

Revision	Date	By	Revisions
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Introduction:

Safety risk is an everyday part of our lives. In many situations in our personal lives, we intuitively deal with risk. In an organisational structure, such as in the engineering industry, risk can be more complex, owing to the nature of the risk and the number of stakeholders involved, and requires a structured approach to its management. In this project, you will learn to apply risk tools to identify and manage the risks associated with well-known activities.

Instructions:

Students should undertake this project while reviewing Module 1 of Safe System for Universities. This project can be undertaken individually or in small groups.

Select an activity that you are familiar with. This activity could be from a personal situation (e.g. travelling to and from your education institution) or a professional situation (e.g. undertaking a laboratory experiment). You will need to have an in-depth understanding of the steps required during the selected activity, so make sure that the activity you select is familiar to you.

Steps:

1. For your selected activity, list the stakeholders that are involved in the activity. Make sure to differentiate between managers and users.

Tips: Managers are those who oversee the activity and its outcomes, but are generally not involved in the activity itself. Users are those who undertake the activity, and who run the risk of personal harm through the activity. Examples of managers and users could be teachers and students; company managers and company employees; or railway operators and railway passengers. The separation between manager and user is not always distinct. For example, airline pilots could be considered managers as well as users, as they oversee an activity but also have a personal stake in the outcomes of safety.

2. For your selected activity, consider each step in the process of the activity. List each step and the potential safety risks associated with each activity.

Tips: Steps make up the logical pathway along which an activity is performed. An example could be the steps required to travel from home to work: walking to the bus stop; catching the bus into the city; and walking from the city bus stop to work. Each step can come with its own risks, such as the risk of being hit by a car when walking to the bus, or the risk of falling when the bus suddenly stops.

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3. For each step in the activity, identify, using the risk triangle, which factors most heavily contribute to the existence of risk. You can rate each factor as low, moderate, or high.

Tips: The risk triangle consists of three factors, as explained in Snippet 2. Factors of risk can be exposure to an event that could result in failure, the likelihood that failure will occur, and the consequence of failure. For example, when walking to the bus stop, exposure depends on how many cars you are exposed to along your walk, which is dependent on when and where you walk. The likelihood that you will be hit by a car is low, but the consequence is likely to be high, such as sustaining a life-threatening injury.

4. For each step in the activity, identify, by using Reason's model of failure trajectory, the barriers to failure and where gaps could occur in each barrier.

Tips: There are five barriers in Reason's model of risk trajectory, which are explained in Snippet 3. When undertaking this step in the project, it could help to draw out the model of failure trajectory and list barriers to failure and associated gaps below each barrier. An example of the barriers to failure and associated gaps for falling while travelling on a bus could be: the fleet purchasing policies of the bus company, and whether to buy buses that have more seating and less standing room (system decision makers barrier); the capability of the bus driver to safely operate the bus and not undertake sudden stops (preconditions barrier); and the safety equipment in the bus to help protect passengers from falling in a sudden stop, such as seats, seatbelts, and handles for those people who are standing (defences).

5. For each step in the activity, develop, using the Hierarchy of Controls, controls that can be used to reduce the risk of failure.

Tips: There are five levels to Hierarchy of Controls, which is explained in Snippet 4. Controls are ranked in order of preference, based on their effectiveness to successfully protect people from harm. For our example of walking to the bus stop, controls to prevent or mitigate harm from being hit by a car could be: working at home instead of travelling to work (exposure); finding a safer mode of travel to work (substitution); installing physical barriers to prevent interactions with cars (engineering controls); travelling to work when there are less cars on the road (administrative controls); or wearing high-visibility clothing to make yourself more visible to car drivers (PPE).