



What is Risk?

“effect of uncertainty on objectives” (AS/NZS ISO 31000:2009)

Where

- An effect is a deviation from the expected – positive and/or negative
- Objectives can have different aspects and can apply at different levels
- Risk is often characterised by reference to potential events and consequences, or a combination of these.
- Risk is often expressed in terms of a combination of the consequences of an event and the associated likelihood of occurrence
- Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of an event, its consequence, or likelihood.

What is Risk?

How most people think about Risk

HAZARDOUS
EVENT
↓
The chance that “something” will happen, which will have a
“negative outcome”

LIKELIHOOD ↑

CONSEQUENCE ↑

		CONSEQUENCE				
		Insignificant 1	Minor 2	Moderate 3	Major 4	Extreme 5
LIKELIHOOD	Almost Certain A	Medium	High	High	Extreme	Extreme
	Likely B	Low	Medium	High	Extreme	Extreme
	Possible C	Low	Medium	Medium	High	High
	Unlikely D	Low	Low	Medium	Medium	High
	Rare E	Low	Low	Low	Medium	Medium

Consequences, likelihoods and levels of risk will depend on the controls that are in place and their effectiveness.
Source: "HB 89-2012, Risk management – Guidelines on risk assessment techniques Part 3.4 Risk Analysis"

■ Extreme
 ■ High
 ■ Medium
 ■ Low

What is a “Negative Outcome”

What is a “Negative Outcome”

From the perspective of Mum and Dad

- Filling up on sugar so less room for healthy food
- Poor source of energy and nutrients
- Bad for their teeth
- Puts germs into the cookie jar
- Could break the cookie jar making a mess or hurting the child
- Reinforces bad behaviour (reward for being naughty)



From my kids perspective

- Getting caught and making Mum and Dad angry
- Punishment
 - Not being able to watch a movie tonight or
 - Not being able to have screen time or
 - Not being able to go to their friends house or
 - Not getting desert after dinner

What are the “Drivers?”

What are the reasons why we either

- do something, or
- do not do something



What are M&D's Drivers?

- The health and well being of their child

Essentially the *long term positive effect*

What are the kids Drivers?



- Punishment

Essentially the *immediate loss of privileges*




For Mum and Dad
Delayed Positive

For the kids
Immediate Negative (if caught)
Immediate Positive (if they get away with it)

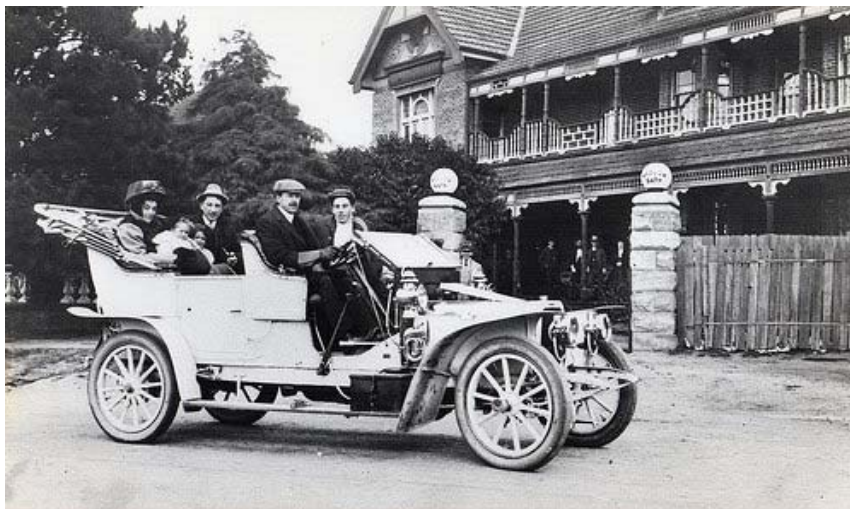
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In General the more immediate the 'reinforcer' the stronger its effect on behavior.

Immediate Positive →  ← Delayed Positive

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Drivers



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Drivers

Immediate

- Positive
- Negative

Delayed

- Positive
- Negative

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Drivers

Immediate

- Positive
 - No call outs in the middle of the night – more sleep
 - Getting home on time to see family/relax - “problem free operation”
 - “Achieving” quality targets that are ‘Obvious’
 - Praise from manager, colleagues and consumers










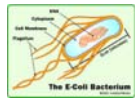
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Drivers

Immediate

- Negative
 - Complaints from manager, colleagues, councilors and consumers. For example from acute events such as a change in colour, taste and water pressure.
 - Late night call outs
 - having to stay back at work and missing family events
 - Doing something for nothing (no recognition)
 - Positive E-Coli result
 - Health outbreak



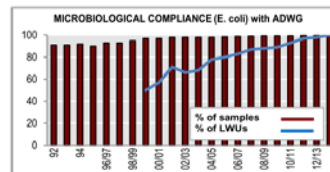
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Drivers

Delayed

• Positive

- Good long term system quality monitoring results
- “Achieving” long term targets – quality, customer complaints
- Review time praise from Manager



- Decrease in the burden of disease down to 1×10^{-6} DALY ??



Drivers

Delayed

• Negative

- Poor long term system quality monitoring results.
- Review time negative comments from Manager
- Seeing no impact from effort expended/put into a task



- Increase in the burden of disease above 1×10^{-6} DALY ??



Examples

- E.Coli Detection
 - Immediate extra work
 - Immediate negative stimulus
 - Community
 - Managers
 - Councilors
 - Immediate extra Paperwork
 - Immediate extra cost
 - Delayed Negative Reporting results

Examples

- Low Storage Reservoir Level
 - Immediate extra work (out of work hours operation)
 - Immediate negative stimulus
 - Community
 - Managers
 - Councilors
 - Immediate extra Paperwork (possibly)
 - Immediate extra cost
 - Delayed Negative Reporting results (Customer complaints KPI)

Examples

- Individual Filter Effluent of 0.33NTU, where the target is for <0.15NTU
 - Immediate extra work (out of work hours operation) **NO**
 - Immediate negative stimulus
 - Community **NO**
 - Managers **Delayed Maybe**
 - Councilors **NO**
 - Immediate extra Paperwork **NO**
 - Immediate extra cost **NO**
 - Delayed Negative Reporting results **Maybe**

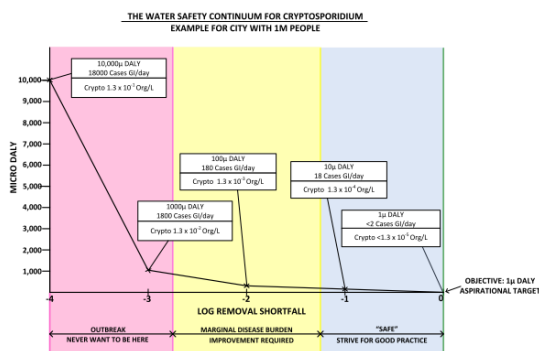
So.....

Without specific measurable drivers, without immediate reinforces, how will the Risk from such events be prioritized so that actions are taken?



How can we effectively and efficiently create a culture which values HBT's and prioritises moving towards the aspirational target of the "Water Safety Continuum"?

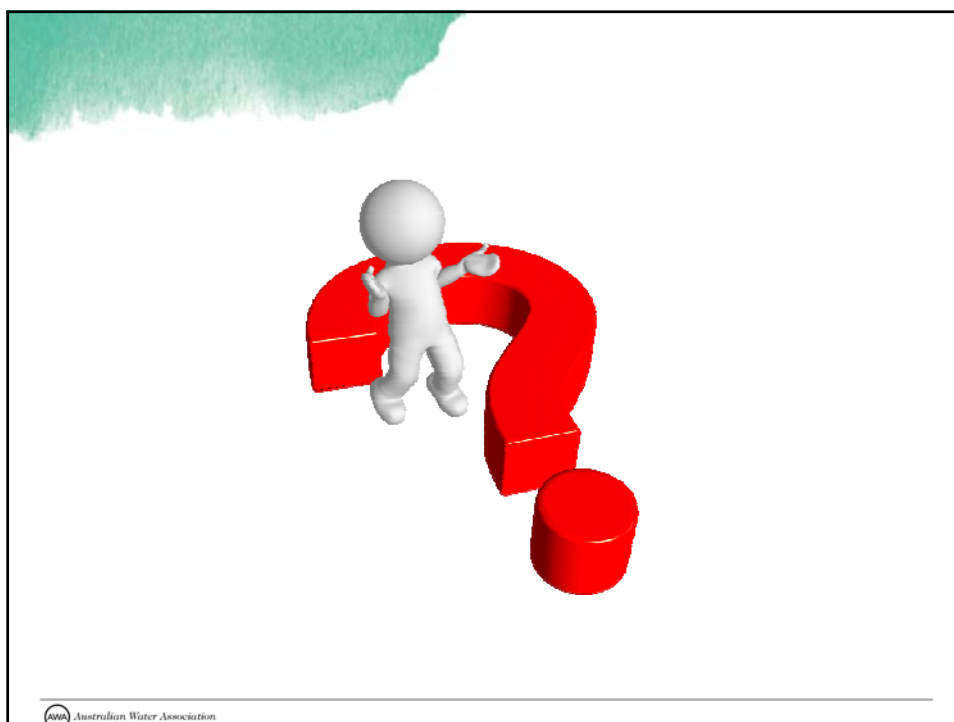
Figure 3: Illustrative example of the 'Water Safety Continuum' for *Cryptosporidium*



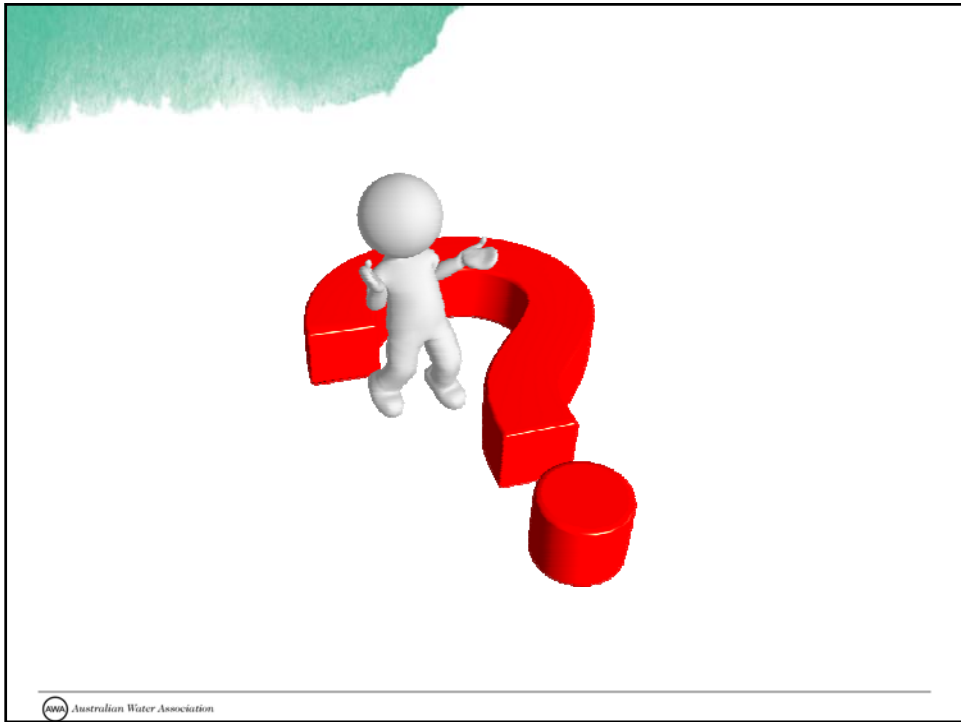
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Workforce that has spent many years dedicated to ensuring that they have a **"good system"** as measured by the **metrics of, complaints, alarm call outs in the middle of the night and water quality verification testing results**

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The paradigm shift that is occurring is that where once the most likely outcome of an “issue” was to provide a reduced quality, now the outcome is to provide less quantity.



Thank you

Further information:

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