



# **Risk Assessment - Common Fallacies & Mistakes**



Ross Underwood  
MAIDGC







# Hazard

- Is a thing or a situation with potential to cause harm to a person, property or the environment

(Qld DGSM Act)

- A source of potential harm

(AS/NZS 4360-2004)



# Risk

- The likelihood of harm to a person, property or the environment arising out of a hazard (Qld DGSM Act)
- The chance of something happening that will have an impact on *objectives* [AS/NZS 4360-2004]

# Risk assessment – (law v logic)

- Identify hazard

- Assess risk

- Control risk

- What have we got, what are we dealing with?
- What can go wrong?
- Consequences/likelihood

- What stops it going wrong?
- What do we need to do if it does?



# Hazard checklist

- **fire/explosion**
- **loss of containment - toxic release to the air**
- **loss of containment - toxic release to watercourse or built or natural environment**
- **asphyxiation**
- **corrosivity**
- **extremes of heat and cold**

- a flammable vapour, gas or mist contacts a source of ignition that may be:
  - a fixed source of ignition (e.g. electrical fittings)
  - a mobile source of ignition (e.g. a vehicle)
  - static electricity
  - spark/Heat
  - frictional heat
  - smoking
- substance may self-decompose or dangerously interact with another substance
- products of combustion of a fire
- container may leak, rupture or spill



# Some observed problems

- It is possible to go from hazards to controls without establishing a 'what can go wrong' scenario

*e.g. hazard = ethanol, rather than ethanol vapours may catch fire or explode if they are within the explosive limits and they contact an ignition source*

- This is 'unhelpful'

# Factors to be considered

- **nature & quantities of goods**
- **manner of handling & equipment used**
- **technical & operational competence**
- **access & egress**
- **surrounding land use**
- **flammability**
- **instability**
- **reactivity**
- **toxicity, environmental impact**
- **corrosivity**



# Consequence Descriptions

Level	Descriptor	Examples of Description
1	Insignificant	No injuries. Minor delays. Little or no financial loss.
2	Minor	First aid required. Small spill/gas release easily contained within work area. No environmental impact. Small financial loss
3	Moderate	Medical treatment required. Large spill/gas release contained with help of emergency services. No permanent environmental impact. Modest financial loss
4	Major	Extensive or multiple injuries. Hospitalisation required. Permanent severe health effects. Spill/gas release spreads outside boundary of premises but with minimal environmental impact. Significant financial loss
5	Catastrophic/ Severe	Death of one or more people. Toxic substance or toxic gas release spreading outside boundary of premises. Major environmental impact. Very significant financial loss

# Probability Descriptions

Level	Descriptor	Examples of Description
<b>A</b>	Very likely	The event is expected to occur in most circumstances. Common or repeated occurrence. Constant exposure to hazard.
<b>B</b>	Likely	The event will probably occur in most circumstances. Known history of occurrence. Frequent exposure to hazard..
<b>C</b>	Possible	The event might occur at some time. Regular or occasional exposure to hazard.
<b>D</b>	Unlikely	The event could, but is not likely to, occur in other than normal circumstances. Infrequent exposure to hazard. Low probability of damage.
<b>E</b>	Rare	The event may occur only in exceptional circumstances. Rare exposure to hazard. Requires multiple system failures.

# Risk Rating

Probability	Consequence				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic / Severe 5
A (Almost certain)	H	H	E	E	E
B (Likely)	M	H	H	E	E
C (Possible)	L	M	H	E	E
D (Unlikely)	L	L	M	H	E
E (Rare)	L	L	M	H	H

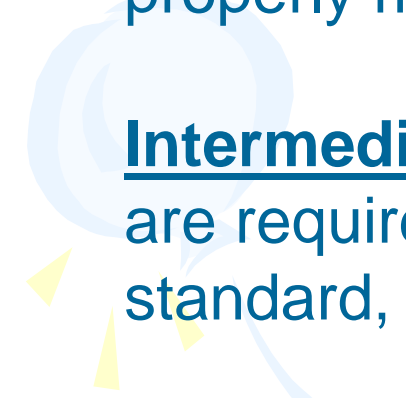
## Recommended Action Guide:

Abbrev	Action Level	Descriptor
E	Extreme	The proposed task or process activity <b>MUST NOT</b> proceed until the supervisor has reviewed the task or process design and risk controls. They must take steps to firstly eliminate the risk and if this is not possible to introduce measures to control the risk by reducing the level of risk to the lowest level achievable. In the case of an existing hazard that is identified, controls must be put in place immediately.
H	High	Urgent action is required to eliminate or reduce the foreseeable risk arising from the task or process. The supervisor must be made aware of the hazard. However, the supervisor may give special permission for staff to undertake some high risk activities provided that system of work is clearly documented, specific training has been given in the required procedure and an adequate review of the task and risk controls has been undertaken. This includes providing risk controls identified in Legislation, Australian Standards, Codes of Practice etc.* A detailed Standard Operating Procedure is required. * and monitoring of its implementation must occur to check the risk level
M	Moderate	Action to eliminate or reduce the risk is required within a specified period. The supervisor should approve all moderate risk task or process activities. A Standard Operating Procedure or Safe Work Method statement is required
L	Low	Manage by routine procedures.




There are several levels of risk assessment

**Simple & obvious** – where the hazards are well-understood and where it is self-evident that the risk can be properly managed with the proposed control measures



**Intermediate** – where some additional control measures are required beyond those set out in an appropriate standard, and





**Complex** – where some secondary assurance is required that even when a critical system fails, there is some additional back-up

<b>Risk Assessment</b>		
<b>Date:</b>	<b>Location</b>	<b>Assessment completed by:</b>
<b>What is the facility or task ?</b>		
<b>Briefly explain the usage of this facility</b>		

<b>Hazard</b>	<b>Mechanism.</b>	<b><u>Risk (Harm)</u> eg Possible Outcome</b>	<b>Existing or <i>Proposed</i> Controls</b>	<b>Consequence</b>	<b>Likelihood</b>	<b>Rating</b>

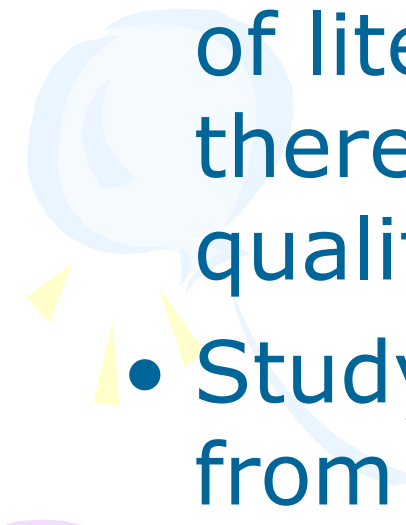



# **HSE Study 2003 (Research Report 151)**

- Aim of research project to identify common pitfalls
  - The report sets out examples of good practice and contrasts these with examples with pitfalls encountered by HSE
  - Provide guidance for HSE Inspectors
  - Confined to workplace OH&S examples
- 
- 



# Study methodology


- Conduct a literature search (the report says that while there is a lot of literature on risk assessment, there are few critiques of adequacy & quality)
  - Study team then collated insights from HSE operational divisions and from the study team's experience
- 
- 






# Pitfalls identified

19 different issues were identified

- R/A to 'justify' decision already made
  - Generic R/A when site specific R/A needed
  - R/A without 1<sup>st</sup> considering good practice
  - R/A using inappropriate 'good' practice
  - Using individual instead of societal risk
  - Only considering the risk from one activity
- 

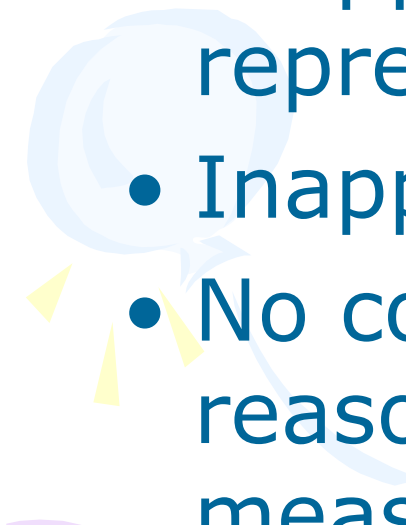



# More pitfalls

- 'Salami slicing' - dividing the time spent in the hazardous activity between several individuals
  - Not using a team, not involving people with practical knowledge of the process
  - Ineffective use of consultants
  - Failure to identify all hazards with a particular activity
  - Failure to consider all possible outcomes
- 



# Yet more pitfalls

- Inappropriate use of data
  - Inappropriate definition of representative sample of events
  - Inappropriate use of risk criteria
  - No consideration of ALARP (as low as reasonably practicable) or further measures that could be taken
  - Inappropriate use of cost benefit analysis
- 
- 



## **and finally**

- Using reverse-ALARP arguments (i.e. using cost benefit analysis to argue that it is acceptable to reduce safety standards)
- Not doing anything with the results of the assessment
- Not linking hazards with risk controls

A decorative graphic on the left side of the slide features three balloons: a light green one at the top, a light blue one in the middle, and a light purple one at the bottom. Each balloon has a string and several small yellow triangular shapes radiating from it, resembling a sun or starburst.

# Risk of What?

- It is essential to state what the definition of harm is at the outset
- Without this it is not possible to arrive at a particular level of harm that is agreed to be acceptable
- 'dangerous dose' (HSE) defined as dose that would kill roughly 1% of exposed population
- 'equivalent fatalities' 1 fatality = 100 major injuries = 1,000 minor injuries



# Risk 'to What' (Risk 'to Whom')

On-site

- Employees?
- Contractors, others at the workplace?

Off-site



- Members of the public?

Target population

- Vulnerable people?
- 

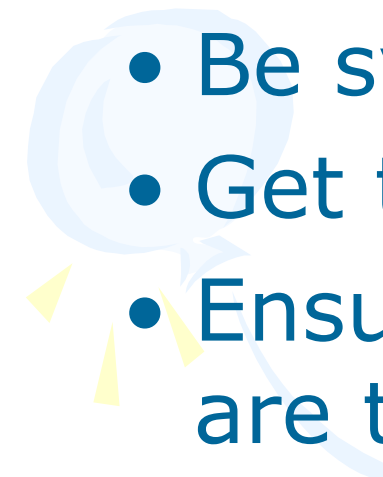



# Risk 'from What'?

- Work activities
  - Routine/non-routine
  - Planned activities
  - Reasonably foreseeable events
  - Need not consider trivial events
  - Scope for doing generic risk assessments for specific types of hazard categories
- 
- 



# Learning insights

- Main finding of HSE study – avoid the pitfalls
  - Be systematic
  - Get the logic right
  - Ensure the process and the results are transparent and can be adequately explained to others
- 
- 



# Better control measures?

