Serious Incident and Fatality (SIF) Prevention Model

TOOLS FOR STEP 2: DO

Assess and Understand SIF Risk

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Do Tool 1:

Identify Potential SIF Hazards

Guidance: Using information gathered in the PLAN: Leadership Commitment and Organizational Readiness phase, identify which of the following potential SIF hazards exist across the organization. **For prevention purposes, the SIF model should be applied to one SIF hazard at a time.**

Companies may also consider using the Energy Wheel as a place to start in identifying potential SIF hazards.

Adopted from Hallowell, M. et al. (2020). *Construction Safety Research Alliance.*

SIF Hazards Checklist:
High Hazard Activities, Conditions, and Events:

- ☐ **Contact with electricity or arc flash/electrical energy**
- ☐ **Contact with moving equipment/mechanical energy**
- ☐ **Control of hazardous energy (lock-out tag-out): stored or potential energy, pressure, mechanical, hydraulic, including pressurized vessels and equipment of all types**
- ☐ **Work at height/falls from elevations**
- ☐ **Falls on same level**
- ☐ **Fire, explosion, reaction, or combustible dust**
- ☐ **Crushing hazards, heavy objects, caught under or between**
- ☐ **Bulk material storage and engulfment hazards**
- ☐ **Suspended loads, lifting and rigging**
- ☐ **Confined spaces or other suffocation hazards**
- ☐ **Highly toxic chemicals**
- ☐ **Extreme heat and cold**
- ☐ **Radiation**
- ☐ **Working around high vehicle traffic or driving motor vehicles**
- ☐ **Wild animals, poisonous snakes, biological agents**
- ☐ **Storms, floods, lightning, high winds, earthquakes, wildfires**

Do Tool 2:
Baseline Assessment Onsite

Guidance: When applying the SIF Prevention Model to assess and analyze an identified SIF hazard at a specific site or facility, a Baseline Assessment On-site should be conducted. The goal is to gain a better understanding of the SIF risk that workers are exposed to, which should lead to more effective SAFEGUARDS, mitigation techniques and reduction of risk.

Collect documentation according to the list in the initial PLAN step of the SIF Model l
(See **Document Review: PLAN TOOLS** : *Pages 2-7*).

Use the questions from the initial PLAN step of the SIF Model (See **Feedback Questions from Stakeholder Groups: PLAN TOOLS** : *Pages 22-30)* to collect feedback from:

- Site Management or Senior Leadership
- Safety & Health Professionals (corporate and onsite)
- Frontline Leaders
- Frontline Employees & Union Stewards (if applicable)

Baseline Assessment Onsite

Notes and Observations:

Baseline Assessment Onsite

Notes and Observations:

Do Tool 3:

Severity and Risk Controls Matrix

Guidance: Use the Severity and Risk Controls Matrix to rank the identified SIF hazard based on **Severity** of the potential outcome and the strength of **Controls/Safeguards**. Consider the highest level of controls currently in place to either prevent exposure or reduce the impact of exposure.

SIF hazards with a score of 10 or more should be prioritized in the next phase of the SIF Model to reduce the risk through a robust controls strategy.

Controls Ranking Descriptions

» Elimination Controls:

-Highly effective

-Physically remove the hazard

-Cannot be defeated by worker actions

» Substitution Controls:

-Generally effective

-Replace the hazard

-Can be defeated by worker actions

» Engineering Controls:

-Somewhat effective

-Replace the hazard

-Somewhat dependent on worker actions

» Administrative Controls:

-Somewhat ineffective

-Isolate people from the hazard

-Highly dependent on worker actions

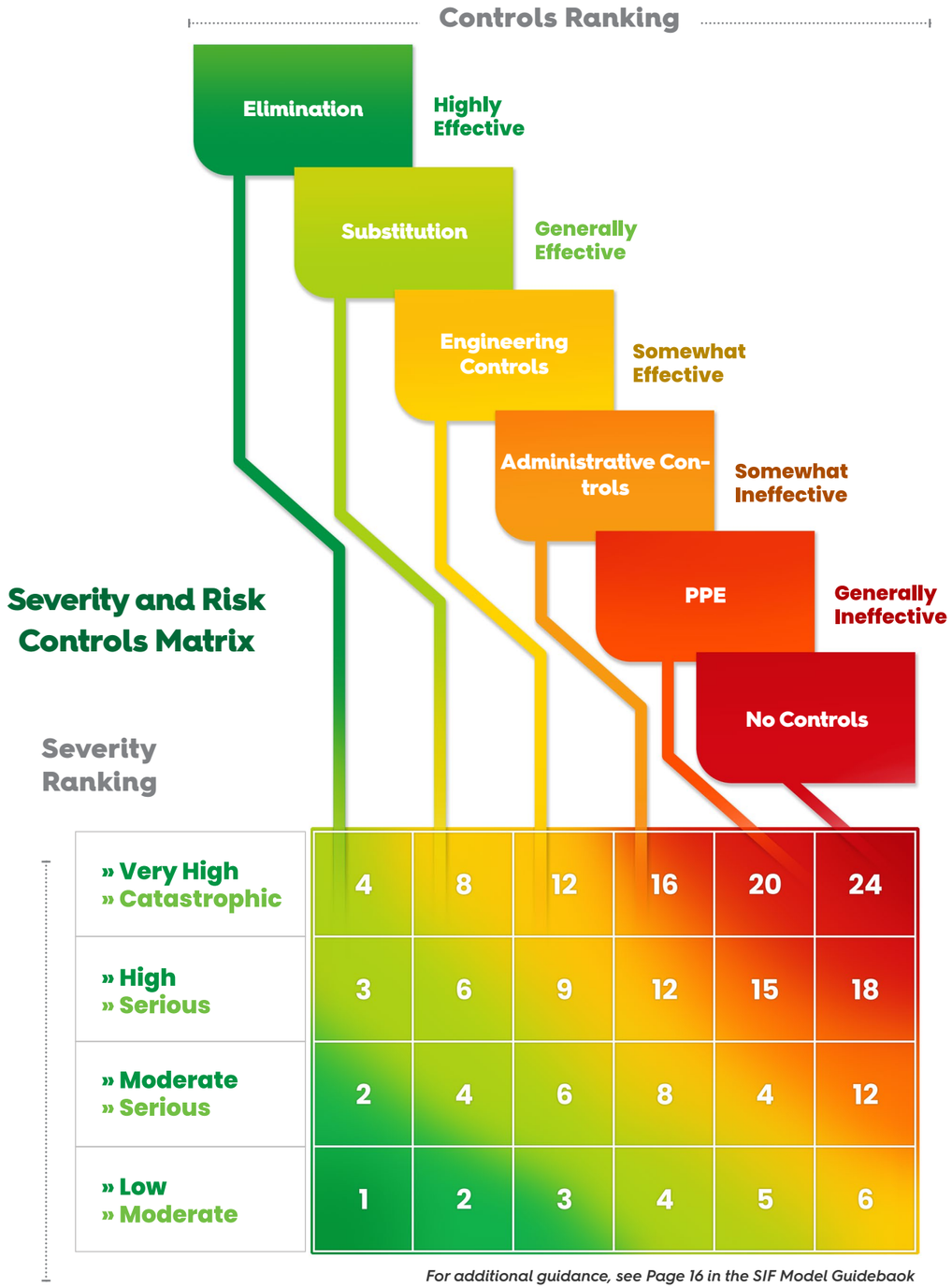
» PPE Controls:

-Generally ineffective

-Protect the worker

-Very highly dependent on worker action

Note: Risk controls are most effective when they CANNOT be defeated by worker actions.



For additional guidance, see Page 16 in the SIF Model Guidebaok

Do Tool 4:
HOP-related SIF Analysis

Guidance: Use the **HOP-related SIF Analysis** Table to consider possible precursor situations that **amplify SIF risk,** often requiring further attention and analysis for adequate control. These contributing factors related to the work environment, individual capabilities, task demands, and more, along with the impact, probability, and magnitude of each SIF risk, can be used to support the rationale for prioritizing SIF risk reduction.

If more than five of the following HOP-related risk amplifiers are applicable, be sure to consider ways to mitigate or reduce the influence and impact. Also, be sure to include these factors when completing the **SIF Hazard Prioritization and Rationale Table** *: Page 11.*

HOP-related SIF Analysis Table

Cultural/ Organizational (Attitudes and Values)	Management Systems (Policies and Practices)	Process Conditions and Task Demands	Human Factors / Behavioral	Impact or Magnitude
High Risk Tolerance	Lack of Goals or Objectives for Safety & Health	Significant Process Upsets	Physical Abilities Unmatched to Job/ Task Requirements	Level of Risk Identified
Low Employee Engagement	Low Management Accountability	Unexpected Maintenance or Repair is Common	Physical or Mental Fatigue Common	Proximity to the Hazard
Value for Safety Not Demonstrated by Senior Leaders	Poor Risk Recognition Training	Poor Management of Change	Workload Contributes to Worker Burnout	Length of Time Exposed to Hazard
Production is Prioritized Over Safety	Inspections Not Conducted Regularly	Production Pressures Exist	High Potential for Distractions	Number of Employees Exposed
Substance Abuse Exists in the Workplace	Poor Communication of Safety-critical Information	Poor Lighting or Visibility	Pre-existing Illness / Injury / Conditions	Personal Protective Equipment Not in Use
Personnel Resources are Not Adequate	Potential for Mis-communication	High Noise or Vibration in the Work Area	Financial Strain Common Among Workforce	Critical Controls Not Verified
Safe Behavior is Not Recognized by Supervisors	Procedures or Work Instructions Not Adequate	Schedule Demands (24/7, Rotating Shifts, 12+ hours)	Deviations from Procedures are Common	Non-routine Tasks Common
Other:	Other:	Other:	Other:	Other:

Combine and calculate the HOP Risk Amplifier score:

Do Tool 5:

SIF Hazard Prioritization and Rationale Table:

Guidance: Using information from the **Baseline Assessment Onsite** and analysis using the **Severity/Risk Controls Matrix** and the **HOP-related SIF Analysis**, complete the **SIF Hazard Prioritization and Rationale Table** below to capture SIF hazards to prioritize and corresponding rationale. This information can be used to report progress of the organization's SIF strategy and justify necessary resources to adequately address the prioritized SIF hazards.

Prioritized SIF Hazards	Rationale to Share with Senior Leaders to Prioritize SIF Prevention
1	
2	
3	
4	
5	

Notes and Observations:

Notes and Observations:

Notes and Observations:

For more information visit nsc.org/sif