

'Reason' and 'Risk'



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Reason and Risk

Scope

- What is 'safety' ?
- The 'Reason' accident causation model
- Holes in the Swiss cheese
- Reason and Risk
- Future challenges
- The investigator

What is 'safety' ?

The condition of being protected from or unlikely to cause danger, risk or injury

Oxford Dictionary (World English)



What is 'safety' ?

- Safety can also be defined to be the control of recognized hazards to achieve an acceptable level of risk
- This can take the form of being protected from the event or from exposure to something that causes health or economical losses.

Wikipedia

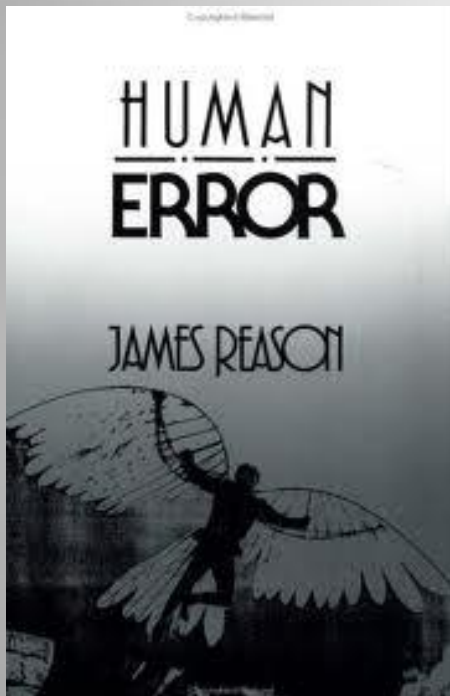
What is 'safety' ?

It may be, that the concept of safety is nothing more than the acceptance of and belief in an appropriate level of risk

The ongoing balance between safety and output



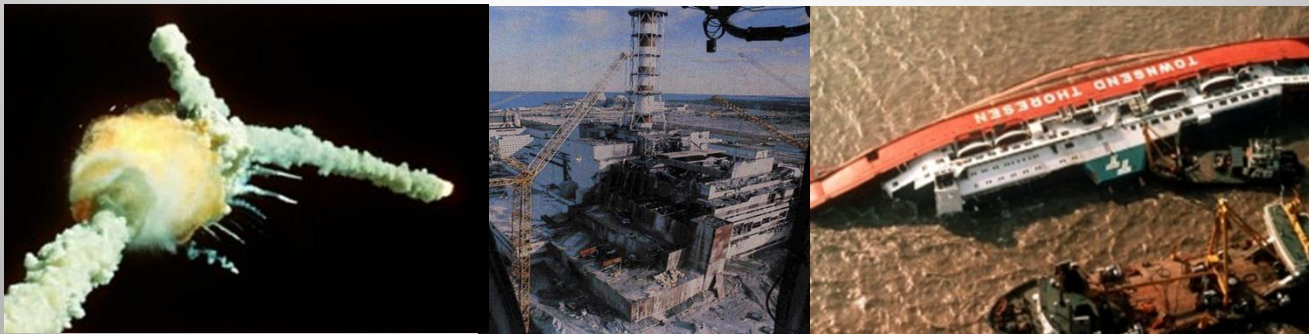
The 'Reason' accident causation model



In the mid 1980's Dr James Reason conducted ground breaking research into human error and the way people, systems and processes interact in the breakdown of complex, well-defended technologies

The 'Reason' accident causation model

Reason's accident causation model was based on the study of catastrophic failures in high hazard, process driven industries.



The 'Reason' accident causation model

- The model has influenced the investigation of accidents and the management of human error across a wide range of organisations and transport modes
- ✦ It is promoted by ICAO in the ICAO Safety Management Manual, it is currently used by the ATSB (in modified form) and is also used by the Australian Defence Force (ADF).

The 'Reason' accident causation model

- Using the 'Reason model' the investigator reviews the accident or incident from multiple areas:
 - ✦ Organisational conditions and management influences
 - ✦ Local/environmental (error producing) conditions
 - ✦ Individual and group actions (including unsafe acts)
 - ✦ Defences or (risk controls).

In applying the model the investigator identifies:

- The defences which were absent or inadequate
- The actions of individuals or groups which had a negative effect on the safety of the system
- The local environmental (and task) conditions which affected the performance of the people involved (including error promoting conditions)
- The organisational influences (and management decisions) which related to the local task and environmental conditions.

Defences (Risk Controls)

- Defences are equipment or procedures for detection, warning, recovery, containment and escape
- They may include such things as warning systems, training, risk awareness, procedures and protective equipment.

Defences (Risk Controls) Categories

- ✦ **Awareness:** awareness of the hazards/risks and their appropriate treatment/management
- ✦ **Detection/warning:** warning of a system failure or adverse event and prevention mechanisms
- ✦ **Protection/containment:** protection from further adverse consequences and any escalation of the problem
- ✦ **Escape/rescue:** caring for the injured, removing personnel/equipment from potential harm
- ✦ **Control and recovery:** controlling the consequences, preventing further injury or damage, and post event recovery

Reason and Risk

Where does the concept of risk management fit in to the 'Reason' model ?





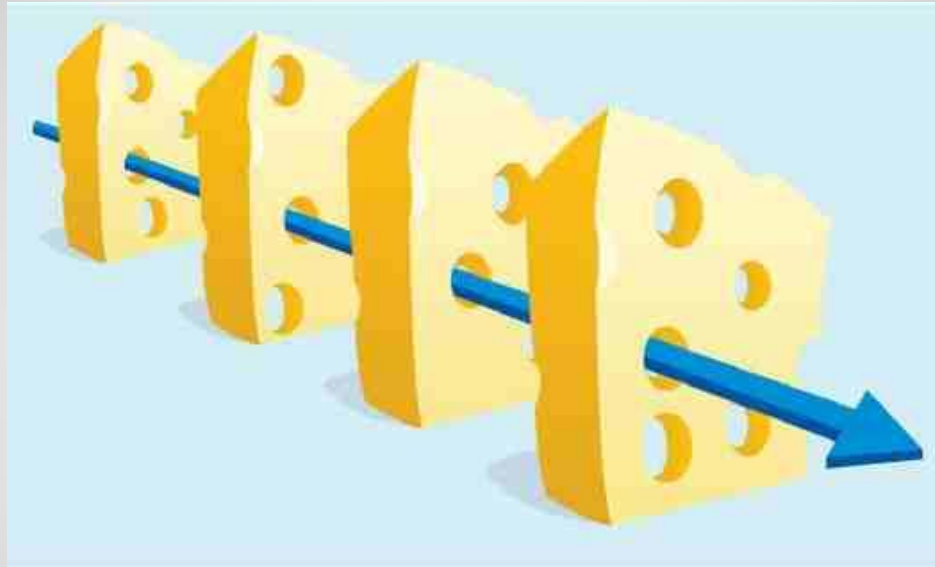
The so called 'Swiss cheese' represents the various layers of defences or risk controls **both internal and external to the system**

Holes in the Swiss cheese



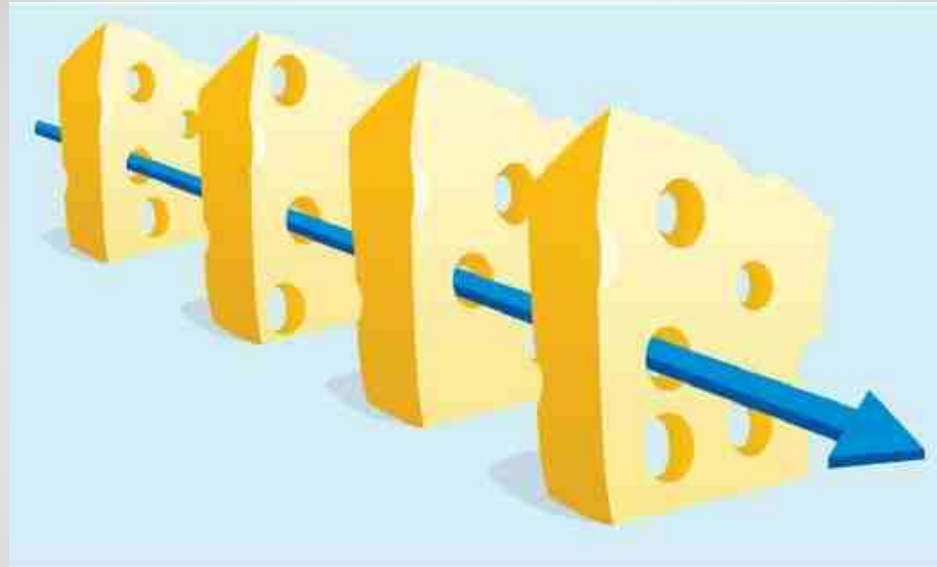
But what do the holes in the Swiss cheese actually represent ?

Holes in the Swiss cheese



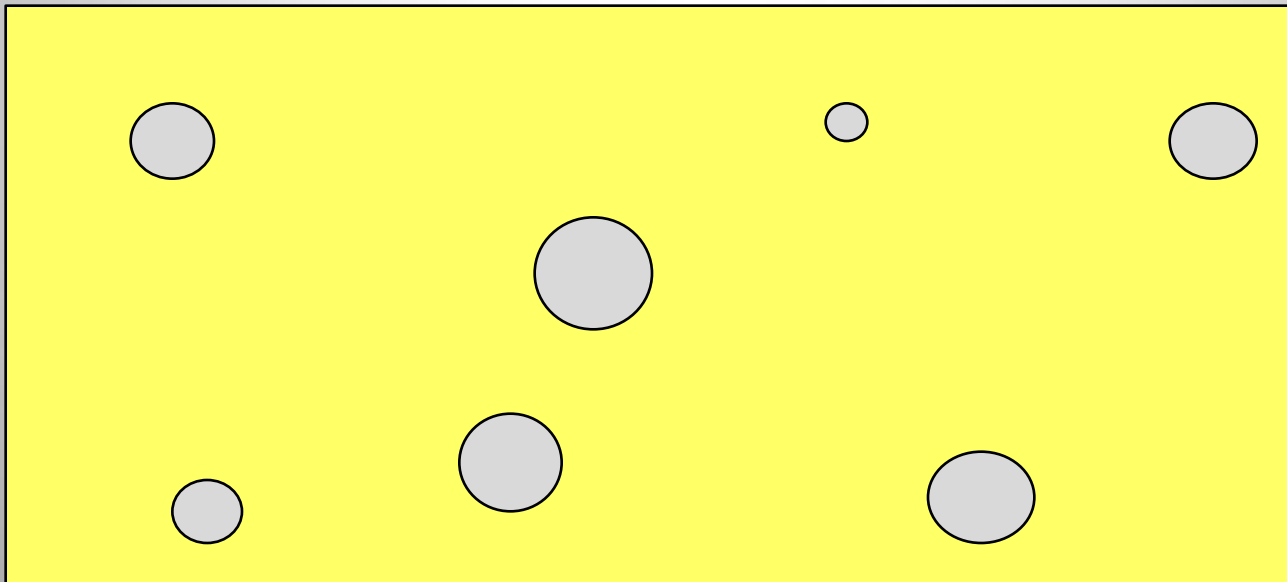
Each hole in the Swiss cheese may be thought of as a breakdown in the defences or risk controls

Holes in the Swiss cheese



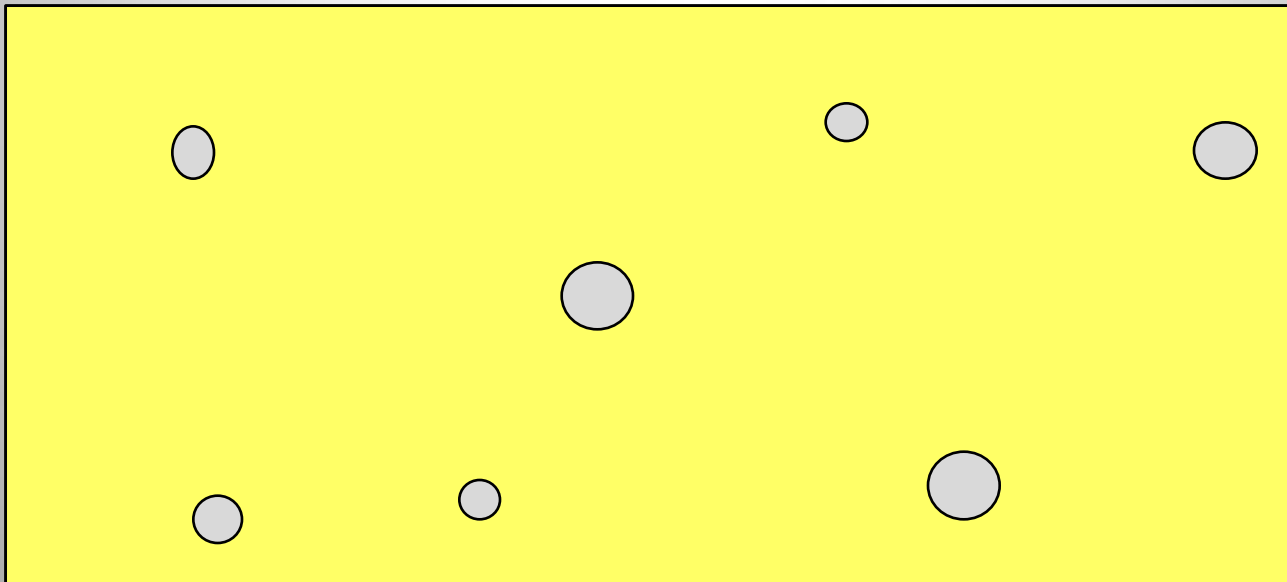
Accidents occur when these individual breakdowns in defences align, permitting what Dr Reason calls "a trajectory of accident opportunity"

Hazard identification and Risk Management processes when properly applied, may be thought of as ...

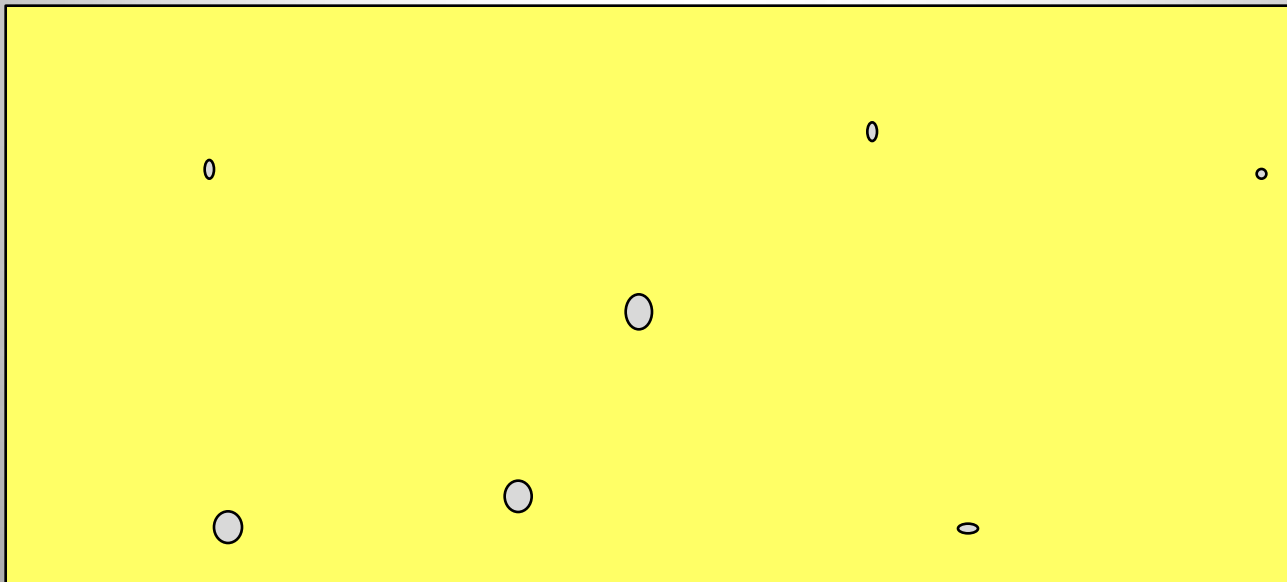


Effectively reducing the number and size of the holes in the Swiss cheese

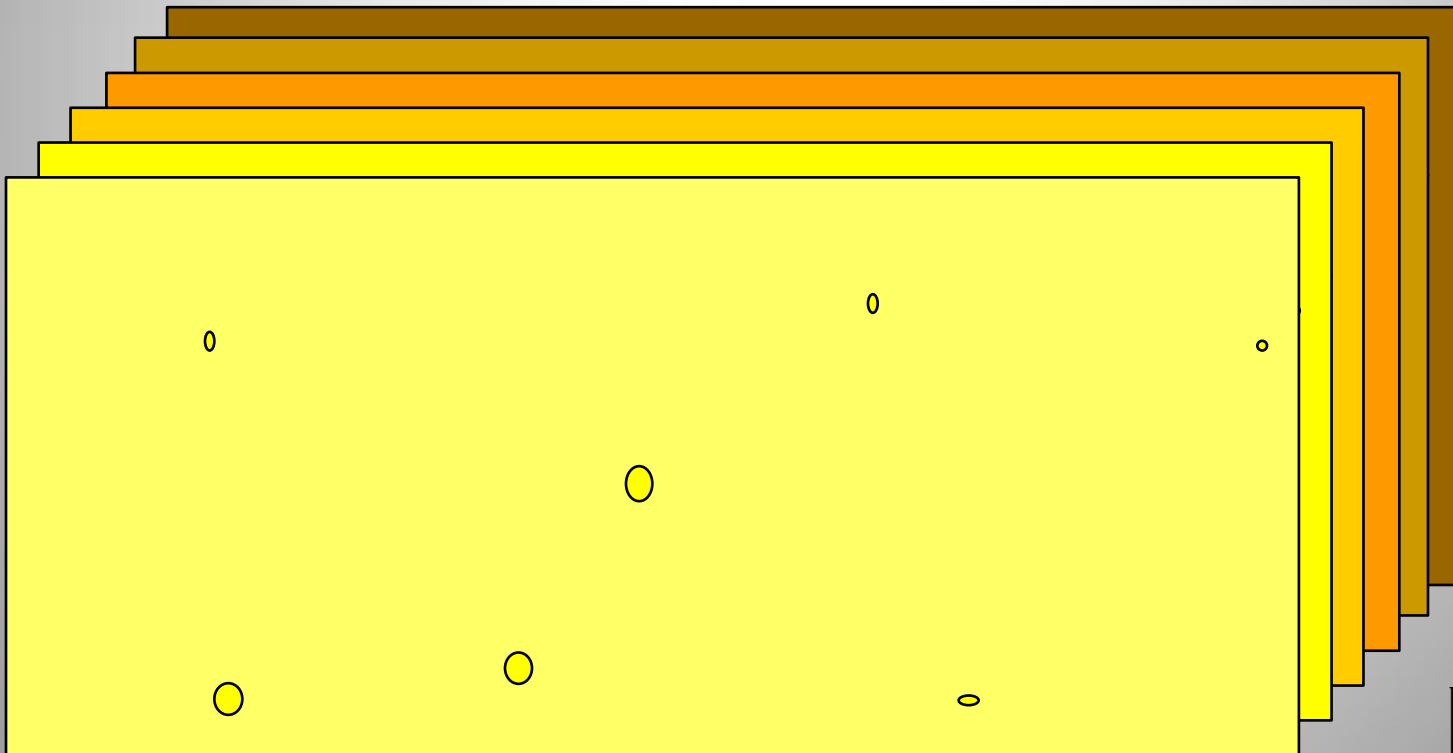
...



Until all of the known and predicted risks are reduced to as low as reasonably practicable



Effective multiple risk controls – (or defences in depth), should minimise (or remove) the potential for a trajectory of accident opportunity



Management responsibility?

In a high hazard operation, does management have a responsibility for the proper application and integration risk management processes?



Future challenges...

Developing an organisational culture of risk and hazard awareness

- Hazard awareness and Risk Management – Must be understood and applied at the grass roots level
- Hazard and risk awareness should be internalised as the way individuals think and act
- It is through this process that an organisation has the flexibility to respond appropriately to new safety challenges.

Future challenges...

Integrated risk management and hazard reporting processes

- **An organisation's hazard identification, reporting and tacking system should automatically inform the hazard register and be integrated with the organisational risk management processes**
- Full integration of these systems should provide management with an accurate understanding of the current levels of hazard and risk and provide updated data on frequency (and likelihood) of adverse events.

Future challenges...

Proper application and full integration of organisational risk management processes

When management has access to timely and accurate hazard, risk and safety information it can be used to appropriately inform organisational risk management decisions

With properly thought through and fully integrated risk management processes, management should be able to predict emergent risk and manage it appropriately.

The investigator

Given the relatively wide spread application of organisational risk management to operations and the considerable variation in risk management processes, should a comprehensive review of an organisation's risk management processes (both internal and external) form a significant part of any future safety investigations ?

The investigator

As an investigator, are you trained in contemporary risk management techniques?


Do you have a thorough understanding of the concept and application of risk management processes?

Does your organisation have access to personnel with the appropriate expertise to review organisational risk management processes ?

The investigator

A comprehensive review of the existing organisational risk management processes can assist the investigator to understand what pre-existing risk controls should or could have been in place

This can assist the investigator in making appropriate systemic recommendations aimed at improving safety and preventing a re-occurrence.



Thank you for your attention -
QUESTIONS ?

Rick Sellers

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