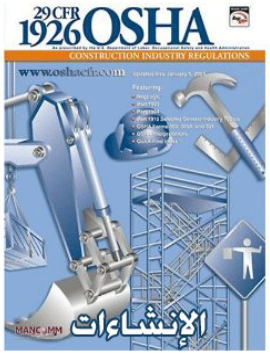
إدارة السلامة والصحة المهنية – الأوشا

Safety by Design



يتم تدرس هذا الموضوع في دورات أوشا التالية:

- ❑ **OSHA 510:** Occupational Safety and Health Standards for the Construction Industry.
- ❑ **OSHA 511:** Occupational Health and Safety Standards for General Industry.

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دورات الاوشا

إذا أردت دورات الاوشا بصيغة بوربوينت، عليك ترجمة موضوعين للغة العربية من دورات المقدمة في موقع "هندسة الإطفاء والسلامة".

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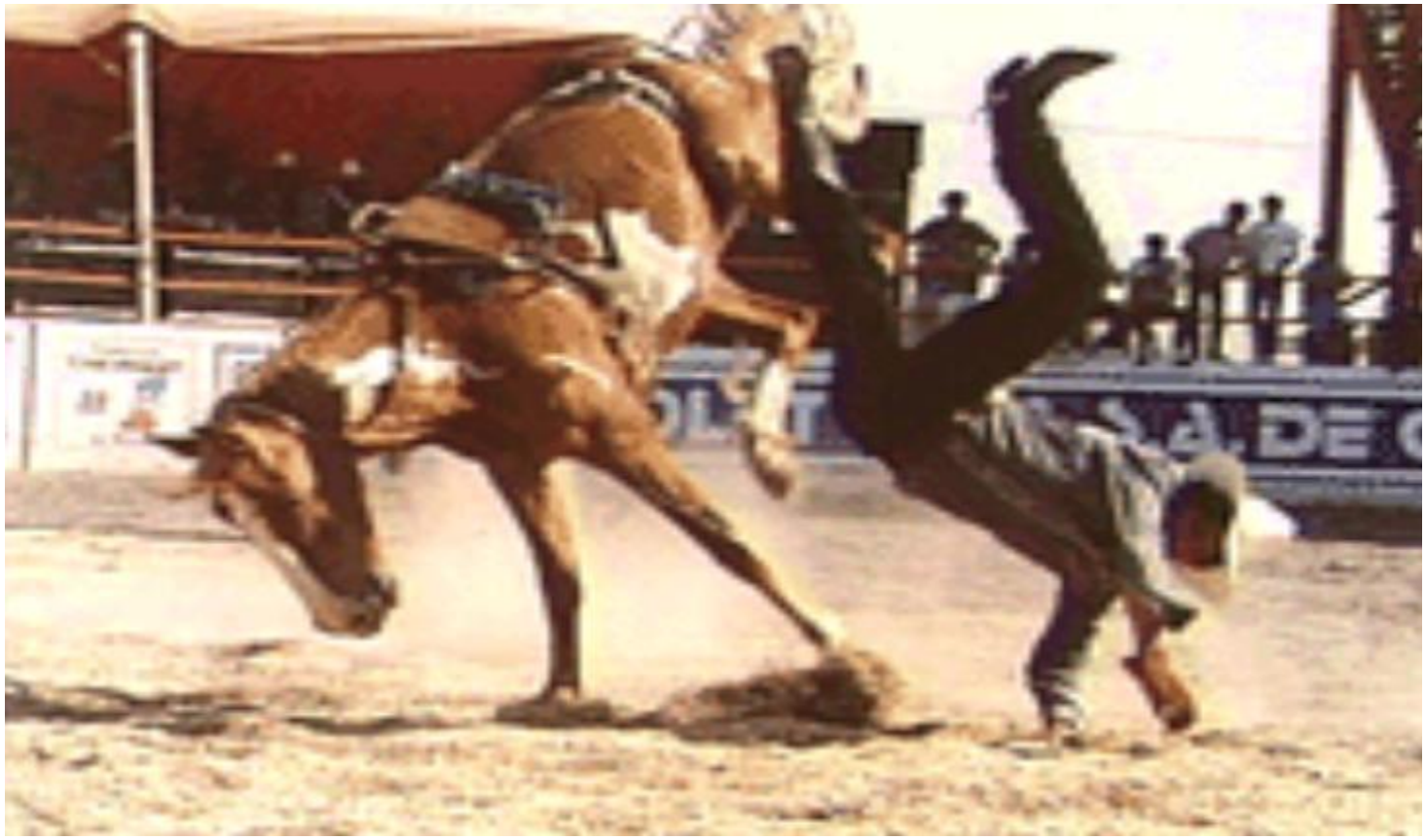
Safety by Design



Safety Through Design

- hazard analysis and risk assessment methods early in the design and engineering stages
- risks of injury or damage are at an acceptable level
- encompasses the entire enterprise and its processes or operating systems

Early Hazard Recognition

- Less costly safety implementation
- Easier
- Avoids costly retrofitting

Benefits of Designing Safety In

- Reductions will be achieved in injuries, illnesses, damage to the environment
- Enhanced productivity
- Lower operating costs
- Expensive correction design shortcomings will be avoided.

Measures and Changing Cultures

- Consider a benchmarking initiative
- A change may required effectively incorporate safety through design concepts into the design process.
- Benchmarking is a standard against which similar things are measured or judged.
- Benchmarking allows learning from the experience of others
- Eliminates experiencing negatives to influence changes necessary in the design/build stages of the safety through design model

Safety Thru Design

- Is not an add-on; it's an integral part of the business planning
- The benefits of incorporating safety as a way of doing business are mirror management goals, i.e.
  - lower costs
  - less down time
  - less re-design due to unfavorable work or product conditions

Risk and Safety

- Risk is defined as a measure of the probability of a hazards-related incident occurring and the severity of harm or damage that could result

- Safety is defined as that state in which the risks are acceptable

Probability & Severity

Two distinct aspects of risk must be considered to conduct a risk assessment:

- avoiding, eliminating, or reducing the *probability* of a hazards-related incident occurring;and

- minimizing the *severity* of harm or damage, if an incident occurs.

Risks & Hazards

- All risks to which the concept of safety through design applies derive from hazards
- Therefore *hazards* must be the focus of design efforts to achieve safety
- The design must consider both the technology and human activity aspects of hazards in
- A hazard is defined as the *potential* for harm

Risk Assessment

- A risk assessment is an analysis that addresses both the probability of a hazards-related incident occurring and the expected severity of its adverse effects
- Hazards analyses and risk assessments must be integral parts of the design process
- Minimum risk must be sought
- Risks must be deemed acceptable
- Minimum risk does not mean zero risk, which is unattainable

Order of Design Precedence *(Hierarchy of Control)*

Companies should apply the following priorities to all design and redesign processes

- *First priority:* Design for minimum risk ***(eliminate)***
- *Second priority:* Incorporate safety devices. ***(engineering controls)***
- *Third priority:* Provide warning devices ***(administrative)*** Develop and implement operating procedures and employee training programs
- *Fourth priority:* Personal protective equipment ***(Protect)***

Proactive vs. Reactive

- Proactive attitude is one that endeavors to prevent an undesired event
- A reactive approach to safety is one that must correct the deficiency, the event has already occurred and resulted in injury, illness or increased costs
- shifts the emphasis away from employee behavior to the design of work practices and methods.

Workplace Designs

- Should recognize the limitations of workers
- Some design characteristics can increase the probability of error, such as a job, situation, or system which:
  - violates operator expectations
  - requires performance beyond what an operator can deliver
  - induces fatigue
  - provides inadequate facilities or information
  - for the operator
  - is unnecessarily difficult or unpleasant
  - is unnecessarily dangerous

Hazard Elimination or Control

1. Avoid introduction of the hazard or prevent buildup of the form of energy or hazardous materials
2. Limit the hazard or the amount of energy or hazardous material
3. Substitute, using the less hazardous
4. Prevent unwanted energy or hazardous material buildup
5. Prevent unwanted energy or hazardous material release

Hazard Elimination or Control (continued)

6. Slow down the release of energy or hazardous material
7. Separate in space or time, or both, the release of energy or hazardous materials from that which is exposed to harm
8. Barriers to protect the people, property, or the environment exposed to an unwanted energy or hazardous material release
9. Modify the shock-concentrating surfaces

Assessing Hazard Probability and Severity

1. Establish the analysis parameters.
2. Identify the hazards.
3. Consider the failure modes.
4. Describe the exposure.
5. Assess the severity of consequences.
6. Determine the probability of the hazard being realized.
7. Write a concluding statement.
8. Develop proposals to remedy the hazards.