# **Risk Assessment Guidance Document**

**Overview**

Supervisors have a general duty to ensure the health and safety of their workers. Conducting a risk assessment enables the supervisor to take the measures necessary to meet this requirement. It provides an opportunity to consider all foreseeable hazards associated with a task and the risks associated with those hazards. This information is then used to establish controls to remove the hazard or minimize the risk. See Figure 1 to see the full process. Lastly, a documented Safe Work Procedure is created that incorporates all the information from the hazard identification and risk assessment allowing one to carry out the task safety.

Note: The risk assessment should be based on what is reasonably anticipated. If at any time, there is a change in location, timing, equipment, environment or any other factor that could affect the worker’s safety, a new hazard identification and risk assessment will be required and changes to the safe work procedure may be necessary.

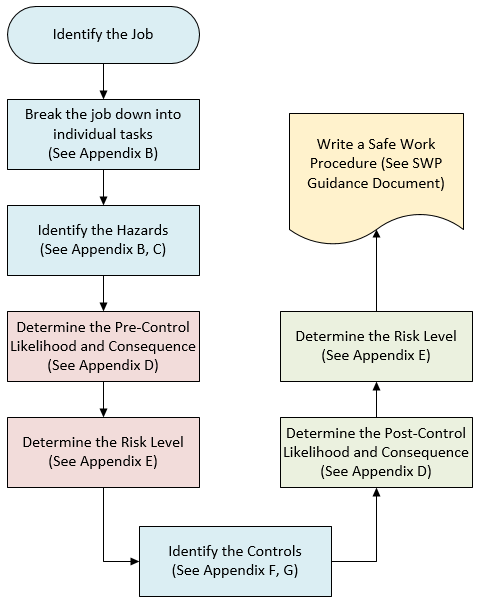
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Figure 1: Steps associated with conducting a Risk Assessment

**Appendix A: Definitions**

***Administrative Controls:*** The modification of work processes or activities to minimize risk

***Engineering Controls:*** The modification of the physical work environment to minimize risk

***Hazard:*** A potential source of harm to a person that can lead to a risk of injury or occupational disease

***Risk:*** The chance of injury or occupational disease

***Risk Assessment:*** The process where hazards are identified, their risk evaluated, and controls for the risk are determined to eliminate the hazard or minimize the risk

***Supervisor:*** The person directly responsible for overseeing the tasks of the worker

***Violence in the Workplace:*** Attempted or exercised physical force causing injury to a worker by a non-worker, including threatening statements or behaviours which gives a worker reasonable cause to believe that he or she is at risk of injury

***Worker:*** All employees of UBC including faculty, staff, and paid students

***Working Alone:*** Working in circumstances where assistance will not be readily available to the worker in case of an emergency, an injury, or ill health

**Appendix B: Conducting a Hazard Identification**

This appendix will assist in completing the first column of the Risk Assessment Template entitled “Task”. The first step in conducting an effective risk assessment for a job is to identify the hazards associated with each task that constitutes the job.

In order to determine the hazards in a workplace, follow the steps below:

1. Identify the job
2. Break the job down into specific tasks/steps. Note: you should not have more than 10-15 steps in your job. If you do, combine steps, eliminate unnecessary detail, or break the job into two procedures
3. Determine the hazards for each task/step (See Appendix C: Examples of Hazards in the Workplace). Note: Each task can have more than one hazard.

Once the hazards have been determined, these can be used in the risk assessment to establish controls and minimize the risk.

**Appendix C: Examples of Hazards in the Workplace**

This appendix will assist in completing the second column of the Risk Assessment Template entitled “Hazards and possible outcomes.” It is helpful to identify possible outcomes of negative interaction with the hazard in the risk assessment.

The tables below provides generic examples of workplace hazards within each of the five categories. This is not an exhaustive list and the supervisor is responsible for listing the detailed site specific hazards.

**Physical Hazards:**

Physical hazards can cause injury to workers when an object, piece of equipment or material comes into contact with the worker though direct contact is not always necessary. Physical hazards are often associated with an uncontrolled source of energy (e.g. kinetic, electrical, pneumatic, hydraulic, etc.). Examples of physical hazards are **exposure to**:

|  |  |  |
| --- | --- | --- |
| ***Environment*** | ***Equipment*** | ***Miscellaneous Physical Hazards*** |
| * Extreme temperatures | * Fast moving equipment | * Arc flash |
| * Humidity extremes | * Exposed moving parts | * High voltage |
| * Sunlight (e.g. heat stress, sun exposure, etc.) | * Mobile equipment | * Electromagnetic fields |
| * Terrain (e.g. uneven, slippery, etc.) | * Powered equipment | * Electricity |
| * Extreme land weather (e.g. strong winds, rain, fog, etc.) | * Pinch point | * Heights (e.g. falling from, items falling from, etc.) |
| * Extreme marine weather (e.g. currents, waves, etc.) | * Nip point | * Radiation (e.g. open or sealed source, ionizing or non-ionizing, etc.) |
| * Fire | * Sharp edges | * Asbestos |
| * Entanglement | * Ladder use | * Overhead hazards |
| * Engulfment | * Vibration | * Confined space |
| * Muddy environment |  | * Nearby road traffic |
| * Lighting |  |  |
| * Noise |  |  |
| * Cliffs/Mountains |  |  |
| * Wildlife (e.g. aggressive nature, etc.) |  |  |

Note: When identifying physical hazards, detail the source of the hazard where applicable along with the nature of the hazard (e.g. high pitched, continuous, glare, dim, etc.), exact equipment that is used and useful details (e.g. exact temperatures, etc.)

**Appendix C: Hazards in the Workplace (cont’d)**

**Ergonomic Hazards:**

Ergonomic hazards arise when the interaction between the work and the worker is not ideal. They cause harm to the musculoskeletal system. Examples of ergonomic hazards are:

|  |  |  |
| --- | --- | --- |
| * Repetitive movements | * Using too much force | * Awkward postures |
| * Frequent lifting | * Sustained/static postures | * Contact stress |
| * Strains | * Sprains |  |

Note: Use this tool to assist with identifying ergonomic hazards: <http://www.hr.ubc.ca/wellbeing-benefits/files/Ergonomics-MSI-Hazard-Identification-Checklist.pdf>

**Psychosocial Hazards**

|  |  |  |
| --- | --- | --- |
| * [Violence in the Workplace](http://rms.ubc.ca/health-safety/safety-programs/personal-safety/workplace-violence-prevention/#What%20are%20supervisor/department%20responsibilities%20for%20workplace%20violence?)\* | * Workplace Conduct | * [Working Alone](http://rms.ubc.ca/health-safety/safety-programs/personal-safety/6969-2/#What%20is%20working%20alone?)\* |

*Note: Some hazards require their own risk assessments. These hazards are identified by an asterix (\*) and the relevant link is provided.*

**Biological Hazards:**

Biological hazards are organisms or substances produced by organisms that may pose a threat to human health and safety. Biological hazards include **exposure to**:

|  |  |  |
| --- | --- | --- |
| * Allergens | * Bodily fluids | * Microorganisms |
| * Animals | * Insects | * Waste (human or animal) |
| * Blood | * Plants | * Bites from insects or animals |

Note: When identifying biological hazards, provide more detailed statements in your Risk Assessment. For example, detail the type of animal/insect/microorganism, which species it belongs to, the specific aspect of it being used (e.g. tissues, heart etc.) and the nature of the blood/bodily fluid (e.g. Is it infectious?” or, “Is it poisonous?”)

**Chemical Hazards:**

Chemical hazards are substances which, because of its characteristics and effects, may cause harm to human health and safety. Chemical hazards can be broke down to include exposure to: vapours, gasses, mists, dusts, fumes and smoke. Examples of chemical hazards include **exposure to**:

|  |  |  |
| --- | --- | --- |
| * Compressed gases | * Corrosives | * Flammables |
| * Cytotoxic substances | * Carcinogenic | * Oxidizers |
| * Pressurized containers | * Pesticides | * Toxic |
| * Explosive | * Fumes | * Lead |

Note: When identifying chemical hazards in your Risk Assessment, detail exact chemical names as they pertain to the hazard (e.g. Instead of writing “flammables”, write “acetone” as the hazard).

# **Appendix D: Risk Assessment Elements**

Use the table below to determine the likelihood and consequence for each hazard identified in the hazard identification. Document the results in the Risk Assessment Table under the relevant headings of Pre-Control Risk and Post Control Risk.

Note: Do not consider controls that would be used when determining the Pre-control likelihood and consequence. Do consider controls that would be utilized when determining the Post control likelihood and consequence.

|  |  |
| --- | --- |
| **Consequence:** | **In order to determine the Consequence, consider the following items:** |
| * Extreme (Fatality, Injury or illness resulting in long term (more than 6 months) or permanent impairment) | * What are the possible consequences? * What is the possible severity of the harm? * Presence of others: Are other people in the vicinity? (Consider field work, remote locations) * Awareness: Will others capable of providing assistance be aware of the worker’s needs? * Willingness: Is it reasonable to expect others to provide assistance? * Timeliness: Will assistance be provided within a reasonable time period? (Consider access to first aid and emergency services for remote locations and field work) |
| * Major (Injury or illness requiring hospital admission and/or temporary impairment (less than 6 months)) |
| * Moderate (Injury or Illness requiring medical treatment) |
| * Minor (Minor cuts, bruises, irritation or physical discomfort) |

|  |  |
| --- | --- |
| **Likelihood** | **In order to determine the likelihood consider the following items:** |
| * Very likely (Continuously or many times daily) | * How likely are the consequences to occur? * Have such incidents occurred in the past? * Is the incident common in this field of work? * How frequent is the exposure to the hazard? * Is the task repeated many times each shift? * How long are workers exposed to the hazard? The longer the exposure, the higher the risk |
| * Likely (From once per day to once per month) |
| * Moderate (From once per month to once per year) |
| * Unlikely (It has been known to occur but not likely in normal circumstances) |
| * Rare (Not known to have occurred, but considered remotely possible) |

# **Appendix E: Risk Matrix**

Use the risk matrix to complete the “Risk Level” and “Residual Risk Level” columns of the Risk Assessment Template. Note: The table below does not suggest that any level of risk is acceptable.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Continuously or many times daily, expected to occur regularly under normal circumstances | Very Likely | **Medium** | **High** | **High** | **High** |
| From once per day to once per month, expected to occur at some time | Likely | **Medium** | **Medium** | **High** | **High** |
| From once per month to once per year, may occur at some time | Moderate | **Medium** | **Medium** | **Medium** | **High** |
| It has been known to occur but not likely in normal circumstances | Unlikely | **Low** | **Medium** | **Medium** | **Medium** |
| Not known to have occurred, but considered remotely possible | Rare | **Low** | **Low** | **Medium** | **Medium** |
|  |  | Minor | Moderate | Major | Extreme |
|  |  | Minor cuts, bruises, irritation or physical discomfort | Injury or illness requiring medical treatment | Injury or illness requiring hospital admission and/or temporary impairment (less than 6 months) Permanent Disability | Injury or illness resulting in long term or permanent impairment One or more fatalities |

**Likelihood**

**Consequence**

# **Appendix F: Hierarchy of Controls**

For each hazard, after determining the risk level, consider the following to aid in developing appropriate controls

1. **Can the hazard be eliminated?**
2. Can the task be avoided? Does the task need to be done to achieve the desired result?
3. Can the hazardous part of the task be removed?
4. Can it be done in a way so workers are not exposed to the hazard?
5. **Can substitution produce a less hazardous situation?**
6. Can a different machine or tool be used?
7. Can less hazardous materials be substituted to reduce risk?
8. Can work practices be developed to reduce exposure to hazard?
9. **Can an engineering control be used?**
10. Can the hazard be controlled at its source (e.g. local ventilation)
11. Can the hazard be enclosed (e.g. noise control)?
12. Can a physical barrier be provided (e.g. guarding)?
13. **Can an administrative control be used?**
14. Can work be scheduled to reduce individual exposure (e.g. providing regular breaks, rotating work assignments)?
15. Can the workplace be reorganized to provide distance between hazard and workers?
16. Can susceptible workers (e.g. to certain chemicals) be transferred to other duties?
17. Are training and safe work procedures required and available?
18. **Can personal protective equipment be used?**
19. Is PPE provided?

**Appendix G: Examples of Controls**

Controls can be placed at the source, along the path or at the worker. This appendix will assist with completing the “Controls” column of the Risk Assessment Template. This is not an exhaustive list and the supervisor is responsible for listing the detailed hazard specific controls.

**Engineering Controls**

Engineering controls are methods that are built into the design of a plant, equipment or process to minimize the hazard. Engineering controls are a very reliable way to control worker exposures as long as the controls are designed, used and maintained properly. Three types of engineering controls are: Process control, enclosure and/or isolation of emission source, and ventilation. Examples within each category are listed below:

|  |  |  |
| --- | --- | --- |
| ***Process Control*** | ***Enclosure and Isolation*** | ***Ventilation*** |
| * Wet methods instead of dry | * Glove boxes | * Fume hoods |
| * Mechanical transportation instead of manual | * Remote controlled devices | * Biological safety cabinets |
| * Guards |  |  |

**Administrative Controls**

Administrative controls are the modification of work processes or activities to minimize risk. Some examples of administrative controls are listed below:

|  |  |  |
| --- | --- | --- |
| * Signs/Labels | * Restricting access to a work area | * Rotating job schedules to limit time an individual worker is exposed |
| * Training on Safe Work Procedure | * Restricting task to only those competent or qualified to perform the work | * Using a work-rest schedule that limits the length of time a worker is exposed |
| * Completing RMS online general safety courses | * Scheduling maintenance and high exposure when few workers are present |  |

**Personal Protective Equipment (PPE) Controls**

This is the last line of defense as PPE does not remove the hazard in any way but instead serves as a barrier between the worker and the hazard. Some examples of PPE are listed below:

|  |  |  |
| --- | --- | --- |
| * Safety glasses | * Respirator | * Steel toed boots |
| * Safety goggles | * Hard hat | * Laboratory coat |
| * Face shield | * Gloves (Indicate the material) |  |