Risk Assessment Mitigation Phase
(Chapter SCG-4)
Customer and Public Safety

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SoCalGas
A Sempra Energy utility®

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Risk: Customer and Public Safety

I. INTRODUCTION

The purpose of this chapter is to present the Risk Mitigation Plan for Southern California Gas Company's (SoCalGas or Company) Customer and Public 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 (the SA Decision).[1]

SoCalGas has identified and defined RAMP risks in accordance with the process described in further detail in Chapter RAMP-B of this RAMP Report. On an annual basis, SoCalGas' Enterprise Risk Management (ERM) organization facilitates the Enterprise Risk Registry (ERR) process, which influenced how risks were selected for inclusion in this 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 SoCalGas' General Rate Case (GRC). The costs presented in this 2019 RAMP Report are those costs for which SoCalGas anticipates requesting recovery in its Test Year (TY) 2022 GRC. SoCalGas' TY 2022 GRC presentation will integrate developed and updated funding requests from information in this 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, O&M costs are only presented for TY 2022.

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[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 (SMAP) 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] *See,* D.18-12-014 at Attachment A, A-14 ("Mitigation Strategy Presentation in the RAMP and GRC").

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.[3] A "Control" is defined as a "[c]urrently established measure that is modifying risk."[4] A "Mitigation" is defined as a "[m]easure or activity proposed or in process designed to reduce the impact/consequences and/or likelihood/probability of an event."[5] Activities presented in this chapter are representative of those that are primarily scoped to address SoCalGas' Customer and Public 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 and certain internal labor costs). Additionally, SoCalGas 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, or General Order. Activities with no RSE score presented in this 2019 RAMP Report are identified in Section VII below.

SoCalGas 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 SoCalGas' 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

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[3] *Id.* at Attachment A.

[4] *Id.* at 16.

[5] *Id.* at 17.

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 2019 RAMP report, SoCalGas' Customer and Public Safety Risk is defined as "the risk of customer safety incidents, which results in fatality, serious injury[6] and/or facility damage."

B. Summary of Elements of the Risk Bow Tie

Pursuant to the SA Decision,[7] for each Control and Mitigation presented herein, SoCalGas 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	Employees who deviate from Company policy or procedure
DT.2	Employee inexperience or lack of training
DT.3	Condition of customer premises or equipment
DT.4	Condition of Company facilities
DT.5	Distracted driving
PC.1	Serious injuries and/or fatalities
PC.2	Property Damage
PC.3	Adverse litigation
PC.4	Penalties and fines
PC.5	Erosion of public confidence

[6] For purposes of this 2019 RAMP Report, a "serious injury" is defined as an injury that requires an overnight hospital stay.

[7] *Id.* at Attachment A, A-11 ("Bow Tie").

C. Summary of Risk Mitigation Plan

Pursuant to the SA Decision,[8] SoCalGas performed a detailed pre- and post-mitigation analysis of controls and mitigations for the risks included in RAMP, as further described below. SoCalGas' baseline controls for this risk consist of the following programs/activities:

Table 2: Summary of Controls

ID	Name
SCG-4-C1	Employee Formal Skills Training
SCG-4-C2	Natural Gas and Appliance Testing
SCG-4-C3	Leak and Emergency Order Response
SCG-4-C4	Gas Consumption Analytics
SCG-4-C5	Customer Services Field - Leak Detection Equipment
SCG-4-C6	Quality Assurance
SCG-4-C7	Policy, Procedures and Standards
SCG-4-C8	Collect Customer Contact Data for Safety Communication
SCG-4-C9	Safe Driving Programs
SCG-4-C10	Pole and Data Collector Unit (DCU) Inspections

[8] D.18-12-014 at Attachment A, A-11 ("Definition of Risk Events and Tranches").

SoCalGas will continue the 2018 controls identified above and puts forth additional projects and/or programs (*i.e.*, mitigations) as follows:

Table 3: Summary of Mitigations

ID	Mitigation Name
SCG-4-M1	Underground Leak Detection Tool

Finally, pursuant to the SA Decision,[9] SoCalGas considered alternatives to the Risk Mitigation Plan for the Customer and Public Safety risk and summarizes the reasons that the alternatives were not included in the plan in Section VIII.

II. RISK OVERVIEW

SoCalGas' possesses a "safety-first" culture, which focuses on its employees, customers, and the public, and is embedded in every aspect of its work. As discussed in the Employee Safety chapter, SCG-2, SoCalGas employee safety programs are founded on proven employee-based programs, safety training, and workforce education. Many, if not all, of these employee safety programs also promote the safety of the public and our customers. While the costs and activities are presented in the operational risk chapters and the Employee Safety chapter of this 2019 RAMP Report, the benefits received by SoCalGas' customers and the public remain present.

The majority of risk mitigation activities presented in the various Chapters of this 2019 RAMP Report provide customer and public safety risk reduction benefits. For example, the mitigation activities presented in SoCalGas' medium- and high-pressure pipeline risk Chapters (SCG-1, SCG-5) that focus on reducing pipeline incidents are designed to protect the public but are more accurately captured in the respective pipeline infrastructure chapters of this RAMP Report since the activities focus on infrastructure protection. The same applies to SoCalGas' third party dig-in risk Chapters (SCG-6, SCG-7). Therefore, the definition of SoCalGas' Customer and Public Safety risk is very limited in scope.

SoCalGas' Customer and Public Safety risk also includes motor vehicle incidents. To mitigate this risk, SoCalGas utilizes a driver safety program as part of the employee safety efforts. This program includes a monthly training module that serves to remind and bolster safe driving practices to help

[9] *Id.* at 33.

prevent motor vehicle incidents. The goal of this program is to help drivers see, think and act their way through various driving environments, challenges and changes that may exist or develop regardless of where they travel or the vehicles they operate. These principles enable employees to be better drivers, to keep themselves safe and, by extension, to keep the public safe as well (*see* Risk Bow Tie driver DT.5).

The last serious injury to a SoCalGas customer that occurred after-the-meter was related to a field service technician's performance in late 2014. Since then, there has been no reoccurrence of a similar incident. SoCalGas regularly assesses its policies, procedures and safety culture and encourages two-way communication between employees and management as a means of identifying and managing safety risks. Further, since 2014, management has created multiple methods for employees to report close calls/near misses, which has helped further mitigate this risk. Safety is a core value, so we provide all employees with the training necessary to safely perform their job responsibilities. SoCalGas has formal procedures, processes, and standards it maintains to provide guidance to employees and document the manner in which work is to be performed safely, which are continuously updated, in addition to training practices including module and skills testing, field evaluations for employees and a Quality Assurance Program that involves random testing. Strong continuous improvement practices result in periodic updates to these items.

An integrated approach to safety is taken by SoCalGas, and there is a multitude of safety practices infused in every aspect of the Company from its design and construction of facilities to the continuous evaluation and improvement of operation and maintenance activities. As further discussed in Chapter RAMP-F, SoCalGas is continually working to evolve and enhance its safety practices as illustrated in descriptions of the programs/activities below. SoCalGas addresses safety concerns through public communication and awareness, emergency response, safety programs and practices and fosters a workplace that encourages continual open and informal discussion of safety-related issues. For example, as discussed in the Employee Safety chapter (SCG-2), SoCalGas has meetings and campaigns that are founded on safety training and workforce education. These initiatives also reassure the safety of the public and our customers. Similarly, controls and mitigations that are discussed through-out the various chapters of this 2019 RAMP Report encompass initiatives and activities that also promote the

safety of the public and our customers but are not discussed here (*e.g.,* Meter-Set Assembly inspections). *See* Appendix A of Chapter RAMP-A.

As further discussed in SoCalGas Chapter RAMP-F, the safety of employees, contractors, customers and the public in the communities it serves is a core value for SoCalGas. The Company endeavors to foster a work environment where employees are focused on and engaged in sustaining a culture that emphasizes safety; from initial employee training, to the installation, operation, and maintenance of utility infrastructure, and the commitment to provide safe and reliable service to customers.

III. RISK ASSESSMENT

In accordance with the SA Decision,[10] the following section describes the risk Bow Tie, possible Drivers/Triggers, and Potential Consequences of the Customer and Public 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 that lead to a risk event and the right side shows the potential consequences of a risk event. SoCalGas applied this framework to identify and summarize the information provided above.

[10] *Id.* at 33 and Attachment A, A-11 ("Bow Tie").

Figure 1: Risk Bow Tie

B. Asset Groups or Systems Subject to the Risk

The SA Decision[11] 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 Decision[12] instructs the utility to include a Bow Tie illustration for each risk included in RAMP. As illustrated in the above Bow Tie, the Risk Event (center of the Risk Bow Tie) is a Customer and Public Safety event that results in 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. The Risk Scenario (*i.e.*, a potential reasonable worst-case scenario used to assess the residual risk impacts and frequency) is assessed for SoCalGas' 2018 Enterprise Risk Registry. This scenario does not

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[11] *Id.* at Attachment A, A-11 ("Definition of Risk Events and Tranches").

[12] *Id.* at Attachment A, A-11 ("Bow Tie").

necessarily address all Drivers/Triggers and Potential Consequences and does not reflect actual or threatened conditions.

D. Potential Drivers/Triggers[13]

The SA Decision[14] instructs the utility to identify which element(s) of the associated bow tie each mitigation addresses. When performing the risk assessment for this risk, SoCalGas identified potential leading indicators, referred to as drivers. These include, but are not limited to:

- **D.T1 – Employees who deviate from Company policy or procedure**: Failure of an employee to adhere to Company safety policies or procedures could result in a safety-related event.
- **DT.2 – Employee inexperience or lack of training**: Failure to use experienced employees or provide the proper training to perform the necessary work may lead to an increase in the occurrence of safety incidents.
- **DT.3 – Condition of customer premises/gas equipment poses hazard to customers**: Unsafe customer premises or equipment may increase the likelihood of a safety event.
- **DT.4 – Condition of Company facilities:** The state or condition of Company facilities, if not properly maintained, could lead to a safety event.
- **DT.5 – Distracted driving**: Use of cellphones or other types of distractions while driving can lead to serious injuries and/or fatalities

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 or triggers listed above were to result in an incident, the potential consequences, in a reasonable worst-case scenario, could include:

- Serious injuries[15] and/or fatalities;

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

[14] D.18-12-014 at Attachment A, A-11 ("Bow Tie").

[15] For purpose of this 2019 RAMP Report, "serious injury" is broadly defined as an injury that requires an overnight hospital stay.

- Property damage;
- Adverse litigation;
- Penalties and fines; and
- Erosion of public confidence.

These potential consequences were used in the scoring of the Customer and Public Safety Risk that occurred during the development of SoCalGas' 2018 enterprise risk registry.

IV. RISK QUANTIFICATION FRAMEWORK

The SA Decision sets minimum requirements for risk and mitigation analysis in RAMP,[16] including enhancements to the Interim Decision 16-08-018.[17] SoCalGas 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: Pre-Mitigation Analysis Risk Quantification Scores[18]

Customer &Public Safety	Low Alternative	Single Point	High Alternative
Pre-Mitigation Risk Score	98	**765**	1875
LoRE	**0.5**		
CoRE	204	**1586**	3888

[16] D.18-12-014 at Attachment A.

[17] *Id.* at 2-3.

[18] 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.

A. Risk Scope & Methodology

The SA Decision requires a pre- and post-mitigation risk calculation.[19] The section below provides an overview of the scope and methodologies applied for the purpose of risk quantification.

Table 5: Risk Quantification Scope

In-Scope for purposes of risk quantification:	The risk of motor vehicle incidents or after-meter incidents, which results in significant consequences including injuries, fatalities and/or facility damage.
Out-of-Scope for purposes of risk quantification:	The risk of incidents that could affect customers and/or the public already captured in other RAMP risks, and other incidents not described as "In Scope."

Pursuant to Step 2A of the SA Decision,[20] the utility is instructed to use actual results, available and appropriate data (*e.g.*, Pipeline and Hazardous Materials Safety Administration data). The SoCalGas Customer and Public Safety risk assessment identified two main risks: SoCalGas motor vehicle risk and SoCalGas after-meter risk. The motor vehicle risk assessment primarily utilized data from the Department of Transportation (DOT), National Highway Traffic Safety Administration (NHTSA), and Federal Highway Administration (FHA).

Fatality Analysis Reporting System (FARS) historical data from the DOT was used to determine the fatal accident rate per year by vehicle type. The General Estimates System (GES) historical data from the National Automotive Sampling System (NASS) was used to calculate nonfatal incident rates per year by vehicle type. To determine fatal and nonfatal incident rates per year for SoCalGas, the national average incident rate per mile per year was applied to the vehicle miles traveled (VMT) at the company. The safety and financial consequence distributions were generated based on both FARS and GES historical data. A Monte Carlo simulation was used to yield the probabilistic safety and financial consequences for SoCalGas motor vehicle risk.

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[19] D.18-12-014 at Attachment A, A-11 ("Calculation of Risk").

[20] *Id.* at Attachment A, A-8 ("Identification of Potential Consequences of Risk Event").

The safety and financial consequence of SoCalGas after-meter risk was estimated based on SME input.

B. Sources of Input

The SA Decision[21] directs the utility to identify Potential Consequences of a Risk Event using available and appropriate data. The inputs utilized as part of this assessment are listed below.

- Fatality Analysis Reporting System (FARS)
  - Agency: U.S. Department of Transportation
  - Link: https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars
- General Estimates System (GES) of National Automotive Sampling System (NASS):
  - Agency: U.S. Department of Transportation
  - Link: https://www.nhtsa.gov/research-data/national-automotive-sampling-system-nass
- The Economic and Societal Impact of Motor Vehicle Crashes, May 2015 (Revised)
  - Agency: U.S. Department of Transportation, National Highway Traffic Safety Administration
  - Link: https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812013
- Shares of Highway Vehicle-Miles Traveled by Vehicle Type, 1970–2015
  - Agency: Oak Ridge National Laboratory
  - Link: https://tedb.ornl.gov/wp-content/uploads/2019/03/Edition36_Full_Doc.pdf

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."[22] This section describes SoCalGas' Risk Mitigation Plan by each selected control and mitigation for this risk, including the rationale supporting each selected control and mitigation.

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[21] *Id.* at Attachment A, A-8 ("Identification of the Frequency of the Risk Event").

[22] *Id.* at Attachment A, A-14 ("Mitigation Strategy Presentation in the RAMP and GRC").

As stated above, SoCalGas' Customer and Public Safety risk includes the in-scope motor vehicle incidents and after-meter incidents, as well as other customer safety incidents that result in fatality, injury, and/or facility damage. The Risk Mitigation Plan discussed below includes controls and mitigations that are expected to continue for the period of SoCalGas' Test Year 2022 GRC cycle.[23] 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. SCG-4-C1 – Employee Formal Skills Training

Training is an integral part of how SoCalGas mitigates the Customer and Public Safety Risk. All field service technicians and call center customer service representatives (CSRs) must complete and pass mandatory training.

The Customer Contact Center (CCC) is generally the first point of Company contact for emergencies; as such it provides a critical support role in the safety of the SoCalGas system and the public's well-being. CSRs working in the CCC are trained to answer notifications for multiple types of emergencies in which gas leak calls are given top priority in the CSR call queue. This training is crafted to teach CSRs to discern different types of emergencies and manage calls to confirm appropriate field technician or emergency response personal are sent in response to the particular type of situation. Additionally, the CSRs at the CCC help mitigate risk to customer and public safety during non-emergency situations by issuing customer-requested appliance inspection and maintenance orders.

The orders taken in the CCC are prioritized and then completed by field service technicians. For field service technicians, training includes classroom and situational field exercises to educate employees on safety processes and procedures to perform work in a manner that meets all applicable rules, regulations and SoCalGas internal policies and procedures. Formal skills training reduces the likelihood of employees deviating from Company policy or procedure because field service technicians do not work customer orders on their own until they are fully trained to do their jobs adequately and

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[23] *Id.* at 16-17 and 33. A "Control" is defined as a "[c]urrently established measure that is modifying risk." A "Mitigation" is defined as a "[m]easure or activity proposed or in process designed to reduce the impact/consequences and/or likelihood/probability of an event."

safely. Additionally, field instructors provide field service technicians with formal field training and perform job observations. Once the field service employees successfully pass formal training, they are permitted to work customer orders on their own. A follow-on quality assurance assessment is then performed to confirm that the field service employees have retained the training knowledge and skills required to safely perform their duties.

B. SCG-4-C2 – Natural Gas and Appliance Testing

SoCalGas performs Natural Gas Appliance Testing (NGAT) in homes that receive air infiltration measures such as weather-stripping, caulking, or window and door repair as part of the services offered under the Energy Savings and Assistance Program (ESAP).[24] Following the completion of energy efficiency work, the SoCalGas contractor performing the ESAP service must inspect every natural gas appliance in the home to help mitigate exposure to carbon monoxide (CO). The inspection process involves an operational evaluation of each gas appliance as well as the measurement of carbon monoxide levels within the living space. This safety precaution is conducted to verify conditions are suitable for building occupants, which mitigates risk to customer and public safety.

C. SCG-4-C3 – Leak and Emergency Order Response

Customers call SoCalGas' CCC to request service for many different reasons, including potential gas leaks and other emergency orders. As previously stated, the CCC is generally the first point of Company contact for emergencies; as such it provides a critical support role in the safety of the SoCalGas system and the public's well-being. Gas leak calls are given top priority in the CSR call queue and CSRs are trained to discern the different types of emergencies and manage calls to see that appropriate field personnel are sent in an order prioritizing the necessary response in accordance with the Code of Federal Regulations (CFR) 49 Part § 192.615.[25]

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[24] *See* A.19-11-006, Application of Southern California Gas Company for Approval of its Energy Savings Assistance and California Alternate Rates for Energy Programs and Budgets for Program Years 2021-2026 (November 4, 2019).

[25] *See* 49 CFR Part 192, § 192.615 Emergency Plans.

These types of requests include, but are not limited to:

- General Leaks – at appliances, at gas meters, inside structures-source unknown, ignited leaks;
- Outside Leaks- damaged gas lines or meter, dying vegetation;
- Carbon Monoxide (CO) – customer experiencing symptoms or not, CO safety checks, CO Alarm/Detectors activated or not;
- Miscellaneous Safety-Related issues – Odor Fade, appliance recalls; and
- Other Urgent Situations – water heater not cycling off (water steaming), bomb threats.

The CCC also helps to mitigate risk to customer and public safety during non-emergency situations by issuing customer requested appliance inspection and maintenance orders.

Field service technicians respond to the customer orders taken by the CCC. They are trained to rectify safety hazards on customer premises in order to maintain safe operations of Company facilities. Some of these customer requests are safety related, such as checking appliances upon move in. However, any customer call about a gas leak, both hazardous and non-hazardous, is dispatched to a field service technician to perform a gas leak investigation. SoCalGas requires that all hazardous and non-hazardous leak orders are responded to by a field technician within the same day of receiving the customer call, with the response to the highest priority gas leak orders within 30 minutes.

D. SCG-4-C4 – Gas Consumption Analytics

SoCalGas continuously analyzes and monitors gas consumption on all meters that have been advanced to identify any potentially unsafe anomalies in consumption. Prior to the installation of the Advanced Metering Infrastructure (AMI) technology, gas consumption at premises with installed security devices was identified as part of the billing exception processes by the Customer Information System (CIS). Billing analysts would be required to evaluate and schedule additional visits to the meter if there is unusual gas consumption that is not associated with the customer's historical usage patterns. With AMI, SoCalGas can now identify and investigate these possibly unsafe situations within the same day that unusual consumption is identified, reducing the risk of a customer or public safety incident.

Gas Consumption Analytics furthers the safe operation of SoCalGas and customer equipment (*e.g.,* meter, regulator) by allowing SoCalGas to actively recognize and investigate potentially unsafe conditions, such as equipment failures, gas leaks at unoccupied facilities, or unsafe natural gas diversion. Safety is a SoCalGas core value and strategies to address tampering of gas devices by non-SoCalGas personnel reduces the potential for hazardous conditions that could be detrimental to customers and/or to the public.

E. SCG-4-C5 – Customer Services Field - Leak Detection Equipment

Job-specific tools are required by service field technicians to perform work safely. SoCalGas provides specialized equipment to its field service technicians to detect leaks inside and outside customer homes and businesses.

A team is in place to review and evaluate proposed changes and support continuous improvement. The team works closely with potential suppliers, manufacturers and various departments within SoCalGas to verify that the functional requirements of the leak detectors are met. The costs associated with the leak detection equipment currently in use, are included in this category.

F. SCG-4-C6 – Quality Assurance and Control Programs

As referenced in Section SCG-4-C1, SoCalGas performs regular Quality Assurance (QA) checks to assess the work quality of its field and CCC personnel. The QA function regularly includes in-field sampling of completed customer service field orders to assess employee work quality and compliance with Company policies and procedures. QA Specialists receive random orders previously completed by customer service field representatives and make in-home visits. The purpose of the QA program is to have QA Specialists verify that customer service field representatives recognize and address safety issues with customer-owned appliances and Company-owned equipment.

The CCC QA program involves sampling voice calls to better assess employee work quality and compliance with Company policies and procedures. The efforts of both QA programs promote improved consistency in adherence to policies and processes and a reduction in work errors that may pose a risk to customer and public safety.

G. SCG-4-C7 – Policy, Procedures & Standards

SoCalGas develops and maintains formal written procedures, processes, and standards. These materials provide guidance to employees and document the manner in which work is to be performed. Systems are in place to track employee training (*e.g.*, DOT Operator Qualification (Op Qual) certification, facility site inspections (Uniform Building Code requirements per Assembly Bill (AB) 32) and administration of the Company's Environmental and Safety Compliance Management Program (ESCMP).

As discussed in further detail in the Employee Safety Chapter (SCG-2) and Chapter RAMP-F, ESCMP is an environmental, health, and safety management system to plan, set priorities, inspect, educate, train, and monitor the effectiveness of environmental, health, and safety activities in accordance with the internationally accepted standard, International Organization for Standardization (ISO) 14001. ISO 14001 is the international standard that specifies requirements for an effective environmental management system. Included in the ISO 14001 standards are Consumer Product Safety Commission published recalls on gas appliances and equipment. SoCalGas continually monitors the ISO 14001 standards to confirm that Company standards are current. Company policies, procedures and standards are always accessible to field service technicians on their Mobile Data Terminals,[26] enabling them to safely do their jobs with the most current information.

H. SCG-4-C8 – Collect Customer Contact Data

Customer Contact Center service representatives (CSRs) confirm and collect updated customer contact information during a service call. This data provides SoCalGas with contact information that allows it to call the customer ahead of a service call or to provide information in case of an emergency. On all calls that involve direct interaction between CSRs and customers, CSRs will collect/verify customer email addresses and mobile phone numbers. Gathering this additional information better enables SoCalGas to communicate with customers in the event of a natural disaster, emergency incident or when property access is required for conducting maintenance on company facilities.

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[26] SoCalGas is currently in the process of transitioning from Mobile Data Terminals to iPhone technology.

I. SCG-4-C9 – Safe Driving Programs

SoCalGas' safe driving programs include the Employer Pull Notice (EPN) program and the AlertDriving® program. These two programs are discussed in greater detail in SoCalGas' Employee Safety Risk Chapter (SCG-2) but have relevancy to Customer and Public Safety risk. The California DMV Pull Notice Program allows employers to monitor driver's license records of employees who drive on the Company's behalf. The EPN is currently used to monitor the driving records of the Company's commercial (Class A) drivers. The EPN is designed to promote driver safety through the ongoing review of driver records.

The AlertDriving program is designed to enhance the driving skills of service technicians. The program teaches drivers to proactively see, think and act their way through various driving environments, challenges and changes that exist regardless of where they travel or the vehicles they operate. These principles enable employees to be better drivers to keep themselves safe and in doing so, the public safe as well.

J. SCG-4-C10 – DCU Pole Inspections

SoCalGas conducts cyclical inspections of Data Collector Units (DCUs) and poles to identify structural problems and/or hazards in support of public safety and a reliable network communication. Although SoCalGas is only mandated to inspect SoCalGas-owned poles, SoCalGas goes above and beyond and inspects all DCU units on an annual basis, including third party poles. The annual inspections support public safety. The pole inspection process identifies structural problems and/or hazards in support of public safety and system reliability.

Qualified SoCalGas field resources perform this work to comply with the CPUC's General Orders.[27] Inspection results are logged and maintained by the Network Maintenance & Construction team for compliance reporting.

K. SCG-4-M1 –Underground Leak Detection Tool

As previously stated for Customer Services Field - Leak Detection Equipment (SCG-4-C5), job-specific tools are required by service field technicians to perform work safely. SoCalGas customer

[27] CPUC General Orders 95 and 165.

service field employees currently utilize the Sensit G2 Multi-Gas Detector for indoor and outdoor leak detection and carbon monoxide detection. SoCalGas Gas Operations uses a different gas detection tool for underground detection purposes (GMI Gasurveyer 500). SoCalGas Customer Services is working to deploy a new underground leak detection tool (GMI Gasurveyor 700). Since both the Gas Surveyor 500 and 700 utilize the same detection principles, the new tool will provide greater consistency and reliability for company underground leak detection.

VI. POST-MITIGATION ANALYSIS

As described in Chapter RAMP-D, SoCalGas has performed a Step 3 analysis where necessary pursuant to the SA Decision. SoCalGas has not calculated an RSE for activities beyond the requirements of the SA Decision but provides 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 Decision[28] 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).

SoCalGas' Customer and Public Safety program consists of programs aimed to reduce risk of injury or fatality to customers or the public. SoCalGas grouped similar activities with like risk profiles into mitigation programs. Since each of SoCalGas' Customer and Public Safety risk mitigation activities have the same goal of reducing the risk of injury or fatality to our customers and the public, all controls and mitigations have the same risk profile and are not further tranched. Further, a single tranche is appropriate for the Customer and Public Safety Risk event as there is no logical disaggregation of assets or systems related to the controls presented in the Risk Mitigation Plan.

[28] D.18-12-014 at Attachment A, A-11 ("Definition of Risk Events and Tranches").

B. Post-Mitigation/Control Analysis Results

1. SCG-4-C1 – Employee Formal Skills Training

a. Description of Risk Reduction Benefits

The CCC helps to mitigate risk to customer and public safety during non-emergency situations by scheduling customer requested appliance inspection and maintenance orders. Training for CSRs is critical because the CCC is often the first point of contact during an emergency. With proper training, CSRs can better recognize and escalate public and employee safety issues. Training for field service technicians also helps to confirm that technicians operate in a safe and compliant manner.

Formal skills training must be completed and passed by all field service technicians and call center CSRs. Training gives CSRs the ability to identify different types of emergencies and determine the appropriate response to the situation. Training for field service technicians includes classroom and situational field exercises. After training is conducted, a QA process is performed to confirm that employees have retained their knowledge.

As further discussed in the Employee Safety Chapter (SCG-2), SoCalGas provides numerous employee safety training courses to educate employees across the entire Company how to safely perform their jobs.

b. Elements of the Risk Bow Tie Addressed

SCG-4-C1 helps to address the following elements of the Risk Bow Tie: Employees who deviate from Company policy or procedure (DT.1), Employee inexperience or lack of training (DT.2), Serious injuries and/or fatalities (PC.1), Property Damage (PC.2), Adverse litigation (PC.3), Penalties and fines (PC.4) and Erosion of public confidence (PC.5).

2. SCG-4-C2 – Natural Gas Appliance Testing

a. Description of Risk Reduction Benefits

SoCalGas conducts carbon monoxide (CO) testing on homes weatherized through the Energy Savings Assistance (ESA) Program in accordance with Statewide Energy Savings Assistance Program Installation Standards and the Statewide Energy Savings Assistance Program Policy and Procedures Manual. CPUC directives order SoCalGas to charge the costs for the Natural Gas and Appliance Testing (NGAT) program to base rates rather than to the public purpose funds. Additionally, the frequency of

NGAT is expected to increase in proportion to the forecast increase proposed in the 2019 Low Income Application (A.)19-11-006, subject to Commission Decision.

In order to help safeguard conditions for customers, NGAT involves an operational evaluation of each gas appliance and the measure of carbon monoxide level and is performed after the completion of energy efficiency work. NGAT is required on a residence due to weatherization measures, such as air sealing and increased home insulation, which increase the risk of CO exposure for customers. Inspection work is conducted by pre-qualified contractors on each home where weatherproofing work has been completed. These contractors are required to hold and maintain an active C-20 Warm-Air Heating, Ventilating, and Air-Conditioning license that is issued by the Contractors State License Board (CSLB).

b. Elements of the Risk Bow Tie Addressed

SCG-4-C2 helps to address the following elements of the Risk Bow Tie: Condition of customer premise or equipment (DT.3), Condition of Company facilities (DT.4), Serious injuries and/or fatalities (PC.1), Property Damage (PC.2), Adverse litigation (PC.3), Penalties and fines (PC.4).

3. SCG-4-C3 – Leak and Emergency Order Response

a. Description of Risk Reduction Benefits

The SoCal Gas CCC is the first point of contact for potential gas-related emergencies, including gas leaks. If a gas leak is called in to the CCC, a CSR follows a script designed to obtain information that allows the location and the severity of the leak to be determined. The CSR will then generate a gas leak investigation order. The order will be worked within the same day by a SoCalGas Technician, as stated above in Section V.

Based on the information provided by the customer, CSRs determine whether a potential leak is an emergency. In 2018, emergency calls made up 11.9% of the total number of calls received by the CCC. The total number of emergency calls amounted to 518,086 that year. The average call answer time for emergency orders is 6 seconds with an average response time of field technicians to the gas leak at 22.7 minutes. This response time is faster than the company response time goal of 30 minutes. With

efficient, trained and intelligent leak and emergency order response, SoCal Gas can help mitigate public and employee harm associated with gas emergencies.

b. Elements of the Risk Bow Tie Addressed

This control addresses the following elements of the Risk Bow Tie: Condition of customer premise or equipment (DT.3), Condition of Company facilities (DT.4), Serious injuries and/or fatalities (PC.1), Property Damage (PC.2), Adverse litigation (PC.3), Penalties and fines (PC.4).

4. SCG-4-C4 – Gas Consumption Analytics

a. Description of Risk Reduction Benefits

With AMI technology, SoCalGas can monitor gas usage to identify irregular usage patterns and investigate potentially unsafe conditions more quickly. Elements of Gas Consumption Analytics include the comparison of real-time gas consumption with prior consumption patterns, customer behavior, and the results from prior field visits.

Gas Consumption Analytics improves SoCalGas' ability for prompt identification of gas leaks and can lead to a timelier response time for remediation. With AMI technology, SoCalGas can proactively identify potential leaks based upon gas usage spikes that may have otherwise been missed. In 2018, AMI technology identified 4,952 customer facilities with unusual gas consumption levels that were undetected by customers. Typically, these were facilities that were vacant with no customers on premise to smell a gas leaks or the customer was unaware that appliances were unintentionally left on. Once a facility with highly unusual gas consumption is identified by AMI technology, the customer is contacted, and a technician is dispatched for further investigation.

AMI technology can also detect potential gas diversion. In 2018, AMI technology identified 356 customer facilities investigated by CSF Operations technicians for tampering. When work on a customer facility by a non-SoCalGas technician is detected, an ETR (Gas Service Technician) is sent to the site within two business days for investigation and/or remediation. In many instances, situations were resolved that could have led to unsafe conditions for the customer and the public.

b. Elements of the Risk Bow Tie Addressed

The technology described within SCG-4-C4 helps reduce customer and public safety risk, and addresses the following elements of the Risk Bow Tie: Condition of customer premise or equipment

(DT.3), Condition of Company facilities (DT.4), Serious injuries and/or fatalities (PC.1), Property Damage (PC.2), Adverse litigation (PC.3), Penalties and fines (PC.4) and Erosion of public confidence (PC.5).

5. SCG-4-C5 – Customer Services Field – Leak Detection Equipment

a. Description of Risk Reduction Benefits

SoCalGas uses job-specific tools so that field technicians can perform work safely and efficiently. Leak detection equipment is used by field technicians at customer premises to detect natural gas leaks on the customers natural gas systems. Currently, the Company uses the Sensit G2 Multi-Gas Detector® for detection of indoor leaks and rotameter technology to test for leakage on customer natural gas systems.

As described previously, the Company is continually looking to identify new tools and technologies. SoCalGas is currently piloting Crystal Gauges technology to detect leaks on customer natural gas systems. The Crystal Gauges provide a greater level of accuracy than the rotameter technology. The preliminary results of the pilot are positive – not only was accuracy increased, but the Crystal Gauges were easier to use and to maintain than the rotameters.

b. Elements of the Risk Bow Tie Addressed

SCG-4-C5 addresses the following elements of the Risk Bow Tie: Condition of customer premise or equipment (DT.3), Condition of Company facilities (DT.4), Serious injuries and/or fatalities (PC.1), Property Damage (PC.2), Adverse litigation (PC.3), Penalties and fines (PC.4) and Erosion of public confidence (PC.5).

6. SCG-4-C6 – Quality Assurance and Control Programs

a. Description of Risk Reduction Benefits

Quality Assurance (QA) checks provide valuable information on the quality of service to customers in the field and on customer service calls in the CCC. In the Field QA Program, an "after-the-completion-of-the-order" assessment is made to verify that the field service technician completed field orders in accordance with Company policies and procedure. In 2018, Field QA Specialists inspected 11,877 field orders, which reflected 99.87% of the inspected orders without any hazardous safety errors.

The data obtained by the QA Program is reported on a monthly basis. Feedback is provided to the impacted employees so they can improve their performance. The data obtained is also analyzed for trends. The data trends are used to identify areas where additional training might be needed.

In the CCC, QA Specialists can listen to CSR/customer calls, making assessments on the quality of the service provided. CSR responses to safety related calls are assessed on key elements that include: accurate analysis of safety risks, providing customers with appropriate safety advice, and the CSR's adherence to the Customer Service Order (CSO) flow chart. The flow chart contains an established process outlining the requirements for handling customer calls by the CSRs. Like the Field QA program, the CCC QA Specialist provides feedback to the CSR so that performance can be improved.

For purposes of an RSE analysis, Company SMEs looked at existing controls, considered the historical improvement achieved as a result of performing these activities, and used that in considering the potential increase in safety incidents if those activities ceased to be performed. As such, the Company expects to continue to achieve higher levels of accuracy as a result of the QA program and therefore expects to receive an additional 12% risk reduction[29] by continuing to perform these activities. Further, without performing these activities, the Company could potentially see a decrease in other programs' effectiveness, such as the ability to deploy focused employee training where needed as a result of findings from the QA program.

b. Elements of the Risk Bow Tie Addressed

SCG-4-C6 allows for increased consistency in adherence to policies and processes and a reduction in work errors that may risk customer and public safety. This control addresses the following elements of the Risk Bow Tie: Employees who deviate from Company policy or procedure (DT.1), Employee inexperience or lack of training (DT.2), Serious injuries and/or fatalities (PC.1), Property Damage (PC.2), Adverse litigation (PC.3), Penalties and fines (PC.4) and Erosion of public confidence (PC.5).

[29] Please refer to the accompanying RSE workpapers for additional detail.

c. Summary of Results

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	**LoRE**	**0.482**		
	CoRE	204	**1586**	3888
	Risk Score	98	**765**	1875
Post-Mitigation	**LoRE**	**0.494**		
	CoRE	207	**1588**	3890
	Risk Score	102	**785**	1924
	RSE	2.74	**15.06**	35.60

7. SCG-4-C7 – Policy, Procedures & Standards

a. Description of Risk Reduction Benefits

The purpose of policies, procedures, and standards is to guide and direct all employees to work safely and to prevent injury to themselves and others. The employee safety standards provide guidance on the manner in which work is to be performed and how to conduct work safely in the workplace. As new equipment is incorporated, or changes occur in the organization, policies and procedures are updated to reflect these adjustments. Updates to policies are performed by the Customer Service Field Department. The policies at SoCalGas are continuously updated, depending on how frequently changes are made in the organization, with all policies reviewed and updated as necessary at least every five years.

SoCalGas has created procedures, standards, and various programs to protect the safety of work activities. An example includes, the Environmental Safety Compliance Management Program (ESCMP), which is used to monitor the effectiveness of environmental, health and safety activities in accordance with ISO14001. SoCalGas also conducts self-assessments and inspections for hazardous environmental factors and monitors the compliance activities for Proposition 65.

b. Elements of the Risk Bow Tie Addressed

SCG-4-C7 addresses the following elements of the Risk Bow Tie: Employees who deviate from Company policy or procedure (DT.1), Employee inexperience or lack of training (DT.2), Condition of customer premise or equipment (DT.3), Condition of Company facilities (DT.4), Distracted Driving (DT.5), Serious injuries and/or fatalities (PC.1), Property Damage (PC.2) and Erosion of public confidence (PC.5).

8. SCG-4-C8 – Update Customer Contact Data

a. Description of Risk Reduction Benefits

Customer contact data collected by CSRs provides SoCalGas with information that allows it to remind and contact the customer ahead of a service call or to contact customers in the event of an emergency. CSRs now solicit mobile phone information on all calls, both emergency and non-emergency. For example, communication with customers is important in the event of a natural disaster or other emergency situations. It can also provide customers with timely announcements of pipeline inspections, leakage surveys, and other safety-related activities. During live calls, CSRs will collect and verify mobile phone numbers and also email addresses. Accurate customer data obtained during these calls also provides contact information to technicians who may need access to facilities for safety-related maintenance activities.

b. Elements of the Risk Bow Tie Addressed

SCG-4-C8 addresses the following elements of the Risk Bow Tie: Employees who deviate from Company policy or procedure (DT.1), Employee inexperience or lack of training (DT.2), Distracted Driving (DT.5), Serious injuries and/or fatalities (PC.1), Property Damage (PC.2) and Erosion of public confidence (PC.5).

9. SCG-4-C9 – Safe Driving Programs

a. Description of Risk Reduction Benefits

Driver safety programs enable SoCalGas employees to be better drivers to keep themselves safe and by doing so, keep the public safe as well. The safety programs educate employees on driving techniques and the principles that decrease the risk of motor vehicle incidents and traffic violations. The AlertDriving program focuses on reducing service technicians' driving risk by enhancing their driving

skills. This training involves practical exercises that require the technicians to think about the challenges that exist in various driving environments, helping them to make informed decisions and anticipate situations.

The Employer Pull Notice (EPN) program is another safe driving program. This program enables SoCalGas to electronically receive the driving records of the Company's commercial (Class A) drivers. This allows SoCalGas to monitor those people who drive on behalf of the organization. Monitoring the records of these employees helps SoCalGas to determine if there are any convictions, accidents, and/or unsafe driving behaviors. The EPN provides SoCalGas a way to stay up to day with drivers' records, notifying the Company if any issues arise. Access to these notices helps SoCalGas identify where the Company should take corrective measures with the particular employee driver to reduce the likelihood of incidents (*see* SoCalGas' Employee Safety Chapter, SCG-2, risk mitigation activity SCG-2-C5, for RSE analysis).

b. Elements of the Risk Bow Tie Addressed

SCG-4-C9 addresses the following elements of the Risk Bow Tie: Employees who deviate from Company policy or procedure (DT.1), Distracted Driving (DT.5), Serious injuries and/or fatalities (PC.1) and Property Damage (PC.2).

10. SCG-4-C10 – DCU Pole Inspections

a. Description of Risk Reduction Benefits

Annual inspections of Data Collector Units (DCUs) and poles are designed to identify structural problems or hazards and are performed to support public safety and the reliability of the system. Although SoCalGas is only responsible for inspecting company-owned poles, the Company has chosen to annually inspect its entire DCU infrastructure, including DCUs that are attached to third-party poles and indoor DCUs not attached to poles. Qualified field resources who perform the annual inspections log their inspection records. These records are maintained by the Maintenance & Construction team and are reported to the CPUC.

In 2018, SoCalGas inspected 4,323 DCU poles, which comprises 100% of the total DCU infrastructure. These inspections have helped SoCalGas proactively identify issues and hazards before

the DCU stops communicating. Therefore, the DCU inspections are beneficial from a public safety, compliance, and network stability standpoint.

b. Elements of the Risk Bow Tie Addressed

SCG-4-C10 addresses the following elements of the Risk Bow Tie: Condition of customer premise or equipment (DT.3), Condition of Company facilities (DT.4), Serious injuries and/or fatalities (PC.1), Property Damage (PC.2), Adverse litigation (PC.3), Penalties and fines (PC.4) and Erosion of public confidence (PC.5).

11. SCG-4-M1 –Underground Leak Detection Tool

a. Description of Risk Reduction Benefits

As previously stated, SoCalGas uses job specific tools that allow field technicians to perform their work safely. In addition to above-ground leak detection tools that are currently being utilized by technicians, SoCalGas is planning to upgrade the gas service technician's current underground leakage detection tool with the state of the art GMI Gasurveyor 700. The GMI Gasurveyor 700 is equipped with an intake pump and methane-specific infrared technology to detect leaks. The instrument is intended to be used for investigating all outdoor leakage orders.

The GMI Gasurveyor 700 meets all compliance safety and operational requirements and implementation of this unit supports the company's adherence to all FERC, PHSMA and CPUC rules and regulations. Upgrading to the GMI Gasurveyor 700 will provide customers and employees with consistent and safe leak detection.

b. Elements of the Risk Bow Tie Addressed

SCG-4-M1 will address the following elements of the Risk Bow Tie: Condition of customer premise or equipment (DT.3), Condition of Company facilities (DT.4), Serious injuries and/or fatalities (PC.1) and Property Damage (PC.2).

VII. SUMMARY OF RISK MITIGATION PLAN RESULTS

SoCalGas' Risk Mitigation Plan considers recent trends related to Customer and Public Safety, affordability impacts, possible labor constraints and the feasibility of mitigations. SoCalGas has performed RSEs, in compliance with the SMAP decisions and the SA, however, selecting activities for mitigating risks can be influenced by other factors including funding, labor resources, technology,

planning and construction lead time, 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 the RSE.

SoCalGas 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 below were estimated using assumptions provided by SMEs and available accounting data.

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Table 6: Risk Mitigation Plan Summary[30]

(Direct 2018 $000)[31]

ID	Mitigation/Control	2018 Baseline Capital[32]	2018 Baseline O&M	2020-2022 Capital[33]	2022 O&M	Total[34]	RSE[35]
SCG-4-C1	Employee Formal Skills Training	-	3,400	-	3,400 - 4,000	3,400 - 4,000	-
SCG-4-C2	Natural Gas Appliance Testing	-	2,200	-	2,100 - 2,600	2,100 - 2,600	-

[30] Recorded costs and forecasted ranges were rounded. Additional cost-related information is provided in workpapers. Costs presented in the workpapers may differ from this table due to rounding.

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

[32] 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.

[33] 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 SoCalGas' Test Year 2022 GRC Application.

[34] Total = 2020, 2021 and 2022 Capital + 2022 O&M amounts.

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

ID	Mitigation/Control	2018 Baseline Capital[32]	2018 Baseline O&M	2020-2022 Capital[33]	2022 O&M	Total[34]	RSE[35]
SCG-4-C3	Leak and Emergency Order Response	-	33,000	-	37,000 - 44,000	37,000 - 44,000	-
SCG-4-C4	Gas Consumption Analytics	-	500	-	700 - 900	700 - 900	-
SCG-4-C5	Customer Services Field – Leak Detection Equipment	-	4	-	10 - 14	10 - 14	-
SCG-4-C6	Quality Assurance	-	2,000	-	2,100 - 2,500	2,100 - 2,500	2.74 – 35.60
SCG-4-C7	Policy, Procedures & Standards	-	1,000	-	1,100 - 1,300	1,100 - 1,300	-
SCG-4-C8	Collect Customer Contact Data for Safety Communication	-	200	-	190 - 230	190 - 230	-
SCG-4-C9	Safe Driving Programs[36]	-	780	-	850 - 980	850 - 980	-

[36] These costs are also captured in the SoCalGas Employee Safety risk Chapter (SCG-2) of this RAMP Report; as discussed in Chapter RAMP-A, internal labor hours (*e.g.*, employee time to take training courses) are not captured in in the costs for this risk mitigation activity.

ID	Mitigation/Control	2018 Baseline Capital[32]	2018 Baseline O&M	2020-2022 Capital[33]	2022 O&M	Total[34]	RSE[35]
SCG-4-C10	DCU Pole Inspections	-	-	-	160 - 200	160 - 200	-
SCG-4-M1	Underground Leak Detection Tool	40	-	4,100 - 5,300	-	4,100 - 5,300	-
	TOTAL COST	**40**	**44,000**	**4,100 - 5,300**	**48,000 – 55,000**	**54,000 – 60,000**	

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

SoCalGas also notes there are activities related to the Customer and Public Safety risk that will be carried over to the GRC for which the costs are primarily internal labor (*e.g.,* time spent to perform training). The costs associated with these internal labor activities are not captured in this chapter because SoCalGas does not track training labor in this manner. These activities related to the Customer and Public Safety Risk are: Classroom time related to formal training and employee time for policy, procedures, and standards review.

SoCalGas is not calculating RSEs on the following activities:

Table 7: Summary of RSE Exclusions

Control/Mitigation ID	Control/Mitigation Name	Reason for No RSE Calculation
SCG-4-C1	Employee Formal Skills Training	Mandated activity per Cal. Labor Code § 6400, 8 CCR § 8350
SCG-4-C2	Natural Gas and Appliance Testing	Mandated activity per statewide policy[37]
SCG-4-C3	Leak and Emergency Order Response	Mandated activity per 49 CFR Part 192
SCG-4-C4	Gas Consumption Analysis	Non-scoped safety activity
SCG-4-C5	Customer Services Field – Leak Detection Equipment	Non-scoped safety activity
SCG-4-C7	Policy, Procedures & Standards	Mandated activity per 49 CFR Parts 192 and 195, CA Proposition 65
SCG-4-C8	Collect Customer Contact Data	Non-scoped safety activity

[37] Statewide Energy Savings Assistance Program 2017-2020 Cycle, Policy and Procedures Manual (September 2019), available at https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442457425

SCG-4-C9	Safe Driving Programs	RSE analysis included in Employee Safety Chapter (SCG-2)
SCG-4-C10	DCU Pole Inspections	Mandated activity per CPUC General Orders 95 and 165
SCG-4-M1	Underground Leak Detection Tool	Non-scoped safety activity

VIII. ALTERNATIVE MITIGATION PLAN ANALYSIS

Pursuant to D.14-12-025 and D.16-08-018, SoCalGas considered alternatives to the Risk Mitigation Plan for the Customer and Public Safety Risk. Typically, analysis of alternatives occurs when implementing activities to obtain the most effective result. The alternatives analysis for this Risk Mitigation Plan also considered modifications to the plan and constraints, such as operating, compliance and resource constraints.

A. SCG-4-A1 – Technician Refresher Training

SoCalGas considered increasing the frequency of employee refresher training as an alternative to the training program put forth in SoCalGas' Risk Mitigation Plan, above (Employee Formal Skills Training, SCG-4-C1). Currently, SoCalGas reviews policies and procedures on a periodic basis. The time interval is dependent upon the nature of the policy/procedure. When policies and procedures are updated, the updates are shared with gas service technicians. As mentioned previously, Company policies, procedures and standards are accessible to field service technicians on their Mobile Data Terminals.

This alternative proposal considered that all field service technicians complete periodic refresher training sessions at the Company's training facility at Pico Rivera. The refresher training would provide greater reinforcement of the gas service technician job skills. The training would include both classroom and hands-on scenario-based modules reinforcing that policies and procedures are being followed and confirming that updates to policies and procedures are understood.

This alternative proposal is not currently being implemented. The high percentage results seen for the service technician QA program validate the adequacy of the current practice of periodic policy and procedure reviews. Expanding the scope of training by adding periodic refresher training would

require additional resources. The cost of the increased resources was not projected to yield significant benefits.

1. Summary of Results

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	**LoRE**	**0.482**		
	CoRE	204	**1586**	3888
	Risk Score	98	**765**	1875
Post-Mitigation	**LoRE**	**0.482**		
	CoRE	204	**1586**	3888
	Risk Score	98	**764**	1874
	RSE	0.06	**0.31**	0.74

B. SCG-4-A2 –Post-Training Follow-Up Field Evaluations

Another alternative proposal considered by SoCalGas is for field service technicians to receive a scheduled, formal field evaluation with a QA Specialist 6-months after graduation from formal training. The QA Specialist would field ride with the employee to observe the employee's adherence to Company policies and procedures after their formalized training. Any deficiencies would be addressed with the employee. The findings from the field rides would be compiled to determine if formal training enhancements are needed and/or if the system wide refresher training is needed.

This alternative proposal is not currently being implemented. Like the previous proposal, the high percentage results seen for the service technician QA program validate the adequacy of the current practice of periodic policy and procedure reviews. Implementing the QA Program field rides would require additional resources. The cost of the increased resources was not projected to yield significant benefits.

1. Summary of Results

		Low Alternative	Single Point	High Alternative
Pre-Mitigation	**LoRE**	**0.482**		
	CoRE	204	**1586**	3888
	Risk Score	98	**765**	1875
Post-Mitigation	**LoRE**	**0.482**		
	CoRE	204	**1586**	3888
	Risk Score	98	**764**	1874
	RSE	0.26	**1.40**	3.31

Table 8: Alternative Mitigation Summary

(Direct 2018 $000)[38]

ID	Mitigation	2020-2022 Capital[39]	2022 O&M	Total[40]	RSE[41]
SCG-4-A1	SCG-4-A1 – Technician Refresher Training	-	466 - 595	466 - 595	0.06 – 0.74
SCG-4-A2	SCG-4-A2 –Post-Training Follow-Up Field Evaluations	-	104 - 132	104 - 132	0.26 – 3.31

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

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

[40] Total = 2020, 2021 and 2022 Capital + 2022 O&M amounts.

[41] 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	Name	Elements of the Risk Bow Tie Addressed
SCG-4-C1	Employee Formal Skills Training	DT.1, DT.2, PC.1, PC.2, PC.3, PC.4, PC.5
SCG-4-C2	Natural Gas and Appliance Testing	DT.1, DT.2, DT.3, DT.4, PC.1, PC.2, PC.3, PC4
SCG-4-C3	Leak and Emergency Order Response	DT.1, DT.2, DT.3, DT.4, PC.1, PC.2,PC.3, PC.4
SCG-4-C4	Gas Consumption Analytics	DT.3, DT.4, PC.1, PC.2,PC.3, PC.4, PC.5
SCG-4-C5	Customer Services Field - Leak Detection Equipment	DT.3, DT.4, PC.1, PC.2,PC.3, PC.4, PC.5
SCG-4-C6	Quality Assurance	DT.1, DT.2, PC.1, PC.2,PC.3, PC.4, PC.5
SCG-4-C7	Policy, Procedures & Standards	DT.1, DT.2, DT.3, DT.4, DT.5, PC.1, PC.2, PC.5
SCG-4-C8	Collect Customer Contact Data for Safety Communication	DT.1, DT.2, DT.5, PC.1, PC.2, PC.5,
SCG-4-C9	Safe Driving Programs	DT.1, DT.5, PC.1, PC.2
SCG-4-C10	Pole and Data Collector Unit (DCU) Inspections	DT.3, DT.4, PC.1, PC.2, PC.3, PC.4, PC.5
SCG-4-M1	Underground Leak Detection Tool	DT.3, DT.4, PC.1, PC.2