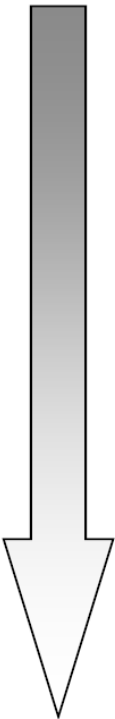


Appendix D – Hierarchy of Controls

The Hierarchy of Controls is the primary means of reducing risk when working with machine hazards. Risk reduction measures are applied following the order of hierarchy as depicted in the following table. Risks can be mitigated by reducing the severity of harm presented by the hazard, improving the possibility of avoiding harm, and/or reducing the need for access to the hazard zone. Identified hazards should ideally be addressed using the most preferred measures on the table.

| | Risk Reduction Measures | Examples | Influence on Risk Factors | Classification |
|---|--|---|---|-------------------------|
|  <p>Most Preferred</p> <p>Least Preferred</p> | Elimination or Substitution | <ul style="list-style-type: none"> Eliminate pinch points (increase clearance) Intrinsically safe (energy containment) Automated material handling (robots, conveyors, etc.) Redesign the process to eliminate or reduce human interaction Reduced energy Substitute less hazardous chemicals | <ul style="list-style-type: none"> Impact on overall risk (elimination) by affecting severity and probability of harm May affect severity of harm, frequency of exposure to the hazard under consideration, and/or the possibility of avoiding or limiting harm depending on which method of substitution is applied. | Design Out |
| | Guards, Safeguarding Devices, and Complementary Measures | <ul style="list-style-type: none"> Barriers Interlocks Presence sensing devices (light curtains, safety mats, area scanners, etc.) Two hand control and two-hand trip devices | <ul style="list-style-type: none"> Greatest impact on the probability of harm (Occurrence of hazardous events under certain circumstance) Minimal if any impact on severity of harm | Engineering Controls |
| | Awareness Devices | <ul style="list-style-type: none"> Lights, beacons, and strobes Computer warnings Signs and labels Beeper, horns, and sirens | <ul style="list-style-type: none"> Potential impact on the probability of harm (avoidance) No impact on severity of harm | Administrative Controls |
| | Training and Procedures | <ul style="list-style-type: none"> Safe work procedures Safety equipment inspections Training Lockout / Tagout / Verify | <ul style="list-style-type: none"> Potential impact on the probability of harm (avoidance and/or exposure) No impact on severity of harm | |
| | Personal Protective Equipment (PPE) | <ul style="list-style-type: none"> Safety glasses and face shields Ear plugs Gloves Protective footwear Respirators | <ul style="list-style-type: none"> Potential impact on the probability of harm (avoidance) No impact on severity of harm | |

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