

Risk Assessment Mitigation Phase

Risk Mitigation Plan

Lessons Learned

(RAMP – B)

November 30, 2016

Risk Management Framework

Consistent with the historic commitment of Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E) (collectively referred to as the utilities) of evaluating and mitigating risks to the public, employees, and infrastructure, the utilities implemented new risk management practices as described in the Safety Model Assessment Proceeding (S-MAP) proceeding, Application (A.) 15-05-002 and A.15-05-004. The utilities’ risk management framework is consistent with the Cyclac Corporation 10-step Evaluation Method adopted in Decision (D.) 16-08-018.¹ The utilities’ consolidated Cyclac’s 10-steps into six distinct steps, each of which are described below:

1. Risk identification;
2. Risk analysis;
3. Risk evaluation and prioritization using a 7X7 matrix;
4. Mitigation plan development;
5. Risk-informed investment decisions and risk mitigation implementation; and
6. Monitoring and review.

Figure 1 Risk Management Process



¹ D.16-08-018 Ordering Paragraph 4.

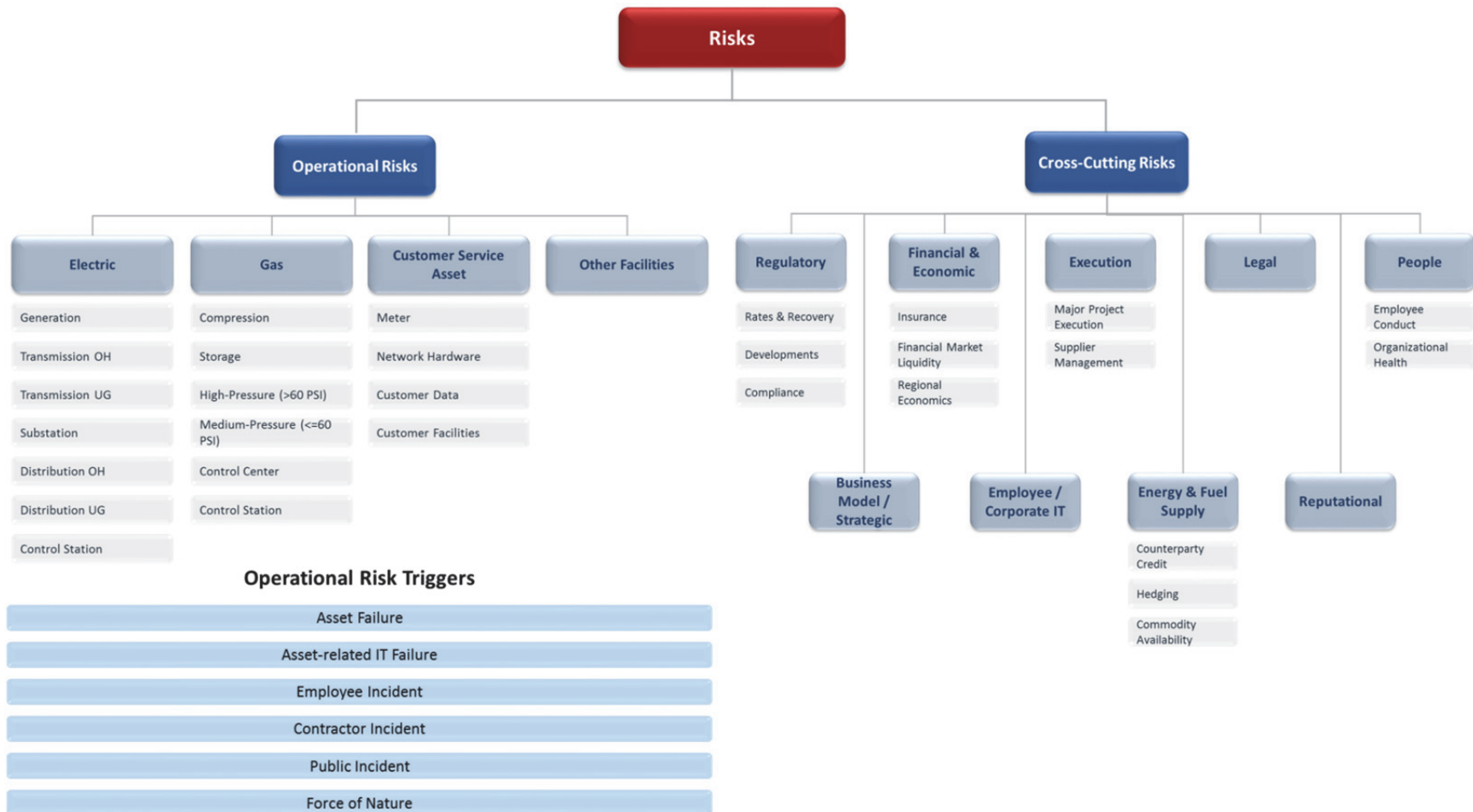
Risk Identification

Risk identification, as defined by ISO 31000, is the process of finding, recognizing and describing risks. It includes the identification of risk sources, events, their causes and potential consequences. On an annual basis, the Enterprise Risk Management (ERM) organization facilitates the enterprise risk identification process through interviews and meetings with risk owners and managers to review and discuss potential changes to the utilities' respective enterprise risk registry. The utilities are moving toward a more structured approach to classifying risks and mitigations through the development of its new risk taxonomy. The purpose of the risk taxonomy is to help categorize and understand the spectrum of risks to which the companies are exposed using a common framework. The taxonomy helps ensure that the risk identification process covers the full range of risks to which the utilities are exposed, in a structured manner. As the companies' ERM function continues to evolve, the taxonomy will provide a shared language around risk and support a broader range of ERM activities, which include: risk ownership, mitigation planning, and risk measurement and monitoring (e.g., key risk indicators).

The taxonomy breaks into two main branches at the highest level: operational risks and cross-cutting risks. Operational risks are those events that can result in damage to or loss of company or public asset, environmental impact, personnel injury, and/or interruption of service to customers. These are defined as operational implications. The taxonomy further categorizes operational risks by commodity, asset-type and classifies risk triggers that tie to operational risks. Cross-cutting risks are called such because they cut across a range of assets, and are not linked to specific triggers associated with those assets.

The companies' early implementation of the taxonomy is laid out in this report and can be seen in each risk chapter where each risk was mapped to the appropriate categories of risk, assets and drivers in accordance with the taxonomy. Figure 1 below is a visual depiction of the taxonomy.

Figure 1 Risk Taxonomy



Risk Analysis

Risk analysis as defined by ISO 31000 is the process to comprehend the nature of risk and to determine the level of risk. It provides a basis for risk evaluation and decisions about risk mitigation. As stated in ISO 31000, risk analysis is undertaken with varying degrees of details depending on the risk and the availability of data and resources. The utilities utilize a combination of qualitative and quantitative analyses to analyze their risks. On an annual basis, the ERM organization facilitates a risk assessment session where risk owners discuss their risk analysis based on the information they have and the risk mitigations in place.

Risk Evaluation & Prioritization

Risk evaluation is the process of comparing the results of risk analysis against impact and likelihood dimensions. The utilities use the 7x7 Risk Evaluation Framework (REF) to evaluate the level of risks and differentiate risks from one another by gauging their frequency of occurrence against their potential impact. On an annual basis, the ERM organization facilitates the risk prioritization session where risk owners discuss the relative ranking of the utilities' enterprise risks with senior management and achieve consensus around risk priorities. In the REF, risk scores are calculated from two primary inputs: impact and frequency. The impact is the effect or outcome of an event. The frequency reflects the likelihood of the risk event occurring within a certain time. Both the impact and the frequency are evaluated on a scale of 1 – 7 as depicted in Figure 3 below.



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	Impact						
	7	6	5	4	3	2	1
	Catastrophic	Severe	Extensive	Major	Moderate	Minor	Negligible
<p>Health, Safety, & Environmental: Endanger workplace or public safety; impact to surrounding environment; Long-term: 10+ years Medium-term: 3-10 years Short-term: 1-3 years</p>	<p>Fatalities: Many fatalities and life threatening injuries to the public or employees. Immediate, severe, and irreversible impacts to environment</p>	<p>Fatalities: Few fatalities and life threatening injuries to the public or employees. Severe and long-term impacts to environment</p>	<p>Permanent/Serious Injuries or Illnesses: Many serious injuries or illnesses to the public or employees. Significant and medium-term impacts to environment</p>	<p>Permanent/Serious Injuries or Illnesses: Few serious injuries or illnesses to the public or employees. Significant and short-term impacts to environment</p>	<p>Minor Injuries or Illnesses: Minor injuries or illnesses to many public members or employees. Moderate and short-term impacts to environment</p>	<p>Minor Injuries or Illnesses: Minor injuries or illnesses to few public members or employees. Environmental impact is immediately correctable or contained within small area</p>	<p>No injury or illness or up to an un-reported negligible injury. No environmental impact</p>
<p>Operational and Reliability: Disruption to company operations that could impact customers; may be measured in quantity of impacted customers, critical locations, loss of energy flows, and/or duration</p>	<p>> 1 MM customers affected; or impacts an entire metropolitan area, including critical customers; or disruption of service of more than a year due to permanent loss to a facility</p>	<p>>100 K customers affected; or impacts multiple critical locations and customers; substantial disruption of service greater than 1 months</p>	<p>> 50 K customers affected; or impacts multiple critical locations or customers; substantial disruption of service greater than 10 days</p>	<p>> 10 K customers affected; impacts single critical location or customer; disruption of service greater than 1 day</p>	<p>> 1 K customers affected; impacts single critical location or customer; disruption of service for 1 day</p>	<p>> 100 customers affected; impacts small area with no disruption to critical location or customer; disruption of service less than 1 day</p>	<p>< 100 customers affected; impacts small localized area with no disruption to critical location/customer; disruption of service less than 3 hours</p>
<p>Regulatory, Legal, & Compliance: Diminishing relationship and increased scrutiny by regulators or government agencies; ongoing media coverage forces outreach to policy makers/regulators; increasing stakeholder revolt or objections leading to increased oversight; loss of license, exclusivity, or monopoly</p>	<p>Actions resulting in closure, split, sale of the company, or criminal conviction</p>	<p>Cease and desist orders are delivered by regulators; Critical assets and facilities are forced by regulators to be shut down; revoking license, market-based rate authority, or monopoly</p>	<p>Governmental, regulatory investigation (including criminal), and enforcement actions lasting longer than one year; violations that result in fines/penalties and large non-financial sanctions</p>	<p>Violations that result in fines or penalties, or a regulator enforces non-financial sanctions, or significant new and updated regulations are enacted as a result of an event</p>	<p>Violations that result in fines or penalties</p>	<p>Self-reported or regulator identified violations with no fines or penalties</p>	<p>No impact to administrative impact only</p>
<p>Financial : Potential financial loss, including disallowance, legal actions or fines, replacement energy, remediation, damage to 3rd party properties, etc.</p>	<p>Loss > \$3 billion Ability to raise capital significantly impacted; or decrease in stock price greater than 25%; or potential insolvency</p>	<p>\$1 B - \$3 B Ability to raise capital is challenged; or decrease in stock price greater than 15%</p>	<p>\$100 MM - \$1 B Ability to raise capital becoming more difficult; or decrease in stock price greater than 5%</p>	<p>\$10 MM - \$100 MM</p>	<p>\$1 MM - \$10 MM</p>	<p>\$50 K - \$1 MM</p>	<p>< \$50 K</p>
	Frequency/Likelihood						
	7	6	5	4	3	2	1
	Common	Regular	Frequent	Occasional	Infrequent	Rare	Remote
<p>Frequency of an occurrence: How often does the risk event occur</p>	> 10 times per year	1-10 times per year	Once every 1-3 years	Once every 3-10 years	Once every 10-30 years	Once every 30-100 years	Once every 100+ years

The risk score for each risk is then calculated using the following algorithm:

$$\text{Risk score} = \sum_{i=1}^n \text{weight}_i * \text{frequency}_i * 10^{\text{impact}_i}$$

Each impact category is assigned a weight as follows:

- 40% for Health, Safety & Environmental,
- 20% for Operational and Reliability,
- 20% for Regulatory, Legal & Compliance, and
- 20% for Financial.

Frequency ratings translate to certain values as shown in the table below:

Frequency Rating	Value
1	0.005
2	0.018
3	0.058
4	0.183
5	0.577
6	3.162
7	31.623

Thus, if a risk received a score of 6 for Health, Safety & Environmental Impact, 5 for Operational and Reliability Impact, 5 for Regulatory, Legal & Compliance Impact, and 6 for Financial, it would receive a score of 369,280 based on the following calculation:

(Using frequency table, frequency 5 has value of 0.577)

$$\begin{aligned}
 &= 0.4 * 0.577 * 106 \text{ [safety]} + 0.2 * 0.577 * 105 \text{ [reliability]} + 0.2 * 0.577 * 105 \text{ [compliance]} \\
 &\quad + 0.2 * 0.577 * 106 \text{ [financial]} \\
 &= 230,800 \text{ [safety]} + 11,540 \text{ [reliability]} + 11,540 \text{ [compliance]} + 115,400 \text{ [financial]} \\
 &= 369,280
 \end{aligned}$$

Risk Mitigation Plan Development & Documentation

Based on the analysis and evaluation of risks, risk owners and managers develop and document risk mitigation plans to capture the state of the risk given current mitigations and any proposed additional mitigations. On an annual basis, the ERM organization facilitates the risk mitigation planning session where risk owners present their key risk mitigation plans and alternatives considered to the senior management team and discuss the feasibility and prudence of those proposed plans. This risk mitigation planning session helps shape the utilities' priorities going into the annual investment planning process and helps identify gaps and/or areas of overlap in risk mitigation plans.

Risk Informed Investment Decisions and Risk Mitigation Implementation

The capital planning process is the utilities' current process for prioritizing funding based on risk informed priorities and input from operations. On an annual basis, initial capital allocations begin with inputs from Functional Capital Committees that comprise subject matter experts who perform high level assessments of the capital requirements based on achieving the highest risk mitigation at the lowest attainable costs. These requirements are presented to the Capital Planning Committee which is a cross-functional team representing each functional area with capital requests. This committee reviews the spending requirement submissions from all functional areas, and projects are evaluated against priority metrics including safety, cost effectiveness, reliability, security, environmental and customer experience. The Capital Planning Committee then presents its recommendations for capital spending to the Executive Finance Committee which reviews the recommendations and either approves the proposed capital funding allocations or requests changes. Once the capital allocations are approved, each individual operating organization is chartered to manage their respective capital needs within the capital allotted by the plan. Similar to the utilities' risk evaluation processes, the capital planning process is continuing to evolve as the utilities endeavor to achieve the shared goal of determining the risk reduction per dollar invested. In this report, the utilities demonstrate the first steps towards this evolution by showcasing a pilot the utilities are currently conducting to calculate a risk spend efficiency for the proposed mitigations. This approach is further described in the Overview & Approach section of this report.

Monitoring and Review

Monitoring and review of all aspects of risk management supports the utilities' efforts at continuously improving its risk management framework. Periodic reviews of the utilities' risk registry are performed to keep the registry current and facilitate discussions on any emerging or new risks that the utilities could face. Existing Key Risk Indicators (KRIs) support the monitoring of the utilities' key risks and as mentioned above, the process of identifying and implementing KRIs will continue to improve this step of the process.