# Risk Management | Framework

## 1. Hazard Identification

- **Hazard —** A source or condition with the potential to cause harm, damage, or loss.

## 2. Likelihood & Consequence Assessment

- **Likelihood —** How likely something is to happen (e.g., unlikely, possible, or very likely).
- **Probability —** The chance of something happening, usually expressed as a number or percentage (e.g., 20% chance).
- **Exposure —** How often, how long, or to what extent someone or something is subjected to a hazard.
- **Vulnerability —** Things that make someone or something more likely to be harmed or seriously affected by a hazard.
- **Consequence —** The potential outcome of an event.
- **Severity —** How serious that outcome would be; consider existing protections and a range of credible outcomes.

## 3. Initial Risk Classification

- **Assess initial risk —** Determine how likely something is to happen and how serious the consequences could be. Use a risk matrix to determine the risk level.
- **Classification —** Low (green) • Moderate (yellow) • High (red) • Extreme (black).
- **Judgment —** Assessments can differ between people; shared definitions and criteria improve consistency.
- **Safety margin(s)—** The buffer between operating conditions and a limit beyond which an unacceptable outcome may occur.

  How much room for error do we have?

## 4. Mitigation (Risk Controls)

- **Mitigation —** Take measures to reduce likelihood, consequences, or both.
- **Methods —** Remove hazards, when possible, reduce exposure and vulnerability, add protective measures, or change the activity.
- **Increase safety margins —** Create more separation, time, capacity, flexibility, and alternatives; reduce exposure and vulnerability; prepare for changing conditions, uncertainty, and human error.

## 5. Residual Risk Assessment

- **Reassess —** Reevaluate likelihood and consequence with controls/mitigation.
- **Reevaluate safety margins —** Have conditions changed? What risk remains? How much room for error do we have? Are we ok with that?
- **Residual risk —** The risk that remains after safety measures are put in place. Some risks may still be unknown or not fully controlled.

## 6. Risk Acceptance

- **Risk acceptance —** Deciding whether the remaining risk is acceptable after considering the safety measures, what is still unknown, and the potential benefits. You cannot always mitigate the risk, are you ok with that?
- **Risk versus reward/tolerance —** Do expected benefits justify the risk? Who bears the risk?
- **Uncertainty —** What is unknown or incompletely understood about conditions, likelihood, or outcomes?
- **Confidence —** How reliable are the information, wx forecasts, and assumptions underlying the assessment? High confidence does not mean low risk.
- **Human factors —** Groupthink; positive feedback from previous success; normalization of deviance; overconfidence.
- **Decision —** Accept, mitigate further, modify, postpone, or avoid.

**Notes**

Exposure and vulnerability can affect both likelihood and consequences. Uncertainty and confidence matter throughout assessment but are emphasized here at the acceptance decision. Color thresholds depend on the organization's matrix.

- **Increase margins —** Build generous safety margins for both intentional risk-taking and unintended mistakes or surprises. Leave room to learn without a small error becoming a major consequence.
- **Chaos and unknowns —** Unexpected events will occur. We can identify and account for many variables, but never all of them. Distinguish known risks from unknown/ unrecognized risks.
- **Progress deliberately —** Build knowledge and experience through thoughtful, progressive exposure with high safety margins. Use each experience to recognize more variables and improve judgment.
- **Do the homework & collect data points—** Invest time in managing known risks.

**Sources/References**


1. ISO 31000:2018 — Risk Management Guidelines
2. ISO 31073:2022 — Risk Management Vocabulary
3. IEC 31010:2019 — Risk Assessment Techniques
4. NIOSH — Hierarchy of Controls
5. National Avalanche Center — Decision Making
6. National Avalanche Center — Human Factors