

The tolerability of risk – misunderstood, misapplied or missed altogether?

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NZ OHS legislation

- **Health & Safety in Employment Act**
 - **All practicable steps test**
 - **Reasonably practicable test**



All practicable steps test

Matter to consider	Consequence of an event or likelihood of an event?
(a) The nature and severity of the harm that may be suffered if the result is not achieved	Consequences of an event
(b) The current state of knowledge about the likelihood that harm of that nature and severity will be suffered if the result is not achieved	Likelihood of an event
(c) The current state of knowledge about harm of that nature	Consequences of an event
(d) The current state of knowledge about the means available to achieve the result, and the likely efficacy of each of those means	Uncertainty as a component of likelihood of an event



Reasonably practicable test

- Reasonably practicable is a narrower term than "physically possible" and it seems to me to imply that a computation must be made by the owner, in which the **quantum of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk** (whether in money, time or trouble) is placed in the other; and that if it be shown that there is a gross disproportion between them - the risk being insignificant in relation to the sacrifice - the defendants discharge the onus on them. Moreover, this computation falls to be made by the owner at a point of time anterior to the accident
 - *Edwards –v– NCB*



NZ OHS legislation

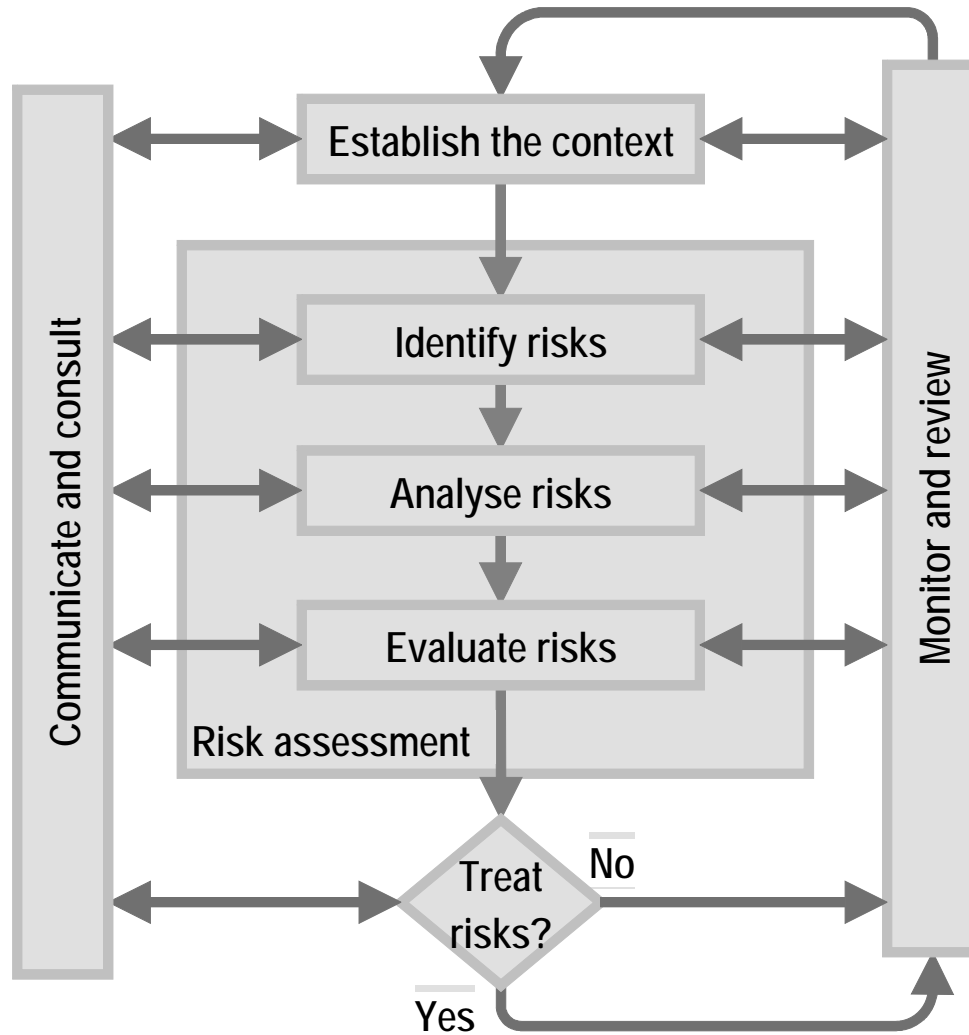
- **Is therefore risk management-based, not hazard management-based**

Risk & AS/NZS 4360

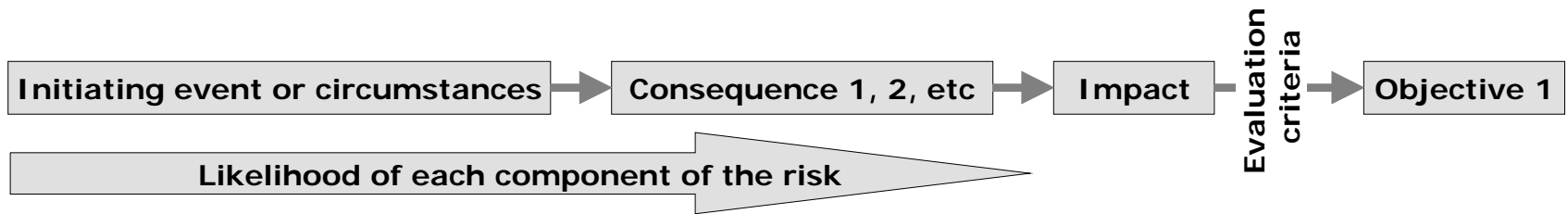
- **Risk is the chance of something happening that will have an impact upon objectives.**
 - Notes
 - A risk is often specified in terms of an event or circumstances and the consequences that may flow from it.
 - Risk is measured in terms of a combination of the consequences of an event and their likelihood.
 - Risk may have a positive or negative impact.
- **Risk is the effect of uncertainty on objectives**
 - Draft ISO 31000



Risk & AS/NZS 4360



The place of criteria

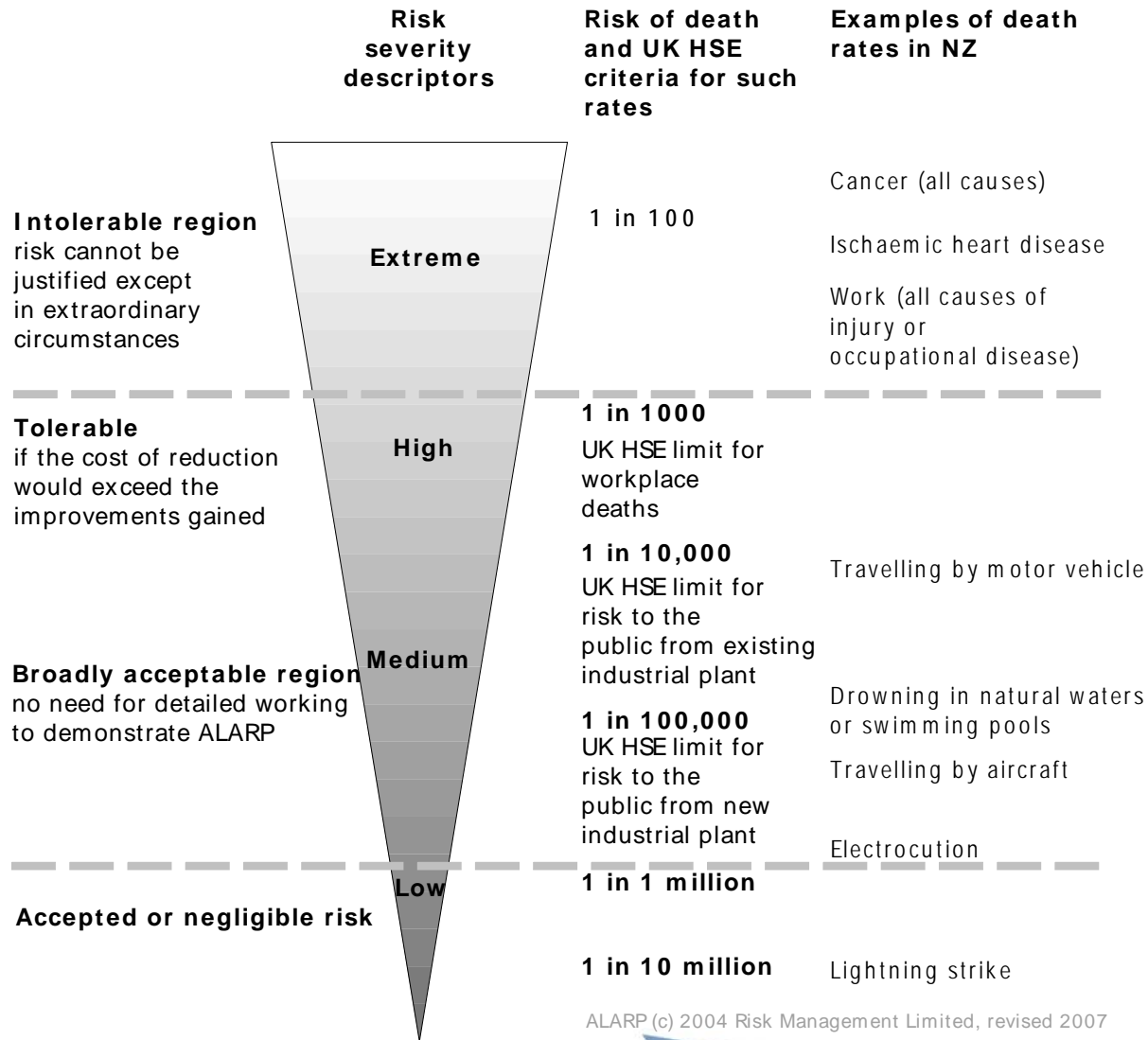


Risk criteria

- **Risk criteria are the terms of reference by which the significance of risk is assessed**
 - AS/NZS 4360: 2004
- **Risk criteria are the terms of reference against which the significance of risk is evaluated**
 - Draft ISO31000



ALARP in the NZ context



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Guidance and criticisms

- **UK HSE “Tolerability of Risk from Nuclear Power Stations”**
 - Low probability, very high consequence events
 - Origins are from iodine 131 escape
 - Farmer (1967)
- **UK HSE “Reducing Risk, Protecting People”**
- **NSW Planning guidance**
- **Do the following equate**
 - NZ OH risks and iodine 131?
 - NZ tsunami risks and nuclear power?
 - NZ lahar risks and nuclear power?
- **Has the TLV/WES for Iodine 131 changed since mid 1960s?**



Is the TOR concept understood?

- **Social amplification of risk**
 - Lay people
 - Media
- **Legal tests**
 - DoL inspectors
 - Safety practitioners
 - Courts
- **How do stakeholders cope with the lack of local guidance on TOR?**



Research proposal

- **Context of risk in NZ (man-made & natural hazards; work & non-work hazards; historical, historical & future likelihood; etc)**
- **Detailed literature review of risk criteria used in NZ, Australia & comparable countries and the origins of the criteria**
- **High-level risk assessment of risks in NZ (occupational, transport, residential, etc) to compare & contrast what seems to be acceptable under different circumstances**
- **Development of draft criteria for a NZ TOR framework that can be proposed for planning, regulatory & enforcement purposes by duty-holders, regulatory agencies & the courts**



Conclusion

- **You want a valve that doesn't leak and you try everything possible to develop one but the real world provides you with a leaky valve. You have to determine how much leaking you can tolerate.**
 - **Arthur Rudolph, 89, developer of rocket in first Apollo flight**
- **To reiterate the question posed by Slovic et al (1978)**
- **How Safe is Safe Enough?**

