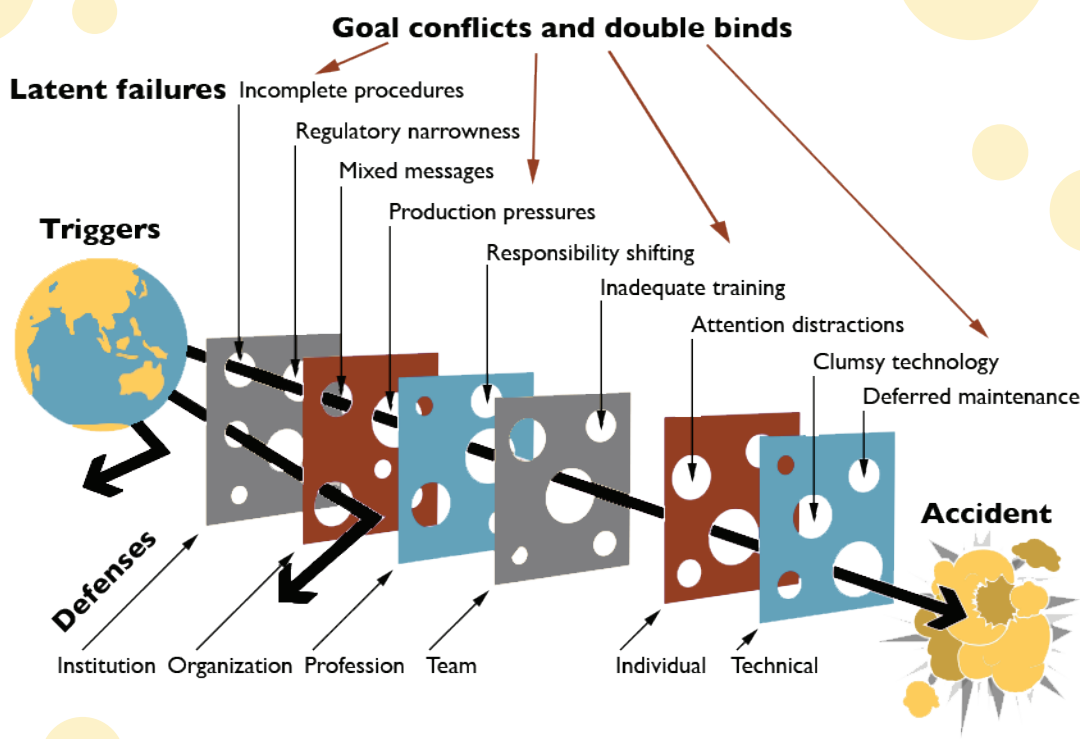


# What Does Swiss Cheese Have to do With Mining Accidents?

The Swiss Cheese Model of accident causation is widely used in industries throughout the world, including mining, in risk analysis and risk management. It uses cheese slices in a diagram to show how accidents can occur unexpectedly when certain events, conditions, or hazards “line up” at the same time in an unprotected system.

## The Swiss Cheese Model\*



01

### Multiple Slices, Stacked Side by Side

The risk of a potential accident becoming a reality is lessened when different barriers or defenses are “layered” behind one another. Still, there is always a chance for failure, meaning that an accident might result.

02

### What Are the Holes?

The holes represent weaknesses in individual parts of the system. They continually vary in size and position across the slices.

03

### When Does a “Failure” Occur?

When a hole in each slice momentarily aligns, there is an opportunity for an accident to happen. That’s when a hazard passes through holes in all of the slices and can lead to a failure.

04

### What Can Lead to Failure?

1. Organizational influences
2. Unsafe supervision
3. Preconditions for unsafe acts
4. The unsafe acts themselves

Most accidents can be traced to one or more of these four failure “domains.”

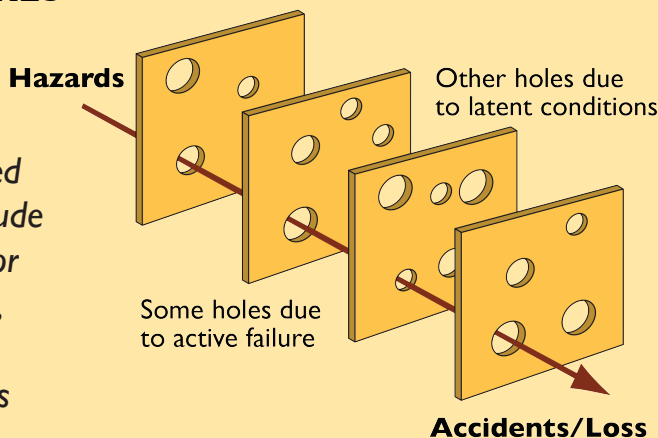
05

### Who’s to Blame for Failure?

It’s inevitable that humans will make mistakes. But in the Swiss Cheese Model, most errors are caused by an organization having incomplete layers of protection, which allow errors to line up and “pass through the cheese” until an accident occurs.

### ACTIVE & LATENT FAILURES

Active failures occur immediately and are often caused by a person or persons’ actions or inactions. These failures can be directly linked to an accident. Latent failures include conditions that may be “hidden” for long periods of time until, one day, they contribute to an accident. The Swiss Cheese Model considers both types of failures.



06



### Who Created the Swiss Cheese Model?

James Reason developed the concept and first described it in his 1990 book “Human Error.” He is currently Professor Emeritus of Psychology at the University of Manchester, England.



To learn more, visit [www.coresafety.com](http://www.coresafety.com)

Sources: \* Modified from Reason, 1991 Copyright 1991, James Reason Reason, J., 1990, Human error: Cambridge University Press, UK, 316 pp. MineSafe, Dept. Of Consumer and Employment Protection, Government of Western Australia, 2006. "What are latent conditions?" – [www.constructionlawmadeeasy.com](http://www.constructionlawmadeeasy.com) – MinterEllison, 2015 "Encountering latent conditions" – [www.miningaustralia.com.au](http://www.miningaustralia.com.au) – Daniel Hall, March 30, 2009