Introduction to Risk-Based Decision Making

Kathryn Nobrega
2:30–3:00 p.m.
Learning Objectives

By the end of this session, you will know how to:

- Define techniques for risk-based decision making
- Identify how to apply those techniques in business situations, aided by a risk assessment tool

Time: 30 minutes
What Is Risk Assessment?

Risk assessment is a tool to help you deal with the regulatory and waste management issues we have presented earlier in the course.

- Helps decision making:
  - Accept risk
    - -or-
  - Take action to correct or minimize risk
- Systematic, repeatable process
- Helps you manage or reduce risk to an acceptable level
Risk Assessment Methodology

What It Evaluates

- The potential severity and probability of risk—to decide whether to accept or minimize risk

How To Use It

- Use the Risk Assessment Matrix to determine priorities for managing your hazardous materials and wastes.
- Rank activities and tasks as high, medium, or low risk.

When To Use It

- When you are establishing a hazardous materials and waste compliance program for your business
## Risk Assessment Matrix

The Risk Assessment Matrix is used to evaluate the probability and severity of environmental harm. The risk is calculated using the formula:

\[ \text{Risk} = \text{Probability} \times \text{Severity} \]

<table>
<thead>
<tr>
<th>Severity of Environmental Harm</th>
<th>Probability of Environmental Harm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (Unlikely But Possible)</td>
<td>1</td>
</tr>
<tr>
<td>Medium (Likely)</td>
<td>2</td>
</tr>
<tr>
<td>High (Very Likely)</td>
<td>3</td>
</tr>
</tbody>
</table>

### Risk Matrix

<table>
<thead>
<tr>
<th>Severity of Environmental Harm</th>
<th>High: Serious Harm</th>
<th>Medium: Significant Harm</th>
<th>Low: Minor or No Harm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability of Environmental Harm</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Low (Unlikely But Possible)</td>
<td>3</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Medium (Likely)</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>High (Very Likely)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
# Risk Assessment Matrix

**RISK = PROBABILITY x SEVERITY**

<table>
<thead>
<tr>
<th>SEVERITY OF ENVIRONMENTAL HARM</th>
<th>PROBABILITY OF ENVIRONMENTAL HARM</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>LOW Unlikely But Possible</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>MEDIUM Likely</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>HIGH</td>
<td>HIGH Very Likely</td>
<td>3</td>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>

**PROBABILITY OF ENVIRONMENTAL HARM**

- **1**: Unlikely But Possible
- **2**: Likely
- **3**: Very Likely

**SEVERITY OF ENVIRONMENTAL HARM**

- **1**: Minor or No Harm
- **2**: Significant Harm
- **3**: Serious Harm

**To-Do List**

- **High Priority**
- **Medium Priority**
- **Low Priority**
How To Apply Risk Assessment

- This matrix will help you decide which activities to take action on first.
- Remember to evaluate each activity on a scale of 1 to 9.
- Then you need to form an action plan.
- The higher the number associated with the activity, the more quickly you need to take action on it.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Assessment Score</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Activity x]</td>
<td>9</td>
<td>High</td>
</tr>
<tr>
<td>[Activity y]</td>
<td>1</td>
<td>Low</td>
</tr>
<tr>
<td>[Activity z]</td>
<td>3</td>
<td>Medium</td>
</tr>
</tbody>
</table>
Risk Assessment Exercise

Spend five minutes thinking about activities and situations that you might want to rank:

- Chemical storage condition
- Status of employee training
- Organization of documents
- Anything related to hazardous material or waste management that might affect your business or the environment

![Risk Assessment Table]

\[
\text{RISK} = \text{PROBABILITY} \times \text{SEVERITY}
\]

<table>
<thead>
<tr>
<th>PROBABILITY OF ENVIRONMENTAL HARM</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW Unlikely But Possible</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>MEDIUM Likely</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>HIGH Very Likely</td>
<td>3</td>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>

- LOW Minor or No Harm
- MEDIUM Significant Harm
- HIGH Serious Harm
Break
(15 minutes)
Spill and Release Reporting, Training Requirements, and CUPA Inspections

Kathryn Nobrega
3:15–4:15 p.m.
Learning Objectives

By the end of this session, you will know how to:

- Define legal requirements and best practices for reporting a spill or release of hazardous materials, and define the penalties for not following regulations regarding this reporting
- Determine training and documentation requirements for emergency responses

Time: 60 minutes
HMBPs and Release Reporting

Hazardous materials handlers and hazardous waste generators not only need to complete an HMBP, but they must also know how to properly report a release and other incidents involving hazardous materials.
Release Reporting

- All businesses are required to report any release or threatened release of hazardous materials.
- Immediate notification must be provided to the local CUPA, State Office of Emergency Services (OES) and local first-responding agency (911).
- Where the release incident involves a “reportable quantity” of a federal “hazardous substance” (listed at 40 CFR Part 302) or “extremely hazardous substance” (listed at 40 CFR Part 355), immediate notification must also be made to the federal National Response Center.
California, in contrast, requires broader reporting, both for releases of hazardous materials into the environment, as well as “threatened releases”, i.e., incidents where there is a substantial probability of harm that necessitates immediate action to mitigate the risk of harm.

In general, you should report all releases of hazardous materials to your CUPA and OES, except where you have a reasonable basis for believing that the release poses no significant threat to human health, safety, property or the environment.

Penalties for failure to report are significant and could involve criminal sanctions.
Which Agencies Require Notification?

Depending on the circumstances, releases or threatened releases of hazardous materials are most often reported to one or more of the following agencies:

- The Certified Unified Program Agency (CUPA) /Administering Agency (AA)/Participation Agency (PA),
- The Local Emergency Response Agency: 9-1-1 or the Local Fire Department
- The Governor’s Office of Emergency Services (OES), California State Warning Center; Phone: 1-800-852-7550 or 916-845-8911
- For releases occurring on highways, the California Highway Patrol: 9-1-1

Other agencies may need to be notified as well, depending on the nature of the spill or release and other factors.
Which Information Is Required for Notification?

State notification requirements for a release or threatened release include (as a minimum):

- Identity of caller
- Location, date and time of release or threatened release
- Location, including any involved waterway or storm drains
- Substance, quantity involved, and isotope if relevant
- Chemical name (if known, it should be reported if the chemical is extremely hazardous) and risks associated with the hazardous material, if known
- Description of what happened
What May Happen Once a Notification Is Made?

Once a notification is made, agencies may:

- Respond to the scene
- Interview witnesses
- Take a report of the incident
- Take actions as needed to protect the environment and community
Workplace Training Requirements and Emergency Response

Personnel are expected to be:

- Familiar with workplace handling and usage of hazardous chemicals
- Trained in the use of personal protective equipment (PPE) needed for safe chemical handling
- Trained on waste requirements, if responsible for waste disposal
- Trained in emergency response, if a designated emergency responder
- Trained annually and documented training records kept 3 years
Documentation Requirements

Business owners are required to:

- Maintain documents of their current chemical inventories and emergency response plan electronically or as hardcopy and is available to employees
- Maintain copies and track all manifests they issued for hazardous waste transportation and disposal
- Maintain of training records electronically or as hardcopy
CUPA Inspections

CUPA staff inspect businesses for compliance with:

- The hazardous material and waste regulations
- Underground and aboveground storage tanks regulations
- Extremely hazardous substances regulations
- Waste tire regulations
- Tiered treatment regulations
- Respond to complaints of illegal hazardous waste disposal
- Respond to releases
Course Closure

Facilities Tour