Words matter

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Risk concepts sometimes harbour challenges in understanding and communications. This means that we must employ extra care in our choice of language when discussing risk issues.

I recently heard a pipeline expert say "We shouldn't fool ourselves into thinking we can predict risk. At best, we can prioritise."

This type of statement carries a strong implication that we do not understand the risk. I believe I understand what he means when he makes such statements. However, some adjustments should be made at least to his word choice if not to his thinking.

Let's examine his statement. He probably meant that we cannot reliably predict where and when a future failure will occur nor its exact consequences. This interpretation brings probability concepts into the discussion. It is true that, even with perfect knowledge of probabilities, we cannot accurately predict the outcome of each future event. We don't know the outcome of the next coin flip. We only know the possible outcomes and their associated likelihoods.

Imagine that we know, with certainty, that a pipeline failure will occur once every 20 years. We still don't know in which year(s) a failure will occur. Or, suppose we know that the most consequential event will occur only once in every 1,000 failures. That does not mean that this extreme event won't accompany the very next failure, or even the next two or three failures. That's the way probabilities work. Perhaps that is the thought that underlies his statement.

However, it is not fair to imply lack of understanding or lack of control, simply because there is a probabilistic aspect to an event. That kind of implication causes damage to the credibility of those responsible for managing risk. We can, and should, predict frequencies of failures and magnitudes of associated consequence, thereby 'predicting risk'.

Imagine if a stakeholder (a member of the public, an insurer, a regulator, attorney, etc.) asks the risk manager, "About how often do you think this pipeline will fail?"

Will this expert respond, "I have no idea"? If he does, how does that make the questioner feel about his ability to manage risk? Language matters. Choice of words matters.

In reality, the expert always has some idea.[1] He could, in the interest of full disclosure, state the pipeline's failure history: "This pipeline has experienced three failures in the 18 years it has been in service. The cost of those failures to offsite stakeholders ranged from $X to $Y."

Such historical, or 'backwards looking', numbers could be used as predictors of current risk. Hopefully, the expert can add something like, "All of those failures have had a root cause identified and have prompted the employment of additional preventive measures. Therefore, past performance should over-estimate current risk levels."

The expert could also answer the question by providing larger context. Perhaps something like: "In North America, pipelines similar to this one have a historical incident rate of an incident about once every 2,000 mile-years. If this pipeline behaves like an 'average' pipeline has behaved in the past, then we would expect it to experience a failure about once every 37 years."

Again, this answer is based on a 'backwards looking' set of statistics.

Perhaps the expert or operator chooses to add a candid observation at this point: "Unfortunately, I can't control everything that surrounds this pipeline – 54 miles (86.9 km) is a long distance – and protective systems are imperfect. So, I must acknowledge that, despite my best efforts, there is a chance of some kind of leak occurring rarely – about every 37 years using the generic failure experience – somewhere along this 54-mile (86.9 km) pipeline. The most likely leak by far (88 per cent) would be small (less than 2 bbl) and cause only minor offsite consequences (< $2,000)."

All of these are risk predictions.[2]

The expert or operator could now hopefully switch to more forward-looking risk predictions, discussing the results of a modern risk assessment and a sound risk-management strategy: "Since these pipeline miles have extra safeguards (mitigation) and less 'exposure', our calculations estimate a rare frequency of failure– on the order of once every 180 years,

looking forward. This is far below comparable operating pipelines much less risk. Since this pipeline employs extra precautions where the risk is potentially higher, calculations show that the risk has generally been made uniform (< $50/mile-year) along the 54 miles. So, no location is bearing a disproportionate amount of risk".

Again, prediction of risk.

Many other 'language-matters' scenarios related to risk often emerge. It is often stated in a pipeline operator's mission statement that a goal is zero failures. This is not only a worthy goal but, arguably, the only reasonable objective for a modern, prudent, operator.

Here, too, word choice matters. Such a goal does not necessarily mean an expectation of zero failures but rather an intention, plan, and strategy to minimise failure potential to as small a value as possible – hopefully down to virtually zero.

Other word choice issues are related to terminology. Frequency, probability, likelihood, distributions, conservatism, and many statistical terms are often sources of confusion. Concepts like 'acceptable risk' and 'tolerable risk' can be challenging to discuss. Risk versus 'rate of risk' – risk over time and/or space – offer technical nuances to understanding. Even basics like assessing risk versus managing risk can lead to misunderstandings. Finally, there is the aspect of emotional reactions to risk discussions. This is especially important when risk is presented, as it often must be, in terms of human safety, environmental preservation, and other potential damage receptors that we are naturally very protective of.

The cautionary note is that, with so many opportunities for misunderstandings, we must be vigilant in our communications and choose our words carefully. The good news is that we really can understand risk, which leads inevitably to better management of that risk. **P**

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[1] See previous article illustrating the trap associated with the "I have no idea" phrase, especially in legal proceedings.

[2] All predictions should carry numerical quantifications—not relying on qualitative terms like 'rare', 'small', 'unlikely', etc.

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