Introduction to risk assessment: understand

IOSH guides
This free Introduction to risk assessment: understand is part of a series from IOSH aimed at workers, supervisors and managers (including senior managers) and links to the competency framework theme identified on the next page. The series provides general information on a range of important occupational safety and health (OSH) topics, helping the reader to understand better the role they can play in ensuring that OSH risks are well-managed.

Other titles in this Introduction series from IOSH can be downloaded from our resources page.

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The IOSH competency framework

The framework covers all the skills, knowledge and behaviours needed by occupational safety and health professionals. It has 69 competencies, divided into 12 areas which together make up three categories:

1. technical
2. core
3. behavioural.

These guides align with the framework with four levels:

1. understand
2. implement
3. lead
4. innovate.

Some guides are aligned to multiple levels. The levels indicate your career stage and your experience as an OSH professional.

Find out more about the competency framework here.

This guide aligns to the following technical competencies:

- risk assessment and analysis: understand level
- risk identification and profiling: understand level
- risk prioritisation: understand level.
What is risk assessment?
Risk assessment is the process of evaluating risks to workers’ and others’ safety and health from work hazards. It involves:

- identification of hazards and risk factors that have the potential to cause harm
- analysis and evaluation of the risks associated with a particular hazard
- determination of appropriate ways to eliminate the hazard or control the risks when a hazard cannot be eliminated.

Risk assessments range from complex, calculation-based methodologies (which tend to be used in heavy industry, such as power generation, mining and offshore facilities) to simpler, experience-based risk assessments (used for most other types of organisation, such as offices and shops). This introduction will focus on a methodology for doing simpler risk assessments.

There is often a legal requirement for organisations to undertake risk assessments. They are the first step towards managing OSH, as they help organisations identify problems and offer solutions.

How risk assessments fit in an occupational safety and health management system
An OSH management system (OSHMS) is an organisational framework and a collection of tools and processes, designed to deliver the intent set out in an OSH policy. Risk assessments form a central part of an OSHMS, linking in with risk management and control systems.

For general information, see Introduction to occupational safety and health management systems: understand and Introduction to risk management: understand.
Introduction to risk assessment

Figure 1: IOSH’s ‘Plan, Do, Check, Act’ model
Risk assessment process

Figure 2: An example of a risk rating matrix

<table>
<thead>
<tr>
<th>Increasing consequence</th>
<th>Increasing likelihood</th>
<th>Stop</th>
<th>Urgent action</th>
<th>Action</th>
<th>Monitor</th>
<th>No action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>20–25</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
<td>12</td>
<td>16</td>
<td>15–16</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td>9</td>
<td>12</td>
<td>8–12</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td>6</td>
<td>8</td>
<td>3–6</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
<td>2</td>
<td>4</td>
<td>1–2</td>
</tr>
</tbody>
</table>

Figure 3: Sample risk assessment template (actions section removed)

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Identify the hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Who can be harmed and how?</td>
</tr>
<tr>
<td>Step 3</td>
<td>Assess the risks</td>
</tr>
<tr>
<td>Step 4</td>
<td>Decide on what controls are needed Reassess the risks</td>
</tr>
<tr>
<td>Step 5</td>
<td>Record significant findings, communicate them and review assessment as necessary</td>
</tr>
</tbody>
</table>

Figure 4: Five steps to risk assessment
Risk assessment process

Step 1
Hazards can be identified by OSH inspections, worker engagement or by an in-depth review of processes and procedures.

Types of workplace hazards include:
- safety hazards such as those caused by inadequate machine guards, and unsafe work practices such as workers not following safe systems of work (SSOW)
- biological hazards caused by organisms such as viruses, bacteria, fungi and parasites
- chemical hazards such as acids, alkalis, carcinogens and sensitisers
- ergonomic hazards caused by physical and psychological demands

Step 2
As well as workers, others may be harmed by particular work activities. These can be:
- contractors
- members of the public
- those using products and services
- anyone else affected by the activity.

Some more vulnerable groups of workers, such as younger workers, new or expectant mothers and people with disabilities, might be more vulnerable to certain hazards. For example, younger workers, who may still be undergoing physical biological developments, are at a higher risk of being affected by metal lead poisoning than older workers.

Step 3
Risk assessments are a careful examination of what (in the workplace) could cause harm to people, damage or loss to property or processes. They enable judgment as to whether enough precautions are in place or if more should be done to prevent harm to those at risk.

Risk assessments can be either qualitative (an educated opinion) or quantitative (using measurement and calculations). Any existing control measures should also be considered when assessing the risks.

A risk assessment can be used to estimate the impact of the risk, based on its likelihood and consequence (risk = likelihood x consequence). An example is shown in Figure 2.

Step 4
Risk ratings help to prioritise risks. Higher risk ratings will need more urgent action than lower ratings.

Higher-level risk controls will need to be used to eliminate or reduce the risk.

Step 5
Risk assessments are recorded on documents such as the template shown in Figure 3.

More IOSH content
For general information, see Introduction to risk management: understand.
Risk assessment process

How can information from risk assessments be communicated to workers?
Risk assessments can sometimes be difficult for workers to read directly and to put into context in relation to the task or activity they are undertaking.

Safe systems of work, sometimes known as safe operating procedures (SOPs), can be used to define safe methods of working for an activity based on the findings from a risk assessment.

They highlight the controls that need to be in place to eliminate or reduce OSH risks and how to implement them. They can also inform the worker of any risks that remain and how to deal with them.
Challenging risk assessments

An important aspect of an OSH professional’s role is to advise managers on how to undertake risk assessments and challenge content to ensure the information is of good quality. Qualitative risk assessments are subjective. They require justification for a particular risk rating or challenging an aspect of likelihood, such as the true effectiveness of a control, which is essential in making sure it is suitable and sufficient for the process, equipment or area.

Contractor risk assessments are another example of where OSH professionals must challenge the content of the documents. These risk assessments can often be generic to the task being undertaken but may not consider the specific environment of each workplace. Therefore, hazards may be missed, or risks may not be appropriately assessed.
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