Transparency of Estimates and Assumptions

TURN

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Settlement Line 29: Transparency in RAMP and GRC– Results can be understood

- Inputs and computations for the Steps described in this document should be clearly stated and defined in RAMP and, when applicable, the GRC.
- The sources of inputs should be clearly specified. When SME judgment is used, the process that the SMEs undertook to provide their judgment should be described. Any questionnaire or document used to solicit SME judgment will be made available to the CPUC and parties upon request.
- The utility should specify all information and assumptions that are used to determine both pre- and post-mitigation risk scores.
- The methodologies used by the utility should be mathematically correct and logically sound. The mathematical structure should be transparent. All algorithms should be identified. All calculations should be repeatable by third parties using utility data and assumptions recognizing that, dependent on the models used, some variation of result may occur. This requirement is subject to practicality and feasibility constraints of sharing data and models (such as confidentiality, critical energy infrastructure data, volume of information and proprietary models). If these constraints arise, the utility will walk through the calculation in detail when requested by intervenors or the CPUC staff.

Settlement Line 30: Sensitivity Analysis

- The utility will identify critical parameters and assumptions made in performing the risk analysis and explain why such parameters are critical.
- The utility will be prepared to complete a sensitivity analysis of its results when requested. Intervenors may request sensitivity analyses via the discovery process.

Settlement Line 31: Data Support and Data Sources

- All estimates should be based on data whenever practical and appropriate. However, the available data should not restrict the application of the risk assessment methodologies. SME judgment should be used if the methodologies require use of data that is not available. Over time, SME judgment should be increasingly supplemented by data analysis as the methodologies mature.
- Data can include company-specific data or industry data. Whether use of a type of data is appropriate depends on the issue under consideration. If a utility relies on industry data, the utility will provide justification for applying those data to the specific circumstances of the utility.
- Data can be combined with SME judgment to provide inputs to the risk methodology.
- Data can be information derived from, but not limited to, observations, models, records, analysis, or measurements.

Transparency allows Repeatability

- The utility should provide information sufficient that a stakeholder can repeat the calculation and arrive at roughly the same result.
- This requires a transparent process and transparent inputs.
- Repeatability allows parties to test the assumptions and estimates to better understand how they drive to the results. This provides context to the results.

Uncertainty is an important point of information.

- It is important that the utility acknowledges what it doesn't know.
- Outputs can be tested to see the impact of the uncertain inputs. This will help us identify where it might be valuable to gain further information.
- The JIA Test Drive in A.15-05-002 demonstrated how to determine the value of additional information.

Granularity Informs Transparency

- Insufficient granularity masks the ability to see the impact of proposed mitigations on individual asset segments.
- Using average RSE values that do not account for individual asset differences prevents the Commission from making fine-tuned decisions about which mitigations to approve and in what scope, given affordability and other constraints.
- Impact of each mitigation should be calculated separately rather than aggregating mitigations together.
- When multiple mitigations are deployed the utility should show the incremental impact of each mitigation based on the order of the mitigations.

How can the utility be transparent in the description of uncertain inputs?

- Identify when inputs are based on assumptions of estimates.
- Define with specificity what is being assumed or estimated.
- Describe the basis or source for the assumption or estimate.
- Identify the confidence in the assumption or estimate.
- Identify why a given assumption or estimate is reasonable.
- Identify the uncertainty of the assumption or estimate.

Example: Post Mitigation LoRE and CoRE.

- Calculation of the Risk Spend Efficiency requires Pre-Mitigation and Post-Mitigation LoRE and CoRE; the Post-Mitigation LoRE and CoRe reflect the implementation of a proposed mitigation.
- The utility must identify the effectiveness of the mitigation to calculate the Post-Mitigation values.
- Unless the utility provides context for the value used for effectiveness, stakeholders and the Commission cannot determine whether the value used is reasonable.

Streamlined Format for Reporting Estimates and Assumptions

- Discount Rate used
- Estimates and assumptions required for each mitigation:
  - Time horizon, T, years
  - Cost of mitigation: cash flows for each year 1, 2, 3, …, T
  - CoRE: attribute levels for each year, 1, 2, 3, ..., T, for each attribute, before and after mitigation.
  - LoRE: likelihood of occurrence of the risk event for each year, 1, 2, 3, …, T, before and after mitigation
- In principle, estimates and assumptions for each mitigation are presented in a matrix of T columns and $1 + 2n_A + 2$ rows, where n_A is the number of attributes.

Streamlined Format for Reporting Estimates and Assumptions (cont'd)

- Matrix of Estimates and Assumptions if there are n_A different attributes

	YEAR	1	2	3	…	T
COST						
CoRE Before (n_A rows)						
CoRE After (n_A rows)						
LoRE Before						
LoRE After						

Streamlined Format for Reporting Estimates and Assumptions: Reporting Uncertainties

- Costs of a mitigation
  - If costs are certain, then report the cost for each period. The cost row is a sequence of numbers.
  - If costs are uncertain, then report the probability distribution of the cost in each period in each cell of the matrix.
    - Report the probability distribution as a named distribution with parameters specified for each year
      - If the parameters of the probability distribution are uncertain, then report the probability distribution for the uncertain parameter for each year
    - Report the probability distribution using percentiles. Our preferred approach is to report the 10-50-90 percentiles for each year.
      - If the percentiles of the distribution are uncertain, then report the probability distribution for the uncertain percentiles for each year.

Streamlined Format for Reporting Estimates and Assumptions: Reporting Uncertainties

- Consequences of the Occurrence of the Risk Event (CoRE)
  - If attribute levels are certain, then report the attribute level for each attribute for each period before and after mitigation. Each attribute row is a sequence of numbers.
  - If attribute levels are uncertain, then report the probability distribution of the attribute level for each attribute in each period before and after mitigation in each cell of the matrix.
    - Report the probability distribution as a named distribution with parameters specified for each year
      - If the parameters of the probability distribution are uncertain, then report the probability distribution for the uncertain parameter for each year
    - Report the probability distribution using percentiles. Our preferred approach is to report the 10-50-90 percentiles for each year.
      - If the percentiles of the distribution are uncertain, then report the probability distribution for the uncertain percentiles for each year.

Streamlined Format for Reporting Estimates and Assumptions: Reporting Uncertainties

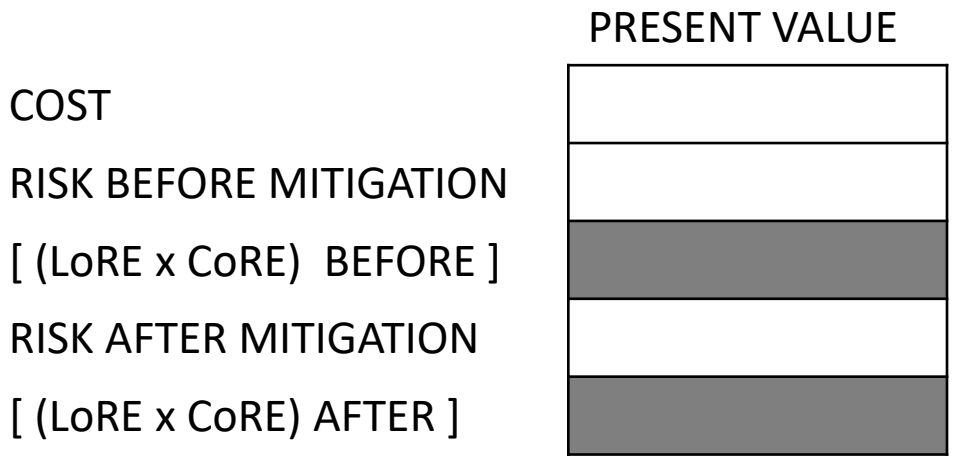
- Likelihood of Occurrence of the Risk Event (LoRE)
  - If the Risk Event can occur at most once in each year then report the probability of occurrence of the Risk Event for each period before and after mitigation. Each row is a sequence of numbers.
    - If the probability of occurrence of the risk event is estimated by SMEs, then in addition report the underlying probability distribution of the the relative frequency of the Risk Event provided by the SME. If there are several SMEs, then report the underlying probability distribution of the relative frequency of the Risk Event for each SME, or the combined probability distribution on the relative frequency of the Risk Event.
  - If the Risk Event can occur more than once in each year, report the probability distribution on the number of occurrences of the Risk Event per year.
    - Report the probability distribution as a named distribution with parameters specified for each year
      - If the parameters of the probability distribution are uncertain, then report the probability distribution for the uncertain parameter for each year
    - Report the probability distribution using percentiles. Our preferred approach is to report the 10-50-90 percentiles for each year.
      - If the percentiles of the distribution are uncertain, then report the probability distribution for the uncertain percentiles for each year.

Reporting Computed Results: RSE

- RSE is the ratio of two present values: the present value of the Risk Reduction divided by the present value of the Cost.
- The present value of the Risk Reduction is the discounted value of the Risk Reduction in each period.
- The Risk in each period is the product of the expected value of the LoRE (or the probability of occurrence of the Risk Event) multiplied by the expected value of the CoRE, where the CoRE is expressed in terms of weighted scaled units of the MAVF.
- The Risk reduction in each period is the difference between the Risk before mitigation and the Risk after mitigation
- The present value of the Cost is the present value of the expected Cost in each period if the Cost is uncertain.

Reporting Computed Results: RSE (cont'd)

- Similar to the matrix format for reporting the Estimates and Assumptions, the RSE can be reported as a single column of present values:



- Note that RSE is uncertain if and only if there is uncertainty in the probability distributions for Cost, CoRE, or LoRE. Uncertainty in the outcomes does not mean there is uncertainty in the RSE because the RSE is a ratio of expected values.