



Risk Assessment and Mitigation Phase

(Chapter SDG&E-Risk-5)

**Customer and Public Safety –
Contact with Electric Equipment**

May 17, 2021

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RISK: CUSTOMER AND PUBLIC SAFETY – CONTACT WITH ELECTRIC EQUIPMENT

I. INTRODUCTION

The purpose of this chapter is to present SDG&E’s risk control and mitigation plan for the Customer and Public Safety – Contact With Electric Equipment (Electric Contact) 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 Settlement 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 RAMP Report. On an annual basis, SDG&E’s Enterprise Risk Management (ERM) organization facilitates the Enterprise Risk Registry (ERR) process. The ERR process influenced how risks were selected for inclusion in this 2021 RAMP Report, consistent with the Settlement Decision’s directives, as discussed in Chapter RAMP-C.

The RAMP Report’s purpose is to present a current assessment of key safety risks and the proposed activities for mitigating those risks. The RAMP Report does not request funding. Any funding requests will be made in SDG&E’s General Rate Case (GRC) application. The costs presented in this 2021 RAMP Report are those costs for which SDG&E anticipates requesting recovery in its Test Year (TY) 2024 GRC. SDG&E’s TY 2024 GRC presentation will integrate developed and updated funding requests from the 2021 RAMP Report, supported by witness testimony.² This 2021 RAMP Report is presented consistent with SDG&E’s GRC presentation, in that the last year of recorded data (2020) provides baseline costs, and cost estimates are provided for years 2022-2024, as further discussed in Chapter RAMP-A. This 2021 RAMP Report presents capital costs as a sum of the years 2022, 2023, and 2024 as a three-year total; operations and maintenance (O&M) costs are only presented for TY 2024 (consistent with the GRC). Costs for each activity that directly address each risk are provided where those costs are available and within the scope of the analysis required in this RAMP Report.

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

Throughout this 2021 RAMP Report, activities are delineated between controls and mitigations, consistent with the definitions adopted in the Settlement Decision’s Revised Lexicon. A “control” is defined as a “[c]urrently established measure that is modifying risk.”³ 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.”⁴ Activities presented in this chapter are representative of those that are primarily scoped to address SDG&E’s Electric Contact risk; however, many of the activities presented herein also help mitigate other areas.

As discussed in Chapters RAMP-A and RAMP-C, SDG&E has endeavored to calculate an RSE for all controls and mitigations presented in this risk chapter. However, for controls and mitigations where no meaningful data or subject matter expert (SME) opinion exists to calculate the RSE, SDG&E has included an explanation why no RSE can be provided, in accordance with California Public Utilities Commission (CPUC or Commission) Safety Policy Division (SPD) staff guidance.⁵ Activities with no RSE value presented in this 2021 RAMP Report are identified in Section V below.

A. Risk Overview

The Electric Contact risk is the threat of harm due to contact with SDG&E’s electric equipment that is operating in a normal, electrified configuration, including serious injury, fatality, and property damage. For example, the Electric Contact risk includes the threat of harm from a customer contacting an energized electric overhead service drop to their residence with an aluminum ladder. To mitigate this risk, SDG&E strives to continually educate its customers and the public about the dangers and risks associated with working and being around electricity. Bill inserts, public service announcements, postings to social media platforms, paid media tactics such as television, print and digital advertising, and warning signage near electric facilities all serve to warn and communicate to the public about the care that needs to be taken in the vicinity of SDG&E’s electric equipment. The Electric Contact risk was not presented in the Company’s previous Risk Assessment Mitigation Phase (RAMP) Reports.

³ D.18-12-014 at 16.

⁴ *Id.* at 17.

⁵ See Safety Policy Division Staff Evaluation Report on PG&E’s 2020 Risk Assessment and Mitigation Phase (RAMP) Application (A.) 20-06-012 (November 25, 2020) at 5 (“SPD recommends PG&E and all IOUs provide RSE calculations for controls and mitigations or provide an explanation for why it is not able to provide such calculations.”).

SDG&E’s safety-related communications costs are not tracked in a manner that is specific to any particular risk, including the Electric Contact risk. For example, SDG&E’s budget codes for safety communications include costs that address the risks of contacting any electric equipment (whether it is operating in a normal or non-normal operating configuration) as well as the safety risks to the public or customers associated with the company’s gas operations. When preparing the data referenced in the Electric Contact risk chapter, SDG&E used best efforts to separate costs for communications specific to the Electric Contact risk from those that discuss electric and gas safety, only gas safety, or other types of electric safety risk. Therefore, the cost information provided in this chapter reflect SDG&E’s best estimate of costs related to Electric Contact risk mitigation, with the understanding that such costs may, in some cases, address other safety risks.

B. Risk Definition

For purposes of this RAMP Chapter, SDG&E’s Electric Contact risk is defined as the threat of harm to a customer, third-party, or member of the public from making contact with in-service electrical equipment that is operating in a normal configuration.

C. Scope

Table 1 below provides what is considered in scope for the Electric Contact risk in this RAMP Report.

Table 1: Risk Scope

In-Scope:	The threat of harm associated with contact with energized electrical equipment that is operating in a normal configuration.
Data Quantification Sources:	Company data and Subject Matter Expert (SME) judgment See Appendix B for additional information.

II. RISK ASSESSMENT

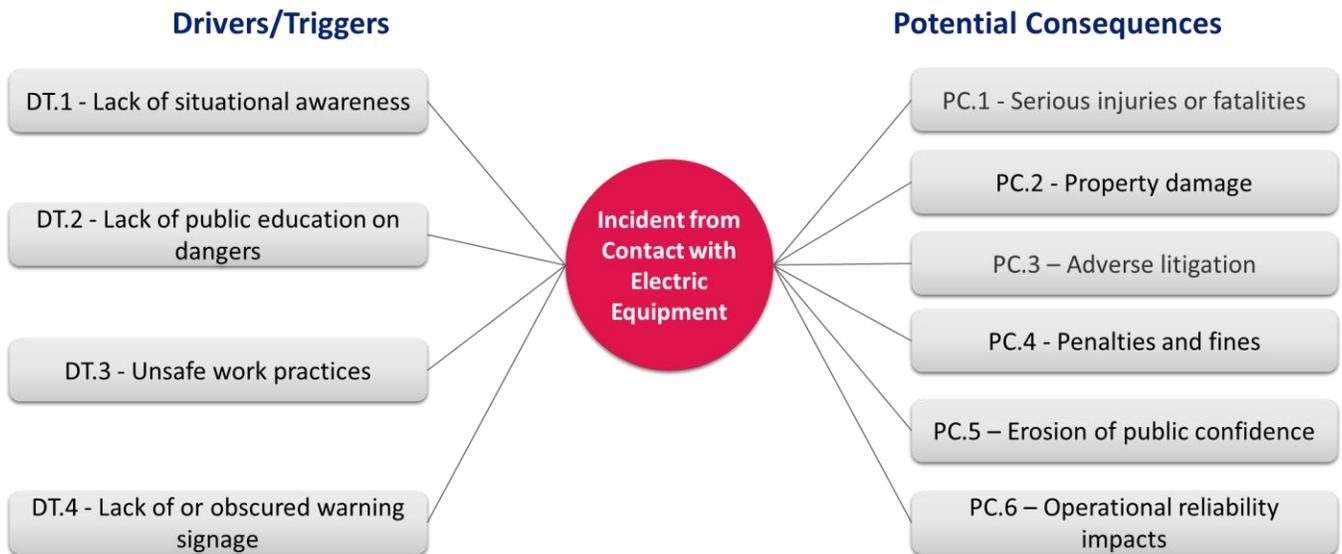
In accordance with the Settlement Decision,⁶ this section describes the risk bow tie, possible drivers, potential consequences, and the risk score for the Electric Contact risk.

⁶ D.18-12-014 at 33 and Attachment A at A-11 (“Bow Tie”).

A. Risk Bow Tie and Risk Event Associated with the Risk

The risk bow tie is a commonly used tool for risk analysis, and the Settlement Decision⁷ instructs the utility to include a risk bow tie illustration for each risk included in RAMP. As illustrated in the risk bow tie shown below in Figure 1, the risk event (center of the bow tie) is Electric Contact, the left side of the bow tie illustrates drivers/triggers that lead to Electric Contact, and the right side shows the potential consequences of Electric Contact. SDG&E applied this framework to identify and summarize the information provided in Figure 1. A mapping of each control and mitigation to the element(s) of the risk bow tie addressed is provided in Appendix A.

Figure 1: Risk Bow Tie



B. Cross-Functional Factors

Aspects of SDG&E’s Emergency Preparedness and Response and Pandemic Cross-Functional Factor are applicable to the Electric Contact risk. For example, the Emergency Operating Center may be activated in response to an Electric Contact incident.

⁷ *Id.*, Attachment A at A-11 (“Bow Tie”).

C. Potential Drivers/Triggers⁸

The Settlement Decision⁹ instructs the utility to identify which element(s) of the associated risk bow tie each mitigation addresses. When performing the risk assessment for Electric Contact, SDG&E identified potential leading indicators, referred to as drivers or triggers. These include, but are not limited to:

- **DT.1 – Lack of situational awareness:** The inability of an individual to identify and understand the dangers associated with contacting energized electrical equipment located within their present environment.
- **DT.2 – Lack of public education on dangers:** Insufficient and/or inadequate outreach to inform the public of the potential dangers associated with coming in contact with energized electrical equipment.
- **DT.3 – Unsafe work practices:** Performing work in a manner and/or location that compromises the safety of the individual as well as others.
- **DT.4 – Lack of or obscure warning signage:** Insufficient and/or inadequate use of visible signage to inform the public of potential dangers associated with coming in contact with energized electrical equipment.

D. Potential Consequences of Risk Event

Potential consequences¹⁰ 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:

- 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
- PC.6 - Operational reliability impacts

⁸ An indication that a risk could occur. It does not reflect actual or threatened conditions.

⁹ D.18-12-014, Attachment A at A-11 (“Bow Tie”).

¹⁰ D.18-12-014 at 16 and Attachment A at A-8 (“Identification of Potential Consequences of Risk Event”).

These potential consequences were used in the scoring of Electric Contact risk that occurred during the development of SDG&E’s 2020 Enterprise Risk Registry.

E. Risk Score

The Settlement Decision requires a pre- and post-mitigation risk calculation.¹¹ Chapter RAMP-C of this RAMP Application 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 2: Pre-Mitigation Analysis Risk Quantification Scores¹²

	LoRE	CoRE	Risk Score
Contact with Electric Equipment	1.17	1,197	1,396

SDG&E used company data to model the uncertainty of safety frequency and consequences and used SME judgment to model financial and stakeholder satisfaction. SDG&E used a Monte Carlo methodology to yield a probability distribution of safety and stakeholder satisfaction results per year. Specific data sources, underlying curves, and other supporting material will be provided in workpapers.

III. 2020 CONTROLS

This section “[d]escribe[s] the controls or mitigations currently in place” as required by the Settlement Decision.¹³ The activities in this section were in place as of December 31, 2020. Controls that will continue as part of the control and mitigation plan are identified in Section IV.

In addition to the controls discussed below, SDG&E performed various inspections of its electrical equipment, in accordance with programs such as the Company’s Corrective Maintenance Program (CMP), conducted pursuant to General Order 165. SDG&E has conducted field observations as part of its inspection programs, to confirm that assets are constructed and maintained per applicable Company standards. CMP and other inspections

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

¹² The term “pre-mitigation analysis,” in the language of the Settlement Decision, refers to required pre-activity analysis conducted prior to implementing control or mitigation activity (See D.18-12-014, Attachment A at A-12, “Determination of Pre-Mitigation LoRE by Tranche,” “Determination of Pre-Mitigation CoRE,” “Measurement of Pre-Mitigation Risk Score”).

¹³ Settlement Decision at 33.

performed by SDG&E are further discussed in the RAMP Chapters of Wildfire Involving SDG&E Equipment (SDG&E-Risk-1) and Electric Infrastructure Integrity (SDG&E-Risk-2).

A. C1: General Safety Communications

SDG&E’s electric safety communications strive to inform customers and the public about safety around electricity and electric equipment. Every year paid marketing efforts and direct communications are employed to try to reach people across the service territory in a variety of manners. Though the tactics listed below are the primary methods the company uses to educate the public about overall electric safety and contact with electric facilities, similar information may be embedded in safety messaging associated with other public education campaigns (*e.g.*, gas safety communications).

1. Social Media Posts

SDG&E uses organic (non-paid) social media to help educate customers with electric safety messaging and provide website links to additional content that customers can use to educate themselves about electric safety. Organic social media also refers to customers who follow the company on their social media channels (paid social media is another form of social media with a broader audience that gets served paid social-media advertisements across social media channels). The primary social media channels that are employed for organic posting include Facebook, Twitter, and Instagram.

2. Paid Media

SDG&E utilizes paid media on an annual basis to implement electric safety campaigns. Paid media refers to communication channels directly paid for by SDG&E to disseminate or advertise information to a wide audience. Examples of typical paid media tactics are listed in the table below. SDG&E uses paid media to promote electric safety information to customers and the public who are in the company’s service territory. The company also evaluates the effectiveness of its paid media campaigns, including the number of impressions associated with these public education campaigns. The term “impressions” is a common industry measure and represents the number of times that paid content (ads) is displayed .

Below is an overview of impressions associated with the company’s broader electric safety paid media that was marketed during 2019 and 2020. 2019 performance measures include tactics, *i.e.*, types of advertising media used from other campaigns that had messaging related to electric safety. 2020 performance measures apply to messaging related to electric safety.

Table 3: Performance Measures

TACTIC	2019 PERFORMANCE (Impressions)	2020 PERFORMANCE (Impressions)
Digital advertising	26,193,027	49,365,163
Paid Search	65,000	81,406
Paid Social Media	0	12,091,403
TV	35,432,921	15,405,500
OTT (Connected TV/Streaming)	2,400,361	1,589,258
Radio	35,282,460	2,750,700
Print/Newspaper	6,745,616	7,189,005
Outdoor Advertising	18,013,780	9,798,133
Cinema Advertising	1,450,408	0
Magazine	410,700	0

3. Press Releases/NewsCenter Stories

Press releases and NewsCenter stories are other tools that SDG&E uses to help disseminate safety-related messaging and information to the public. Press releases are drafted and provided to print and broadcast media outlets. NewsCenter stories are posted to SDG&E’s NewsCenter (at sdgenews.com), provide additional information to customers and the public about various topics, including safety, and are in a news story format. NewsCenter stories are drafted and posted by SDG&E’s media team and provide additional situational awareness information about emergency events or general safety information.

4. Safety Messaging On SDG&E’s Company Website

SDG&E manages and updates the electric safety content on the company’s website found at sdge.com/safety. This section of the website is updated throughout the year and is often referenced in safety-campaign messaging.

5. Bill Inserts/Ads

Safety content is also added to customer billing each year. Associated messaging includes tips and information related to electric safety and dangers associated with potential contact with electric infrastructure.

IV. 2022-2024 CONTROL & MITIGATION PLAN

This section contains a table identifying the controls and mitigations comprising the portfolio of mitigations for this risk.¹⁴

All the activities discussed in Section III above are expected to continue during the TY 2024 GRC. A current activity that is included in the control and mitigation plan may be referred to as either a control or a mitigation. A control that will continue as a mitigation retains its control ID, unless the size and/or scope of that activity will be modified, in which case that activity's control ID will be replaced with a mitigation ID. Table 4 below shows which activities are expected to continue.

Table 4: Control and Mitigation Plan Summary

Line No.	Control/Mitigation ID	Control/Mitigation Description	2020 Controls	2022-2024 Plan
1	C1	General Safety Communications	Yes	Yes
2	M1	Kids Website Expansion	No	Yes
3	M2	Direct Communications to At-risk Businesses	No	Yes

For activities SDG&E plans to perform that remain unchanged, please refer to the description in section III. If changes to the various activities are anticipated, such modifications are further described in this section below.

A. Changes to 2020 Controls

The above-described 2020 control reflects the same scope of activities planned for 2022-24; there are no planned changes.

B. 2022 – 2024 Mitigations

The mitigations below aim to further address the Electric Contact risk.

1. M1: Kids Website Expansion

The SDG&E website (sdge.com) is a major information resource that many public education efforts refer to for additional information. SDG&E plans to expand the content on the website to create a section for children (Kids Website) that can both help further educate the community and reach younger audiences. Efforts in 2021 and after will seek to establish this new resource and promote it to local school districts and communities. Those efforts would

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

include, among other topics, safety education related to the hazards of being around live electric facilities.

2. M2: Direct Communications to At-risk Businesses

There are various businesses and industries within SDG&E's service territory that have employees who regularly encounter electric equipment and power lines. Examples of these businesses include, but are not limited to, tree trimmers, pool cleaners, sign installers, and other types of industries that risk touching electrical equipment. SDG&E plans to expand direct communications with these types of businesses to promote electric safety and identify electric hazards of which their employees should be aware. Efforts in 2021 and after will work to develop and produce print collateral to be mailed to these businesses on an annual basis.

V. COST, UNIT, AND QUANTITATIVE ANALYSIS SUMMARY TABLES

The tables in this section provide a summary of the risk control and mitigation plan, including the associated costs, units, and the RSEs, by tranche. When an RSE could not be performed, an explanation is provided. SDG&E does not account for and track costs by activity or tranche; rather, SDG&E accounts for and tracks costs by cost center and capital budget code. The costs shown were estimated using assumptions provided by SMEs and available accounting data.

**Table 5: Risk Control and Mitigation Plan - Recorded and Forecast Dollars Summary¹⁵
(Direct After Allocations, In 2020 \$000)**

ID	Control/Mitigation Name	Recorded Dollars		Forecast Dollars			
		2020 Capital ¹⁶	2020 O&M	2022-2024 Capital (Low)	2022-2024 Capital (High)	TY 2024 O&M (Low)	TY 2024 O&M (High)
C1	General Safety Communications	-	1,670	-	-	1,500	2,170
M1	Kids Website Expansion	-	-	-	-	Included in C1	Included in C1
M2	Direct Communications to at Risk Businesses	-	-	-	-	Included in C1	Included in C1

¹⁵ Recorded costs and forecast ranges are rounded. Additional cost-related information is provided in workpapers. Costs presented in the workpapers may differ from this table due to rounding. The figures provided are direct charges and do not include company loaders, with the exception of vacation and sick. The costs are also in 2020 dollars and have not been escalated to 2021 amounts. The capital presented is the sum of the years 2022, 2023, and 2024, or a three-year total. Years 2022, 2023 and 2024 are the forecast years for SDG&E's Test Year 2024 GRC Application.

¹⁶ Pursuant to D.14-12-025 and D.16-08-018, the Company provides the 2020 "baseline" capital costs associated with Controls. The 2020 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.

Table 6: Risk Control & Mitigation Plan - Units Summary

ID	Control/Mitigation Name	Units Description		Recorded Units		Forecast Units			
		Capital	O&M	2020 Capital	2020 O&M	2022-2024 Capital (Low)	2022-2024 Capital (High)	TY 2024 (Low) O&M	TY 2024 (High) O&M
C1	General Safety Communications	A measurable unit is not practical given the multiple means of communications used to address this risk.							
M1	Kids Website Enhancement								
M2	Direct Communications to at Risk Businesses								

**Table 7: Risk Control & Mitigation Plan - Quantitative Analysis Summary
(Direct After Allocations, In 2020 \$000)**

ID	Control/Mitigation Name	Forecast			
		LoRE	CoRE	Risk Score	RSE
C1	General Safety Communications	See Table 8			
M1	Kids Website Expansion	See Table 8			
M2	Direct Communications to at Risk Businesses	See Table 8			

**Table 8: Risk Control & Mitigation Plan -
Quantitative Analysis Summary for RSE Exclusions**

ID	Control/Mitigation Name	RSE Exclusion Rationale
C1	General Safety Communications	<p>SDG&E strongly believes that safety related communications are beneficial towards the prevention of contacts with electrical equipment operating in a normal configuration; however, SDG&E is unable to quantify the risk reduction benefits for the General Safety Communications, Kids Website Expansion, and Direct Communications to at Risk Business controls and mitigations, for several reasons:</p> <ol style="list-style-type: none"> 1) It is difficult to determine a direct correlation between the communications campaigns mitigating electric contact and risk events (or non-events). 2) The messaging usually addresses a combination of gas- and electric-related safety risks and therefore does not specifically call out contacting equipment operating in a normal configuration. <p>Safety messages typically are more general in nature, focusing on the inherent dangers of electrical equipment, storm and outage preparedness and importance of treating every downed power line as energized. More simply stated, we inform customers of the importance of staying safe around electricity and electrical equipment no matter its configuration. This is a more efficient use of safety education and outreach funding and results in more effective and simple messaging for our customers.</p> <p>For example, communication campaigns often combine more than one safety message for both gas and electric risks to customers. The difficulty, therefore, arises in the ability to parse out the levels of effectiveness of the multiple messages across the two commodities.</p>
M1	Kids Website Expansion	See rationale for C1
M2	Direct Communications to at Risk Businesses	See rationale for C1

VI. ALTERNATIVES

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

A. A1: K-12 School Curriculum Development

Local school districts can play a pivotal role in assisting with community education. Today's youth will eventually become tomorrow's utility customers, and educating them early about electric safety can have far-reaching benefits. SDG&E considered working with local school districts to develop a curriculum that can be taught in local classrooms about electric safety. This was not pursued due to challenges presented by different school districts within the service territory, distance learning issues, as well as political barriers for quick execution.

B. A2: Dedicated Safety Outreach Position

This new employee position would be responsible for traveling across the service territory for drop-in visits to various industrial and commercial job sites. This person would be responsible for assessing and educating site personnel on electric contact hazards and issues. This position was not pursued due to several identified risks and inefficiencies, including labor and overhead costs, safety risk, vehicle miles and hours traveled relative to volume of customer impact, etc.

Table 9: Alternatives - Forecast Dollars Summary¹⁷
(In 2020 \$000)

ID	Control/Mitigation Name	Forecast Dollars			
		2022-2024 Capital (Low)	2022-2024 Capital (High)	TY 2024 O&M (Low)	TY 2024 O&M (High)
A1	K-12 School Curriculum	-	-	90	115
A2	Dedicated Safety Outreach Position	-	-	90	115

Table 10: Alternate Mitigation Plan - Units Summary

ID	Control/Mitigation Name	Units Description		Forecast Units			
		Capital	O&M	2022-2024 Capital (Low)	2022-2024 Capital (High)	TY 2024 (Low) O&M	TY 2024 (High) O&M
A1	K-12 School Curriculum	Number of curriculum		-	-	1	1
A2	Dedicated Safety Outreach Position	FTE		-	-	1	1

Table 11: Alternate Mitigation Plan - Quantitative Analysis Summary
(Direct After Allocations, In 2020 \$000)

ID	Control/Mitigation Name	Forecast			
		LoRE	CoRE	Risk Score	RSE
A1	K-12 School Curriculum	See Table 12			
A2	Dedicated Safety Outreach Position	See Table 12			

¹⁷ Forecast ranges are rounded. Additional cost-related information is provided in workpapers. Costs presented in the workpapers may differ from this table due to rounding. The figures provided are direct charges and do not include company loaders, with the exception of vacation and sick. The costs are also in 2020 dollars and have not been escalated to 2021 amounts. The capital presented is the sum of the years 2022, 2023, and 2024, or a three-year total. Years 2022, 2023 and 2024 are the forecast years for SDG&E's Test Year 2024 GRC Application.

Table 12: Alternative Mitigation Plan - Quantitative Analysis Summary for RSE Exclusions

ID	Alternative Mitigation Name	RSE Exclusion Rationale
A1	K-12 School Curriculum	See rational in Table 8 for C1
A2	Dedicated Safety Outreach Position	See rational in Table 8 for C1

APPENDIX A: SUMMARY OF ELEMENTS OF THE RISK BOW TIE

Customer & Public Safety – Contact With Electric Equipment: Summary of Elements of the Risk Bow Tie

ID	Control/Mitigation Name	Elements of the Risk Bow Tie Addressed
C1	General Safety Communications	DT.1, DT.2, DT.3 DT.4 PC.1, PC.2, PC.3, PC.4, PC.5, PC.6
M1	Kids Website Expansion	DT.1, DT.2, DT.3 DT.4 PC.1, PC.2, PC.3, PC.4, PC.5, PC.6
M2	School Curriculum	DT.1, DT.2, DT.3 DT.4 PC.1, PC.2, PC.3, PC.4, PC.5, PC.6

APPENDIX B: QUANTITATIVE ANALYSIS SOURCE DATA REFERENCES

The Settlement Decision directs the utility to identify potential consequences of a risk event using available and appropriate data.¹⁸ The list below provides the inputs used as part of this assessment.

San Diego Gas & Electric Annual Serious Injuries and Fatalities (SIFs) Incidents

- 2015 –2020 internal SIF data

¹⁸ D.18-12-014, Attachment A at A-8 (Identification of Potential Consequences of Risk Event).