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Witnesses : M. Botros
 : M. Taul
 : A. Bach
 : T. Holzschuh



**THE PUBLIC ADVOCATES OFFICE
CALIFORNIA PUBLIC UTILITIES COMMISSION**

**SUR-REPLY TESTIMONY
ON
ORDER INSTITUTING INVESTIGATION
INTO SOCALGAS' PRACTICES AND OPERATIONS
OF THE ALISO CANYON STORAGE FACILITY AND THE
UNCONTROLLED RELEASE OF NATURAL GAS**

San Francisco, California
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1 **I. INTRODUCTION AND EXECUTIVE SUMMARY**

2 (Witness: M. Botros)

3 This sur-reply testimony presents the issues that the Public Advocates Office at
4 the California Public Utilities Commission (Cal Advocates) has identified in the opening
5 and reply testimonies of Southern California Gas Company (SoCalGas)¹ concerning the
6 *Order Instituting Investigation (OII) on the Commission’s own motion into the*
7 *operations and practices of SoCalGas with respect to the Aliso Canyon storage facility*
8 *and the release of natural gas, and Order to Show Cause (OSC) why SoCalGas should*
9 *not be sanctioned for allowing the uncontrolled release of natural gas from its Aliso*
10 *Canyon storage facility. Specifically, this testimony focuses on clarifying facts, as*
11 *supported by evidence, pertaining to SoCalGas’ statements that could mislead the*
12 *Commission. This sur-reply testimony is served in accordance with Administrative Law*
13 *Judges (ALJs) Kenney and Poirier’s April 17, 2020 Email Ruling Granting the Joint*
14 *Motion to Extend the Due Date for Serving Testimony and to Hold the Evidentiary*
15 *Hearing in Abeyance.*

16 In its Opening Testimony, SoCalGas asserts that it performed weekly casing
17 inspections and monthly site inspections on its well sites.² SoCalGas also describes the
18 evaluation, testing, and monitoring of the Aliso Canyon Storage Field both before and
19 after the uncontrolled release of natural gas from the SS-25 gas storage well on October
20 23, 2015 (the Leak). In this description, SoCalGas discusses its workover procedures
21 for production wells.³

22 In its Reply Testimony, SoCalGas states that it performed a well evaluation, such
23 as ultrasonic inspection, on SS-25.⁴ SoCalGas also states that the 1988 Vertilog

¹ *Chapter I Prepared Opening Testimony of Dan Neville on Behalf of Southern California Gas Company (U 904 G)*, dated November 22, 2019 (SoCalGas’ Opening Testimony); *Chapter II Prepared Reply Testimony of Robert A. Carnahan, P.E. on Behalf of Southern California Gas Company (U 904 G)*, dated March 20, 2020 (SoCalGas’ Reply Testimony).

² SoCalGas’ Opening Testimony, Chapter I, p. 4.

³ SoCalGas’ Opening Testimony, Chapter I, pp. 3-6.

⁴ SoCalGas’ Reply Testimony, Chapter VI, pp. 1-2.

1 technology was not reliable or sufficiently accurate to address the issues that caused the
2 Leak.⁵

3 In Section II, the Public Advocates Office presents evidence of 14 separate
4 occasions from 2009 to 2015 where SoCalGas failed to take weekly casing pressure
5 inspections, and five separate occasions from 2010 to 2012 where SoCalGas failed to
6 perform timely monthly SS-25 well site inspections as described in SoCalGas’ Opening
7 Testimony. In Section III of this Testimony, the Public Advocates Office addresses the
8 fact that SS-25 did not have any workovers conducted between 1979 and 2015.⁶ In
9 Section IV, the Public Advocates Office demonstrates that Magnetic Flux Leakage
10 (MFL) technologies, such as Vertilog, were sufficiently reliable to perform 70,000
11 miles⁷ of inspections by 1983. In Section V, the Public Advocates Office discusses two
12 technologies—Ultrasonic Imager tool (USIT) and Magnetic Flux Leakage (MFL)—that
13 were available years before the Leak and that were sufficiently accurate to detect
14 abnormalities in the piping of SS-25 before the Leak.

15 The Public Advocates Office concludes that contrary to SoCalGas’ assertions,
16 SoCalGas violated its Internal Standard (SIS)⁸ as well as requirement four (4) as defined

⁵ SoCalGas’ Reply Testimony, Chapter II, p. 2.

⁶ Blade Main Report - Root Cause Analysis of the Uncontrolled Hydrocarbon Release from Aliso Canyon (Blade Report), p. 26. “SS-25 started operations as a gas storage well in 1977. There was a workover in February 1979 to remove, repair, or replace and reinstall the annular flow safety system. The tubing and completion equipment were run back in the well. Figure 9 shows the condition of the wellbore in February 1979. The rig was released February 1979. This was the last reported rig work on SS-25 until the casing leak on October 23, 2015.”

⁷ 112,000 kilometers is about 70,000 miles.

⁸ SoCalGas’ amended response to CalAdvocates-DR-025, p. CalAdvocates - 466. Section 4.1.2.1.1 of SoCalGas Internal Standard 224.070 states: “Surface pressures on each well are measured and recorded weekly using a calibrated test gauge. These include tubing pressure, casing pressure, annuli pressures, and, if applicable, safety valve control line pressures.”

1 by the California Geologic Energy Management Division (CalGEM)² prior to the
2 Leak.^{10 11}
3

² CalGEM was formerly the Division of Oil, Gas, and Geothermal Resources (DOGGR).

¹⁰ SoCalGas' response to CalAdvocates-DR-006, q. 2. Section 4.1.2.1.1 of SoCalGas Internal Standard 224.070 was most recently updated prior to the Leak on November 10, 2014.

¹¹ SoCalGas' amended response to CalAdvocates-DR-025, p. CalAdvocates - 486. CalGEM correspondence states as its fourth requirement for approval of continued operation of the Aliso Canyon Storage Project: "Surface pressures on each active or idle well are measured weekly with a calibrated test gauge, and recorded. Evidence of such measurement and calibration must be made available to this Division upon request."

1 **II. SOCALGAS’ TESTIMONY INCORRECTLY IMPLIES**
2 **THAT SOCALGAS PERFORMED WEEKLY CASING**
3 **INSPECTIONS AND MONTHLY SITE INSPECTIONS ON**
4 **ITS WELL SITES**

5 (Witness: M. Taul)

6 **A. SoCalGas’ Assertion that It Performed Weekly Casing**
7 **Inspections Is Contradicted by Evidence Demonstrating that**
8 **SoCalGas Failed to Take Such Readings on Fourteen**
9 **Separate Occasions**

10 In Chapter I, Section II.B of its Opening Testimony, SoCalGas asserts that it
11 performed casing inspections on its well sites weekly “to check the pressure in each
12 tubular space within the well...”¹² However, as discussed in detail in the Public
13 Advocates Office’s Opening Testimony, the evidence demonstrates that on 14 separate
14 occasions from 2009 to 2015, SoCalGas actually failed to take weekly casing pressure
15 inspections as it describes in its Opening Testimony.¹³ In two particular instances,¹⁴
16 weekly pressure inspections were missed for two consecutive weeks.¹⁵ These weekly
17 casing inspections not only constituted good practices, but were also required by Section

¹² SoCalGas’ Opening Testimony, Chapter I, p. 4.

¹³ The Public Advocates Office’s *Prepared Testimony on the Order Instituting Investigation (OII) Into SoCalGas’ Practices and Operations of the Aliso Canyon Storage Facility and the Uncontrolled Release of Natural Gas*, dated December 20, 2019 (Public Advocates Office’s Opening Testimony), pp. 15-22.

¹⁴ The dates of 12/29/2012 and 1/5/2013 are consecutive missed pressure inspections occurring over two weeks. The dates of 9/22/2014 and 9/26/2014 are consecutive missed pressure inspections occurring over two weeks.

¹⁵ Public Advocates Office’s Opening Testimony, p. 21, Table 2.

1 4.1.2.1.1 of SIS 224.070¹⁶ in 2014,¹⁷ prior to the Leak, and requirement four as defined
2 by CalGEM¹⁸ in 1989 as necessary for “the continued operation of the project.”¹⁹

3 Additionally, multiple entries in the SS-25 weekly casing pressure indicated the
4 documented casing pressure of “0” (psig).²⁰ SoCalGas acknowledged that “[t]he ‘0’
5 data points are indicative of the absence of a pressure reading,”²¹ indicating that no
6 pressure readings were taken during these weeks. Table 2 in the Public Advocates
7 Office’s Opening Testimony captures the 14 instances where the casing pressure was
8 “0” from 2009 through 2015.²² These lapses in surveys violate both SoCalGas’ internal
9 standards and one of the requirements established by CalGEM.²³ These omissions also
10 contradict SoCalGas’ testimony that it had conducted weekly pressure readings on SS-
11 25.²⁴

¹⁶ SoCalGas’ amended response to CalAdvocates-DR-025, p. CalAdvocates - 466. Section 4.1.2.1.1 of SoCalGas Internal Standard 224.070 states: “Surface pressures on each well are measured and recorded weekly using a calibrated test gauge. These include tubing pressure, casing pressure, annuli pressures, and, if applicable, safety valve control line pressures.”

¹⁷ SoCalGas’ response to CalAdvocates-DR-006, q. 2. Section 4.1.2.1.1 of SoCalGas Internal Standard 224.070 was most recently updated prior to the Leak on November 10, 2014.

¹⁸ SoCalGas’ amended response to CalAdvocates-DR-025, p. CalAdvocates - 486. CalGEM correspondence states as its fourth requirement for approval of continued operation of the Aliso Canyon Storage Project: “Surface pressures on each active or idle well are measured weekly with a calibrated test gauge, and recorded. Evidence of such measurement and calibration must be made available to this Division upon request.”

¹⁹ SoCalGas’ amended response to CalAdvocates-DR-025, p. CalAdvocates - 486, states: “The Division of Oil and Gas has responsibility for wells that inject and withdraw natural gas from an underground storage facility. Our records indicate that, although individual wells have been permitted, project approval has not been issued by the Division to conduct underground gas storage operations in the Aliso Canyon field. Therefore, continued operation of the project is approved provided that: [the listed 13 requirements are met].”

²⁰ SoCalGas’ response to CalAdvocates-DR-020, q. 2, pp. CalAdvocates - 562 to CalAdvocates - 569.

²¹ SoCalGas’ response to CalAdvocates-DR-020, q. 2, p. CalAdvocates - 559.

²² Public Advocates Office’s Opening Testimony, p. 21.

²³ SoCalGas’ amended response to CalAdvocates-DR-025, p. CalAdvocates - 486. CalGEM correspondence states as its fourth requirement for approval of continued operation of the Aliso Canyon Storage Project: “Surface pressures on each active or idle well are measured weekly with a calibrated test gauge, and recorded. Evidence of such measurement and calibration must be made available to this Division upon request.”

²⁴ Notably, SoCalGas fails to include with its opening and reply testimonies any documentary evidence to support its assertions of the work purportedly done on SS-25 prior to the Leak.

1 SoCalGas does not dispute the fact that it is missing casing inspections and
2 pressure readings, which is a clear violation of state regulations. Instead, SoCalGas
3 chooses to only briefly comment that “[t]o the extent Cal Advocates has identified
4 imperfect records, it should be noted that, even before the incident occurred, SoCalGas
5 implemented practices to generate and maintain high-quality records.”²⁵ However, the
6 fourteen separate omissions identified by the Public Advocates Office do not support
7 SoCalGas’ summary conclusion but, instead, demonstrate that records were not properly
8 kept, and the required work was not timely performed.

9 **B. SoCalGas’ Assertion that It Performed Monthly Site**
10 **Inspections Is Contradicted by Evidence Demonstrating that**
11 **SoCalGas Failed to Perform Such Inspections on Five**
12 **Separate Occasions**

13 In Chapter I, Section II.C of its Opening Testimony, SoCalGas asserts that
14 “[w]ell site inspections [were] performed monthly [and] included thorough inspections
15 of the structural components of the wellhead, the cellar floor, access roads, and the
16 general conditions of the well site.”²⁶ SoCalGas then concludes its testimony regarding
17 the monthly well site inspections by stating generally that “[i]ssues identified from the
18 inspection that warranted corrective maintenance of further investigation would be
19 recorded and addressed.”²⁷

20 As with the weekly pressure readings, however, the Public Advocates Office has
21 presented evidence that demonstrates that SoCalGas failed to perform timely monthly
22 well site inspections at well SS-25 on five separate occasions from June 2010 to July
23 2012.²⁸ This totals 19% of inspections during this period.²⁹ SoCalGas’ failure to
24 perform the inspections in a timely manner resulted in noncompliance with SoCalGas’

²⁵ SoCalGas’ Reply Testimony, Chapter VII, p. 14.

²⁶ SoCalGas’ Opening Testimony, Chapter I, p. 5.

²⁷ SoCalGas’ Opening Testimony, Chapter I, p. 5.

²⁸ Public Advocates Office’s Opening Testimony, pp. 17-19.

²⁹ Five missed inspections in 26 total inspections from June 2010 to July 2012 yields 19.2% of inspections failed to perform timely during this time.

1 own Internal Standards.³⁰ In its Reply Testimony, SoCalGas attempts to explain how its
2 five monthly well inspections are in compliance with its standards but provides no
3 evidence supporting its assertions:

4 1. SoCalGas asserts that since the June 2010 well inspection
5 includes 27 wells and the work order is not marked until all
6 wells are inspected, the July completion date may not apply
7 to SS-25 specifically.³¹ SoCalGas provides no additional
8 documentation to support its assertion, but instead, admits
9 that *some* of the 27 wells (which includes SS-25) were
10 inspected outside the compliance window. SoCalGas
11 provides no information that proves the inspection on SS-25
12 was timely.

13 2. SoCalGas asserts that the July 2011 well inspection was
14 “likely completed in July 21, 2011” despite the entry
15 recorded in the Maximo database of “November 6, 2013.”³²
16 The two tables provided by SoCalGas show the completion
17 dates of inspections around July 2011 and November 2013
18 but provide no evidence that an inspection actually occurred
19 in July 2011, let alone on the precise date of July 21, 2011.
20 SoCalGas provides no additional documentation to support
21 its assertion that SS-25 received an inspection on or around
22 July 21, 2011.

23 3. SoCalGas claims that “a data entry error” is to blame for the
24 May, June, and July 2012 inspections occurring in the wrong

³⁰ SoCalGas’ amended response to CalAdvocates-DR-025, p. CalAdvocates – 466. Section 4.1.2.1.5 of SoCalGas Internal Standard 224.070 states: “Wellhead inspections are performed on a monthly basis.”

³¹ “Cal Advocates states the monthly well inspection scheduled for June 2010 was completed four days late—on July 4, 2010. The supporting evidence (completion of the work order), however, does not *necessarily* indicate that the inspection was conducted four days late. The monthly well inspection includes a group of wells (this particular work order included 27), and the work order is not marked as completed until all the wells are inspected. It is not unusual for a work order to be completed over the course of multiple days. Thus, it is *not necessarily the case* that the inspection was not timely conducted.” SoCalGas’ Reply Testimony, Chapter VII, p. 15 (emphasis added).

³² “Cal Advocates states a monthly inspection scheduled for July 2011 was completed approximately two-and-a-half years late, on November 6, 2013. *A review of the second half of 2011 monthly inspections indicates the inspection was likely completed on July 21, 2011, but was entered into the Maximo database on November 6, 2013.* The 2011 inspection table below shows monthly inspections for the months following July 2011 (on August 26, September 29, October 22, November 19, and December 17). In addition, the comments entered on the July 2011 inspection record state ‘completed prior but not recorded.’ And, a review of the second half of 2013 monthly inspections indicates that the November 2013 inspection was completed on November 22.” SoCalGas’ Reply Testimony, Chapter VII, p. 15 (emphasis added).

1 months, yet provides no original documents proving that the
2 inspections actually occurred as required.³³ SoCalGas
3 merely admits the data entry errors and fails to provide
4 further documentary evidence to refute the Public Advocates
5 Office’s Opening Testimony.³⁴ Further, Table 3 provided in
6 SoCalGas’ Reply Testimony clearly shows that the July 2012
7 work order was cancelled after the fact (November 4, 2013),
8 leaving no completion date in SoCalGas’ own record for the
9 June 2012 inspection of SS-25.

10 Appropriate inspection standards and adherence to those standards are crucial for
11 well safety because inspections are meant to probe field performance and well integrity.
12 As provided by Section 4.1.2.1 of SIS 224.070, “[p]erformance reviews utilize
13 information collected during individual well and reservoir tests. Parameters such as
14 back pressure curve shifts, changes in deliverability, and field performance are
15 investigated.”³⁵ By performing its inspections late or not conducting them at all,
16 SoCalGas failed to timely collect information useful to the safe operation of its wells.
17 SoCalGas’ Opening Testimony represents that well site inspections were performed
18 monthly and on time. The evidence provided by the Public Advocates Office establishes
19 otherwise, and SoCalGas’ Reply Testimony provides no evidence to refute the Public
20 Advocates Office’s showing. Instead, SoCalGas only relies on possible theories of what
21 may have occurred to explain its noncompliance.³⁶

³³ “Cal Advocates states the well inspections for each of May, June, and July 2012 were missed. However, these inspections were completed *but not accurately reflected* because of a data entry error. The table below, pulled from Maximo, shows that inspections were timely completed on January 14, February 11, March 10, April 8, May 25, July 1, August 2, September 23, October 21, November 30, and December 15.” SoCalGas’ Reply Testimony, Chapter VII, p. 16 (emphasis added).

³⁴ “To the extent that these completion dates are incorrect from an inputting error into a digital system, no other documents were provided to the Public Advocates during the review of records proving that the survey was completed in the correct month.” Public Advocates Office’s Opening Testimony, References 72, 75, pp. 16-19.

³⁵ SoCalGas’ amended response to CalAdvocates-DR-025, p. CalAdvocates - 465.

³⁶ Even if SoCalGas were to provide original documentation demonstrating that the inspections, in fact, did occur timely, SoCalGas’ testimony here establishes that SoCalGas’ recordkeeping practices are inadequate.

1 **III. SOCIALGAS' TESTIMONY INCORRECTLY IMPLIES THAT**
2 **SOCALGAS PERFORMED MECHANICAL INTEGRITY**
3 **INSPECTIONS AND WELL EVALUATIONS DURING WORKOVERS**
4 **ON SS-25**

5 (Witness: A. Bach)

6 Chapter I, Section II.F of SoCalGas' Opening Testimony describes the
7 evaluation, testing, and monitoring of the Aliso Canyon Storage Field both before and
8 after the Leak.³⁷ However, SoCalGas does not clearly discern which of these evaluation,
9 testing, and monitoring activities were conducted on SS-25 before the Leak versus
10 measures that were put in place after the Leak.

11 In particular, SoCalGas' testimony discusses the mechanical integrity inspections,
12 such as running ultrasonic inspection tools, that SoCalGas purportedly performs during
13 well workovers after an extensive discussion describing measures that SS-25 had in
14 place prior to the Leak (e.g., temperature surveys).³⁸ Thus, SoCalGas implies that it had
15 continual mechanical integrity inspections during workovers on SS-25 prior to the Leak.
16 SoCalGas also states that it had implemented a well evaluation program in 2007 that
17 included running ultrasonic inspection tools and pressure testing.³⁹ In both of these
18 instances, however, aside from describing its general programs and procedures,
19 SoCalGas provides no detail as to what measures were actually applied to SS-25 prior to
20 the Leak, and no evidence of the application of any such measures.

21 The Blade Report noted that "SS-25 started operations as a gas storage well in
22 1977. There was a workover in February 1979 to remove, repair, or replace and reinstall
23 the annular flow safety system.... The rig was released February 1979. This was the last
24 reported rig work on SS-25 until the casing leak on October 23, 2015."⁴⁰ SoCalGas has
25 not provided evidence that there were well workovers performed on SS-25 between
26 1979 and the Leak. Thus, SoCalGas could not have conducted any mechanical integrity

³⁷ SoCalGas' Opening Testimony, Chapter I, pp. 3-6.

³⁸ SoCalGas' Opening Testimony, Chapter I, pp. 3-6.

³⁹ SoCalGas' Reply Testimony, Chapter VI, pp. 1-2.

⁴⁰ Blade Report, p. 26.

1 inspections during well workovers on SS-25 over this 36-year time period. As a result,
2 SoCalGas' implication that SS-25 had mechanical integrity inspections prior to the Leak
3 is unsupported by evidence.

4 In terms of SoCalGas' 2007 well evaluation program, SoCalGas has stated that it
5 did not perform ultrasonic inspections on SS-25 because ultrasonic inspections can only
6 be performed in the course of a workover.⁴¹ Prior to the Leak, SoCalGas had not
7 performed a workover on SS-25 since 1979.⁴² Since SoCalGas did not perform any
8 workovers between 1979 and the Leak, the 2007 well evaluation program has no bearing
9 on SS-25.⁴³ Thus, SoCalGas' inference that its well evaluation program directly
10 improved the safety of SS-25 is not supported by evidence.⁴⁴

11

⁴¹ SoCalGas' response to SED-DR-060, q. 7(c), pp. CalAdvocates - 591 to 592.

⁴² Blade Report, p. 26.

⁴³ SoCalGas' response to SED-DR-060, q. 7(c), pp. CalAdvocates - 591 to 592.

⁴⁴ SoCalGas' Reply Testimony, Chapter VI, pp. 1-2.

1 **IV. SOCALGAS' REPLY TESTIMONY INCORRECTLY**
2 **STATES THAT 1988 VERTILOG TECHNOLOGY WAS NOT**
3 **RELIABLE OR ACCURATE**

4 (Witness: A. Bach)

5 The Public Advocates Office states in its Opening Testimony that SoCalGas
6 should have taken prudent action in response to the 1988 Vertilog inspections conducted
7 at Aliso Canyon.⁴⁵ In its Reply Testimony, SoCalGas states that it was reasonable that
8 SoCalGas did not act upon the results of the 1988 Vertilog inspections because the 1988
9 Vertilog technology was not reliable or accurate.⁴⁶ SoCalGas supports its position by
10 citing to a 2003 article from the *Pipeline & Gas Journal*, which asserts that
11 “[h]istorically, the results of first generation of Magnetic Flux Leakage (MFL) tools
12 were not very satisfactory.”⁴⁷

13 SoCalGas is incorrect in stating that the 1988 Vertilog technology was not
14 reliable or accurate. As demonstrated by Blade Energy Partners (Blade),⁴⁸ SoCalGas
15 mischaracterizes the *Pipeline & Gas Journal* source as representing Vertilog as a first
16 generation MFL technology and takes it out of context.⁴⁹ The full text of the source, as
17 relevant, states: “Historically, the results of the first-generation MFL tools were not
18 very satisfactory, but BG (British Gas) and then PII [Pipeline Integrity International
19 Ltd.] developed advanced electronics and analysis algorithms and software which set
20 new standards in the industry.”⁵⁰ According to Blade, first generation MFL technologies
21 primarily operated between 1959 and 1965, which is long before the 1988 Vertilog
22 version of the technology was utilized.⁵¹

⁴⁵ Public Advocates Office’s Opening Testimony, pp. 4-5.

⁴⁶ SoCalGas’ Reply Testimony, Chapter II, p. 2.

⁴⁷ SoCalGas’ Reply Testimony, Chapter II, p. 2, fn. 9.

⁴⁸ Blade published the Blade Report on May 16, 2019, following its independent investigation of the Leak.

⁴⁹ Blade’s response to SED-DR-058, q. 1.2, pp. CalAdvocates - 593 to 598.

⁵⁰ Blade’s response to SED-DR-058, q. 1.2, pp. CalAdvocates - 593 to 598.

⁵¹ Blade’s response to SED-DR-058, q. 1.2, pp. CalAdvocates - 593 to 598.

1 In fact, between the first generation MFL technology and the development of
2 Vertilog, there were enough improvements in MFL technology accuracy that, by 1983,
3 70,000 miles⁵² of pipeline had been inspected by MFL technology.⁵³ Blade also states
4 there were significant improvement in MFL technology in the 1970s.⁵⁴ As a result,
5 SoCalGas' inference that Vertilog was a first generation MFL technology is incorrect.

6 Blade performed an analysis demonstrating that while Vertilog results had some
7 disagreements with modern 2016 ultrasonic inspection tools, in general the two tools
8 have "good agreement."⁵⁵ As the 1988 Vertilog had good agreement with modern tools,
9 this implies that the 1988 Vertilog results were sufficiently accurate and reliable for
10 SoCalGas to act upon. Moreover, there were other technologies that SoCalGas could
11 have used to assess Aliso Canyon wells following the 1988 Vertilog results, as discussed
12 in Section V. Therefore, SoCalGas should have taken prudent action, such as
13 performing follow up inspections, risk analysis, and/or mechanical integrity tests based
14 on the 1988 Vertilog results.

15

⁵² 112,000 kilometers is about 70,000 miles.

⁵³ Blade's response to SED-DR-058, q. 1.2, pp. CalAdvocates - 593 to 598.

⁵⁴ Blade's response to SED-DR-058, q. 1.2, pp. CalAdvocates - 593 to 598.

⁵⁵ Blade's response to SED-DR-058, q. 1.2, pp. CalAdvocates - 593 to 598.

1 **V. SOCALGAS HAD OTHER AVAILABLE CASING**
2 **INSPECTION TOOLS TO MONITOR THE INTEGRITY OF**
3 **SS-25**

4 (Witness: T. Holzschuh)

5 Not only did SoCalGas fail to monitor the condition of its wells in 1988,⁵⁶ but
6 SoCalGas also failed to take advantage of other available technologies. Casing
7 inspections, for example, provide information about the remaining wall thickness of the
8 casing⁵⁷ and, thus, the likelihood of casing rupture. Two technologies, the Ultrasonic
9 Imager tool (USIT) and Magnetic Flux Leakage (MFL), were available far in advance of
10 the Leak and had sufficient accuracy to detect abnormalities in the piping of SS-25
11 before the Leak occurred. USIT works by emitting ultrasonic waveforms and recording
12 the reflections on a rotating head.⁵⁸ MFL works by impressing a magnetic field onto the
13 permeable pipe and recording the magnetic field that “leaks” from the pipe.⁵⁹

14 SoCalGas’ witness, Robert Carnahan, acknowledges the benefits of USIT. Mr.
15 Carnahan compares USIT with an earlier technology, Vertilog, which he tries to explain
16 was not as effective.⁶⁰ He states that USIT yields “excellent pipe thickness information
17 with superior azimuthal resolution.”⁶¹ Schlumberger (an internationally renowned
18 oilfield service company) introduced USIT in 1991, where the specifications list a
19 resolution under “corrosion” of “0.05 mm” with an accuracy of “±2%.”⁶²

⁵⁶ Public Advocates Office’s Opening Testimony, pp. 3-10.

⁵⁷ Schlumberger’s definition of casing inspection log. Available at https://www.glossary.oilfield.slb.com/en/Terms/c/casing-inspection_log.aspx, pp. CalAdvocates - 599 to 600.

⁵⁸ Schlumberger’s product description of USIT. Available at <https://www.slb.com/-/media/files/production/product-sheet/usi>, pp. CalAdvocates - 601 to 603.

⁵⁹ Schlumberger’s definition of flux leakage. Available at https://www.glossary.oilfield.slb.com/en/Terms/f/flux_leakage.aspx, pp. CalAdvocates - 604 to 605.

⁶⁰ SoCalGas’ Reply Testimony, Chapter II, pp. 1-15.

⁶¹ SoCalGas’ Reply Testimony, Chapter II, pp. 9-10.

⁶² Hayman, A. J., Hutin, R., & Wright, P. V, *High-Resolution Cementation and Corrosion Imaging by Ultrasound*, p. 18 (1991). See CalAdvocates - 606 to 631.

1 The USIT technology was available over two decades before the Leak. USIT’s
2 “excellent pipe thickness” information could have been used towards making SS-25
3 safer and USIT’s accuracy of “±2%” and resolution of “0.05 mm” is far more precise
4 that the minimum needed to detect the wall thickness loss before the Leak.⁶³ However,
5 SoCalGas did not use this technology on SS-25.

6 MFL was also effective and had been available for decades. A source that Mr.
7 Carnahan cites states that as of 2003, “defect depth sizing [with MFL tools] now has a
8 typical accuracy of 10 percent of wt [wall thickness] with a confidence level of 80
9 percent. For a typical wt of 8 mm this [the 80 % confidence level] would be ±0.8 mm.”⁶⁴
10 The 80% confidence level corresponding to an interval of ±10% means that 80% of the
11 measurements will be in the range of ±10% of the wall thickness.⁶⁵

12 SoCalGas’ reference demonstrates that MFL tools were available and had
13 sufficient accuracy far in advance of the Leak. Since a confidence level is the percent of
14 samples that lie within a certain range, extending the range will increase the confidence
15 level. Therefore, comparing the ±10% wall thickness (the range of the 80% confidence
16 level of the MFL tool) to the 85% wall loss found in the SS-25 casing⁶⁶ shows that the
17 confidence level for detecting significant wall loss is likely greater than 80% if
18 SoCalGas regularly used an MFL tool of 2003 technology. Therefore, if SoCalGas had
19 used the 2003 technology at regular intervals, SoCalGas likely would have known that
20 there were major issues with its SS-25 well.

21 USIT was available decades before the Leak. MFL tools that were sufficiently
22 accurate to monitor case thickness were also available decades prior to the Leak. Thus,

⁶³ Blade Report, p. 63. Subtracting the 1.26 mm affected area from the 8.15 mm nearby unaffected area gives an estimated 6.89 mm of wall loss after the failed area was removed.

⁶⁴ SoCalGas’ Reply Testimony, Chapter II, Ex. II-2, p. 1.

⁶⁵ “Confidence Intervals,” Lisa Sullivan, PhD. Available at http://sphweb.bumc.bu.edu/otlt/MPH-Modules/BS/BS704_Confidence_Intervals/BS704_Confidence_Intervals_print.html, pp. CalAdvocates - 632 to 635.

⁶⁶ Blade Report, p. 63.

- 1 there were tools available to SoCalGas, in addition to the 1988 technology (discussed in
- 2 Section IV above), that could have assisted SoCalGas in detecting weakness but that
- 3 SoCalGas failed to utilize.

1 **VI. CONCLUSION**

2 The Public Advocates Office presents evidence that demonstrates that SoCalGas
3 failed to perform multiple pressure readings and well site inspections required by state
4 regulations and SoCalGas' own internal standards. SoCalGas' Reply Testimony
5 provides no documentary evidence to refute the Public Advocates Office's showing that
6 SoCalGas missed required pressure readings and well site inspections. SoCalGas also
7 implies that workovers took place on SS-25 prior to the Leak whereas, in fact, no
8 workovers on SS-25 occurred between 1979 and 2015. SoCalGas' Reply Testimony
9 asserts that the 1988 Vertilog technology was not reliable or accurate enough to rely
10 upon, even though MFL technologies were sufficiently reliable and accurate to utilize in
11 inspections for about 70,000 miles by 1983.⁶⁷

⁶⁷ 112,000 kilometers is about 70,000 miles.

VII. WITNESSES QUALIFICATIONS

2 A. Witness Qualifications of M. Botros

3 My name is Mina Botros. My business address is 505 Van Ness Avenue, San
4 Francisco, California, 94102. I am employed as a Senior Utilities Engineer in the Safety
5 Branch of the Public Advocates Office. I am sponsoring Section I of this testimony.

6 I have a MA in Mechatronics Engineering from the Information Technology
7 Institute. I have a BA in Mechanical Engineering from Alexandria University. I am a
8 Professional Engineer in Mechanical Engineering in the State of California and my
9 license number is 38305. I also have taken a graduate-level course in Managing Cracks
10 and Seam-Weld Anomalies on Pipelines. While working for the Public Advocates
11 Office from February 2016 until December 2017, and returning in January 2019, I have
12 worked on the California Public Utilities Commission’s (CPUC) San Joaquin Valley
13 Disadvantaged Community Order Instituting Rulemaking (R. 15-03-010); General Order
14 58-A (R. 16-07-006); Southern California Gas Company and San Diego Gas & Electric
15 Company’s Pipeline Safety Enhancement Plan - Phase 2 (Application (A.)15-06-013)
16 and Phase 3 (A. 18-11-010), Pipeline Safety Enhancement Plan – Reasonableness
17 Review (A. 16-09-005); Wildfire Expenses Memorandum Account (A. 15-09-010);
18 California Independent System Operator Metering Rules Enhancements, Rule 21 (R. 11-
19 09-011), Risk Assessment and Mitigation Plan (RAMP) (I. 18-11-006), Locate and
20 Mark Investigation (I. 18-12-007), Safety Model Assessment Proceeding (SMAP)
21 (A. 15-05-002), Distribution Physical Security Phase II (R. 15-06-009) and Grid Safety
22 and Resiliency Program (GSRP) (A. 18-09-002). In 2018, I worked in the CPUC’s
23 Safety and Enforcement Division (SED), Electric Safety and Reliability Branch (ESRB),
24 where I investigated incidents related to electric utilities, and conducted and led audits
25 for compliance with GO 95 and GO 167.

26 This completes my prepared testimony.

1 **B. Witness Qualifications of M. Taul**

2 My name is Matthew Taul. My business address is 505 Van Ness Avenue,
3 San Francisco, California, 94102. I am employed as a Utilities Engineer in the Safety
4 Branch of the Public Advocates Office. I am sponsoring Section II of this testimony.

5 I have a BS in Mechanical Engineering from the University of California,
6 Berkeley. I am a California-registered Engineer in Training (EIT), number 165894.

7 Prior to joining the Public Advocates Office, I worked for several years
8 contracting with Pacific Gas and Electric Company (PG&E) as an internal auditor where
9 I cleaned up data stored in PG&E’s maintenance control software, and reviewed records
10 in order to encourage PG&E to self-report mis-compliant maintenance and surveys to
11 the California Public Utilities Commission (CPUC). I and my team of engineers
12 travelled to 18 separate PG&E Gas Transmission and Distribution Maintenance Yards to
13 ensure PG&E was acting in compliance with internal standards and CPUC Regulations.

14 This completes my prepared testimony.

15

1 **C. Witness Qualifications of A. Bach**

2 My name is Alan Bach. My business address is 505 Van Ness Avenue,
3 San Francisco, California, 94102. I am employed as a Utilities Engineer in the Safety
4 Branch of the Public Advocates Office. I am sponsoring Section III and Section IV of
5 this testimony.

6 I have a MS in Civil Engineering and BS in Engineering Science, both from the
7 University of California, Berkeley. I have a Mechanical Professional Engineer license
8 and my license number is 39671.

9 I have been working for the Public Advocates Office since February 2018, and
10 previously worked in the Gas Safety section of the California Public Utilities
11 Commission’s (CPUC) Safety Enforcement Division from February 2017 to February
12 2018. Since joining the Public Advocates Office, I have worked on the following gas
13 and energy safety proceedings: Pacific Gas and Electric Company’s (PG&E) Gas
14 Transmission and Storage Rate Case (A.17-11-009); Amendments to General Order
15 (GO) 95 (R.17-10-010); PG&E’s (I.17-11-003) and Southern California Edison
16 Company’s (I.18-11-006) Risk Assessment Mitigation Phase (RAMP); and Liberty’s
17 risk filing for its General Rate Case A.18-12-001).

18 I have also worked extensively on proceedings related to energy infrastructure,
19 transportation electrification, and rates, such as Rule 21 (R.17-07-007); San Diego Gas
20 & Electric Company’s (SDG&E) Medium- and Heavy-Duty Vehicle Program (A.18-01-
21 012); and PG&E’s Commercial EV Rate (A.18-11-003).

22 This completes my prepared testimony.

23

1 **D. Witness Qualifications of T. Holzschuh**

2 My name is Tyler Holzschuh. My business address is 505 Van Ness Avenue,
3 San Francisco, California, 94102. I am employed as a Utilities Engineer in the Safety
4 Branch of the Public Advocates Office. I am sponsoring Section V of this testimony.

5 I have a MS in Electrical Engineering from University of California, Los
6 Angeles. I have a BA in mathematics and physics from Wesleyan University. I am a
7 Professional Engineer in Mechanical Engineering in the State of California and my
8 license number is 39545.

9 I have been working for the Public Advocates Office since July 2019, and
10 previously worked in the Gas Safety Section of the California Public Utilities
11 Commission's (CPUC) Safety Enforcement Division from April 2018 to June 2019.
12 Since joining the Public Advocates Office, I worked on the CPUC's proceeding
13 regarding Pacific Gas and Electric Company's (PG&E) order to show cause for the 2017
14 wildfires (I.19-06-015), the wildfire mitigation plan proceeding (R.18-10-007), the
15 statewide pole database proceeding (I.17-06-027), and the 2019 microgrid
16 commercialization proceeding (R.19-09-009).

17 This completes my prepared testimony.