



**Risk Assessment Mitigation Phase**  
**Risk Mitigation Plan**  
**Employee, Contractor and Public Safety**  
**(Chapter SDG&E-3)**

November 30, 2016



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## Executive Summary

The Employee, Contractor and Public Safety risk is the risk of non-adherence to safety programs, policies and procedures, which may result in severe harm to employees, contractors and the general public. SDG&E's 2015 baseline mitigation plan for this risk consists of eight controls:

1. Comprehensive Health and Safety risk management framework and organization including an Environmental & Safety Compliance Management Program (ESCMP).
2. Mandatory employee training.
3. Field observations on employee and contractor safety behaviors including SDG&E's Behavior Based Safety (BBS) Program.
4. Regular safety meetings, such as routine safety meetings, safety tailgates, safety committee meetings, safety stand-downs, and Executive Safety Committee Meetings.
5. Ongoing maintenance programs.
6. Customer communications and First Responder training.
7. Contractor safety.
8. Customer orders related to public safety.

These controls focus on safety-related impacts (i.e., Health, Safety, and Environment) per guidance provided by the Commission in Decision 16-08-018 as well as controls and mitigations that may address reliability.

SDG&E will continue the 2015 baseline controls in the proposed plan as well as proposes to add incremental projects and programs as follows:

- Expansion of the Contractor Safety Program - SDG&E has added a Contractor Safety Program Manager and proposes implement a contractor safety system.
- Occupational Safety and Health Administration (OSHA) Voluntary Protection Program (VPP) Assessment - The VPP approach is a commitment by the Company to safety and health management. The objective of VPP is to implement programs that ultimately lead to incident reduction and/or prevention.
- Public Safety Awareness Campaign - SDG&E proposes to add a more robust public safety awareness campaign to address both gas and electric safety concerns, such as Wire Down situations.

The risk spend efficiency (RSE) was developed for Employee, Contractor, and Public Safety. The risk spend efficiency is a new tool that was developed to attempt to quantify how the proposed mitigations will incrementally reduce risk. To calculate the RSE, SDG&E used historical safety performance and incident trends in combination with subject matter expertise as the basis for the estimated benefits for current controls (i.e., 2015 baseline) and incremental mitigations (i.e., expansion of 2015 controls or new proposals).

One way in which SDG&E measures its performance with respect to safety is through its OSHA Recordable Incident rate. Another metric collected by SDG&E pertaining to safety is its Controllable Motor Vehicle Incident (CMVI) rate for its employees, which is the number of Controllable (or



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preventable) Motor Vehicle Incidents per million miles driven. SDG&E used these two metrics to determine the risk spend efficiency of the mitigations.

Finally, SDG&E considered two alternatives to the proposed mitigations for the Employee, Contractor and Public Safety risk, and summarizes the reasons that the two alternatives were not included into the proposed mitigations.



# **Risk: Employee, Contractor and Public Safety**

## **1 Purpose**

The purpose of this chapter is to present the mitigation plan of San Diego Gas & Electric Company (SDG&E or Company) for the Risk Assessment Mitigation Phase (RAMP) risk of Employee, Contractor and Public Safety. The Employee, Contractor and Public Safety risk is the risk of non-adherence to safety programs, policies and procedures, which may result in severe harm to employees, contractors and the general public.

This risk is a product of SDG&E's September 2015 annual risk registry assessment cycle. Any events that occurred after that time were not considered in determining the 2015 risk assessment, in preparation for this Report. Note that while 2015 is used as base year for mitigation planning, risk management has been occurring, successfully, for many years within the Company. SDG&E and Southern California Gas Company (SoCalGas) (collectively, the utilities) take compliance and managing risks seriously, as can be seen by the numerous actions taken to mitigate each risk. This is the first time, however, that the utilities have presented this Risk Assessment Mitigation Phase (RAMP) submission, so it is important to consider the data presented in this plan in that context. The baseline mitigations are determined based on the relative expenditures during 2015; however, the utilities currently do not track expenditures in this way, so the baseline amounts are the best effort of each utility to benchmark both capital and operations and maintenance (O&M) costs during that year. The level of precision in process and outcomes is expected to evolve through work with the California Public Utilities Commission (Commission or CPUC) and other stakeholders over the next several General Rate Case (GRC) cycles.

The Commission has ordered that RAMP be focused on safety related risks and mitigating those risks.<sup>1</sup> In many risks, safety and reliability are inherently related and cannot be separated, and the mitigations reflect that fact. Compliance with laws and regulations is also inherently tied to safety and the utilities take those activities very seriously. In all cases, the 2015 baseline mitigations include activities and amounts necessary to comply with the laws in place at that time. Laws rapidly evolve, however, so the RAMP baseline has not taken into account any new laws that have been passed since September 2015. Some proposed mitigations, however, do take into account those new laws.

The purpose of RAMP is not to request funding. Any funding requests will be made in the GRC. The forecasts for mitigation are not for funding purposes, but are rather to provide a range for the future GRC filing. This range will be refined with supporting testimony in the GRC. Although some risks have overlapping costs, the utilities have made efforts to identify those costs.

## **2 Risk Information**

As stated in the testimony of Jorge M. DaSilva in the Safety Model Assessment Proceeding (S-MAP) Application (A.) 15-05-002, "SDG&E is moving towards a more structured approach to classifying risks and mitigations through the development of its new risk taxonomy. The purpose of the risk taxonomy is

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<sup>1</sup> Commission Decision (D.) 14-12-025 at p. 31.



to define a rational, logical and common framework that can be used to understand analyze and categorize risks.”<sup>2</sup> The Enterprise Risk Management (ERM) process and lexicon that SDG&E has put in place was built on the internationally-accepted ISO 31000 risk management standard. In the application and evolution of this process, the Company is committed to increasing the use of quantification within its evaluation and prioritization of risks.<sup>3</sup> This includes identifying leading indicators of risk. Sections 2 – 8 of this plan describe the key outputs of the ERM process and resultant risk mitigations.

In accordance with the ERM process, this section describes the risk classification, possible drivers and potential consequences of the Employee, Contractor and Public Safety risk.

**2.1 Risk Classification**

Consistent with the taxonomy presented by SDG&E and SoCalGas in A.15-05-002, SDG&E classifies this risk as a cross-cutting risk because an incident could occur throughout different areas of the Company. The risk classification is provided in Table 1.

**Table 1: Risk Classification per Taxonomy**

Risk Type	Asset/Function Category	Asset/Function Type
CROSS-CUTTING	PEOPLE	EMPLOYEE CONDUCT

**2.2 Potential Drivers<sup>4</sup>**

When performing the risk assessment for Employee, Contractor and Public Safety, SDG&E identified potential leading indicators, referred to as drivers. These include, but are not limited to:

- **Deviation from policies or procedures** – SDG&E has many safety-related policies and procedures for employees and contractors to follow. Failure of someone to adhere to such Company safety policies and procedures could result in a safety-related event.
- **Non or improper use of personal protection and safety equipment** – Safety equipment serves to protect employees and contractors from avoidable injuries. Failure to wear personal protection and safety equipment can lead to a safety incident.
- **Not following motor vehicle safe driving practices** – If someone does not follow the law and or other applicable safety practices, it could result in a safety incident.
- **Damages to gas pipelines, electric infrastructure and facilities** – Damage to gas and electric infrastructure and facilities could cause an unpredictable environment and, thus, can lead to a safety incident.
- **Workplace hazards posed to employees** – Unsafe work environments, including work locations, roadways and parking places, customer premises, gas equipment condition, PCBs, lead from paint, asbestos, fumigation chemicals, etc. could lead to a safety event.

<sup>2</sup> A.15-05-002, filed May 1, 2015, at p. JMD-7.

<sup>3</sup> Testimony of Diana Day, Risk Management and Policy (SDG&E-02), submitted on November 14, 2014 in A.14-11-003.

<sup>4</sup> An indication that a risk could occur. It does not reflect actual or threatened conditions.

### **2.3 Potential Consequences**

If one of the drivers listed above were to occur resulting in an incident, the potential consequences, in a reasonable worst case scenario, could include:

- Employee and/or public injuries or fatalities;
- Property damage;
- Disruption to operations;
- Erosion of public confidence; and
- Adverse litigation and related penalties.

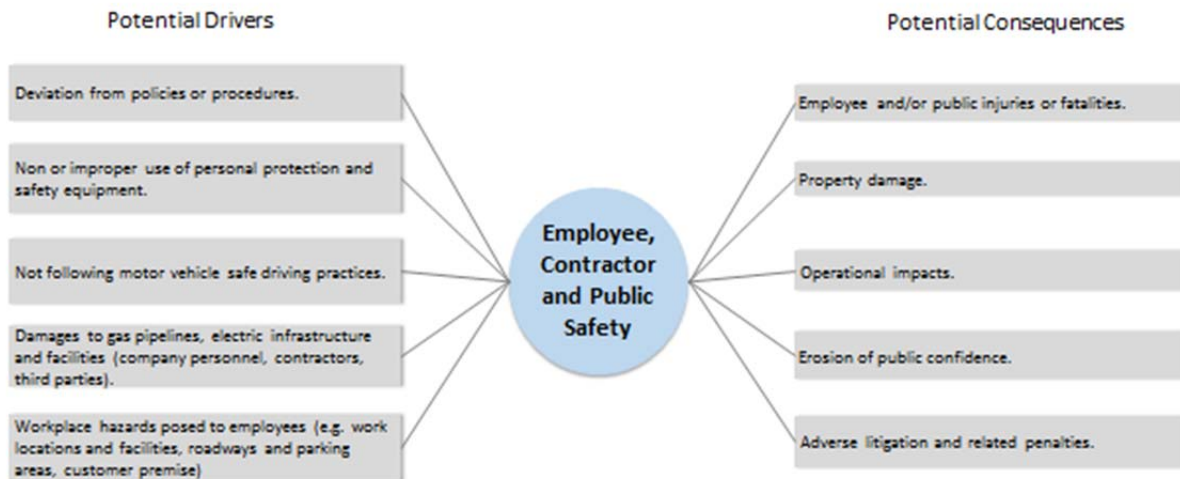
These potential consequences were used in the scoring of Employee, Contractor and Public Safety that occurred during the development of SDG&E's 2015 risk registry process. See Section 3 for more detail.

### **2.4 Risk Bow Tie**

The risk “bow tie” shown in Figure 1 is a commonly-used tool for risk analysis. The left side of the bow tie illustrates drivers that lead to a risk event and the right side shows the potential consequences of a risk event. SDG&E applied this framework to identify and summarize the information provided above.



Figure 1: Risk Bow Tie



### 3 Risk Score

The SDG&E and SoCalGas ERM organization facilitated the 2015 risk registry process, which resulted in the inclusion of Employee, Contractor and Public Safety as one of the enterprise risks. During the development of the risk register, subject matter experts assigned a score to this risk, based on empirical data to the extent it is available and/or using their expertise, following the process outlined in this section.<sup>5</sup>

#### 3.1 Risk Scenario – Reasonable Worst Case

There are many possible ways in which a public safety event can occur. For purposes of scoring this risk, subject matter experts used a reasonable worst case scenario to assess the impact and frequency. The scenario represented a situation that could happen, within a reasonable timeframe, and lead to a relatively significant adverse outcome. These types of scenarios are sometimes referred to as low frequency, high consequence events. The subject matter experts selected a reasonable worst case scenario to develop a risk score for Employee, Contractor and Public Safety:

- An employee or contractor not following a policy or procedure results in the fatality of one or more individuals – whether an employee, a contractor, or a member of the public.

<sup>5</sup> The “Employee, Contractor & Public Safety” risk from 2015 has been split into three distinct safety risks for 2016: “Customer Safety,” “Employee Safety,” and “Contractor Safety.”



Note that the following narrative and scores are based on this scenario; they do not address all consequences that can happen if a risk occurs.

### 3.2 2015 Risk Assessment

Using this scenario, subject matter experts then evaluated the frequency of occurrence and potential impact of the risk using SDG&E’s 7X7 Risk Evaluation Framework (REF). The framework (also called a matrix) includes criteria to assess levels of impact ranging from Insignificant to Catastrophic and levels of frequency ranging from Remote to Common. The 7X7 framework includes one or more criteria to distinguish one level from another. The Commission adopted the REF as a valid method to assess risks for purposes of this RAMP.<sup>6</sup> Using the levels defined in the REF, the subject matter experts applied empirical data to the extent it is available and/or their expertise to determine a score for each of four residual impact areas and the frequency of occurrence of the risk.

Table 2 provides a summary of the Employee, Contractor, and Public Safety risk score in 2015. This risk has a score of 4 or above in the Health, Safety, and Environmental impact area and, therefore, was included in the RAMP. These are residual scores because they reflect the risk remaining after existing controls are in place. For additional information regarding the REF and risk scoring methodology, please refer to RAMP Risk Management Framework discussion within this Report.

**Table 2: Risk Score**

Residual Impact				Residual Frequency	Residual Risk Score
Health, Safety, Environmental (40%)	Operational & Reliability (20%)	Regulatory, Legal, Compliance (20%)	Financial (20%)		
6	4	4	3	4	73,796

### 3.3 Explanation of Health, Safety, and Environmental Impact Score

A score of 6 (severe) was given to this risk in the Health, Safety, and Environmental impact area. Failure to adhere to Company policies or procedures could result in fatalities or life threatening injuries. SDG&E strives to mitigate the drivers of this risk in an effort to avoid the realization of incidents occurring.

### 3.4 Explanation of Other Impact Scores

Based on the selected reasonable worst case risk scenario, SDG&E gave the other residual impact areas the following scores:

- **Operational and Reliability:** SDG&E rated this risk a 4 (major) because damage to Company assets and/or loss of service could be the result of an employee or contractor failing to follow a policy or procedure. For example, if failure to follow a policy or

<sup>6</sup> D.16-08-018 Ordering Paragraph 9.

procedure resulted in a gas pipeline explosion, the impact could be a service disruption to more than 10,000 customers; disrupt one critical location or customer; or disrupt service for one day, as defined in the 7X7 Risk Matrix.

- **Regulatory, Legal, and Compliance:** A violation that could result in financial-related penalties is considered a 4 (major) in SDG&E's 7X7 matrix. Lack of adherence to policy or procedures could result in regulatory investigations or litigation.
- **Financial:** Due to the potential for financial consequences and litigation, SDG&E rated Employee, Contractor and Public Safety a 3 (moderate) in the financial impact area. The estimated financial impacts were not expected to exceed \$10 million.

### 3.5 *Explanation of Frequency Score*

Subject matter experts used empirical data to the extent available and/or their expertise to determine that the frequency of an event occurring due to the failure of an employee or contractor to follow policies or procedures is occasional or once every 3-10 years as defined in SDG&E's 7X7 matrix. This equates to a score of 4. The reasoning is that SDG&E has substantial controls in place to mitigate the realization of this risk.

## 4 **Baseline Risk Mitigation Plan<sup>7</sup>**

As stated above, Employee, Contractor and Public Safety risk is non-adherence to safety programs, policies and procedures, which may result in severe harm to employees, contractors and the general public. The 2015 baseline mitigations discussed below include the current evolution of the utilities' risk management of this risk. The baseline mitigations have been developed over many years to address this risk. They include the amount to comply with laws that were in effect at that time.

In general, most tasks performed by SDG&E employees and its contractors are related to safety. SDG&E employs both a Union and Non-Union workforce. Because the universe of potential mitigation activities related to safety is so extensive, SDG&E conducted a threshold assessment, to identify which ones to address within the scope of this risk, using the following questions:

1. Is the primary driver behind the policy, program or activity the safety of employees, contractors, customers or the public?
2. Does this policy, program or activity serve to identify the actions that should be taken to ensure the safety of employees, contractors, customers or the public?
3. Is this policy, program or activity driven by regulatory safety policy (OSHA, PHMSA, DOT, or CPUC)?
4. Does this policy, program or activity educate or alert employees, contractors or the public to potential safety hazards?

Activities and/or costs that are not included in the scope of this risk include:

- Activities performed to satisfy customer service requests (even though safety tasks are performed when completing the service request). Although work elements within some

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<sup>7</sup> As of 2015, which is the base year for purposes of this Report.

- service requests are performed for safety purposes, if the service request (work order) was not generated to specifically address safety, that service request was not included.
- Activities performed to maintain, repair or operate the gas pipeline infrastructure or Electric Infrastructure Integrity. These activities are captured in other RAMP risks.
  - Computer systems (both hardware and software) used to support operations performed to mitigate safety hazards.
  - Lease costs for motor vehicles used to support operations performed to mitigate safety hazards.
  - The capital equipment used to mitigate safety hazards (and associated depreciation expenses).

SDG&E's baseline mitigation plan for this risk consists of eight controls: (1) Comprehensive Health & Safety risk management framework and organization, (2) Mandatory employee training, (3) Field observations on employee and contractor safety behaviors, (4) Regular safety meetings, (5) Ongoing maintenance programs, (6) Customer communications and First Responder training, (7) Contractor safety, and (8) Customer orders related to public safety. Subject matter experts collaborated to identify and document them. These controls focus on safety-related impacts<sup>8</sup> (i.e., Health, Safety, and Environment) per guidance provided by the Commission in D.16-08-018<sup>9</sup> as well as controls and mitigations that may address reliability. Accordingly, the controls and mitigations described in Sections 4 and 5 address safety-related impacts primarily. Note that the controls and mitigations in the baseline and proposed plans are intended to address various Employee, Contractor and Public Safety events, not just the scenario used for purposes of risk scoring. In addition, some of the activities mentioned also mitigate other risks, such as the Vegetation Management program is also a mitigation in the Wildfire risk.

Each of SDG&E's the baseline risk mitigations are described below.

1. Comprehensive Health and Safety risk management framework, organization and assignment of responsibility

A comprehensive health and safety risk management organization and framework is in place at SDG&E. Several organizations establish and carry out SDG&E's health and safety risk management policies, including SDG&E's Environmental & Safety Compliance Management Program (ESCMP). 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, ISO 14001. Brief descriptions of these groups follow.

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<sup>8</sup> The Baseline and Proposed Risk Mitigation Plans may include mandated, compliance-driven mitigations.

<sup>9</sup> D.16-08-018 at p. 146 states "Overall, the utility should show how it will use its expertise and budget to improve its safety record" and the goal is to "make California safer by identifying the mitigations that can optimize safety."



## ***Safety Services***

Safety Services encompasses SDG&E's Safety Operations, Safety Compliance and Wellness Programs branches. Safety Services is an organization dedicated to employee, contractor and public safety, which manages SDG&E's overall Health and Safety framework. The Safety Services department functions to:

- Reduce or eliminate incidents resulting in injury, property damage, or outages;
- Raise awareness of safety concerns and incidents through programs, regular safety campaigns and communications;
- Provide oversight and regulatory guidance to confirm adherence to policies and procedures; and
- Provide resources to integrate safety into everyday business decisions to promote the importance of safety to the overall organization's success.

Safety Services has developed policy and training programs including, but not limited to:

- Injury and Illness Prevention Program;
- Emergency Action Plan & Fire Prevention;
- Job observations;
- Incident investigation and analysis;
- Defensive driving;
- Body mechanics;
- Ergonomics;
- Contractor safety;
- Hazard communication;
- Confined spaces;
- Asbestos and lead;
- Hearing conservation, respiratory protection and personal protective equipment (PPE); and
- Public safety and substance abuse awareness and prevention programs.

## ***Safety Operations***

The Safety Operations branch of Safety Services provides field operations support including the use of Field Safety Advisors. Safety Operations supports field safety compliance audits, major safety programs, communications, management and statistical analysis. In an effort to reduce or eliminate incidents, the department provides safety training, conducts job observations, investigates and analyzes incidents, assists with the development of corrective actions, and promotes defensive driving, body mechanics, and ergonomically protective workplaces.

SDG&E monitors leading indicators to support injury prevention. One mechanism for capturing leading indicators is by conducting a bi-annual Safety Barometer Survey to assess the overall health of our safety climate and identify areas of opportunity that can help eliminate injuries and improve our focus and commitment to safety. The goal of this assessment is to increase employee participation in, and contribution to, SDG&E's ongoing efforts to continually improve its safety performance. The Safety



Operations department interprets and advises field operations regarding safety-related rules and regulations, and provides reviews of potential legislation that would impact field operations.

Field Safety advisors in the Safety Operations department serve a significant role and support all areas of the Company for:

- Support programs, initiatives and requirements for incident prevention;
- Incident investigation, including self-audits;
- Motor vehicle incident corrective action;
- Support of field operations safety committees, programs, training and compliance; and
- Technical safety support for projects to help develop plans for design/permitting and cost impacts to engineers, contractors, and other technical specialists.

### ***Safety Compliance***

The Safety Compliance branch is primarily responsible for compliance with safety regulations, establishing and managing programs, incident investigation training, policies and guidelines for the safety of SDG&E employees. This group interprets safety-related rules and regulations and provides reviews of potential legislation that would impact field operations, with the goal to maintain compliance with all federal, state and local regulations. This branch also monitors changes in employee safety and health regulations, develops internal safety policies and procedures to verify compliance with the applicable regulations, and manages company-wide implementation of key industrial hygiene programs, such as Hazard Communications, Hearing Conservation, Respiratory Protection, Asbestos and Lead Exposure Management. This area of Safety Services would also serve as a liaison during CPUC, Department of Transportation (DOT), California Highway Patrol (CHP), or Cal/OSHA audits or citations.

This branch also administers DOT-regulated and non-regulated drug and alcohol testing programs, including oversight of all pre-employment, random and other required testing of employees in safety sensitive positions at SDG&E under DOT regulations. In addition, this group addresses unique and highly complex employee issues which include but are not limited to:

- Administering the Substance Abuse Awareness and Drug & Alcohol Testing Program; and
- Rehabilitation case management.

### ***Wellness Programs***

Wellness Programs *are designed* to promote the physical and mental well-being of all company employees. These support the Company's commitment to providing quality health & wellness programs to motivate and promote safe and healthy lifestyles. Wellness Programs coordinates on-site employee assistance services for employees and work groups, including:

- Health & Education Seminars/Lectures (Stress Management, Weight Management, Nutrition, Heart Disease, High Blood Pressure, etc.)
- Fitness Subsidy Program (Company subsidy for gym membership)
- Annual Flu Immunizations

- Health Screenings (i.e., Body Fat, Cholesterol, Blood Pressure, Carotid Artery, Abdominal Aneurysm)
- Work-site programs, i.e., Weight Watchers, Yoga, Walking Class, Chair Massages, Reflexology
- Special Events (Health Fairs, Walk-a-thons, Blood Drives)
- Educational pamphlets/brochures on a variety of health & wellness topics
- Employee Assistance Programs
- Evaluation management of mental health behaviors affecting job performance, critical incidents and fitness for duty determination
- Safety stand-down support

Other examples of SDG&E safety and wellness programs include, but are not limited to:

- Facilities Maintenance Program – In addition to Facilities Capital projects designed to make workspaces safer, preventative, predictive and corrective maintenance are used to address deficiencies. Some examples include structural changes, asbestos inspection and abatement, and parking lot safety amenities.
  - Traffic Control for employee and public safety at worksites.
  - Vegetation Management – Tree Trim program includes inspecting and maintaining approximately 400,000 trees that have the potential to encroach within the minimum required compliance distance between vegetation and overhead power lines. Pole brushing for SDG&E involves the clearing of flammable brush and vegetation away from SDG&E distribution poles subject to California Public Resource Code (PRC), section 4292. PRC 4292 is intended to prevent energized electrical hardware from igniting a fire by keeping the area under subject poles clear of flammable vegetation at all times.
  - Work Methods and Standards – Business functions related to developing and maintaining construction standards, standards practices, and system design for electric service, primary and secondary systems.
  - Gas System Protection – Patrolling, Leakage Surveys, atmospheric corrosion control and odorization of gas. Mandated under Federal Regulations DOT/PHMSA Title 49.
  - Occupational Health Nurse (OHN) Services – Occupational health nursing is a specialty practice that delivers health and safety programs and services to employees. The practice focuses on promotion and restoration of health, prevention of illnesses and injuries, and protection from work related and environmental hazards.
  - Telemedicine – The practice of healthcare diagnosis and physician consultation using telecommunications technology. Telemedicine eliminates any wait time to see a provider by allowing quicker, real-time, on-demand evaluation for first aid and healthcare. It supports on-site first-aid injury care and injury care management.
2. Mandatory employee training, retraining and refresher programs and standardized policies<sup>10</sup>

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<sup>10</sup> This section does not pertain to Contractors. Please see control number seven (7) regarding Contractors.



Training is a significant contributor to mitigating the Employee, Contractor and Public Safety risk. Both new (new hires, transfers or newly-assigned) and existing employees are required to complete mandatory safety and environmental training. Some training is one-time only, such as the Injury & Illness Prevention Program; other training is one-time with an annual refresher, such as driver training. Job Skills Training including Substation, Electric Regional Operations and Gas Operations job skills, Call Center Emergency Call Training, and the Apprentice Lineman Program. The Apprentice Lineman Program is a three-year (6,000 hours) apprenticeship consisting of formal training at Skills Training Center, on the job training and night school (San Diego Community College). Each step in the program is six months in length. There are three State approved apprentice programs. Apprentice program positions include lineman, electrician and meter tester. The program is a phased approach and the apprentice must pass each step of the program to advance to the next step. Also there is a variety of role-specific training including: SDG&E employees are required to take web-based training. For ESCMP, the year-end training certification process consists of:

**Course Completion:** Environmental & Safety (E&S) mandatory training is complete (and certifiable) only when the course has been taken by the employee AND is recorded as complete in the Company personnel records system (My Info).

**Records:** The use of a course code in My Info documenting that an employee completed Company specified mandatory training is only allowed when the actual course corresponding to the course code was taken by the employee (either instructor-led or e-learning). This is limited to courses available from the Safety and Environmental websites, with the exception of courses provided by outside vendors where prior approval of the correct subject matter expert has been given (e.g., Remedy Ergonomics).

**Calendar Year:** Only E&S mandatory training that was completed during a calendar year applies to the annual ESCMP certification process for that year.

**Timing for Training:** The timing for mandatory employee training for Existing Employees, New Hires, Transfers, or Newly Assigned Employees is described below:

***Existing Employees:***

Safety and Environmental

Existing employees (*start date prior to 1/1 of current year*) must complete all applicable **mandatory** training by 12/31 of the current year.

Exception: Existing employees who are completely absent from 10/1-12/31 (and who did not complete all applicable mandatory training prior to absence).

***New Hires, Transfers, or Newly Assigned Employees:***

Safety

New hires, transfers, or newly assigned employees should complete **mandatory initial** training within 30 days of hire, transfer, or assignment, unless specified otherwise in the course code description.

Employer shall review with each employee upon initial assignment those parts of the Emergency Action Plan which the employee must know to protect the employee in the event of an emergency.





### Environmental

New hires, transfers, or newly assigned employees must complete **mandatory initial** training within 90 days of hire, transfer, or assignment.

New hires, transfers, or newly assigned employees hired, transferred, or assigned after 10/1 should attempt to complete **mandatory initial** training by 12/31 but are still authorized up to 90 days to complete.

### **Initial, One-time Mandatory Training:**

Where a mandatory E&S training course requires only an **initial** training, proof of that training must be recorded in My Info in order to certify that training is complete. If other written record exists, the information must be entered into My Info to establish a record of the training. If no other written record exists, employee must re-take training, and the information must be entered into My Info. Smith System<sup>®</sup> Driving records are not included in this requirement.

Examples of such training are:

#### **Injury & Illness Prevention Program (IIPP)**

**Emergency Action Plan and Fire Prevention (EAP)** for employees who are not located at Century Park, Lightwave and Sempra HQ.

#### **Initial Mandatory Training with Annual Refresher:**

Where a mandatory E&S training course requires an *initial* training session and an *annual* refresher, proof of the *initial* and *annual refresher* training must be recorded in My Info each calendar year. If there is no proof of initial training available, then the initial course must be re-taken and the completion recorded in My Info, with the following exceptions:

**Smith System<sup>®</sup> Driving:** For those employees required to complete the initial Smith System<sup>®</sup> Driving training and annual refreshers, and for whom there is no history of completing the initial training, we will accept (for ESCMP certification purposes) a history of taking an annual refresher.

**Emergency Action Plan and Fire Prevention (EAP)** for employees who are located at Century Park, Lightwave and Sempra Headquarters facilities.

3. Field observations of and feedback on employee and contractor activities and safety behaviors

SDG&E's Behavior Based Safety (BBS) Program is a proactive approach to safety and health management, focusing on principles that recognize at-risk behaviors as a frequent cause of both minor and serious injuries. The purpose is to reduce the occurrence of at-risk behaviors by modifying an individual's actions and/or behaviors through observation, feedback and positive interventions aimed at developing safe work habits. The BBS training process is observer training. It is peer-to-peer training which teaches the observers to identify and promote safe behaviors while providing feedback for potential exposure to risk. It empowers employees to not only control their own safe behaviors, but the company's as well.

#### 4. Regular Safety Meetings

Safety meetings are scheduled to occur on a regular basis. Examples of safety meetings are:

- Routine safety meetings per Cal-OSHA
- Safety tailgates
- Safety committee meetings
- Safety stand-downs
- Executive Safety Committee Meetings

Routine safety meetings are attended by operational personnel. Agenda items include:

- Company-wide safety messages and updates;
- Discussion surrounding near miss/close call events;
- Business unit related materials;
- Updates to policies and standards; and
- Hazard identification.

Operational personnel also attend safety tailgates. Typically, these are held at the workplace or at the jobsite and facilitated by a Supervisor. Tailgates are designed to review the job prior to work starting, so that everyone understands the task at hand. The tailgate allows opportunity to discuss problems or issues at the site including hazard identification and protection plans. Work stop authority is also reiterated to employees including the importance of public safety. These are documented by tailgate sheets signed by attendees.

Safety Committee Meetings are held monthly in many departments at SDG&E. There are roughly 65 safety committees company-wide, which include over 500 employees. Safety Committee Meetings address district/location specific issues and plan Safety Stand-downs. Company-wide Safety Committee Chairpersons meet with the Safety Advisory Team (SAT) quarterly to disseminate company-wide safety information. The SAT team includes the Director and Manager of Safety, Field Safety Advisors and office Safety Advisors. SAT teams discuss current events regarding safety, with the intent that Safety Chairpersons will share the information with their individual workgroups. For example, if there is an influx of slips, trips and falls, the SAT team will discuss messaging and tips to take back to the groups to reduce these incidents and keep employees safer.

Safety Stand-downs are held annually or bi-annually, usually for a half-day, to:

- Bring in experienced speakers to discuss various safety topics;
- Provide employees with workshops to learn about safety in their area;
- Introduce grassroots ideas to the districts; and
- Solicit participation in safety related activities.

Executive Safety Council Meetings are led by the Chief Operating Officer (COO), comprise members from the Senior Management Team and are held quarterly at various locations. Agenda items include:

- Employee dialogue sessions – Employees of varying levels have the opportunity to speak directly with the executives about suggestions, concerns or issues relating to their job or location.

- Supervisor dialogue sessions – Supervisors are afforded a forum to provide ideas, discuss safety-related issues or concerns and receive updates from the executives on prior agenda items.
  - Grassroots employee-led presentations – Employee-led safety teams help to create solutions that prevent injuries and result in safer worksites and enhanced culture of accountability. These teams demonstrate that passionate, engaged employees can work together to create effective safety solutions.
  - Behavior Based Safety (BBS) updates, observations and data.
  - Action item review.
  - Roundtable discussions.
5. Ongoing maintenance programs

Properly maintaining SDG&E's assets and infrastructure contributes to the well-being and safety of employees, contractors and the public. The Corrective Maintenance Program (CMP), mandated under General Order 165, outlines the procedures for the inspection and maintenance of electrical distribution facilities. Qualified inspectors perform the inspections and generate follow-up repair orders that are completed by crews located at the various Construction and Operating Centers (Districts).

Transmission Line Maintenance Practices are mandated under CPUC code 348 and Western Electric Coordinating Council (WECC) Regional Reliability Standard FAC-501-WECC-1. The purpose of SDG&E's Transmission Inspection & Maintenance Program is to promote safety for the general public, SDG&E personnel and contractors by providing a safe operating and construction environment, while maintaining system reliability. This inspection and maintenance program helps SDG&E identify and repair component/conditions and clear the transmission system of defective equipment to minimize safety hazards and maintain system reliability.

Transmission Substation Maintenance Practices are mandated under General Order 174 and WECC Regional Reliability Standard PRC-005-2. The purpose of SDG&E's Substation Inspection & Maintenance Program is to promote safety for the general public, SDG&E personnel and contractors by providing a safe operating and construction environment, while maintaining system reliability. This inspection and maintenance program helps SDG&E identify and repair component/conditions and clear the substations of defective equipment to minimize safety hazards and maintain system reliability.

The activities included in this chapter are limited to the inspection and testing of Live Line tools mandated under OSHA rule 1910.269. The purpose of SDG&E's Live Line Tools Inspection & Testing Program is to confirm that SDG&E crews are provided with safe tools needed to carry out maintenance and construction responsibilities in the field, which in turn affect safety for the general public, SDG&E personnel and contractors. The costs and benefits related to the remaining programs described within this mitigation are addressed in the RAMP risk chapter for Electric Infrastructure Integrity.

6. Customer Communications and First Responder Training

Customer outreach, communication, and education are another way SDG&E mitigates this risk. The activities in this mitigation include:

- Communication campaign efforts regarding preparing for emergencies. These efforts are mainly concentrated in the high risk fire area.

- Public Safety campaigns focusing on informing and educating the public from the danger of downed power lines, pole contact from vehicles and the hazards associated with digging near gas lines. The campaign includes videos, TV and radio spots, newspaper ads, billboards and collateral geared toward a variety of scenarios used for different audiences.
- Safety-related messages delivered using multiple communication channels. Examples are bill inserts, print media, radio, web and social media. Messages include, but are not limited to, Carbon Monoxide Safety, fumigation and furnace safety.
- Pipeline safety campaign, which is mandated by federal pipeline safety regulations. SDG&E's campaign includes bill inserts, mailings to residential and business customers, mailings to excavators, businesses, land developers and farmers, and communications to schools and universities, public officials and emergency officials. Pipeline safety efforts provide customers with information about:
  - Natural gas pipeline locations
  - What to do if you sense a leak/smell gas
  - Messaging to direct customers to call 811 (DigAlert) and other actions to take prior to digging

Emergency Management/Fire Coordination provides safety and basic operational information about electricity and SDG&E's facilities as they relate to First Responder operations and activities. Events include training activities relative to substation safety, new hire fire academy sessions, Capstone crews, electric fire safety training to fire department personnel, and Wildland Simulation exercises. Emergency Operations Center (EOC) First Responder Training includes incident response training and exercises.

#### 7. Contractor Safety

SDG&E relies heavily on contractors. Major Projects, Construction Services Construction Management, Construction Services Contracting, Aviation Services, and Fire Coordination and Prevention provide construction management and field oversight of all construction performed by contractors on electric distribution. This includes safeguarding that all contracted work is built to SDG&E design and safety standards and in accordance with GO 95 (Rules for Overhead Electric Line Construction) and GO 128 (Rules for Construction of Underground Electric Supply and Communications Systems).

Safeguards can include: administrative activities associated with construction services-managed construction work; oversight for construction, incident review and investigation, operations and maintenance activities that involve helicopter and fixed wing aircraft; and a wide range of highly skilled and experienced fire safety and fire preventative services, including design, operational, training and construction expertise, and coordination with fire departments and first responders during extreme fire weather events (such as red flag Santa Ana events).

Other Contractor Safety activities include:

- Annual Contractor Safety Summit – SDG&E sponsored contractor safety half-day event covering safety incidents, training and seminars.

- Contractor Quarterly Safety Council Meetings – SDG&E sponsored contractor safety two-hour event covering safety incidents, hazard identification, compliance, training and seminars.
  - Southern California Utility Safety Alliance (SCUSA) monthly meetings – SCUSA meets monthly to review working methods, standards and regulations, and reviews safety incidents and injuries.
  - Contractor Incident Database – an in house database designed to calculate metrics based on hours worked, incident and injury totals and incident descriptions for reporting, review and mitigation.
8. Customer orders relating to public safety

Customers call SDG&E’s call center for many reasons. Some of those reasons are to inform SDG&E of safety-related items such as outages, emergencies, and detection of gas. Below are activities managed by SDG&E’s call center with respect to safety:

- Call types relative to public safety include:
  - English/Spanish Emergency
  - English/Spanish Outage
  - English/Spanish Business Emergency
  - Fire and Police Calls
- Customer Service Field Emergency Orders
  - Carbon Monoxide
  - Fumigation
  - Hazardous and Non Hazardous gas leaks
  - NGAT or CO Testing is a safety-related program for Customer Assistance's ESA Program participants. The purpose is to test in-home equipment for carbon monoxide hazards. SDG&E conducts CO testing on homes weatherized through the Energy Savings Assistance (ESA) Program in accordance with the Statewide Energy Savings Assistance Program Installation Standards and the Statewide Energy Savings Assistance Program Policy and Procedures Manual. CPUC directives order SDG&E to charge the costs for the NGAT program to base rates rather than to the public purpose funds.
- Energy Diversion Investigation – Meter tampering and meter bypass investigation and remediation. Bypasses or unauthorized attachments create unsafe conditions for our crews as well as public safety officers and first responders. The unauthorized attachments are not standard and are a violation of the electric code and local building ordinances. These connections present the potential for fire, electrical shock or even the risk of electrocution to an SDG&E service technician, law enforcement, firefighters, city or county officials, occupants of the residence and/or community.

## 5 Proposed Risk Mitigation Plan

The 2015 baseline mitigations outlined in Section 4 will continue to be performed in the proposed plan, in most cases, to maintain the current residual risk level. This plan is expected to leverage the current momentum of SDG&E's existing safety programs and policies, as well as incorporate a few, incremental activities for the years 2017-2019. These additions, along with any updates about other controls are described below.

### 1. Expansion of the Contractor Safety Program

SDG&E has added a Contractor Safety Program Manager and proposes implement a contractor safety system. The system is a database that collects health and safety, procurement, quality and regulatory information. This is needed to proactively review contractor safety performance consistently across all companies contracted by SDG&E, and to communicate SDG&E's expectations with regard to safety. The system will enhance SDG&E's ability to report, track and provide metrics with regard to its contractors.

### 2. OSHA Voluntary Protection Program (VPP) Assessment

The VPP approach is a commitment by the Company to safety and health management. The objective of VPP is to implement programs that ultimately lead to incident reduction and/or prevention. This would benefit SDG&E as VPP sites evolve into models of excellence and influence practices industry-wide. The VPP process includes four main elements:

- Leadership and employee involvement
- Worksite analysis
- Hazard Prevention and Control
- Safety and Health Training

### 3. Public Safety Awareness Campaign

SDG&E proposes to add a more robust public safety awareness campaign in the Customer Communications and First Responder Training mitigation to address both gas and electric safety concerns, such as Wire Down situations. This program aims to educate and provide a deeper level of understanding to the public with respect to safe practices around electric and gas infrastructure. The details of this incremental campaign will be addressed in SDG&E's Test Year 2019 General Rate Case (GRC) Application.

SDG&E is constantly evaluating new programs, technologies and ideas designed to reduce or eliminate incidents. Examples of such programs include:

- Job Hazard Analysis Enhancements
- Serious Injury and Fatality (SIF) program
- Safety Center of Readiness & Excellence (SCORE)
- IBEW Code of Excellence program
- Human Performance



## 6 Summary of Mitigations

Table 3 provides a summary of the 2015 baseline risk mitigation plan, the risk driver(s) a control addresses, and the 2015 baseline costs for this risk. While control or mitigation activities may address both risk drivers and consequences, risk drivers link directly to the likelihood that a risk event will occur. Thus, risk drivers are specifically highlighted in the summary tables.

SDG&E does not account for and track costs by activity, but rather, by cost center and capital budget code. So, the costs shown in Table 3 were estimated using assumptions provided by SMEs and available accounting data.

**Table 3: Baseline Risk Mitigation Plan Overview<sup>11</sup>**  
(Direct 2015 \$000)<sup>12</sup>

ID	Control	Risk Drivers Addressed	Capital <sup>13</sup>	O&M	Control Total <sup>14</sup>	GRC Total <sup>15</sup>
1	Comprehensive Health & Safety risk management framework, organization and assignment of responsibility*	<ul style="list-style-type: none"> <li>• Deviation from policies or procedures</li> <li>• Workplace hazards posed to employees</li> <li>• Non or improper use of personal protection and safety equipment</li> </ul>	\$5,010	\$34,600	\$39,610	\$39,610
2	Mandatory employee training, retraining	<ul style="list-style-type: none"> <li>• Deviation from policies or</li> </ul>	n/a	16,670	16,670	16,670

<sup>11</sup> Recorded costs were rounded to the nearest \$10,000.

<sup>12</sup> The figures provided in Tables 3 and 4 are direct charges and do not include Company overhead loaders, with the exception of vacation and sick. The costs are also in 2015 dollars and have not been escalated to 2016 amounts.

<sup>13</sup> Pursuant to D.14-12-025 and D.16-08-018, the Company is providing the “baseline” costs associated with the current controls, which include the 2015 capital amounts. The 2015 mitigation capital amounts are for illustrative purposes only. Because projects generally span several years, considering only one year of capital may not represent the entire mitigation.

<sup>14</sup> The Control Total column includes GRC items as well as any applicable non-GRC jurisdictional items. Non-GRC items may include those addressed in separate regulatory filings or under the jurisdiction of the Federal Energy Regulatory Commission (FERC).

<sup>15</sup> The GRC Total column shows costs typically presented in a GRC.



ID	Control	Risk Drivers Addressed	Capital <sup>13</sup>	O&M	Control Total <sup>14</sup>	GRC Total <sup>15</sup>
	and refresher programs and standardized policies*	procedures				
3	Field observations of and feedback on employee and contractor activities and safety behaviors	<ul style="list-style-type: none"> <li>• Deviation from policies or procedures</li> <li>• Workplace hazards posed to employees</li> <li>• Non or improper use of personal protection and safety equipment</li> </ul>	n/a	650	650	650
4	Regular Safety Meetings*	<ul style="list-style-type: none"> <li>• Deviation from policies or procedures</li> <li>• Workplace hazards posed to employees</li> <li>• Non or improper use of personal protection and safety equipment</li> </ul>	n/a	3,520	3,520	3,520
5	Ongoing maintenance programs*	<ul style="list-style-type: none"> <li>• Deviation from policies or procedures</li> </ul>	n/a	2,660	2,660	2,660
6	Customer Communications and First Responder training*	<ul style="list-style-type: none"> <li>• Failure of emergency preparedness and response</li> </ul>	n/a	1,970	1,970	1,970
7	Contractor Safety Review	<ul style="list-style-type: none"> <li>• Deviation from policies or procedures</li> </ul>	38,160	740	38,900	38,900
8	Customer orders relative to public safety*	<ul style="list-style-type: none"> <li>• Damages to gas pipelines and facilities</li> </ul>	n/a	4,960	4,960	4,960





ID	Control	Risk Drivers Addressed	Capital <sup>13</sup>	O&M	Control Total <sup>14</sup>	GRC Total <sup>15</sup>
	<b><i>TOTAL COST</i></b>		\$43,170	\$65,770	\$108,940	\$108,940

\* Includes one or more mandated activities

While all the controls and baseline costs presented in Tables 3 and 4 mitigate the Employee, Contractor and Public Safety risk, some of the controls also mitigate other risks presented in this Risk Assessment Mitigation Phase Report, including: Electric Infrastructure Integrity, Public Safety Events Electric, Wildfire, Catastrophic Damage Involving High-Pressure Pipeline Failure and Catastrophic Damage Involving Medium-Pressure Pipeline Failure.

Table 4 summarizes SDG&E’s proposed mitigation plan, associated projected ranges of estimated O&M expenses for 2019 and projected ranges of estimated capital costs for the years 2017-2019. It is important to note that SDG&E is identifying potential ranges of costs in this plan and is not requesting funding approval. SDG&E will request approval of funding in the next GRC. There are non-CPUC jurisdictional mitigation activities addressed in RAMP; the costs associated with these will not be carried over to the GRC. As set forth on Table 4, the utilities are using a 2019 forecast provided in ranges based on 2015 dollars.

**Table 4: Proposed Risk Mitigation Plan Overview<sup>16</sup>**  
(Direct 2015 \$000)

ID	Mitigation	Risk Drivers Addressed	2017-2019 Capital <sup>17</sup>	2019 O&M	Mitigation Total <sup>18</sup>	GRC Total <sup>19</sup>
1	Safety Policies & Programs*	<ul style="list-style-type: none"> <li>• Deviation from policies or procedures</li> <li>• Workplace hazards posed to employees</li> <li>• Non or improper use of personal protection and safety equipment</li> </ul>	\$20,340 - \$24,410	\$33,220 - 39,870	\$53,560 - 64,280	\$53,560 - 64,280
2	Mandatory employee training, retraining and refresher programs*	<ul style="list-style-type: none"> <li>• Deviation from policies or procedures</li> </ul>	n/a	16,680 - 20,010	16,680 - 20,010	16,680 - 20,010
3	Field Observations and Behavior Based Safety Programs	<ul style="list-style-type: none"> <li>• Deviation from policies or procedures</li> <li>• Workplace hazards posed to employees</li> <li>• Non or improper use of personal protection and safety equipment</li> </ul>	n/a	900 - 1,080	900 - 1,080	900 - 1,080
4	Regular Safety Meetings, Safety Stand-downs and Tailgates*	<ul style="list-style-type: none"> <li>• Deviation from policies or procedures</li> <li>• Workplace hazards posed to employees</li> <li>• Non or improper</li> </ul>	n/a	3,520 - 4,230	3,520 - 4,230	3,520 - 4,230

<sup>16</sup> Ranges of costs were rounded to the nearest \$10,000.

<sup>17</sup> The capital presented is the sum of the years 2017, 2018, and 2019 or a three-year total. Years 2017, 2018 and 2019 are the forecast years for SDGE's Test Year 2019 GRC Application.

<sup>18</sup> The Mitigation Total column includes GRC items as well as any applicable non-GRC items.

<sup>19</sup> The GRC Total column shows costs typically represented in a GRC.



		use of personal protection and safety equipment				
5	Ongoing Maintenance Programs*	• Deviation from policies or procedures	n/a	2,810 - 3,370	2,810 - 3,370	2,810 - 3,370
6	Customer Communications and First Responder training*	• Failure of emergency preparedness and response	n/a	7,000 - 8,400	7,000 - 8,400	7,000 - 8,400
7	Contractor Safety Program	• Deviation from policies or procedures	115,370 - 138,440	740 - 890	116,110 - 139,330	116,110 - 139,330
8	Customer orders relative to public safety*	• Damages to gas pipelines and facilities	n/a	5,080 - 6,100	5,080 - 6,100	5,080 - 6,100
	<b>TOTAL COST</b>		\$135,710 - 162,850	\$69,950 - 83,950	\$205,660 - 246,800	\$205,660 - 246,800

<input type="checkbox"/>	Status quo is maintained
<input checked="" type="checkbox"/>	Expanded or new activity
*	Includes one or more mandated activities

The forecasting methodologies used to develop the low range of the costs were primarily base year (2015) recorded amounts plus incremental and five-year average costs. These methodologies were deemed most accurate given the nature of the activities within the mitigations. The high range was derived to provide flexibility as SDG&E may expand or add incremental projects and programs as dictated by regulatory, legal or industry changes.

## 7 Risk Spend Efficiency

Pursuant to D.16-08-018, the utilities are required in this Report to “explicitly include a calculation of risk reduction and a ranking of mitigations based on risk reduction per dollar spent.”<sup>20</sup> For the purposes of this Section, Risk Spend Efficiency (RSE) is a ratio developed to quantify and compare the effectiveness of a mitigation at reducing risk to other mitigations for the same risk. It is synonymous with “risk reduction per dollar spent” required in D.16-08-018.<sup>21</sup>

<sup>20</sup> D.16-08-018 Ordering Paragraph 8.

<sup>21</sup> D.14-12-025 also refers to this as “estimated mitigation costs in relation to risk mitigation benefits.”

As discussed in greater detail in the RAMP Approach chapter within this Report, to calculate the RSE the Company first quantified the amount of Risk Reduction attributable to a mitigation, then applied the Risk Reduction to the Mitigation Costs (discussed in Section 6). The Company applied this calculation to each of the mitigations or mitigation groupings, then ranked the proposed mitigations in accordance with the RSE result.

## 7.1 General Overview of Risk Spend Efficiency Methodology

This subsection describes, in general terms, the methods used to quantify the *Risk Reduction*. The quantification process was intended to accommodate the variety of mitigations and accessibility to applicable data pertinent to calculating risk reductions. Importantly, it should be noted that the analysis described in this chapter uses ranges of estimates of costs, risk scores and RSE. Given the newness of RAMP and its associated requirements, the level of precision in the numbers and figures cannot and should not be assumed.

### 7.1.1 Calculating Risk Reduction

The Company's SMEs followed these steps to calculate the Risk Reduction for each mitigation:

1. **Group mitigations for analysis:** The Company "grouped" the proposed mitigations in one of three ways in order to determine the risk reduction: (1) Use the same groupings as shown in the Proposed Risk Mitigation Plan; (2) Group the mitigations by current controls or future mitigations, and similarities in potential drivers, potential consequences, assets, or dependencies (e.g., purchase of software and training on the software); or (3) Analyze the proposed mitigations as one group (i.e., to cover a range of activities associated with the risk).
2. **Identify mitigation groupings as either current controls or incremental mitigations:** The Company identified the groupings by either current controls, which refer to controls that are already in place, or incremental mitigations, which refer to significantly new or expanded mitigations.
3. **Identify a methodology to quantify the impact of each mitigation grouping:** The Company identified the most pertinent methodology to quantify the potential risk reduction resulting from a mitigation grouping's impact by considering a spectrum of data, including empirical data to the extent available, supplemented with the knowledge and experience of subject matter experts. Sources of data included existing Company data and studies, outputs from data modeling, industry studies, and other third-party data and research.
4. **Calculate the risk reduction (change in the risk score):** Using the methodology in Step 3, the Company determined the change in the risk score by using one of the following two approaches to calculate a Potential Risk Score: (1) for current controls, a Potential Risk Score was calculated that represents the increased risk score if the current control was not in place; (2) for incremental mitigations, a Potential Risk Score was calculated that represents the new risk score if the incremental mitigation is put into place. Next, the Company calculated the risk reduction by taking the residual risk score (See Table 2 in this chapter.) and subtracting the Potential Risk Score. For current controls, the analysis assesses how much the risk might increase (i.e., what

the potential risk score would be) if that control was removed.<sup>22</sup> For incremental mitigations, the analysis assesses the anticipated reduction of the risk if the new mitigations are implemented. The change in risk score is the risk reduction attributable to each mitigation.

### 7.1.2 Calculating Risk Spend Efficiency

The Company SMEs then incorporated the mitigation costs from Section 6. They multiplied the risk reduction developed in subsection 7.1.1 by the number of years of risk reduction expected to be realized by the expenditure, and divided it by the total expenditure on the mitigation (capital and O&M). The result is a ratio of risk reduction per dollar, or RSE. This number can be used to measure the relative efficiency of each mitigation to another.

Figure 2 shows the RSE calculation.

*Figure 2: Formula for Calculating RSE*

$$\text{Risk Spend Efficiency} = \frac{\text{Risk Reduction} * \text{Number of Years of Expected Risk Reduction}}{\text{Total Mitigation Cost (in thousands)}}$$

The RSE is presented in this Report as a range, bounded by the low and high cost estimates shown in Table 4 of this chapter. The resulting RSE scores, in units of risk reduction per dollar, can be used to compare mitigations within a risk, as is shown for each risk in this Report.

### 7.2 Risk Spend Efficiency Applied to This Risk

SDG&E analysts used the general approach discussed in Section 7.1, above, in order to assess the RSE for the Employee, Contractor and Public Safety risk. The RAMP-A Overview and Approach chapter in this Report provides a more detailed example of the calculation used by the Company.

The Company used two, standard metrics to estimate the potential risk reduction of the proposed mitigations: Occupational, Safety and Health Administration (OSHA) incident rates and controllable motor vehicle incident (CMVI) rates. OSHA incident rates reflect the rate of occupational injuries that occur while conducting work for the Company, while CMVI incident rates reflect the rate of avoidable motor vehicle incidents that occur during Company operations. Subject matter experts deemed these to be the best available to use for quantification. The OSHA Recordable Incident and CMVI data are commonly available – both internally and externally across utilities, which supports a data-driven and comparable assessment. Additionally, several of the mitigations are expected to yield qualitative benefits, particularly mitigations 6 and 7 on Table 3 and 4.

For purposes of quantifying the potential risk reduction, mitigations were split into two groups, as described in Table 5: ones that address work-related incidents that do not involve motor vehicles and one that addresses motor vehicle incidents.

<sup>22</sup> For purposes of this analysis, the risk event used is the reasonable worst case scenario, described in the Risk Information section of this chapter.

**Table 5: Mitigation Groupings for Risk Reduction Analysis**

Mitigation	Description
1	Activities that address occupational incidents not involving motor vehicles
	This mitigation includes activities that are focused on occupational safety. Activities in this mitigation group include safety standards and policies, skills training, and job observations.
2	Activities that address occupational incidents involving motor vehicles
	This mitigation includes activities that are focused on safe driving practices. Activities in this mitigation group include driver training and telematics system.

**• Analysis of Mitigations that Address Occupational Incidents**

SDG&E estimated the potential increase in risk frequency if current controls were not in place. The assumption was that if these activities were not in place, SDG&E’s OSHA incident rate would increase to the level of the worst OSHA incident rate in the industry. Based on 2015 data, SDG&E’s OSHA incident rate was at 1.9 and the highest peer utility in that year had an OSHA incident rate of 5.2, which is 172% higher than SDG&E’s rate. Additionally, SDG&E has seen a 3-year improvement rate of 3.1% since 2007. If the current controls were not in place, it was assumed that SDG&E would not have achieved that 3.1% improvement rate, along with experiencing a rate the same as the worst in the industry. The total estimated potential increase in risk frequency would be 174.9%.

**• Analysis of Mitigations that Address Motor Vehicle Incidents**

Similarly, an estimated percentage increase in risk frequency was calculated based on the assumption that current controls were not in place: SDG&E’s CMVI rate would increase to the worst CMVI rate in the industry. Based on 2015 data, SDG&E’s CMVI rate was at 2.9 and the highest peer utility in that year had a CMVI rate of 7.4, which is 259% higher than SDG&E’s rate. Additionally, SDG&E has seen a 3-year improvement rate of 0.7% since 2007. If the baseline activities were not in place, then SDG&E would lose that 0.7% improvement rate along with experiencing a rate the same as the worst in the industry. The total estimated potential increase in risk frequency would be 260%.

**7.3 Risk Spend Efficiency Results**

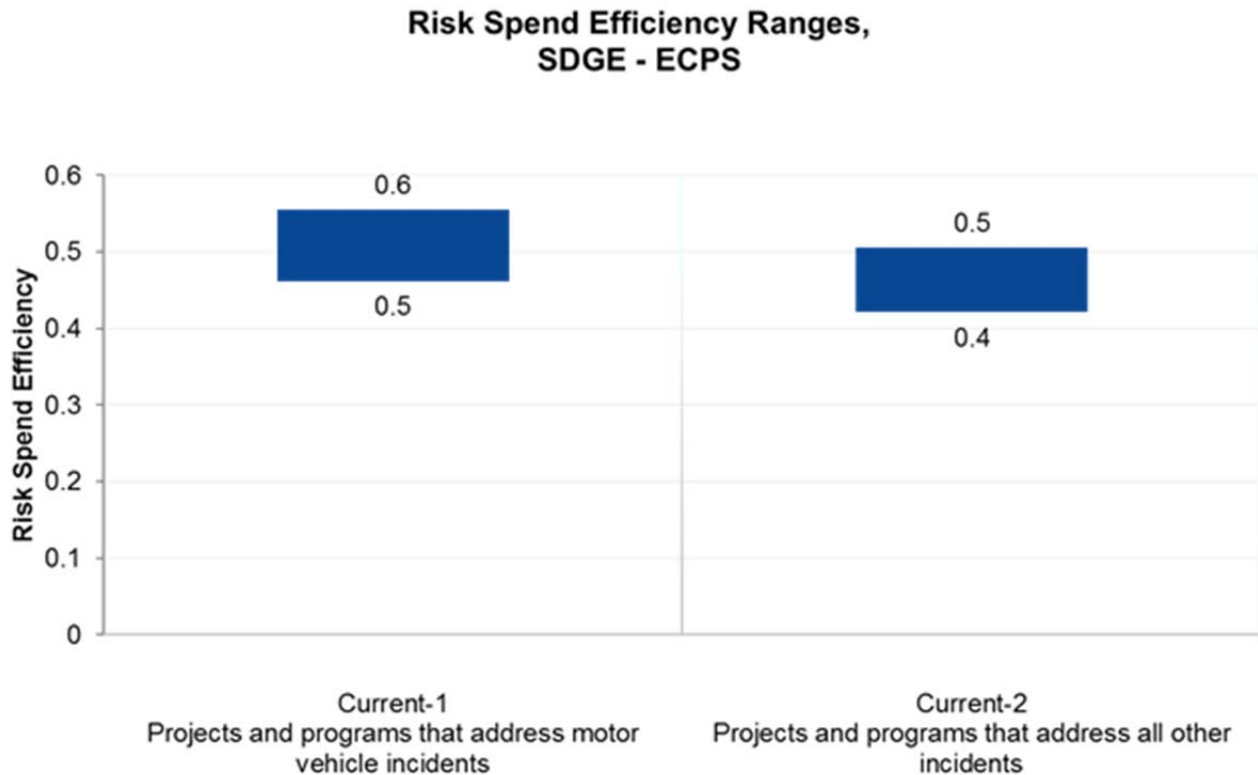
Based on the foregoing analysis, SDG&E calculated the RSE ratio for each of the proposed mitigation groupings. Following is the ranking of the mitigation groupings from the highest to the lowest efficiency, as indicated by the RSE number:

1. Activities that address motor vehicle incidents (current controls)
2. Activities that address occupational incidents (current controls)



Figure 3 displays the range<sup>23</sup> of RSEs for each of the SDG&E Employee, Contractor, and Public Safety risk mitigation groupings, arrayed in descending order.<sup>24</sup> That is, the more efficient mitigations, in terms of risk reduction per spend, are on the left side of the chart.

*Figure 3: Risk Spend Efficiency*



## 8 Alternatives Analysis

SDG&E considered alternatives to the proposed mitigations as it developed the incremental mitigation plan for the Employee, Contractor and Public Safety risk. Typically, alternatives analysis occurs when implementing activities, and with vendor selection in particular, to obtain the best result or product for the cost. The alternatives analysis for this risk plan also took into account modifications to the proposed plan and constraints, such as budget and resources.

<sup>23</sup> Based on the low and high cost ranges provided in Table 4 of this chapter.

<sup>24</sup> It is important to note that the risk mitigation prioritization shown in this Report, is not comparable across other risks in this Report.

### **8.1 Alternative 1 – Training Modifications**

As described in the sections above, education and training is a significant mitigation activity for this risk. Accordingly, SDG&E considered expanding the scope of training or increasing the frequency of training intervals. For example, SDG&E could add all employees to Smith System® driver training versus only those who drive 3,000 miles on Company business, or regularly drive a company vehicle. The Smith System ® training increases driver’s safety awareness with principles based on the Five Keys to Space Cushion Driving: (1) aiming high in steering, (2) getting the big picture, (3) keeping your eyes moving, (4) leaving yourself an out, and (5) making sure others see you. Likewise, offering training more frequently could further reinforce the subject matter.

This alternative was dismissed in favor of the proposed plan because SDG&E has found that the current safety policies and programs have proven effective based on the gradual decline of SDG&E’s OSHA rate. It was considered unlikely that the additional resources needed to expand training scope and increase training intervals would yield significant enough benefit.

### **8.2 Alternative 2 – Modernizing Training**

SDG&E also considered modernizing its training techniques to include videos, computer simulations and computer-based training delivery channels. A majority of the current training is either online, on-the-job or in a classroom, face-to-face setting. SDG&E continues to consider new techniques and process improvements that may enhance the way in which it operates.

Similar to Alternative 1, SDG&E prefers its proposed plan over this alternative. All training is kept up-to-date to be current and comply with mandated regulations. There likely would be significant up-front costs to perform a large scale modernization of safety training which are not expected to produce significant enough benefits (e.g., fewer incidents and injuries).