



# **2025 Risk Assessment Mitigation Phase**

**(Chapter SCG-Risk-6)**

**Contractor Safety**

**May 15, 2025**

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## **I. INTRODUCTION**

The purpose of this chapter is to present Southern California Gas Company's (SoCalGas or Company) risk control and mitigation plan for the Contractor Safety Risk. This chapter contains information and analysis for this risk that meet the requirements of the California Public Utilities Commission's (Commission or CPUC) Risk-Based Decision-Making Framework (RDF),<sup>1</sup> including the requirements adopted in Decision (D.) 22-12-027 (Phase 2 Decision) and D.24-05-064 (Phase 3 Decision). The Contractor Safety Risk is included in the 2025 RAMP Report based on a safety risk assessment, further informed by its reliability and financial consequence attributes, consistent with RDF guidance. This risk chapter describes the basis for selection of the Contractor Safety Risk, the controls and/or mitigations put forth to reduce the likelihood or consequence of this risk, a discussion of alternative mitigations considered but not selected, and a graphic to show historical progress. This chapter presents cost and unit forecasts for the risk mitigating activities, but it does not request funding. Any funding requests for this risk will be made through the Company's Test Year (TY) 2028 General Rate Case (GRC) application. Finally, this chapter describes the methods applied to estimate the risk's monetized, pre-mitigated risk, the estimated risk-reduction benefits of each included control and mitigation, and the calculation of Cost-Benefit Ratios (CBRs) for each control and mitigation consistent with the method and process prescribed in the RDF.

### **A. Risk Definition and Overview**

#### **1. Risk Definition**

For the purposes of this RAMP Report, SoCalGas's Contractor Safety Risk is defined as the risk of a condition, practice, or event that threatens the safety of a SoCalGas contractor. The risk definition captures an incident caused by the injured contractors themselves and/or other contractors and includes the processes and systems around contractors that could contribute to an incident, and which may also result in harm to SoCalGas infrastructure, employees and/or the public.

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<sup>1</sup> As discussed in Volume 1, Chapter RAMP-1, the RDF Framework broadly refers to the recent modifications to the Commission's Rate Case Plan adopted in Rulemaking (R.) 13-11-006, Safety Model Assessment Proceeding A.15-05-002 et al. (cons.), and R.20-07-013 (the Risk OIR), including D.24-05-064, Appendix A.

Certain controls and mitigations presented in this chapter are subject to compliance mandates and standards beyond RDF requirements, such as those from state and federal Occupational Safety and Health Administrations (OSHA), the Pipeline and Hazardous Materials Safety Administration (PHMSA) of the Department of Transportation (DOT), American Petroleum Institute Recommended Practice (API RP) 1173, and the CPUC. A list of compliance requirements applicable to Contractor Safety Risk is provided in Attachment A. Certain mitigation programs have value beyond the estimated risk reduction calculated under the RDF, such as enhancement of operations and promoting public trust and confidence in the communities SoCalGas serves.

## **2. Risk Overview**

SoCalGas relies on support from its contractors to perform a significant amount of construction related work on its gas infrastructure assets located throughout its service territory, which encompasses parts of Central and Southern California. Such work is frequently performed in public space and exposed to external factors, such as vehicular traffic in populated areas. Contractors support SoCalGas during normal operating conditions as well as during emergency situations resulting from events, such as wildfires, mudslides, and earthquakes. SoCalGas has many safety-related policies and procedures for contractors to follow.

### **B. Risk Scope**

SoCalGas's analysis of Contractor Safety Risk considers the risk of a work-related safety incident, involving a Class 1 contractor, while conducting work on behalf of SoCalGas, which causes minor<sup>2</sup> or serious injury/illness,<sup>3</sup> or fatality.

SoCalGas defines Class 1 Contractors as a Contractor engaged by the Company to perform work that can reasonably be anticipated to expose the Contractor's employees, subcontractors, SoCalGas employees, or the general public to one or more hazards that, if not

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<sup>2</sup> Minor injury or illness is one that does not meet the criteria for a serious injury as defined by Cal/OSHA.

<sup>3</sup> Cal/OSHA defines a serious injury or illness as "any injury or illness occurring in a place of employment or in connection with any employment that requires inpatient hospitalization for other than medical observation or diagnostic testing, or in which an employee suffers an amputation, the loss of an eye, or any serious degree of permanent disfigurement, but does not include any injury or illness or death caused by an accident on a public street or highway, unless the accident occurred in a construction zone." Cal. Code Regs. Tit. 8, § 330(h).

properly mitigated, have the potential to result in Serious Safety Incident.<sup>4</sup> Examples of Class 1 Contractors include contractors that perform construction, repair, or maintenance work on SoCalGas's natural gas pipeline system and appurtenances, including gas distribution, transmission, or storage systems, or building construction, repair, or maintenance work involving elevated work surfaces, confined space, energized equipment, hazardous chemicals, or other similar hazards.

### **C. Data Sources Used to Quantify Risk Estimates<sup>5</sup>**

SoCalGas utilized internal data sources to determine the Contractor Safety Risk Pre-Mitigation Risk Value and calculate risk reduction estimates for mitigation activities (which enables estimation of Post Mitigation Monetized Risk Values and Cost Benefit Ratios). Where internal data is deemed insufficient, supplemental industry or national data is used, as appropriate, and adjusted to account for the risk characteristics associated with the Company's specific operating locations and service territory. For example, certain types of incident events have not occurred within the SoCalGas and SDG&E service territories. Expanding the quantitative data sources to include industry data where such incidents have been recorded is appropriate to establish a baseline of risk and risk addressed by mitigative activities. Attachment B provides additional information regarding these data resources.

## **II. RISK ASSESSMENT**

In accordance with Commission guidance, this section provides a qualitative description of the Contractor Safety Risk, including a risk Bow Tie, which delineates potential Drivers/Triggers and Potential Consequences, followed by a description of the Tranches determined for this risk.

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<sup>4</sup> SoCalGas' Class 1 Contractor Safety Manual defines a "Serious Safety Incident" as a work-connected injury or illness occurring in a place of employment or in connection with any employment that requires inpatient hospitalization for a period in excess of 24 hours for other than medical observation or in which an employee suffers a loss of any member of the body or suffers any serious degree of permanent disfigurement.

<sup>5</sup> Copies and/or links to these data resources are provided in the workpapers served with this Report on May 15, 2025.

## **A. Risk Selection**

The Contractor Safety Risk was included as a risk in SoCalGas's 2021 RAMP and was included in the 2022, 2023 and 2024 Enterprise Risk Registries (ERR).<sup>6</sup> SoCalGas's evaluation and selection process is summarized in Chapter RAMP-2: Enterprise Risk Management Framework and in Chapter RAMP-3: Risk Quantification Framework.

SoCalGas selected this risk in accordance with RDF Row 9.<sup>7</sup> Specifically, SoCalGas assessed the top risks from the Company's 2024 ERR based on the Consequence of a Risk Event (CoRE) Safety attribute. Contractor Safety Risk was among the risks presented in SoCalGas's list of Preliminary 2025 RAMP Risks at a pre-filing workshop. Contractor Safety Risk was selected based on the qualification of its Safety risk attribute, as required under the RDF. At the pre-filing workshop, no party expressed opposition to inclusion of this risk in SoCalGas's 2025 RAMP Report.

## **B. Risk Bow Tie**

In accordance with Commission requirements, this section describes the risk Bow Tie, possible Drivers, Potential Consequences, and a mapping of the elements in the Bow Tie to the mitigations that addresses them.<sup>8</sup> As illustrated in the risk Bow Tie shown below in Figure 1, the Risk Event (center of the Bow Tie) is a Contractor Safety Risk that could lead to a safety-related event, the left side of the Bow Tie illustrates Drivers/Triggers that could cause the Contractor Safety Risk, and the right side shows the Potential Consequences of the Contractor Safety Risk. SoCalGas applies this framework to identify and summarize the information provided in Figure 1. A mapping of each mitigation to the addressed elements of the risk Bow Tie is provided in Attachment C.

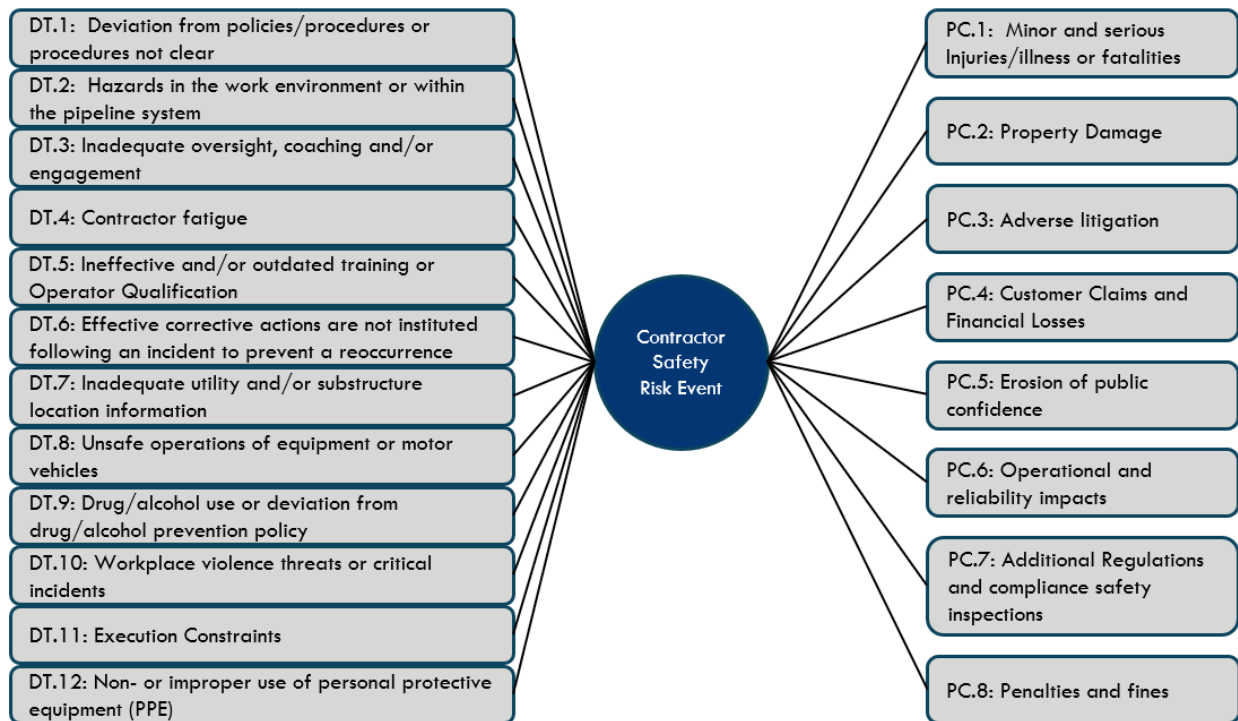
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<sup>6</sup> In the 2021 RAMP Report, Chapter SCG-Risk-7, this risk was called Incident Involving a Contractor. The risk definition was changed to remove limiting, causal language regard "non-adherence" to "policies, procedures, and programs, or by external factors".

<sup>7</sup> D.24-05-064, RDF Row 9 states that risks to be included in the RAMP Report, at minimum, are those identified in the Company's ERR comprising "the top 40% of ERR risks with a Safety Risk Value greater than zero dollars".

<sup>8</sup> D.24-05-064, RDF Row 15.

**Figure 1**  
**Contractor Safety: Risk Bow Tie**



### C. Potential Risk Event Drivers/Triggers<sup>9</sup>

When performing a risk assessment for the Contractor Safety Risk, SoCalGas identifies potential leading causes, referred to as Drivers or Triggers, that reflect current and/or forecasted conditions and may include both external actions as well as characteristics inherent to the risk.<sup>10</sup> These Bow Tie Drivers/Triggers inform the Likelihood of a Risk Event (LoRE) component of the risk value. These include:

- DT.1 – Deviation from policies or procedures or procedures not clear:**  
 SoCalGas maintains comprehensive, safety-related policies and procedures for contractors to follow, including a Safety Manual for Contractors. Failure to adhere to a SoCalGas safety policy or procedure or an unclear procedure could result in a safety-related event.

<sup>9</sup> An indication that a risk could occur. It does not reflect actual or threatened conditions.

<sup>10</sup> D.24-05-064, RDF Row 10-11.

- **DT.2 – Hazards in the work environment or within the pipeline system:** Unsafe work environments, including work locations, roadways and parking places, customer premises, gas equipment condition, lead from paint, asbestos, or fumigation chemicals, for example, can lead to a safety-related event. Also, factors such as heat, night work, and high-risk work locations (*e.g.*, busy roadways), may make working conditions more difficult and could increase the likelihood of a safety-related event.
- **DT.3 – Inadequate oversight, coaching and/or engagement:** Inadequate oversight, coaching, and/or engagement could lead to departures from safe work practices that could result in a safety-related event. Contractors are required to provide appropriate supervision in addition to SoCalGas oversight.
- **DT.4 – Contractor fatigue:** Contractors working excessive hours may create unsafe work environments by reducing the level of awareness to hazards or ability to perform work effectively, which could lead to a safety-related event.
- **DT.5 – Ineffective and/or outdated training or Operator Qualification:** Ineffective and/or outdated training or operator qualifications (“Op-qual”), or inexperience could result in a contractor performing work without appropriate knowledge, competency, training, and or qualification, which could result in a safety-related event.
- **DT.6 – Effective corrective actions are not instituted following an incident to prevent a reoccurrence:** Lessons learned, and the appropriate follow-up actions or training, can help prevent future safety events from occurring. The failure to report near misses or share lessons learned and implement corrective actions following an event could lead to the recurrence of safety-related events.
- **DT.7 – Inadequate utility and/or substructure location information:** Proper information about the assets, systems, or infrastructure that are part of the SoCalGas facilities they are contracted to work on and the auxiliary substructures in the vicinity of their work activities is important for contractor safety. Inadequate or inaccurate utility and/or substructure information could lead to a safety-related event.



- **DT.8 – Unsafe operations of equipment or motor vehicles:** Non-adherence to motor vehicle laws or not utilizing equipment according to safety standards could lead to a safety-related event.
- **DT.9 – Drug/alcohol use or deviation from drug/alcohol prevention policy:** Medication/drug/alcohol use while on the job can impede the ability of contractors to perform work safely, which could lead to a safety-related event.
- **DT.10 – Workplace violence threats or incidents:** Workplace violence incidents (*e.g.*, an active shooter, hostile customers) could increase the likelihood of a safety-related event.
- **DT.11 – Execution Constraints:** Events (excluding those covered by outside force damages) that negatively impact SoCalGas’s ability to perform as anticipated, such as ineffective materials, permitting constraints, or operational oversight, delays in response or awareness, resource constraints, and/or inefficiencies or reallocation of (human and material) resources, or unexpected maintenance need could increase the likelihood of a safety-related event.
- **DT.12 – Non- or improper use of personal protective equipment (PPE):** Safety equipment serves to protect employees and contractors from avoidable injuries. Failure to wear personal protection and safety equipment could lead to a safety-related event

#### **D. Potential Consequences of Risk Event (CoRE)**

Potential Consequences are listed to the right side of the risk Bow Tie. SoCalGas identifies the Potential Consequences of this risk by analyzing internal data sources, where available, industry data,<sup>11</sup> and subject matter expertise (SME).<sup>12</sup> These Bow Tie Consequences inform the CoRE component of the risk value. If one or more of the Drivers listed above were to

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<sup>11</sup> Industry data includes data from SoCalGas’ annual Safety Performance Metrics Report (SPMR) and Centers for Disease Control and Prevention (CDC), *Web-based Injury Statistics Query and Reporting System (WISQARS) Cost of Injury*, available at: <https://wisqars.cdc.gov/cost/?y=2023&o=MORT&i=0&m=20810&g=00&s=0&u=TOTAL&u=AVG&t=COMBO&t=MED&t=VPSL&a=5Yr&g1=0&g2=199&a1=0&a2=199&r1=MECH&r2=INTENT&r3=NONE&r4=NONE>.

<sup>12</sup> D.24-05-064, RDF Row 10.

result in an incident, the Potential Consequences, in a plausible worst-case scenario, could include:

- **PC.1 – Minor and serious injuries/illness or fatalities**
- **PC.2 - Property damage**
- **PC.3 - Adverse litigation**
- **PC.4 - Customer claims and financial losses**
- **PC.5 - Erosion of public confidence**
- **PC.6 - Operational and reliability impacts**
- **PC.7 - Additional regulations and compliance safety inspections**
- **PC.8 - Penalties and fines**

These Potential Consequences were used by SoCalGas in the scoring of the Contractor Safety Risk during the development of its 2024 ERR.

#### **E. Evolution of Risk Drivers and Consequences**

As specified in the Phase 3 Decision,<sup>13</sup> the following changes to the previous ERR and/or the 2021 RAMP include:

##### **1. Changes to Drivers/Triggers of the Risk Bow Tie**

SoCalGas implemented several changes to the possible Drivers and Triggers to promote clarity and alignment. These changes include efforts to promote consistency and advance an aligned and integrated approach to personnel and occupational safety issues faced by people doing work for SoCalGas by aligning the possible Drivers and Triggers within the Contractor and Employee Safety Risks. In addition, SoCalGas clarified and added language to the Triggers, Drivers, and associated definitions to more clearly identify and explain the possible Driver/Trigger.

##### **2. Changes to Potential Consequences of the Risk Bow Tie**

- **PC.1 – Minor and serious injuries/illness or fatalities:** Revised to include minor injuries and illnesses.

#### **F. Summary of Tranches**

To determine groups of assets or systems with similar risk profiles, or Tranches, and in accordance with Row 14 of the RDF, SoCalGas applied the Homogeneous Tranching

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<sup>13</sup> D.24-05-064, RDF Row 8.

Methodology (HTM) as outlined in Chapter RAMP - 3: Risk Quantification Framework. As a result, the following classes, LoRE-CoRE pairs, and resulting number of Tranches were determined.<sup>14</sup>

**Table 1: Contractor Safety Risk  
Tranche Identification**

<b>Class</b>	<b>Number of LoRE-CoRE Pairs</b>	<b>Number of Resulting Tranches</b>
OSHA Recordables	2	2
Vehicle Incident	3	2
Workplace Violence	1	1
<b>TOTAL</b>	<b>6</b>	<b>5</b>

Attachment D illustrates the derivation of the Tranches, as shown in Table 1 above, in accordance with the HTM. The classes were identified by SoCalGas as logical groups of events that can lead to the Contractor Safety Risk. These classes also align risk treatments with event risk profiles reflective of SoCalGas’s operations. More detailed Tranche information, including risk quantification by LoRE-CoRE pair, Tranche names, and mitigation associations (*i.e.*, cost mapping and risk reduction) to Tranches, is provided in workpapers.

### **III. PRE-MITIGATION RISK VALUE**

In accordance with RDF Row 19, Table 2 below provides pre-mitigation risk values for the Contractor Safety Risk. Further details, including pre-mitigation risk values by Tranche, are provided in workpapers. Explanations of the risk quantification methodology and other higher-level assumptions are provided in Chapter RAMP-3: Risk Quantification Framework.

**Table 2: Contractor Safety Risk  
Monetized Risk Values  
(Direct, in 2024 \$millions)**

<b>LoRE</b>	<b>CoRE [Risk-Adjusted Attribute Values]</b>			<b>Total CoRE</b>	<b>Total Risk [LoRE x Total CoRE]</b>
	<b>Safety</b>	<b>Reliability</b>	<b>Financial</b>		
179.9	\$0.067	\$0.00	\$0.010	\$0.077	\$13.86

<sup>14</sup> Note, the Contractor Safety Risk, as a human-based safety risk, does not feature the natural segmentation characteristics that asset-based risks do, which limits the number of viable Tranches.

**A. Risk Value Methodology**

SoCalGas's risk modeling for the Contractor Safety Risk follows RDF guidance<sup>15</sup> for implementing a Cost Benefit Approach, as described below:

- 1. Cost Benefit Approach Principle 1 – Attribute Hierarchy (RDF Row 2):** The Contractor Safety Risk is quantified in a combined attribute hierarchy as shown in the table above, such that Safety, Reliability, and Financial are presented based on available, observable, and measurable data.
- 2. Cost Benefit Approach Principle 2 – Measured Observations (RDF Row 3):** The Contractor Safety Risk used observable and measurable data in the estimation of CoRE values. SoCalGas utilized internal incident data to represent natural units for contractor injuries. These injuries were classified as either Minor, Serious, or Unsurvivable and assigned the corresponding fractional VSL value.
- 3. Cost Benefit Approach Principle 3-Comparison (RDF Row 4):** The Contractor Safety Risk utilized proxy data from various sources including, but not limited to, the Federal Bureau of Investigation (for workplace violence), Bureau of Labor Statistics (to determine a proration of SoCalGas's employee base versus the national working population), the Centers for Disease Control and Prevention (to determine financial impacts associated with injuries), and National Safety Council (to estimate costs associated with motor vehicle incidents). Please refer to Attachment B for specific details regarding these sources.
- 4. Cost Benefit Approach Principle 4-Risk Assessment (RDF Row 5):** Data distributions were not applicable for the risk events modeled for the OSHA, Workplace Violence, and Vehicle Incident components of this risk. For those components, probabilities of future events were derived based on internal recorded data from past years, or supplemented with national data where applicable (to estimate likelihood of workplace violence incident).
- 5. Cost Benefit Approach Principle 5-Monetized Levels of Attributes (RDF Row 6):** In accordance with D.22-12-027 and D.24-05-064, RDF Row 6, SoCalGas used a California-adjusted Department of Transportation monetized

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<sup>15</sup> D.24-05-064, RDF Rows 2-7.

equivalent to calculate the Safety CoRE attribute of \$16.2 million per fatality, \$49 thousand per minor injury, and \$4.1 million per serious injury;<sup>16</sup> and the Financial CoRE attribute is valued at \$1 per dollar.<sup>17</sup> Reliability is quantified at \$0 due to the lack of empirical and proxy data supporting these Consequences occurring from Contractor Safety incidents.

Further information regarding SoCalGas’s quantitative risk analyses, including raw data, calculations, and technical references, are provided in workpapers.

**6. Cost Benefit Approach Principle 6-Adjusted Attribute Level (RDF Row 7):**

**Table 3: Contractor Safety Risk  
Scaled vs Unscaled Value by CoRE Attributes  
(Direct, in 2024 \$ millions)**

	<b>Safety</b>	<b>Reliability</b>	<b>Financial</b>	<b>Total</b>
Unscaled Risk Value	\$10.96	\$0	\$1.76	\$12.73
Scaled Risk Value	\$12.10	\$0	\$1.77	\$13.86

The values in the table above are the result of SoCalGas applying the risk scaling methodology described in Chapter RAMP-3 to the CoRE attributes for the Contractor Safety Risk. The Contractor Safety Risk does not feature a significant risk aversion scaling impact because a relatively small proportion of the observed events rise to the level at which scaling is applicable, and the magnitudes of the consequences are not as high (*e.g.*, multiple-fatality event) as can occur with other risks.

Further information regarding the risk scaling function, including the risk scaling factor and the loss threshold at which the risk scaling factor begins to apply, is provided in Chapter RAMP-3.

**IV. 2024-2031 CONTROL & MITIGATION PLAN**

This section identifies and describes the controls and mitigations comprising the portfolio of mitigations for the Contractor Safety Risk and reflects changes expected to occur from the last year of recorded costs at the time of filing this RAMP Report (2024) through the 2028 GRC

<sup>16</sup> D.22-12-027 at 35 (“We adopt Staff’s recommendation to require a dollar valuation of the Safety Attribute in the Cost-Benefit Approach in the RDF using the DOT VSL as the standard value.”).

<sup>17</sup> See Chapter RAMP-3: Risk Quantification Framework, Section II.

cycle (2031). For clarity, a current activity that is included in the plan may be referred to as either a control and/or a mitigation. Table 4 below shows which control activities are in place in 2024 and which are expected to be on-going, completed, or new during the 2025-2031 time periods. Because the TY 2024 GRC proceeding established rates through 2027,<sup>18</sup> information through 2027 is calculated as part of the baseline risk, in accordance with D.21-11-009.<sup>19</sup> For the TY 2028 GRC, SoCalGas calculated CBRs beginning with TY 2028 and for each Post-Test Year (PTY) (2029, 2030, and 2031).<sup>20</sup>

**Table 4: Contractor Safety Risk  
2024-2031 Control and Mitigation Plan Summary**

<b>ID</b>	<b>Control/Mitigation Description</b>	<b>2024 Control</b>	<b>2025-2031 Plan</b>
C349	<b>Contractor Safety Program</b>	X	Ongoing

***Bold indicates this control/mitigation includes mandated programs/activities.***

#### **A. Control Programs**

In accordance with Commission guidance, this section “[d]escribe[s] the controls or mitigations currently in place”<sup>21</sup> (*i.e.*, activities in this section were in place as of December 31, 2024). Controls that will continue as part of the risk mitigation plan are identified in Table 4 above.

- **C349: Contractor Safety Program:** The Contractor Safety Program is comprised of activities managed by the Safety and Infrastructure Project Delivery organizations. These activities include Contractor Safety Management, Contractor Performance Management, and Contractor Engagement.

##### **1. Contractor Safety Management**

SoCalGas’s Contractor Safety Management includes oversight of the following:

- Pre-qualification of contractors;

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<sup>18</sup> See D.24-12-074.

<sup>19</sup> D.21-11-009 at 136 (Conclusion of Law (COL) 7) (providing a definition for “baselines” and “baseline risk”).

<sup>20</sup> In the TY 2028 GRC, the last year of recorded costs, or base year, will be 2025. SoCalGas and SDG&E will forecast information for 2026 through 2031, in accordance with the Rate Case Plan.

<sup>21</sup> D.18-12-014 at 33.

- Internal contractor safety standard;<sup>22</sup>
- Contractor Safety Manual for Class 1 Contractors;<sup>23</sup>
- Stop-the-Job, Near-Miss, and Good Catch reporting;
- Internal awareness and coordination; and
- Third-party audits.

The purpose of these contractor management activities is to enhance the safety of contractors. These activities also enhance the safety of employees and the public on SoCalGas construction projects from inception to completion. Among other things, the Contractor Safety Manual provides Class 1 contractors with a comprehensive overview of SoCalGas's requirements and expectations for performing work safely on behalf of SoCalGas.

As noted above, SoCalGas Contractor Safety Management also includes Stop-the-Job, Near Miss and Good Catch reporting. SoCalGas requires all of its Class 1 contractors to develop and implement a Stop-the-Job policy on SoCalGas projects. Stop the Job is a critical process and gives authority to everyone onsite to stop a job or task if an unsafe work condition, behavior, or activity is identified. All work must immediately cease in the area of concern once the Stop-the-Job is declared until SoCalGas site supervision and the involved contractor(s) have done an investigation, the identified situation is abated, controlled, or otherwise determined to be safe, and the situation and outcome are explained to affected personnel. SoCalGas also encourages its contractors to report Near Miss and Good Catch incidents so that everyone can learn from these incidents and prevent injuries and/or reduce/eliminate safety risks on the job and risks to the pipeline delivery system. Contractors submit these incidents using the Near Miss/Good Catch form in ISNetworld® as described below. These incidents are shared with contractors so that SoCalGas and contractors can learn from one another.

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<sup>22</sup> The internal contractor safety standard applies to SoCalGas employees and third-party agents of SoCalGas who oversee Class 1 contractors and Class 1 subcontractors. The standard establishes the standard, scope, and approach used by SoCalGas to manage contractor safety, requirements for pre-qualification of contractors, roles and responsibilities for various employees who work with contractors, and expectations on contractor oversight, periodic safety inspections, and investigations of contractor safety incidents.

<sup>23</sup> The Contractor Safety Manual for Class 1 Contractors is a consolidated document of safety requirements and expectations SoCalGas has established for contractors working for SoCalGas.

Additionally, SoCalGas utilizes two third-party tools to manage various aspects of its contractor safety. The following third-party tools enable SoCalGas to monitor contractor activities:

**ISNetworld®:** The purpose of the ISNetworld® platform (created and managed by ISN) is to pre-qualify, vet, and monitor Class 1 contractors for safety. ISNetworld® is an online contractor and supplier management platform of data-driven products and services that help manage risk through data collected across contractors' operations nationally. ISNetworld® helps reduce unnecessary duplication associated with traditional qualification processes. It streamlines the contractor pre-qualification process and is intended to improve workplace safety. Each Class 1 contractor currently performing or seeking to perform work for SoCalGas must have an ISN account. Before performing any work for SoCalGas, Class 1 contractors must upload the information specified in the SoCalGas Pre-Qualification Criteria to ISN. ISN's Review and Verification Services (RAVS) Team reviews self-reported information against regulatory requirements. ISN safety experts also review Contractor Safety compliance programs and validate accuracy and completeness. ISN uses a "Compliant," "Conditional," and "Non-Compliant" grading system to measure contractors' safety performance against criteria established by SoCalGas. Contractors who receive a "Compliant" grade and continue to maintain a "Compliant" grade, are deemed qualified and are approved to work for SoCalGas. Contractors who receive a "Conditional" or "Non-Compliant" grade, and those whose grade changes from a "Compliant" to "Conditional" or "Non-Compliant," must be approved through SoCalGas's Variance Request Process. Variances are approved at the director and officer levels. This process promotes the use of safe contractors by SoCalGas to reduce the risk of safety incidents on SoCalGas projects.

**Veriforce®:** SoCalGas utilizes Veriforce® to centrally track records for covered task qualifications, along with related certifications and training. SoCalGas also utilizes Veriforce® to monitor contractors' compliance with the Pipeline and Hazardous Materials Safety Administration/Department of Transportation (PHMSA/DOT) Drug and Alcohol (D&A) program requirements. Veriforce® delivers a comprehensive platform for D&A compliance, combining software with audit services to help streamline management of



the contractor D&A compliance program and drive improvements that mitigate contractor risk. The Veriforce® platform is a comprehensive solution for DOT/PHMSA Operator Qualification (OQ) Rule compliance for Class 1 contractors who work on safety sensitive tasks.

As part of Contractor Safety Management, additional resources are needed to support SoCalGas's Environmental Services, Facilities, Gas Distribution, Storage, and Transmission departments in their programs and projects that utilize Class 1 contractors, as described below. Each department within SoCalGas has the responsibility of monitoring its contractors for safe work performance. These departments rely on the Contractor Safety Program to provide them with guidance and support, and the team plans to increase opportunities for training and education, to further support these business departments in their contractor safety responsibility. The addition of personnel to the Contractor Safety Management team could improve contractor oversight of compliance with policies, standards, and procedures for the approximate 550 Class 1 contractors performing work for the various SoCalGas departments. Additional resources could assist with the following activities:

- Educate department personnel working and managing contractors on how to vet and monitor contractors on ISNetworld®.
- Coach personnel in these departments on how to perform job safety observations thoroughly and regularly with the appropriate follow-up.
- Assist departments in evaluating contractor safety-related events for timely evaluation, resolution, and sharing of any best practices.
- Encourage and analyze Near Miss and Good Catch data submitted by contractors for these departments.
- Oversee contractor safety incident investigations, and share corrective actions and lessons learned from incidents within SoCalGas and other contractors to minimize the likelihood of similar incidents.
- Provide support and guidelines for conducting regular meetings with contractor executive leadership to review safety performance and safety management plans.
- Facilitate meetings to communicate program requirements, and provide a forum for contractors to share questions, concerns, and/or ideas regarding contractor safety to aid in assessing the effectiveness and potential deficiencies of

SoCalGas's contractor safety program and support consistent application and compliance with its contractor safety processes and procedures by all Class 1 contractors.

- Support engagement efforts with Class 1 contractors performing work across various business units.

## **2. Contractor Performance Management**

SoCalGas conducts documented jobsite inspections of pipeline construction contractors working at a facility, property, or worksite owned, operated, or managed by SoCalGas (including leased premises and rights-of-ways) at a frequency of twice per week per contractor. The following inspections are conducted as part of SoCalGas's Contractor Performance Management:

- When there are multiple crews for a specific contractor working on similar projects, one inspection per contractor per week meets this requirement. The Construction Inspection Report, Company Form 2848, built in ISNetworld®, is used for documenting such inspections.
- SoCalGas conducts weekly documented jobsite safety observations of each contractor working at a facility, property, or worksite owned, operated, or managed by SoCalGas. Company Form 4211, built in ISNetworld®, is used to document these safety observations.
- SoCalGas also tracks completion of a post-job safety evaluation of Class 1 contractors at the completion of every project or annually, whichever is earlier, including a final evaluation at the end of the term for Master Services Agreements and multi-year contracts. Company Form Number 6350, Report of Contractor's Performance, built in ISNetworld®, is used to appraise and document the annual or post-project safety performance of contractors performing work for SoCalGas.
- Finally, certain large projects have dedicated, full-time, on-site safety personnel provided by SoCalGas as well as the contractor(s) to oversee the safety of the

project throughout its implementation and completion (*e.g.*, Honor Rancho Compressor Station modernization project).<sup>24</sup>

These inspections, evaluations, and on-site monitoring provide important oversight and valuable feedback on contractors' overall safety performance on SoCalGas projects.

Contractor safety and performance is also furthered by SoCalGas's requirement that all new and existing contracts and Master Service Agreements between SoCalGas and a primary contractor include Contractor Safety Program related requirements such as following the Class 1 Contractor Safety Manual, as part of the contract terms and conditions. Moreover, contractors are made aware of the Class 1 contractor safety requirements during the Request for Proposal (RFP) bid process. Additionally, SoCalGas utilizes mechanisms to monitor and evaluate safety requirements for Class 1 contractors, including conducting formal safety audits, requiring contractors to conduct their own evaluations, submission of their Safety Management System (SMS)<sup>25</sup> plans, and imposing corrective actions in response to safety issues identified through oversight activities. SoCalGas has implemented a Contractor Performance Response Team (CPRT) to address enforcement actions when contractors are found to not meet SoCalGas's safety standards. The intention of the CPRT is to inform and receive input from stakeholders who use a particular contractor for awareness and consistency in applying enforcement actions. For example, if SoCalGas observes a safety-related event associated with a Class 1 contractor, SoCalGas may utilize several measures to address the risk of a potential serious injury or fatality. This includes stopping the job, putting the contractor on probation, conducting an audit of its safety program, asking the contractor to evaluate its safety culture, and following up on all the corrective actions resulting from this effort to emphasize the importance of safety on SoCalGas projects.

When safety-related incidents with contractors result in a contractor suspension, SoCalGas may request that a safety culture evaluation by a third-party vendor specializing in safety analysis be conducted. SoCalGas would then require results to be shared, and

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<sup>24</sup> For the purposes of this RAMP Report, SoCalGas only includes the O&M portion of the Contractor Safety Program. The Contractor Safety Program includes contractor safety oversight, performance management, and engagement efforts related to large capital projects, but those costs are captured as part of those capital project forecasts.

<sup>25</sup> Refer to API RP 1173, *see* API, *Pipeline Safety Management Systems* (July 2015), available at: <https://pipelinesms.org/rp-1173/>.

improvements to be completed for the contractor to be cleared to continue to work for SoCalGas. The results of these outside assessments help contractors gain awareness of potential gaps and areas of improvement in their internal operations, including the facilitation of systematic advances of safety processes, and development of their own internal comprehensive safety management systems.

Further, when new multi-year contracts are issued, contractors are required to perform a safety culture assessment at their expense. The benefits of this requirement has led SoCalGas to requiring all contractors with multi-year contracts to arrange and pay for these assessments at the onset and mid-point of their contracts, further supporting contractor commitment to continuous safety improvement.

SoCalGas's Contractor Performance Management team also expects to expand Advisor roles in the following areas:

- Provide safety subject matter expertise. This includes maintaining safety policy documentation, and supervising contractor full-time on-site safety personnel and performing routine onsite inspections. Contractor Performance Management is engaged early in the planning process to advance compliance with occupational health and safety regulations throughout the duration of a project to align their safety programs and processes with the Contractor Safety Manual.
- Improve high-pressure contractor risk assessment, oversight, and support to other departments utilizing contractors performing these tasks. Currently, Contractor Performance Management supports Construction Operations, Transmission Technical Services, Pipeline Integrity, CNG/LNG projects and has recently expanded support to Storage, High-Pressure Construction Distribution, and Control Center Modernization.

### **3. Contractor Engagement**

SoCalGas aims to reinforce its strong safety culture by engaging contractors in a variety of ways, including hosting an annual Contractor Safety Congress for all Class 1 contractors and three Quarterly Meetings for Class 1 pipeline construction contractors.

SoCalGas's annual Contractor Safety Congress was initiated in 2015 to share safety best practices and learn from one another's experiences. The event is expected to continue to further strengthen SoCalGas and contractors' collective safety culture and provide a foundation for

safety improvement. Attendees include representatives from a wide variety of contractors, including diverse business enterprises, and select representatives from SoCalGas who oversee contractors. The forum provides an opportunity for SoCalGas executives and others to share their safety vision and expectations with contractors and offers an opportunity for contractors to showcase their safety successes and challenges, as well as share safety incidents and lessons learned so others can benefit from their experience and improve their own safety performance.

The Quarterly Meetings focus on approved pipeline construction contractors who perform the vast majority of pipeline construction work for the Company. These meetings are established as a focused forum to give pipeline construction contractors the opportunity to collaborate with SoCalGas on safety, share issues and challenges faced by contractors on SoCalGas projects, communicate new requirements, and foster the safety culture for contractors and the Company.

**B. Changes from 2024 Controls**

SoCalGas plans to continue each of the existing controls discussed above, and reflected in Table 4, through the 2025-2031 period without any significant changes.

**C. Mitigation Programs**

Because the controls above are ongoing, SoCalGas considers them mitigations to the Contractor Safety Risk. SoCalGas does not currently foresee implementing new mitigations not described above during the 2025-2031 period.

**D. Climate Change Adaptation**

Pursuant to Commission decisions<sup>26</sup> in the Climate Adaptation OIR (R.18-04-019), SoCalGas performed a Climate Adaptation Vulnerability Assessment (CAVA) focused on years 2030, 2050, and 2070, with the aim of identifying asset and operational vulnerabilities to climate hazards across the SoCalGas system. SoCalGas recognizes the need to address climate vulnerabilities to promote safety and reliability of its services and mitigate the increasing climate-related hazards through innovative and community-centric approaches. Some of the climate hazards that will have short- and long-term ramifications in the Southern California region include extreme temperatures, wildfire, inland flooding, coastal flooding and erosion, and landslides. Climate change is recognized as a factor that can drive, trigger, or exacerbate

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<sup>26</sup> D.19-10-054; D.20-08-046.

multiple RAMP risks. Implementing climate change adaptation measures and integrating climate vulnerability considerations into RAMP controls and mitigations can enhance system infrastructure longevity and reduce the severity of long-term negative climate impacts. The controls and mitigations described in further detail in this chapter, as shown below, align with the goal of increasing SoCalGas’s physical and operational resilience to the increasing frequency and intensity of climate hazards. Additional information on the CAVA and a list of climate-relevant controls and mitigations included in RAMP are provided in Chapter RAMP-5: Climate Change Adaptation.

**Table 5: Contractor Safety Risk  
Controls and Mitigations that Align with Increasing Resilience to Climate Hazards**

<b>Relevant ID</b>	<b>Relevant Control/Mitigation</b>	<b>Potential Climate Hazard(s)</b>
C349	Contractor Safety Program	Extreme Temperatures

#### **E. Foundational Programs**

Foundational Programs are “[i]nitiatives that support or enable two or more Mitigation programs or two or more Risks but do not directly reduce the Consequences or reduce the Likelihood of safety Risk Events.”<sup>27</sup> There are no Foundational Programs that are applicable to the Contractor Safety Risk and the mitigation activities that are supported.

#### **F. Estimates of Costs, Units, and Cost-Benefit Ratios (CBRs)**

The tables in this section provide a quantitative summary of the risk control and mitigation plan for Contractor Safety Risk, including the associated costs, units, and CBRs. Additional information by Tranche is provided in workpapers. The costs shown are estimated using assumptions provided by SMEs and available data. In compliance with the Phase 3 Decision,<sup>28</sup> for each enterprise risk, SoCalGas uses actual results and industry data and when that is not available, supplements the data with SME input. Additional details regarding the data and expertise relied upon in developing these estimates are provided in Attachment B.

<sup>27</sup> D.24-05-064, Appendix A at A-4.

<sup>28</sup> D.24-05-064, RDF Row 10.

**Table 6: Contractor Safety Risk  
Control and Mitigation Plan Recorded and Forecast Costs Summary  
(Direct, in 2024 \$ thousands)**

Control/Mitigation		Adjusted Recorded		Forecast Costs			
ID	Name	2024 Capital	2024 O&M	2028 O&M	2025-2028 Capital	PTY Capital	PTY O&M
C349	<b>Contractor Safety Program</b>	0	839	1,516	0	0	4,500
<b>Total</b>		<b>0</b>	<b>839</b>	<b>1,516</b>	<b>0</b>	<b>0</b>	<b>4,500</b>

***Bold** indicates this control/mitigation includes mandated programs/activities.*

**Table 7: Contractor Safety Risk  
Control & Mitigation Plan – Units Summary**

Control/Mitigation		Recorded Units			Forecast Units			
ID	Name	Unit of Measure	2024 Capital	2024 O&M	2028 O&M	Capital 2025-2028	PTY Capital	PTY O&M
C349	<b>Contractor Safety Program</b>	FTEs	0	5	10	0	0	30

***Bold** indicates this control/mitigation includes mandated programs/activities.*

In the table below, CBRs are presented in summary at the mitigation or control level for the TY 2028 GRC cycle. CBRs are calculated based on scaled, expected values, unless otherwise noted, and are calculated for each of the three required discount rates<sup>29</sup> in each year of the GRC cycle and for the post-test years in aggregate (2029-2031). Costs and CBRs for each year of the GRC cycle and the aggregated years are provided in workpapers.

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<sup>29</sup> See Chapter RAMP-3 for definitions of discount rates, as ordered in the Phase 3 Decision.

**Table 8: Contractor Safety Risk  
Cost Benefit Ratio Results Summary (2028-2031)  
(Direct, in 2024 \$ millions)**

<b>ID</b>	<b>Control/Mitigation Name</b>	<b>Capital (2028 – 2031)</b>	<b>O&amp;M (2028 – 2031)</b>	<b>CBR (Societal)</b>	<b>CBR (Hybrid)</b>	<b>CBR (WACC)</b>
C349	<b>Contractor Safety Program</b>	\$0	\$6.0	1.69	1.80	1.69

***Bold** indicates this control/mitigation includes mandated programs/activities.*

Tranche-level CBRs by year and in aggregate for each mitigation are provided in workpapers.

## **V. ALTERNATIVE MITIGATIONS**

Pursuant to D.14-12-025, D.16-08-018 and D.18-12-014<sup>30</sup> SoCalGas considered two alternatives to the Risk Mitigation Plan for the Contractor Safety Risk. The alternatives analysis for this plan considered changes in risk reduction, cost, reasonableness, current conditions, modifications to the plan, and constraints, such as budget and resources.

**Table 9: Contractor Safety Risk  
Alternative Mitigation Forecast Costs Summary  
(Direct, in 2024 \$ thousands)**

	<b>Alternative Mitigation Name</b>	<b>Forecast Costs</b>			
		<b>2025-2028 Capital</b>	<b>PTY Capital</b>	<b>2025-2028 O&amp;M</b>	<b>PTY O&amp;M</b>
A397	Additional External Contractor Safety Oversight Advisors	0	0	8,316	6,225
A398	No Expansion of Contractor Safety Oversight	0	0	3,356	2,517
<b>Total</b>		<b>0</b>	<b>0</b>	<b>11,672</b>	<b>8,742</b>

<sup>30</sup> See, e.g., D.18-12-014 at 33-35.



**Table 10: Contractor Safety Risk  
Alternative Mitigation Cost Benefit Ratio Results Summary  
(Direct, in 2024 \$ thousands)**

<b>ID</b>	<b>Alternative Mitigation Name</b>	<b>Capital TY 2028</b>	<b>O&amp;M TY 2028</b>	<b>CBR (Societal)</b>	<b>CBR (Hybrid)</b>	<b>CBR (WACC)</b>
A397	Additional External Contractor Safety Oversight Advisors	\$0	\$2,075	1.24	1.32	1.24
A398	No Expansion of Contractor Safety Oversight	\$0	\$839	1.54	1.63	1.54

**A. Alternative A397: Additional External Contractor Safety Oversight Advisors<sup>31</sup>**

SoCalGas considered hiring additional SoCalGas employees and further expanding this capability by hiring third-party resources to observe and oversee the safety performance of SoCalGas’s contractors. SoCalGas considered this alternative because third party resources observing SoCalGas’s contractors could provide an outside perspective and assist in augmenting resource needs for emergent programs and/or projects. Accordingly, SoCalGas believes it is a better use of resources to add internal safety advisors as opposed to third-party resources to advance these important efforts. At this stage, investing in additional internal expertise and oversight is an important incremental next step for contractor safety management. This helps expand SoCalGas’s internal capabilities and builds SoCalGas’s internal capacity. In the future, SoCalGas plans to continue exploring and engaging more targeted expertise from external consultants.

**B. Alternative A398: No Expansion of Contractor Safety Oversight**

As part of analyzing the proposed expansions to contractor safety oversight, SoCalGas considered continuing with the existing resources of the Contractor Safety Program. This would mean that SoCalGas would not be engaging additional, centralized personnel to support SoCalGas’s Environmental Services, Facilities, Gas Distribution, Storage and Transmission departments in their programs and projects that utilize Class 1 contractors. This would reduce costs but would also limit SoCalGas’s ability to provide contractor oversight of compliance with

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<sup>31</sup> SoCalGas uses the terms “Contractor Safety Oversight Advisors”, “Safety Advisors”, and “Advisors” interchangeably in workpapers and herein.

standards and procedures, coach SoCalGas personnel on how job safety observations are conducted, evaluate contractor safety-related events, encourage and analyze contractor reporting and data, and support engagement activities.

Based on the analysis, the proposed change of further investing in dedicated full-time Advisors is reasonable to support consistent application and compliance with SoCalGas's contractor safety processes and procedures by all Class 1 contractors.

## VI. HISTORICAL GRAPHICS

As directed by the Commission in Phase 2 Decision, this section illustrates the accomplishments in safety work and the progress in mitigating safety risks over the two immediately preceding RAMP cycles. A bar chart graphic is employed to depict historical progress. This graphic uses a key metric that aligns with Company safety goals to illustrate trends in historical progress and identify remaining tasks necessary to continue mitigating risks.

**Figure 2:**  
**Contractor Safety: Safety Progress 2016-2024**

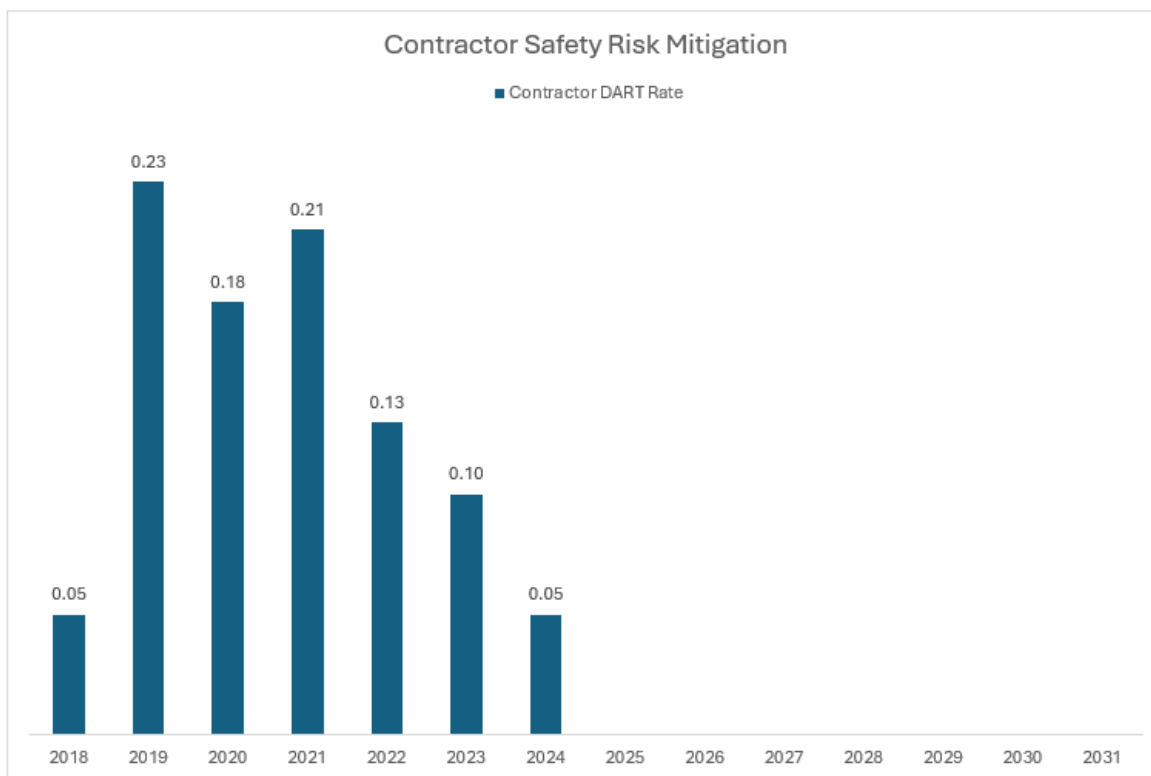


Figure 2 above shows the Contractor Days Away, Restricted and Transfer (DART) Rate<sup>32</sup> from 2016-2024. SoCalGas began tracking DART Rate for Class 1 Contractors in 2018. DART Rate is calculated based on the number of OSHA-recordable injuries resulting in Days Away from work and/or Days on Restricted Duty or Job Transfer, and hours worked. (DART Rate = DART Cases times 200,000 divided by contractor hours worked.) The historical safety work activities completed using the DART Rate from 2016-2024 include:

- 2017: Issued Contractor Safety Manual for Class 1 Contractors;
- 2018: Contractor Safety in Pipeline Construction Quarterly meetings; internal contractor safety standard published, contractor pre-qualification process in ISNetworld®; and close-call, near-miss, lessons learned program;
- 2019: Expanded Pre-qualification process to subcontractors;
- 2020: Contractor Safety Oversight adds focus on Construction Operations; and
- 2021: Field Safety Observations Form released expanding field audits of contractor; and Contractor Performance Response Policy created establishing the Contractor and Performance Response Team (CPRT).

The contractor safety oversight work that remains to be performed is addressed in the controls/mitigations detailed above.

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<sup>32</sup> Contractor DART Rate is Metric No. 19 in SoCalGas's 2024 Safety Performance Metrics Report, filed on April 1, 2025.

# **ATTACHMENTS**

## **ATTACHMENT A**

### **CONTRACTOR SAFETY - CONTROLS AND MITIGATIONS WITH REQUIRED COMPLIANCE DRIVERS**

The table below indicates the compliance Drivers which underpin identified controls and mitigations.

<b>ID</b>	<b>Control/Mitigation Name</b>	<b>Compliance Driver</b>
C349	Contractor Safety Program	OSHA, DOT / PHMSA, CalGEM

## ATTACHMENT B

### CONTRACTOR SAFETY – REFERENCE MATERIAL FOR QUANTITATIVE ANALYSES

The Phase 3 Decision at RDF Row 10 and Row 29 and Row 29 directs each utility to identify Potential Consequences of a Risk Event using available and appropriate data.<sup>33</sup>

Appropriate data may include Company specific data or industry data supplemented by the judgment of subject matter experts. Provided below is a listing of the inputs utilized as part of this assessment and a description of the data.

<b>Risk Data</b>	<b>Source Type</b>	<b>Source Information</b>
SoCalGas Contractor SIFs and non-SIFs	Internal Data	<u>Source:</u> ISNetworld® (ISN)  <u>Description:</u> Internal data used to determine likelihood of OSHA SIF and non-SIF event
Active Shooter Incidents in the United States 2023	External Data	<u>Agency:</u> Federal Bureau of Investigation (FBI)  <u>Link:</u> <a href="https://www.fbi.gov/file-repository/2023-active-shooter-report-062124.pdf/view">https://www.fbi.gov/file-repository/2023-active-shooter-report-062124.pdf/view</a>  <u>Description:</u> FBI national data is used to provide a larger sample size of workplace violence incidents to determine the likelihood of an incident
Injury and Illness Prevention Programs White Paper	External Data	<u>Agency:</u> Occupational Safety and Health Administration (OSHA)  <u>Link:</u> <a href="https://www.osha.gov/sites/default/files/OSHAwhite-paper-january2012sm.pdf">https://www.osha.gov/sites/default/files/OSHAwhite-paper-january2012sm.pdf</a>  <u>Description:</u> OSHA study was used to estimate effectiveness of implementing an injury and illness prevention program, noting a 15%-35% reduction in injuries compared to employers without a safety and health program.
SoCalGas Contractor TRIR and DART Rate	Internal Data	<u>Source:</u> ISNetworld® (ISN)  <u>Description:</u> Internal data used to estimate reduction in OSHA non-SIF, vehicle incident minor injury and no injury rates year over year

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<sup>33</sup> D.24-05-064, RDF Row 10 and Row 29.

<b>Risk Data</b>	<b>Source Type</b>	<b>Source Information</b>
Treatment of the Values of Life and Injury in Economic Analysis	External Data	<p><u>Agency</u>: Federal Aviation Administration (FAA)</p> <p><u>Link</u>: <a href="https://www.faa.gov/sites/faa.gov/files/regulations_policies/policy_guidance/benefit_cost/econ-value-section-2-tx-values.pdf">https://www.faa.gov/sites/faa.gov/files/regulations_policies/policy_guidance/benefit_cost/econ-value-section-2-tx-values.pdf</a></p> <p><u>Description</u>: Abbreviated Injury Scale (AIS) used to determine magnitude of Serious Injuries and Minor Injuries compared to Value of a Statistical Life (VSL)</p>
Work Injury Costs and Time Lost	External data	<p><u>Agency</u>: National Safety Council (NSC)</p> <p><u>Link</u>: <a href="https://injuryfacts.nsc.org/work/costs/work-injury-costs/">https://injuryfacts.nsc.org/work/costs/work-injury-costs/</a></p> <p><u>Description</u>: National data used estimate the financial impact of a potential work-related fatality</p>
Number of Injuries and Associated Costs	External data	<p><u>Agency</u>: Centers for Disease Control and Prevention (CDC)</p> <p><u>Link</u>: <a href="https://wisqars.cdc.gov/cost/">https://wisqars.cdc.gov/cost/</a></p> <p><u>Description</u>: National data used to estimate the financial impact of serious injuries and minor injuries</p>
Workplace Violence Risk and Mitigation Effectiveness	SME Input	Sempra Corporate Security forecasts the rise of potential Workplace Violence events based on national trends, as well as the expected effectiveness of selected risk mitigation activities in reducing the likelihood of these events.

**ATTACHMENT C**

**CONTRACTOR SAFETY - SUMMARY OF  
ELEMENTS OF BOW TIE**

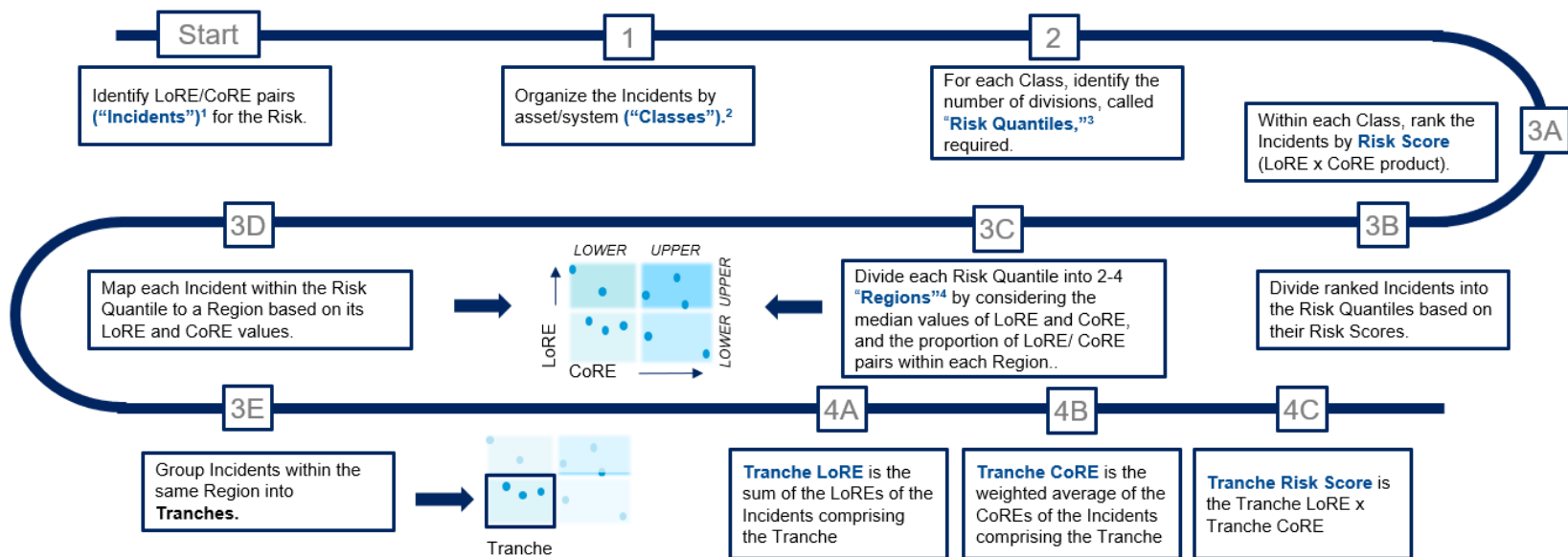
<b>SUMMARY OF ELEMENTS OF BOW TIE</b>			
<b>ID</b>	<b>Control/Mitigation Name</b>	<b>Drivers Addressed</b>	<b>Consequences Addressed</b>
C349	Contractor Safety Program	DT.1 – DT.12	PC.1 – PC.8



## ATTACHMENT D

### CONTRACTOR SAFETY - APPLICATION OF TRANCHING METHODOLOGY

A sample walkthrough of the Homogeneous Tranching Methodology (HTM) as outlined in Volume 1, Chapter RAMP - 3: Risk Quantification Framework is provided.



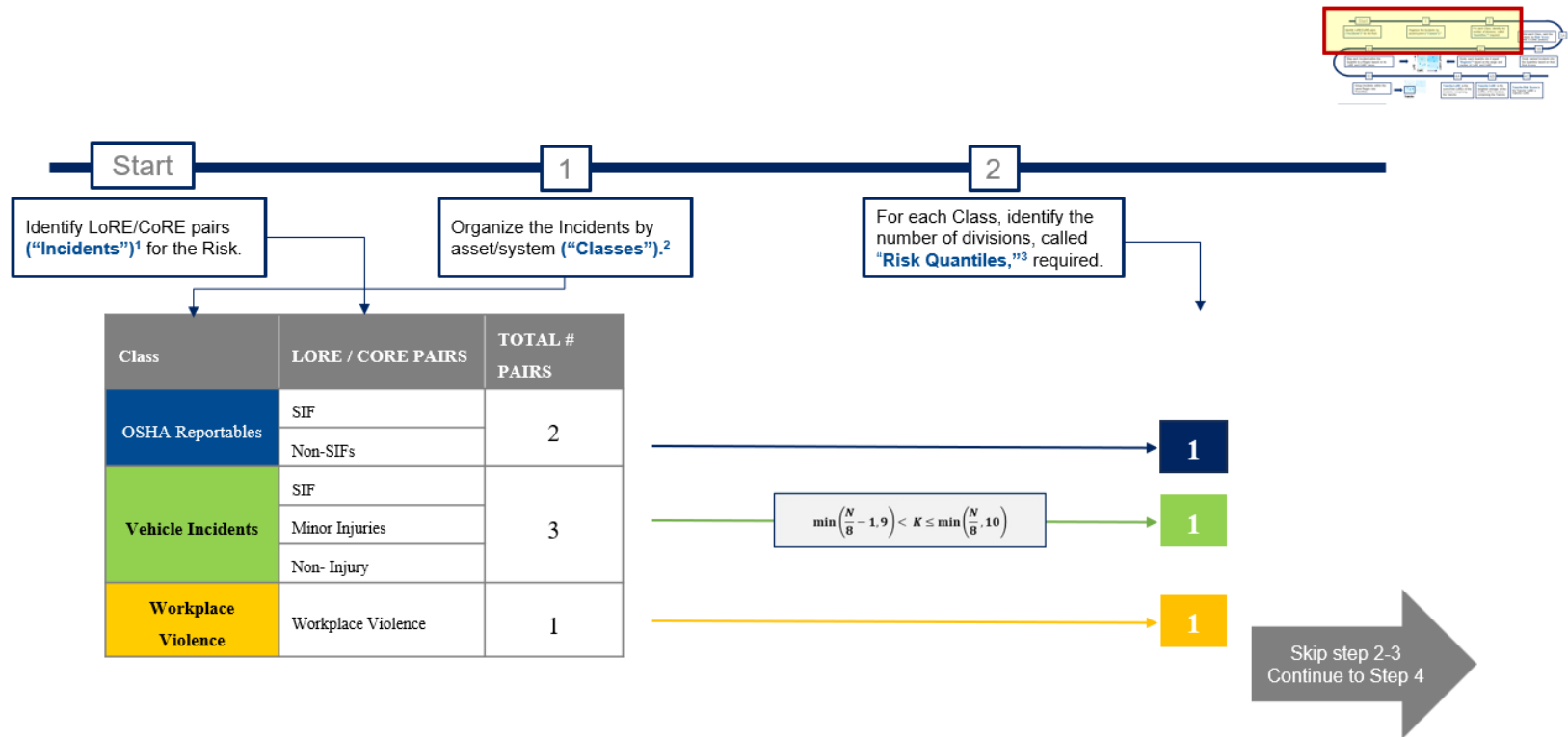
#### NOTES

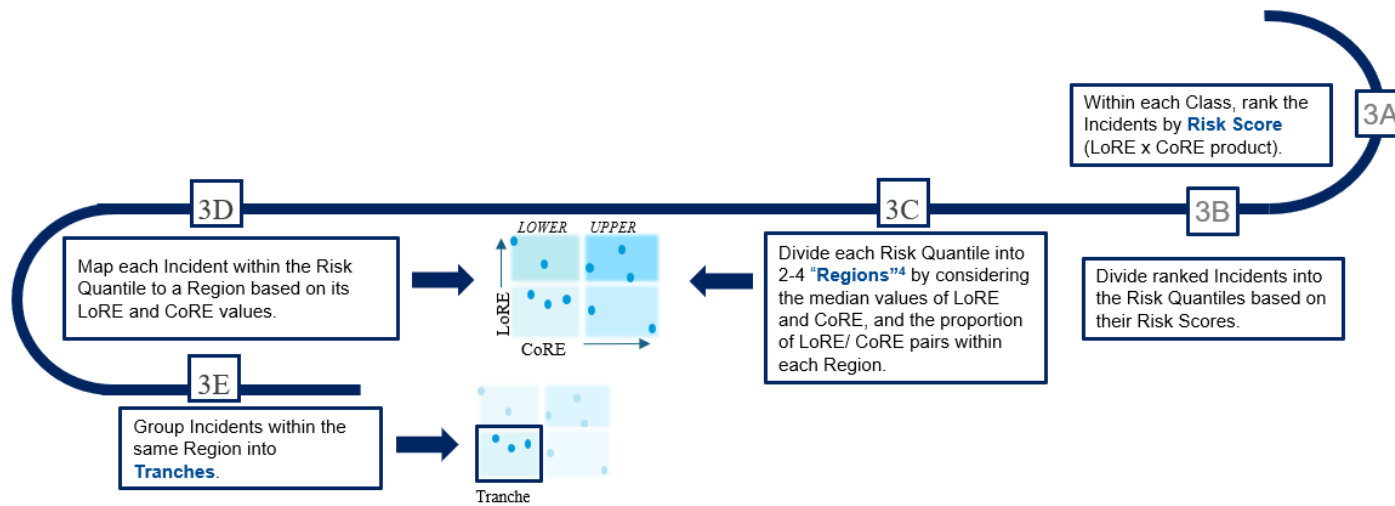
<sup>1</sup>For example, **Incidents (or "Risk Incidents")** for Contractor Safety refer to incidents which threaten a contractor's safety.

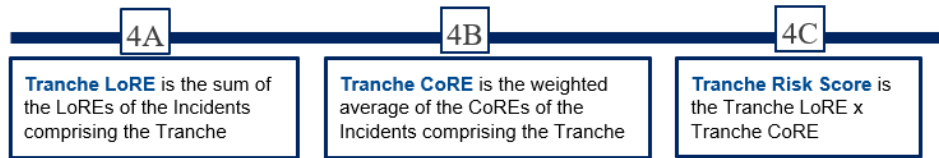
<sup>2</sup>For example, **Classes (or "Asset Classes")** for Contractor Safety include OSHA Reportables, Vehicle Incidents, and Workplace Violence.

<sup>3</sup>**Quantiles** are divisions of equal numbers of incidents (quartiles have 4 divisions, quintiles have 5, etc.) The number of incidents dictates the number of quantiles needed.

<sup>4</sup>The four **Regions** are: 1. Lower LoRE-Lower CoRE (LL-LC), 2. Lower LoRE-Upper CoRE (LL-UC), 3. Upper LoRE-Lower CoRE (UL-LC), and 4. Upper LoRE-Upper CoRE (UL-UC).







					4A	4B	4C
Class	Risk Quantile	Incident (LoRE/CoRE) Pair	Risk Quantile Region	Tranche	Tranche LoRE	Tranche CoRE	Tranche Risk Score
OSHA Reportables	1	SIF	LL / UC	OSHA Reportables-1	1.72	5,294,280	9,118,224
		Non-SIFs	UL / LC	OSHA Reportables-2	17.8	50,856	905,080
Vehicle Incidents	1	Minor Injuries / Non - Injury	UL / LC	Vehicle-1	160.2	7,942	1,272,354
		SIF	LL / UC	Vehicle-2	0.11	5,338,596	606,113
Workplace Violence	1	Cause- Employee	None	WPV-1	0.014	140,915,841	1,962,713