Docket:	:	I.11-02-016
Exhibit Number	:	________
Commissioner	:	M. Florio
Admin. Law Judge	:	Yip-Kikugawa
CPSD Witness	:	Margaret Felts
	:	

CONSUMER PROTECTION AND SAFETY DIVISION
CALIFORNIA PUBLIC UTILITIES COMMISSION

REBUTTAL TESTIMONY OF MARGARET FELTS

I.11-02-016

San Francisco, California
August 20, 2012

[redacted]

Introduction

This rebuttal testimony follows the order of the violations numbered 1-27, as set out in Table 1 of the March 30, 2012 Supplemental Testimony of Margaret Felts. Where applicable, references are made to pages in PG&E's Response Testimony (Response) served on June 26, 2012.

Records Violations Relating to Line 132, Segment 180, San Bruno Incident

1. No Records For Salvaged Pipe Installed Into Segment 180 ....pre1956-2010

PG&E defends the absence of records for the Segment 180 project by stating "that level of material tracking was uncommon in that era."[1] However, it appears from records recently produced by PG&E that during the 1950's it was keeping accounting records of pipe that were sufficient to determine the source and reuse locations of pieces of salvaged pipe.[2] PG&E has construction and accounting records for other projects constructed in the 1950s but it failed to keep similar records showing the source of pipe for Segment 180.[3]

The Segment 180 Job File, GM 136471, produced by PG&E to NTSB and CPSD includes some accounting records, but the incomplete file fails to provide enough information to determine the sources of the pipe installed.[4] PG&E recently produced detailed accounting records for holding accounts that were created from 1951 through 1966 to keep track of new and salvaged pipe.[5] From the guidance included in these files, it appears that the source of the pipe used in the Segment 180 project should have been recorded in these files. However, PG&E admits that there are no records related to the Line 132, Segment 180 project in these

[1] Response Page 4-2, lines 8-9.
[2] See discussion in Section 23.0 about GM 119689 and other holding accounts created in the 1950's to track pipe.
[3] GM 119689 (to track pipe from 1952-1966) and GM 134655 (Advanced Purchase account for 1956 transmission main projects). PG&E produced, and CPSD reviewed, a total of 3569 pages in these files. The 1956 pages, plus additional example pages, are compiled and provided as GM_119689.
[4] PG&E Response to DR_CPUC_091_Q04Atch01.
[5] GM_119689, see fn 3.

accounting files. [6] PG&E cannot explain why the project was not included in the accounting files.[7]

The lack of records about reused pipe is a safety issue because salvaged pipe may have longitudinal weld quality problems from original manufacturing or stress after installation.[8] Since PG&E's records do not show the source of the pipe in Segment 180, the type and quality of the welds was unknown from 1956 until PG&E inspected the pipe in 2011 after the San Bruno explosion. Operating a facility without the basic knowledge of its construction, including the source of pipe and the types of welds used in the manufacture of the pipe is inherently unsafe because it is impossible to accurately determine safe operating parameters such as the maximum operating pressure.

Records show that PG&E accumulated miscellaneous sections of 30 inch pipe in the Milpitas storage yard from 1954-1956.[9] PG&E denies that it had a storage yard at Milpitas,[10] but records show Substores General Construction #73 and #1 Storage Yard were operated out of Milpitas during these years.[11] Records also show that PG&E had at least one piece of 30 inch pipe in the Milpitas storage yard in 1955, identified as "short pups and scrap" and a note that it was "junked."[12] PG&E cannot determine from its records what happened to this piece of pipe.[13] However, PG&E's policy for handling junk pieces of pipe intended for scrap included the option for reuse of the scrap pipe on jobs.[14] Therefore, it is possible that the piece of junk pipe taken to the Milpitas Yard ended up in Segment 180.

Another possible source of pipe in Segment 180 arises from a Job File document that

---

[6] PG&E Response to DR 73 Q 3.d, PG&E confirmed that there are no GM 136471 (Segment 180) related records in the Holding Account files.

[7] PG&E Response to DR 73 Q 4.g.ii. PG&E "believes" this may be because Segment 180 had its own purchase account associated with it, but did not produce evidence of a separate purchase account other than reference to a Work Order account number on two documents.

[8] I.11-02-016 PG&E Supplemental Response to Legal Division's "Notice and Disclosure of Safety Evidence and Companion Motion for Public Release of Evidence, October 31, 2011 Appendix, Pages 76-83.

[9] Milpitas Storage Yard (Example Pages from ECTS.)

[10] PG&E Response to DR 10 Q 1 and DR 10 Q 1 Atch 1 (a list of storage yards).

[11] PG&E Response to DR 38 Q 1.

[12] MAOP21825311 and MAOP05266970.

[13] PG&E Response to CPSD DR 210 Q 2.

[14] PG&E Response to DR 10 Q 5 atch5.

shows a 90 foot section of 30 inch pipe reused on Segment 180 was salvaged from the pipe being replaced.[15] There is no indication that this section of pipe was reconditioned, suggesting it may have been the piece of pipe that was not buried, but spanned San Bruno Creek canyon,[16] and was therefore potentially readily available for reuse on the Segment 180 project.[17] The possible reuse of this pipe is troublesome because it was subject to external physical stresses requiring PG&E to install a special support to stabilize the pipe in 1952.[18] It was also part of the 1948 installation that is known to have had weld problems.[19] The 30 inch pipe installed in 1948 was erroneously identified as seamless pipe in construction drawings in the GM 98015 Job File.[20] If 30 inch pipe was salvaged and reused from the 1948 project, the description of the pipe would have been transferred to the 1956 project. At the time of the San Bruno explosion, PG&E's GIS indicated that Line 132 at that location was made of 30 inch seamless pipe. Thus, the records suggest that the pipe originally installed to span the creek may have ended up installed in Segment 180.

In its Response, PG&E notes that its Job File documents do not foreclose the possibility that some of the pipe used on the Segment 180 job may have been reconditioned pipe.[21] Reconditioned pipe is simply salvaged pipe that has been cleaned and rewrapped before it is reused within PG&E's pipeline system.[22] PG&E states that it has not identified any centralized process of tracking pipe within its company.[23]

[15] MAOP06001661.

[16] MAOP13191950.

[17] MAOP13191844, MAOP13191835, and Drawing 383738s1: When PG&E originally installed Line 132 through the San Bruno area, it installed a 90 foot section of 30 inch pipe at 33 feet across a creek canyon without using the type of supports used in other spans on the project. There was a washout of soil on the side of the canyon beneath the pipe in 1951, exposing an additional 10 feet of pipe. The washout caused PG&E to add a support from the creek bed to the 30 inch line.

[18] 383738s1 (see fn 17)and MAOP13191847.

[19] In I.11-02-016, PG&E's Supplemental Response to Legal Division's "Notice and Disclosure of Safety Evidence and Companion Motion for Public Release of Evidence, Appendix, Pages 76-83, October 31, 201.1

[20] GM-98015. Example Construction drawings from the GM 98015 file showing the 30 inch seamless error. This is an error because 30 inch seamless steel pipe was never manufactured and therefore could not have been installed. In fact, the pipe that failed in San Bruno was identified as seamless, but was seamed and failed on a seam weld.

[21] Response Page 4-2, lines 6-8.

[22] PG&E Response to DR 3 Q 10.

[23] PG&E Response to DR 16 Q 8.

2. Failure to Create/Retain Construction Records for 1956 Project on Line 132, Segment 180.....................1956-2010

PG&E acknowledges that the construction records it has located for Segment 180 do not contain documents or drawings that depict the Segment 180 installation in granular detail.[24] PG&E states that it is unrealistic to expect that construction documentation created at the time Segment 180 was installed would have tracked or depicted the presence of pups.[25] And yet, records found in other files in PG&E's database show the existence of small pieces of pipe welded together and pups installed in pipelines for other projects that bracket the time when Segment 180 was being installed.[26] PG&E claims that "[i]n 1956, when Segment 180 was installed, industry practice did not include creating construction drawings or other documentation that showed a pipeline installation at the joint-by-joint level.[27] Despite this argument, Job Files for other PG&E projects from 1950 to 1960 provide ample evidence that PG&E kept detailed construction records at that time Regardless of industry practice.[28] A similar level of documentation should have been created by PG&E for the Segment 180 project; if created, it has since been lost.

The Job File PG&E produced for the Segment 180 project GM 136741 is an accounting file that does not contain any of the typical records expected to be in a construction project file, such as construction drawings, plans, correspondence or details of the construction project.[29] For instance, a note in the file explains that the project is at company expense due to a right-of-way agreement with Consolidated. The project file also specifies that a new right-of-way must be obtained. Neither of these Agreements is included in the Job File, which is where such Agreements are typically found.[30]

[24] Response Page 4-4, lines 23-25.
[25] Response Page 4-5, lines 22-26.
[26] PG&E Response to DR 7 Q 12, atch 4, an annotation on a Pipeline Survey Sheet showing "short lengths welded together at Milpitas Pipe Yard, and MAOP06003579, Line 132 project GM 16913, a 1967 project involving 30 inch pipe installed at Woodside Rd., which notes on an x-ray report "pups welded together."
[27] Response page 4-5, lines 13-16 – PG&E defines uses the industry term "joint" to mean a piece of pipe as before it is welded into a pipeline, typically about 31 feet long.
[28] Examples from small jobs 1953-1955: GM119640 (see fn 29) and GM124622.
[29] GM_119640 Compiled Records, the 30-300 By-pass line, 1955, (2200 feet of 30 inch line).
[30] Based on review of Job files in the ECTS data base.

In addition, PG&E cannot explain how or when, between 1952 and 1956, San Bruno Creek was filled and states that it believes the developer filled the creek canyon.[31] It is hard to believe PG&E would allow a third party to fill the canyon, covering 90 feet of active 30 inch gas transmission line and would not have any explanatory or supporting documentation. These records typically would have been added to a Job File for a construction project like Segment 180, but are now missing.[32] The absence of detailed construction records for Segment 180 cannot be explained by PG&E's claims about industry practice.

3. Failure to Retain Pressure Test Records for Line 132, Segment 180............. 1955-2010

PG&E is required to retain pressure test records for the life of the facility. Pressure test records that confirm the integrity of a pipeline, as designed and constructed, are basic facility records that should always be retained for the life of the plant because these records prove that the pipe is fit for service at a specific operating pressure. In its Response, PG&E admits that it has not located records showing that a post-installation pressure test was conducted on Segment 180.[33] It then refers to testimony given in relation to the San Bruno explosion civil cases by [redacted], a former PG&E employee, who recalls a pressure test done on Segment 180 when it was installed.[34] However, [redacted] recalls the test pressure being 1000 psi[35] which would be 2.5 times greater than the design pressure of 400 psig, which was not PG&E's standard at the time, as discussed below.

A 1956 PG&E Standard Form for Strength Test Pressure Reports (STPR) was found in PG&E's records.[36] PG&E cannot find the instructions employees would have used to fill out

---

[31] Response to DR 22 Q 4, San Bruno Creek ran at the location of the San Bruno explosion, along the current location of Earl Ave, crossing what is now Glenview Drive. Originally, about 90 feet of 30' pipeline (Line 132) was suspended 33 feet above the creek without supports. In 1951, the south side of the creek wall washed out, apparently exposing an additional 10 feet of the pipe. In 1952 PG&E installed a support from the creek bed to the pipe (GM 120721 – see fn 17). The creek bed had to be filled to street level prior to development of the Crestmoor #7 residential area and prior to the installation of Segment 180 pipe.

[32] Based on review of Job Files in the ECTS data base.

[33] Response page 4-6, lines 9-10.

[34] Response page 4-6, Footnote 13.

[35] PG&E Response to DR 65, deposition of [redacted] .

[36] Example Standard Forms #75-27 (copies of 3 completed forms).

the form.[37] However, based on this form, it appears that PG&E was creating pressure test records as a matter of policy in 1956. Records show PG&E used this form for both hydrotests (using water) and gas pressure tests.[38] The test pressure for a hydrotest was approximately 1.10 time the design pressure of the line and the gas test pressure was about 1.15 times the design pressure.[39] So, it is highly unlikely that PG&E performed a hydrotest on Segment 180 at 1000 psi (2.5 times greater than the design pressure). Available records do not reveal whether PG&E conducted a pressure test on Segment 180 in 1956, either gas or hydro. However, PG&E stated in its June 20, 2011 Response in this proceeding that the Job File documents indicate that upon completion of construction Segment 180 was tested for leaks using the "soap test" which was a common method for identifying weld leaks during that era.[40] Soap is on a list in the job file of items purchased for the project.[41] However, if PG&E conducted any pressure or leak test on Segment 180 and completed the standard form, it failed to retain the record.

4. Lost Underlying Records to Support MAOP of 390 on Segment 180……… 1977-2010

In its Response, PG&E defends its use of the grandfather clause and historical records to establish an MAOP of 400 psig on Line 132 without officially uprating and hydrotesting the section of the line from MP 35.84 to MP 46.59.[42] PG&E attributes the lower MAOPs that were recorded for segments of Line 132 to an error made by the San Francisco Division in determining the highest pressure measured in the 5-year period 1965-1970.[43] CPSDbelieves there was no error and finds that the lower MAOPs recorded for several segments of L-132, appear to have been purposely entered into the Pipeline Survey Sheets.[44] MAOPs of 400, 375 and 390 were entered for L-132. These Pipeline Survey Sheets were initially created in 1974 and modified from 3 to 9 times,[45] depending on the sheet number, until the data was transferred in 1998 to GSAVE, a database that predated GIS, then to the GIS database that is currently in

[37] PG&E Response to DR 79 Q 1.
[38] Example Standard Forms #75-27 (see fn 36).
[39] Example Standard Forms #75-27(see fn 36).
[40] PG&E June 20, 2011 Report, Page 6D-4, lines 8-10.
[41] PG&E Response to CPSD DR 91 Q 4 Atch 1, page 167 (See fn 4).
[42] Response Pages 4-8 through 4-12.
[43] Response Pages 4-10 through 4-11.
[44] DR 7 Q 12 attachments 60 through 65: Survey Sheets showing various MAOPs for Line 132.
[45] Modifications with dates are shown in the title block at the lower right hand corner of each Survey Sheet.

use. The lower MAOPs are not limited to the San Francisco Division. PG&E's explanation based on a San Francisco Division error does not address the MAOP of 375 psig that is not within the San Francisco Division.

Note also, that from 1974 to 1998 several revisions were made to the Pipeline Survey Sheets, which means someone was looking at the data on the sheets each time a change was made. For instance, Sheets numbers 12 and 13,[46] each showing an MAOP of 390, list "data updates" in 1978, 1989, 1992 and 1998. Sheet number 11,[47] showing an MAOP of 375, was updated in 1981, 1983, 1986, 1989, 1991 and 1992.

The Pipeline Survey Sheets were PG&E's most accessible source of pipeline data other than going back to individual Job Files. Thus, one might assume engineers and operating personnel were using these drawings routinely for numerous purposes related to pipeline operation and maintenance. Given the active and ongoing use of these drawings, if there were errors in the MAOP on the Pipeline Survey Sheets for Line 132, someone in PG&E would have noticed and corrected them sometime between 1974 and 1998. Because the Pipeline Survey Sheets were the source of data for GIS, presumably these MAOP figures were transferred into GIS. The GIS electronic drawings provided to CPSD were dated mid-2011, so it is not possible to determine when PG&E changed the MAOP. However, based on the annotations discovered in PG&E's records, it appears, as noted in the March 16 Felts testimony, the MAOP was changed to 400 psig for the entire Line 132 in 2004 by editing historical records.

If PG&E had hydrotested line 132 to uprate the pressure to 400 psig on the section from MP 35.84 to MP 46.59, the line would have failed during the test, the pipe would have been replaced, and the San Bruno explosion would not have occurred. PG&E cannot and does not deny that it had conflicting MAOP records for Line 132 from 1978 to 2004 and even today PG&E cannot produce underlying records to explain why it set the MAOPs of some parts of Line 132 at 390 and 375 and operated its system with these values in place for at least 30 years. If PG&E indeed relies on conservative assumptions where it has no data, in the absence of

[46] PG&E Response to DR 7 Q 12 atchs 62 and 63 (See fn 44).
[47] PG&E Response to DR 7 Q 12 atch 61 (See fn 44).

underlying records documenting the reasons for the recorded MAOPs on the Pipeline Survey Sheets, it should have made a conservative assumption that there was a valid reason why the MAOP was set below 400 MAOP on some sections of Line 132.

5. Failure to Follow Procedures to Create Clearance Record…............................ 2010

PG&E admits that the written clearance documentation prepared for the electrical work at Milpitas Terminal for September 9, 2010 fell short of PG&E's clearance procedure.[48] PG&E also acknowledges that the clearance application did not designate a clearance supervisor or fully describe the work to be performed and the sequence of operations that would be undertaken.[49] PG&E claims its operators followed good communication practices and took actions that focused on and furthered the safety of the work.[50] Good communication practices and additional actions are not a substitute for complying with clearance procedures which are intended to ensure safety through the creation of written step-by-step instructions before performing maintenance on an operating gas facility.

On September 9, 2010, at the time the San Bruno pipe failed when it was over pressured, PG&E maintenance personnel were performing maintenance on the electronic systems of the fully operating Milpitas Terminal without the benefit of a written sequence of steps that would be undertaken in the maintenance procedure. Subsequently, when problems occurred in the electrical system, personnel at Milpitas and in the San Francisco Control Room lacked the records of the maintenance sequence that could have helped them determine and resolve the cause of the problems. It is also possible that an adequate Clearance Procedure could have prevented the electrical problem that led to the over pressuring of the Peninsula pipelines and, thus, could have prevented the San Bruno explosion from occurring. At the least, an adequate Clearance Procedure may have made recovery quicker because there would have been a traceable step-by-step record of each change that had been made to the electrical system. The only notes from the electrical procedure performed on September 9, 2010 is a list

[48] Response page 4-15, lines 4 – 6.
[49] Response page 4-13, lines 16-19.
[50] Response Page 4-13, lines 20-22.

of numbers scribbled on a couple of pages without context or apparent order,[51] written by the contract electrical engineer who was overseeing the work.[52]

6. Out-of-Date Operations and Maintenance instructions at Milpitas Terminal..............................1991-2010

In its Response, PG&E suggests that CPSD has misinterpreted its data responses regarding the version of the Operations & Maintenance (O&M) manual that was at the Milpitas Terminal on September 9, 2010.[53] When a records inventory of the Milpitas Terminal was performed in 2011, the Operations & Maintenance manual identified as being on the shelf at that time was "issued 1991, January 2011 update."[54] Because the January update was not issued until 2011, CPSD assumes the manual available at the Terminal on September 9, 2010 was Version 0, the 1991 manual without the 2011 update. Other than the manual included in the records inventory, there appears to be no record of which manual was available at the Terminal on September 9, 2010.

In its Response, PG&E does not specifically identify the 2009 Version 6 O&M manual as the one that was available at the terminal on September 9, 2010. CPSD asked for copies of all records kept at the Milpitas Terminal as of September 9, 2010. PG&E did not include an operations manual in its otherwise voluminous response to that question.[55] Based on PG&E's responses and the records provided, it remains impossible to verify the version of the O&M manual that was available at Milpitas on September 9, 2010. In its Response, PG&E admits it cannot conclusively determine that the then-current version of the respective O&M manuals were at each of the 11 stations on September 9, 2010.[56]

---

[51] PG&E Response to DR 3 Q13 atch 1.
[52] PG&E Response to DR 3 Q 13.
[53] Response Page 4-18.
[54] PG&E Response to DR 1 Q 7 atch 2, Summary Inventory, Page 3.
[55] PG&E Response to DR 1 Q 7.
[56] Response Page 4-17 line 31 through Page 4-18, line 2.

7. Out-of-Date Drawing and Diagrams of the Milpitas Terminal..................2008-2010

In its Response, PG&E confuses the terms Drawing and Diagram, leading to confusing testimony.[57] In this context, "drawing" should refer only to paper Drawing #383510[58] of the Milpitas piping and valves, and "Diagram" should refer only to the diagram of the Milpitas piping and valves that appears on the Gas Control Room computers, which PG&E identifies as a "SCADA display."[59]

Drawing #383510 is a drawing on paper that shows the general arrangement of piping, valves, flow meters and other equipment such as separators at the Milpitas Terminal. PG&E provided to NTSB a version of this drawing that was updated after September 9, 2010 to reflect the general arrangement as it existed at the Terminal on September 9, 2010. The drawing that was available at the Terminal on September 9, 2010 was an outdated version.

In addition to the out of date drawing at the Milpitas Terminal, a diagram viewed by controllers in San Francisco was incomplete. This issue has to do with a diagram called up on the SCADA display by gas control operators in San Francisco on September 9, 2010. The diagram is a line schematic that shows the pipelines, open/closed status of valves, and other information relevant for operating the gas system.[60] PG&E added the 30-300 By-pass line to this schematic after September 9, 2010. However, the bypass line should have been on the display diagram viewed by the gas control operators on September 9, 2010. PG&Ehas two by-pass lines associated with the Milpitas Terminal, both of which allow operators to channel gas directly from the feed lines to the output lines without going through the maze of control valves in the terminal.[61] One by-pass system is inside the terminal fence line and serves as a by-pass for the terminal with minimal pressure control through one monitor valve. This by-pass line was visible on the SCADA display diagram on September 9, 2010. The second by-pass line is

[57] Response Page 4-20 through 4-23.

[58] PG&E Response to DR8_Q8, atchs 3 and 4 Drawing #383510 with redline changes.

[59] Response page 4-20, lines 8-9.

[60] PG&E Response to DR8 Q8, atch 5.

[61] PG&E Response to DR 8 Q8 Atch 4, Drawing #383510, shows the by-pass within the Milpitas Terminal fence line (valve 62) and shows a partial representation of the By-Pass line 30-300 that is missing from the Diagram shown in DR8 Q8, atch 5 first image (See fn 60). See Drawing #282067 showing the entire 30-300 By-pass line that runs outside of the Milpitas Terminal fence line.

referred to as the 30-300 By-pass line. It is a 30 inch line that was built in 1954 outside of the Terminal fence line south of the Terminal.[62] The 30-300 By-pass line was installed for emergency purposes so that PG&E could completely by-pass the Terminal and supply gas to the Peninsula in the event that the Terminal became inoperative.[63]

Although the 30-300 By-pass line was installed for use when there was an emergency at Milpitas Terminal, it was not visible to control room operators on the SCADA display diagram on September 9, 2010. PG&E says that the line was omitted from SCADA displays because it is a "normally-unused bypass system."[64] Of course, by definition, a by-pass line designed to be used when the terminal is inoperative would be unused in normal conditions. Thus, PG&E's statement essentially acknowledges that the line would become relevant during an emergency. Drawing #282067 shows the 30" By-pass line.[65] One would expect that the diagrams available to Gas Control operators would include all lines designed and installed for use during emergencies. PG&E also states that it added the 30-300 By-pass to the SCADA diagram when the line was being considered as an alternate means of providing gas to the San Francisco Peninsula transmission lines following the San Bruno accident.[66] Regardless of PG&E's timing for adding the By-pass line to the diagram, the absence of this information in SCADA during the September 9, 2010 emergency was a safety issue.

The By-pass line can carry gas from Lines 107, 300 A, or 300 B around the Milpitas Terminal and discharge it into lines 109, 101 and 132 on the Peninsula side of the Terminal.[67] PG&E states that the 30-300 By-pass line was valved closed on September 9, 2010 but kept no

[62] Example construction project Pages: GM119640 (See fn 29).

[63] MAOP00551451. The purpose of the 30-300 By-pass line was described in PG&E records as follows: "Install by-pass around Milpitas Control Station. By-pass to connect major incoming and outgoing transmission mains in station area to permit operations when station is inoperative."

[64] Response page 4-21, lines 25-26.

[65] Drawing_282067 (See fn 61).

[66] PG&E Response to DR 67 Q 39: This response eludes common logic. The pressures in the Peninsula were reduced due to the over pressuring on September 9, 2010 and were required by CPSD to remain reduced until certain actions were taken to verify the integrity of the lines. By-passing the Milpitas Terminal, which was restored to operation on September 10, 2010, would not change allow PG&E to increase the pressure or amount of gas it could deliver through the only Peninsula Lines 109, 101 and 132.

[67] Drawing_282067 (See fn 61).

records that can be used to confirm this statement.[68] This absence of records on the operation of a By-pass line installed for use during emergencies exemplifies PG&E's haphazard recordkeeping. For instance, from the records that PG&E did keep, a plausible argument can be made that the By-pass line was not valved closed at least part of the time leading up to the San Bruno pipe explosion.

The following chronology is taken from PG&E's records of events on the evening of September 9, 2010: 1) at 5:20 P.M., Gas Control operators at Brentwood noticed an unexplained flow of gas from Line 107 at the rate of 10 million standard cubic feet per day,[69] 2) at 5:21 P.M. backflow alarms began warning of reverse flow through Line 107 flow meters within the Milpitas Terminal mixer and one minute later, at about 5:22 P.M., "high-high" pressure warnings were transmitted from the Milpitas outgoing flow meters on lines 132, 101 and 109,[70] 3) at 5:25 P.M. a gas control Operator told Milpitas personnel that the Peninsula Lines were pressured,[71] 4) at 5:54 P.M. a pressure within the Milpitas Terminal but downstream of monitor control valves was measured at 494 psig,[72] and 5) at 5:52 P.M. the PG&E Gas Control supervisor issued an order to reduce the Milpitas feed pressure using control valves upstream of the Milpitas Terminal (at PLs 7A and PLS 7B and Sheridan Road) from 565 psi[73] to 370 psi.[74] It takes a few minutes for these remotely operated valves to close. Meanwhile, at 5:55 P.M. a Gas Control Operator told Milpitas Terminal personnel that he was seeing 500 pounds downstream.[75]

The line at San Bruno failed at 6:11 PM, releasing the pressure on Line 132. This series of events is consistent with an open by-pass line that was not controlled through a monitor

68 Response Page 4-21, lines 16-19 and PG&E Response to DR 73 Q 9.f.

69 Transcript of Brentwood Control Room calls: Brentwood_9.9.2010_11.27.59_AM_7.19.03_PM_20110811.

70 AlarmLog9.9.10: Alarm Sequence for 9/9/2010 shows the first backflow alarms at flow meters M13 and M14, upstream of monitor control valves. Within the same minute, additional backflow alarms came in from flow meters M7 and M8, which are on Line 300B. Thus, PG&E's explanation that the flow in Line 107 was actually gas flowing from Line 300B (PG&E Response to DR 67 Q 38) into Line 107 cannot be correct since gas was back flowing in both lines 300B and 107. The last backflow alarms on M13 and M14 came in at 8:43 PM (the data provided by PG&E ends at 10:59:42 PM).

71 TRANSCRIPT_SF_9.9.2010_2.05.43_PM_11.57.23_PM_20110113.

72 PG&E Response to DR 1 Q 3 Supp01Atch0 1a, See 107Hdr4 at 17:54.

73 [redacted]nterview, Page 26, lines 19-21.

74 PG&E Response to DR 8 Q 1, Atch 2: Gas Control Room Log for 9/9/2010, and PG&E Response to DR 67 Q 3 Atch 1, showing pressure reduced at PLS 7 A and B from 525 psig to 370 psig and from Sheridan Rd from 565 psig to 370 psig.

75 TRANSCRIPT_SF_9.9.2010_2.05.43_PM_11.57.23_PM_20110113 (See fn 71).

valve. (The gas pressure of the gas that passed through the by-pass line within the Milpitas fence line was controlled by a monitor valve, but the 30-300 By-pass line was not.) This distinction suggests gas could have been flowing through the 30-300 By-pass line, back flowing into the Terminal and, at the same time, delivering high pressure gas to the Peninsula pipelines. In this scenario, gas at a pressure as high as 565 psi may have flowed into Line 132, causing the weakest section of pipe to fail in San Bruno.

Due to PG&E's recordkeeping shortfalls, operators may have lacked the data essential for fully understanding what was happening in its gas transmission system when things went wrong at the Milpitas Terminal.

8. No Back-up Software at the Milpitas Terminal................................. 1991-2010\

PG&E acknowledges that the gas technician at Milpitas Terminal on September 9, 2010 did not have the software needed to reprogram the three valve controllers that experienced problems.[76] Additional information related to the timing of the PG&E personnel's discovery of the loss of the controllers can be found on Page 10 of the [redacted] interview of September 16, 2010[77] and page 10 of the J. Groppetti interview of September 16, 2010, quoted here:

> "I was sitting there . . . and . . . the tech was standing in front of the controllers and said, "Oh xxx," And I said, "What's wrong?" And he said "I've got three controllers that have failed." [78]

See also, the transcript of phone calls for the SF Control Room at 5.36.49PM-607939000393841 [redacted] speaking to [redacted]) ". . . I think I lost the programming to these controllers . . ." The March 16 Revised Testimony of Margaret Felts, Footnote 45 identifies additional relevant quotes related to the loss of programming for the controllers at Milpitas Terminal.[79]

Even though PG&E states that the loss of the controllers were not related to the pressure

---

[76] Response, Page 4-25, lines 7-10.

[77] [redacted] Interview.

[78] J. Groppetti Interview.

[79] Footnote 45 reprinted: SF Control Room Transcript Line 11.03.33 PM - .wav file 6079390000394346 ". . . I'll give you a call once [the engineer] starts reloading the programs in there. . . I don't have the software for the 353s. I got all the stuff for the 352s but these are the 363s." and OM transcript, Sept 16, 2010, p. 29 lines 2-4: "My laptop only has a program for the 352 Moore controllers. These are 353 controllers, so I did not have the programming, the software for them." (Note: It is unclear whether the controllers at Milpitas Terminal are 353 or 363 Moore controllers since both are stated here).

increase,[80] records from the evening of September show that operators at Gas Control and the maintenance personnel believed there was a relationship between the two and were taking steps to try to control the pressures based on this mistaken belief. Had the maintenance technician at Milpitas been able to immediately restore the programming to the controllers, Gas Control operators and the maintenance technician may have been able to focus on other causes, thus possibly resolving the high pressure problem quicker.

9. Unsafe Design of Supervisory Control And Data Acquisition System……2008-2010

The unsafe condition of the SCADA system contributed to the inability of the Gas Control Operators to timely evaluate data related to the emergency. In its Response, PG&E argues at length that control operators took only 14 minutes, not 30 minutes, to recognize there was a ruptured PG&E gas line in San Bruno.[81] However, PG&E's expert, [redacted], who testified in the San Bruno civil cases, stated: ". . . the operators in PG&E's gas control room recognized that Line 132 was experiencing a leak 34 minutes after the rupture."[82]

PG&E says that Gas Control operators determined the leak was in San Bruno,[83] but fails to explain adequately why Gas Control operators could not identify the location of valves required to close off the gas to the flaming line. PG&E admits that it can improve its SCADA system.[84]

10. Emergency Response Plans Too Difficult to Use.........................Apr 2010-Sept 2010

PG&E points out that its Gas Emergency Plan meets regulatory criteria.[85] However, Violation 10 is based on PU Code section 451 because a thorough review of records relating to the September 9, 2010 incident shows the emergency response plan to be ineffective in guiding personnel during the initial phases of the emergency. Even if an emergency response plan includes all required elements, the proof of its value is in how well it serves those handling an

[80] Response Page 4-25, lines 16-19.
[81] Response Page 4-27, line 20 through Page 4-28, line 3.
[82] Declaration of [redacted], Page 7.
[83] Response Page 4-28, line 18-21, but, there are miles of gas pipeline in San Bruno.
[84] Response, Page 4-26, lines 6-7.
[85] Response , Page 4-55, lines 21-26.

emergency.

The pipe in San Bruno exploded at 6:11 P.M. PG&E's Concord Dispatch office called the San Francisco Gas Control Room at 6:27 P.M. and asked if they had lost any pressure in San Bruno. Gas Control's response was that "they had not received any calls yet." Dispatch said he had received "a couple of calls from the fire department and that he's "got a group of guys heading out there. They want a supervisor and GSR to figure out what is going on."[86] Other accounts say that only one on-call first responder was asked to go to the scene.[87] This first responder was delayed in traffic and there is no indication that dispatch called out a second person.[88] Two measurement and control (M&C) mechanics saw the story on the news around 6:30 PM and responded on their own initiative.[89] It appears from listening to the audio records of the calls in the San Francisco Gas Control Room that personnel were not sure of their roles in the emergency and were primarily responding to information and directions coming from personnel outside of the control room.

As written, PG&E's emergency plan was not useful for responding to the catastrophic gas line break and fire. A review of the 2009 Emergency Plan reveals checklists for both overpressure situations and fire/explosion situations.[90] The overpressure checklist is vague regarding the type of situation to which it applies and it fails to give a timeframe for allowing the problem to continue before taking the first step to minimize danger, which is to shut off the gas. The fire/explosion checklist gets to the point quickly, saying "Is the gas shut off? *Shut it off.*" But, this instruction fails to identify who may or should shut off the gas. In fact, only an authorized employee who knows exactly where the valves are and who has the proper set of keys to access the fence, vault and valve lock can shut off the gas to a main gas line. As a result, it is imperative that someone be directed to contact the person who has the knowledge and the keys immediately upon learning of the pipe failure. Based on the response time to turn off the gas and the fact that the responders only responded because they happened to see the

[86] Transcript SF_9.9.2010_2.05.43_PM_11.57.23_PM_20110113 (See fn 71).
[87] Interview of [redacted], 16 Sep 2010.
[88] Interview of [redacted] and Transcript, SF_9.9.2010_2.05.43_PM_11.57.23_PM_20110113 at 6.31.12 PM (See fn 71).
[89] Interview of [redacted] (See fn 87).
[90] ER_checklists.

fire on a TV news broadcast, it is evident that the emergency plan failed to serve the needs of PG&E employees as well as the public.

PG&E argues that its employees were not confused about how to respond to the emergency on September 9, 2010.[91] When managers off-site must explain the emergency process to gas control operators, as they did during that emergency, then there is a problem in the way the emergency plan is written and/or accessed.

10. PG&E Operated L-132 in Excess of 390 MAOP Three Times…………...... 2003-2010

PG&E's position is that it did not exceed the MAOP at any time on Line 132 because it believes the MAOP was always 400 psi. Violation #11 addresses three pipeline over pressure events: December 11, 2003,[92] December 9, 2008[93] and September 9, 2010.[94] On each of these days, PG&E documented operating Line 132 at pressures in excess of 390 psi. In 2003 and 2008 PG&E purposely pressured Line 132 to 400 psig and held it at this level for 2 hours each time to trigger a five-year period in which it could operate Line132 at an MAOP of 400 psig.[95] This process was based on PG&E's interpretation of federal regulations that became effective in 2004.[96] On September 9, 2010, PGE allowed Line 132 to be over pressured to at least 394 psig as a result of problems at the Milpitas Terminal.[97] This high-pressure event ended when the pipe in San Bruno failed.[98]

The issue of PG&E's inconsistent records and failing to uprate Line 132 from an MAOP of 390 to 400 psig is discussed in the section addressing Violation 4, above.

---

[91] Response Page 4-55 through 4-56.
[92] PG&E Response to DR 15 Q 1 Atch 358.
[93] PG&E Response to DR 15 Q 1 Atch 253.
[94] PG&E Response to CPUC DR 188 Q 13, Atch 1, Page 13, Transcript: SF_9.9.2010_2.05.43_PM_11.57.23_PM_20110113, p. 242 (.wav file #307939000393937) and p. 668 (.wav file #307939000394349).
[95] DR 15 Q 1 atch 6, atch 53, atch 136, atch 138, atch 188, atch 255, atch 358-CONF.
[96] See fn 95 .
[97] PG&E Response to CPUC DR 188 Q 13, Atch 1, Page 13.
[98] PG&E Response to DR 7 Q1 09.09.2010-4, Investigation & Documentation Report (for Documenting Abnormal Operations).

11. Failure to Attempt to Preserve Video Recordings that PG&E Believed Was on Brentwood Camera 6 2010-2012

As discussed in Felts Supplemental Testimony, PG&E was subject to preservation orders from the Commission's executive director on September 13, 2010 and the Commission itself on September 23, 2010.[99] Moreover, PG&E's General Counsel issued an internal preservation order on September 13, 2010.[100]

Regarding the issue of possible video recordings on Brentwood Camera 6, PG&E states that it provided one response to CPSD on October 10, 2011 ("first response") which contained "known facts" at that time, and a revised response on March 9, 2012 ("second response") which contained new facts PG&E became aware of regarding the Brentwood Alternate Gas Control facility security camera (Camera 6).[101]

In its first response, PG&E stated that,

> "Video cameras are installed at the Brentwood facility to monitor security system activation events. *Video is recorded and retained on a digital video recorder until it is automatically overwritten when the disk array becomes full, which occurs after approximately 60 days. The video recording from the Brentwood facility for September 9 and 10, 2010, was overwritten in this manner.*"[102]

In its second response, PG&E stated that,

> "In certain past communications with the Commission, including responses to three data requests, PG&E stated that video from a security camera in the Brentwood Terminal's Alternate Gas Control ("AGC") recorded on September 9, 2010 was automatically overwritten about 60 days later.
>
> PG&E based these statements on the mistaken belief that the security camera inside the AGC ("Camera 6") and the related digital video recorder ("DVR") had been configured in the same manner as other PG&E security camera systems. PG&E has recently learned, however, that the vendor who installed the Brentwood Terminal camera system did not configure the system properly. As a result, *Camera 6 could provide a live feed but its video was not recorded onto the DVR. No video from Camera 6 was recorded on September 9. Thus, no video was overwritten.*"[103]

[99] Felts Supplemental Testimony, Page 4, lines 15-20.
[100] Felts Supplemental Testimony, Supplement Appendix A, Pages 19-20.
[101] Response Page 5-3, lines 18-23.
[102] PG&E Exhibit 5-8; PG&E Response to DR 8 Q 16.
[103] PG&E Exhibit 5-9; PG&E Response Revision 01 to DR 8 Q16.

The second response also stated that,

> "PG&E recently examined the video recorded from the five outdoor cameras, which were configured properly, and found video from approximately 110 days before the examination was made. With respect to Camera 6, an inspection has been made and has confirmed that no video was recorded onto the DVR."[104]

PG&E does not assert in either of these two data responses that it took any steps to comply with the preservation order of the Commission, as interpreted by its general counsel. If the first response was true, PG&E did not take steps to disengage the overwriting function and prevent it from deleting over the video recording.

Moreover, the first response suggests that PG&E knew as a certainty that the Camera 6 video was recording and overwriting, while the second response shows that PG&E made no attempt to check whether Camera 6 was recording, or whether overwriting was preventable in order to preserve that video as evidence for the CPSD investigation prior to its first response. Prior to the second response, when the CPSD Investigation relied upon PG&E's disclosure of factual and objective information, PG&E merely speculated that Brentwood Camera 6 video recording had been destroyed. Therefore, the conflicting information between these two responses prejudiced the Commission's investigation.

Finally, the second response suggests that Camera 6 would record and keep video for 110 days just as the other five outdoor cameras did.

For reasons that will be discussed in the following section on Violation 13, CPSD has no way of knowing whether PG&E's statement that no video from Camera 6 was recorded onto the DVR is a false statement.

13. PG&E's Contradictory Data Responses Regarding Recorded Brentwood Camera 6 Video ....2011 and 2012

In its Response testimony, PG&E states that its first response contained the known facts at the time, and that its second response contained new facts PG&E became aware of regarding

[104] See fn 103.

the security camera at the Brentwood Alternate Gas Control facility.[105] PG&E asserts that it self-disclosed the new facts to CPSD and revised prior responses, making the alleged Rule 1.1 violation unwarranted.[106]

PG&E's representation that it provided the facts it knew on October 10 (its first response date) is itself misleading. In truth, CPSD has no way of knowing whether only one or both answers from these contradictory data responses contain false statements. However, assuming solely for the sake of argument, that PG&E's second response is accurate, that shows PG&E's first response was false and misled the Commission.

PG&E's Response testimony says its first response to CPSD "contained the known facts at that time."[107] However, as explained in violation 12, PG&E's second response shows that PG&E merely speculated that the video recording had been destroyed in its first response without bothering to check whether the recording existed and the rewriting was preventable. PG&E speculated at a time during CPSD's investigation when CPSD relied upon PG&E's disclosure of factual and objective information.

These contradictory data responses regarding Brentwood Camera 6 video are the basis for Violation 13.

14. PG&E's Data Responses Did Not Identify All of the People in Milpitas Handling the Pressure Problem on September 9, 2010, October 10 and December 17, 2011

PG&E asserts that CPSD alleged this violation based on a question that was not asked.[108] PG&E's claim is misleading for three reasons. First, PG&E misstates what CPSD's question was. PG&E cites Exhibit 5-13 and states that "CPSD requested the names of field crew personnel who had access to operating diagrams at the Milpitas Terminal".[109] In fact, in Exhibit 5-13, CPSD asked "For all diagrams identified above, state whether personnel at the Milpitas Terminal had access to those diagrams on September 9, 2010. Identify the personnel who had

[105] Response Page 5-3, lines 18-23.
[106] Response Page 5-3, lines 23-24.
[107] Response Page 5-3, lines 18-19.
[108] Response Page 5-4, lines 13-14.
[109] Response Page 5-4, lines 7-8.

that access."[110] This question sought the names of all personnel who had access to operating diagrams at Milpitas Terminal, not merely field crew personnel. However, PG&E's answer did not include all personnel as the question asked.

Second, CPSD asked in Data Request 30-Q02, "Provide the names of the maintenance personnel and the maintenance supervisor who were headquartered at the Milpitas Terminal on September 2010. Specify the hours each person identified was present at the Milpitas Terminal on September 9, 2010 and summarize the work that person performed during that time."[111] PG&E specifically said in its response that [redacted] was the acting supervisor at Milpitas terminal on September 9 2010. He was present at Milpitas Terminal from approximately 7:30 AM to 11:30 AM, at which time he went to Hollister station until leaving for the day at approximately 4:30 p.m."[112] The only way to interpret PGE's response is that [redacted] was never at Milpitas on September 9 after 11:30 a.m., because PG&E does not state that he returned. Also, the phrase "leaving for the day at approximately 4:30 p.m." misleads the reader that [redacted] work day was over at 4:30 p.m. and that he left without returning. As shown by the transcripts, [redacted] was indeed present at Milpitas Terminal after 5:00 p.m. on September 9.

Third, PG&E's response mischaracterizes CPSD's data requests by asserting that "Neither of the data requests asked PG&E to identify all of the people at the Milpitas Terminal handling the pressure problem on September 9, 2010, or all of the people who were present after 5 PM at Milpitas Terminal."[113] As can be seen by the data requests quoted above[114] and below,[115] CPSD's questions both asked for people present at Milpitas Terminal throughout September 9, 2010; not merely those who were present before 5:01 PM on that day. For these

---

[110] PG&E Exhibit 5-13; PG&E Response to DR 8, Q 8.d.
[111] PG&E Exhibit 5-14; PG&E Response to Data Request 30, Question 02.
[112] PG&E Exhibit 5-14.
[113] Response Page 5-4, lines 10-13.
[114] PG&E Exhibit 5-13; PG&E Response to Data Request 8, Question 08d. (See fn 110).
[115] PG&E Exhibit 5-14; PG&E Response to Data Request 30, Question 02.(See fn 111).

reasons, CPSD maintains that PG&E's data responses did not identify all of the people in Milpitas handling the pressure problem on September 9, 2010.[116]

15. Loss of the 2010 Agreement Controlling Access to Audio Recordings ….2010-2012

CPSD pursued the request to view the earlier Verint Agreement because of a concern about the security of PG&E's call records and the possibility that anyone in the company might have access to the recordings and might be able to modify or delete recordings. On May 31, 2012, PG&E provided to CPSD a copy of the Verint Agreement, Version 1.2, dated April 8, 2010.[117] By comparing the Version 1.5, dated July 25, 2011 to Version 1.2, it can be seen that Section 7.1.4, quoted below, was added after September 9, 2010, indicating a desire to be specific about access to recordings.

> <u>Recorder Access</u>
>
> Access to the recordings is controlled by access to the Viewer application which allows users to listen to the recordings. Access to the Viewer is maintained by Limited Access Security Groups and controlled by the LOB Department Managers. A department that wants to allow access will call the IT Service Desk and ask for an Active Directory request, that specific users be added to the group for that specific Viewer. They will also put in a request to remove this access when they desire the user's access to stop.

<u>General Records Violations for All Transmission Lines, Including Line 132</u>

16. Job Files Missing and Disorganized..1987-2010

PG&E recognizes that it has not located some historic pipeline records, including strength test reports that should have been retained. And, it recognizes that its recent records

[116] On August 17, 2012, PG&E responded to DR 77 Q1 with a complete list of the PG&E personnel who were present at the Milpitas Terminal on September 9, 2010. This list included [redacted], showing he was present after 8:30 PM on the 9th.

[117] PG&E Response to DR 39 Q 1, Supp. atch 1. We note here that the two versions provided were Version 1.2 and 1.5, leaving unknown how the agreement might have changed, or what the wording may have been in Section 7.1.4, or the dates of Versions 1.3 and 1.4. On August 17, 2011, in Response to DR 78 Q 4 PG&E produced Version 1.3, which indicates the following revision to language: "Added verbage about retaining "Player" application for playback of voice logs." PG&E states that Versions 1.3-1.4 were drafts.

management practices have come up short.[118]

In its Response, PG&E fails to specifically address the issue of missing Job Files, the subject of Section 4.2 of the March 16, 2012 Felts' testimony and of Violation 16. Felts notes that many Job Files are missing from PG&E records,[119] meaning that entire Job Files are missing. Because PG&E no longer has its Pipeline History Files, Job Files serve as PG&E's only contemporaneous source of records for individual segments of pipeline in its transmission system. Usually, intact Job Files contain detailed records of individual construction projects.[120] A Job File typically includes design records, material specification and source records, cost accounting, journal vouchers, transfer tags that identify the source of pipe, several types of construction drawings from detailed to transmission plats, post installation pressure test and x-ray reports, and other records relevant to that job. The loss of a Job File represents the loss of virtually all of the information about a particular construction project, which includes the physical characteristics and the status of that segment of pipe as of the date of the project. Some Job Files also include records of smaller construction or maintenance projects and records of pressure tests performed in years after the original construction project was completed on a segment of pipe. In short, the missing information is critical to safety, especially because PG&E has identified Job Files as its primary source of information about pipeline characteristics.

PG&E also has many Job Files that are incomplete.[121] These incomplete Job Files are labeled with the project number, but are lacking many of the records that must have been in the file at the time the construction was completed, such as design and construction drawings, x-ray and pressure test reports. Apparently, as time passed, PG&E lost some of the records from these files.

Not only has PG&E lost Job File records, CPSD recently learned that PG&E has also lost track of some Job File record numbers issued over time.[122] Since January 2011, PG&E

[118] Response Page 1-1, lines 20-22.
[119] Felts Revised Testimony of March 16, 2012, page 32, Section 4.2.
[120] Based on review of thousands of records in the ECTS database of job files.
[121] Based on review of thousands of records in the ECTS database of job files.
[122] I.11-02-016 Testimony of Paul Duller and Alison North.

employees have been reviewing older paper drawings to identify Job File numbers (GM numbers) in an effort to locate the records they need in order to complete the MAOP process.[123] In recent responses to CPSD questions, PG&E has confirmed that it did not keep a running record of Job File numbers with associated job titles.[124] CPSD also has learned that, in addition to being assigned to construction jobs, GM numbers were used for other purposes. Specifically, Job File numbers were used to name accounting files developed for various purposes, including tracking piping and other capital assets.[125]

17. Pipeline History Records Missing..........................1987-2010

Section 4.1.2 of the March 16, 2012 Felts testimony points out that PG&E purposely discontinued its policy of keeping Pipeline History Files.[126] And even though that policy required keeping the Pipeline History Files for the life of the facility,[127] PG&E no longer has the files. PG&E says the standard practice containing the "life of the facility" requirement was rescinded no later than October 1987.[128] PG&E notes that the Pipeline History Files were really copies of underlying documents that would presumably have been found in Job Files. Therefore, when it discontinued the Pipeline History File policy, if it had retained the existing history files, it "would have been holding onto secondary sources of information and copies of original documents found elsewhere, such as in job files."[129] Although PG&E cites its policy (effective April 1, 1994) of destroying duplicate records, the policy to avoid keeping duplicate records was not applied consistently. Some records appear more than 25 times in various Job Files that have been compiled in PG&E's new ECTS database.[130] So, it does not appear that avoiding duplication was a serious concern within PG&E. Because PG&E had failed to retain a good and complete set of Job Files, when it disposed of the Pipeline History Files it was

[123] PG&E orally described the process to CPSD as virtual "walking the pipelines" on drawings to find GM numbers.
[124] PG&E Response to DR 67 Q 26.
[125] PG&E Response to DR 73 Q 4. Examples are GM 134655, Advanced Purchase of Pipeline for 1956 Projects; GM 119689, Blanket Account for Pipe 1953-1967; GM 110690 Blanket Account for Cable; and GM 115991-118686, GM 119690-121258, all described as Blanket accounts for pipe, pre 1953.
[126] Felts Revised Testimony of March 16, 2012, page 29, Section 4.1.2.
[127] Standard Practice 463.7 "Pipeline History Files, Establishing and Maintaining".
[128] Response, page 2-21, line 27.
[129] Response, page 2-21, lines 29-31.
[130] Based on review of thousands of records in the ECTS database.

actually discarding the only copy of some records. In a reflective comment, PG&E notes that "[i]n retrospect, the company wishes it had retained the Pipeline History Files."[131]

In PG&E's Response, PG&E attempts to blame the Commission for allowing PG&E to end its Standard Practice 463.7 (maintaining history files for the life of the facility) when the Commission adopted General Order (GO) 112-C (1971) and GO 112-E (1995).[132] However, the dates of PG&E's document destruction policies (i.e., October, 1987 and April, 1994) have no relationship whatsoever to the dates of the Commission's GO 112-C (1971) and GO 112-E (1995). In addition, the contents of the Commission's decisions, which adopted GO 112-C and 112-E, as well as the contents of the GOs themselves, have no relationship whatsoever with PG&E's fabrication of the background of these GOs.

PG&E refers to the Commission's "Finance and Accounts Division's" reconciliation of the Commission's record retention policy with the record retention policy for the uniform system of accounts in 18 CFR Parts 125 and 225 of the Federal Power Commission (FPC), now called the Federal Energy Regulatory Commission (FERC).[133] These FPC/FERC and Commission record retention policies are irrelevant to the requirement of preserving historic pipeline safety documents. The uniform system of accounts is used for ratemaking purposes, not safety purposes. For this reason, it was the Commission's Resolution No. ***FA***-570, adopted in 1976, which provided for a new document retention policy for ratemaking documents. Although PG&E asserts that it quickly refreshed its retention standards in response to the adoption of Resolution No. FA-570,[134] this would make sense only for ratemaking documents, not for the pipeline safety documents, which must be preserved for the life of the pipeline. Moreover, PG&E's dates of PG&E's document destruction policies (i.e., October 1987 and April, 1994) were 11 and 18 years after the Commission's Resolution No. FA-570 was adopted in 1976. This further strains PG&E's credibility that the Commission's Resolution No. FA-570 had anything to do with PG&E's unreasonable position in its Response.

---

[131] Response, page 2-23, lines 3-4.
[132] Response, page 2-20, fn. 19 and line 5 through page 2-21, line 28.
[133] Response, pages 2-7, line 26, through 2-10, line 17.
[134] Response, page 2-11, lines 7-9.

PG&E's argument is totally irrelevant to pipeline *safety* record preservation requirements. In terms of pipeline safety record preservation requirements, not only does PG&E refer to a Resolution written by the wrong Division within the Commission, the Commission's "Finance and Accounts Division," rather than the "Utilities Safety Branch of the Commission's Safety and Enforcement Division," PG&E's reference to the FPC/FERC is to the wrong federal agency. Congress enacted the Natural Gas Pipeline Safety Act of 1968 (NGPSA), 49 U.S.C § 60102(a)(1), "to provide adequate protection against risks to life and property posed by pipeline transportation and pipeline facilities by improving the regulatory and enforcement authority of the *Secretary of Transportation.*" (Emphasis added). "The Secretary shall prescribe minimum safety standards for pipeline transportation and for pipeline facilities." 49 U.S.C § 60102(a)(2). The legislative history of the NGPSA quoted then President Johnson as supporting the Act so that one federal agency, the Department of Transportation (DOT), will be given the authority to prescribe minimum safety standards for natural gas pipelines.[135]

In addition, Congress further provided that the Secretary of Transportation could certificate States in order to enforce the minimum pipeline safety standards as to intrastate pipeline facilities if the State authority: 1) has adopted the DOT's standards; 2) has regulatory jurisdiction over the intrastate pipelines; and 3) can enforce the standards by injunctive relief and civil penalties.[136] When the CPUC issued its Decision No. 78513 (1971), the Commission explained that on August 11, 1970, the U.S. DOT had adopted its minimum federal gas safety standards in 49 CFR Part 192 (effective November 12, 1970) and the Commission had issued its Resolution No. ***G***-1499 to supplement its GO 112-B by adopting the U.S. DOT's minimum gas safety standards to be effective on November 12, 1970. The Commission further found that its issuance of GO 112-C was to eliminate ambiguity and a conflict between federal and state pipeline safety systems by revising its GO 112-B. Therefore, the Commission issued GO 112-C to supersede GO 112-B with the adoption of the minimum federal pipeline safety standards, 49 CFR Part 192, and to identify and state the Commission's more stringent safety

[135] House Report No. 1390, quoted in U.S. Code, Cong. and Admin. News (90th Congress, Second Session) (1968), p. 3228.
[136] NGPSA, 49 U.S.C. § 60105(a) & (b).

standards.[137]

The Commission's adoption of the federal standards in GO 112-C did not provide PG&E with an excuse for not maintaining its historic pipeline safety records, which are necessary to ensure the safety of the general public. GO 112-C § 103.2 explicitly states that compliance with these rules is not intended to relieve a utility of statutory requirements (e.g., PG&E's duty under section 451 of the California Public Utilities Code to provide safe and reliable services).[138] The Commission' GO 112-C § 121.1, further provided that the utility bears the responsibility for maintaining necessary records to establish compliance with the rules and such records shall be available for inspection at all times by the Commission or Commission staff.

PG&E also fails to acknowledge that one of the minimum federal pipeline standards, the Commission had adopted, 49 CFR Part 192.517 (1970) Records, required PG&E:

> "to retain for the useful life of the pipeline, a record of each test performed under §§ 192.505 [for steel pipelines to operate at a hoop stress of 30% or more of SMYS] and 192.507 [for pipelines to operate at a hoop stress less than 30% of SMYS and above 100 psig]. The record must contain at least the following information:
>
> (a) The operator's name, the name of the operator's employee responsible for making the test, and the name of any test company used.
> (b) Test medium used.
> (c) Test pressure.
> (d) Test duration.
> (e) Pressure recording charts, or other record of pressure readings.
> (f) Elevation variations, whenever significant for the particular test.
> (g) Leaks and failures noted and their disposition."[139]

[137] Accompanying my testimony is the Commission's Decision No. 78513 and its Appendix A, GO 112-C with relevant excerpts of 49 CFR Part 192 (1970).

[138] In Decision No. 78513, the Commission also found: "It is recognized that no code of safety rules, no matter how carefully and well prepared, can be relied upon to guarantee complete freedom from accidents. Moreover, the adoption of precautionary safety rules does not remove or minimize the primary obligation and responsibility of gas corporations to provide safe service and facilities in their gas operations. Officers and employees of the gas corporations must continue to be ever conscious of the importance of safe operating practices and facilities and their obligation to the public in that respect."

[139] See GO 112-C, 49 CFR Part 192.517 (1970).

In 1995, the Commission explained in its Decision No. 95-08-053, as modified by its Decision No. 95-12-065, that the Commission needed to stay current with revisions to the DOT's Federal Pipeline Safety Standards on an ongoing basis and avoid any lag in its adoption of changes to those standards. Therefore, the Commission issued its General Order No. 112-E, which included a new section 104.1 that automatically adopts any revisions to the Federal Pipeline Safety Standards. However, contrary to PG&E's implication, the Commission's GO 112-E did not relieve PG&E of maintaining its records. GO 112-E contains a requirement in § 101.4 that the utilities shall maintain necessary records to ensure compliance with the rules and the records shall be available for inspection at all times by the Commission or Commission staff. It also provides in § 103.3 that compliance with these rules is not intended to relieve a utility of statutory requirements. Moreover, it contains the same requirements provided in 49 CFR Part 192.517 (2012).[140]

In view of the above, PG&E's attempt to blame the Commission for PG&E's destruction of its historic pipeline safety records by referring to the Commission's and the FPC/FERC's record retention policies concerning ratemaking documents is baseless and very misleading. A review of 18 CFR Part 225 (2012) reveals that it is in Subchapter F- Accounts, Natural Gas Act, and is immediately after Part 201-Uniform System of Accounts. Therefore, although it discusses the preservation of records of natural gas companies, it is only concerned with retention policies for ratemaking documents. This is confirmed by § 225.3 "Schedule of records and periods of retention," which is followed by a Table of Contents and a Retention Period Schedule listing all of the documents used for ratemaking purposes (e.g., general accounting records, plant and depreciation records, tax records, etc.)

The FERC's regulation explicitly makes clear that its document retention policies do not affect document retention policies required by other Federal or State agencies for other purposes. Thus, 18 CFR Part 225 (2012), § 225.2(2) states: " The regulations in this part should not be construed as excusing compliance with other lawful requirements of any other governmental body, Federal or State, prescribing other record keeping requirements, or for

[140] Accompanying my testimony is the Commission's Decision No. 95-08-053, as modified by Decision No.95-12-065, and its Appendix A, GO 112-E.

preservation of records for periods longer than those prescribed in this part."[141]

Because PG&E's historic pipeline safety records are required to be retained to comply with the minimum federal pipeline safety requirements of the DOT and the Commission, the FPC/FERC's retention periods do not excuse PG&E's compliance with these other lawful requirements. In PG&E's Response, p. 2-11, PG&E claims its "clear understanding that GO 112-C records were generally life-of-the-facility records." But then PG&E fails to explain how the Commission's Resolution FA-570 (which involved the FPC/FERC document retention policy concerning ratemaking documents) could have modified the Commission's GO 112-C.[142] Under the certification provisions of the NGPSA, 49 U.S.C. § 60105, the Commission can and has imposed additional, more stringent safety requirements beyond the minimum federal pipeline safety standards. But the Commission would have risked losing certification if it had allowed PG&E to destroy records prior to the time set forth in the minimum federal regulations. 49 U.S.C. § 60105(f).

18. Design and Pressure Test Records Missing…................ 1930-2011

PG&E does not dispute the Felts testimony about missing design and pressure test records. PG&E states that it has made numerous filings in OIR 11-02-019 related to its efforts to locate strength test records and that it has taken steps to validate the MAOP of pipelines as required by the PUC in that proceeding.[144] PG&E acknowledges these records are missing and that it is currently engaged in an extensive effort to develop the missing data through strength testing.[145]

[141] See also Order No. 450 (1972), 47 FPC 871, 875, which is referred to in PG&E's Response, p.2-10, lines 8-9 and its exhibits 2-18, 2-19, 2-20, and 2-21.

[142] The Commission subsequently amended its GO 112-C twice. The first time was in 1979, when the Commission issued its Decision No. 90372, to adopt GO 112-D to establish Liquefied Natural Gas (LNG) safety standards for a proposed LNG project at Point Conception. The second time was in 1995, when, as discussed above, the Commission issued its Decision No. 95-08-053 to adopt its GO 112-E in order to automatically adopt all new DOT safety requirements.

[143] Placeholder – no attachment.

[144] Response, page 3-35, lines 14-18.

[145] Response, page 3-35, lines 19-23.

PG&E also notes that it cannot possibly be "missing" a post-installation pressure test from the 1930s or 1940s."[146] It explains this statement by saying "the means to conduct post-installation hydrostatic pressure tests was not widely available in the pipeline industry until the early 1950s." However, PG&E's records, including the current data in its Integrity Management model, show that it was conducting various pressure tests in the 1930's and 1940s.[147] These tests included pressuring the pipe with gas and soaping welds to identify leaks. The following paragraphs appear in a 1948 construction contract:

> "(1) Before pipe joints are wrapped and coated, air shall be introduced into the pipe line until a gauge pressure of 100 lb/sq.in is recorded. While air pressure is maintained all welded field joints shall be tested with soap suds as directed. This test shall be made on the string of pipe line completed each day.
>
> "(2) After the pipe lines are completed and in place in the trench, air pressure at 100 psig shall be maintained in the entire pipeline without any loss for a continuous period of 48 hours. A suitable recording device shall be used which will record on a chart the fluctuation and intensity of the air pressure during the test period."[148]

Although the contract quoted above for GM 98015, which installed Line 132 from Crystal Springs to Martin Station in 1948, called for pressure testing, there are no Strength Test Pressure Records (STPR) in the job file. Thus, PG&E cannot confirm from records that the pressure testing was conducted.

Available records reveal that pressure testing was common at PG&E long before the 1950's, regardless of what PG&E contends was "widely available" in the industry. By 1956, PG&E had developed a standard form (#75-27) to record pressure tests - both gas and hydrotests.[149] Records using this form indicate a standard pressure test using gas exceeded the design operating pressure by about 10% and the standard pressure test using water exceeded

[146] Response, page 3-36, footnote 28.

[147] 1. Refer to PGE's response to DR 67-Q30 Atch01-CONF, its 2011 Integrity Management Model. In Column AI, data input titled "Testdate", which represents "the date on which the last pressure test was performed," PG&E shows many entries from 1930 through 1950 for pressure tests on various transmission lines in PG&E's current pipeline system. 2. Refer to P3-30031, 1968 Report to the CPUC listing leak tests back to 1944 on Line 132.

[148] P3-30006, Contract to construct part of L-132, page 26, Section17, 1948.

[149] S.P.75-27 Forms (See fn 36).

the design operation pressure by about 15%.[150]

19. Weld Maps and Weld Inspection Records Missing or Incomplete……….. 1930-2011

In his testimony, PG&E's witness, John Zurcher, confirms the necessity of retaining weld records:

> "For Integrity Management purposes, operators utilize information or conservative assumptions regarding the vintage and method of welding employed on their pipelines, given that particular construction methods such as acetylene girth welding have proven susceptible to ground movement regardless of the size or quantity of imperfections in the girth weld. *Operators often derive such knowledge or conservative assumptions regarding the welding method employed from records relating to construction of the pipeline in question.*[151] (emphasis added)

Weld records are an integral part of the construction record for any pipeline installation project and should be kept in the Job File. Because weld inspection data is reported based on weld number, the only way to locate the weld at a later time is to have a weld map that shows the location of each weld identified by weld number. While PG&E may be able to derive some information regarding the weld methods from other sources in a Job File, a review of PG&E's Job Files reveals that this type of information is often missing.[152] Weld inspection records would serve as an alternative source of information in situations where other source records were not made or not retained. Weld information on a joint-by-joint basis would be a good source of information to identify potential weak links in pipeline segments, thus would provide a basis for conservative assumptions about welds in the integrity management model.[153]
PG&E says it reviewed tens of thousands of weld inspection reports.[154] PG&E produced 6,935 individual pages identified as weld inspection reports, which are listed in an index that provides

[150] S.P.75-27 Forms (See fn 36).
[151] Response page 3-12, lines 11-18.
[152] Based on Felts review of PG&E Job Files in ECTS.
[153] Examples of relevant uses of the information include Integrity Management Model inputs such as joint efficiency, girth welding process, longitudinal seam design, and joint type (girth weld geometry). X-ray reports may also provide information about individual weld quality that may have been acceptable when the inspection was completed but may now be considered a potential problem, such as voids or cracks in a weld.
[154] Response Page 3-56, lines 10-15.

dates and GM numbers.[155] PG&E fails to say that multiple pages are associated with individual GM numbers, which diminishes the total number of reports it produced. There are 10,051 Job Files associated with the transmission pipe currently installed in PG&E's system.[156] For each of those Job Files there should be a weld inspection report that summarizes the results of an inspection when the pipe was installed. As a conservative estimate, PG&E has produced records for less than 50% of the Job Files. Some of the existing files are incomplete.[157] Some weld records are missing entirely.

20. Operating Pressure Records Missing, Incomplete or Inaccessible............ 1930-2010

PG&E acknowledges that it only has pressure data "from 1998 through the present day" and also that 1999 data is lost.[158] The March 16 Felts testimony illustrates that specific missing records are needed for PG&E to operate a meaningful and useful Integrity Management program. The Felts testimony does not say, and should not be interpreted to mean that PG&E's only recordkeeping requirements for those records would be spelled out within the rules for Integrity Management (IM). Recordkeeping requirements throughout PG&E's history apply to PG&E's records, whether or not the records are used now in the new Integrity Management program.

PG&E fails to refute Felts' points that PG&E lost or discarded historic pressure records and that PG&E's Integrity Management procedure requires these historic records to determine the risk related to internal corrosion.[159] While PG&E's IM model does not require a direct input for historical operating pressure, the Pipeline Engineer must consider operating pressure history (maximums and minimums) in flow model calculations associated with the identification of Dry Gas Internal Corrosion Direct Assessment (DC-ICDA) regions. According to PG&E's Procedure No. RMP-10, significant changes in pressure may trigger new DC-ICDA regions.[160] The absence of data makes it impossible for the Pipeline Engineer to

[155] P7-0047 Index of documents produced with PG&E's June 20, 2011 Report.
[156] Testimony and Rebuttal Testimony of Paul Duller and Alison North.
[157] Based on review of Job Files in ECTS.
[158] Response Page 3-59, lines 1-6.
[159] Felts Testimony, page 37-38 and footnote 156, citing P2-390, p. 26.
[160] P2-390, Procedure for Dry Gas Internal Corrosion Direct Assessment, page 26 (See fn 59).

perform this assessment using accurate data instead of general assumptions. The input to the integrity management model is a "yes" or "no" to the question of whether or not there is an internal corrosion threat on a pipeline segment based on the Pipeline Engineer's direct assessment.

21. Pre-1970 Leak Records missing, incomplete and inaccessible…..........1930-2010

PG&E states that its earliest-located leak report form (also called "A-Form") is dated 1979.[161] In direct contradiction to this statement, PG&E records include a standard practice calling for leak reports on a specified form as early as 1958. In other words, there were A-Forms as early as 1958. CPSD cannot explain why PG&E has testified that it did not have the earlier forms. And, despite the identification of earlier A-Forms, records are still missing. Based on other Job File information, such as statements used to justify projects, leaks on pipeline segments were recorded and PG&E was keeping track of the leaks at one time because there are references to tallies of the number of leaks on a pipeline.[162] But, generally, the Job Files do not contain A-Forms or other leak report forms.

22. Post 1970 Leak Records incomplete and inaccessible.......................... 1970-2010

PG&E says it shares Felts' concerns regarding the completeness and accuracy of data in some A-Forms.[163] Incomplete forms are equivalent to missing records. If an employee reports a leak, but fails to complete the sketch or include information sufficient for someone else to locate the leak, the leak could not be included with any accuracy on maps or in GIS. The following statement taken from PG&E's Response seems to capture PG&E's problems with its leak data:

> "The leak data that appears to have been gathered for the 2006 ECDA is provided in attachment P3-24137. The attachment contains a mixture of GIS leak data outputs and hardcopy A-Forms. Most of the 13 leaks identified in the 2006 pre-assessment attachment appear to have been leaks derived from the GIS leak data

[161] Response page 3-61, lines 2-3, and P2-1152.
[162] P3-27435.
[163] Response page 3-63, lines 22-23.

from pipeline survey sheets, rather than A-Forms or IGIS."[164]

Leak data appearing on a pipeline survey sheet and later transferred to GIS, would have originally come from data collected in the process of performing leak surveys or in response to the report or discovery of a leak.[165] In any event, there would have been a record of the leak independent of the annotation on a survey sheet, which was simply the placement of an icon on a row in the table shown above a sketch on the pipeline survey sheet.[166] The bottom line is that, even just a few years after PG&E developed a record of leaks as part of its Integrity Management program, it cannot say the data is accurate or, with any certainty, where the leak data came from within PG&E.

PG&E acknowledges leak data is relevant to Integrity Management processes generally.[167] However, PG&E changed the significance of leak data in the Integrity Management process from 1984 to present day. As stated in the March 16, 2012 Felts testimony, PG&E began with a risk assessment model in 1984 in which leak history made up 15% of the weighted data.[168] In 2009, leak history made up 0.5% of the weighted data. The shift appears to reflect PG&E's inability to locate valid leak data to use in its risk assessments.[169]

23. Records to track salvaged and reused pipe missing............................1954-2010

In its Response, PG&E discusses at length its claim that it did not track salvaged and reused pipe. PG&E states that it did not in the past "capture data identifying reconditioned pipe."[170] PG&E also says:

> PG&E has not, as best it is aware, lost records about reused pipe. Where older records of this kind are lacking, it more likely is because they were not created.[171]

---

[164] Response Page 3-63, line 34 through 3-64, lines 1-4.
[165] See I.11-02-016, Testimony of Paul Duller and Alison North for more specific discussion of how leak data was handled.
[166] Example: PG&E Response to DR 7 Q 12 atch 51, See icons on line labeled "Leaks".
[167] Response, page 3-64 line 32.
[168] Felts' Revised Testimony of March 16, 2012, page 19, lines16-24.
[169] Felts' Revised Testimony of March 16, 2012, page 26, lines10-18.
[170] Response, page 3-28, lines 19 -20.
[171] Response, page 3-33, lines 26 – 28.

As discussed above in Section 1, it appears that PG&E was creating accounting records that could be used to determine where salvaged pipe was reused within its pipeline system. Given that PG&E was creating detailed records, it should still have them. In a June 5, 1944 letter, PG&E acknowledged to the Railroad Commission, the predecessor to the CPUC, its responsibility for keeping these records permanently when it asked to film them for safekeeping:

> Pursuant to the provisions of your General Order No. 28 that became effective on October 10, 1912, the Pacific Gas and Electric Company has retained permanently the original copy of each material and supply disbursement requisition covering the withdrawal of material and supplies and each credit requisition issued to cover the return of overdrawn or salvage material to Materials and Supplies Account, together with the monthly tabulated statements showing the quantity and cost of each item of material that was withdrawn from or returned to stock on each requisition, summarized by material and supplies classification number. The volume of these records has reached a point where the matter of housing and safeguarding them presents a serious problem and under the circumstances the Pacific Gas and Electric Company hereby requests your authorization to photograph these three forms of records that are rarely referred to after they are five years old, appropriately index the records filmed and preserve the film in lieu of the original documents which would be destroyed.[172]

To date, PG&E has not produced the index or the filmed records referenced in the above letter. And it has not produced the originals. In short, these records are missing. In light of the statement to the Railroad Commission in 1944, quoted above, it now appears that PG&E had voluminous accounting records that included annotations showing pipe that was salvaged. PG&E also acknowledges in the letter that it is required, as of 1912, to permanently retain the records. These records could have been used to trace the location of the installation of salvaged pipe that was reused within PG&E's pipeline system.

[172] PG&E Response to DR 33 Q 3 Atch 11, page 3, June 5, 1944. Note that the 1938 Code section PG&E cited in this letter excludes filming of cash and journal vouchers. As it turns out, Journal Vouchers are an important type of record in tracing salvaged pipe because they show both the project GM number from which pipe was salvaged and the project GM number that received the salvaged pipe. To date, PG&E has not produced an independent set of Journal Vouchers, so we may assume those were also lost.

Further, improved access to ECTS allowed this investigator to locate the Job File GM 119689, an accounting inventory file used from 1952 through 1967.[173] The stated purpose of account, GM 119689, was to transfer from Materials and Supplies (M&S) Division to Construction Work In Progress, pipe that had been assigned to specific installations.[174] This accounting file appears to have been accessible to the General Construction Department, as well as to PG&E "Stores" managers who managed PG&E supplies at various equipment yards.[175] Monthly reports were to be generated.[176] An example report dated November 1954 shows pipe in each storage location within PG&E and identifies pipe as junk, salvaged, bare, and double wrapped (DW).[177] The recordkeeping procedure was specified in a document called Schedule 1, Procedures for Pipe Holding, which called for keeping finder cards "that will be set up for <u>all</u> installation GM's on the statement so that all requisitions and MPO's covering pipe withdrawals to those GM's will be cleared through the Holding GM (instead of allocating pipe to specific GMs by Plant Accounting.)[178] The finder cards are not in the current GM 119689 ECTS file, so these are apparently additional missing records that could have been used to track salvaged pipe.

[173] This particular box of files is listed in ECTS as having been scanned from a field office file, which may explain why it was not destroyed. There are few duplicate records in the ECTS copy of this file, which is in indication that there was only one source for this set of records and the source was not PG&E accounting department which should have preserved the records. This set of records was located in ECTS after CPSD's access was improved.

[174] MAOP26528682, This "Face Sheet," dated March 1953, that revision of this G.M has been made due to new procedure of handling all pipe under one Blanket Account as outlined in letter of January 16, 1953. CPSD has identified a number of blanket account GM numbers that apparently predated GM 119689, but those records were not found in the ECTS data base. For instance, additional GM numbers are annotated on this Face Sheet: GM's 115991 – 118686 and 119689-121258. Also, see MAOP26528780 and MAOP26528758, (In December 1966 there was a decision to "arrange to have Standard Practice 113-1 – Accounting for Material Charged to 'Holding G.M.s' rewritten." MAOP26531558).

[175] MAOP26528753.

[176] MAOP26528761 - MAOP26528764. These reports would specify the GM number, disbursement reference, the date, the installation GM (job file number), code number, quantity, location number, account number, balance (in feet and outside diameter size) for each open project file at the beginning and close of the month.

[177] MAOP26528755- MAOP26528756.

[178] MAOP26528757-MAOP26528758 .

24. Bad data in Pipeline Survey Sheets and the Geographic Information System…..................1974-2010

PG&E states in its Response that it is aware that data errors exist within the current GIS system, either from original pipeline data or introduced during the transfer.[179] PG&E also states that the GIS is not its system of record for pipeline records.[180] However, GIS is the only ready and easily accessible source of data for gas control room operators. It would not be reasonable to assume gas control operators would take the time to research Job Files to verify the accuracy of GIS data, especially given that the Job Files are stored in Emeryville (previously in Walnut Creek) and the operators work in the San Francisco Control Room. Thus, it is critically important that the data in GIS is accurate because it is not safe for gas control operators or maintenance personnel to be relying on erroneous pipeline data.[181]

Also, the data for the Integrity Management model is drawn from GIS. To the extent that the data in GIS is erroneous, the data in the Integrity Management model is also erroneous. The model is designed to determine the segments of pipe in PG&E's system that present the highest risk (of failure and damage) and are subject to the highest threats to integrity. These determinations are made by comparing (or ranking) calculated values for each segment. The Integrity Management model is (just like every other model) based on formulas and data. Bad data in yields bad data out.[182] Thus, relying on GIS data for the Integrity Management model is not a safe practice.

25. Use of an Integrity Management Risk Model that uses inaccurate data 2004-2010

In the 1980's PG&E hired Bechtel to develop a model that was essentially an Integrity Management model. The purpose of developing the model was to create a systematic, mathematical approach to identifying segments of pipe that needed to be replaced, rather than

[179] Response, Page 3-66, lines 26-28.
[180] Response Page 3-66, lines 14-15.
[181] Maintenance personnel are in communication with Gas Control Operators when they are maintaining system equipment. In addition to other sources of information they may have with them in the field, they rely on the GIS data accessed by the Gas Control Operators on the Control Room computer terminals.
[182] Refer to Section 25 of this Testimony for additional discussion about IM model data.

replacing whole pipelines on a calendar basis. The idea was to create a more efficient use of capital while replacing pipe that presented the highest safety risk. Although the concept is good, PG&E's model is unreliable because PG&E lacks a complete set of good data to put into the model. Over time, PG&E has modified the model in a way that emphasizes PG&Es risk related to third party damage to the extent that segments with a higher risk of third party damage rise to the top of the rankings. The model has rendered manufacturing threats, for instance bad welds, to such a low risk factor that a pipe segment with bad welds would never rise into the top 100 segments for replacement.

There are 19,963 segments identified in PG&E's 2009 IM model.[183] Given that PG&E only repairs a maximum of about 20 segments in a normal year, it would be 50 years before a pipe segment with a ranking of 1000 would be repaired, assuming rankings for all segments remained the same for 50 years. In the 2009 model, Segment 180 on Line 132 was ranked 2989. When the data is corrected to reflect NTSB findings about the pipe welds, Segment 180 rises to risk ranking number 528 (assuming all other data in the model is held constant). Thus, even if all of the data for Segment 180 in its model had been accurate prior to the San Bruno explosion, PG&E would not have inspected or replaced line 132 segment 180 as a result of Integrity Management prioritization.[184]

The priorities that result from running the Integrity Management model with inaccurate data are erroneous. Thus, PG&E may or may not be replacing pipe that presents the highest risk. This approach to pipeline management is inherently unsafe.

26. 1988 weld failure – no Failure Report..1988-2010

In its Response PG&E says that it produced a 1988 Weld Failure report, which it claims is a "report by letter," which is a report in the form of a letter."[185]The one other example that

[183] The model is P3-20060_1_thru_3(N)_CONFIDENTIAL.xls. In the 2011 IM Model recently provided to CPSD, there are 23142 segments. (This Exhibit was in the Exhibit set provided with the March 16, 2012 Testimony of Margaret Felts).
[184] While the IM model itself is not the subject of this hearing, the Commission might want to evaluate the safety of continuing to allow PG&E to use the IM model to prioritize pipe replacement projects.
[185] Response, Page 3-48, lines 26-28.

PG&E provides of a report by letter[186] is a report of an investigation of a possible leak in a pipe within an active pipeline. This report provided as an example cannot be considered relevant because Technical and Ecological Services (TES) did not have a piece of pipe to evaluate in that case, as it did in the case of the 1988 leak incident. After reviewing the reports produced by PG&E from its internal organizations named the Pipeline System Engineering of Gas System Design Department, Applied Technology Services (ATS) and TES,[187] it is clear that when a pipe section is removed from an operating pipeline and sent to one of these organizations for weld analysis, a report that includes all of the tests, images, and test results is ultimately produced and sent under a cover letter to the requesting organization. The March 5, 1989 letter PG&E copied in its Response is similar to other cover letters in PG&E's records used to transmit reports. [188] The March 5, 1989 letter shows that it had an attachment. From this evidence, CPSD concludes that there was a report which PG&E has lost or discarded.[189]

The following statement from PG&E about the 1988 leak, identified in its records as a "longitudinal weld defect" is troubling:

> In short, pinhole leaks, such as the one identified in 1988, do not constitute a pipeline failure under integrity management rules, and are not evidence of a manufacturing threat. Had we located leak records relating to this leak, it would not have put our Integrity Management engineers on notice of the need to inspect the longitudinal seam of pipe used or similar to that installed on Line 32 in 1948.[190]

Even though PG&E lost the full report, it still has the summary report from the cover letter that identifies defects in the pipe segment removed, including cracks that do not yet extend through the pipe wall:

> A section of the 30" Bunker Hill transmission line (132) was removed for failure analysis because of a pinhole leak in the longitudinal seam weld (see attached material failure report.) X-ray, dye, penetrant, and magnetic particle inspections were performed on the submitted section, but these do not locate the leak. The X-

---

[186] P7-7076.

[187] The offices were always located at San Ramon. The name of the organization has changed over time.

[188] For example, see P7-7075 (cover letter) and P7-7074 (Report), both dated 1986.

[189] In response to DR 19 Q 3, PG&E provided copies of all of the San Ramon records indexes. CPSD reviewed the indexes which span the entire life of PG&E, but found no index for reports produced in 1988.

[190] Response Page 3-65, lines 20-25.

> ray and subsequent metallographic examination identified several weld shrinkage cracks but they did not extend through wall. The cracks are pre-service defects, i.e., they are from the original manufacturing of the pipe.[191]

PG&E considered the pinhole leak serious enough to remove 12 feet of pipe and replace it on an emergency project.[192] A decision not to consider the possibility of shrinkage cracks like the one detected in the pipe in other sections of the same vintage (or purchase order) of pipe seems risky. According to industry sources, since the advent of the higher tensile pipe steels, such as 5L X52, it has been necessary to exercise better procedural control to eliminate the possibility of weld and heat-affected zone cracks.[193] Cracks tend to occur at the areas on either side of the stringer bead. This could propagate through the weld.[194] J. F Kiefner, Bechtelle Senior Research Engineer notes that defects in pressurized pipelines can cause sudden catastrophic ruptures and discusses manufacturing defects, including non-leaking cracks and proposes methods of repair.[195] So, a very cursory look at a typical, currently available, industry reference suggests it would be prudent to consider the potential risk of keeping pipe in the system without inspecting it for possible non-leaking cracks that could eventually propagate through the weld resulting in a leak or, in the worst case, a catastrophic rupture.

27. 1963 weld failure – no Failure Report... 1963-2010

> PG&E admits that it has not located a copy of the 1963 Weld Report.[196]

[191] Response, page 3-43 lines 3-13.
[192] MAOP09002459.
[193] Pipeline Rules of Thumb Handbook, 7th Edition, 2009, page 71.
[194] Pipeline Rules of Thumb Handbook, 7th Edition, 2009, page 71.
[195] "Welding Criteria Permit Safe and Effective Pipeline Repair", Pipeline Rules of Thumb Handbook, 7th Edition, 2009, page 74.
[196] PG&E Response, page 3-40, lines 25-26.