# Risk Assessment: Identifying and Assessing Risks and Hazards in the Workplace

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# What is a Risk Assessment?

- ANSI/ASSP Z 690.3-2019 –Risk Assessment Techniques adopted from ISO 31010
- Risk assessment is that part of risk management which provides a structured process that identifies how objectives may be affected, and analyzes the risk in terms of consequences and their probabilities before deciding on whether further treatment is required.

# Risk Assessment – ANSI/ASSP Z590.3-2011 PtD

- Risk assessment . A process that commences with hazard identification and analysis, through which the probable severity of harm or damage is established, followed by an estimate of the probability of the incident or exposure occurring, and concluding with a statement of risk.

# Learning Objectives for the workshop

- Identifying common hazards in organizations
- Understanding the steps in a risk assessment
- Quantifying both probability & severity variables in a risk matrix
- Evaluation of control techniques
- Prioritizing corrective actions

# Risk Assessment attempts to answer

- What can happen and why (by risk identification)?
- What are the consequences ?
- What is the probability of their future occurrence?
- Are there any factors that mitigate the consequence of the risk or that reduce the probability of  the risk?
- Is the level tolerable or acceptable and does it require further treatment?

- ANSI/ASSP Z690.3-2011 Risk Assessment Techniques

# Risk Assessment Objective

- Identify Common Hazards
- Quantify the Nature of Probability & Severity Variables
- Evaluate Control Techniques
- Prioritize Corrective Actions
- Enhance Worker Safety through Risk Awareness

# WHAT ARE RISK ASSESSMENTS?

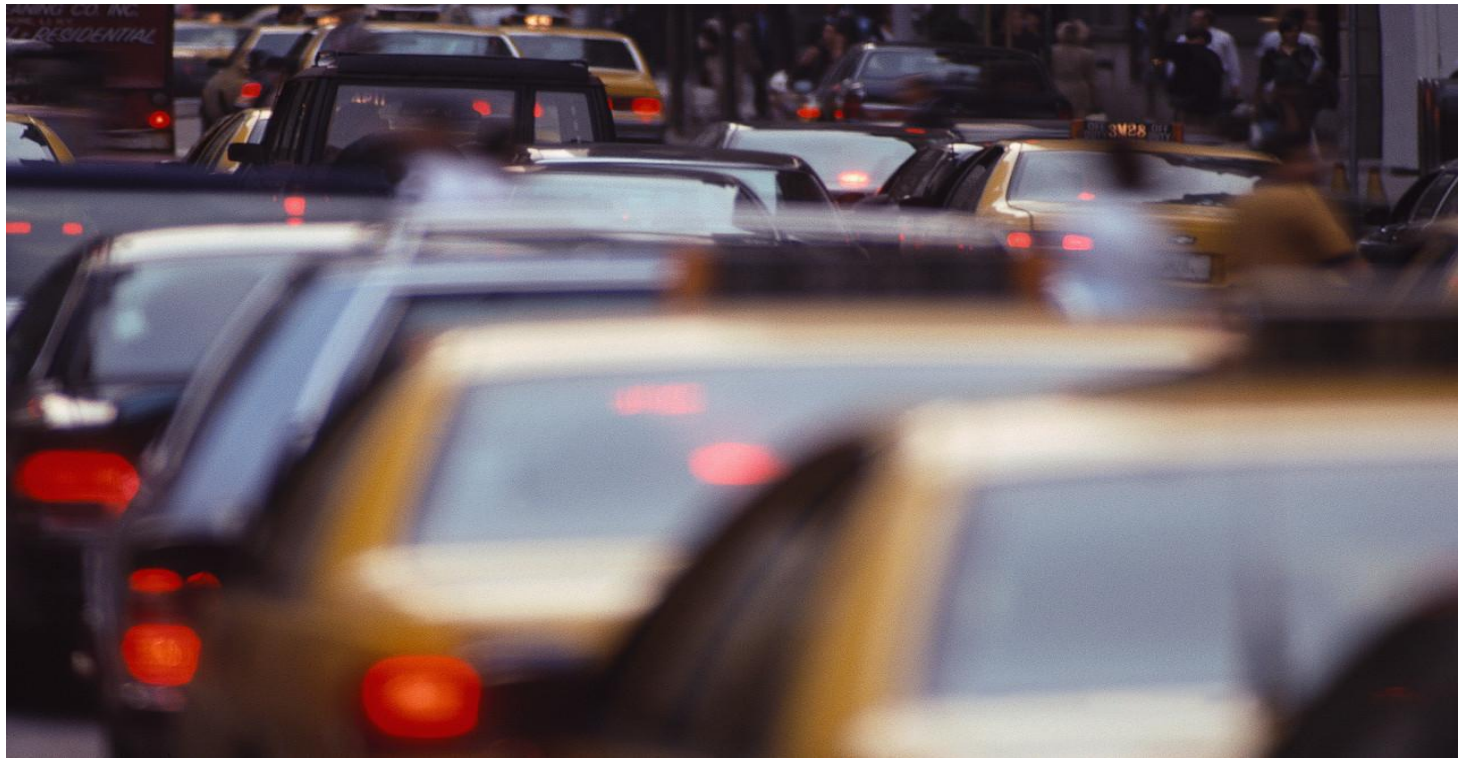
- The identification of hazards in the workplace i.e. anything  with the potential to cause harm.
- Evaluation of the risk i.e. the likelihood and severity.
- The identification of adequate control measures to eliminate / minimize the risk.
- Living documents subject to regular monitoring and review

# Definitions

- Hazard – the potential for harm (ANSI/ASSP Z590.3-2011)
- Hazard – a condition, set of circumstances, or inherent property that can injury, illness or death (ANSI/AIHA/ASSP Z10 -2019)
- Risk – effect of uncertainty on objectives (ISO Guide 73)
- Risk – an estimate of the probability of a hazard-related incident or exposure occurring and the severity of harm or damage that could result (Z590)

# A child crossing a busy road

Do we tell children to never cross a road because we believe it is too dangerous?
No -we assess the risk and introduce suitable control measures;
Always use the crosswalk and the crossing signal.



# 5 steps to risk assessment

1. Identify the hazards
2. Identify who can be harmed
3. Identify the current controls and decide if more is required?
4. Record your findings
5. Review as necessary

Let’s look at each of these in turn……

# Hazard Descriptions – Step 1

- Examples for Distribution Facilities Include:
- Electrical
- Mechanical Safety
- Storage Practices
- Working Surfaces
- Forklift Operations
- Chemical Handling
- Ergonomics
- Hand tools & Knives
- Fall hazards

# Hazards in a department

- Take a few minutes on your own and list as many hazards as you can in any department in your organization.
- What tasks are conducted in that department that are impacted by those hazards?

# Step 1. Identifying the hazards

- The first thing you need to do is identify the hazards associated with the task or activity.
- One way of doing this is by using “PEME”.
- People
- Equipment
- Materials
- Environment

- Let’s look at People hazards first…….

# “People” hazards

- People hazards cover a number of issues.
- Some of the hazards are to do with the individual themselves; other are to do with the systems that people have to use.
- When thinking about people hazards, words such as training, capabilities/restrictions, supervision, communication, adequate numbers and human error should come to mind.
- Consider the following task……


Are these people trained?
How can people make mistakes?
Are they adhering to correct procedures?
Are they physically capable of doing the task?
Does horseplay occur?
How do they communicate (during the job and in emergency situations)?
Is anybody supervising the work?
Are there enough people to do the work?

# Equipment Hazards

- “Equipment hazards” will relate to the equipment used and will also cover tasks associated with the repair, maintenance, handling, cleaning, storage and operation of the equipment.
- Consider the chainsaw task again. The chainsaw hazards would include……

# Material hazards”

- Material hazards will cover any solids, liquids or gases associated with the task.

- This not only covers substances that are required for the specific task but also any bi-products or wastes generated by the task or activity.

- With the chainsaw task we can consider the following to be hazards

# “Environment hazards”

- Finally, environment hazards are all about the surroundings you are working in. Depending on the location and the activity, hazards could include poor lighting, heating and ventilation, poor access/egress, tripping/slipping hazards, restricted space/visibility and other activities taking place nearby.

- The chainsaw work will include the following hazards....

# “Environment hazards”

- Finally, environment hazards are all about the surroundings you are working in.
- Depending on the location and the activity, hazards could include: poor lighting
- heating and ventilation
- poor access/egress
- tripping/slipping hazards
- restricted space/visibility and other activities taking place nearby.

- The chainsaw work will include the following hazards....

# Step 2 -who can be harmed?

# Who can be harmed?

- Although the task seems to be well managed, if control measures fail then a whole range of people could be injured, e.g.

- Permanent workers in the area
- People visiting the area
- The general public walking alongside the site
- Intruders and children who break into the site

- *Your risk assessment should consider all those people who could potentially be harmed if controls fail*

# Step 3 -What are the current controls?

- Step 3 has two parts.
- First, you need to look at what control measures are currently in place for each hazard you have identified. In some cases there may be no controls, perhaps because the hazard hasn’t been considered.
- At the other end of the scale, there may be good controls in place because the hazard is obvious and easily controlled.
- Consider the chainsaw task again……..

# Step 3. What are the current controls?

- When trying to identify the current controls remember that they can be broken down in 3 ways:

1. Physical controls (e.g. a metal fence around a construction site)
2. Procedural controls (e.g. a safe working procedure for the task)
3. Behavioral controls (e.g. adequate supervision and monitoring of behavior)

Examples of controls on a construction site……

# Hazard Descriptions & Exposures

- The hazard description identifies the type of hazard associated with the task.
- The type of exposure relates to the specific nature of the hazard and how it may cause injury.
- Example:
- If the hazard description is material handling (ergonomics) - exposures are typically comprised of the following exposures:
- Manual Lifting (excessive force)
- Repetitive Motion
- Non-neutral body posture (reaching & twisting)

# Task Identification

- Risk Assessments are most useful if defined by a specific tasks or workstation.
- It is useful to narrow the task scope as small as possible to better control hazardous exposures.
- For Example, if an employee performs 3 tasks in his/her job, a risk assessment should be conducted on each task and not a combined assessment for the job description.

# Step 3. Are further controls required?

- You also need to ask yourself –can more be done? What other control measures are necessary?
- Before you can do this we need to look at what is known as the hierarchy of control. Simply choosing a control measure is not enough.
- You need to be choosing the best, most effective controls so far as you can for all tasks.
- You may have looked at a particular task, identified the current controls and may be thinking about adding extra controls…but how do you know which controls measures are best.
- Let’s look at the hierarchy of control…….

# Hierarchy of Control

1. Eliminate the hazard
2. Substitute the hazard
3. Contain the hazard at source
4. Remove employee from hazard
5. Reduce exposure to hazard
6. Standard Operating Procedures
7. Warning signals
8. PPE

# Step 4. Record your findings

- The fourth step is to record your findings. Any organization with more than five people has to record their assessments. So you will need to:

- State clearly what task/activity the risk assessment covers.
- Ensure that the hazards and controls are clearly listed.
- Consider all those people who could potentially be harmed.
- Ensure that an appropriate member of staff signs off the assessment.

- Make sure that the completed risk assessments are readily available to those who might need them -Do not just file them away to gather dust!

- Once these have been done the only thing left is.....

# Step 5. Regular review of your assessments

- Risk assessments must be reviewed on a regular basis (at the very least once every three years).
- The period of review should reflect the hazards, the greater the hazards the more frequent the review.
- They should also be reviewed if there is a significant change to the work or if you believe that it is no longer valid.
- Remember –the risk assessment should be a living document it should change as the work changes.

# Hazard Descriptions & Exposures

Task : Picking Boxes from a Floor Position Pallet

| Hazard Description | Exposure | Probability | Severity | Risk Score |
|---|---|---|---|---|
| Ergonomics Exposures | Excessive Force | | | |
| | Repetitive Motion | | | |
| | Posture | | | |

# Probability Evaluation

- Examining probability relates to estimating the frequency of the event and rating it numerically:

- Example:
- Low Frequency = 1 (Activity conducted occasionally)
- Medium Frequency = 2 (Activity conducted routinely)
- High Frequency = 3 (Activity conducted continuously)

# Severity Evaluation

- Examining Severity relates to estimating the consequences of the possible outcome and rating it numerically:

- Example:
- Low Severity = 1 (First Aid / Near Miss)
- Medium Severity = 2 (Requiring Medical Treatment and or physical job restrictions but employee recovers completely)
- High Severity = 3 (Requires Medical Treatment but employee could suffer long term disability, hospitalization, or extended lost time.)

# Risk Scoring

- The values assigned for probability and severity are multiplied together and the resulting value represents the risk score.

For example:

- (Probability = 2) X (Severity = 2) the resulting score = 4

- The higher the risk score the greater potential for employee injury.
- The strategy here is to assess risk and develop a strategy for lowering the potential for employee injury for those tasks with the greatest risk potential.

# Acceptable Risk

- Acceptable Risk is defined by management as to the level of risk which is acceptable in site operations.
- If the site has injury experience which is unacceptable, or desires to improve their safety performance, then the level of acceptable risk should be reduced from historical levels.

- Example: Using a ranking of 1-3 for probability & severity
- Risk Score of 1-3 = Low Risk
- Risk Score of 4-6 = Medium Risk
- Risk Score of 6+ = High Risk (viewed to be unacceptable)

# Lifting boxes from floor level pallet

- In your group develop an initial risk score based on the probability and  severity if this activity is done four hours per day.
- Typically eight pallets per hour and between twelve and sixteen boxes per pallet each weighing twenty five pounds per box.
- Boxes are two foot cubes.
- Employees walk fifteen feet and place boxes on shelves.

# Risk Reduction Strategies

- Should the Risk Score be viewed to be unacceptable a variety of measures could be used to reduce risk.
- Examples Include:
- Establishing Standard Operating Procedures (forklift license)
- Guarding (protect the point of operation)
- Tool Substitution (knife configuration)
- Personal Protective Equipment (to prevent exposure)
- Material Substitution (less hazardous material)
- Employee Rotation (for repetitive motion exposures)

# Hazard Descriptions & Exposures

Task : Picking Boxes from a Floor Position Pallet

*Unacceptable Risk Defined as any Risk Score >6*

| Hazard Description | Exposure | Probability | Severity | Risk Score |
|---|---|---|---|---|
| Ergonomics Exposures | Excessive Force | 2 | 2 | 4 |
| | Repetitive Motion | 3 | 2 | 6 |
| | Posture | 2 | 2 | 4 |

# Risk Assessment Example

Task : Picking Boxes from a Floor Position Pallet

*Unacceptable Risk Defined as any Risk Score > 6*

| Hazard Description | Exposure | Probability | Severity | Risk Score | Control / Corrective Action |
|---|---|---|---|---|---|
| Ergonomics Exposures | Excessive Force | 2 | 2 | 4 | Lift Table & Conveyor |
| | Repetitive Motion | 3 | 2 | 6 | Employee Rotation |
| | Posture | 2 | 2 | 4 | Redesign Station |

# Re-Assessment w/ Control

Task : Picking Boxes from a Floor Position Pallet

*Unacceptable Risk Defined as any Risk Score >6*

| Hazard Description | Exposure | Probability | Severity | Risk Score | Control / Corrective Action |
|---|---|---|---|---|---|
| Ergonomics Exposures | Excessive Force | 2 | 1 | 2 | Lift Table & Conveyor |
| | Repetitive Motion | 2 | 1 | 2 | Employee Rotation |
| | Posture | 2 | 1 | 2 | Redesign Station |

*Shaded Cells Denote Revised Values*

# Thank You – Be safe

- Questions and Answers???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