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Commissioner : Randolph
ALJ : Lirag
Witnesses : Carolina Contreras
Jenny Au



**OFFICE OF THE SAFETY ADVOCATE
CALIFORNIA PUBLIC UTILITIES COMMISSION**

**PREPARED TESTIMONY
OF CAROLINA CONTRERAS AND JENNY AU
ON SAN DIEGO GAS AND ELECTRIC COMPANY AND
SOUTHERN CALIFORNIA GAS COMPANY 2019
GENERAL RATE CASE**

PUBLIC VERSION

A.17-10-007 and A.17-10-008


San Francisco, California

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MEMORANDUM

1 This report was prepared by the Office of the Safety Advocate (OSA) of the
2 California Public Utilities Commission (Commission) in San Diego Gas and
3 Electric (“SDG&E”) and Southern California Gas Company (“SoCalGas”)
4 Application 17-10-007 and Application 17-10-008 for Authority, Among Other
5 Things, to Update their Gas Revenue Requirement and Base Rates Effective on
6 January 1, 2019.

7 OSA presents its analysis and recommendations associated with the
8 applicant’s request.

9 Carolina Contreras served as OSA’s project coordinator in this review, and
10 is responsible for the overall coordination in the preparation of this report. OSA’s
11 witnesses’ prepared qualifications and testimony are contained in Appendix A of
12 this report.

List of OSA Witnesses and Respective Chapters

Chapter Number	Description	Witness
1	Overview	Contreras
2	SDG&E/SoCalGas Safety Management and Culture	Contreras
3	SoCalGas Pipeline Safety Management System	Contreras
4	SoCalGas Line 235-2 Failure	Au

1 **CHAPTER 1 : OVERVIEW**

2 **I. INTRODUCTION**

3 The Office of the Safety Advocate (OSA) submits its direct testimony in response
4 to the applications of San Diego Gas and Electric (SDG&E) and Southern California Gas
5 Company (SCG or SoCalGas), collectively “the Utilities”, for Test Year 2019 General
6 Rate Cases (GRCs).¹

7 As recognized by the Commission, the safety of public utilities needs to be
8 evaluated more holistically considering “implementation of best practices, industry
9 standards, and the associated metrics of the security and safety of its electric grid, gas
10 pipelines, and facilities.”²

11 These GRCs set forth the resources that the Utilities deem necessary to maintain
12 their operations: 39% of SDG&E’s total 2019 GRC increase and 54% of SoCalGas’
13 incremental Risk Assessment Model Proceeding (RAMP) spending are considered as
14 safety-related costs.³ To ensure that all of these programs, initiatives, and investments
15 will effectively provide long-term safety benefits and create the appropriate barriers to
16 proactively prevent safety incidents, a holistic view of safety management and safety
17 management best practices is necessary, including the supporting safety culture.
18 Inadequate management of safety can lead to ineffective safety programs, misinformed
19 leadership, and potential catastrophic safety incidents. The costs in these GRCs and the
20 replacement rate of aging infrastructure may not be just and reasonable if the approach to
21 managing safety and the supporting safety culture is deficient.

22 Although not an exhaustive review, this exhibit presents the analyses and
23 recommendations of OSA regarding select aspects of the Utilities’ safety culture
24 enhancement efforts, approach to managing safety and related improvements, potential

¹ Application (A.) 17-11-007 and A.17-11-008, respectively.

² R.13-11-002 at p. 7; D.14-12-025 at p. 6; D.16-08-018 at p. 156.

³ Exhibit SDG&E-01 at CAW-07, SCG-01-R at JBL-11.

1 safety gaps, and means to help the Commission hold the Utilities accountable for their
2 safety.

3 As a result of the broad scope involved with safety management and culture, this
4 testimony addresses select items either contained in parts of several different exhibits of
5 the Utilities' Applications⁴, or items that may not have been explicitly contained in a
6 specific exhibit of the Application but that are important to the effective management of,
7 and thus relevant to the proposals presented in the Applications.

8 To develop this testimony, the Applications were reviewed, multiple data requests
9 were issued, meetings with Company representatives were held, as well as consultation
10 with respected safety industry experts. However, this is not an exhaustive review of the
11 Utilities' practices, but rather the identification of gaps and improvements that should be
12 addressed as part of the upcoming GRC cycle.

13 **II. SUMMARY OF RECOMMENDATIONS**

14 This testimony recommends improvements to the Utilities' approach to managing
15 safety in order to achieve greater effectiveness of existing and proposed safety programs
16 and investments, enhance their commitment to safety, and mitigate potential pitfalls that
17 could compromise the success of important safety initiatives in the long term, such as the
18 implementation of safety management systems. Generally, this testimony recommends
19 that:

20

21 ... Requirements that promote improvements to the Utilities'
22 management of and commitment to safety be instituted to help
23 ensure the long-term effectiveness and accountability of their
24 safety practices.

25

26 ... Certain expectations be set on the Utilities' approach to
27 managing safety for the next rate-case proposal so that the

⁴ Such as exhibits SCG/SDG&E-01, SCG/SDG&E-02-R, SCG/SDG&E-05-R, SCG among others, SDG&E-15-R, SDG&E-30, SCG-32.

1 Utilities will work towards extending the safety management
2 system framework to all of their operations, including
3 underground gas storage and electric operations, and to consider
4 all forms of safety, particularly process safety.
5

6 ... Additional conditions be instituted on the Utilities' initiative to
7 implement a pipeline safety management system for their gas
8 operations;
9

10 For the detailed recommendations, please refer to Section II of Chapters 2 and 3.

11 **III. OVERARCHING CONCLUSIONS**

12 Adequate conditions that promote improvements in the Utilities' management of
13 safety and enhance their commitment to safety are necessary to ensure the effectiveness
14 of safety programs and spending in the upcoming GRC cycle and beyond. In turn, the
15 Commission must remain vigilant and monitor the effectiveness of the Utilities
16 management of safety.

1 **CHAPTER 2 : SDG&E/SOCALGAS SAFETY POLICY AND**
2 **MANAGEMENT OF SAFETY**

3 **I. INTRODUCTION**

4 SoCalGas and SDG&E view safety as a “three-pronged effort that requires
5 vigilant attention to 1-employee/contractor safety, 2-customer/public safety, and 3- the
6 safety our gas delivery system”⁵. In their respective exhibits, the Utilities’ Chief
7 Operating Officers (COOs) provided an overview of how their 2019 GRC applications
8 reflect their “strong commitment to delivering safe, clean, and reliable, electric and
9 natural gas service”⁶

10 Safety is an organizational value demonstrated by leadership commitment and
11 expressed by providing adequate resources, systems, and rewards to serve this end.⁷
12 Those organizational values (*what is important*, i.e. whether production is more important
13 than safety) and beliefs (*how things work*) interact with an organization’s structure and
14 control systems to create behavioral norms (*the way we do things around here*) on safety
15 that ultimately drive safety outcomes.⁸ In other words:

16 “Safety culture reflects the extent to which an organization’s culture understands
17 and accepts that safety comes first, with a majority of organizational members directing

⁵ Exhibit SCG 01 at JBL-04, lines 21-24. SDG&E -01 at CAW-04.

⁶ Exhibits SCG-01.

⁷ “Safety”, as supported by the North American Regulators Working Group on Safety Culture (NARWGSC) and used herein, includes safety of workers and the public, process safety, operational safety, facility integrity, security and environmental protection. See “*Safety Culture Research Project: A Regulatory Perspective*” (2016) by NARWGSC. <https://www.neb-one.gc.ca/sftnvrnmnt/sft/sftyctr/sftcltrndctr-eng.pdf> .

⁸ Canada’s National Energy Board Safety Culture Statement.

1 their attention and efforts toward its improvement”⁹ Culture has been explicitly identified
2 as an important aspect of effective safety management.¹⁰

3 This Chapter addresses portions relevant to the Utilities’ approach to managing
4 safety and whether or not their initiatives promote safety culture.

5 **II. SUMMARY OF RECOMMENDATIONS**

6 OSA’s recommendations are listed below:

- 7 ... The Utilities should increase their focus on process safety, all the
8 way from the top of their organization, and highly prioritize it.
9 Particular attention should be given to SDG&E’s electric
10 operations. The Utilities should:
- 11 ○ develop and effectively monitor process safety performance,
12 including *leading* indicators¹¹, at the enterprise level,
13 including the Board of Directors (BODs);
 - 14 ○ ensure efforts are in addition to complying with and
15 participating in regulatory proceedings: regulatory
16 compliance should not be the goal to strive for;
 - 17 ○ incorporate process safety related performance objectives to
18 achieve a better balanced representation of safety objectives;
 - 19 ○ regularly discuss process safety performance in all BOD
20 meetings.
- 21 ... Safety Key Performance Indicators (KPIs) should drive safety-
22 related decisions. KPIs should be structured to represent safety
23 performance as opposed to a straight count of the output or
24 financial spending. These should include leading indicators, and
25 consider human and organizational factors.

⁹ “*Strengthening Safety Culture of the Offshore Oil and Gas Industry*” (2016), Transportation Research Board Special Report 321, by The National Academies of Sciences, Engineering, and Medicine, p. 22; “*Organizational Culture and Leadership*” (2004), by Edgar H. Schein.

¹⁰ Lord Cullen Report on Piper Alpha disaster on 6 July 1988, in which gas condensate ignited, killing 167 of the 229 people on board the oil platform in only 22 minutes.

¹¹ Leading indicators should give signals for concern about future safety as they identify precursor conditions. They may be “inputs” to a safety program. On the other hand, lagging indicators give signals of concern about past safety as they more readily measure “output” performance.

- 1 ... The Utilities should add safety as a qualification to select new
2 Board members.
- 3 ... Members should, at a minimum, be required to take safety
4 management and system/process safety training, including
5 related on-boarding for new members;
- 6 ... Utilities should only consider performance measures whose
7 primary purpose is safety for the safety performance component.
8 Based on this, they should clarify what the real Incentive
9 Compensation Plan (ICP) percentage is for safety;
- 10 ... SDG&E should add an adequate level of safety performance
11 measures for electric operations to ICP.
- 12 ... The Utilities should adopt a more comprehensive multi-method
13 approach to assessing their safety culture by ideally incorporating
14 the five methods listed in Table 1, but at a minimum, by at least
15 incorporating one for each information type. If the latter, the
16 Utilities should strive to incorporate an ideal comprehensive
17 approach to their assessments based on the needs of each utility
18 as their assessment efforts mature.
- 19 ... The Utilities should work to incorporate contractors and any
20 others involved in a work process or at a work site who are the
21 responsibility of the operator or who could affect or be affected
22 by safety culture.
- 23 ... The Utilities, especially SDG&E must:
- 24 ○ Evaluate the effectiveness of the improvement strategies that
25 resulted from the safety culture assessment. This involves
26 monitoring the implementation of the improvement actions
27 and the impact of the outcomes.
- 28 ○ Follow best practices for effective safety culture assessments,
29 such as those promulgated by safety culture experts¹² or
30 equivalent documents from other industries¹³
- 31 ... As part of its safety assurance activities, the Commission should
32 verify the Utilities' implementation of their Natural Gas Safety
33 Plans before submittal of the next rate case Application.

¹² Fleming, M; and Scott, N. “*A Regulator’s Guide to Safety Culture and Leadership*”.

¹³ International Civil Aviation Organization (ICAO), International Atomic Energy Agency (IAEA).

1 ... SDG&E should be required to submit an Electric Operations
2 Safety Plan to the Safety and Enforcement Division (SED),
3 similarly purposed as the Natural Gas Safety Plan, before the
4 next GRC application.

5 ... The Utilities should develop a safety management system (SMS)
6 framework to address electric and underground gas storage
7 assets/operations, and present its proposal in the next GRC.

8 ... The framework/s should leverage the API 1173 framework's
9 emphasis on safety culture.

10 **III. DISCUSSION**

11 **A. Higher visibility of occupational safety over other forms** 12 **of safety at the enterprise level can lead to overlooking** 13 **critical process safety issues.**

14 To effectively manage the safety of complex systems that pose a threat to not just
15 employees and the environment but also to the public, such as gas and electric utility
16 systems do, it is important to distinguish between occupational safety – sometimes
17 referred to as personal safety – and process safety.

18 Major accident investigations have cautioned that a focus on personal safety and
19 occupational injury statistics can lead to a false sense of security with regard to process
20 safety.¹⁴

21 **1. Occupational Vs. Process Safety**

22 Occupational safety hazards, such as slips, falls, cuts, and vehicle accidents,
23 usually affect one individual worker at a time. On the other hand, process safety hazards
24 may cause major accidents involving the release of energy or potentially dangerous
25 materials, fires and explosions, or both. Process safety incidents can have catastrophic
26 effects and can result in multiple injuries and fatalities, as well as substantial economic,
27 property, and environmental damage.¹⁵

¹⁴ *Strengthening Safety Culture of the Offshore Oil and Gas Industry* (2016), Transportation Research Board Special Report 321, by The National Academies of Sciences, Engineering, and Medicine, p. 108.

¹⁵ Hopkins, A, *Disastrous Decisions: The Human and Organizational Causes of the Gulf of Mexico*

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1 Although both forms of safety are necessary for overall safety, it is now widely
2 recognized that good occupational safety performance does not ensure good process
3 safety performance. While there is much in common, such as a healthy safety culture and
4 attitude, good process safety performance requires a thorough understanding of the
5 specific hazards associated with the material being handled or stored, and the process
6 operations being carried out in a particular system. It is also considered that, because
7 process safety disasters are rare, they do not contribute to workforce injury statistics on
8 an annual basis.¹⁶

9 This problem has come to the forefront following major catastrophic incidents like
10 the Deepwater Horizon oil well blow out of 2010 and the Texas City refinery disaster of
11 2005. Investigations into those events found that “...management paid attention to,
12 measured, and rewarded personal safety rather than process safety”, concluding that this
13 attention largely contributed to the events.¹⁷

14 **2. Utilities may be over-relying on occupational safety**
15 **performance.**

16 For most companies, performance measures both reported *and* used at the
17 executive and Board of Directors (BoD) level generally focus on those aspects of
18 organizational performance that are considered the most critical for the organization’s
19 success.

20 The Utilities explained to OSA that, at the enterprise level, the indicators/measures
21 used to track and assess their safety performance primarily consist of
22 occupational/personal safety indicators such as “employee injuries, illnesses and motor

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Blowout.”

¹⁶ Hopkins, A. “*Management Walk-Arounds: Lessons from the Gulf of Mexico Oil Well Blowout,*” p. 9.

¹⁷ The Chemical Safety Board (CSB) report on Texas City refinery explosion, as repeated in President’s Report on BP Deepwater Horizon Oil Spill and Offshore Drilling, 221.

1 vehicle incidents, near misses and facility safety inspections related to the workplace.”¹⁸
2 This would also appear to be the case at the BoD level. By reviewing 12-months of the
3 Utilities’ meeting minutes– from October, 2016 to October, 2017 - OSA learned that
4 “safety metrics” are reported on a semi-regular basis during the “[REDACTED]
5 [REDACTED]” item for SoCalGas, and occasionally for SDG&E. The majority of
6 discussions related to safety metrics noted in the meeting minutes that contained
7 sufficient detail for OSA to gather their context were concerning occupational /personal
8 safety metrics and initiatives. [REDACTED] The Utilities have failed to provide documented evidence
9 of any other safety performance metrics regularly reported to the BoDs through this [REDACTED]
10 [REDACTED], despite OSA’s request.²⁰

11 Based on the review discussed above, it would appear that, at least at the
12 enterprise/BoD level, the Utilities’ focus on occupational safety performance.

13 **3. Focus on occupational safety can be detrimental to**
14 **overall safety.**

15 There are several examples of major disasters where investigations found the
16 companies focused on personal injury and fatality data while overlooking looming
17 process safety issues that largely contributed to catastrophic events. As mentioned
18 earlier, such an example is the 2005 explosion and fire at British Petroleum’s (BP’s)
19 Texas City, Texas refinery where an eruption of flammable liquid hydrocarbons formed a
20 vapor cloud that ignited and resulted in 15 deaths, more than 170 injuries, and significant
21 economic losses as the worst US industrial accident in more than 10 years at that time.
22 The Chemical Safety Board’s (CSB’s) and the Independent Review Panel’s (Baker
23 Report) investigations into the incident concluded that BP focused primarily on

¹⁸ Utilities’ Response to Q.1.e) of OSA-SEU DATA REQUEST-001.
[REDACTED]

²⁰ OSA requested the material/handouts provided to the BoD for discussion of safety metrics on the dates mentioned above. The Utilities’ expressed that no such material exists.

1 occupational safety and improving those accident rates while overlooking a poor level of
2 process safety management largely leading to the accident:

3 “BP primarily used injury rates to measure process safety performance
4 at its U.S. refineries before the Texas City accident. Although BP was
5 not alone in this practice, BP’s reliance on injury rates significantly
6 hindered its perception of process risk. BP tracked some metrics
7 relevant to process safety at its U.S. refineries. Apparently, however, BP
8 did not understand or accept what this data indicated about the risk of a
9 major accident or the overall performance of its process safety
10 management systems. As a result, BP’s corporate safety management
11 system for its U.S. refineries does not effectively measure and monitor
12 process safety performance.”²¹
13

14 Similar findings were made for BP’s Deepwater Horizon/Macondo well explosion in the
15 Gulf of Mexico:

16 “...companies like Transocean and BP, trade associations, and U.S.
17 regulators largely judged the safety of offshore facilities by focusing on
18 personal injury and fatality data (such as dropped objects and slips, trips,
19 and falls), that overshadowed the use of leading indicators more focused on
20 managing the potential for catastrophic accidents.”²²
21

22 In fact, in both instances the operator seemed to enjoy an excellent occupational
23 safety record, including awards for safety performance in that domain.²³ These and many

²¹ Baker Report at p. xiv.

²² CSB News Release on Investigation: At the Time of 2010 Gulf Blowout, Transocean, BP, Industry Associations, and Government Offshore Regulators Had Not Effectively Learned Critical Lessons from 2005 BP Refinery Explosion in Implementing Safety Performance Indicators, July 24, 2012. <https://www.csb.gov/csb-investigation-at-the-time-of-2010-gulf-blowout-transocean-bp-industry-associations-and-government-offshore-regulators-had-not-effectively-learned-critical-lessons-from-2005-bp-refinery-explosion-in-implementing-safety-performance-indicators/>

²³ The Chemical Safety Board’s investigation into the Deepwater Horizon explosion found that BP was a finalist for a safety award from the Minerals Management Service, the former Department of the Interior agency overseeing offshore oil exploration and production, and that a total of 15 safety awards had been given to BP and Transocean over a period of years. See <http://www.csb.gov/csb-investigation-at-the-time-of-2010-gulf-blowout-transocean-bp-industry-associations-and-government-offshore-regulators-had-not-effectively-learned-critical-lessons-from-2005-bp-refinery-explosion-in-implementing-safety-performance-indicators/>

1 other incidents exemplify the potential consequences of over-emphasizing occupational
2 safety over other forms of safety applicable to the industry, such as process safety.

3 Another example of this can be found in SDG&E’S “incentive compensation
4 plan” (ICP).²⁴ The Utilities believe the ICP demonstrates their “commitment to safety
5 culture through compensation related metrics and key-performance indicators to drive
6 improved safety performance.”²⁵ However, the only *true* safety measures used for
7 SDG&E’s electric operations’ ICP again correspond to occupational safety.²⁶ Although
8 System Average Interruption Duration Index (SAIDI) and Worst Circuit (SAIDI and
9 SAIFI) are also listed as safety measures, these are widely recognized as indicators of
10 reliability rather than safety, and acknowledged as such throughout SDG&E’s Testimony
11 – see discussion in Section C of this Chapter. Therefore the only form of safety that the
12 ICP may drive for SDG&E’s electric operations relate to occupational safety.

13 **4. The Utilities should increase focus on process safety**

14 As recommended by the Organization for Economic Co-operation and
15 Development’s (OECD’s) guidance on process safety governance,²⁷ the Utilities should
16 incorporate the lessons learned from incidents like BP’s Texas City and
17 Macondo/DeepWater Horizon:

18 “The lessons from past incidents demonstrate that strong process
19 safety leadership [(is)] vital in preventing catastrophe, and it is essential
20 that these lessons are learned and adopted across all sectors to prevent the
21 same failings leading to more accidents in the future”²⁸
22

²⁴ SDG&E-30 at DSR-12 – 13.

²⁵ *Id* at DSR-5 lines 10-11.

²⁶ SDG&E-30 Table DSR-06.

²⁷ Corporate governance for process safety: OECD Guidance for senior leaders in high hazard industries, <http://www.oecd.org/chemicalsafety/chemical-accidents/corporate%20governance%20for%20process%20safety-colour%20cover.pdf>

²⁸ *Ibid*.

1 Upon further inquiry by OSA expressing concern for the lack of performance
2 indicators for all forms of safety at the enterprise level, not just occupational safety, the
3 Utilities responded that formalization of “operational safety metrics is a work-in-
4 progress.”²⁹ Most of the efforts cited to formalize “operational” metrics however, are
5 related to regulatory requirements and proceedings at the Commission. This is of
6 concern to OSA as regulatory compliance should not be the goal to strive for; doing so is
7 a major contributor to many ineffective safety programs and management cultures, not to
8 mention safety incidents. *Instead, it is important to focus on the goal – managing safety.*

9 The Utilities should increase their focus on process safety, all the way from the top
10 of their organization, and highly prioritize it. Particular attention should be given to
11 SDG&E’s electric operations. This effort should begin immediately and its progress
12 should be explicitly demonstrated in the next RAMP and/or GRC filing. At a minimum,
13 the utilities should:

14 ... develop and effectively monitor process safety performance, including
15 *leading* indicators, at the enterprise level, including the Board of
16 Directors.³⁰

17 ... ensure efforts are in addition to complying with and participating in
18 regulatory proceedings: regulatory compliance should not be the goal to
19 strive for;

20 ... incorporate process safety related performance objectives to achieve a
21 better balanced representation of safety objectives; and

22 ... regularly discuss process safety performance in all BOD meetings.

23 **5. KPIs dot not always drive asset related decisions.**

24 The assessment reports on the Utilities’ risk maturity and integration of risk, asset
25 and investment management³¹, indicates that:

²⁹ OSA-SEU Data Request-001 Supplemental 2, Utility supplemental response 1.

³⁰ Leading indicators should give signals for concern about future safety as they identify precursor conditions. They may be “inputs” to a safety program. On the other hand, lagging indicators give signals of concern about past safety as they more readily measure “output” performance.

1 “Interview feedback suggested, however, that KPIs do not always drive
2 asset-related decision making and are often based on task completion (e.g.
3 miles of pipeline installed) and cost (i.e. budget). Supplementing such KPIs
4 with those that address asset health and performance would improve the
5 Company’s maturity level in this area.”
6

7 Likewise, safety KPIs should drive safety-related decisions. Additionally, the KPIs
8 should be structured to represent safety performance as opposed to a straight count of
9 outcome of financial spend. These should include *leading* indicators, and consider human
10 and organizational factors.

11 **B. System/Process Safety Training for Board of Directors.**

12 To describe their safety governance, the Utilities explain that Executive Safety
13 Councils, which are headed by each (COO), are “committed to and accountable for the
14 development and maintenance of safety culture”³². However, safety starts at the very top:
15 with the BoD.

16 Unless the members of the BoD are sufficiently qualified and knowledgeable in all
17 forms of safety, they will be unable to respond to information received on safety
18 deficiencies, including process/system safety. Even though management is responsible
19 for managing the Utilities’ safety, the BoD will be unable to effectively exercise their
20 oversight and ensure, as a best practice, that management is actually doing so.

21 To ensure the BoD will be able to exercise its oversight duty, members should, at
22 a minimum, be required to take safety management and system/process safety training,
23 including related on-boarding for new members.

24 Also, the Utilities should add safety to the list of qualification used in selecting
25 Directors to the BoD. This is recommendation is similar to that made to Pacific Gas &

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³¹ SCG/SDG&E-02-R, Appendix C.

³² Exhibit SCG-02-R at DD-28, lines1- 20.

1 Electric in the Safety Culture Proceeding.³³ This recommendation was noted as high
2 priority and relatively easy to implement at lower cost.

3 **C. Safety measures used for the Incentive Compensation**
4 **Plan are not all safety-related.**

5 Exhibits SCG-28/SDG&E-30 state that “compensation programs are designed to
6 focus employees on the companies’ key priorities, the most important of which is safety”,
7 and further explain that “by placing increased emphasis on employee and operational
8 safety measures in their ICP plans, SoCalGas and SDG&E in turn bolster their already
9 strong safety culture and safety performance”. To achieve this, the Utilities claim that
10 safety measures now make up 70% of the ICP’s company performance component.
11 Tables DSR-6 and DSR-7, for SDG&E and SoCalGas respectively, list these measures
12 under a category labeled “Safety and Public Safety Related Operational Measure.”

13 However, at least three of the seven “operational safety measures” were not
14 primarily representative of, or related to, safety. For SDG&E’s “Electric Safety”
15 component, for example, the measures are solely based on System Average Interruption
16 Duration Index (SAIDI) and Worst Circuit (SAIDI and SAIFI) which “focus on reducing
17 the cumulative outage time or frequency experienced by SDG&E.”³⁴ These are widely
18 recognized as measures of reliability instead of safety. SDG&E itself recognizes that their
19 application of incentive mechanisms, such as the performance based ratemaking (PBR)
20 mechanism which is based on SAIDI/SAIFI measures, “would not be consistent with
21 SDG&E’s efforts to build upon its strong safety culture,”³⁵ and in fact believes its
22 application “presents conflicting incentives with the more recent safety risk-mitigation

³³ Recommendation III-1, Governance and strategy “*Assessment Of Pacific Gas And Electric Corporation And Pacific Gas And Electric Company’s Safety Culture Prepared For California Public Utilities Commission*” by Northstar, I.15-8-019.

³⁴ Exhibit SDG&E-28/SCG-30 at DSR-15, lines 7-10.

³⁵ Exhibit SDG&E-15-R at WHS-92, lines 4-6.

1 initiatives at the Commission.”³⁶ Likewise, these ICP measures do not represent safety
2 and can even be in conflict with safety performance. These account for 100% of the
3 electric safety measures contained in SDG&E’s ICP.

4 Similarly, the make-up of SoCalGas’ ICP component categorized as “Safety and
5 Public Safety Related Operational Measures” contains measures that are not primarily
6 related to safety. More precisely:

7 ... AMI-Advance meter installations; and

8 ... Incomplete Orders Reduction (Customer Service Field Efficiency)³⁷

9
10 SoCalGas explains that “the AMI ICP performance measures focus on meeting
11 goals related to the installation of advanced meters and migration of customers to
12 automated meter reading and billing while staying within the AMI project’s budget.”³⁸
13 While safety data analytics can be a side benefit of AMI installations, this is secondary to
14 the primary purpose of operational efficiency of AMI’s through automating meter
15 reading and billing and other non-safety-related uses of data.

16 In terms of the other measure, SoCalGas explains that “The Incomplete Orders
17 Reduction ICP performance measure focuses on reducing the number of repeat visits by
18 Customer Service Field by reducing incomplete orders.”³⁹ Orders are not necessarily
19 generated due to safety-related matters, but can be for a myriad other reasons.

20 Therefore the label “operational safety measures” used by the Utilities to claim 70
21 percent of incentive compensation based on safety measures is misleading. The Utilities
22 should clarify what the *real* percentage is for the safety component.

³⁶ *Id.* at WHS-95, lines 2-4.

³⁷ Exhibit SDG&E-28/SCG-30 Table-DSR-7.

³⁸ *Id.* at DSR-15, lines 15-18.

³⁹ *Id.* lines 15-18.

1 Since these incentives are targeted at driving behavior towards achieving goals, it
2 is imperative that the Utilities send the right signals through a balanced approach that
3 considers the most critical safety aspects and is representative of all forms of safety.
4 Imbalanced signals that may not adequately prioritize safety in all its forms can
5 negatively impact safety programs and outcomes, and have an adverse effect on safety
6 culture.

7 Therefore:

8 ... The Utilities should only consider performance measures whose
9 primary purpose is safety for the safety performance component. Based
10 on this, they should clarify what the real ICP percentage is for safety.

11 ... SDG&E should add an adequate level of safety performance measures
12 for electric operations to ICP.

13 **D. Safety Culture Enhancements**

14 Public utilities regulated by the Commission are expected to “create a culture
15 within their organizations that puts safety first in their actions”.⁴⁰ An organization’s
16 safety culture is increasingly recognized as ultimately driving its safety outcomes: a
17 healthy safety culture is a prerequisite for positive safety performance of public utilities.⁴¹

18 This section addresses some select practices presented by the Utilities in order to
19 promote safety culture and related improvements.

20 **1. Comprehensive approach to safety culture assessment** 21 **should be applied.**

22 It is not only important for utilities to promote a healthy safety culture, but also to
23 continually assess the condition of their cultures to identify strengths/weaknesses and
24 continually identify opportunities for improvement. The Utilities state that “SoCalGas

⁴⁰ Safety Policy Statement of the California Public Utilities Commission (July 10, 2014)
http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Safety/VisionZero4Final621014_5_2.pdf.

⁴¹ I.15-08-019 *into whether PG&E and P&E Corporation’s organizational culture and governance prioritize safety.*

1 and SDG&E both regularly assess their safety culture through the National Safety
 2 Council Barometer Safety Culture Survey (Safety Culture Survey) which measures the
 3 overall health of the Companies’ safety climate and identifies areas of opportunity to
 4 eliminate injuries and improve focus and commitment to safety”⁴², with the goal to
 5 “increase employee participation in, and contribution to, improvements in safety
 6 performance.”⁴³

7 Safety culture experts and regulators who actively seek evidence of safety culture
 8 within their regulated entities, all agree that a multi-method approach is more
 9 appropriate.⁴⁴ Safety culture differs from other aspects of safety such as a hazard
 10 assessment, as it is a more abstract concept. It is not possible to go and touch or see
 11 safety culture; it must be inferred from other indicators. It is therefore important to use
 12 multiple sources of information to form a comprehensive picture of the culture. The table
 13 below lists the recommended assessment methods based on the type of information they
 14 gather. Each has its own benefits and limitations.⁴⁵

15 Table 1: Safety culture assessment methods by type of information gathered

Employees Perceptions	Culture in Action	Stated Values
Surveys/Questionnaires	Observation	Document Analysis
Interviews		
Focus Groups		

16

⁴² OSA-SEU DATA REQUEST-002, Utilities Response 1 Continued.

⁴³ Exhibit SDG&E- 30 at TT-8.

⁴⁴ “IAEA’s approach to safety culture and safety culture assessment” paper by Monica Haage presented at 2011 COG Safety culture Meeting, Toronto, Canada; “A Regulator’s Guide to Safety Culture and Leadership” Technical Report prepared by Mark Fleming, PHD and Natasha Scott, PHD, Saint Mary’s University; “Principles of a Strong Safety Culture”, Institute of Nuclear Operations(INPO); IAEA, Bureau of Safety and Environmental Enforcement (BSEE).

⁴⁵ “A Regulator’s Guide to Safety Culture and Leadership” Technical Report prepared by Mark Fleming, PHD and Natasha Scott, PHD, Saint Mary’s University.

1 The Utilities should adopt a more comprehensive multi-method approach to
2 assessing their safety culture by ideally incorporating the five methods listed in Table 1,
3 but at minimum, by at least incorporating one for each information type. If the latter, the
4 Utilities should strive to incorporate an ideal comprehensive approach to their
5 assessments based on the needs of each utility as their assessment efforts mature.

6 **2. Contractors should be included in safety culture**
7 **assessments.**

8 Best practices identified for other industries, such as nuclear and offshore oil and
9 gas, promulgate that safety culture assessments should *include employees, contractors,*
10 *and any others involved in a work process* or at a work site who are the responsibility of
11 the operator or who could affect or be affected by safety culture⁴⁶. Although contractors
12 play a significant role in the Utilities’ operations, this group is absent from the Utilities’
13 assessment efforts, namely the Barometer Surveys which the Utilities use to assess their
14 overall safety culture.

15 The Utilities should work to incorporate contractors and any others involved in a
16 work process or at a work site who are the responsibility of the operator or who could
17 affect or be affected by safety culture.

18 **3. Safety culture enhancements and their effectiveness**

19 **a. Degradation in SDG&E’s Safety Climate**

20 Each of the Utilities has performed two safety culture surveys to assess their
21 overall safety culture health: the first in 2013 followed by another in 2016. Conducting
22 these at regular intervals helps measure improvement. For 2016, SoCalGas reports a
23 slight improvement in safety barometer score and increase in employee participation to
24 75% ([REDACTED]). On the other hand, SDG&E’s results experienced a

⁴⁶ “ SCART Guidelines: Reference report for IAEA safety culture assessment review team” IAEA; and
“Strengthening Safety Culture of the Offshore Oil and Gas Industry”(2016), Transportation Research
Board Special Report 321, by The National Academies of Sciences, Engineering, and Medicine.

1 noticeable [REDACTED]

2 [REDACTED]

3 ... overall safety barometer percentile score [REDACTED]

4 [REDACTED]

5 ... employee participation rate was [REDACTED] corresponding to a

6 [REDACTED] over the 2013 survey.

7 Although SDG&E states that the reduction is a reason to “double-down”, and as

8 recommended by the National Safety Council, applied the three-step interpretation

9 process,⁴⁷ the noticeable reduction in both overall score *and* the [REDACTED]

10 in 2016 possibly indicate a lack of:

11 ... *evaluating effectiveness* of the improvements implemented;

12 ... *follow-through* and *communication* with employees; and/or

13 ... *commitment from leadership* to make the improvements necessary.

14 As an example of evaluating effectiveness, take the “stop a job” policy that is

15 constantly referred to by the Utilities as one their efforts “to help foster a healthy safety

16 culture” in the organization:

17 “SDG&E employees, regardless of rank or title, are given the authority to

18 “stop a job” at any time if they spot a safety hazard, and are encouraged to

19 raise a red flag whenever they feel it is needed”⁴⁸

20

21 Unlike SoCalGas, SDG&E does not have a method to capture the instances when

22 an employee avails themselves of this policy. Without at a minimum tracking this type of

23 information it seems impossible for SDG&E to know if the program is even working as

24 intended, much less learn from the occurrences to identify serious safety issues, nor

25 conduct any trends. Despite OSA’s request, the Utilities failed to explain how they

26 evaluate the effectiveness of this policy.⁴⁹

⁴⁷ Exhibit SDGE-30 at TT-8, lines 16-19.

⁴⁸ Exhibit SDG&E-01 at CAW-05, SDG&E-02-R at DD-29.

⁴⁹ OSA-SEU DATA REQUEST-004, Utilities Response 3.

1 It is also critical that the Utilities promptly and diligently follow up with
2 employees on the survey results, subsequent efforts, and further explore the feedback
3 provided by the workforce. If employees don't feel like real efforts to address issues are
4 being made, then they will see their participation as unimportant and render the survey
5 useless. This was reflected in some of the comments left by employees. Lack of follow
6 through can be detrimental and could be reflected in the low-participation.

7 Both Utilities must continually make improvements based on their assessments.
8 SDG&E in particular needs to take the results of this survey to heart and take swift action
9 in following up with employees on the results. These surveys are only good if action is
10 taken, and employees see that action is taken. Then in the future, even more valuable
11 feedback can be provided.

12 The Utilities, especially SDG&E must:

13 ... Evaluate the effectiveness of the improvement strategies that resulted
14 from the safety culture assessment. This involves monitoring the
15 implementation of the improvement actions and the impact of the
16 outcomes.

17 ... Follow best practices for effective safety culture assessments, such as
18 those promulgated by safety culture experts⁵⁰ or equivalent documents
19 from other industries⁵¹

20 **b. Assessments can be biased based on the safety focus**
21 **of the Utilities**

22 Although SoCalGas claims a “very high” score for its overall safety barometer
23 results, the Utilities should keep in mind that results can be biased based the perception or
24 concept that employees have on what safety is. If there is an organizational emphasis on
25 occupational safety, employees will likely respond to the survey based on that perception
26 of safety. This means that the results will also reflect that perception and not be
27 representative of other process/system safety considerations.

⁵⁰ Fleming, M; and Scott, N. “A Regulator’s Guide to Safety Culture and Leadership”.

⁵¹ International Civil Aviation Organization (ICAO), International Atomic Energy Agency (IAEA).

1 For future surveys, the Utilities should consider incorporating questions that reveal
2 process safety perceptions, and proactively work to ensure that its workforce is well
3 aware of process safety, its importance, and the differences with occupational safety.

4 **E. Increase safety oversight assurance activities for the**
5 **upcoming rate case cycle.**

6 As evidence of its commitment to safety and implementing a safety management
7 system, the Utilities cite to their Natural Gas Safety Plans. These plans are submitted
8 yearly to the Commission’s Safety and Enforcement Division, pursuant to Public Utilities
9 Code Sections 961 and 963 which were enacted as a result of San Bruno.

10 “The Natural Gas Safety Plans for SoCalGas and SDG&E convey
11 the safety performance expectations of the utilities’ Senior
12 Management Team, and describes all of the safety plans, programs,
13 policies, standards, and procedures that are designed to accomplish
14 those expectations. In the hierarchy of utilities’ documents that
15 communicate their safety programs, *this Safety Plan is at the top.*”⁵²

16 All too often, organizations are quick to be seen as valuing safety, outwardly
17 espousing safety as one of the organization’s core values, while meeting only the
18 minimum requirements for safety. In a study commissioned by a North American energy
19 regulator to compare major industrial accidents, it found that when these accidents occur
20 “there is often an observable disconnect in the company’s vision (what they say) and their
21 planning, implementation, monitoring, and review (what they actually do).”⁵³ This
22 precise issue was highlighted by the Independent Review Panel (IRP) in its Report of the
23 San Bruno incident. The IRP concluded that “[s]imply put, ‘the rubber did not meet the
24 road’ when it came to PG&E’s implementation of the recommendations of its enterprise
25 risk management process.”⁵⁴ This gap is depicted in the figure below.

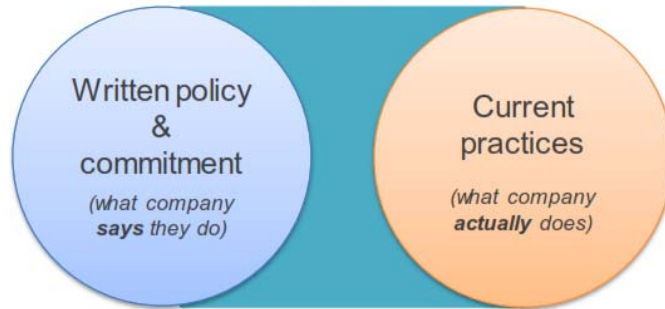
⁵² OSA-SEU DATA REQUEST-004, Utilities Response 4.

⁵³ *Id.* p.1; “Major Hazard Incidents: Arctic Offshore Drilling Review” (2011), Det Norske Veritas

⁵⁴ “Assessment of PG&E Corporation and PG&E Company’s Safety Culture”(2017), by Northstar Consulting Group for the California Public Utilities Commission at p. II-1.

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Figure 1.
Source: Dr. Claudine Bradley, CPUC Safety En Banc March 7, 2018.
Gap between what is said and what is done



It is important for the Commission and in the public’s best interest to not only check that the Utilities are committed to safety on paper but actually verify the effectiveness of that commitment through safety oversight activities that go beyond the minimum regulatory requirements.

As part of its safety assurance activities, the Commission should verify the Utilities’ implementation of their Natural Gas Safety Plans before submittal of the next rate case Application.

Verification can be done through an evaluation conducted by OSA staff in collaboration with Staff from SED’s Gas Safety and Reliability Branch (GSRB) and Risk Assessment and Safety Advisory (RASA) groups to form a multi-disciplinary team approach. Alternatively, it could be performed by a third-party at the direction and with potential participation of Commission Staff. The evaluation should focus on activities that are not part of SED’s regular audits, but that play a critical role in the management of safety, such as incident investigation procedures.

F. Electric Operations Safety Plan

The Natural Gas Safety Plans (Safety Plans) described in the previous section required the gas pipeline operators – many, if not most, for the first time - to take stock of their safety related policies, programs, procedures, and plans, while working to align them towards objectives that are critical to ensuring safety: (1) safety systems, (2) emergency response, (3) state and federal regulations, (4) continuing operations, and (5) emerging issues. The Safety Plans can also help in holding the gas operators

1 accountable for their safety and potentially help enhance their safety culture. The gas
2 operations function of the Utilities sees them as their “top safety document”.

3 Despite the benefits derived from developing these plans, SDG&E’s electric
4 operations did not produce a similar plan. The Commission has in the past required such
5 plans in other rate cases, for example, related to Underground Natural Gas Storage.⁵⁵

6 SDG&E should be required to submit an Electric Operations Safety Plan to SED,
7 with the same purpose as the Natural Gas Safety Plan, before the next GRC application.

8 **G. Electric Operations and Underground Gas Storage would**
9 **benefit from a Safety Management System approach.**

10 It is widely agreed that the Safety Management System (SMS) is a key tool for
11 achieving safety goals, managing risks and opportunities, and meeting requirements and
12 expectations. Numerous industries, from transportation to petrochemicals, nuclear power
13 and medical, use the SMS as a basis to assess and improve their safety performance,
14 enhance their safety culture, and avoid high consequence incidents. These systems help
15 manage the safety of the many interconnected, complex processes involved in designing,
16 building, operating, maintaining, and managing an enterprise.

17 The National Transportation Safety Board (NTSB) placed Safety Management
18 Systems on their “most wanted” list in 2011.⁵⁶ This list “represents actions which, if
19 taken, will reduce property damage, prevent injuries, and save lives in all modes of
20 transportation.”⁵⁷ The NTSB stated that many of its investigations have revealed that
21 “SMS or system safety programs could have prevented loss of life and injuries”. NTSB
22 defines a SMS as follows: “SMS is the formal, top-down business approach to managing
23 safety risk, which includes a systemic approach to managing safety, including the

⁵⁵ PG&E Gas Storage Safety Plan.

⁵⁶ <https://www.nts.gov/safety/mwl/Pages/mwl-3.aspx>.

⁵⁷ Remarks at the NTSB 2017-2018 Most Wanted List Press Conference at the National Press Club, Washington, DC.

1 necessary organizational structures, accountabilities, policies and procedures. (Order VS
2 8000.367)”

3 At the urging of the NTSB, the pipeline industry has followed suit and developed
4 a safety management system standard for pipelines: API 1173. The Utilities are
5 proposing to adopt this standard and apply it “to cover Distribution, Transmission, Above
6 Ground Storage, Customer Service and San Diego Gas Operations” ⁵⁸, and discussed in
7 Chapter 3 of this exhibit.

8 While the Gas Operations of the Utilities are proposing to implement API 1173,
9 the scope of adoption excludes underground gas storage at SoCalGas and electric
10 operations at SDG&E⁵⁹. Instead, SDG&E is relying on its adoption of ISO 55000, while
11 SoCalGas is relying on RP API 1171 (Functional Integrity of Natural Gas Storage in
12 Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs), to manage safety of their
13 electric and underground gas storage operations, respectively.

14 ISO 55000 is an Asset Management System standard, and RP API 1171 is a
15 risk/integrity management standard for underground storage. While there are obvious
16 benefits to their adoption, their objectives differ from an SMS and do not replace all the
17 elements of a safety management system.

18 **ISO 55000 has different objectives to an SMS; it does not cover all elements of**
19 **an SMS.**

20 Despite both ISO 55000 and SMS being management systems and having
21 overlapping elements, their goals differ. ISO 55000 is an asset management system
22 standard that often looks at optimizing the use and life-cycle of assets to achieve value
23 for *various business goals*, whereas SMS is specifically targeted at improving safety. So
24 they have differing *lenses*. Often other business objectives can overshadow safety.

⁵⁸ OSA-SEU Data Request-003, Utility response 2.b.i.

⁵⁹ *Ibid.*

1 Although asset management standards can have many overlapping aspects with
2 SMSs, all of the elements of SMS may not covered by asset management. For example,
3 ISO 55000 standard is missing the Safety Culture element that is explicitly contained in
4 SMS standards like API 1173, which the Utilities propose to implement for their gas
5 pipeline system (see the following chapter for discussion on the implementation of API
6 1173).

7 Furthermore, a safety management system is thought to strengthen an
8 organization’s safety culture.

9 **Safety Risk Management is not the same as Safety Management**

10 API RP 1171, "Functional Integrity of Natural Gas Storage in Depleted
11 Hydrocarbon Reservoirs and Aquifer Reservoirs” appear to be the underground gas
12 storage equivalent of the Transmission Integrity Management Program (TIMP) and
13 Distribution Integrity Management Program (DIMP) which exist for pipelines. TIMP and
14 DIMP are essentially risk management programs, and although very important, they are
15 not sufficient to manage pipeline safety. While safety risk management is an essential
16 element within a management system for safety, it is not the only element required. API
17 1173, for example, includes risk management as one of the ten tenets, while in aviation
18 risk management is only one of the four “pillars” of its SMS⁶⁰. The remaining
19 elements/tenets of a management system for safety should lead to “ensuring a systematic
20 approach to safety risk management and help fostering the necessary ‘culture’ within the
21 organization to enable careful management and sound understanding of risk, including in
22 day-to-day activities.”⁶¹

23

⁶⁰ <https://www.faa.gov/about/initiatives/sms/explained/components/>

⁶¹ FAQ n. 19147: “Is there a difference between safety risk management (SRM) and SMS?”, European Aviation Safety Agency; <https://www.easa.europa.eu/faq/19147>.

1 **Electric and Underground Gas Storage operations would benefit from**
2 **adopting an SMS framework.**

3 Although the Utilities’ pipeline operations may see the benefits of systematically
4 managing their safety through use of a SMS framework contained in API 1173, the
5 electric and underground gas storage operations will be unable to similarly improve the
6 safety of their systems unless a deliberate effort to close the safety management gaps
7 through an SMS approach is adopted. For example, prompted by the development of API
8 1173, the Utilities’ gas operations state they have developed an improved incident
9 evaluation procedure⁶² that ensures consistency and dissemination of lessons learned.
10 This is crucial to effectively manage and improve safety.

11 Considering the severity of the Aliso Canyon event⁶³ and the unprecedented
12 magnitude of safety-related work that will be required as a result of new DOGGR
13 regulations for all underground gas storage facilities in California in response to the Aliso
14 Canyon event, an SMS approach is a critical step towards ensuring that this work is
15 efficiently managed and implemented to enhance the safety of those assets and
16 operations. Learning from experience is a vital component of safety and risk performance
17 through an SMS framework, and one that SoCalGas’ underground storage operations
18 should keep front and center.

19 Likewise, SDG&E’s electric operations would benefit from similar improvements
20 that ensure thoughtful consistency of safety processes, closing of safety information loops
21 for enhanced flow of information up/down and across the organization, and to ensure that
22 effectiveness of safety enhancing activities is evaluated. For example, electric incident

⁶² OSA: API RP 1173 Follow-Up Response.

⁶³ On October 23, 2015, the largest methane leak from a UGS facility in United States history was discovered at one of Southern California Gas Company’s wells at its Aliso Canyon facility in Los Angeles County. Relocation of thousands of people in proximity of the leak was required and 109,000 metric tons of methane was released. The leak represented “a significant threat to public peace, health, safety, and general welfare” prompting a Governor’s Emergency Order calling for increased oversight of gas storage facilities.

1 investigation processes that look beyond occupational safety do not appear to have the
2 level of rigor proposed by the gas operations' incident evaluation process.⁶⁴ Safety
3 culture is enhanced through discovering, communicating, and acting upon safety lessons,
4 often discovered through evaluation of incidents and other events such as near-misses and
5 even stop-the job events. These activities also contribute to an environment where
6 personnel are comfortable about identifying and speaking up about risk and safety
7 concerns, knowing that their actions will result in safety improvements.⁶⁵ The latter
8 would be particularly important for SDG&E's electric operations: the organization should
9 not only be addressing the potential safety culture issues identified in the assessments⁶⁶,
10 but also placing greater focus on evaluating the effectiveness of any chosen intervention.
11 For example, the stop-the-job policy applies to both the Utilities and is cited as one of the
12 initiatives used to enhance safety culture. However, unlike the gas operations side,
13 SDG&E's electric operations does not formally track the instances when employees do
14 actually stop the job under that policy.⁶⁷ Without such information it seems impossible
15 for the organization to begin exploring whether the initiative is working as intended, nor
16 to conduct any trending or analysis of issues, or institute the appropriate corrective
17 actions system wide. Since evaluating the effectiveness of safety initiatives is a core
18 element of an SMS, it should be anticipated that a concerted effort to adopt such a
19 framework could effectively improve the safety of the system.

20 These are but a few examples of practices that could be improved through a SMS
21 and are by no means an exhaustive evaluation of the safety management practices.

⁶⁴ OSA has not performed an extensive evaluation of this procedure.

⁶⁵ "Pipeline Safety Management System Cascade Natural Gas Company Gap Analysis" Report prepared by Jacobs consultancy, p. 35.

⁶⁶ OSA-SEU DATA REQUEST-001 SUPPLEMENTAL 2, Utility Response 1-Overview Response Attachments: SDG&E 2013 and 2016 National Safety Council Barometer Safety Culture Surveys.

⁶⁷ OSA-SEU DATA REQUEST-004, Utility Response 3.

1 However, as explained at OSA’s safety en-banc, the incident investigation is the element
2 that ties much of safety management together.⁶⁸

3 While API 1173 is a standard developed for pipelines, it is a very broad non-
4 prescriptive framework: it’s elements are common to SMSs applied in other industries
5 and are not exclusive to pipelines. So, although there is no SMS standard that is specific
6 to underground gas storage or electric operations that OSA is aware of, the principles are
7 broad enough that they can apply across industries. Therefore the basic 10 tenets could be
8 modified as necessary to apply to other utility functions.

9 The Utilities should develop a SMS framework to address electric and
10 underground gas storage assets/operations, and present its proposal in the next GRC. The
11 framework/s should leverage the API 1173 framework’s emphasis on safety culture.

⁶⁸ Megan Weichel, DNV, March 07 2018 CPUC Safety En Banc;
http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/Safety_Advocates/S1P5%20Weichel.pdf

1 **CHAPTER 3 : PIPELINE SAFETY MANAGEMENT SYSTEM**

2 **I. INTRODUCTION**

3 In this GRC, the Utilities are proposing to implement a pipeline safety
4 management system in accordance with the American National Standards Institute/API
5 Recommended Practice (RP) 1173, Pipeline Safety Management System (PSMS). The
6 PSMS will “reinforce its safety culture” and “improve the integration of business needs
7 and the risks of operations in a more systemic manner”.⁶⁹

8 SoCalGas and SDG&E are requesting funding for a new group and staff that “will
9 be involved in developing a strategic safety management capability in accordance with
10 RP API 1173”.⁷⁰

11 **API RP 1173: PSMS**

12 Several pipeline incidents in 2010 and 2011, including PG&E’s San Bruno
13 pipeline rupture, revealed weaknesses in safety management processes and lack of
14 management oversight as contributing factors.⁷¹ The NTSB’s Marshall, MI incident
15 report⁷² stated:

16 “Evidence from this accident and from the San Bruno accident
17 indicates that company oversight of pipeline control center
18 management and operator performance was deficient.”
19

20 Following the 2010 Marshall, MI the NTSB also recommended that API, in
21 collaboration with industry, regulators, and other stakeholders, develop a SMS standard
22 for pipelines. In 2015 API released RP 1173 PSMS for the pipeline industry. The API,

⁶⁹ Exhibit SCG-05 at OR-23, lines 5-6.

⁷⁰ *Id.* at OR-46, lines 7-8.

⁷¹ Marshall, MI 2010; San Bruno, CA, 2010; Allentown, PA, 2011; Laurel, MT, 2011;

⁷² In 2010, in Marshall, Michigan, a crude oil transmission pipeline ruptured and released oil for over 17 hours before being discovered. As a result, nearly 850,000 gallons of crude oil spilled into the surrounding area and flowed into local waterways, resulting in the most expensive environmental response and clean-up for an onshore oil spill in US history.

<https://www.nts.gov/investigations/AccidentReports/Pages/PAR1201.aspx>

1 which represents commercial concerns throughout the oil and natural gas industry,
2 addresses safety culture and other safety-related issues in the new recommended
3 practice.⁷³ Implementation of API 1173 is fully supported by industry organizations and
4 pipeline safety regulators. The federal pipeline regulator - the Pipeline and Hazardous
5 Material Safety Agency (PHMSA) has expressed that:

6 “(it) fully supports the implementation of RP 1173 and plans to promote
7 vigorous conformance to this voluntary standard.”⁷⁴
8

9 Since a new pipeline rule can take three or more years, PHMSA is looking to other
10 avenues to persuade the industry to voluntarily improve its safety operations such as the
11 adoption of API 1173.⁷⁵

12 The PSMS provides a framework to continuously identify, address, and monitor
13 threats to safety operations by doing the following:

- 14 ... proactively address issues before they become incidents/accidents;
- 15 ... document safety procedures and requiring strict adherence to the
16 procedures by safety personnel;
- 17 ... treat operator errors as system deficiencies and not as reasons to punish and
18 intimidate operators;
- 19 ... require senior management to commit to operational safety;
- 20 ... identify personnel responsible for safety initiatives and oversight;
- 21 ... implement non-punitive method for employees to report safety hazards;
- 22 ... continuously identify and address risks in all safety critical aspects of
23 operations;
- 24 ... provide safety assurance by regularly evaluating (or auditing) operations to
25 identify and address risks.

⁷³ NTSB 10/30/2015 Press Release <https://www.nts.gov/news/press-releases/Pages/PR20151030a.aspx>

⁷⁴ Written Statement of Administrator Marie Therese Dominguez before the House Committee on Transportation and Infrastructure on Pipeline Reauthorization, Feb 25, 2016.

⁷⁵ Remarks by Jeff Wiese, past PHMSA Associate Administrator
<https://insideclimatenews.org/news/20130911/exclusive-pipeline-safety-chief-says-his-regulatory-process-kind-dying>

1 Based on the Plan Do Act Check (PDCA) cycle, API 1173 consists of 10 elements
2 with multiple sub-elements, as depicted in Figure 2 below.

3 Figure 2: PDCA Cycle and API 1173



4
5 **II. SUMMARY OF RECOMMENDATIONS**
6 API 1173 is a very important framework which shares similar principles to those
7 already adopted for safety in other industries, such as aviation, nuclear, and offshore oil
8 and gas. OSA supports the *strategic, deliberate, and committed* implementation of API
9 1173 standards by the Utilities. However, The Utilities must strive to implement a *robust*
10 *and effective* pipeline safety management system that is embedded in a *healthy* safety
11 culture. This is a critical tool to continually improving the safety of these Utilities, and to
12 ensuring the effectiveness of all the safety programs and initiatives that are proposed in
13 this GRC.

1 To ensure the effectiveness of this effort and the continued safety improvements it
2 promises for the ultimate safety of employees, the public and the systems, OSA strongly
3 recommends that additional conditions and considerations be placed on the Utilities’
4 implementation of API 1173, as follows:

- 5 ... The Utilities must feverishly seek implementation of API 1173 and
6 make the effort a high priority.
- 7 ... To realize the Commission’s safety vision of “achieve(ing) a goal of
8 zero incidents and injuries across all the utilities.. (it) regulate(s)” by
9 following its safety principle to “provide clear guidance on
10 expectations for safety management and outcomes,” the Commission
11 must lay out the expectation that the Utilities feverishly seek
12 implementation of API 1173 and make the effort a high priority.
- 13 ... The Utilities must seek effectiveness of the PSMS in meeting
14 objectives, rather than seeking evidence of conformity with detailed
15 requirements.
- 16 ... The Utilities should explicitly designate an “Accountable Officer”
17 (AO) with a clearly defined role. The AO is accountable for providing
18 the resources required to conduct a safe operation and to implement
19 and maintain the management of safety, and for the safety performance
20 of the Utilities.
- 21 ... The Utilities should conduct a third-party audit of their implementation
22 before submittal of next GRC application and share the results with
23 OSA.
- 24 ... The Utilities must develop a long-term multi-year plan based on what
25 will be prioritized and how to get there.
- 26 ... The Utilities should conduct a thorough resource assessment to ensure
27 that the effort will be adequately resourced.
- 28 ... The PSMS must be included as part of RAMP and reported on the
29 respective Accountability/Spending reports required by the
30 Commission.
- 31 ... The Utilities’ leadership should, at a minimum, meet annually with
32 OSA and SED staff to present their progress and continued
33 implementation plans of API 1173 during the upcoming rate case
34 cycle.

1 **III. DISCUSSION**

2 **A. PSMS is a vital tool for safety and must be made a high**
3 **priority by the Utilities and the expectation clearly set by**
4 **the Commission.**

5 Despite about 40 years of pipeline safety regulation and steady declines in
6 significant pipeline incidents, too many accidents that have large impacts on the
7 environment, the public and property continue to happen. Based on three decades of
8 incident investigation, NTSB feels strongly that robust SMSs could have prevented many
9 of these incidents. Leading pipeline safety regulators also recognize that a “carefully
10 designed and well-implemented (safety) managements system is essential to keep people
11 safe and protect the environment”⁷⁶ and if effectively implemented, can strengthen safety
12 culture.

13 The PSMS is broader than the integrity management regulations for transmission
14 (TIMP) and distribution pipelines (DIMP).⁷⁷ Figure 3 shows the pipeline safety
15 regulation trajectory. API 1173 reaches beyond traditional standards with a strong
16 emphasis on Safety Culture as a key component, Management Review, and Continuous
17 Improvement as core elements. The key components are as follows:

- 18 ... focuses on how top management develops processes to reveal and
19 mitigate safety threats,
- 20 ... provides for continuous improvement,
- 21 ... strives to make compliance and risk reduction routine through
22 intentional actions by top management,

⁷⁶ Canada’s National Energy Board Safety Culture Statement.

⁷⁷ PHMSA adopted integrity management regulations for natural gas transmission pipelines in 2004, and for distribution pipelines in 2009, to reduce the frequency of incidents and improve safety. Operators of hazardous liquid and gas transmission pipelines were required to analyze their pipeline systems to identify threats to pipeline integrity and rank by risk their relative importance. Operators are then required to take actions to address these threats. Operators must identify those segments of their pipeline where an accident could result in significant consequences, prioritize these segments, assess them periodically, repair identified anomalous conditions that meet specified criteria, and evaluate the results to validate that their programs assure the integrity of their pipelines. Integrity management requires operators to use a risk-based approach to manage the safety of their pipelines

- 1 ... more philosophical than other recommended practices and standards
- 2 ... expands upon the relationship of Safety Culture to PSMS
- 3 ... provides an overarching set of ideals for management and employees to
- 4 pursue safety improvement.

6 Figure 3: Progress in Pipeline Safety Regulation



7 ...

8

9 The PSMS is a key tool for achieving safety goals, managing risks and

10 opportunities, and meeting requirements and expectations. The Utilities must feverishly

11 seek implementation of API 1173 and make the effort a high priority. Likewise, the

12 Commission should clearly lay out this expectation, particularly if it is to realize its safety

13 vision to “achieve a goal of zero incidents and injuries across all the utilities.. (it

14 regulate(s)” by following its own safety principle to “provide clear guidance on

15 expectations for safety management and outcomes.”⁷⁸

16 **B. Ultimate goal should not be conformance with API 1173,**

17 **but continued improvement and learning.**

18 The Utilities have repeatedly indicated that their 2019 GRC request was developed

19 with the goal and intent to attain “conformance” with API 1173.⁷⁹ However, the PSMS is

⁷⁸ Safety Policy Statement of the California Public Utilities Commission (July 10, 2014)
http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Safety/VisionZero4Final621014_5_2.pdf

⁷⁹ Exhibits SCG/SDG&E-02-R, SCG/SDG&E-05-R; OSA: API RP 1173 Follow-Up Response.

1 a framework that strives for continuous improvement and learning as a key core
2 principle. In order to be effective and achieve its full potential, it must be taken on as a
3 lifetime commitment. This is much more than checking “conformance” with specific
4 tenets as expressed by the Utilities. While OSA recognizes that “conformance” is
5 language used by API’s maturity level model to describe early phases of API 1173
6 adoption⁸⁰, it is widely recognized that the goal should not be conformance but continued
7 improvement and learning.

8 The Utilities must seek effectiveness of the PSMS in meeting objectives, rather
9 than seeking evidence of conformity with detailed requirements.

10 **C. PSMS Requires Management Commitment**

11 To achieve continued safety management system improvement, all frameworks
12 recognize the importance of leadership commitment. Although an SMS can strengthen an
13 organization’s safety culture, its effectiveness will ultimately depend on the health of that
14 organization’s safety culture. In other words, as recognized in API RP 1173, “a positive
15 safety culture can exist without an effective SMS, but an effective SMS cannot exist
16 without a positive safety culture”.⁸¹

17 **1. Designate an Accountable Officer**

18 Leadership is key to establishing, fostering, and maintaining a healthy safety
19 culture, and in turn to support an effective SMS. The pipeline industry has developed a
20 process in which the first step to implementing API 1173 consists of signaling company
21 agreement to adopting API RP 1173 through a “Commitment Letter”. Through this letter
22 operators pledge their commitment to implementing API 1173: 95% of liquids pipeline
23 industry barrel miles have committed to PSMS.⁸²

⁸⁰ PSMS Maturity model, <http://pipelinesms.org/pipeline-sms-maturity-model/>.

⁸¹ API RP 1183, First Edition, Draft Version 11.2

⁸² <http://pipelinesms.org/about/membership/>.

1 Aside from asserting through regulatory filings that they recognize the importance
2 of safety culture and stating that their leadership is committed to safety, the Utilities
3 failed to provide any supporting evidence of their leadership’s commitment to
4 implementing the PSMS.⁸³ In fact, the Utilities are behind in their PSMS efforts. They
5 have indicated deferring “developing an implementation plan for API 1173 standard”
6 throughout 2016 because personnel were occupied with the Aliso Canyon incident.⁸⁴

7 Leadership’s accountability for their organization’s safety performance is a critical
8 aspect reflective of leadership’s actual commitment to safety. It is also part of the safety
9 governance necessary to ensure the PSMS is adequately resourced, followed and
10 maintained. Other industries and regulatory agencies, such as the Federal Aviation
11 Administration (FAA) and Canada’s National Energy Board (NEB), require designation
12 of an “Accountable Officer/Executive” as part of their safety management approach. This
13 person is usually the highest level of management – typically the Chief Executive Officer
14 - who has the *ultimate* control over the financial and human resources necessary to
15 maintain the organization’s operations and establish, develop, and maintain the safety
16 management system.⁸⁵

17 This approach is also encouraged by the North American Regulators Working
18 Group on Safety Culture (NARWGSC)⁸⁶ who indicate that “there [should be] an
19 accountable officer (AO) designated. This delegation is appropriate based upon the
20 organizational structure (i.e. the correct person is delegated with the authority and control
21 for human and financial resources). The AO demonstrates understanding of and

⁸³ OSA-SEU Data Request-003, response 3.

⁸⁴ Exhibit SCG-08 at MAB-04, lines 2-4.

⁸⁵ US 14 CFR 5.25; Canada’s National Energy Board Onshore Pipeline Regulations (OPR) Section 6.2.

⁸⁶ NARWGSC consists of oil and gas regulators with representatives from National Energy Board (NEB), Canada Newfoundland Labrador Offshore Petroleum Board (C-NLOPB), Canada Nova Scotia Offshore Petroleum Board (CNSOPB), United States’ Bureau of Safety and Environmental Enforcement (BSEE), and the United States’ Pipeline and Hazardous Materials Safety Administration (PHMSA).

1 commitment to the role and responsibilities. There [should be] evidence of the AO
2 taking action to resolve issues.”⁸⁷

3 Likewise, the Utilities should explicitly designate an “Accountable Officer” (AO)
4 with a clearly defined role.⁸⁸ The AO is accountable for providing the resources required
5 to conduct a safe operation and to implement and maintain the management of safety, and
6 for the safety performance of the Utilities. For this role to be efficient, the AO should
7 understand its role, have *ultimate* authority and control over human and financial
8 resources, demonstrate knowledge of current safety issues, and be easily accessible –
9 through formal mechanism (i.e. direct reporting) - by key safety personnel.

10 Although the AO is ultimately accountable, it is important to note that internally,
11 accountability should be shared throughout an organization:

12 “all leaders are knowledgeable about the regulations, their own procedures
13 and current safety activities, issues and challenges, such as causes of recent
14 incidents, results of previous audits and ongoing or new safety programs.
15 All leaders routinely dedicate significant time to safety, which includes
16 talking to frontline staff about safety concerns and potential solutions and
17 leaders are routinely involved in incident investigations/reviews and in
18 resolving safety issues.”⁸⁹

19 **2. Board of Directors also play a role**

20 The Board of Directors, or equivalent authority, plays a similar critical role
21 in budget planning and will need to stay informed of top utility safety
22 management priorities and, in consultation with the Accountable Officer, ensure
23 that safety risks are minimized through the strategic application of available
24 resources. The PSMS is critical to the success of the safety programs and investments.

⁸⁷ *Safety Culture Indicators Research Project: A regulatory Perspective*, prepared by North American Regulators Working Group on Safety Culture (2016).

⁸⁸ For some roles and responsibilities of AO’s in other industries, like the Federal Aviation Administration, see 14 CFR 5.25.

⁸⁹ North American Regulators Working Group on Safety Culture (NARWGSC), "Safety Culture Indicators Research Project: A Regulatory Perspective."

1 Therefore, it is also important to engage and inform the BoD on the PSMS efforts: their
2 disconnect from the effort can be detrimental to the effectiveness of the SMS.

3 The Utilities should periodically update the Utilities’ BoDs on the establishment
4 of the PSMS. Periodic updates to SEMPRA’s BoD would also be a good opportunity for
5 sharing best management practices across SEMPRA’s enterprises.

6 **D. Development, implementation, and continuous**
7 **improvement of the PSMS is critical to its effectiveness**

8 The development, implementation, and continuous improvement of a SMS is
9 critical to its effectiveness. Canada’s NEB explain that “a recent comparative study of
10 several major industrial accidents that occurred between 1982 and 1995 indicated that
11 most of the affected organizations had management systems or programs developed;
12 however they were not effectively implemented or reviewed on a regular basis to ensure
13 adequacy and effectiveness.”⁹⁰

14 It appears the Utilities’ effort is in its early stages. As explained earlier, however,
15 the Utilities are overdue in beginning their implementation.

16 **1. No supporting evidence of the critical assessments**
17 **necessary to implement PSMS. Limited**
18 **information provided indicates deficiencies in these**
19 **assessments.**

20 To implement a PSMS, it is recommended that operators start by performing a
21 “gap analysis” to see how their existing systems might already satisfy some of the
22 requirements of RP 1173 and to identify any gaps.⁹¹ An implementation action plan to
23 close the safety management gaps identified is then developed. Therefore, the gap
24 analyses/assessments are the foundational information used for any effort to adopt API
25 1173.

⁹⁰ NEB Safety Culture Statement; Det Norske Veritas. (2011) Major Hazard Incidents: Arctic Offshore Drilling Review.

⁹¹ API RP 1173 Implementation Spreadsheet Guide Version 1.0 February 15, 2016.

1 The Utilities indicate that “multiple gap analyses have been performed by a third
2 party” and that “the latest gap analysis for SoCalGas and SDG&E was completed in
3 November 2017, which reflects the progress and evolution since our prior assessments.”
4 However, the Utility has refused to provide these analyses to OSA, claiming they “were
5 performed at the direction of counsel and are subject to the attorney-client privilege and
6 work product doctrine.”⁹²

7 Without any evidence of these assessments or ability to review the results, OSA is
8 unable to determine whether the Utilities have 1) performed the work necessary to
9 implement API 1173, nor 2) whether its proposed implementation in this GRC
10 adequately addresses the gaps in its management of safety. However, at OSA’s
11 insistence, the Utilities provided some high level information on the methodology of the
12 last assessment, conducted on November, 2017, which they have indicated is the basis for
13 their implementation.

14 The November 2017 assessment consisted of a “Mind Mapping Campaign” were
15 “approximately seventy-five (75) subject matter experts (SME) were interviewed for each
16 of the tenets of API RP 1173, which consisted of managers and supervisors from various
17 business units.”⁹³

18 Based on the information provided, the Utilities’ assessment approach is deficient
19 in number of ways, including but not limited to those listed below.

20 **1. Did not conduct interviews with employees at all levels.**

21 Comparing what is documented against what is expected by
22 management and how that is interpreted by the front lines is
23 very important. Management’s expectations are often very
24 different to those actually implementing the work. So
25 including management and field personnel is critical, as they
26 tend to think differently.

⁹² OSA-SEU Data Request-003, response to question 2.b)ii.

⁹³ Safety Management System Follow-up Response

- 1 2. **Relied on interviews as its form of assessment.** However, it
2 is important to know what is written versus what is expected
3 versus what is interpreted in the field before moving forward.
4 As with the point above, what is written in
5 procedures/processes may not be what is being done in the
6 field, and these in-turn may not match management
7 expectations. Therefore, document reviews and field
8 observations need to be incorporated into the assessment.
- 9 3. **Interviews were also conducted by internal utility**
10 **personnel** in addition to a third-party. To ensure the most
11 honest information is gathered and avoid bias, all the
12 interviews should have been conducted by the third party. A
13 third party can mitigate confirmation bias, overcome
14 reluctance of staff and field personnel, and ask questions of
15 management that might otherwise not be asked.

16 Based on the above discussion, OSA cannot support this initiative without
17 additional transparency on the effort and assurances of its outcome. This is a very
18 important endeavor. The Commission should require that the Utilities conduct a third-
19 party audit of their implementation before submittal of the next GRC application. The
20 audit results should be used by the Utilities to inform its continued improvement of the
21 PSMS. The audit report should be shared with OSA and be made available before the
22 GRC application is due. The report should provide sufficient information documenting
23 compliance, but support measurement of degrees of implementation or effectiveness. It
24 should not be a compliance checklist, and should incorporate sufficient information on
25 the analysis. From the audit report, the Utilities should be able to assess the progress of
26 implementation, identify those elements that are progressing as planned, and focus on the
27 elements where additional management attention or resources are needed. To ensure the
28 impartiality of the audit, the third-party entity should be adequately certified, if such
29 certification is available, and be guided by the audit protocol that may soon be
30 established by API, if available at the time.

1 **2. Proposal lacks evidence of a strategic vision and**
2 **plan for implementation**

3 The implementation plan provided by the Utilities is too vague and lacks any level
4 of detail to sufficiently indicate that a thoughtful plan has been assembled.⁹⁴ In fact, the
5 plan does not delineate any efforts beyond 2018.

6 The Utilities must develop a long-term multi-year plan based on what will be
7 prioritized and how to get there. A plan should be developed based on a thoughtful
8 strategy that prioritizes the gaps that are to be addressed in a risk-based manner. It is to be
9 expected that the multi-year plan will be revised as often as necessary to accommodate
10 the dynamic and non-steady state of safety.

11 The absence of a detailed implementation plan is also a concern in terms of
12 ensuring that the effort will be adequately resourced and not just tacked on to current
13 efforts that could be a set-up for failure. Implementation activities will span across the
14 Utilities’ organizational units, across its different functions, and include its many
15 different types of personnel. This effort will require buy-in from all levels of the
16 organization. A detailed plan and everyone’s awareness of how they fit into the
17 implementation is necessary for its success. The proposal in this GRC nor the
18 information provided to OSA on their efforts demonstrate that the Utilities have a good
19 handle of the resources needed for implementation. The Utilities should conduct a
20 thorough resource assessment to ensure that the effort will be adequately resourced.

21 **3. KPI development should include Human and**
22 **Organizational factors**

23 The development of Key Performance Indicators (KPI’s) is a core component of
24 the PSMS. KPI’s are developed to determine the effectiveness of the PSMS. Since there
25 is such a strong organizational and managerial component to this PSMS, the Utilities
26 should develop metrics that address human and organizational factors to assess the

⁹⁴ OSA-SEU DATA REQUEST-003, Utilities response to 4.c).

1 effectiveness of its PSMS. The Utilities should work with OSA and its safety consultants
2 to develop experimental metrics that could help the Utilities’ transition. This
3 collaboration could be through a series of workshops were experts and the Utilities
4 discuss safety metrics that can integrate human and organizational factors.

5 Although the SMAP proceeding does have a working group on safety metrics, that
6 forum is more concentrated on pure risk metrics that so far appear to ignore the widely-
7 acknowledge importance of human and organizational factors that safety forward
8 regulators and industries, such as the International Atomic Energy Industry (IAEA) for
9 the nuclear industry, believe are critical to SMSs:

10 “A management system, including organizational models, concepts
11 and tools, should also cover human factor issues and other integrated
12 management approaches that complement the traditional approach to
13 achieving results, which was based on inspections and verification
14 checks”⁹⁵

15 **E. Integration of RAMP in GRC: PSMS should be part of**
16 **RAMP and Accountability Reports**

17 Despite clearly being a measure implemented to systematically control and
18 manage safety risks, the Utilities have failed to identify the PSMS in their RAMP Reports
19 as one of their “RAMP-post filing” activities.⁹⁶ Yet, the Utilities’ did include their efforts
20 regarding ISO 550000: asset management system as a “RAMP-post filing” activities.

21 The PSMS must be directly included in their RAMP report and reported on the
22 respective Accountability/Spending reports required by the Commission starting with this
23 rate case cycle.

24 This omission puts into question the Utilities’ true commitment to and
25 understanding of API 1173, as does the Utilities’ proposal to for the PSMS effort as a
26 subset function of the “Gas Contractor Controls” department which primarily deals with

⁹⁵ IAEA Safety Guide No. GS-G-3.1, Sec 2.2.

⁹⁶ Exhibit SCG-02-R/SDG&E-02-R, Chapter 3, at JKY-5 lines 17-22.

1 “construction contractor safety”.⁹⁷ This placement does not recognize that a PSMS is a
2 company-wide effort that is not focused on contractors, even if contractors are part of the
3 SMS.

4 To ensure the effective implementation of the PSMS, the CPUC should remain
5 vigilant and continuously monitor the development, implementation, and effectiveness of
6 the PSMS. The Utilities’ leadership should, at a minimum, meet annually with OSA and
7 SED staff to present their progress and continued implementation plans of API 1173
8 during the upcoming rate case cycle.

⁹⁷ Exhibit SCG-05 at OR-43 to OR-45. Since submittal of their GRC application, the Utilities now indicate that

1 **CHAPTER 4 : SOCALGAS LINE 235-2 FAILURE**

2 **I. INTRODUCTION**

3 This chapter discusses the October 1, 2017 failure of Line 235-2, and the need to
4 improve SoCalGas’ pipeline management programs to prevent a similar failure. Despite
5 having pipeline management programs that meet federal regulations, SoCalGas continues
6 to experience pipeline failures, which impacts reliability and safety.

7 **Figure 1-1: Extent of Damages⁹⁸**



8 Heavy equipment destroyed in a gas line explosion that also left a crater near Newberry Springs on Sunday, Oct. 1. (Photo courtesy of San Bernardino County
9 Fire Department)

⁹⁸ <https://www.sbsun.com/2017/10/01/newberry-springs-gas-line-catches-fire-destroys-heavy-equipment/>.

1

Figure 1-2: Incident Site⁹⁹

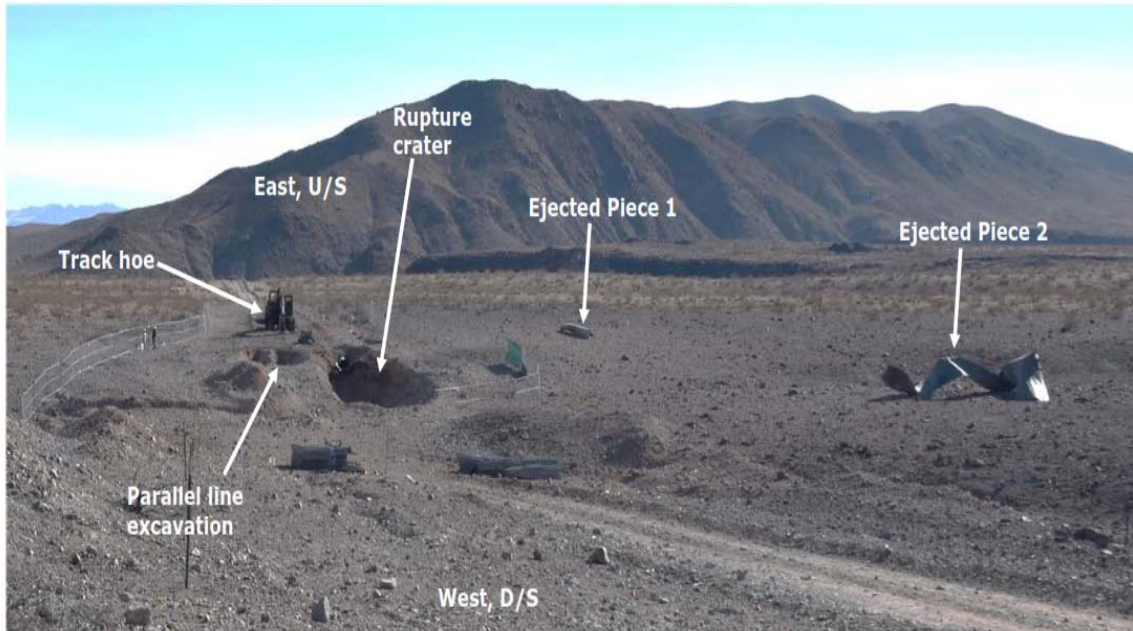


Figure 2. Photograph of the failure site.

2

3 The failure of Line 235-2 and other pipeline outages contributed to the
4 Commission's and the California Energy Commission's (CEC) concern about SoCalGas'
5 ability to meet winter months' demand.¹⁰⁰ The shortage of gas supply during the winter
6 months can have a devastating impact on the elderly and families with small children
7 who depend on natural gas to heat their homes. A summary of SoCalGas' pipeline
8 outages is shown below.

⁹⁹ SCG – DNV-GL Final Report, [REDACTED]
[REDACTED] Figure 2.

¹⁰⁰ On October 17, 2017, the Commission and CEC issued a letter to Bret Lane of SoCalGas, expressing concerns with SoCalGas' ability to meet its obligation to provide safe and reliable service for the upcoming winter months.

1 **Figure 1-3: Current SoCalGas Pipeline**
2 **Outages¹⁰¹**

SoCalGas' System Remains Impaired by Multiple Pipeline Outages

- On October 1, Line 235-2 ruptured, burning the outside of an excavated section of Line 4000
- The rupture led to increased concerns about Line 4000, which went down for expedited maintenance
- Line 4000 partially returned to service on December 22
- There is no estimate for when Line 235-2 will return to service
- Line 3000 remains out
- Line 2000 is reduced to 980 MMcfd
- May be more outages



3
4 **II. SUMMARY OF RECOMMENDATIONS**

5 The failure of Line 235-2 underscores the importance of safe utility operation and
6 exposes the vulnerability of buried infrastructure that was constructed decades ago.
7 While it is impossible and unaffordable to replace all aging infrastructure at once, the
8 lessons learned from these incidents should be used to enhance SoCalGas' pipeline
9 management programs to prevent similar incidents. Below is a summary of OSA's
10 recommendations:

- 11 ... Safety management systems should be used to develop the programs in
12 general rate cases. (See OSA Witness Carolina Contreras' Testimony)
- 13 ... The Root Cause Analysis (RCA) for the Line 235-2 contains valuable
14 information that would help prevent a similar incident from occurring in
15 the future and should be made available to interested parties.

¹⁰¹ Southern California Energy Reliability - Joint Agency IEPR Workshop. May 8, 2018. CEC Docket Number 18-IEPR-03. CPUC presentation.

1 ... Information from the RCA should be used to determine if the
2 Transmission Integrity Management Program (TIMP) should be
3 expanded to include non-HCA pipelines or improve the Pipeline Safety
4 Enhancement Plan (PSEP.)

5 ... SoCalGas needs to correct its “systemic”¹⁰² problem with deficient
6 Cathodic Protection practices.

7 III. DISCUSSION

8 On October 1, 2017, SoCalGas’ Line 235-2 ruptured and caused an explosion near
9 Newberry Springs.¹⁰³ It was fortunate that the pipeline rupture did not cause any injuries
10 or fatalities, and the workers who were performing maintenance work in the area were
11 able to escape prior to the explosion.¹⁰⁴

12 **Figure 1-4: Ruptured Pipeline and Damaged**
13 **Equipment¹⁰⁵**



14

¹⁰² Citation # ALJ 274 16-05-001, pp 2 to 3.

¹⁰³ <http://www.vvdailynews.com/news/20171003/gas-line-explosion-causes-blaze-damage-in-newberry-springs>.

¹⁰⁴ Ibid.

¹⁰⁵ SCG – DNV-GL Final Report, [REDACTED], Figure 3.

1 A break in Line 235-2 ignited a 5-acre fire, left a crater, destroyed several large
2 pieces of equipment and caused several explosions throughout the night.¹⁰⁶ According to
3 the San Bernardino County Fire Department spokesperson, a crew of sixteen¹⁰⁷ workers
4 were extremely “lucky – they would have been dead” if they did not leave.¹⁰⁸

5 Following such an incident, it is important for the utility to investigate the causes
6 of the incident, to identify the most effective solutions, to address the problem, and to
7 prevent a similar incident from taking place in the future.

8 **A. Root Cause Analysis (RCA)**

9 A RCA is usually conducted to determine the causes of an incident and evaluate
10 the process safety gaps and failures in the safety barriers which allowed the incident to
11 happen. SoCalGas has completed the RCA for the Line 235-2 incident and shared the
12 report with the Commission’s Safety and Enforcement Division (SED) but has not made
13 the document available to OSA.¹⁰⁹ In its response to OSA’s request for the RCA,
14 SoCalGas indicated that its availability “to discuss and provide updates on findings and
15 next steps” with OSA.¹¹⁰ It is unclear at this point if SoCalGas will make the document
16 available to OSA.

17 SoCalGas indicated that it will use the information gained from the RCA to feed
18 into the TIMP to reduce the risk of pipeline failure. Incident investigations, investigation
19 findings, and lessons learned are important elements of a pipeline safety management
20 program (PSMP discussed in Chapter 3). The information from the investigation
21 findings to improve pipeline safety performance and lessons learned may be used in the

¹⁰⁶ <http://www.vvdailynews.com/news/20171003/gas-line-explosion-causes-blaze-damage-in-newberry-springs>.

¹⁰⁷ <https://www.sbsun.com/2017/10/01/newberry-springs-gas-line-catches-fire-destroys-heavy-equipment/>.

¹⁰⁸ <http://www.vvdailynews.com/news/20171003/gas-line-explosion-causes-blaze-damage-in-newberry-springs>.

¹⁰⁹ SED’s email to OSA and Energy Division staff on 5/11/2018 at 11:42 AM.

¹¹⁰ SoCalGas’ Response to OSA Data Request OSA-A1710008-05, Utilities Response 2, on May 4, 2018.

1 risk assessment analysis. OSA supports SoCalGas’ efforts to use lessons learned to
2 improve its pipeline management programs. The information gained from this incident is
3 invaluable not just to SoCalGas but also to other gas operators to prevent similar failures
4 in the future. Therefore, OSA recommends that SoCalGas make the RCA available to
5 interested parties.

6 **B. Transmission Integrity Management Program (TIMP)**

7 Code of Federal Regulations (CFR) Part 192, Subpart O, requires pipeline
8 operators to identify, prioritize, assess, evaluate, repair and validate the integrity of gas
9 transmission pipelines in High Consequence Areas (HCAs). According to SoCalGas,
10 “[t]he purpose[s] of the TIMP [are] to continually identify threats on transmission
11 pipelines, determine the risk posed by these threats, schedule assessments to address
12 threats, collect information about the condition of the pipeline, and take actions to
13 minimize applicable threats and integrity concerns to reduce the risk of a pipeline
14 failure.”¹¹¹ SoCalGas’ TIMP also assesses some “non-HCA pipelines that are contiguous
15 to or near HCA pipelines.”¹¹² Line 235-2 is not considered an HCA pipeline and would
16 not be required to be a part of the TIMP under CFR 192 Subpart O.¹¹³ The rupture of
17 Line 235-2 highlights a safety gap in SoCalGas’ pipeline integrity program. While Line
18 235-2 is not a located in a HCA, the impact from its failure would have had deadly
19 consequences if the sixteen workers were not able to escape before the explosion. The
20 lessons learned from this incident should be used to determine if SoCalGas should
21 expand its TIMP to pipelines similar to Line 235-2 or address it in the Pipeline Safety
22 Enhancement Plan (PSEP).¹¹⁴

¹¹¹ SoCalGas’ Response to OSA Data Request OSA-A1710008-05, Utilities Response 4.

¹¹² SoCalGas Exhibit SCG-14: Direct Testimony of Maria T. Martinez, p MTM-3, lines 9 to 10.

¹¹³ Based on the plain language of CFR 49 Subpart O, the location of Line 235-2 would not be considered an HCA pipeline.

¹¹⁴ SoCalGas’ PSEP addresses transmission pipelines that have not been pressure tested by either testing to obtain data or replacement.

1

[Redacted text block]

[Redacted text block]

1 [REDACTED]
2 [REDACTED]
3 **IV. CONCLUSION**

4 The gas industry cannot afford to have any more pipeline ruptures regardless of
5 location. The nearby workers were very “lucky” to have escaped without injuries.¹²⁰
6 There are existing industry standards such as the American National Standards
7 Institute/API Recommended Practice (RP) 1173 to guide the utilities in the development
8 and maintenance of a pipeline safety management system (PSMS)¹²¹ and to pursue a goal
9 of zero incidents. The rupture of Line 235-2 demonstrates that it is necessary to go
10 beyond meeting the minimum standards and implement best management practices to
11 achieve safe and effective pipeline operation. While SoCalGas’ TIMP complies with
12 federal regulations and it has a PSEP to address transmission pipelines without data, there
13 is still a gap in the transmission pipeline management program that allowed the failure of
14 Line 235-2. SoCalGas and SDG&E need to incorporate the lessons learned from this
15 incident to prevent another failure. Further, SoCalGas and SDG&E should incorporate
16 safety management systems in various programs proposed in its general rate cases.

¹²⁰ <http://www.vvdailynews.com/news/20171003/gas-line-explosion-causes-blaze-damage-in-newberry-springs>.

¹²¹ See OSA Witness Carolina Contreras’ Testimony.

APPENDIX A
Qualifications of Witnesses

1 **QUALIFICATIONS AND PREPARED TESTIMONY**
2 **OF**
3 **JENNY AU**
4

5 Q1. Please state your name, business address, and position with the California Public
6 Utilities Commission (Commission).

7 A1. My name is Jenny Au and my business address is 320 West 4th Street, Suite 500,
8 Los Angeles, California. I am a Senior Utilities Engineer in the Office of the
9 Safety Advocate.

10 Q2. Please summarize your educational background.

11 A2. I graduated from the Cal Poly Pomona, with a Bachelor of Science Degree in Civil
12 Engineering. I am a registered civil engineer in the State of California.

13 Q3. Briefly describe your professional experience.

14 A3. I have been employed at the Commission since 2007. I participated in many Class
15 A Water Utility proceedings as an engineer in the Office of Ratepayer Advocates.
16 My previous professional experience includes engineering positions at the Los
17 Angeles Regional Water Quality Control Board and the Department of Toxic
18 Substances Control.

19 Q4. What is your responsibility in this proceeding?

20 A4. I am responsible for Chapter 4, SoCalGas Line 235-2 Failure.

21 Q5. Does this conclude your prepared direct testimony?

22 A5. Yes, it does.

23

1 **QUALIFICATIONS AND PREPARED TESTIMONY**
2 **OF**
3 **CAROLINA CONTRERAS**
4

- 5 Q1. Please state your name and business address.
- 6 A1. My name is Carolina Contreras. My business address is 505 Van Ness, San
7 Francisco.
- 8 Q2. By whom are you employed and in what capacity?
- 9 A2. I am employed by the California Public Utilities Commission as a Senior Utilities
10 Engineer in the Office of the Safety Advocate (OSA).
- 11 Q3. Please describe your educational and professional experience
- 12 A3. I hold a Bachelor of Science degree in Civil Engineering from the University of
13 New Orleans, a Master degree in Economics and Management of Network
14 Industries from Université Paris-Sud XI, in Paris, France, and a Master of Science
15 degree in Electric Power Industry from Comillas Pontifical University in Madrid,
16 Spain. I have nine years of experience in the utility and related industries, six of
17 those with the California Public Utilities Commission (CPUC). At the CPUC I
18 worked on a broad spectrum of water and natural gas safety issues, ranging from
19 general rate cases and utility funding requests to implementing post-San Bruno
20 natural gas safety legislation. While working for the Safety and Enforcement
21 Division I reviewed utility safety spending, budgeting, and resource-allocation
22 practices, worked on PG&E's Pipeline Safety Enhancement Plan (PSEP) and Gas
23 Transmission and Storage rate case, and audited new gas safety initiatives. I joined
24 OSA in 2017. Prior engagements include engineering and utility design work at
25 Kimley-Horn and Associates, and energy management work for AXPO Iberia, a
26 European energy company.
- 27 Q4. What is the scope of your responsibility in this proceeding?
- 28 A4. I am the sponsor of Chapters 1-3 of prepared testimony regarding the Utilities'
29 2019 GRC Application (A. 17-10-007/8)
- 30 Q5. Does this complete your testimony?
- 31 A5. Yes