

**Risk Assessment Process**

The Risk Assessment Process in machine safeguarding is used to identify hazards through each phase of the machine's lifecycle and to minimize dangers to personnel and equipment.

**The Basic Steps**

1. **Identify** hazards and where they occur.
2. **Assess** risk by severity of harm and probability of occurrence.
3. **Reduce** the risk through the use of protective measures.
4. **Validate** and **Document** results.

**1. Identify**

- A. Personnel who will be affected.  
(e.g. Operators, Maintenance workers, Engineers, Installers)
- B. History and limits of the machine.  
(e.g. Accident history, Use limits, Layout)
- C. Task associated with the machine including use and foreseeable misuse.  
(e.g. Operation, Repair, Maintenance)
- D. Hazard related to the task.
- E. Hazards not related to the task.

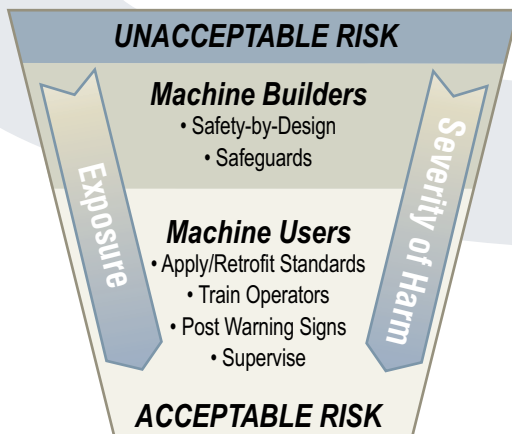
**2. Assess**

**Risk:** A combination of the probability of occurrence of harm and the severity of that harm. (ANSI B.11 TR3)

Probability vs. Severity Matrix (based on ANSI B11.TR3)				
Probability of Occurrence	Severity of Harm			
	Minor	Moderate	Serious	Catastrophic
Remote	—	—	Low	Low
Unlikely	—	Low	Medium	Medium
Likely	Low	Medium	High	High
Very Likely	Medium	High	High	High

**3. Reduce**

Unacceptable risk must be reduced to an acceptable level.



**4. Validate and Document Results**



**Risk Assessment Standards**

- OSHA 3071, (Job Hazard Analysis)
- MIL-STD-8820, (US DOD System Safety Program)
- ANSI/RIA R15.06-1999, (Safety Requirements for Industrial Robots and Robot Systems)
- ANSI B11.TR3, (Risk Assessment and Risk Reduction)
- ISO 14121 (EN 1050), (Principles of Risk Assessment)
- SEMI S10, (Risk Assessment, Semiconductor Manufacturing Equipment)