

Overall process comprising a risk analysis and a risk evaluation. This method involves identifying injuries that could possibly be caused by the product, analyzing the probability and severity of these injuries, and assessing the risk level (probability combined with severity).

Ensuring product safety is essential in manufacturing

Today, the importance of product safety is emphasized more than ever before.

Products with safety concerns can lead to serious problems, such as user injury or even a fatal accident. Product-related injuries and damage do not affect the user only. The manufacturer may lose the public's trust and be damaged by reduced effectiveness of the brand, lower sales, and a large loss of money due to product recalls, etc.

Therefore, when making products, not only the pursuit of quality but also the effort to ensure safety by risk assessment is effective.

The word "risk" is used in various contexts, but in the area of product safety, it is used in sentences like "Because the risk of injury from using this product is significant, it is not acceptable." There is no perfect measure for safety, but by implementing the process of risk assessment and risk reduction, we can reduce the risk of severe injuries and lower it to an acceptable level.

Implementing truly effective risk countermeasures by identifying and analyzing risks based on knowledge

So how is risk assessment done on a prod-

uct? Generally we use the following procedure.

First, to identify risks, we imagine the users of the product and when, where, and how they use it. For example, we normally expect that adults will use the washing machine according to the manual, but a child may sit on the lid. This is the wrong way to use a washing machine, but we include such cases and list as many situations that could occur as possible. Although there is a possibility of using a washing machine upside down, that is too unrealistic to actually happen. So it should not be included with the possible situations. To identify risks thoroughly, it is essential to ask for opinions from departments other than the product design department, such as the marketing and sales departments, as well as from veteran workers with plenty of experience and knowledge.

Next, we think up hazards (sources of risk) and danger scenarios related to the situations identified at the previous stage. If a hose from the washing machine is not connected properly to the tap, water can leak and someone can slip on the wet floor, or if that water drips into an outlet, someone may get an electric shock. In this way we think up hazard scenarios based on the sources of risk, like water and electricity.

Third, we analyze risks for each scenario and then assess them. One often-used method of risk analysis and assessment is risk mapping.

Risks in each scenario are assessed using a risk map (R-map), that is a matrix of risks having fre-

quency (or probability) of occurrence as the vertical axis and severity (degree of harm) as the horizontal axis.

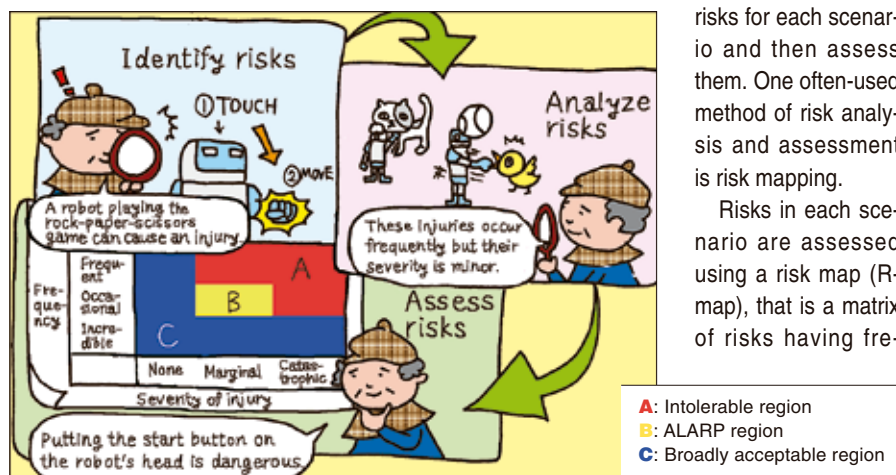
The area of the matrix is divided into sections, such as "A" sections for the risk of severe injury that is intolerable, "B" sections for the risk of injury whose severity is as low as reasonably practicable (ALARP) and "C" sections for the risk of injury whose severity is broadly acceptable. If a risk appears in the A or B areas, its severity level should be lowered by applying countermeasures, or its frequency should be reduced, so that it can be moved to the C area.

In the case of a washing machine, the frequency of water leaks can be reduced if the type of hose connection or its material is changed. As in these examples, risks should be lowered into the C area by repeating the process of risk assessment and incorporating countermeasures into the design.

For risks caused by the wrong use of the product, etc., if the risk level cannot be lowered by changing or improving the design, it can be lowered by placing a warning, such as "Risk of Electric Shock," on the product to guide users to use the product properly.

Many of the products we use daily have had their risk reduced to an acceptable level through these kinds of risk assessment.

Safety standards change with the times and technologies for safety is advancing every day. There is no end to the effort to pursue product safety.



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Azbil Trading Co., Ltd., makes a product called a pressure-sensitive mat switch that can immediately stop robots or deactivate the start switches of machine tools in order to protect people who step into a dangerous area in industrial plants and factories. This switch is an additional safety measure.



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