



**Risk Assessment Mitigation Phase
(Chapter SDG&E-2)
Contractor Safety**

November 27, 2019

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Risk: Contractor Safety

I. INTRODUCTION

The purpose of this chapter is to present the Risk Mitigation Plan for San Diego Gas & Electric Company's (SDG&E or Company) Contractor Safety risk. Each chapter in this Risk Assessment Mitigation Phase (RAMP) Report contains the information and analysis that meets the requirements adopted in Decision (D.) 16-08-018 and D.18-12-014 (and the Settlement Agreement included therein (SA Decision)).¹

SDG&E has identified and defined RAMP risks in accordance with the process described in further detail in Chapter RAMP-B of this report. On an annual basis, SDG&E's Enterprise Risk Management (ERM) organization facilitates the Enterprise Risk Registry (ERR) process, which influenced how risks were selected for inclusion in the 2019 RAMP Report, consistent with the SA Decision's directives.

The purpose of RAMP is not to request funding. Any funding requests will be made in SDG&E's General Rate Case (GRC). The costs presented in this 2019 RAMP Report are those costs for which SDG&E anticipates requesting recovery in its TY 2022 GRC. SDG&E's TY 2022 GRC presentation will integrate developed and updated funding requests from the 2019 RAMP Report, supported by witness testimony.² For this 2019 RAMP Report, the baseline costs are the costs incurred in 2018, as further discussed in Chapter RAMP-A. This 2019 RAMP Report presents capital costs as a sum of the years 2020, 2021 and 2022 as a three-year total; whereas, operations and Maintenance (O&M) costs are only presented for TY 2022.

Costs for each activity that directly addresses each risk are provided where those costs are available and within the scope of the analysis required in this RAMP Report. Throughout this 2019 RAMP Report, activities are delineated between controls and mitigations, consistent with the definitions adopted in the SA Decision's Revised Lexicon. A "Control" is defined as a

¹ D.16-08-018 also adopted the requirements previously set forth in D.14-12-025. D.18-12-014 adopted the Safety Model Assessment Proceeding (S-MAP) Settlement Agreement with modifications and contains the minimum required elements to be used by the utilities for risk and mitigation analysis in the RAMP and GRC.

² D.18-12-014 at Attachment A, A-14 ("Mitigation Strategy Presentation in the RAMP and GRC").



currently established measure that is modifying risk. A “Mitigation” is defined as a measure or activity proposed or in process designed to reduce the impact/consequences and/or likelihood/probability of an event. Activities presented in this chapter are representative of those that are primarily scoped to address SDG&E’s Contractor Safety risk; however, many of the activities presented herein also help mitigate other risk areas as outlined in Chapter RAMP-A.

As discussed in Chapter RAMP-D, Risk Spend Efficiency (RSE) Methodology, no RSE calculation is provided where costs are not available or not presented in this RAMP Report (including costs for activities that are outside of the GRC certain internal labor costs). Additionally, SDG&E did not perform RSE calculations on mandated activities. Mandated activities are defined as activities conducted in order to meet a mandate or law, such as a Code of Federal Regulation (CFR), Public Utilities Code statute, or General Order. Activities with no RSE score presented in this TY 2022 RAMP Report are identified in Section VII below.

SDG&E has also included a qualitative narrative discussion of certain risk mitigation activities that would otherwise fall outside of the RAMP Report’s requirements, to aid the California Public Utilities Commission (CPUC or Commission) and stakeholders in developing a more complete understanding of the breadth and quality of SDG&E’s mitigation activities. These distinctions are discussed in the applicable control/mitigation narratives in Section V. Similarly, a narrative discussion of certain “mitigation” activities and their associated costs is provided for certain activities and programs that may indirectly address the risk at issue, even though the scope of the risk as defined in the RAMP Report may technically exclude the mitigation activity from the RAMP analysis. This additional qualitative information is provided in the interest of full transparency and understandability, consistent with guidance from Commission staff and stakeholder discussions.

A. Risk Definition

For purposes of this RAMP Report, SDG&E’s Contractor Safety risk is defined “as the risk of a safety event, caused by a contractor or subcontractor not following safety standards and/or procedures, which results in serious injuries and/or fatalities while conducting work on behalf of the Company.”

B. Summary of Elements of the Risk Bow Tie

Pursuant to the SA Decision,³ for each control and mitigation presented herein, SDG&E has identified which element(s) of the Risk Bow Tie the mitigation addresses. Below is a summary of these elements.

Table 1: Summary of Risk Bow Tie Elements

ID	Description of Driver/Trigger and Potential Consequence
DT.1	Contractor crew deviation from policies/procedures
DT.2	Contractor and sub-contractor crew inexperience
DT.3	Lack of oversight of contractor work
DT.4	Inadequate contractor training/supervision
DT.5	Inadequate use of job site safety plans/job safety analysis
DT.6	Inadequate or inaccurate utility and/or substructure location information
DT.7	Unsafe operation of equipment or motor vehicle
DT.8	Contractor crew fatigue/complacency
DT.9	Contractor impairment due to environmental factors
PC.1	Serious injuries ⁴ and/or fatalities
PC.2	Property damage
PC.3	Additional compliance safety inspections
PC.4	Operational and reliability impacts
PC.5	Adverse litigation
PC.6	Penalties and fines
PC.7	Erosion of public confidence

³ D.18-12-014 at Attachment A, A-14 (“Mitigation Strategy Presentation in the RAMP and GRC”).

⁴ A “serious injury” is defined in the California Code of Regulations as “any injury or illness occurring in a place of employment or in connection with any employment which 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, but does not include any injury or illness or death caused by the commission of a Penal Code violation, except the violation of Section 385 of the Penal Code, or an accident on a public street or highway.” 8 California Code of Regulations (CCR) § 330(h).

C. Summary of Risk Mitigation Plan

Pursuant to the SA Decision,⁵ SDG&E has performed a detailed pre- and post-mitigation analysis of controls and mitigations for each risk selected for inclusion in RAMP, as further described below. SDG&E’s baseline controls for this risk consist of the following programs/activities:

Table 2: Summary of Controls

Control ID	Control/Mitigation Name
SDG&E-2-C1	Contractor Safety Oversight Program
SDG&E-2-C2	Contractual Requirements
SDG&E-2-C3	Third-Party Administration and Tools
SDG&E-2-C4	Stop the Job
SDG&E-2-C5	Near Miss/Close Call Reporting Program
SDG&E-2-C6	Contractor Safety Summit and Quarterly Safety Meetings

SDG&E will continue the baseline controls identified above and describes additional projects and/or programs (*i.e.*, mitigations) as follows:

Table 3: Summary of Mitigations

Mitigation ID	Mitigation Name
SDG&E-2-M1	Expanded Contractor Oversight Program
SDG&E-2-M2	Updated Class 1 Contractor Safety Manual, Development of Class 2 Contractor Safety Manual
SDG&E-2-M3	Near Miss/Close Call Reporting Portal/App All contractor safety data from ISN and predictive solutions rolled up into real-time dashboard

⁵ D.18-12-014 at Attachment A, A-11 (“Definition of Risk Events and Tranches”).



Finally, pursuant to the SA Decision,⁶ SDG&E presents considered alternatives to the Risk Mitigation Plan for the Contractor Safety risk and summarizes the reasons that the alternatives were not incorporated in the Risk Mitigation Plan in Section VIII.

II. RISK OVERVIEW

The Contractor Safety risk was included in SDG&E's 2018 ERR and, for purposes of this RAMP filing, is defined as the risk of a safety event, caused by a contractor or subcontractor not following safety standards and/or procedures, which results in serious injuries and/or fatalities while conducting work on behalf of the Company. While 2018 is used as the base year for mitigation planning presented in the RAMP, risk management has been occurring, successfully, for many years within the Company and is continuously evolving. SDG&E takes compliance and managing risks seriously, as evidenced by the many actions taken to mitigate each risk. The baseline mitigations are determined based on the relative expenditures during 2018; however, SDG&E does not currently track expenditures in this way, so the baseline amounts reflect the best effort of each utility to benchmark both capital and O&M costs during a year.

The Commission has ordered that RAMP be focused on safety-related risks and mitigating those risks.⁷ For many risks, safety and reliability are inherently related and cannot be separated, and the mitigations reflect that fact. Compliance with laws and regulations is also inherently tied to safety and SDG&E takes those activities very seriously. In all cases, the 2018 baseline mitigations include activities and amounts necessary to comply with the laws in place at that time. Laws can rapidly evolve, however, and if new laws have been passed since September 2018 the RAMP baseline has not taken these into account.

As noted above, the purpose of RAMP is not to request funding. Any funding requests will be made in the TY 2022 GRC. The forecasts for mitigation are therefore not for funding purposes but are rather to provide an anticipated range of costs for the future GRC filing. This range will be refined with supporting testimony in the GRC.

⁶ *Id.* at p. 33.

⁷ D.16-08-018.

Not included in the Contractor Safety risk is the inadvertent contact of intact, energized SDG&E equipment potentially causing serious injury or fatality. While the consequences of this risk event could fall under the risk definition for this chapter, the risk event is captured in the Electric Infrastructure Integrity chapter (SDG&E-4). Additionally, excluded from the Contractor Safety risk is the risk of potential injuries or fatalities associated with medium-pressure or high-pressure natural gas pipelines. While the consequences of this risk event could fall under the risk definition for this chapter, the risk event is captured in the Medium-Pressure Gas Pipeline Chapter (SDG&E-6) and the High-Pressure Pipeline Incident (SDG&E-8) chapters of this report. The Contractor Safety risk chapter focuses on mitigations that address safety, education, training, oversight, and other internal procedural enhancements, whereas SDG&E's Electric Infrastructure Integrity and High-Pressure and Medium-Pressure Pipeline Incident chapters focus on infrastructure improvements, and thus those risk events are more appropriately captured within those chapters.

Finally, this RAMP Report is the first instance where SDG&E has had to apply the SA Decision to its risk analysis of this risk (and all of its risks in RAMP). SDG&E looks forward to feedback from the Commission on its application of the SA to this risk.

III. RISK ASSESSMENT

In accordance with the SA Decision,⁸ this section describes the Risk Bow Tie, possible drivers, and potential consequences of the Contractor Safety risk.

A. Risk Bow-Tie

The Risk Bow Tie shown in Figure 1, below, is a commonly-used tool for risk analysis. The left side of the Risk Bow Tie illustrates drivers/triggers that lead to a risk event and the right side shows the potential consequences of a risk event. SDG&E applied this framework to identify and summarize the information provided above. A mapping of each Control/Mitigation to the elements of the Risk Bow Tie addressed is provided in Appendix A.

⁸ D.18-12-014 at 16 and Attachment A, A-11 (“Bow Tie”).

Figure 1: Risk Bow Tie



B. Asset Groups of Systems Subject to the Risk

The SA Decision⁹ directs the utilities to endeavor to identify all asset groups or systems subject to the risk. This is a “cross-cutting” risk and therefore is associated with human systems, rather than particular asset groups.

C. Risk Event Associated with the Risk

The SA Decision¹⁰ instructs the utility to include a Risk Bow Tie illustration for each risk included in RAMP. As illustrated in the above Risk Bow Tie, the risk event (center of the Risk Bow Tie) is a contractor safety event that results in a serious injury or fatality along with any of the Potential Consequences listed on the right. The Drivers/Triggers that may contribute to this risk event are further described in the section below.

⁹ *Id.* at Attachment A, A-11 (“Definition of Risk Events and Tranches”).

¹⁰ *Id.* at Attachment A, A-11 (“Bow Tie”).

D. Potential Drivers/Triggers¹¹

The SA Decision¹² instructs the utility to identify which element(s) of the associated Risk Bow Tie each mitigation addresses. When performing the risk assessment for Contractor Safety, SDG&E identified potential leading indicators, referred to as Drivers or Triggers. These include, but are not limited to:

- **DT.1 – Contractor crew deviation from policies/procedures:** SDG&E has many safety-related policies and procedures for employees and contractors to follow. Failure of a contractor to adhere to a company safety policy or procedure could result in a safety-related event.
- **DT.2 – Contractor and sub-contractor crew inexperience:** Contractors and sub-contractors used by SDG&E are expected to hire experienced employees to perform the work required. Failure of contractors to hire and utilize experienced employees for their work may lead to a safety-related event.
- **DT.3 – Lack of oversight of contractor work –** Oversight by SDG&E is an integral part of managing work performed by contractors, not only from a work quality perspective, but also to verify that safe work practices are being followed. A lack of oversight of a contractor’s work can lead to departures from safe work practices and result in a safety-related event.
- **DT.4 – Inadequate contractor training/supervision –** SDG&E expects its contractors to provide training to and to supervise its employees to reduce the likelihood of an incident. Inadequate training or the lack of sufficient supervision can be a cause of a safety-related event.
- **DT.5 – Inadequate use of job site safety plans/job safety analysis –** Insufficient knowledge of the work environment or improper planning for

¹¹ An indication that a risk could occur. It does not reflect actual or threatened conditions.

¹² D.18-12-014 at Attachment A, A-11 (“Bow Tie”).

potential job hazards may lead to contractors sustaining safety-related event while on the job.

- **DT.6 – Inadequate or inaccurate utility and/or substructure location information** – Contractors need to have the proper information about the assets or systems they work on for the benefit of SDG&E. Inadequate or inaccurate utility and/or substructure information can lead to safety-related events to contractor employees.
- **DT.7 – Unsafe operation of equipment or motor vehicle** – Contractors may utilize their own company vehicles and equipment or vehicles and equipment owned by SDG&E. The unsafe operation of such may lead to a safety-related event.
- **DT.8 – Contractor crew fatigue/complacency** – Contractors working excessive hours can create unsafe work environments. Also, complacency may reduce the level of awareness to hazards which can lead to a safety-related event.
- **DT.9 – Contractor impairment due to environmental factors** – Factors such as heat, night work, high-risk work locations (*e.g.* busy roadways), etc., may lead a contractor to become impaired and as a result increase the likelihood of a safety-related event.

E. Potential Consequences

Potential Consequences are listed to the right side of the Risk Bow Tie illustration provided above. If one or more of the Drivers/Triggers listed above were to result in an incident, the Potential Consequences, in a reasonable worst-case scenario, could include:

- Serious injuries and/or fatalities;
- Property damage;
- Additional compliance safety inspections;
- Operational and reliability impacts;
- Adverse litigation;
- Penalties and fines; and

- Erosion of public confidence.

These Potential Consequences were used in the scoring of the Contractor Safety risk that occurred during the development of SDG&E’s 2018 Energy Risk Registry.

IV. RISK QUANTIFICATION

The SA Decision sets minimum requirements for risk and mitigation analysis in RAMP,¹³ including enhancements to the Interim Decision 16-08-018.¹⁴ SDG&E used the guidelines in the SA Decision as a basis for analyzing and quantifying risks, as shown below. Chapter RAMP-C of this RAMP Report explains the Risk Quantitative Framework which underlies this Chapter, including how the Pre-Mitigation Risk Score, Likelihood of Risk Event (LoRE), and Consequence of Risk Event (CoRE) are calculated.

Table 4: Risk Quantification Scores¹⁵

Contractor Safety	Low Alternative	Single Point	High Alternative
Pre-Mitigation Risk Score	231	1408	3371
LoRE	1.2		
CoRE	200	1223	2926

A. Risk Scope & Methodology

The SA Decision requires a pre- and post-mitigation risk calculation.¹⁶ The below section provides an overview of the scope and methodologies applied for the purpose of risk quantification.

¹³ *Id.* at Attachment A.

¹⁴ *Id.* at 2-3.

¹⁵ The term “pre-mitigation analysis,” in the language of the SA Decision (Attachment A, A-12 (“Determination of Pre-Mitigation LoRE by Tranche,” “Determination of Pre-Mitigation CoRE,” “Measurement of Pre-Mitigation Risk Score”)), refers to required pre-activity analysis conducted prior to implementing control or mitigation activity.

¹⁶ D.18-12-014 at Attachment A, A-11 (“Calculation of Risk”).

Table 5: Risk Quantification Scope

<p>In-Scope for purposes of risk quantification:</p>	<p>The risk of a work-related – as defined by Occupational Safety and Health Administration (OSHA) – safety incident involving a Class 1 contractor(s) that causes serious injuries or fatalities while conducting work on behalf of SDG&E.</p> <p>SDG&E is focusing its enhanced Contractor Safety Program on Class 1 Contractors. Class 1 Contractors are:</p> <p><i>“A Class 1 Contractor is a contractor engaged to perform work that can reasonably be anticipated to expose the Contractor’s employees, Subcontractors, SDG&E employees, or the general public to one or more hazards that have the potential to result in Serious Safety Incident. Examples of a Class 1 Contractor include contractors performing work involving energized equipment or hazardous chemicals.”</i></p>
<p>Out-of-Scope for purposes of risk quantification:</p>	<p>The risk of a work-related safety incident involving a non-Class 1 contractor(s), or the risk of a work-related safety-incident involving a Class 1 Contractor(s) while conducting work for a company other than SDG&E. Safety incidents involving a Class 1 contractor(s) that are not work-related (as defined by OSHA regulation) and impacts to the public resulting from work-related safety incidents involving Class 1 contractor(s).</p>

Pursuant to Step 2A of the SA Decision, the utility is instructed to use actual results, available and appropriate data (e.g., Pipeline and Hazardous Materials Safety Administration data).¹⁷ SDG&E’s safety risk assessment primarily utilized data from the Bureau of Labor Statistics (BLS), OSHA, and the Department of Labor (DOL).

Calculating serious injury and fatality incidence rates required data on total employment by sector. Therefore, the BLS Employment & Earnings data was used to determine total employment by sector. This data was filtered by NAICS (North American Industry Classification System) sector codes determined by analyzing SDG&E Class 1 Contractor data from ISN (ISNetwork – third-party administrator of the SDG&E contractor safety program) to

¹⁷ *Id.* at Attachment A, A-8 (“Identification of Potential Consequences of Risk Event”).



find the NAICS codes for companies contracted with SDG&E. Based on this data and SME input from the Contractor Safety Programs and Safety Services groups, total hours of Class 1 Contractor work for SDG&E were estimated at 9.031 million hours per year.

From the BLS industry data, total employees per sector were converted to total hours per sector using the following guidance from the BLS: Total hours by Sector = Total Employees by sector * 40 hours per week * 50 weeks per year. The total contractor hours were then allocated to the Class 1 Contractor sectors contracted by SDG&E.

Injuries, Illnesses, and Fatalities (IIF) program historical data from the BLS was used to determine the serious injury and the fatality incidence rates per year. From this data, the serious injury frequency was calculated as the ratio of serious injuries to recordable incidents by sector during 2015-2016. Industry serious injury and fatality rates were applied to total SDG&E Class 1 Contractor work hours to obtain the respective incidence rates for SDG&E.

OSHA Enforcement Data, supplemented with OSHA Severe Injury Reports, from the DOL was used to determine the distribution of safety consequence resulting from a single safety event. The NAICS code structure used in the data from the BLS is consistent with the NAICS codes in the OSHA enforcement data used for determining the distribution.

A Monte Carlo simulation was used to yield the probabilistic safety and financial consequences. The safety consequence scoring was based on a publication from the Federal Aviation Administration (FAA): a fatality is represented by 1.000 and a serious injury is represented by 0.253. Internal subject matter expert (SME) input was provided to estimate the financial consequence of a contractor safety incident. Based on SME input, reliability is not impacted by contractor safety related incidents.

B. Sources of Input

The SA Decision¹⁸ directs the utility to identify Potential Consequences of a Risk Event using available and appropriate data. The below provides a listing of the inputs utilized as part of this assessment.

- Injuries:

¹⁸ *Id.* at Attachment A, A-8 (“Identification of the Frequency of the Risk Event”).

- Agency: Bureau of Labor Statistics- Injuries, Illnesses, and Fatalities Program (IIF)
- Link: https://www.bls.gov/iif/oshsum.htm#15Summary_Tables
- Report Title: TABLE Q1. Incidence rates of total recordable cases of nonfatal occupational injuries and illnesses by quartile distribution and employment size, 2009-2016, All establishment sizes
- Fatalities:
 - Agency: Bureau of Labor Statistics- Injuries, Illnesses, and Fatalities Program (IIF)
 - Link: <https://www.bls.gov/iif/oshcfoi1.htm#2015>
 - Report Title: Census of Fatal Occupational Injuries-TABLE A-3. Fatal occupational injuries to private sector wage and salary workers, government workers, and self-employed workers by industry, all United States
- Distribution Fitting Data:
 - Agency: Department of Labor (DOL)
 - Link: https://enforcedata.dol.gov/views/data_catalogs.php
 - Report Title: OSHA Enforcement Data: osha_accident, osha_accident_injury, osha_inspection
- Severe Injury Assumption:
 - Agency: Occupational Safety and Health Administration (OSHA)
 - Link: <https://www.osha.gov/severeinjury/index.html>
 - Report Title: Severe Injury Reports
- Support Data:
 - Agency: Bureau of Labor Statistics- Office of Publications & Special Studies
 - Link: <https://www.bls.gov/opub/ee/archive.htm>

- Report: Employment & Earnings- Table B-1b. Employees on nonfarm payrolls by industry sector and selected industry detail, not seasonally adjusted, 2011-2016
- North American Industry Classification System - NAICS
 - Agency: US Census Bureau
 - Link: https://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart_code=22&search=2017%20NAICS%20Search

V. RISK MITIGATION PLAN

The SA Decision requires a utility to “clearly and transparently explain its rationale for selecting mitigations for each risk and for its selection of its overall portfolio of mitigations.”¹⁹ This section describes SDG&E’s Risk Mitigation Plan by each selected Control and Mitigation for this risk, including the rationale supporting each selected Control and Mitigation.

As stated above, SDG&E’s Contractor Safety risk is defined as the risk of a safety event, caused by a Class 1 Contractor or subcontractor not following safety standards and/or procedures, which results in serious injuries and/or fatalities while conducting work on behalf of the Company. The Risk Mitigation Plan discussed below includes both Controls that are expected to continue and Mitigations for the period of SDG&E’s TY 2022 GRC cycle.²⁰ The Controls are those activities that were in place as of 2018, most of which have been developed over many years, to address this risk and include work to comply with laws that were in effect at that time.

A. SDG&E-2-C1: Contractor Safety Oversight Program

The contractor oversight program is the way SDG&E standardizes its approach to contractor safety. SDG&E uses both the Contractor Safety Program Standard G8308, the internal standard for SDG&E, and the Class 1 Contractor Safety Manual for contractors to hold

¹⁹ *Id.* at Attachment A, A-14 (“Mitigation Strategy Presentation in the RAMP and GRC”).

²⁰ *Id.* at 33. A “Control” is defined as a currently established measure that is modifying risk. A “Mitigation” is defined as a measure or activity proposed or in process designed to reduce the impact/consequences and/or likelihood/probability of an event.



all business units and Class 1 Contractors to the same requirements and/or standards. Business units such as Major Projects, Construction Services, and Vegetation Management, also have field safety oversight of all construction work performed by Class 1 Contractors working for those respective groups. This oversight includes instituting safeguards that all contracted work is performed in accordance with SDG&E standards, OSHA regulations, applicable laws, Commission Orders (such as GO 95, Rules for Overhead Electric Line Construction), and GO 128 (Rules for Construction of Underground Electric Supply and Communications Systems).

The safeguards can include:

- Administrative activities associated with construction services-managed construction work.
- Pre-qualification of all Class 1 contractors according to SDG&E's

Contractor Safety Program:

- Contractors that meet the criteria targets in the table below are granted points toward an overall compliance grade in SDG&E's third-party administrator.
- Contractors that fall below the criteria targets do not receive points toward an overall compliance grade in SDG&E's third-party administrator.

Criteria	Target	Below Target
3-Year TRIR (Total Recordable Incident Rate)	Equal to or less than BLS industry average for applicable NAICS code	Greater than BLS industry average for applicable NAICS code
3-Year DART (Days Away Restricted/Transfer Rate)	Equal to or less than BLS industry average for applicable NAICS code	Greater than BLS industry average for applicable NAICS code
EMR (Experience Modification Rate)*	Equal to or less than 1.1	Greater than 1.1
5 -Year Fatality Data	Zero (0) fatalities within the last five (5) years	One (1) or more fatalities within the last five (5) years
5-Year Non-Fatal, Serious Safety Incident Data (e.g., life altering/life threatening, including incidents affecting the public)	Zero (0) non-fatal, serious safety incidents within the last five (5) years	One (1) or more non-fatal, serious safety incidents within the last five (5) years
3-Year OSHA Serious, Willful, or Repeat Citations	Zero (0) serious, willful, or repeat OSHA citations within the last three (3) years	One (1) or more serious, willful, or repeat citations within the last three (3) years
3-Year OSHA Non-Serious Citations	Zero (0) non-serious OSHA citations within the last three (3) years	One (1) or more non-serious citations within the last three (3) years
Written Safety Programs	Company has comprehensive written safety programs that are in compliance with environmental, health, and safety laws and regulations and are specific to the hazards associated with the work to be performed	Company does not have comprehensive written safety programs that are in compliance with environmental, health, and safety laws and regulations and are specific to the hazards associated with the work to be performed
Drug and Alcohol Plan	Company has a comprehensive written drug and alcohol plan that is in compliance with applicable laws and regulations	Company does not have a comprehensive written drug and alcohol plan that is in compliance with applicable laws and regulations
Subcontractor Management Plan	Company has a written plan to monitor subcontractors and hold them accountable for the same requirements as themselves	Company does not have a written plan to monitor subcontractors and hold them accountable for the same requirements as themselves
Employee Disciplinary Action Plan	Company has a written employee disciplinary action plan	Company does not have a written employee disciplinary action plan
Safety Culture Evaluation	Company has a positive safety culture that it is working to advance	Company does not have a positive safety culture that it is working to advance

* Experience modification rate (EMR) is a number insurance companies use to represent a business' prior workers' comp claims and potential for future injuries.

- Pre-Work Safety Meeting notice and Acknowledgment Form.
- SDG&E notifies contractors of known jobsite hazards, then meets with contractors to discuss hazards and mitigations that are jointly acknowledged before performing work.
- Safety oversight and observations for contractors:
 - SDG&E has formed Contractor Safety Services (CSS) to oversee safety for Class 1 Contractors.



- CSS currently has 2 team leads and a mixture of internal safety advisors and third-party safety advisors that perform safety observations of Class 1 Contractors.
- Incident review and investigation for all Class 1 work performed:
 - Contractors must notify SDG&E of all incidents.
 - Reports are initiated for applicable incidents.
 - Serious Near-Miss events, Serious Safety Incidents, Fatalities, and other serious incidents by contractors as determined by SDG&E are investigated internally.
- Post-Job Evaluations:
 - A review by the SDG&E construction team on the contractor's jobsite performance is conducted post major project or annually. This review has the ability to affect the contractor's qualification status and therefore their ability to continue working with SDG&E.

B. SDG&E-2-C2: Contractual Requirements

The contractual requirement control is in place to add updated language to all contracts in order to hold all Class 1 Contractors accountable to follow SDG&E's Class 1 Contractor Safety Manual. SDG&E requires the following:

- All new and existing contracts and Master Service Agreements (MSAs) between SDG&E and a primary contractor include Contractor Safety Program-related requirements as part of the contract terms and conditions.
- Contractor contract language includes references to the Contractor Safety Program Requirements that are hosted in the Class 1 Contractor Safety Manual.
- A CSS Manager consults on updates to any contract terms or conditions that are considered in new or existing contracts.

C. SDG&E-2-C3: Third-Party Administration and Tools

SDG&E currently uses certain third-party administration tools to verify that contractors comply with SDG&E's established safety requirements according to the Class 1 Contractor



Safety Manual and the contractual requirements. SDG&E currently uses Predictive Solutions for safety observations and Veriforce for gas operator qualifications as third-party software administration tools to address risk in a more cost-effective manner than has been found utilizing an internal workforce.

Predictive Solutions is used by SDG&E as the primary software application for safety observations of Class 1 Contractors. This customizable tool can house a specifically designed safety observation form for each Business Unit in order to capture all relevant data. There is also a core group of questions that is used to track and trend safety contractor observations enterprise wide. Predictive Solutions allows SDG&E to easily collect safety observations, track and trend, then communicate the results of observations in a clear format so SDG&E can potentially mitigate at-risk behaviors or incidents.

Veriforce is a third-party vendor that offers comprehensive solutions for Operator Qualifications (OQ), Drug & Alcohol (D&A), Training, Auditing, and Consulting programs to Operators and contractors nationwide. In 2012, SDG&E partnered with Veriforce to manage all gas contractors' OQ and D&A programs. The Veriforce partnership allows SDG&E to improve the overall OQ program for gas contractors by requiring them to abide by a common OQ program and tracks their D&A status to maintain compliance. Some key features of using the Veriforce system are: the ability for contractors to have proof of qualifications on the job site; the ability to track qualification failures; and visibility to the D&A status of each contractor company and its employees.

SDG&E partnered with Veriforce in response to increased scrutiny and auditing by internal and/or external parties of the OQ and D&A programs which revealed inconsistencies among contractors. Veriforce provided SDG&E with solutions to address these audit findings and improved the OQ and D&A programs by implementing an electronic platform for testing and an electronic database for tracking this data. The Veriforce platform also allows for portability of qualifications between SDG&E and Southern California Gas Company.

SDG&E uses a third-party administrator, ISNetworld, to house and verify the established SDG&E pre-qualification requirements for our Class 1 Contractors. ISNetworld also gives SDG&E a place to communicate with our contractors, including:



- Communication of new rules, regulations and requirements;
- Reports from contractors on SDG&E specific incidents and hours in order for SDG&E to track and trend performance;
- A bulletin board that houses documents communicated to all connected contractors; and
- An action item tool for targeted communication to specific contractors.

ISNetworld monitors new and changing OSHA requirements and verifies SDG&E's Class 1 Contractors meet minimum OSHA requirements for written safety programs for the work performed and grades Class 1 Contractors according to the pre-qualification criteria SDG&E establishes.

The main elements in the scoring criteria of pre-qualification collected by ISNetworld are:

- The nationwide review of the three previous years of Total Recordable Incident Rate (TRIR);
- The nationwide review of the three previous years of Days Away Restricted or Transferred Rate (DART);
- Previous year Experience Modification Rate (EMR);
- Previous 5-year fatalities review;
- Previous 5-year Serious Safety Incidents (SSI) review;
- Previous 3-year OSHA citations;
- Written safety program reviews according to the work type performed; and
- Safety culture questionnaire review.

The nationwide-level data captured by the third-party administration program is reviewed by SDG&E to standardize the pre-qualification process and to use for selecting Class 1 Contractors.

D. SDG&E-2-C4: Stop the Job

The Stop the Job (STJ) Process is a protocol SDG&E has established for all contractors. It gives authority to everyone onsite to stop a job or task if an unsafe work condition or activity is identified. All work must immediately cease in the area of concern once the STJ is declared



until 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.

E. SDG&E-2-C5: Near Miss/Close Call Reporting Program

SDG&E requires its contractors to report all incidents per the Class 1 Contractor Safety Manual including Near Miss/Close Call incidents immediately, then monthly in a report. This information is then tracked and used during SDG&E's Class 1 Contractor safety observations and also communicated out to contractors if applicable.

SDG&E defines a Near Miss/Close Call as follows:

- Non-Serious Near Miss: A Work-Connected incident in which Property Damage less than \$50,000 or an injury or illness (other than a Serious Safety Incident) could have occurred, but did not.
- Serious Near Miss: A Work-Connected incident in which Property Damage, a Spill/Release resulting in damages of \$50,000.00 or more, or a Serious Safety Incident could have occurred but did not.

F. SDG&E-2-C6: Contractor Safety Summit and Quarterly Safety Meetings

This control includes a summit and quarterly safety meetings for contractors. These events create a forum to share industry leading best practices with our contractors, communicate new requirements, give our contractors the opportunity to collaborate with SDG&E on safety, and foster an improved safety culture for contractors and SDG&E. The Contractor Safety Summit is a broad-scoped meeting with focused attendance from SDG&E and Class 1 Contractor Executives and Management. The quarterly safety meetings are attended by SDG&E and Class 1 Contractor Executives and Management, but also include field level personnel.

G. SDG&E-2-M1: Expanded Contractor Oversight Program

This mitigation is part of enhancing and expanding SDG&E's current control SDG&E-2-C1. SDG&E has additional Business Units that utilize Class 1 Contractors (Customer Programs, Electric Operations, Electric Generation, Emergency Management, Aviation Services, Environmental Services, Facilities, Gas Operations, and Transmission Substation Operations) that would benefit from having a safety professional observe their work. With an additional 2



FTEs (1 Team Lead and 1 Field Safety Observers) and 4 Third-Party Field Safety Observers to cover the additional Business Units, SDG&E could support safety oversight and observations of the additional Class 1 Contractor activities. SDG&E has similar oversight in other Business Units which show a measurable safety improvement of Class 1 Contractor Total Recordable Incident Rates (TRIR) and improved safety culture.

Additionally, SDG&E would like to develop a real-time dashboard that consolidates all the current data collected in order to make timely decisions, share current contractor data enterprise wide, and more accurately identify risk with our contractor base to potentially mitigate future incidents.

H. SDG&E-2-M2: Update/Develop Contractor Safety Manual

SDG&E plans to update the Class 1 contractor safety manual annually or as needed with new requirements and/or updating regulatory and SDG&E requirements. SDG&E also aims to develop a manual for Class 2 contractors that are not currently covered under the enhanced contractor safety program or Class 1 Contractor Safety Manual.

Class 2 Contractors are defined as: a contractor engaged to perform any other work (than defined as Class 1). Examples of Class 2 Contractors include contractors engaged to perform administrative tasks or IT work.

I. SDG&E-2-M3: Near Miss/Close Call Reporting Portal/App

SDG&E plans to create a portal and/or app where Class 1 Contractors can submit Near Miss/ Close Call incidents. Near Miss/Close Call incidents are already required to be reported to SDG&E but are collected on incident report form. A new reporting mechanism could promote the submittal of Near Miss/Close Call incidents, a leading indicator that reflects a proactive safety program and culture.

VI. POST-MITIGATION ANALYSIS OF RISK MITIGATION PLAN

As described in Chapter RAMP-D, SDG&E has performed a Step 3 analysis where necessary pursuant to the terms of the SA Decision. Where SDG&E has not calculated an RSE for activities, the Company has provided a qualitative description of the risk reduction benefits for each of these activities in the section below.

A. Mitigation Tranches and Groupings

The Step 3 analysis provided in the SA Decision²¹ instructs the utility to subdivide the group of assets or the system associated with the risk into Tranches. Risk reduction from controls and mitigations and RSEs are determined at the Tranche level. For purposes of the risk analysis, each Tranche is considered to have homogeneous risk profiles (*i.e.*, the same LoRE and CoRE). SDG&E’s rationale for the determination of Tranches is presented below.

SDG&E’s comprehensive Contractor Safety program consists of pre-qualification of Class 1 contractors, oversight, observations, pre-work safety meetings and efforts all aimed to reduce risk of a safety event caused by a contractor while conducting work on behalf of SDG&E. Given the vast number of activities SDG&E performs to mitigate Contractor Safety risk, SDG&E grouped like activities with like risk profiles into mitigation programs. Since all Class 1 contractors have the potential for serious safety incidents and fatalities and each of SDG&E’s Contractor Safety risk mitigations have the same goal of reducing the frequency and consequence of safety events caused by contractors, all controls and mitigations have the same risk profile and are not further trached. Additionally, since SDG&E’s Contractor Safety risk is a “cross-cutting” risk that applies to contractors and is not asset-focused, the concept of tranching does not directly apply to this risk.

B. Post-Mitigation/Control Analysis Results

For purposes of this post-mitigation and post-control analysis, SDG&E looked at historical safety performance results and the improvements year-over-year to calculate an overall risk reduction benefit of performing these activities.²² SDG&E then looked at existing/continuing programs (*i.e.*, controls), with the expectation of similar results (*i.e.*, percentage of risk reduction benefit by continuing the activity). SDG&E also accounted for the risk increase that would occur over time if we stopped performing these activities. For new and/or incremental mitigations, we expect to achieve further risk reduction. The specific risk

²¹ D. 18-12-014 at Attachment A, A-11 (“Definition of Risk Events and Tranches”).

²² *Id.* at Attachment A, A-12 (“Determination of post-Mitigation LoRE,” “Determination of Post-Mitigation CoRE,” “Measurement of Post-Mitigation Risk Score,” “Measurement of Risk Reduction Provided by a Mitigation”).



reduction benefit percentages used for each identified control/mitigation are included under each program heading below.

1. SDG&E-2-C1: Contractor Safety Oversight Program

a. Description of Risk Reduction Benefits

SDG&E has always provided oversight of our contracted work, with each Business Unit responsible for managing those elements of their safety oversight programs that differed other Business Units. By creating the Contractor Safety Services (CSS), SDG&E has provided Business Units using Class 1 Contractors with a consistent Contractor Safety Program that is easily understood by SDG&E and its contractors, regardless of Business Unit. Each of the elements included in SDG&E-2-C1 (including pre-qualification of Class 1 Contractors, use of pre-work safety meeting notices and acknowledgement forms, implementation of consistent safety oversight procedures and policies, formalization of incident review and investigation, and development of post-job evaluations) supports SDG&E not only in the selection/engagement of contractors with acceptable safety records, but also with the ongoing management of worksite safety and evaluation. Furthermore, SDG&E's use of a single enterprise-wide system as a repository for Class 1 Contractor safety information allows all of SDG&E's Business Units to access information on an as needed basis, promoting sharing of information and enhanced safety awareness.

To date, SDG&E has implemented elements of SDG&E-2-C1 in all Business Units that use Class 1 Contractors, to include the requirement for all Class 1 Contractors to acknowledge the Class 1 Contractor Safety Manual. More specifically, approximately 75% of Class 1 Contractor work is subject to the entirety of the CSS Oversight Program, with higher risk work prioritized for oversight and observations (due to resource constraints addressed in SDG&E -2-M1), including Major Projects, Construction Services, and Vegetation Management. SDG&E estimates the Oversight Program has contributed to an approximate 30% reduction OSHA recordable rate in Business Units where CSS has fully implemented its Oversight Program. As this control is relatively new and still developing, the sustained reduction in the OSHA rate is still being evaluated. SDG&E realizes with enhanced oversight we could see a fluctuation in rates.



b. Elements of the Risk Bow Tie Addressed

SDG&E-2-C1 addresses several Drivers/Triggers and Potential Consequences as outlined above in Section 1. The contractor oversight program is the way SDG&E standardizes its approach to contractor safety. This oversight includes instituting safeguards that all contracted work is performed in accordance with SDG&E standards, OSHA regulations, applicable laws, Commission Orders (such as GO 95, Rules for Overhead Electric Line Construction) and GO 128 (Rules for Construction of Underground Electric Supply and Communications Systems). SDG&E’s contractor safety oversight program therefore addresses elements of the left side of the Risk Bow Tie such as contractor crew deviation from policies/procedures (DT.1), and lack of oversight of contractor work (DT.3) and aims to reduce the Potential Consequences identified in the right side of the Risk Bow Tie such as serious injuries or fatalities (PC.1).

c. Summary of Results

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE		1.152	
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE		1.3362	
	CoRE	200.387	1222.56	2926.19
	Risk Score	267.76	1633.61	3910.02
	RSE	9.20	56.13	134.34

2. SDG&E-2-C2: Contractual Requirements

a. Description of Risk Reduction Benefits

SDG&E has updated the contractual requirements of all contract templates and Master Service Agreements for Class 1 work to include language that holds SDG&E’s Class 1 Contractors accountable for following SDG&E’s policies, procedures, and safety practices, including the enhancements implemented through the Contractor Safety Program. All Class 1



Contractors have executed contracts including the new language and without this control, SDG&E may have difficulty enforcing its safety policies, procedures, and practices.

SDG&E has not performed a Risk Spend Efficiency Evaluation on SDG&E-2-C2 because this control in itself does not have a monetary value/cost that could be calculated in any reasonable manner.

b. Elements of the Risk Bow Tie Addressed

SDG&E-2-C2 addresses several Drivers/Triggers and Potential Consequences as outlined above in Section 1. The contractual requirement control is in place to add updated language to all contracts in order to hold all Class 1 Contractors accountable to follow SDG&E's Class 1 Contractor Safety Manual. SDG&E's contractor requirements therefore address one element of the left side of the Risk Bow Tie contractor crew deviation from policies/procedures (DT.1) and aims to reduce the Potential Consequences identified in the right side of the Risk Bow Tie such as adverse litigation (PC.5).

3. SDG&E-2-C3: Third-Party Administration and Tools

a. Description of Risk Reduction Benefits

SDG&E uses different third-party administration tools (Predictive Solutions and Veriforce) to manage contractor data and verify compliance with SDG&E and outside party rules and regulations. SDG&E estimates that the use of Predictive Solutions, Veriforce, and ISNetwork combine to contribute to a 3% risk reduction. Furthermore, Predictive Solutions and ISNetwork, which are used by the majority of utilities in California and are considered leading practice contractor safety management systems, support SDG&E in proactive identification of safety trends, provide a centralized system to store and review safety data to verify compliance, and allow the Company to address Class 1 Contractor at-risk behavior before the occurrence of an incident. Finally, using third-party administration tools (rather than SDG&E resources) allows the Company to verify Contractor data, conduct trend analyses, and manage safety compliance more cost-effectively. SDG&E has determined that ISNetwork is the most cost-effective method of ensuring contractor compliance with safety regulations and SDG&E policies, practices, and procedures. As with the use of Predictive Solutions and Veriforce, using ISNetwork (rather than SDG&E employees) allows the Company to conduct pre-qualification,



assess Contractor safety performance not only on the SDG&E system but nationwide, and track safety assessments in the most cost-effective manner.

Prior to performing any work for SDG&E, ISNetworkworld conducts a review and verification of all Class 1 Contractors' pre-qualification requirements (as defined by SDG&E), conducts a nationwide search of each Contractor's safety performance, reviews Contractors' safety compliance programs, and validates each for accuracy and completeness. SDG&E establishes grading criteria for ISNetworkworld to assess Contractors using an "A," "B," "C," and "F" grading system to measure Contractors' safety performance. Contractors, which are graded annually and following any safety incident, receiving and maintaining an "A" or "B" grade are deemed qualified and approved to work for SDG&E. Contractors that receive a "C" or "F" grade must obtain a waiver through SDG&E by either three directors (for a "C" grade) or three vice presidents (for an "F" grade). Failure to obtain a variance for either a "C" or "F" requires that the Contractor leave SDG&E properties within 45 days. Business Units are advised of grades and variances and are responsible for removal where no variance is granted. The use of ISNetworkworld verifies Class 1 Contractor compliance with SDG&E safety rules and regulations, maintenance of a safe record in compliance with OSHA requirements and regulations and provides SDG&E with a centralized system to house contractor documents, pre-qualification requirements, and communications, thereby reducing the risk of safety incidents on SDG&E work.

b. Elements of the Risk Bow Tie Addressed

SDG&E-2-C3 addresses several Drivers/Triggers and Potential Consequences as outlined above in Section 1. SDG&E currently uses certain third-party administration tools to verify contractors comply with SDG&E's established safety requirements according to the Class 1 Contractor Safety Manual and the contractual requirements. SDG&E's initiatives using third-party administration and tools reduce risk, give SDG&E a way to verify contractor data in a way that is more effective than performing this service would be in-house, and provides a way to monitor new and changing OSHA requirements, verify SDG&E's Class 1 Contractors meet minimum OSHA requirements for written safety programs for the work performed, and grades Class 1 Contractors according to the pre-qualification criteria SDG&E establishes. SDG&E's

third-party administration and tools therefore address elements of the left side of the Risk Bow Tie such as contractor crew deviation from policies/procedures (DT.1), inadequate contractor training/supervision (DT.4), inadequate use of job site safety plans/job safety analysis (DT.5), and aims to reduce the Potential Consequences identified in the right side of the Risk Bow Tie such as serious injuries or fatalities (PC.1).

c. Summary of Results

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE		1.152	
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE		1.1557	
	CoRE	200.39	1222.56	2926.19
	Risk Score	231.60	1412.98	3381.94
	RSE	32.24	196.72	470.84

4. SDG&E-2-C4: Stop the Job

a. Description of Risk Reduction Benefits

Every Class 1 Contractor and employee at SDG&E has the authority to stop the job or stop a task that they believe is unsafe or requires a pause for clarification regardless of level. This action is supported by management, the union, the Class 1 Contractor Safety Manual, and CSS. Planning and understanding the work being performed are key to understanding and mitigating the risks associated with job site safety. They define the task description, discover what can go wrong (hazard description), how risk exposure can arise, contributing factors, consequences and hazard controls.

SDG&E has not performed a Risk Spend Efficiency Evaluation on SDG&E-2-C5 because this control in itself does not have a monetary value / cost that could be calculated in any reasonable manner.



b. Elements of the Risk Bow Tie Addressed

SDG&E-2-C4 addresses several Drivers/Triggers and Potential Consequences as outlined above in Section 1. The Stop the Job (STJ) Process is a protocol SDG&E has established for all contractors. It gives authority to everyone onsite to stop a job or task if an unsafe work condition or activity is identified. This program promotes a stronger safety culture in all workers and gives all employees the right to stop the job when they have a concern or question. SDG&E's stop the job process therefore addresses elements of the left side of the Risk Bow Tie such as contractor crew deviation from policies/procedures (DT.1), and inadequate contractor training/supervision (DT.4) and aims to reduce the Potential Consequences identified in the right side of the Risk Bow Tie such as serious injuries or fatalities (PC.1).

5. SDG&E-2-C5: Near Miss/Close Call Reporting Program

a. Description of Risk Reduction Benefits

Near miss reporting helps prevent future incidents by alerting CSS of an event that had the potential to result in injury, illness, or damage but did not. Integrating Near Miss reporting into the Contractor safety culture provides CSS with an opportunity to investigate, conduct lessons learned, mitigate, communicate and educate Contractors about the risk/hazard, improve future practices, and avoid similar incidents – thereby reducing risk. In addition, Near Miss reporting provides SDG&E and its Contractors with an opportunity to discuss (during the quarterly meetings and annual summit discussed in SDG&E-2-C7) potential incidents and actions that should be taken to mitigate future risk. A key element of having a Near Miss reporting program is ensuring that Contractors do not associate reporting a Near Miss with occurrence of an incident or adverse action (since that association will drive Contractors to avoid reporting), which is intended to be addressed through SDG&E-2-M3.

SDG&E has not performed a Risk Spend Efficiency Evaluation on SDG&E-2-C5 because this control in itself does not have a monetary value / cost that could be calculated in any reasonable manner.

b. Elements of the Risk Bow Tie Addressed

SDG&E-2-C5 addresses several Drivers/Triggers and Potential Consequences as outlined above in Section 1. SDG&E requires its contractors to report all incidents per the Class 1



Contractor Safety Manual including Near Miss/Close Call incidents immediately. SDG&E's initiatives to reduce incidents starts with identifying potential incidents in order to mitigate future incidents from occurring. SDG&E's near miss/close call reporting program therefore addresses elements of the left side of the Risk Bow Tie such as contractor crew deviation from policies/procedures (DT.1), and unsafe operation of equipment or motor vehicle (DT.7) and aims to reduce the Potential Consequences identified in the right side of the Risk Bow Tie such as serious injuries or fatalities (PC.1).

6. SDG&E-2-C6: Contractor Safety Summit and Quarterly Safety Meetings

a. Description of Risk Reduction Benefits

The four annual meetings (three Quarterly Safety Meetings and one Contractor Safety Summit) create a forum in which SDG&E and Contractors can share industry leading best practices, discuss new safety policies and regulations, discuss lessons learned and opportunities for improvement, and collaborate to improve the Company's and its Contractors safety culture. SDG&E estimates that approximately 95% of all Contractors, representing 99% of work performed, attend at least one meeting per year. Not only do the meetings place emphasis on safety and demonstrate SDG&E's engagement in developing a safety culture, but they have also resulted in identifiable enhancements in Contractor safety practices – following a discussion of training practices and options, a Contractor built a training facility to enhance its safety practices.

SDG&E has performed a Risk Spend Efficiency Evaluation on SDG&E-2-C6 and believes this control brings a 1% reduction in risk.

b. Elements of the Risk Bow Tie Addressed

SDG&E-2-C6 addresses several Drivers/Triggers and Potential Consequences as outlined above in Section 1. Summit and quarterly meetings for contractors create a forum to share industry-leading best practices with our contractors, communicate new requirements, give our contractors the opportunity to collaborate with SDG&E on safety, and foster an improved safety culture for contractors and SDG&E. These meetings promote a stronger joint safety culture and greater opportunity to learn from one another. SDG&E's contractor safety meetings therefore address elements of the left side of the Risk Bow Tie such as contractor crew deviation from



policies/procedures (DT.1), and inadequate contractor training/supervision (DT.4) and aims to reduce the Potential Consequences identified in the right side of the Risk Bow Tie such as serious injuries or fatalities (PC.1).

c. Summary of Results

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE		1.152	
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE		1.1557	
	CoRE	200.39	1222.56	2926.19
	Risk Score	231.60	1412.98	3381.94
	RSE	58.51	356.94	854.34

7. SDG&E-2-M1: Expanded Contractor Oversight Program

a. Description of Risk Reduction Benefits

As noted previously, expansion of the Contractor Oversight Program, through the addition of two SDG&E Full Time Equivalents and two contractor resources, to those Business Units utilizing Class 1 Contractors but not currently under the Program (Customer Programs, Electric Operations, Electric Generation, Emergency Management, Aviation Services, Environmental Services, Facilities, Gas Operations, and Transmission Substation Operations) is expected to result in a measurable impact on Class 1 Contractor OSHA recordables, would be able to oversee all Class 1 Contractor work, and verify compliance with contractor safety program enterprise-wide. Since the implementation of the Oversight Program, SDG&E has seen an approximately 16% decrease in OSHA recordables. Considering the types of work performed by the Class 1 Contractors for the Business Units that would be integrated in the expanded Program and the amount of work that would become subject to enhanced oversight, SDG&E estimates a further 2% reduction in OSHA recordables through this mitigation.

b. Elements of the Bowtie Addressed

SDG&E-2-M1 addresses several Drivers/Triggers and Potential Consequences as outlined above in Section 1. Expanding SDG&E’s current Contractor Oversight Program to include additional Business Units that utilize Class 1 Contractors would aim to provide the same standardized safety oversight, improve safety culture, and potentially mitigate future incidents as those already in the program. SDG&E’s expansion of its contractor oversight program therefore addresses elements of the left side of the Risk Bow Tie such as contractor crew deviation from policies/procedures (DT.1), and lack of oversight of contractor work (DT.3) and aims to reduce the Potential Consequences identified in the right side of the Risk Bow Tie such as serious injuries or fatalities (PC.1).

c. Summary of Results

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE		1.152	
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE		1.1289	
	CoRE	200.39	1222.56	2926.19
	Risk Score	226.21	1380.12	3303.29
	RSE	3.02	18.44	44.12

8. SDG&E-2-M2: Update/Develop Contractor Safety Manual

a. Description of Risk Reduction Benefits

As noted previously, SDG&E’s CSS, in collaboration with the Legal Business Unit, will update the Company’s Class 1 Contractor Safety manual to confirm it addresses updated or new regulatory requirements. The cost of this mitigation is limited, as the work will be performed by existing SDG&E FTEs. The risk reduction would be associated with ensuring that Class 1 Contractors are updated on new and/or updated safety regulations on a timely basis.



b. Elements of the Risk Bow Tie Addressed

SDG&E-2-M2 addresses several Drivers/Triggers and Potential Consequences as outlined above in Section 1. SDG&E updates the Class 1 Contractor Safety Manual annually, or as needed, with new requirements and/or updating regulatory and SDG&E requirements. Additionally, SDG&E aims to develop a manual for Class 2 contractors that are not currently covered under the enhanced contractor safety program or Class 1 Contractor Safety Manual. SDG&E’s update/development of contractor safety manual efforts therefore address elements of the left side of the Risk Bow Tie such as contractor crew deviation from policies/procedures (DT.1), and inadequate use of job site safety plans (DT.5) and aims to reduce the Potential Consequences identified in the right side of the Risk Bow Tie such as serious injuries or fatalities (PC.1).

9. SDG&E-2-M3: Near Miss/Close Call Reporting Program Portal/App

a. Description of Risk Reduction Benefits

As noted previously, SDG&E’s Class 1 Contractors currently report Near Misses and Close Calls through the SDG&E incident report form. The connection of Near Misses/Close Calls to an incident (through the use of the same form) has historically acted as a deterrent to reporting by Class 1 Contractors – who have communicated hesitation at reporting Near Misses/Close Call incidents on the incident report form, since there is an insinuation that by completing the incident report form, an incident occurred. By developing or implementing an existing Near Miss/Close Call reporting application, SDG&E expects to see an increase in the number of Near Miss/Close Calls incidents reported by Class 1 Contractors, which will lead to enhanced awareness of safety issues and provide SDG&E with the ability to effectively manage Class 1 Contractor safety and promote a its safety culture. The use of Near Miss/Close Call reporting applications is considered a leading practice in the industry.

b. Elements of the Risk Bow Tie Addressed

SDG&E-2-M3 addresses several Drivers/Triggers and Potential Consequences as outlined above in Section 1. SDG&E plans to create a portal and/or app which could promote the submittal of Near Miss/Close Call incidents, a leading indicator that reflects a proactive safety program and culture. SDG&E’s near miss/close call reporting portal/app therefore addresses

elements of the left side of the Risk Bow Tie such as contractor crew deviation from policies/procedures (DT.1), and unsafe operation of equipment or motor vehicle (DT.7) and aims to reduce the Potential Consequences identified in the right side of the Risk Bow Tie such as serious injuries or fatalities (PC.1).

c. Summary of Results

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE		1.152	
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE		1.1481	
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.06	1403.59	3359.47
	RSE	7.25	44.26	105.94

VII. SUMMARY OF RISK MITIGATION PLAN RESULTS

SDG&E’s Risk Mitigation Plan takes into account recent data and trends related to Contractor Safety, affordability impacts, possible labor constraints and the feasibility of mitigations. SDG&E has performed RSEs, in compliance with the S-MAP decisions, but ultimate mitigation selection can be influenced by other factors including funding, labor resources, technology, planning, compliance requirements, and operational and execution considerations.

Table 6 below provides a summary of the Risk Mitigation Plan, including controls and mitigation activities, associated costs, and RSEs by tranche.

SDG&E does not account for and track costs by activity, but rather, by cost center and capital budget code. Thus, the costs shown in Table 6 were estimated using assumptions provided by SMEs and available accounting data.



Table 6: Risk Mitigation Plan Summary²³
 (Direct 2018 \$000)²⁴

ID	Mitigation/Control	Tranche	2018 Baseline Capital ²⁵	2018 Baseline O&M	2020-2022 Capital ²⁶	2022 O&M ²⁷	Total ²⁸	RSE ²⁹
SDG&E-2-C1	Contractor Safety Oversight Program	T1	1,670	0	7,830-10,000	840-1,020	8,670-11,020	9.20-134.34
SDG&E-2-C2	Contractual Requirements	T1	0	0	0	0	0	-

- ²³ Recorded costs and forecast ranges were rounded. Additional cost-related information is provided in workpapers. Costs presented in the workpapers may differ from this table due to rounding.
- ²⁴ The figures provided are direct charges and do not include company loaders, with the exception of vacation and sick. The costs are also in 2018 dollars and have not been escalated to 2019 amounts.
- ²⁵ Pursuant to D.14-12-025 and D.16-08-018, the Company provides the 2018 “baseline” capital costs associated with Controls. The 2018 capital amounts are for illustrative purposes only. Because capital programs generally span several years, considering only one year of capital may not represent the entire activity.
- ²⁶ The capital presented is the sum of the years 2020, 2021, and 2022 or a three-year total. Years 2020, 2021 and 2022 are the forecast years for SDG&E’s Test Year 2022 GRC Application.
- ²⁷ As previously stated, internal labor (e.g., employee time spent to complete training courses, employee time spent to perform inspections) are not included in SDG&E’s O&M cost forecasts since these costs would rely on cost assumptions (e.g., number of employees, x length of training course, x average hourly wage). Further, SDG&E does not track labor in this manner and thus would not be able to include such internal labor costs in future spending accountability reports.
- ²⁸ Total = 2020, 2021 and 2022 Capital + 2022 O&M amounts.
- ²⁹ RSE ranges are further discussed in Chapter RAMP-C and Section VI above.



SDG&E-2-C3	Third-Party Administration and Tools	T1	5	20	0	20-25	20-25	32.24-470.84
SDG&E-2-C4	Stop the Job	T1	0	0	0	0	0	-
SDG&E-2-C5	Near Miss/Close Call	T1	0	0	0	0	0	-
SDG&E-2-C6	Contractor Safety Summit and Quarterly Meetings	T1	0	10	0	10-20	10-20	58.51-854.34
SDG&E-2-M1	Expanded Contractor Oversight	T1	0	0	3,240-4,140	220-310	3,460-4,450	3.02-44.12
SDG&E-2-M2	Updated Class 1 Safety Manual, Development of Class 2 Manual	T1	0	0	0	0	0	-
SDG&E-2-M3	Near Miss/Close Call Reporting Portal/App	T1	0	0	0	90-130	90-130	7.25-105.94
TOTAL COST			1,680	30	11,000-14,000	1,200-1,500	12,000-16,000	



It is important to note that SDG&E is identifying potential ranges of costs in this Risk Mitigation Plan and is not requesting funding herein. SDG&E will integrate the results of this proceeding, including requesting approval of the activities and associated funding, in the next GRC.

SDG&E notes that there are activities related to this Contractor Safety risk that will be carried over to the GRC for which the costs are a combination of external and internal labor (e.g., employee time spent for training, performing inspections or monitoring). These costs associated with these internal labor activities are not captured in this chapter because SDG&E does not track labor in this manner.

In addition, as discussed in Section VI above, the table below summarizes the activities for which an RSE is not provided:

Table 7: Summary of RSE Exclusions

ID	Control/Mitigation Name	Reason for No RSE Calculation
SDG&E-2-C2	Contractual Requirements	Excluded internal labor; no identified costs
SDG&E-2-C4	Stop the Job	Excluded internal labor; no identified costs
SDG&E-2-C5	Near Miss/Close Call Reporting Program	Excluded internal labor; no identified costs

VIII. ALTERNATIVE MITIGATION PLAN ANALYSIS

Pursuant to D.14-12-025 and D.16-08-018, SDG&E considered alternatives to the mitigations for the Contractor Safety risk. Typically, analysis of alternatives occurs when implementing activities to obtain the best result or product for the cost. The alternatives analysis for this Risk Mitigation Plan also took into account modifications to the plan and constraints, such as budget and resources.

A. SDG&E-2-A1: Development of an internal program to pre-qualify and oversee contractor safety.

SDG&E reviewed the feasibility of not using a third-party administrator. During SDG&E’s internal evaluation, it was determined that SDG&E did not have the proper resources or personnel to administer the pre-qualification and verification of requirements of its contractor workforce. Furthermore, the cost of using a third-party administrator was \$30,000.00 compared to our estimated addition of 10 FTE’s at \$1,390,000.00 to accomplish the same tasks.



1. Summary of Results

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE		1.152	
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE		1.1500	
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.44	1405.89	3364.98
	RSE	0.27	1.62	3.88

B. SDG&E-2-A2: Use alternative third-party administrator to pre-qualify contractors

During the implementation of our enhanced contractor safety program, SDG&E considered using other third-party administrators, including Avetta and Browz. Additionally, SDG&E benchmarked with other California Investor Owned Utilities on the third-party administrators they were using. Each of the alternatives offered similar basic functionality: a pre-qualification system centered around verifiable data to include OSHA documents and safety rates. After assessing the services offered and associated costs of those options, SDG&E decided to execute an agreement with ISN instead of others because (1) 52% of our current contractors were already enrolled and would not incur additional costs, (2) PG&E and SCE were already using ISN, thus keeping consistency with our common contractors, and (3) ISN had the industry-leading platform that best fit our needs.

1. Summary of Results

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	LoRE		1.152	
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.83	1408.28	3370.71
Post-Mitigation	LoRE		1.1481	
	CoRE	200.39	1222.56	2926.19
	Risk Score	230.06	1403.59	3359.47
	RSE	22.80	139.11	332.95

**Table 8: Alternative Mitigation Summary
(Direct 2018 \$000)³⁰**

ID	Mitigation	2020-2022 Capital ³¹	2022 O&M	Total ³²	RSE ³³
SDG&E-2-A1	Develop an all internal program to pre-qualify an oversee contractor safety	0	1,390-1,530	1,390-1,530	0.27-3.88
SDG&E-2-A2	Use alternative third-party administrator to pre-qualify contractors	0	30-40	30-40	22.80-332.95

³⁰ The figures provided are direct charges and do not include company loaders, with the exception of vacation and sick. The costs are also in 2018 dollars and have not been escalated to 2019 amounts.

³¹ The capital presented is the sum of the years 2020, 2021, and 2022 or a three-year total.

³² Total = 2020, 2021 and 2022 Capital + 2022 O&M amounts.

³³ The RSE ranges are further discussed in Chapter RAMP-C and Section VI above.

APPENDIX A: SUMMARY OF ELEMENTS OF RISK BOW TIE ADDRESSED

ID	Control/Mitigation Name	Elements of the Risk Bow Tie Addressed
SDG&E-2-C1	Contractor Safety Oversight Program	DT.1 – DT.9 PC.1 – PC.7
SDG&E-2-C2	Contractual Requirements	DT.1 PC.5, PC.6
SDG&E-2-C3	Third-Party Administration and Tools	DT.1, DT.2, DT.4, DT.5, DT.6, DT.9, PC.1 – PC.7
SDG&E-2-C4	Stop the Job	DT.1, DT.3, DT.4 PC.1 – PC.7
SDG&E-2-C5	Near Miss/Close Call Reporting Program	DT.1, DT.2, DT.7 PC.1 – PC.7
SDG&E-2-C6	Contractor Safety Summit and Quarterly Safety Meetings	DT.1, DT.2, DT.3, DT.4 PC.1 – PC.7
SDG&E-2-M1	Expanded Contractor Oversight Program	DT.1 – DT.9 PC.1 – PC.7
SDG&E-2-M2	Updated Class 1 Contractor Safety Manual, Development of Class 2 Contractor Safety Manual	DT.1 – DT.9 PC.1 – PC.7
SDG&E-2-M3	Near Miss/Close Call reporting portal/app. All contractor safety data from ISN and predictive solutions rolled up into real-time dashboard	DT.1, DT.2, DT.7 PC.1 – PC.7