

# **Incorporating Risk Tolerance in the RDF: PG&E Working Position**



# SPD Staff Proposal

The Staff Proposal is a critical first step that PG&E believes is beneficial to the progression of the Risk-Based Decision-Making Framework.

PG&E believes that the Staff Proposal:

- ✓ Promotes transparency (about assumptions and modeling choices)
- ✓ Promotes consistency
- ✓ Broadens the discussion of risk by expressing it in familiar units

However, as the Safety Policy Division notes, further discussion (and potentially modification) is required in Phase III.

The Staff Proposal takes steps towards a Cost/Benefit Framework. Is that all there is to Risk Management?

No. Among other things we need to consider how risk tolerance will be incorporated. Risk Tolerance, broadly speaking determines whether the residual risk is within acceptable levels. It is an established principle:

In *Industrial Union Department v. American Petroleum Institute*, 448 U.S. 607, 100 S. Ct. 2844 (1980), the Court established that rulemaking by a regulator of jurisdiction must comply with its authority and demonstrate by scientific evidence a safety concern that is risk significant (i.e., by crossing a set threshold, called a threshold requirement), and ***any risk-management measures set in regulation to address this safety concern, if it exceeds the threshold, are not necessarily governed by benefit-cost analysis***; however subsequent improvements of such measures can be governed by benefit-cost analysis. Addressing the safety concern in the first place is out of necessity for the protection of life and not economic efficiency; whereas the improvements can be determined based on economic efficiency.

**Risk Tolerance** can be specified both at the overall \$ based-level, but more likely, at the Natural Unit (e.g., # of occurrences, etc.) level, and by risk. The RDF needs to be flexible enough to recognize and/or incorporate these different specifications and objectives.

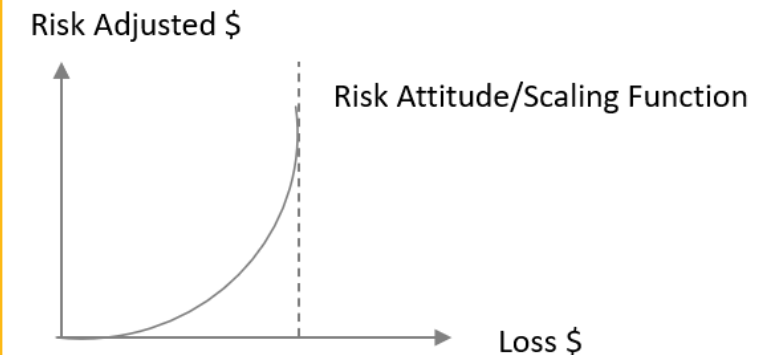
**Risk Attitude** (aka the Utility Function in Decision Analysis and Economics) determines the certainty equivalent level that makes one indifferent between accepting a risky outcome and a certain outcome, it is the “price to mitigate the risk”. Risk Attitude is closely related to Risk Tolerance.

It has always been the Commission's intention to address Risk Tolerance: D.16-08-018, Conclusions of Law #34. : The Commission should adopt explicit risk tolerance standards over time, but not before laying the groundwork in the development of probabilistic risk analysis

PG&E believes we are at an appropriate stage where the groundwork has been laid to start adopting risk tolerance standards. Expressing risk in \$ is a worthwhile goal that PG&E supports because of the transparency it provides. At the same time, risk tolerance needs to have the same level of transparency so that the risk framework fully incorporates all the factors and considerations in risk management.

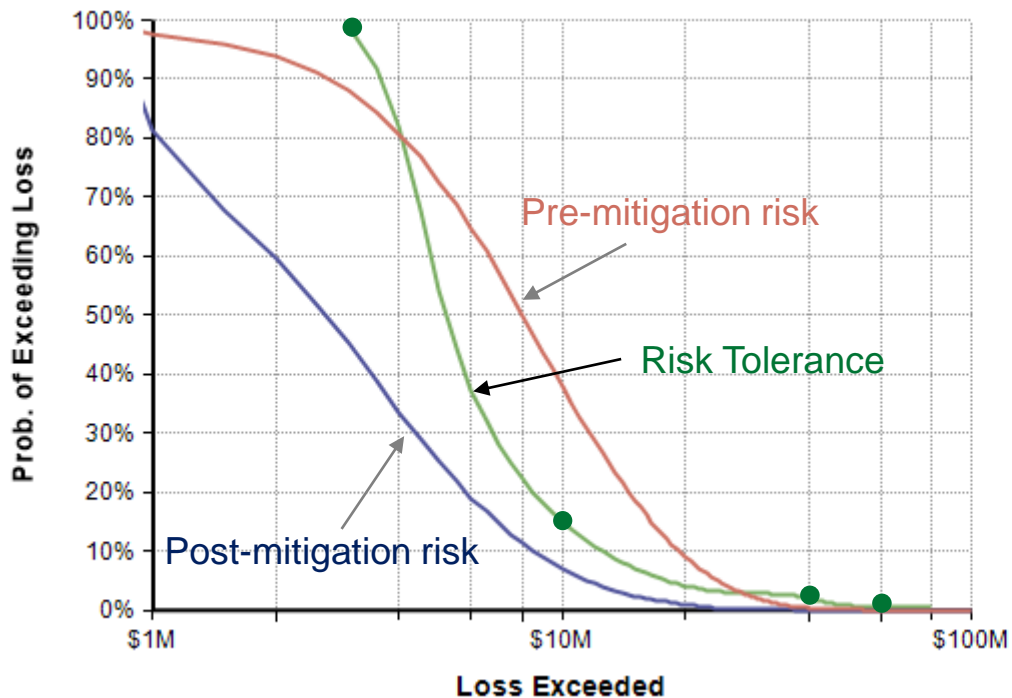
Alternatives on how the two can be incorporated:

1. Limits on either the full loss distribution, or the frequency/consequence distribution
  - Easier to understand. Implementation is more straightforward and consistent with existing practices.
  - Risk Tolerance establishes the necessary work that must be done because the risks exceeds what is acceptable. The Risk Attitude function can be used to calculate cost-benefit ratios to apply to programs after the risk is within acceptable limits.
2. Combined into the Risk Attitude/Scaling function with a vertical segment.
  - Have doubts on how to operationalize and communicate.





# Risk Tolerance on loss distribution in the form of an Exceedance Curve



Risk Tolerance is expressed as a curve relating Natural Units (NU) to the acceptable Probability that some NU value will be exceeded.

The curve on the left is specified as:

Magnitude of Loss	Probability of Exceeding Loss
\$3M	99%
\$10M	15%
\$40M	2%
\$80M	0.5%

In this example considering a Financial loss/impact, the pre-mitigation risk is above risk tolerance over part of the distribution

# Preliminary Thoughts on PG&E RDF Implementation for 2024

