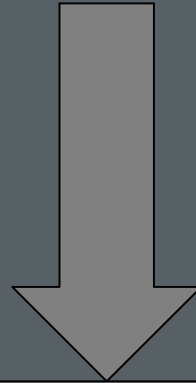


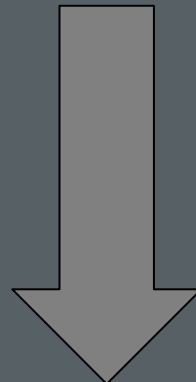
Ethics and transparent risk communication start with proper risk assessment methodologies

By Franco Oboni, Cesar Oboni,
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Mishaps & undetected exposures,



interconnected systems



generate dominoes effects, complex consequences, risks.

“Modern Phenomena”:

- Poor reaction to risk assessments.
- Projects' promoters have hard time understanding public reactions.
- Many projects are rejected without apparent valid reasons.

Partial components of the consequences are impacts on:

- Biology, ecology and land use.
- Regulations and censure.
- Public.
- Image and reputation.
- Health and Safety.
- Direct and indirect costs.
- Operations.

On June 20th, 2013 a major decision was taken by a Canadian Environmental Impact Review Board.

Their mission is to protect the environment, including the social, economic and cultural well-being of its residents.

They stated that **a Risk Assessment needs to include:**

A **holistic consequence function** integrating all health and safety, environmental, economic and financial direct and indirect effects.

Explicitly define Risk Acceptability/Tolerability thresholds in consultation with potentially affected communities, using a unified metric.

Risk Assessments have to be holistic!

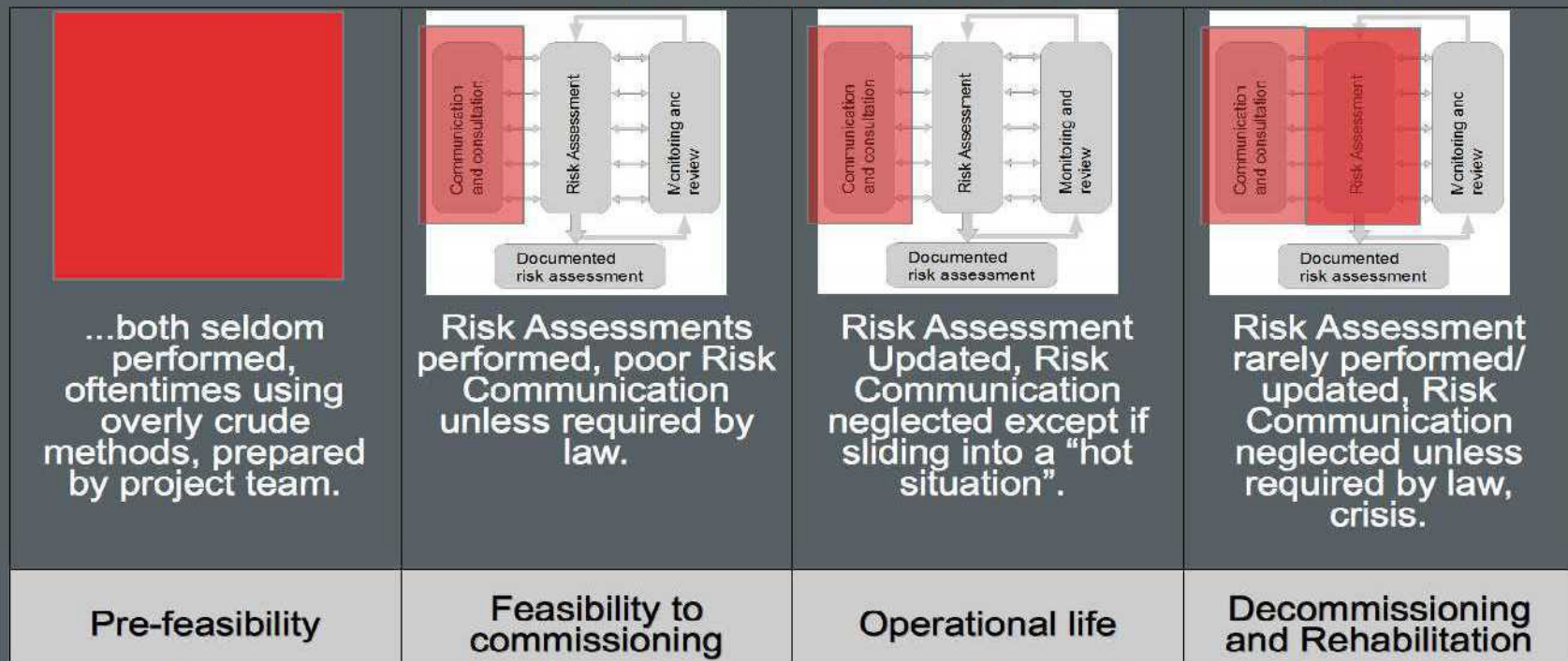
Need for a true understanding

There is nothing worse than people thinking they understand each other when discussing a poorly defined problem!

We must communicate risks now and for future generations....

....but generally we do not, through projects' lives!

Risk Assessment and Risk Communication are...



NB: the scheme displayed for the risk assessment at each phase is the ISO 31000 scheme, which includes Communication (left side) and Monitoring (right side).

Communication has to be understandable by all partners.



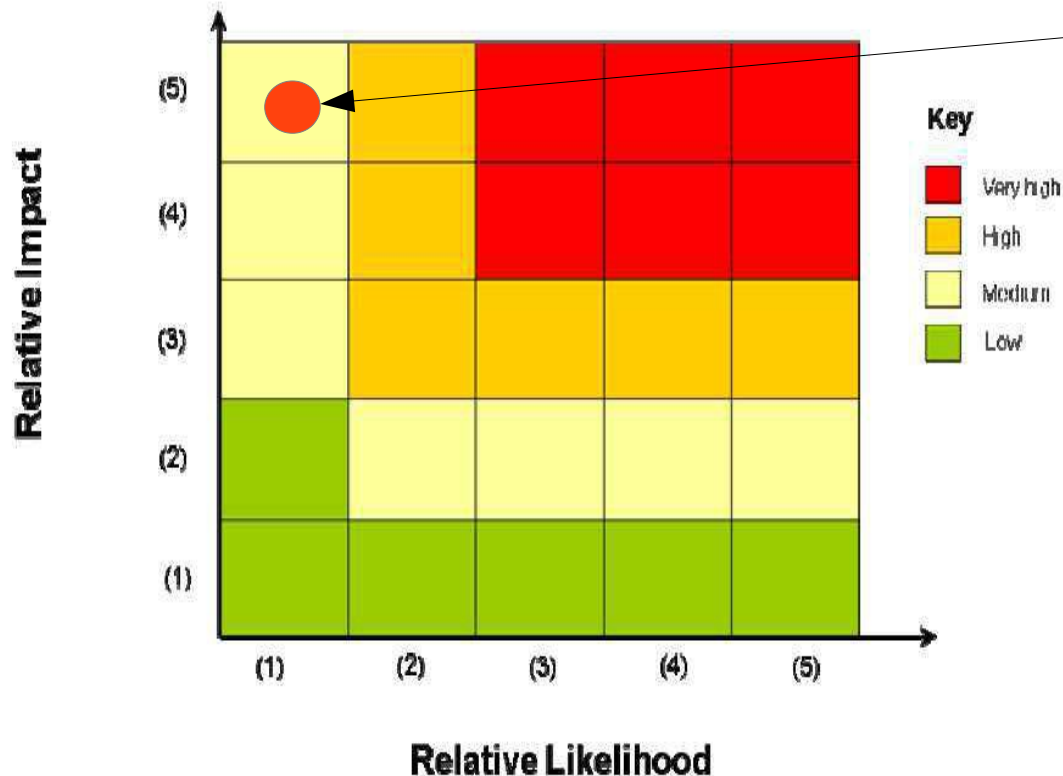
We need to properly evaluate and communicate risks to preserve our social license to operate.

Simplistic approaches do not fly (anymore!)

Simplifying is good, but we cannot accept simplistic solutions to model our complex reality anymore.

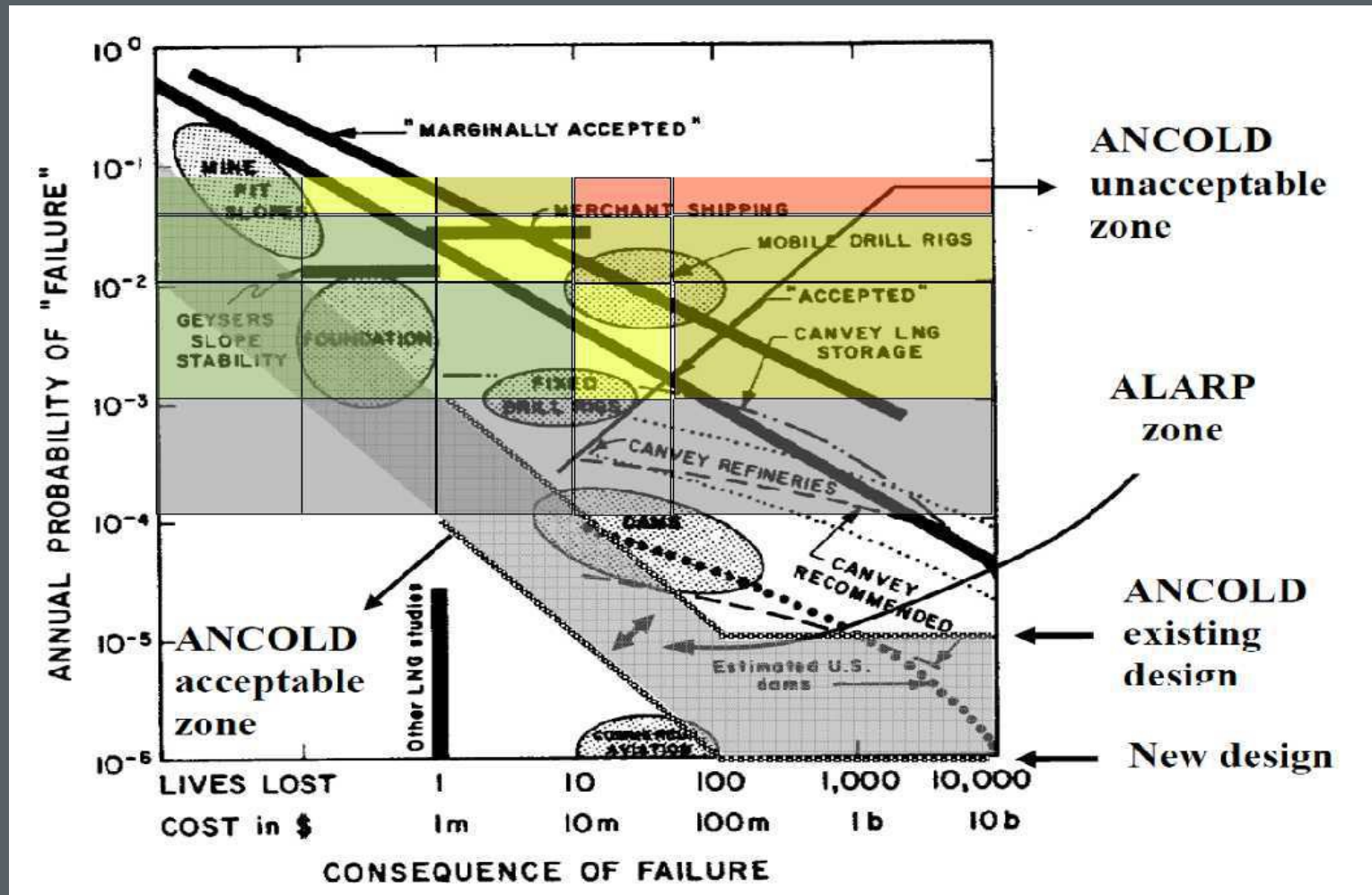
Common practice tools like this one are often misleading...

Figure 2: Example of risk matrix



Within this framework Fukushima was light yellow, lowest class of probabilities, highest consequences, certainly not a significant risk!

...plot most PIGs (FMEA) on top of published societal thresholds, the nonsense becomes evident!



Common Practice Methods and Approaches:
have significant contradictions!

The public has become hostile because they
have not received proper communication and
have understood, instinctively that risk
assessments are often nonsensical.

Governments will be ashamed,
Decision makers will go to jail.
If it is not tomorrow, after tomorrow!

ISO, COSO, ONR....

No one of these will really help us, unless we properly define:

- the context of the studies,
- the risk tolerability,
- a proper structure for the hazard and risk register.

Let's prove this with examples!

How many major (higher than level 5) nuclear reactor (NR) accidents do you remember?

Level 5

Accident with wider
Consequences

Chalk River (1952)
Windscale (1957)
Lucens (1969)
Three Mile Island
(1979)

Level 6

Serious Accident

Kyshtym (1957)

Level 7

Major Accident

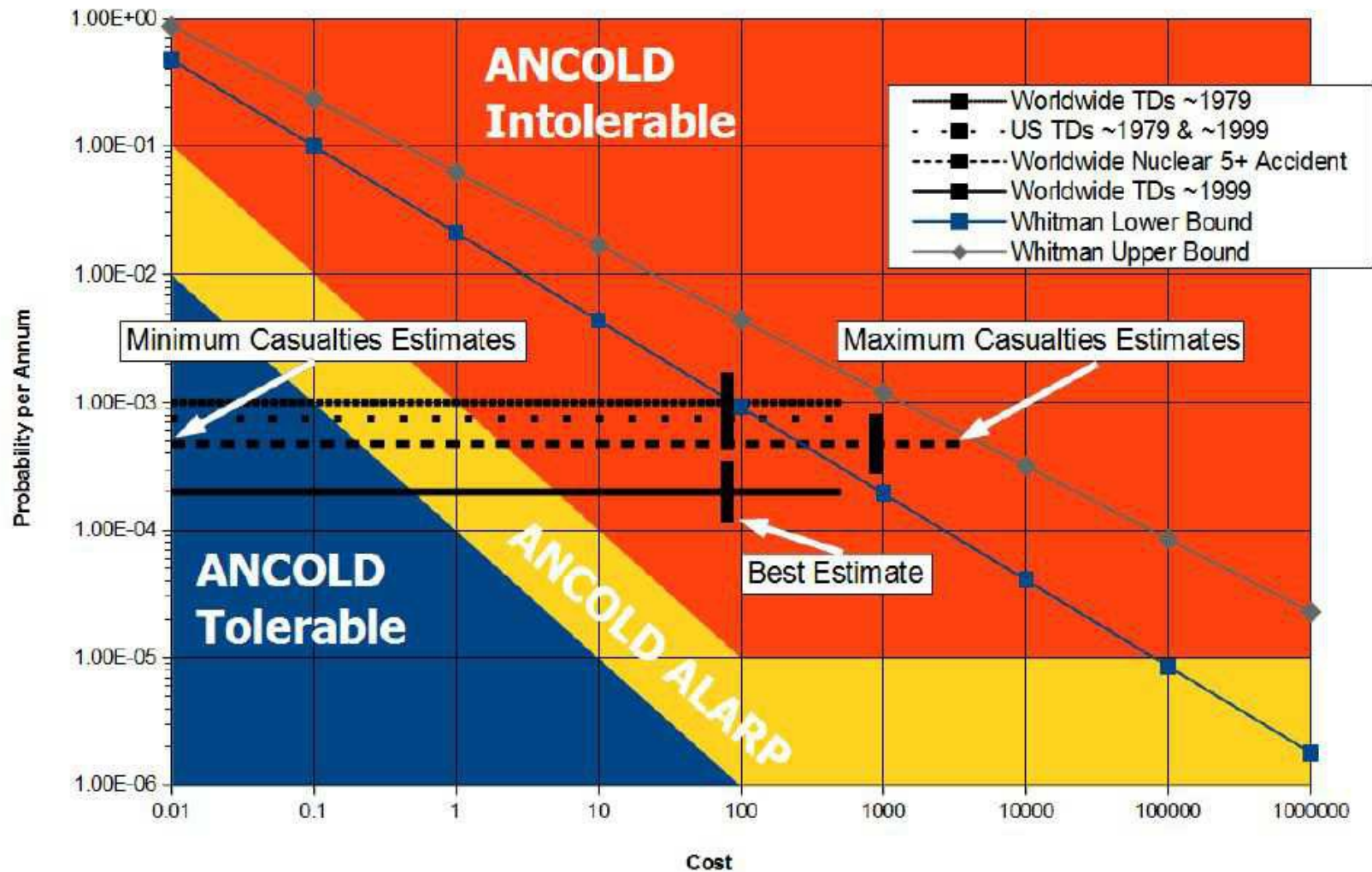
Chernobyl (1986)
Fukushima (2011)

You certainly remember a few tailings dams (TD) failures. There are reasonable data on their occurrence and “statistics” are therefore also possible.



On 4 October 2010, in western Hungary, 10 people died, and 122 people were injured.
photo: copyright greenpeace/peter somogyi-tóth

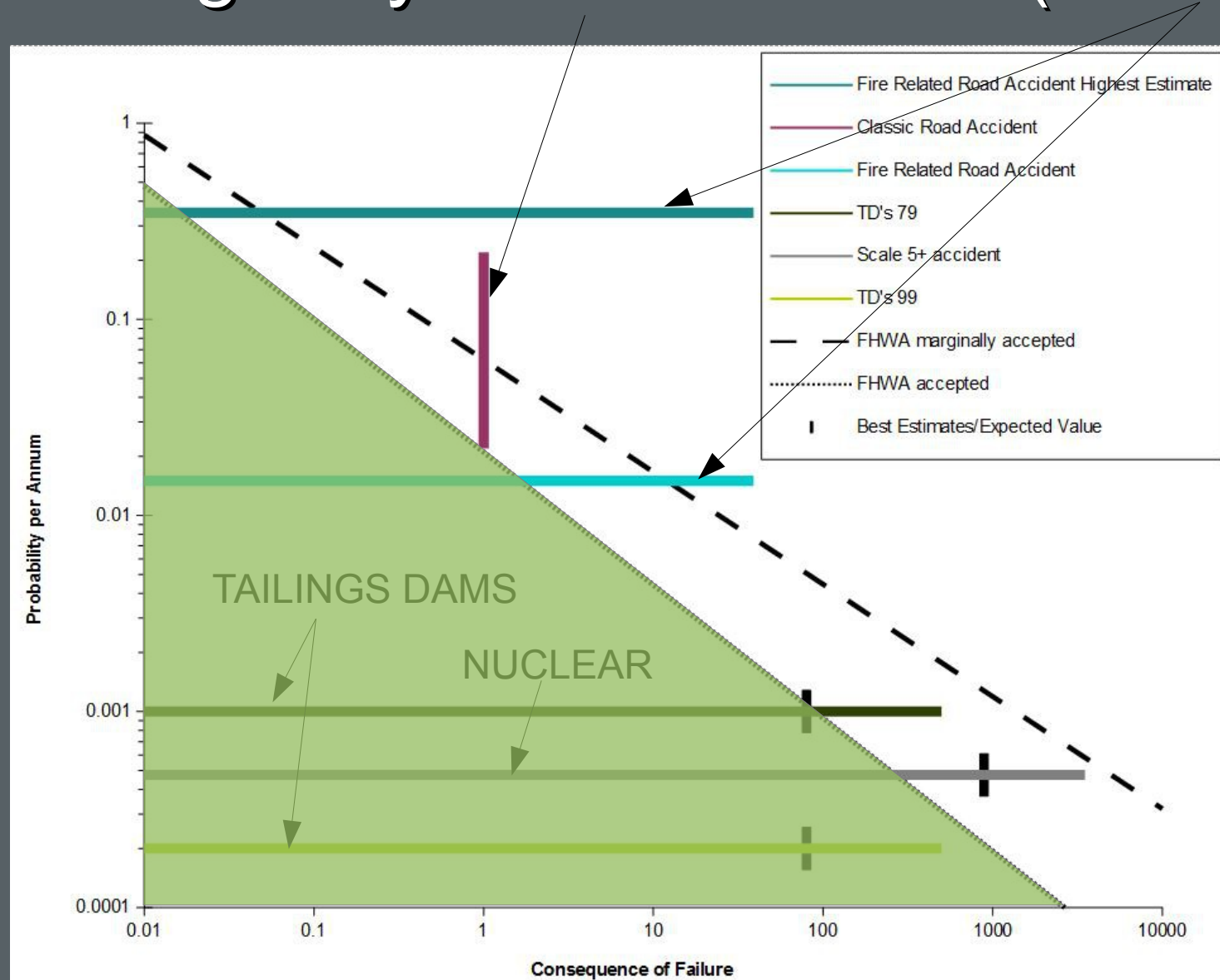
Historic TD and NR failure rates, consequences compared to published societal tolerability



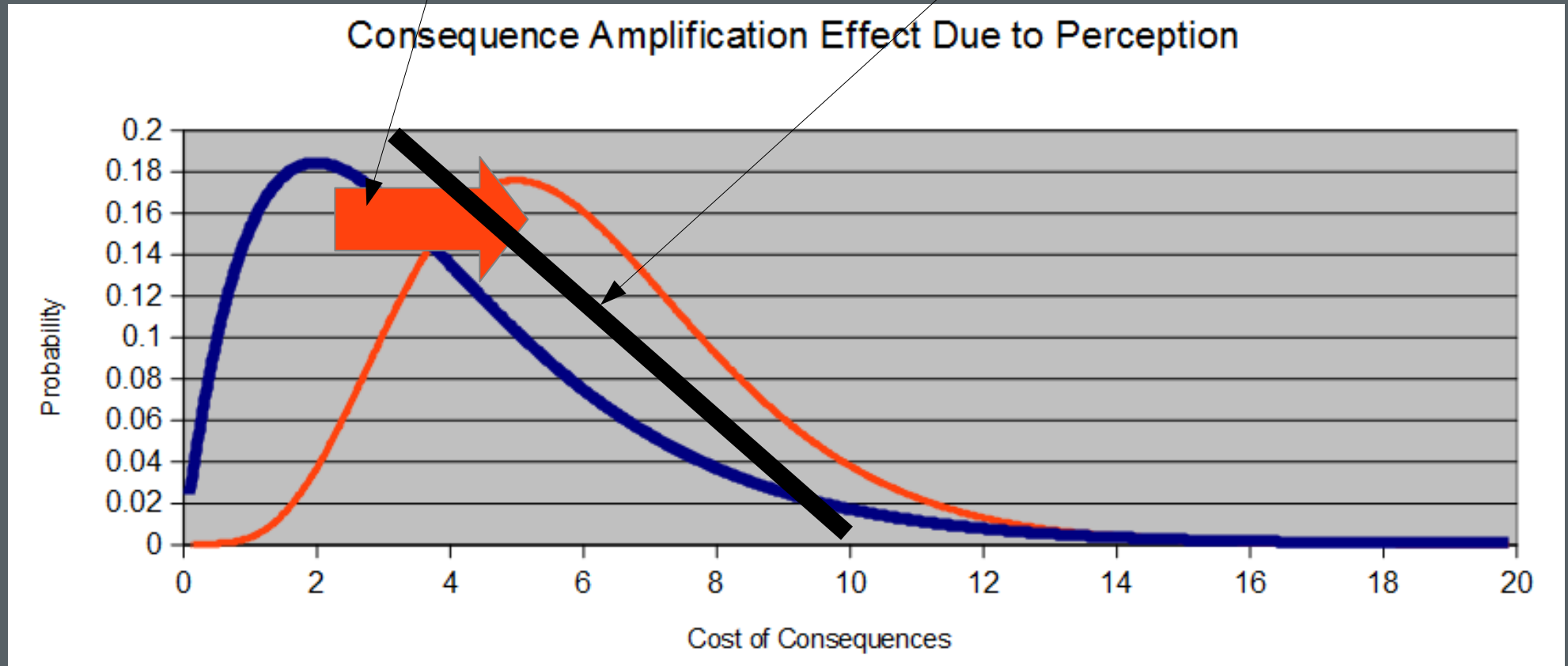
Miners have learned from experience

Hazards and risks from TDs have apparently reduced because pf has been reduced ...
Consequences may at best remain constant.

Let's add highway traffic accidents (Mont Blanc)



Public perception can amplify factual consequences and bring a risk scenario “sliding” above tolerability



Conclusions drawn from the examples:

- Social tolerability can be identified.
- Identification performed 40-60 years ago still works.
- Governments can reply quite sharply when social tolerability thresholds are exceeded by an industry.
- Public can increase factual consequences by reacting with outcry leading to boycotts and other actions.

Risks have to be properly understood from infancy, so that long term survival is possible under an appropriate level of care

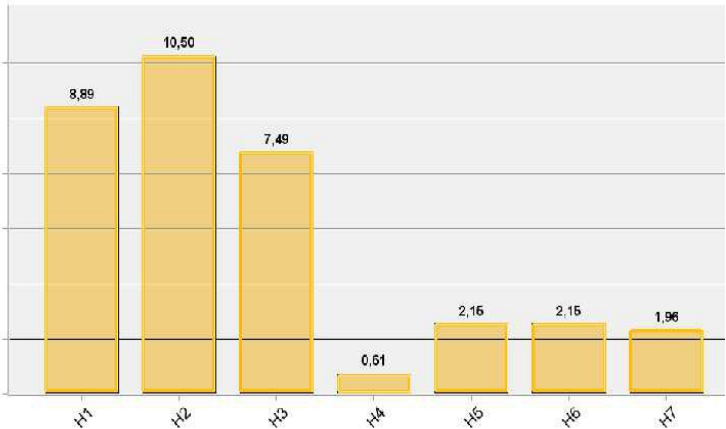
Risks assessments are “at risk” if plagued by conflict of interest or biases, or censure.

Design teams, engineers, geoscientists involved in projects should not perform risk assessments of their own projects...it's a blatant case of conflict of interest.

Risk assessments have to be conducted by specially trained professionals who are accustomed to “think about the unthinkable”.

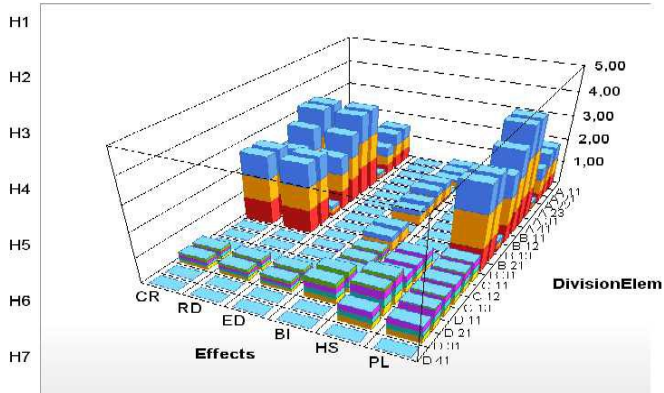
ORE: twenty years of experience and world-wide deployments in transportation, energy, mining related geosciences.

Sources of Threats

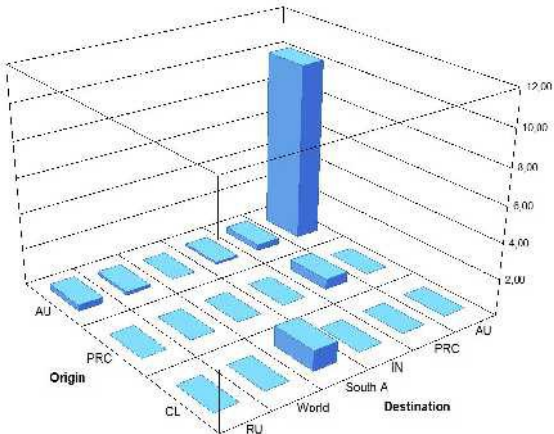


Acme Inc.
4 Divisions:
A,B,C,D;
Diversified
3 countries;
International
Exports.

Potential Losses per Product



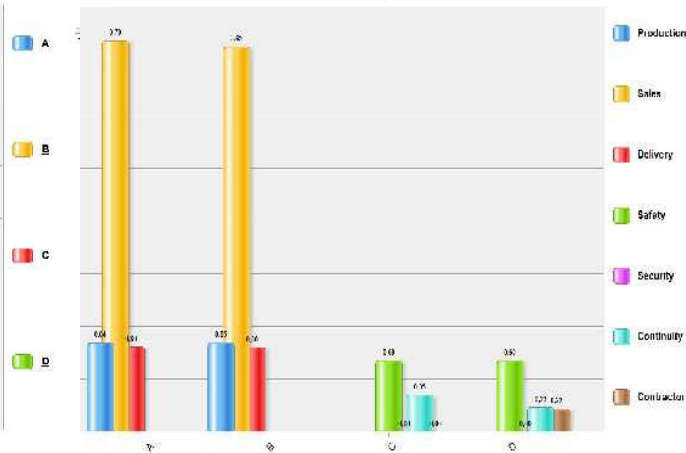
Logistic Risks



Media Vulnerability



Hazardous Sectors



But in the meantime: our legacy has to be kept under constant eye.

We have to stop fooling ourselves (it's expensive!) with poorly made risk assessments.

We have to stop fooling the public (they will take our social license away) with poorly made risk assessments.

We have to understand that our actions will have very significant impacts in the future.

Questions?