I**magine how this could happen. Visualize the task.
4. **L**ist all the things that could cause this to happen (both physical and mental)
5. **R**epeat steps 1-4 for each task.

These causes, as you have mentally identified them are in fact the hazards that are associated with the task. Let's consider each step in the TAIL-R method in a little more detail.

1. Think about the Task

Use the information from your job package, safe work procedures and your previous experience performing the task to get a mental picture of you performing the task without incident.
This is similar to the approach that Gary Player used in golf. Before every shot, before he would even approach the ball, Player used to imagine himself hitting the perfect shot. Only after seeing himself make that perfect shot would he approach and hit the ball. It is important to realize that Player, a successful PGA tour player did not think about the next shot or his previous shot or what it would be like to win the tournament – he focused on one shot at a time. And by doing this he was able to put together many winning rounds of golf. It is similar with hazard identification – any successful job is made up of a series of successful tasks. Each task requires focus and concentration.

2. Ask, "What could Happen"

In this step there are no boundaries in terms of what could go wrong. Experience has shown that there are a large number of possibilities. Most of the possibilities exist because we do not consider the "unexpected". For example – When someone starts the task of tightening a nut on a stud they typically do not expect the wrench to slip. But everyone who has done this task soon comes to accept that this is a very real possibility. It could happen!

Another example is when a crew is working above you in the Plant. When working below there is a definite possibility that a tool or a piece of material such as a clamp could very likely fall.

While these two examples are quite obvious there are other more subtle possibilities that exist as well. A case in point is taken from an incident that occurred on this Site in 2003:

A contractor was checking out a tool he had not been trained on;. The cutting tool of choice was an approved safety utility knife. He thought he could figure it out on his own and ended up with a recordable injury needing stitches on hand..

The possibility of slicing his hand on the open blade was never taken seriously because there was a guard and the result is clearly not desirable. (avoid pain) However, as the investigation later revealed, the possibility of getting cut by an approved safety knife and having a body part in the direct "line of fire" was also never considered. The contractor fell into the trap of thinking that because he was using a common tool i.e. utility knife, which he used regularly without negative consequence that "nothing could go wrong, he didn't need explanation about how to use it" In fact, as the incident demonstrates nothing could have been farther from the truth. These types of possibilities where things can go wrong can often be picked up in step 3 of this method.

3. Imagine how this could happen

This step of hazard identification requires the person to draw a mental picture of the possibilities identified in step two. In the cut hand example above the person needs to imagine all the ways that the knife blade, though protected, could contact his hand. The person should also realized that they were not trained or knowledgeable about how the new tool operated. Since very few people would ever intentionally put a body part in the line of fire it is hard to miss the reason of losing focus. From this point it is a short mental step to identify the reason for losing focus as the nature of exploring a new tool, is considered a low repetitive activity.
Once a person can see himself or herself "getting hurt", whether that results from a sharp knife slicing into your body, wrapping your knuckles when the wrench slips or "seeing" a pinchbar fall from twelve feet above and land on your neck, it is relatively simple to think about the things that might cause this to happen.

We have often heard the expression 20/20 hindsight. The expression refers to the fact that it is easy to see what happened after the event. Step 3 of this hazard identification method is an attempt to use the "hindsight" of your imagination to advantage even though the incident has not occurred.

4. List the things that could cause this to happen

Remember that we are considering the task. It is usually a single step in a series of steps required to complete a job. In step 5 this exercise (steps 1-4) is repeated for each task.

By listing the things that could cause the imagined event to happen on your STAC you are identifying the hazards associated with the task. Hazards are nothing more or nothing less than possible scenarios where the potential exists to cause damage or harm to people, property, materials, or the environment.

SECTION 3: HOW TO IDENTIFY HAZARDS - QUIZ

1) List the five steps of the TAIL-R Method of Hazard Identification.

2) What is a hazard?

List some EXAMPLES of hazards

Environmental/Physical	Attitudinal/Behavioral

3) Use the following scenario to answer this question.

" You are part of a crew that is unloading cable reels from a picker truck flatbed. You require the cable to be on the third level of a building that is in the early stages of construction. There are three people on your crew: a crane operator, a rigger and yourself. There are other workers on site, some of whom are using noisy power tools. Another group is involved in trenching activities nearby."

Complete the following table:

(a) Job Steps	(b) Hazards Associated with each task or step
1. Position the truck	
2. Attach the cable reels to the sling	
3. Connect the tag line	
4. Lift the reels to the third level	
5. Remove the reels from the sling	

SECTION 4: HOW TO ASSESS RISKS

Learning Objective

After this Section the participant will be able to demonstrate the use of the Task Risk Assessment Matrix.

Risk

Before considering risk assessment it is important to have a common understanding of risk as it specifically relates to EH&S hazards. From this perspective risk almost always refers to the chances of something harmful happening, such as injury, loss of containment or environmental damage. If the potential loss or harm is considered very serious or the chances of the harm are great then the risk is high.

Whether we are talking about Safety, financial planning or playing the horses there are always two parts that determine risk; the size of the potential loss and the chance of the loss occurring.

Risk Assessment

Factors in Risk Assessment

For each hazard an assessment is needed to determine the level or degree of risk. An assessment of any kind always includes some personal judgment. Does this mean that two people could judge the risks associated with a particular hazard differently and end up with a different result? Consider the following example to illustrate this point:

The Same Old Grind

In some crafts, the use of grinders is a skill that is required to successfully work in the craft. The degree of proficiency that an individual demonstrates while using a grinder is variable depending on several factors, including experience with the tool and of course aptitude. This degree of proficiency contributes to variances in the risk assessment as was illustrated in a recent Observation/Interaction on this Site.

The Observer (not in the craft) was surprised to find that the craftsperson with more than 15 years of experience in the craft had assessed the risk in grinding as LOW RISK. When the Observer questioned this assessment the craftsperson looked at him as though he was "from another planet" and then answered: " I have been using a grinder for more than 15 years and have never had an injury."

In this case the personal experience of the craftsperson and, in fact, his success in using a grinder had a very strong influence on the result of his risk determination. In the craftsperson's judgment the likelihood or chance of getting hurt while using the grinder seemed very small. After all, in all his years of experience using the tool he had never had a mishap.

The problem of course is that the craftsperson only used one half of the equation when evaluating risk - probability. On the other hand, the Observer, who happened to be an EH&S professional had recently been involved in a number of Incident Investigations where people were seriously hurt. In one case, the grinder "jumped" from the surface of the material the craft's person was grinding and landed on the unprotected leg of the user. In another case the grinder (being used with only one hand) jumped and seriously cut the hand of the user. The Observer was very much influenced by his knowledge of the serious potential consequence that occurs when there is a mishap.

Two judgments, two very different assessments, both correct in their own right.

However, the method used to determine risk requires that both consequence and probability or likelihood be considered before the final assessment is made. It is equally important that the hazard is correctly identified before the assessment is made. In the example above, the hazard is not "using a grinder". The controlled use of a grinder (or any tool for that matter) does not pose a high risk for the craft's person. If the hazard however, is identified as loosing control of the grinder - this results in a much higher risk assessment.

Step 3 of our TAIL-R method of Hazard ID will help to correctly identify the hazard as the craft's person envisions a grinder cutting into a body part. It will also help to correctly assess the risk when, with the "image" in mind, two questions are asked:

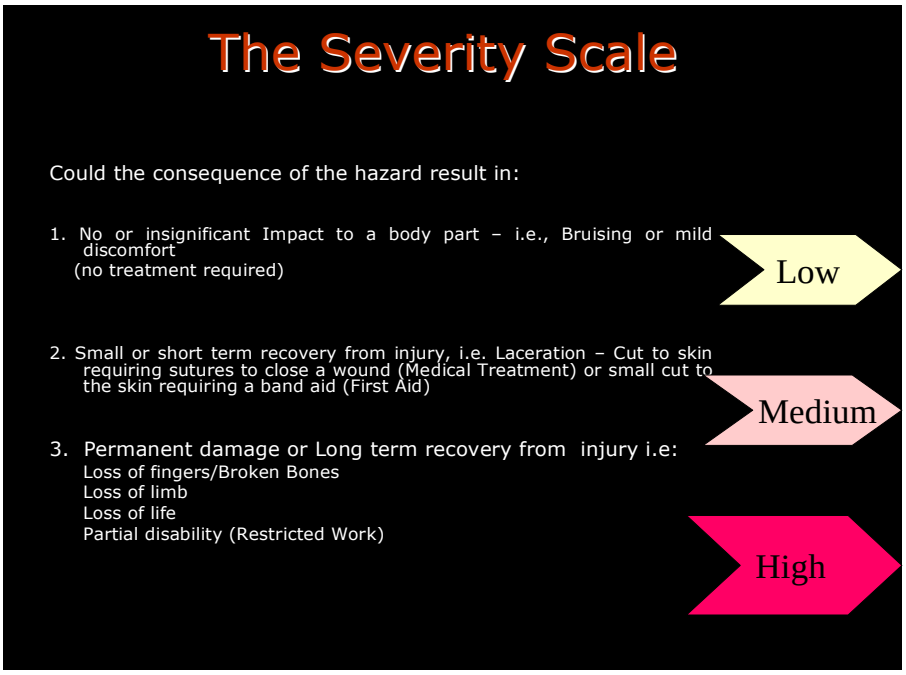
(1) How serious would the consequences of this hazard be? and
(2) How likely is this hazard to occur?

Once again it is important to understand that while you may have agreement on the consequence there may be a difference in the interpretation of the word **serious.**

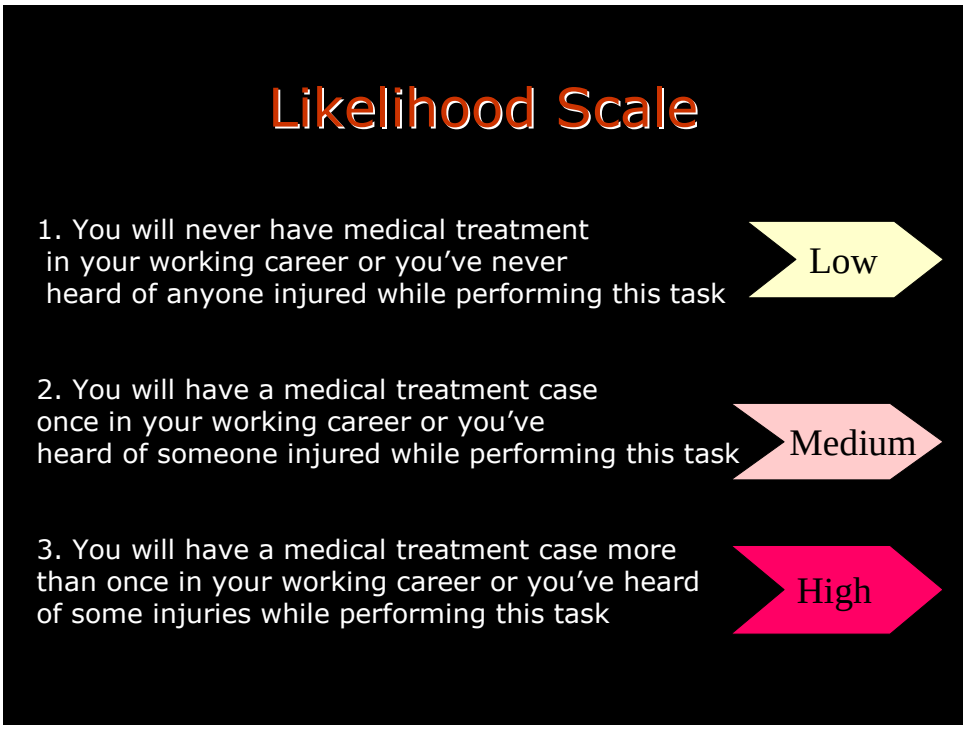
For the craftsperson "serious" might mean the loss of a body part – for the EH&S professional "serious" might mean a stitch. Each comes to understand the term based on their personal experience. In order, then, to attain a consistent level of evaluation it is helpful if each person agrees to use the following scale to determine how serious a consequence could be.

"Serious" Consequence Scale

From our grinding example, given the ease at which a grinding disk can cut though flesh, the consequence from loosing control of the grinder could easily result in the loss of a finger or the loss of a hand. Therefore you would have to place the severity of the consequence in category 4 or 5. This means a rating of High on the first question.



In the same way a scale can be used for the second question, How likely is this hazard to occur:



Task Risk Assessment Matrix

The **TASK RISK ASSESSMENT MATRIX** will help you assess the level of risk. The "Severity" side of the Matrix represents the seriousness of the result of the hazard. The "Likelihood" in this Matrix refers to the probability of a hazard.

In all cases, for all tasks the desired outcome is a task performed with LOW risk.

RISK = Severity X Likelihood

LIKELIHOOD

SEVERITY	H	M	L
H	H	H	L
M	H	M	L
L	M	L	L

How to Use the Risk Assessment Matrix

1. Think about the identified hazard and using the Severity Scale judge the severity
2. Find the appropriate rating (High, Medium or Low) for the consequence along the left side
3. Think about the identified hazard and using the Probability Scale judge the likelihood
4. Find the appropriate rating (High, Medium or Low) for the probability along top of the Matrix.
5. Draw a mental line across the diagram from the Severity Side and down the diagram from the probability rating.
6. The point where they meet is your assessment of the risk associated with the hazard.

SECTION 4: HOW TO ASSESS RISKS - QUESTIONS

1. What are the two questions would you ask in order to determine the risk associated with a particular hazard?

1
2

2. If you were to loose a finger while performing a task the severity would be:
High_____Medium_____Low_____

If the chance of losing a finger while performing the task was once in your working career the likelihood would be:
High_____Medium_____Low_____

Based on your assessment above what is the risk? _____

3. Using the identified hazards in the table below complete the last three columns of the table. Remember to use the Matrix to obtain the answers for the last column:

Hazards	**Severity**	**Likelihood**	**Risk**
Loosing control while performing a grinding task			
Loosing focus or concentration while cutting Styrofoam with a utility knife			
Slipping on an icy surface while approaching a job site			
Wrench slipping while tightening up the studs on a flange plate			
Exerting excessive force loosen a threaded fitting			
Over reaching while dismantling scaffold sections			
Tripping over material while working in a congested area			

SECTION 5: HOW TO CONTROL RISKS

Learning Objective

At the end of this section the participant will be able to list four control methods and demonstrate their understanding of these methods by using them appropriately on the Pre Task Analysis Card.

Identify Appropriate Controls

1. Hazard controls need to be appropriate to the level of risk. High-risk tasks need very tight controls.
2. All the appropriate controls must be in place **before** any work can proceed.
3. There are some hazards that require specific expertise to identify or apply the appropriate controls. In these situations, employees need to stop the task until the required expertise is applied. For example an air quality test must be done by an occupational hygienist, or the designated Site Representative must perform process equipment isolation.

Four types of controls:

- **Engineering controls**
  Examples: Elimination, Substitution, Guards, Process Enclosures, Automatic Shutdown Devices, Ventilation, and Communication Devices.

- **Administrative controls**
  Examples: Safe Work Permits, Procedures, Maintenance Safe Work Practices, Global and Site Safety Standards, Communication, Training and Work Scheduling to minimize the number of workers exposed.

- **Personal Action (**What **<u>you</u>** do**)**
  Examples: taking a path around a pool of material, notifying fellow employees working above that you will be working in the area, getting a piece of lifting equipment to help with moving heavy pieces of pipe not performing a particular task until the risk can be mitigated to low.

- **Personal Protective Equipment**
  Examples: Fall Protection, Hearing Protection, Chemical Resistant Clothing (Break In Gear) and Eye Protection.

NOTE: If the risk can not be controlled by any of the methods identified above, to an acceptable level (LOW) the task must not proceed. If the resultant risk is Medium stop and seek help from your supervisor.

Questions to ask:

1. **Are permits, written practices, procedures, or work scheduling to reduce the number of workers exposed required?**

2. **What can be done to control the Hazard?**
   - Do I know all the required steps in the procedure, code of practice, permit, or job plan?
   - Do I know what method to use to control this hazard?
   - Are there other controls that I think are needed and are not already in place? For example; personal protective equipment such as fall protection, hearing protection, eye protection, hand protection or process controls such as guards, automatic shutdown devices, enclosures, barriers, ventilation?
   - Do I need mechanical assistance (hoist/crane/forklift) to control the hazard?
   - Do I need additional resources to execute the job at Low Risk?
   - Do I need to have access platforms built to avoid putting my body in an ergonomically compromising position?

3. **Will the controls affect any other part of the job being done?**
   - Does the control introduce a new hazard? For example, does the exhaust from a compressor introduce a new hazard by exposing employees to exhaust fumes in a confined space?

4. **Is training required?**
   - Is everyone working on the job trained on the correct use of the tools and equipment involved in the job?
   - Is this the first time the job is done or has the employee done this task before?

5. **Do I need to tell anyone else?**
   - Is there anyone else who could be affected by these controls?
   - Is there a need to coordinate the work being done by more than one person?
   - Are there more than a single craft working on the same job?
   - Is a formal communication plan required?
   - Is a pre-job meeting required?

6. **Are emergency plans needed?**
   - Have emergency plans been communicated with all employees?

7. **Is there someone that I could call for help?**
   - Who has the knowledge and skill to help me?

Example: Replacing a Fluorescent Bulb

Hazard	Severity	Likelihood	Risk
Falls from elevation	High	Medium	High
Dust inhalation or in eyes	Low	High	Medium
Electrical Shock	High	Low	Medium
Cuts from broken glass	Medium	Medium	Medium
Traffic bumping ladder	High	Medium	High
Eye and muscle strain	Medium	High	High

Controls to address risk:

- Second person on job to steady ladders, control traffic and hand tools
- Housekeeping (clean up dust)
- Electrical isolation of light fixture
- PPE...Hard-hat, gloves, goggles, dust mask if necessary
- Warning signs or traffic pylons
- Portable light source

Note that the last control may create additional hazards that must be controlled. Every control measure has to be thought about to figure out if it might cause an additional hazard.

SECTION 5: HOW TO CONTROL RISKS - QUESTIONS

1. Name the four kinds of controls and give an example of each.

2. What level of risk would require controls?

3. What drives Personal Action?

4. If your task was to loosen a nut on a flange what hazards would you identify?

5. Based on the hazards you have identified what control measures would you take?