



The Risk-Based Decision-Making Framework

Rulemaking (R.) [20-07-013](#) to Further Develop a Risk-Based Decision-Making Framework for Electric and Gas Utilities

What is this Rulemaking about?

The Risk-based Decision-making Framework, or RDF, regulates the way California’s large electric and natural gas investor-owned utilities¹ assess and disclose risks that have safety, reliability, and financial consequences. The goal of the RDF is to increase the transparency and accountability of how the utilities are prioritizing and mitigating safety risks. The RDF also provides Safety Policy Division staff with a guideline and process for evaluating whether the utilities follow the California Public Utilities Commission’s (Commission) expectations/requirements for making risk-based decisions.

What is Risk?

At the Commission, the concept of risk addresses adverse events for which a utility holds a degree of responsibility. A formal definition for a risk event is:

an occurrence or change of a particular set of circumstances that may have potentially adverse consequences and may require action to address. In particular, the occurrence of a Risk Event changes the Levels of some or all of the Attributes of a risky situation.²

Every risk event potentially has a consequence for each of three main risk “attributes,” or areas of potential risk impacts: safety, reliability and financial attributes. A risk event can result in an injury or fatality, making it a matter of safety. Or a risk event can limit or interrupt consumers’ access to natural gas and/or electricity, which is a reliability issue. Finally, risk events can result in direct financial loss. The RDF regulates the way in which the utilities quantitatively model the impact of a risk event on these three attributes.

Background to the Proceeding

The Commission opened this proceeding through an Order Instituting Rulemaking (OIR) adopted on July 16, 2020. This proceeding was informed by the Safety Model Assessment Proceeding (S-MAP, [A.15-05-002](#)), which collected and refined methodologies for identifying, ranking and developing mitigations for safety risks. This proceeding is referred to as the RDF Proceeding or Risk OIR, and occasionally as S-MAP 2.0. The RDF Proceeding is tasked with refining the RDF and continues to be informed by the following Commission proceedings and reports:

¹ This term is often shortened to IOU and includes the following four companies: Pacific Gas and Electric Company (PG&E), Southern California Gas Company, Southern California Edison Company, and San Diego Gas & Electric Company.

² See Decision (D.) 22-12-027, Appendix A, pg. A-5



Relevant Proceedings and Reports

Risk Assessment Mitigation Phase (RAMP) Filing

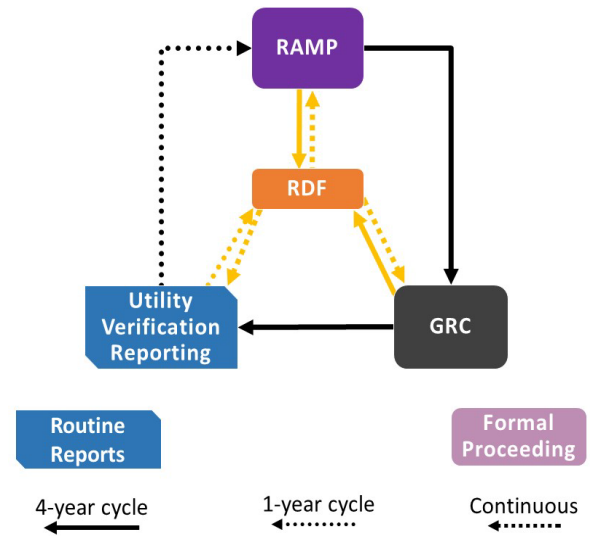
A risk disclosure report filed in a Commission proceeding. This report quantifies the likelihood and consequences of risk events, the benefit of risk reduction from investing in risk mitigations and cost-benefit ratios for risk mitigation investments.

General Rate Case (GRC)

A Commission proceeding used to address the costs of operating and maintaining the utility system and the allocation of those costs among customer classes.

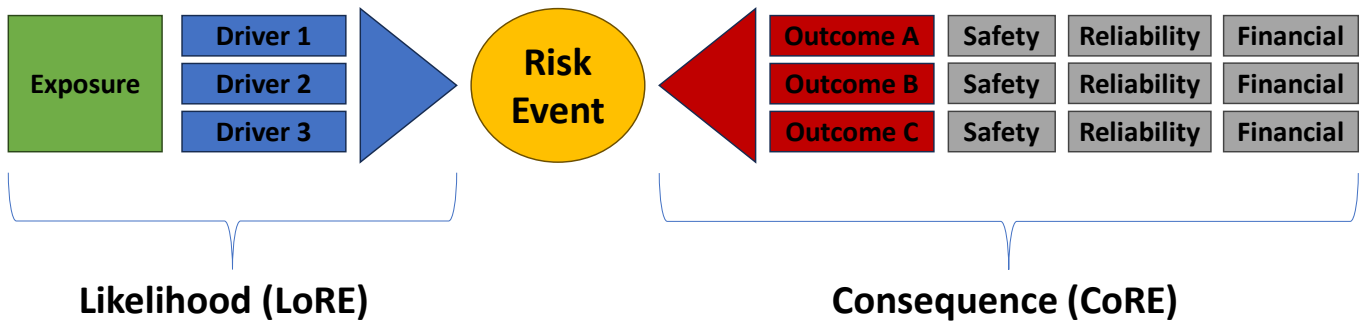
Utility Verification Reporting

A series of reports that includes descriptions of how forecasted expenditure compares with actual spending, measurements of achieved safety improvements, among others.



Risk Bowties

To help clarify RAMP filings, the utilities use a risk bowtie to describe the nature of each risk event. A risk bowtie provides a simple means for visualizing and representing a particular risk event according to its likelihood and consequence. A risk bowtie also visualizes the data-informed components that allow for the calculation of a monetized risk value. A monetized risk value is the representation, in dollars, of the impact of a potential risk event. An example of a bowtie is seen here:



The risk event, a well-defined, single, observable, and measurable event, lies at the center of the bowtie. Risk events are caused by drivers that are characterized by exposure (or the scope of the risk) on the left-hand side of the bowtie, which bring about the outcomes on the right-hand side. Drivers and exposure can be quantitatively measured to calculate the likelihood of a risk event (or LoRE). The utilities typically express LoRE as a Frequency (i.e. the number of events/year). Outcomes have implications for the safety, reliability and financial attributes. Outcomes are often presented as a distribution of probable results, ranging from no impact to severe impacts. Outcomes are measured in terms of each attribute (i.e. number of injuries or duration of an outage). The



measurements of attributes are then used to calculate the consequence of a risk event (or CoRE), which is monetized in dollars. A monetized risk score is the likelihood multiplied by the consequence or:

$$\text{LoRE} \times \text{CoRE} = \text{Monetized Risk Score}$$

Within a RAMP filing, the utilities suggest mitigations that once implemented can reduce monetized risk scores for various risk events. The level of risk reduction is considered a benefit, which would also be expressed as a dollar value. To demonstrate the cost efficiency of a mitigation program, utilities divide the benefit by the cost of implementing the mitigation, which is expressed as a cost-benefit ratio. In simplified terms, this is how the RDF conceptualizes risk modelling and how the utilities use the RDF to prepare their RAMP filings. After the RAMP is evaluated by SPD Staff, the utilities will use this same risk modelling approach to justify investments in mitigations in a GRC proceeding.

Enterprise Risk Register

The RDF requires utilities to identify a set of risks that could be evaluated in a RAMP filing. This inventory of risks, taken as a snapshot in time, is called the utility's enterprise risk register (or ERR). The ERR must be refreshed on a regular basis to reflect the changing nature of a risk. For example, risks that were consolidated may be separated, new risks may be added, and the level of risks may change over time.

For each risk included in the ERR, the utility will compute a monetized safety risk value using only the safety attribute. The utility will then sort these ERR risks in descending order according to the monetized safety risk value. For the top 40% of ERR risks, the utility will compute a monetized risk value using at least the safety, reliability and financial attributes. This risk assessment of the top 40% of ERR risks is the primary focus of every utility's RAMP filing.

The large electric and gas investor-owned utilities file a RAMP report with the Commission every four years. This means that the risks included within a RAMP report could change from one filing to the next. Here are a few examples of risks that the utilities have addressed in previous RAMP reports:

- Climate Change
- Contact with Energized Equipment
- Cyber Attack
- Employee Safety Incident
- Failure of Electric Distribution Overhead Assets
- Hydro Dam Failure
- IT Asset Failure
- Loss of Containment on Gas Distribution Main or Service
- Physical Attack
- Seismic Event
- Underground Equipment Failure
- Wildfire



Additional Information

Webpages

S-MAP 2: R. 20-07-013:

<https://www.cpuc.ca.gov/about-cpuc/divisions/safety-policy-division/risk-assessment-and-safety-analytics/s-map-2-r-20-07-013>

Safety Model Assessment Proceeding (SMAP) A.15-05-002:

<https://www.cpuc.ca.gov/Home/About-CPUC/Divisions/Safety-Policy-Division/Risk-Assessment-and-Safety-Analytics/Safety-Model-Assessment-Proceeding-SMAP-A15-05-002-et-al>

Risk Assessment Mitigation Phase (RAMP):

<https://www.cpuc.ca.gov/about-cpuc/divisions/safety-policy-division/risk-assessment-and-safety-analytics/risk-assessment-mitigation-phase>

Safety Performance Metrics Reports (SPM):

<https://www.cpuc.ca.gov/about-cpuc/divisions/safety-policy-division/wildfire-and-safety-performance/safety-performance-metrics-reports>

Risk Spending Accountability Reports (RSAR):

<https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-costs/risk-spending-accountability-reports>

Recent RAMP Proceedings

Pacific Gas and Electric (PG&E) 2020 RAMP Application (A.20-06-012):

<https://apps.cpuc.ca.gov/p/A2006012>

Southern California Edison (SCE) 2020 RAMP Application (A.22-05-013):

<https://apps.cpuc.ca.gov/p/A2205013>

San Diego Gas and Electric/Southern California Gas (Sempra) 2021 RAMP Application (A.21-05-011/A.21-05-014):

<https://apps.cpuc.ca.gov/p/A2105011>