BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE CALIFORNIA

Order Instituting Investigation on the Commission's Own Motion into the Operations and Practices of Pacific Gas and Electric Company with Respect to Facilities Records for its Natural Gas Transmission System Pipelines	I.11-02-016 (Filed February 24, 2011)

OPENING BRIEF
OF THE CONSUMER PROTECTION AND SAFETY DIVISION

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Pursuant to Rule 13.11 of the California Public Utilities Commission (Commission) Rules of Practice and Procedure and the Administrative Law Judges' Ruling Adopting Revised Schedule and Common Briefing Outlines (dated February 4, 2013) the Consumer Protection and Safety Division (CPSD) hereby submits its opening brief in this proceeding.[1]

I. INTRODUCTION AND SUMMARY

On September 9, 2010, a PG&E 30-inch transmission pipe Line 132 failed along a longitudinal weld. Gas pressure uncovered the buried pipe and hurled it from the ground and into a residential neighborhood in San Bruno. Escaped gas soon ignited, and quickly started massive gas-fed fires. The explosion and fire killed eight persons, injured over fifty others, and destroyed 38 homes and a neighborhood. The rupture has severely shaken the California public's trust in PG&E and in their own home safety.

It became apparent soon after the explosion that poor recordkeeping was implicated in the pipeline rupture. The National Transportation Safety Board (NTSB) noted a few days after the event that PG&E's records erroneously showed that the transmission pipeline segment that failed along its longitudinal weld, was seamless (no longitudinal weld) pipe. On January 3, 2012 the NTSB made an "urgent" recommendation that PG&E search its files to find "traceable, verifiable, and complete" records to validate the maximum safe pressure for its gas transmission lines in populated areas. Three months after San Bruno explosion the NTSB already knew that PG&E had a significant safety records problem.

The Executive Director, in a letter to PG&E dated January 3, 2011 (the same date as the NTSB's Urgent Safety Recommendations) referred to the NTSB's Safety Recommendations, and ordered PG&E to complete compliance with the recommendations by February 1, 2011. The Commission ratified the directive contained in Executive Director's letter on January 13, 2011, in Resolution L-410 (which also extended the compliance report filing date to March 15, 2011. On February 24, 2011, the Commission launched the present order instigating investigation into whether PG&E violated applicable rules or requirements pertaining to safe recordkeeping for its

[1] On January 1, 2013, CPSD officially changed its name to the Safety and Enforcement Division (SED). However, in light of all the references to CPSD in the previous rulings by the Commission and the Administrative Law Judges (ALJ's), pleadings, exhibits, testimony and cross-examination of witnesses and corresponding transcript references, to avoid confusion we will continue to refer to SED as "CPSD" in this briefing and throughout the remainder of this proceeding.

gas service and facilities across its system, including Segment 180 (PG&E Recordkeeping OII). Also on February 24, 2011, the Commission initiated a statewide rulemaking proceeding to consider a "new model of natural gas pipeline safety regulation applicable to all California pipelines."

The San Bruno pipeline rupture and tragedy was entirely avoidable. PG&E's unsafe and deficient management and recordkeeping of its gas system over a long period of time was one of the primary causes of the incident. Such deficiencies also made a serious failure likely to occur sometime and somewhere on PG&E's system.

PG&E's failures are multiple and pertain to a number of different areas of recordkeeping. Decades of deficient recordkeeping manifested itself in the rupture of a scrap pipe that PG&E had placed in service in 1956, after which PG&E lost track of the pipe until its existence was revealed by the terrible events of that day.

Besides Line 132, PG&E records deficiencies have diminished the safety of many other PG&E transmission pipelines currently in service. The recordkeeping deficiencies that contributed to the San Bruno event are far from isolated. In fact, the recordkeeping deficiencies associated with San Bruno are characteristic of PG&E's recordkeeping for its entire transmission system over many years.

This investigation commenced after the San Bruno rupture. The scope of the investigation pertains to PG&E's records and data pertaining to its transmission pipelines, including Line 132 and all other PG&E's transmission lines. The review is primarily retrospective, but where recordkeeping deficiencies remain today, this report will take note of that.

Any gas utility must embrace gas safety as an essential goal of the highest priority. It has been known for more than 100 years that the transportation of flammable and explosive natural gas is dangerous to employees and to the public unless conducted very carefully. Although the statistical chances of a major gas failure on a particular line may be low, the chances of such an event occurring somewhere on the system increase when the utility fails to properly manage its gas system. The consequences of such failures can be catastrophic, as occurred at San Bruno.

Good engineering is essential to achieve gas pipe safety. Engineers must properly oversee the design, construction, testing, maintenance, repair, and replacement of gas pipes in order to maintain and promote safety. These safety activities all require accurate records and

data to be readily available to the utility engineers conducting or planning these essential safety activities. In turn, the availability of such data requires the development and implementation of a robust record and data keeping system.

PG&E's record and data keeping system for its gas transmission system has been in disarray for years, and remains that way today. PG&E's records required to achieve gas safety on key matters are incomplete, inaccurate, missing and virtually unusable when they exist at all. PG&E's records are clearly not traceable, verifiable, and complete, as they must be by law.

Deficient PG&E recordkeeping over a period of many years constitutes multiple violations of federal and state law. Each of the identified violations represents a violation that contributed to a reduction in safety. The identified deficiencies and violations either contributed to causing the rupture, to PG&E's post-rupture emergency San Bruno response, or to a diminishment of safety on the rest of Line 132 and other transmission lines that continues through today.

PG&E has for decades kept records and data that are clearly deficient to create and support transmission pipeline safety. The evidence in the recordkeeping proceeding establishes these major examples of safety deficiencies, among others, in recordkeeping:

- In 1948 PG&E accepted substandard welds on Transmission Line 132 pipe. PG&E has not kept records of that pipe to permit it to ascertain whether the pipe with these welds remains in service in Line 132, has been removed from the ground and placed in service elsewhere within PG&E's service territory, or has been retired from service. Those welds may still constitute a danger to the public and PG&E employees, and PG&E's recordkeeping cannot ensure pipeline safety for those welds.

- PG&E's records cannot identify the location or characteristics of all reused pipe within its gas system. PG&E has identified a very small amount of reused pipe as part of this investigation, and does not know all of the characteristics of all of those pieces either. Reused pipe has a different age and characteristics than other pipe with which it may be joined. Reused pipe is located in unknown but apparently scattered places in PG&E's system, and represents a potential weak link that may fail at unidentified locations. It remains unknown from PG&E's records whether the segment that failed at San Bruno was reused or new pipe.

- PG&E has failed to retain hydrostatic test pressure records required to be retained by law for the life of its pipelines. PG&E is missing more than 20000 test records of hydrotesting that were either created or should have been created since 1956.

- PG&E failed to maintain pipeline records that accurately reflect dates and pipeline characteristics essential to identify gas transmission pipes built before 1950, and that are especially susceptible to extensive earthquake damage. This includes Line 132, as a PG&E consultant pointed out to PG&E in 2007.

- PG&E's records cannot ascertain the manufacturer of a large amount of its transmission pipe in service. Particular pipe manufacturers have produced pipes that exhibit particular identified safety problems. Since PG&E's records cannot establish the location of all pipe made by a certain manufacturer and buried in the ground, PG&E cannot appropriately plan for safety based on manufacturer.

- PG&E's leak records and data are incomplete, impractical to use, and many of them are inaccurate. Leak data has long been fundamental data for PG&E to use to understand when its pipes are deteriorating and are nearing the end of their safe useful life of service. As reported leaks increase, remaining life of the pipe decreases. Despite this knowledge, PG&E has kept and maintained leak records insufficient to ascertain the full leak life history of its pipes.

- PG&E failed to write, maintain, and analyze metallurgical reports pertaining to failed pipe. In 1988, a weld in Line 132 failed (leaked) along its longitudinal weld. After 2000, no PG&E engineer reviewing Line 132 risk and integrity management appears to have had access to records of this leak.

- A 1969 PG&E written policy required the maintenance of pipeline history files. These files were pipeline-by-pipeline folders filled with safety relevant information about the particular pipeline - leak history, operations, testing, materials, and other safety related attributes. Pipeline files were a convenient and detailed means of understanding a particular pipeline. In about 1987 PG&E stopped maintaining the pipeline files, and cannot locate any of them today.

- PG&E's job files are missing critical safety information, and are unwieldy and incomplete. Job files are PG&E's "files of record" information about pipe design and other safety information. PG&E is missing thousands of job files with important pipeline data and information in them. The files that PG&E can locate are often missing key documents and data. Job files may be duplicative but often do not contain they same information. The job files, before 2010, were disorganized and unusable by safety personnel. PG&E's job files consisted of millions of largely un-indexed documents.

- PG&E's GIS, a computer system for describing and maintaining data on assets including pipelines, provides inaccurate and incomplete information to those using it. This system provided the wrong information that the

failed pipe was seamless. That error remained in GIS for about 15 years before the NTSB discovered it after San Bruno. In addition, well over 5000 miles of transmission pipe is included in PG&E's GIS. Each mile of that pipe contains safety data values that are either assumed or unknown.

- PG&E failed to provide critical safety instructions and maps that were clear, accurate, useable in an emergency, and current, to PG&E employees trying to cope with the gas emergency they faced on September 9, 2010. If PG&E's documentation was better, the rupture might have been averted, and the duration of the gas fed fire reduced.

PG&E's recordkeeping deficiencies constitute serious and repeated violations of law, both federal and state, over numerous decades. The laws violated require PG&E to promote safety generally, require records to be kept explicitly to promote safety, and include engineering standards such as the American Society of Mechanical Engineers (ASME), and PG&E's own recordkeeping rules and standards.

PG&E's recordkeeping deficiencies existed over many years, in some areas back to 1948 or longer, and continue through to today. It will take PG&E years to re-establish good recordkeeping and to achieve safety again despite the large number of PG&E safety related records that are forever lost.

PG&E does not deny that its pipeline records have been deficient. PG&E's major defenses are that: (1) Other gas operators have similar recordkeeping challenges and adopt similar recordkeeping practices; (2) PG&E was not required by law to keep good records to support engineering safety practices, unless they are explicit and prescriptive; (3) even if PG&E had kept good records and data, this would not have prevented the San Bruno pipeline rupture and fire, or changed PG&E's safety program for any other pipeline; and (4) PG&E is making efforts to improve its future recordkeeping.

None of these defenses are factually or legally valid. PG&E is obligated by law to provide safe utility service, regardless of possible violations by other gas operators. PG&E is also obligated to provide safety regardless of whether the law does not identify every action that PG&E must take to achieve that goal.

In the aftermath of San Bruno, the Commission must provide the necessary accountability. The evidence in this proceeding warrants a decision and necessary findings that PG&E has violated the law on multiple occasions for many years. The Commission should make it clear to PG&E that the result of its violations has been an unsafe PG&E gas system in general, and the terrible human cost on Segment 180 of Line 132 in particular. The Commission, under the law, bears a responsibility to direct maximum affordable statutory fines consistent with the scope and scale of PG&E's serious violations of law over many years, and to direct extensive remedies to address PG&E's current extensive recordkeeping deficiencies and violations.

II. BACKGROUND (PROCEDURES/FACTS)

On January 3, 2011, based on the discovery of inaccuracies in PG&E records for the ruptured pipe in San Bruno, the National Transportation Safety Board ("NTSB") issued three safety recommendations to PG&E, two of which were designated "urgent." The California Public Utilities Commission observed these three recommendations in the NTSB's report entitled, "Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, California, September 9, 2010".[2]

Partly in response to these recommendations, the Commission issued a specific Recordkeeping Order Instituting Investigation ("OII"), which provided a separate proceeding from the Commission's San Bruno OII (I.12-01-007). In the scoping memo for the Recordkeeping OII, the Commission inquired into PG&E's recordkeeping deficiencies and the resulting safety problems with its gas transmission system.[3] Through ongoing discovery in the Recordkeeping OII, the Commission's Consumer Protection Safety Division ("CPSD") has discovered that PG&E has had extensive recordkeeping deficiencies over the course of more than the last 60 years.

While there has been some overlap between the Recordkeeping and San Bruno OII's, CPSD's particular investigative efforts in this proceeding have focused on PG&E's historical recordkeeping. A thorough investigation has led to the conclusion that PG&E's recordkeeping of its transmission system is poor, and that as a result its gas transmission system is unsafe for the public and PG&E employees. Moreover, the scoping memo from this proceeding has focused upon PG&E's entire gas transmission pipeline system, not merely the specifics of the explosion on Line 132. There have been some joint hearings between the Recordkeeping and San Bruno investigations. However, the rest of hearings from this and San Bruno proceeding have been presided over by one Administrative Law Judge, one trier of fact who has been present to observe the demeanor and determine the credibility of witnesses throughout each of the two proceedings.

The Recordkeeping OII has experienced two rounds of hearings constituting multiple weeks in which four CPSD witnesses and multiple PG&E witnesses testified. In addition, the City of San Bruno, the Utilities Reform Network ("TURN"), the Division of Ratepayer

[2] CPSD Exhibit 6, Attachment 1, Pages 75-76.
[3] I.11-02-016, Assigned Commissioner's Scoping Memo and Ruling, 11/21/2011, Page 2.

Advocates ("DRA"), and the City and County of San Francisco ("CCSF") have all actively participated and made meaningful contributions to the proceeding.

III. LEGAL ISSUES OF GENERAL APPLICABILITY

A. PG&E's Long-Standing and Comprehensive Duty to Act Reasonably to Ensure Gas Pipeline Safety

The Commission has succinctly described the extraordinary dangers of natural gas pipelines and the utility's attendant "unending obligation" to maintain safe operations:

> Among all public utility facilities, natural gas transmission and distribution pipelines present the greatest public safety challenges. Unlike more common public utility facilities, gas pipelines carry flammable gas under pressure - in transmission lines, often at high pressure - and these pipelines are typically located in public right-of-ways, at times in densely populated areas. The dimensions of the threat to public safety from natural gas pipeline systems, including the pace at which death and life-altering injuries can occur, are far more extreme than other public utility systems. This unique feature requires that natural gas system operators and this Commission assume a different perspective when considering natural gas system operations. This perspective must include a planning horizon commensurate with that of the pipelines; that is, in perpetuity, as well as an immediate awareness of the extreme public safety consequences of neglecting safe system construction and operation.
>
> In the context of an unending obligation to ensure safety, we must also realize that in practical terms safety is exacting, detailed, and repetitive. It is also expensive, so ensuring that high value safety improvements are prioritized and obtaining efficiencies wherever possible is also essential. And, in the end, if the goal of safe operations is met, the reward is that absolutely nothing bad happens. In short, safety is difficult, expensive and seemingly without reward.[4]

[4] Decision (D.)12-12-030 (Dec. 20,2012), p. 43, 2012 Cal. PUC LEXIS 600, at *86-87; *see also* D.00-06-038 (2000) 6 Cal.P.U.C.3d 534, 537-538

The California Legislature recently confirmed this critical function of gas utilities.[5] State law, federal law, and industry standards and practices define the scope and nature of PG&E's standard of care.

1. Section 451

Section 451 of the California Public Utilities Code, and its predecessor, California Public Utilities Act, Article II, section 13(b), consistently have set forth PG&E's general and comprehensive obligation since 1912:

> Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities . . . as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public.[6]

Section 451 alone, even if no other laws or standards existed, establishes PG&E's duty to act reasonably – to perform necessary testing and maintenance, and to maintain the necessary records for the safe operation of its natural gas pipelines. In 1953, the California Supreme Court affirmed that section 451 creates a "general duty [of the utility] to exercise reasonable care in operating its system to avoid unreasonable risks of harm to the persons and property of its customers." *Langley v. Pacific Gas and Electric Co.* (1953) 41 Cal.2d 655, 660-661; *Barnett v. Delta Airlines, Inc.* (1982) 137 Cal.App.3d 674, 683-684. Section 451 is not limited to the reasonableness of rates, but also sets forth the obligation of a utility to act for the public good. While PG&E does not have an absolute duty (PG&E is not the guarantor of the safety of its gas operations), it does have an ongoing duty to act reasonably to protect the public:

> "The duty of due care with which the company was charged consists not only in the proper installation of the dangerous instrumentality but in the maintenance thereof in a safe condition at all times and places and under the changing circumstances of the particular case. Even if at the outset of the installation of the equipment the company may have been entirely free from fault,

[5] California Public Utilities Code § 963(b)(3) states in part: "It is the policy of the state that the commission and each gas corporation place safety of the public and gas corporation employees as the top priority."

[6] Cal Pub. Util. Code § 451 (1951); Cal. Pub. Util. Act, Art. II §13(b).

> yet, if, under changing circumstances, a hazardous condition arose, nonaction or the failure to remedy such condition would constitute culpable negligence".

Lozano v. Pacific Gas and Electric Co. (1945) 70 Cal.App.2d 415, 422 (discussing PG&E's duty in the context of electricity services). PG&E's compliance with its obligation should be evaluated under the standard of: "what would a reasonable and prudent person have done in light of the facts known, or which should have been known, at the time the decision was made." D.94-03-048 (1994) 53 Cal.P.U.C.2d 452, 468. [7]

The fact that section 451 does not describe more specific utility obligations does not negate or diminish PG&E's duty. *Gay Law Students Assn. v. Pacific Telegraph & Telephone Co.* (1979) 24 Cal.3d 458, 475-480 (1979). In *Gay Law Students Association*, the California Supreme Court rejected the argument that Public Utilities Code § 453(a) did not prohibit employment discrimination because it was not expressly mentioned. The Court determined: (1) §453(a) imposes a general duty on a utility, a public service entity charged with wielding its monopoly power for the public good, not to engage in employment discrimination even though §453(a) does not expressly reference employment discrimination; and (2) the ban on discrimination in § 453(a) goes beyond utility rates. This reasoning should apply with equal force here regarding § 451: PG&E has a general duty under §451 even though § 451 does not specifically prescribe each and every application of the duty and § 451 is not limited to the reasonableness of rates, but also defines utility obligations to the public.

The Commission has held that it need not enumerate each and every conceivable application of PG&E's duty under section 451:[8]

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[7] In that proceeding, the Commission investigated the reasonableness of Southern California Edison Company's (SCE) operation and maintenance of its Mojave plant following the explosion of a high-pressure steam pipeline which killed six people and seriously injured ten: "The relevant question is whether, based on the information available at the time, the fact that hot reheat temperatures exceeded design temperatures should have prompted SCE to take steps to assure that the reheat line was in safe condition. At the time, SCE could not have known what the cause of a weld failure would be. They could only have known about circumstances that should have prompted them to inspect the piping system or take other related actions." D.94-03-048 (1994) 53 Cal.P.U.C.2d at 468

[8] *See also* D. 61269 (1960) 58 Cal. P.U.C. 413, 420, Findings and Conclusions 8: "[T]he promulgation of precautionary safety rules does not remove or minimize the primary obligation of respondents [which included PG&E] to provide safe service and facilities in their operations."

> [I]t would be virtually impossible to draft section 451 to specifically set forth every conceivable service, instrumentality and facility which might be "reasonable" and necessary to promote the public safety. That the terms are incapable of precise definition given the variety of circumstances likewise does not make section 451 void for vagueness, either on its face or in application to the instant case.

Carey v. Pacific Gas and Electric Co. D.99-04-029(1999) 85 Cal. P.U.C.2d 682, 689.[9]

In *PacBell Wireless*, the California Court of Appeal quoted with approval the Commission's decision in *Carey*, and confirmed that section 451 does not violate due process or fail to provide sufficient notice to the utility of what conduct is prescribed. *PacBell Wireless v. P.U. C.* (2006) 140 Cal.App.4th 718, 742-743. The Court of Appeal rejected the argument that the utility could not be fined because there was no statute or Commission order specifically prohibiting the information practices alleged to be violations of section 451, and explained that there is "no appreciable difference" between section 451 and California Civil Code sections 1709 and 1710, which do not enumerate each and every type of fraud prohibited:

> The Civil Code does not define what is deceitful, or what types of misrepresentations or omissions are material. Those decisions are left to the trier of fact, based on the facts of the particular case. A defendant can be found to have committed fraud based on misrepresentations or omissions that are not specified in any statute, and can be ordered to pay significant sums in compensatory and punitive damages as a result.

Id. at 742-743. One of the ways in which a utility is on notice of what is required by section 451 is from prior Commission enforcement proceedings[10].

Finally, the Commission and the Court of Appeal both have rejected the notion that violation of section 451 requires violation of some other statute or rule.[11] In sum, there is no

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[9] *Carey* was a complaint proceeding against PG&E. The Commission fined PG&E under §§ 2107 and 2108 for violation of § 451 because of an explosion and fire caused by natural gas. On rehearing, the Commission rejected PG&E's arguments that the language of §451 was too vague and general to support the imposition of a fine and § 451 failed to identify what action or inaction was unreasonable.

[10] *Id.* at 741-742

[11] *Carey v. Pacific Gas and Electric Co., supra,* 85 Cal. P.U.C.2d at 683; *PacBell Wireless v. P.U. C.* 140 Cal.App.4th at 743.

basis for any argument that section 451 somehow does not create an obligation of PG&E that can form the basis of an enforcement action or somehow failed to provide sufficient notice to PG&E of what conduct is required to ensure safe pipeline operations and to protect the public.

As the Commission recently stated in D.12-12-030, pp.91-92, 2012 Cal. PUC LEXIS 600 at * 29:

> Pursuant to Public Utilities Code section 451 each public utility in California must:
>
> "Furnish and maintain such adequate, efficient, just and reasonable service, instrumentalities, equipment and facilities, … as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public."
>
> The duty to furnish and maintain safe equipment and facilities is paramount for all California public utilities, including natural gas transmission operators. Furnishing and maintaining safe natural gas transmission equipment and facilities requires that a natural gas transmission system operator know the location and essential features of all such installed equipment and facilities.

Even though section 451 establishes PG&E's general obligation to act reasonably and is sufficiently prescriptive, more particular standards also applied to PG&E. Under Public Utilities Code section 702, PG&E was required to comply with these additional standards as well. Section 702 provides:

> Every public utility shall obey and comply with every order, decision, direction, or rule made or prescribed by the commission in the matters specified in this part, or any other matter in any way relating to or affecting its business as a public utility, and shall do everything necessary or proper to secure compliance therewith by all of its officers, agents, and employees.

2. Industry Standards

As noted by the Court of Appeal in *PacBell Wireless*, industry practice also provided notice to PG&E of what conduct is reasonable and prescribed by section 451.[12] PG&E is

[12] *See PacBell Wireless v. P.U.C., supra,* 140 Cal.App.4th at 742 (utility on notice of what conduct is just and reasonable under § 451 based in part on information from the marketplace).

required to comply with industry practice, and the term used by CPSD, *e.g.,* "best engineering practices," "good utility safety practices" or "good utility practices" is a matter of semantics and does not change PG&E's duty. Significantly, industry practice does not itself conclusively establish the required degree of care. D.94-03-048, 53 Cal.P.U.C.2d at 465-470. Accordingly, even if PG&E complied with industry standards, this does not necessarily establish that PG&E fulfilled its obligation if PG&E did not act reasonably in light of what it knew or should have known.[13] However, at a minimum, it sets the floor of what should be expected of PG&E, since it represents the knowledge of the industry at the time of the industry standards were adopted.

The professional engineering community issued industry standards for testing and recordkeeping. In 1935 before Line 132 was installed, the American Society of Mechanical Engineers (ASME) began developing a code of industry standards for gas transmission operators.[14] In 1955, the ASME published ASME B.31.1.8 (which today is known as ASME B.31.8). ASME B.31.1.8-1955 required air, gas or hydrostatic tests (depending on the pipe and the population around the pipeline) prior to operation for all newly constructed transmission pipes operating at 30% or more of Specified Minimum Yield Strength (SMYS).[15] For transmission pipes operating at less than 30% SMYS, but more than 100 psi, ASME B31.1.8-1955 required air, gas or hydrostatic tests, without the qualification that the pipe must be newly constructed.[16] In addition, ASME B.31.1.8-1955 required an operator to maintain test records for the operational life of the asset, showing "the type of fluid used for test and the test pressure."[17] ASME B.31.1.8-1955 included additional, specific record-keeping requirements:

> Records should be made covering all leaks discovered and repairs made. All pipeline breaks should be reported in detail. These records along with leakage survey records, line patrol records and other records relating to routine or unusual inspections should be kept in the file of the operating company involved, as long as the section of line involved remains in service.[18]

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[13] Id.
[14] The American Standards Association (ASA) Code is the same as the ASME Standards.
[15] PG&E Exhibit 47, p. 48, § 841.41; and p. 49, Table 841.412(d).
[16] PG&E Exhibit 47, p. 50, § 841.42; and Table 841.421.
[17] PG&E Exhibit 47, P 50, § 841.417.
[18] PG&E Exhibit 47, pp. 59- 60, § 841.5.

Significantly, in 1956, the year Line 132 was installed, PG&E represented to the Commission that it followed ASME B.31.1.8-1955.[19] As explained below, in 1960, the Commission formally incorporated the ASME standards into Commission rules governing natural gas safety.

3. General Order 112

PG&E is required to comply with standards promulgated in the Commission's general orders regarding gas pipeline safety. In 1959, the Commission commenced a proceeding to determine whether to promulgate a general order to explicitly specify safety rules for natural gas. On December 28, 1960, in D. 61269, the Commission formally adopted the rules set forth in General Order 112 (GO 112), to be effective July 1, 1961, with utility compliance mandated by January 17, 1961.[20] The Commission emphasized that the adoption of more specific rules did not modify or negate PG&E's pre-existing and "primary" legal obligation to the public to ensure gas pipeline safety:

> Public utilities serving or transmitting gas bear a great responsibility to the public respecting the safety of their facilities and operating practices.
>
> 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 promulgation of precautionary safety rules does not remove or minimize the primary obligation and responsibility of respondents to provide safe service and facilities in their gas operations. Officers and employees of the respondents must continue to be ever conscious of the importance of safe operating practices and facilities and of their obligation to the public in that respect.

D.61269 (1960) 58 Cal. P.U.C. 413, 420 (Findings and Conclusions 7 and 8).

One of the mandatory standards imposed by D. 61269 and included in GO 112 was, except as specifically excluded, the 1958 version of ASME B.31.8 (D. 61269, *supra,* 58 Cal.

[19] PG&E responses to CPSD DR 15, Q.6, and CPSD DR 33, Q 10.

[20] The Commission's General Orders 112 through 112-E were exhibits in this proceeding. See PG&E Exhibit 4 (D.61269, with GO 112 Attached); CPSD Exhibit 36a (D.66399, GO 112-A); CPSD Exhibit 60 (D.73223, GO 112-B); PG&E Exhibit 5 (D.78513, with GO 112-C Attached); PG&E Exhibit 7 (D.95-08-053, with GO 112-E Attached).

P.U.C. at 417, 420; GO-112, section 107.1). Like the 1955 version, the 1958 version of ASME B.31.8 required that all newly constructed pipelines operating at 30% or more of SMYS, except for tie-ins be tested by air, gas, or hydrostatic testing before operation (sections 841.31; 841.41; and 841.411),[21] and sets standards to determine which type of testing was mandated (sections 841.411 through 841.416). Also like the 1955 version, for transmission pipes operating at less than 30% SMYS, but more than 100 psi, the 1958 version required gas or hydrostatic tests, without the qualification that the pipe must be newly constructed (section 841.42). Also like the 1955 version, the 1958 version required that the "operating company shall maintain in its file for the useful life of each pipeline and main, records showing the type and fluid used for test and the test pressure (section 841.417). Finally, like the 1955 version, the 1958 version provided in section 851.5:

> Records should be made covering all leaks discovered and repairs made. All pipeline breaks should be reported in detail. These records along with leakage survey records, line patrol records and other records relating to routine or unusual inspections should be kept in the file of the operating company involved, as long as the section of line involved remains in service.

In 1960, before GO 112 was adopted, PG&E represented to the Commission that a general order requiring testing and recordkeeping was unnecessary because PG&E already voluntarily complied with ASME B31.8 (D. 61269, *supra,* 58 Cal. P.U.C. at 415). PG&E has never since advised the Commission that it was no longer compliant with ASME standards[22]. Although GO 112 has been modified since 1961, compliance with ASME B31.8 remained a specific requirement. *See* GO 112, section 107.1 (effective 1961); GO 112-A, section 107.1 (effective 1963); GO 112-B, section 107.1 (effective 1964). In addition, each of these versions of GO112 also contained records retention sections, which were consistent with ASME B31.8, but made clear that the records should be maintained by the utility and available for inspection at all times by the Commission or its staff. *See* GO 112, sections 301-303 (effective 1961); GO 112-A, sections 301-303 (effective 1963); GO 112-B, sections 301-303 (effective 1964).

[21] PG&E Exhibit 47, §§ 841.31; 841.41; and 841.411.
[22] PG&E Response to CPUC DR 71, Q 1.C. Every PG&E response to a CPSD Data Request, which has been referred to in this brief, has been admitted into the record.

As the Commission explained when it issued D. 78513 (January, 1971), p. 3, and its GO 112-C, the Commission had adopted the minimum Federal Pipeline Safety Standards in 49 CFR Part 192 (1970), as well as some additional state requirements. In 1995, the Commission further 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. Therefore, the Commission issued its General Order No. 112-E, p. 2, which included a new section, 104.1, that automatically adopts any revisions to the Federal Pipeline Safety Standards, 49 CFR Parts 190,191, 192, 193, and 199. Moreover, GO 112-E, p.1 in the Preamble, contains a requirement in section 101.4 that the utilities shall maintain necessary records to ensure compliance with these rules and the Federal Pipeline Safety Standards, and the records shall be available for inspection at all times by the Commission or Commission staff. GO 112-E, p. 2 also provides in section 103.3 that compliance with these rules is not intended to relieve a utility of statutory requirements. Because GO 112-E, section 104.1, provides that all revisions to the Federal Pipeline Safety Standards are automatically updated and incorporated in GO 112-E, it contains the same minimum federal records retention requirements provided in 49 CFR Part 192.

4. "Minimum" federal regulations

PG&E's safety practices also should have been compliant with federal regulations. In 1970, "minimum federal safety standards" (i.e., 49 C.F.R. §§192.1 - 192.753) were promulgated for natural gas pipelines. The Commission has been certificated to enforce these federal regulations for intrastate pipelines under its jurisdiction, such as PG&E. *See* 49 U.S.C. § 60105. Following the promulgation of the federal regulations in 1970, the Commission subsequently incorporated the federal regulations into GO 112-C through its General Order 112-E. Notably, federal law does not prohibit the Commission from imposing stricter standards on its regulated utilities. 49 U.S.C. §60104(c).

The minimum federal regulations impose elementary obligations essential to sound engineering practice. 49 C.F.R. §192.517 requires that "[e]ach operator make, and retain for the useful life of the pipeline, a record of each test performed under §§192.505 and 192.507." Sections 192.505 and 192.507 define the required strength testing for steel pipelines. The record mandated by 49 C.F.R. §192.517 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 failure noted and their disposition.

Significantly, too, §§ 192.551 and 192.553 require operators to justify and control pressure increases to pipelines according to specified criteria, a written plan, and a limitation on the increase in the maximum allowable operating pressure of a pipeline.

B. PG&E's Overwhelming Failure to Maintain Necessary Records Requires the Commission to Shift the Burden of Proof or Impose Adverse Evidentiary Inferences Against PG&E

1. PG&E, not CPSD, should bear the burden of proof

Generally, in an enforcement proceeding, CPSD bears the burden of proving a violation.[23] However, CPSD should not bear the burden in this proceeding.

PG&E cannot find records, determine if or when it lost them, or whether PG&E did a test or other action required by law at all on each pipeline segment. As an example, PG&E has identified over 23,000 segments in populated areas for which it does not possess records for testing or maintenance of its pipeline as required by state and federal law.[24] Given the magnitude and duration of PG&E's recordkeeping failure, the Commission must shift the burden of proof to PG&E, or draw an adverse inference that the missing evidence is unfavorable to PG&E. This result is compelled by the doctrine of spoliation of evidence, which is based on the fundamental legal principle that no party should benefit from its own wrongdoing. *See Galanek v. Wimas* (1999) 68 Cal.App.4th 1417, 1428.

Spoliation of evidence covers a relatively broad range of misconduct. "Spoliation" is the destruction, alteration or failure to preserve evidence for another's use in pending or future

[23] D.12-02-032, 2012 Cal. PUC LEXIS 74, at *4-5 (Feb.16, 2012).
[24] TURN Exhibit 4, PG&E Response to Joint CPSD-TURN Data Request 01, Question 01, and Attachment GasTransmissionSystemRecordsOII_DR_Joint_001-Q01Atch01.

litigation. *Williams v. Russ* (2008) 167 Cal.App.4th 1215, 1223. The remedies for spoliation of evidence include shifting the burden of proof or imposition of a discretionary inference against the spoliator that the missing evidence was unfavorable to it. *Cedars-Sinai Medical Center v. Superior Court* (1998) 18 Cal.4th 1, 11-13 (*Cedars-Sinai"*); *see also* California Evidence Code §§ 412, 413 (adverse evidentiary inference, that the evidence submitted should be viewed with distrust or the destroyed evidence was unfavorable, may arise based on failure to produce more satisfactory evidence or willful suppression of evidence). These remedies are appropriate because fairness and justness are impaired: missing evidence increases the risks of an erroneous decision on the merits and increases the costs of litigation as parties attempt to reconstruct the evidence or to develop other evidence, which "may be less accessible, less persuasive or both." *Cedars-Sinai, supra,* 18 Cal.4th 1, 8.

The Commission need not determine that PG&E failed to preserve evidence with the intention to violate state and federal law. Knowing spoliation of evidence, even without intent to violate a statute requiring its retention, may form the basis for imposition of an adverse evidentiary inference. *Reeves v. MV Transportation, Inc.* (2010) 186 Cal.App.4th 666, 681-682; *Williams v. Russ, supra,* 167 Cal.App.4th at 1223. This is particularly true where a party, like PG&E here, has a duty to preserve evidence. *See Reeves v. MV Transportation, Inc., supra*, 86 Cal.App.4th at 682 (statutory obligation to preserve employment applications gives rise to duty to preserve evidence). Given: (1) PG&E's mandatory and unambiguous duties to conduct pipeline testing and to create and maintain records necessary to ensure the safe operation of its pipeline; and (2) the scope and scale of PG&E's inability to produce records, the only reasonable conclusion is that PG&E's failure to produce this evidence is a knowing failure. PG&E's overwhelming failure to have in its possession records of manufacture, construction, testing, and maintenance cannot be viewed as an isolated instance, or as negligent oversight.

Moreover, even if PG&E's conduct is not viewed as intentional, a negligent failure to preserve evidence is sufficient. *Brewer v. Southern California Gas Co.;* D.89-07-011, 1989 Cal. PUC LEXIS 759, at *7-8, 11-12 (July 6, 1989). In *Brewer,* although the Commission made no finding that Southern California Gas Company (SoCalGas) intentionally destroyed evidence, the Commission nonetheless determined that the loss of evidence, which was in the utility's control, made it impossible for the complainant to prove their case. *Id.* at 12. Thus, the Commission

imposed a negative inference and held that SoCalGas could not argue that its equipment was functioning properly. *Id.*

> The utility, of course, has no duty to prove the plaintiff's case, that is, establish that the meter was not functioning properly while installed at the customer's premises. However, it had undertaken to test the meter and, under the circumstances, should have determined the reason why the meter failed to register. The fact that the meter had failed while in SoCal Gas's possession, and SoCal Gas did nothing to determine the cause of failure undermines the general presumption that the meter had been functioning properly and the customer was being billed for actual usage.

Id. at *12.

Because PG&E cannot prove that it tested Line 132 at the segment that failed and PG&E lacks records and data for so much of its pipeline system and system functions, the Commission is justified in imposing adverse inferences against PG&E. *See Galanek v. Wimas*, *supra,* 68 Cal.App.4th at 1426-27 (negligent failure by party with duty to preserve evidence allows shifting of burden of proof where destruction impacts the ability to establish a *prima facie* case).

Moreover, as the appellate court observed in *Galanek,* the showing required to shift the burden of proof in civil cases "necessarily applies with less force in cases like the present case where the plaintiff's ability to make even a prima facie case of causation is *frustrated* by the loss of critical evidence as a result of defendant's negligence [and the defendant had a duty to preserve the evidence]." (*Id.* at 1427; italics added). Any other result would allow PG&E to take advantage of any lack of proof resulting from its own misconduct. *See id.* at 1428.

To the extent CPSD has any burden of showing prejudice, it is satisfied. PG&E has substantially prejudiced CPSD's ability to prove facts at issue in this proceeding. The adequacy of PG&E recordkeeping is the heart of this case, not a minor or peripheral issue. Even assuming all the required testing, maintenance, and other acts had been performed, PG&E had a duty to preserve critical, direct evidence related to its testing and maintenance on its pipeline, yet grossly failed to do so. This missing evidence –the best evidence – is indisputably relevant and its loss prejudicial to CPSD because it would have allowed CPSD to *verify* the actual testing and maintenance performed on PG&E's pipeline. Witness testimony is no substitute for the actual documentation, as the primary means of corroboration is unavailable. Without the actual

documentation, verification is impossible and CPSD must devote significant resources and expense to attempt to re-construct the facts and develop other evidence, which may be less "accessible or persuasive or both." *See Cedars-Sinai, supra,* 18 Cal.4th at 8. These uncertainties are of PG&E's own making, and should not be shouldered by CPSD.

Therefore, as an example, the Commission is entitled to make a finding that, in instances in which PG&E cannot locate pressure test records, PG&E did not conduct the required hydrostatic test required by the law. In D.12-12-030, p.55, 2012 Cal. PUC LEXIS at *105, the Commission, held that "where PG&E had an obligation to test pipeline and has lost records of such pressure test records, PG&E must remedy the missing records by retesting." PG&E cannot locate records for a hydrostatic test on Segment 180. Moreover, it is dubious any such testing in fact occurred because the NTSB believes that such a test would have ruptured the pipe in 1956, and averted the San Bruno tragedy in 2010. Given the lack of any record of testing, the Commission must impose an adverse inference that PG&E never tested Segment 180 of Line 132.

In sum, at a minimum, PG&E negligently failed to maintain the necessary records to document the safety of its high pressure natural gas pipelines. PG&E's failure to preserve the best evidence regarding the issues in this proceeding indisputably impacts CPSD's ability to prove its case. Accordingly, the Commission must shift the burden of proof to PG&E or impose adverse evidentiary inferences against PG&E. PG&E must not be permitted to benefit from any lack of proof resulting entirely from its own wrongful conduct.

2. The evidentiary standard is preponderance of the evidence

Regardless of whether CPSD or PG&E bears the initial burden of proof, the evidentiary standard is that a violation must be established by a preponderance of the evidence. D.12-02-032, 2012 Cal. PUC LEXIS 74, at *4-5. The Commission has expressly rejected the argument that the higher "clear and convincing" standard should apply in an enforcement proceeding because statutory penalties are akin to a civil punitive damages award. D.03-01-087, 2003 Cal. PUC LEXIS 67, at *12-14 (Jan. 30, 2003). The Commission reasoned that punitive damages are different from statutory penalties in important ways, and accordingly require different standards of proof. *Id.* For example, the standard of proof for statutory penalties in civil actions is a

preponderance of the evidence. *Id.* Moreover, punitive damages are awarded in civil actions for utility violations, and are separate and distinct from any statutory administrative penalties awarded by the Commission. *Id.; cf.* Pub. Util. Code §§ 2106 & 2107.

The simple fact that PG&E is subject to a very large monetary penalty in this proceeding, alone, does not mandate a higher standard of proof. One of the purposes of the Commission's remedial powers is to deter misconduct. There is no basis to conclude that the Legislature intended to make it more difficult to prove or penalize utility misconduct based on multiple violations. Indeed, such a result is contrary to the public interest and would have the anomalous result of rewarding a utility with multiple alleged violations with the application of a higher standard of proof.

Finally, this proceeding is not analogous to administrative proceedings where the potential remedy is revocation of a professional license, and which require proof by clear and convincing evidence.[25] Among other reasons, while the Commission may impose non-monetary remedies in this proceeding, such as requiring PG&E to "change or improve its maintenance,"[26] the purpose and scope of this proceeding is not to determine whether to revoke PG&E's certificate of public convenience and necessity under section 1001.

C. PG&E's Affirmative Defenses Have No Legal Merit

CPSD does not bear the burden to refute any defenses asserted by PG&E, and PG&E must prove each fact the existence or nonexistence of which is essential to any defense it is asserting. D.12-02-032, 2012 Cal. PUC LEXIS 74, at *4-5. However, the Commission need not reach the analysis of whether PG&E has met its burden of proof, because none of the four affirmative defenses advanced by PG&E has any merit as a matter of law.

First, PG&E asserts there was no regulation requiring it to maintain certain records that are the subject of alleged violations. The lack of merit of this contention is demonstrated, above. It is not only not the law, but it defies credulity, for PG&E, as an established gas pipeline operator responsible for an intrinsically hazardous gas system that creates a tremendous public

[25] *Grubb Co. v. Department of Real Estate* (2011) 194 Cal.App.4th 1494, 1502.
[26] I.12-01-007, p. 10; *see also* Pub. Util. Code §761 (after hearing, the Commission may order utility to change unsafe and inadequate practices or facilities).

safety risk, to argue that it should have been specifically told each and every reasonable engineering practice or it is excused from compliance.

Second, PG&E claims that other operators have poor recordkeeping practices. PG&E's handful of examples of other gas utility's alleged, but unproven, recordkeeping "challenges" do not establish that it is the prevailing industry practice to maintain records in violation of the law or to maintain pipelines in an unsafe manner. [27] PG&E must prove its defense, and has not done so.

Even if PG&E's assertions were proven, compliance with unsafe industry practice does not excuse PG&E's unlawful conduct. The magnitude of PG&E's failure and inability to produce records also do not reflect an occasional lapse or a "challenge," but a systemic, comprehensive and sustained failure over many years. Just as a parent rejects the child's excuse for misconduct that "everyone else was doing it," so should the Commission. The Court of Appeal explains why such a defense fails as a matter of law:

> Wrongdoing is not excused merely because others engaged in it. Courts have long upheld prosecutorial discretion to select a defendant from a number of wrongdoers. Whether competitors employ the same or similar methods in their business practices is immaterial to the charge made against Casa Blanca concerning those methods. If such is the case, then such competitors should likewise be prosecuted. It is not a reason why Casa Blanca should escape responsibility.[28]

People v. Casa Blanca Convalescent Homes (1984) 159 Cal.App.3d 509, 527-528.

Third, the fact that PG&E may have changed or improved its recordkeeping practices since the San Bruno explosion is welcome, but is not a valid affirmative defense. Indeed, rather than shield PG&E from liability, evidence of subsequent remedial measures can be used to show that a negligent condition previously existed, and to show the possibility or feasibility of eliminating the cause of the incident. *Love v. Wolf*, 249 Cal.App.2d 822, 831 (1967).

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[27] PG&E Exhibit 61 pp. 1-12 through 1-15.

[28] *See also Huntington Memorial Hospital v. Superior Court* (2001) 131 Cal.App.4th 893, 911. Surely PG&E does not claim that it has been wrongfully and intentionally singled out for prosecution on an "invidiously discriminatory basis." *PacBell Wireless v. P.U.C., supra,* 140 Cal.App.4th 718, 739.

Fourth, contrary to PG&E's assertions, PG&E most certainly committed to compliance with the 1955 version and later versions of the ASME Standard B31.8 engineering code. PG&E represented plainly to the Commission that "the gas utilities in California voluntarily follow the American Standards Association (ASA) code for gas transmission and distribution piping systems."[29] (ASME Code B31.8). When PG&E makes that kind of representation to the Commission about serious safety matters, it has no justification as a regulated utility to assert 55 years later that the code was "voluntary" so it was under no obligation to follow the code at all.

IV. OTHER ISSUES OF GENERAL APPLICABILITY

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[29] See D.61269, "Investigation into the Need of a General Order (GO 112) Governing Design, Construction, Testing, Maintenance and Operation of Gas Transmission Pipeline Systems", December 28, 1960, P. 4.

V. ALLEGED VIOLATIONS PREDICATED ON THE REPORTS AND TESTIMONY OF MARGARET FELTS

A. Alleged Records Violations relating to Line 132, Segment 180, San Bruno Incident

This section discusses records and data related violations that can be tied directly or indirectly to the pipe failure and explosion at San Bruno on September 9, 2010.

Violation 1: Salvaged Pipe Records

a. Summary of Violation

PG&E failed to promote safety and, therefore, endangered its patrons, employees and the public when it failed to create and maintain accurate, complete, and accessible records of pipe salvaged from its transmission system and reused in Line 132.

PG&E engaged in an inherently unsafe practice by failing to create and retain orderly records of salvaged, reconditioned and reused pipe. After the San Bruno incident, PG&E searched its records in an effort to determine the source of the failed pipe and produced to the NTSB a pieced-together summary of new and reused pipe used in the installation of Segment 180.[30] PG&E has been unable to identify records that clearly document the source of the piece of pipe that failed.[31]

If PG&E had kept orderly and accurate records reflecting the purchase, installation, salvage, reconditioning, inspection, and reuse of pipe installed in its transmission system, PG&E would not have selected for use in Segment 180 the section of pipe that failed on September 9, 2010.[32] If PG&E had maintained proper records and data, PG&E would have had sufficient information to determine that the pipe did not meet PG&E's own specifications for high-pressure transmission pipe.[33]

Further, if PG&E had visually inspected the pipe at any time prior to installation, it would have rejected the section of pipe fabricated from several pups based on the obvious poor quality

[30] CPSD Exhibit 2, Page 2, Lines 4-6
[31] NTSB_460802, p. 6
[32] CPSD Exhibit 2, Page 2, Lines 8-11
[33] NTSB_460278, p.4 and p.10

of welds.[34] At the least, informative data and records pertaining to the pipe would have triggered an inspection of the pipe. Thus, PG&E's poor recordkeeping practices made it possible for a piece of junk pipe that did not meet minimum safety standards to be installed in a high pressure transmission line[35] in the ground under a soon to be constructed housing tract. This piece of junk pipe ultimately failed, causing deaths, injuries, and property destruction.

Also, if accurate and useable records about the pipe's manufacture and specifications, previous service, and installation had been available at PG&E after the pipe's installation in 1956, even many years later PG&E's integrity management engineers could have determined that the pipe was problematic and needed to be dug up and inspected. But, since there were no records kept, that inspection never occurred and the pipe ultimately failed catastrophically in 2010.

The best available evidence now remaining, strongly suggests that the pipe that failed was salvaged and possibly junked, but then reused. No way exists now to know for certain, because PG&E failed to maintain the very records that would have been dispositive.

b. Laws that PG&E Violated

Since 1915, California Public Utilities Code §451 and its predecessors have required that "Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities. . .as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public."[36]

Even before section 451 was written, from 1911 to 1951, the California Public Utilities Act, Article II, section 13(b) required that

> "Every public utility shall furnish, provide and maintain such service, instrumentalities, equipment and facilities as shall promote the safety, health, comfort and convenience of its patrons, employees and the public."[37]

[34] NTSB Summary Report and NTSB 469689, NTSB Report, Office of Research and Engineering, Figure 9 e.p. 16
[35] CPSD Exhibit 4, Page.3, Lines 11-19.
[36] CA Pub. Utilities Code §451.
[37] CA Pub. Utilities Act, Article II, § 13(b).

Therefore, from 1915 until the present, this law and California Public Utilities Code section 451 have consistently required PG&E to maintain instrumentalities, equipment, and facilities to promote the safety of their patrons, employees and the public.

Compliance with PUC section 451 requires the use of good engineering practices and compliance with applicable engineering industry codes. Good engineering practice for the transport of gas in pipes requires records and data that accurately and fully describe the pipes. This information includes manufacturer, specifications, inspections done, and any previous use of a pipe.

One widely respected and widely used code of good engineering practices that was available to PG&E in 1956 was the 1955 version of ASA B31.1.8, which sets out the American Standard for Gas Transmission and Distribution Piping System. The 1955 code was the second edition of the American Standard Code for Pressure Piping, section 8, which was published originally in 1951 by the American Society of Mechanical Engineers. Code §804.5 states that "This section [8 of B31.1] is concerned with: (a) Safety of the general public, [and] (b) Employee safety to the extent that it is affected by basic design, quality of the material and workmanship, and requirements for testing and maintenance of gas transmission and distribution facilities. Code §811.25 -§811.27 set out requirements for the reuse of used pipe and unidentified new pipe in a high pressure pipeline system.

c. Discussion of Violation

Accurate and reliable records of natural gas system components are essential for safe operation of a high-pressure gas transmission system. Information about design, manufacture, and installation of a pipe drive safety decisions for years after service begins.[38] Pipe and system maintenance, and the safe limits of operations, and decisions to replace or inspect pipe, all depend on the design details of the system.[39] For instance, ASA B31.1.8 - 1955, Chapter 1, §811.27 sets out information that an operator must know for pipe to be qualified for stress levels above hoop stress of 6,000 psi.[40] At the very outset, the wall thickness of the pipe must be

[38] PG&E June 20 Testimony, p. 3-67, reference to RMP-06 (P2-128). Citations with the designations P2, P3 etc refer to records produced by PG&E in its continuing electronic production of records supporting its June 20 2011 Response. These records are available in the commissions central files on DVD and are part of the record in this proceeding.
[39] ibid
[40] ASA B31.1.8 - 1955, Chapter 1, §811.27

known to calculate hoop stress.[41] Among other things, yield strength and joint efficiency must also be known to qualify the pipe for operating stress above 6,000 psi.[42] Yield strength is usually found in the purchase records identified as the manufacturer's specified minimum yield strength, or it can be determined through physical tests. Joint efficiency is determined in the Code by referring to Table 841.12,[43] if the operator knows the type of longitudinal weld or joint in the pipe (i.e. seamless, electric fusion weld, etc.). If any of the factors are unknown, the code provides a conservative value to be used in operating limit calculations.[44]

The Job File GM 136471 for the 1956 project that installed Segment 180 of Line 132, contains primarily accounting records. These records appear to have been created primarily after the line was installed and contain none of the typical records associated with a construction project.[45] Construction document files typically contain records and data such as design specifications, construction drawings, as-built drawings, inspection reports, weld x-ray inspection results, hydrostatic test records, and records of the source of the section of pipe that failed, which was made up of several small pieces of pipe, referred to as "pups."[46]

Even today PG&E does not know the source of the section of pipe that failed.[47] Without source information and specifications, PG&E lacked the necessary design factors to calculate the acceptable operating stress for this section of pipe during its life of service in Line 132. Thus, because PG&E lacked records about the pipe installed in Line 132, it operated the line without knowing whether the operating pressure exceeded the limits set by code to ensure safe operations.

It is also possible that the failed pipe section was reused pipe, salvaged from some other location in the PG&E transmission system.[48] Since PG&E has no records of the pipe's source, it cannot prove that the pipe was new pipe. PG&E admits both that it "cannot conclusively document the origin of the pipe," and that "[s]egment 180 job file documents do not foreclose

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[41] When PG&E's Line 132 operated at 390 psi, a 30 inch line with pipe wall thickness of .375 inches would have a calculated hoop stress of 15,600 psi.[Hoop Stress = (Pressure in psi X radius in inches)/pipe wall thickness in inches]
[42] ASA B31.1.8 - 1955, Chapter 1, §811.27
[43] 49 CFR Part 192, Table 841.12
[44] PG&E June 20, 2011 Testimony, p. 3-67
[45] Tr. Vol 3 Joint, Harrison/PG&E
[46] Tr. Vol 3 Joint Harrison/PG&E, p. 304, l. 26
[47] NTSB_460802, p. 6
[48] CPSD Exhibit 4, p. 3, Line 20 – p. 4, Line 4

the possibility that some of the pipe used on the Segment 180 job may have been reconditioned pipe."[49]

ASA B31.1.8 - 1955, Chapter 1, Sec. 811.25 provides that a pipe may be reused at a different location in the same pipeline, or may be reused in another pipeline operating at the same, or lower pressure, subject to restrictions that include a) cleaning and visual inspection of the pipe to discover any defects which might impair its strength, b) inspection for gouges, grooves and dents, and c) hydrostatic testing for pipe of unknown specification and the test pressure used shall establish the maximum allowable operating pressure subject to further limitations related to the Steel Pipe Design Formula.[50] The state of PG&E's records do not demonstrate whether PG&E attempted to meet any of these requirements assuming the pipe was indeed reconditioned or reused.[51] Clearly PG&E did not attempt to meet most of these requirements, because either a visual inspection or a hydrostatic test likely would have stopped the pipe installation.

PG&E cannot produce historical records that show the source or specifications for the piece of Segment 180 pipe that failed on September 9, 2010. If the pipe was salvaged from another line in the transmission system, without records PG&E cannot say what the operating pressure was in the pipeline of former service and therefore cannot establish the minimum allowable service pressure for the piece of salvaged pipe. Further, if the pipe was salvaged, PG&E has no records that show that it was cleaned, inspected, or hydrostatically tested to establish the appropriate maximum allowable operating pressure during service in Line 132. Therefore, if the piece of pipe was salvaged from another part of the PG&E gas transmission system, PG&E failed to meet the minimum requirements for the safe reuse of salvaged pipe.

Finally, evidence exists in the accounting Job File for GM 136471 (the 1956 installation of Segment 180) showing that 90 feet of pipe from a portion of Line 132 was replaced and reused in 1956 on the Segment 180 installation. Although there is no further information in PG&E's records regarding the exact location from which the 90 feet of pipe was salvaged, the length matches the length of pipe that previously had spanned the creek canyon that was filled in

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[49] PG&E Exhibit 61, pp. 4-1 and 4-2

[50] The Steel Pipe Design Formula is set out in Sec. 841.1: Design Pressure (in psi) =([2 X Specified Min. Yield Strength (in psi) X minimum wall thickness (in inches)] / Diameter of the pipe (in inches)) X Construction type design factor X Longitudinal joint factor X Temperature derating factor.

[51] PG&E's records provide no pertinent information about the pipe source, or manufacturing specifications regardless of whether the pipe was reused or new.

as part of the work on the housing development.[52] The 90-foot span of pipe had extended across the creek canyon. Over 50 years later, the area of that span became the location of the September 9, 2010 pipe failure. It is known from the record that the pipe that spanned the creek was exposed to additional stresses because it was originally unsupported.[53] An unsupported heavy pipe is always subject to mechanical stress. Also, after installation a landslide occurred on the south slope of the creek, causing PG&E to add a support.[54] Unfortunately, the extensive Job File for GM 98015 that installed Line 132 from Crystal Springs to Martin Station in 1948-49, is missing the construction records that would have detailed the design and construction of the original span itself.[55]

No records show the precise location along Line 132 from which the 90 feet of pipe installed in Segment 180 was salvaged. However, one page in the file shows that 90 feet of pipe was salvaged and reused on the same project.[56] But, if the salvaged pipe had been damaged due to stresses in previous service, reuse of the pipe could have led to the ultimate pipe failure in San Bruno. Under ASA B31.1.8 - 1955, Chapter 1, Sec. 811.27, reuse of pipe in the same line, is permitted, subject to cleaning, inspection, and hydrostatic testing. No records demonstrate that PG&E cleaned, inspected or hydrostatically tested the 90 feet of salvaged pipe before it was reused in Segment 180. If the piece of pipe that ultimately failed, causing the San Bruno explosion, came from the stressed section of pipe salvaged from the span, then the San Bruno failure itself is proof that PG&E failed to comply with the code.

PG&E's records do not foreclose the possibility that the failed pipe was slated to be junked and was instead installed at San Bruno.[57] The NTSB noted that the pipe had metal characteristics of scrap, that it was rolled in an abnormal direction, and that it had a number of pups contrary to good construction practices.[58] In 1955 PG&E's records show a 30 inch pipe made of pups and in a length consistent with the failed pipe.[59] PG&E claims that that pipe was

[52] CPSD Exhibit 4, p. 3, l. 20 – p. 4
[53] CPSD Exhibit 4, p. 4, l. 4-6 and footnote 18
[54] CPSD Exhibit 4, footnote 17
[55] Detailed construction design and As-Built Drawings exist in the GM 98015 for other creek crossings on the project. So, it was the practice to create such drawings.
[56] CPSD Exhibit 4, p. 3, l. 20, referencing document MAOP06001661
[57] CPSD Exhibit 4, p. 3, l. 11-19
[58] CPSD Exhibit 6, fn 1, Attachment 1 Page 46 (NTSB August 30, 2011 Accident Report)
[59] CPSD Exhibit 4, page. 3, l. 14

scrapped, but has no records which show anything about the pipe's destination, whether it was a junkyard, the San Bruno site, or elsewhere.[60]

d. Discussion of PG&E Defenses

PG&E notes that it is common in the industry to be missing historical records.[61] This defense may in some instances be legitimate for records that have no bearing on the safe operation of high-pressure pipelines. However, CPSD is aware of no law that excuses PG&E's practice of operating its pipelines without knowing key design, manufacturing and construction information, including design and manufacturing information, about installed pipe. PG&E has operated Line 132 and its other transmission pipes under conditions for which it was not designed, manufactured, or constructed. PG&E is clearly in violation of Sec. 451 for failing to track the salvaged pipe that ultimately found its way into the Segment 180 pipe installed by GM 136471. The record also shows that PG&E's operation of the pipeline in reliance on erroneous and missing pipe design, manufacturing, and construction information contributed to the catastrophic failure of the piping.

PG&E also states that in 1956, it voluntarily complied with ASA B31.1.8.[62] PG&E claims that it used conservative values, as set out in the code, when it could not determine the value based on historic records, rendering the loss of the original construction records inconsequential.[63] This is PG&E's defense to CPSD charges that the company was missing key engineering records and data for Line 132.

In fact, B31.1.8 called for the use of default yield strength of 24,000 psi in instances where the manufacturer's specified minimum yield strength (SMYS) is unknown. In the case of the bad pipe installed in Segment 180, PG&E not only failed to apply good engineering practices in inspecting, testing and documenting the design and construction of the pipe during the project GM 136471, it also carried on the books a yield strength of either 42,000 psi or 52,000 psi for that segment of pipe.[64] Both of these values are well above the default SMYS of 24,000 psi that B31.1.8 allowed for unknown pipe. Thus, for the operating life of Line 132 since 1956, PG&E

[60] CPSD Exhibit 4, page. 3, fn 13
[61] PG&E Exhibit. 61, page. 1-15
[62] PG&E Response to DR 15 Q 6
[63] PG&E Exhibit 61, p. 4-6, l. 29-31
[64] PG&E's records show both SMYS ratings for the pipe installed in Job 136471, with PG&E stating most recently that it was 52,000 psi.

operated the pipeline well above the pressure level specified based on good engineering practices, and created a safety risk to the public, PG&E employees and contractors at all times that the pipeline was operating between 1956 and 2010.

PG&E's witness Harrison speculated that the bad piece of pipe containing several pups could have been delivered from a manufacturer as the center piece of a 60 foot section of pipe that was then wrapped at an off-site facility and subsequently delivered to the project site.[65] He testified that if that had occurred, PG&E would have been unaware of the pups in the pipe section.[66]

PG&E produced no evidence showing the delivery of 60-foot sections of pipe to the GM 136471 project site and therefore cannot prove that Mr. Harrison's theory is anything more than speculation. PG&E bears the burden of proving its affirmative defenses. PG&E must do so by evidence rather than by guess.

PG&E also contends that the pipe pieces that were used on GM 136471 may have been new pieces of pipe remaining from other projects.[67] This statement is again highly speculative and is unsupported by evidence. A GM 136471 accounting file record shows that 90 feet of pipe previously installed in Line 132 was reused on the GM 136471 project.[68] Further, PG&E cannot explain why allocations of new pipe to GM 136471 do not show up in pipe inventory records for the period 1955 – 1956. PG&E further contends that pipe referred to in the record as "reconditioned pipe" is actually new pipe that has been re-wrapped prior to delivery to a project, and is not salvaged pipe. But, PG&E fails to acknowledge that salvaged pipe was routinely cleaned and rewrapped prior to reuse, a process also referred to by PG&E as "reconditioning."[69]

PG&E claims that the 90 foot section of salvaged pipe could not have been the pipe that spanned the creek. As proof, PG&E offered an illustration that it created after the San Bruno explosion to show the location of the pipe that it claims to have been abandoned in place.[70] PG&E stated that a camera run through the open north end of the abandoned pipe in 2011 revealed that the pipe was still in place, buried under the dirt used to fill the canyon[71].

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[65] Tr. Vol 3 Joint Harrison/PG&E, p. 344
[66] ibid
[67] ibid
[68] CPSD Exhibit 4, page. 3, Lines l. 20
[69] CPSD Exhibit 4, page. 4, Lines l. 14
[70] PG&E Exhibit 55
[71] Tr. Vol. 2 Joint p. 219 Harrison/PG&E

PG&E's presentation fails to prove its claim that the pipe remains in place today, where it was originally installed. First, the only drawings of project GM 136471 that PG&E has produced show the pipe that spanned the creek both as "abandoned in place" and "removed and salvaged," leaving one to guess actual final disposition of the 90 foot span of pipe at the conclusion of the 1956 construction project. Second, PG&E's engineer stated that the camera ran into mud at the point on the drawing that would have been the northern point of the original span.[72] So, although PG&E viewed the pipe north of the span that was buried during the original 1948 project, it was not able to actually verify through the camera that the pipe that had spanned the creek was still in place.[73] Instead, PG&E observed that there is mud where the pipe used to be, which is what one would expect to see if the pipe had been salvaged before the canyon was filled with dirt.

Most importantly, PG&E admits that it does not know the source of the piece of pipe that failed on September 9, 2010. The San Bruno pipe explosion is proof that PG&E engaged in inherently unsafe practices when it failed to create and retain orderly records of new, salvaged, reconditioned, reused, or junked pipe.

e. Duration and Scope of Violation

The GM 136471 project that installed the section of pipe that ultimately failed was completed in July 1956. However, GM 98015 that installed the span over the creek was completed in 1949. Because the missing records from the 1949 project could have informed PG&E about the condition of the section of pipe that failed, this violation extends from 1949 to September 9, 2010. This violation is a continuing violation because every day the records were not available to PG&E, was a day that the operating pipeline operated unsafely.

f. Summary of Violation's Negative Effect on Safety

PG&E's lack of records led it to reuse pipe that was not designed or manufactured to meet the minimum requirements for service in Line 132, and ultimately led to the failure of the pipe. Thus, PG&E's poor recordkeeping practices, combined with its policy of salvaging and reusing pipe, made it possible for a piece of pipe that did not meet minimum safety standards to

[72] JOINT (CPSD) Exhibit 11
[73] Tr. Vol 2 Joint, p. 222-223 Harrison/PG&E

be installed in a high pressure transmission line where it ultimately failed, causing deaths, injuries, and property destruction.

Violation 2: Construction Records for 1956 Project GM 136471

a. Summary of Violation

PG&E failed to keep complete and accurate construction records for the project GM 136471, the project that installed Segment 180 in 1956, replacing a part of Line 132 that had been installed in 1948.[74]

The project file for GM 98015, the 1948 Line 132 project, is missing vital construction records related to the original installation of the portion of the line that was replaced in project GM 136471.[75] PG&E operated Line 132 at high pressures despite a lack of critical information about the design and construction of Segment 180, placing employees and the general public in danger. The unavailability of construction records for line 132 undermined the safe operation of the line just as missing construction records for other lines diminishes their future safety. In addition, construction records are critical to the analysis of the causes of the San Bruno pipe failure.

b. Laws that PG&E Violated

California Public Utilities Code § 451 requires that every public utility shall furnish, provide and maintain such service, instrumentalities, equipment and facilities as shall promote the safety, health, comfort and convenience of its patrons, employees and the public.[76] PG&E's

[74] CPSD Exhibit. 4, Page. 5

[75] Original construction documents for the section of pipe that spanned the creek are missing from the 1948 Job file for Project GM 98015.

[76] Since 1951, California Public Utility Code §451 has required that "Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities. . .as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public." Even before §451 was written, from 1911 to 1951, the California Public Utility Act, Article II, §13(b) required that "Every public utility shall furnish, provide and maintain such service, instrumentalities, equipment and facilities as shall promote the safety, health, comfort and convenience of its patrons, employees and the public. . ." Therefore, from 1911 until the present, this law and California Public Utilities Code §451 have consistently required PG&E to maintain instrumentalities, equipment, and facilities to promote the safety of their respective patrons, employees and the public.

failure to create and maintain accessible information about the 1956 construction project has compromised, and will continue to compromise, Line 132 and system safety.

c. Discussion of Violation

PG&E failed to create and/or retain construction records for GM 136471, the project that installed segment 180 of line 132.[77] Good engineering practices and regulations require the retention of engineering and construction records for gas transmission facilities for the operating life of the facility.[78] PG&E's failure to follow these practices created an unsafe condition for engineering, maintenance, operations, and integrity management risk assessment of Line 132 and the entire high pressure gas transmission system. CPSD's report put the matter in this way. "If PG&E had kept orderly records of the purchase, installation, salvage, reconditioning, inspection, and reuse of pipe installed in its transmission system, PG&E would not have selected that pipe for project GM 136471, because it did not meet PG&E's own standards for high pressure transmission pipe."[79]

Construction records normally include records for the project design, contracts, specifications for purchased materials (including pipe), construction drawings, as-built drawings, inspection records, testing records, maintenance records, details regarding the acquisition and delivery to the site of pipe and materials, as well as the final disposition of materials salvaged during the project.[80]

Job file GM 136471 constitutes PG&E's file of record[81] for the 1956 construction of the high pressure section of pipeline identified as Segment 180. PG&E is adamant that job files are the files of record, and that the job files have been the primary source of accurate information for the company to use for integrity management, rather than its now defunct pipeline history files or its currently Geographic Information System (GIS).[82]

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[77] CPSD Exhibit. 4, Page. 5
[78] PG&E P2-2, FERC 36A (18 CFR 125); June 10, 1920, ch. 285, pt. III, § 302, as added Aug. 26, 1935, ch. 687, title II, § 213, 49 Stat. 855; ASA B31.1.8-1955
[79] CPSD Exhibit. 2, Page 2, Lines8-11, fn 5
[80] CPSD Ex. 2, p.32, l. 7-8 and fn. 125
[81] PG&E Ex. 61, p. 3-66. PG&E states "GIS serves as a central reference, it does not serve as our system of record for pipeline documents, which are maintained in hardcopy format in job files." And Daubin, Transcript Vol 16, p. 47 "PG&E job files would be referred to as the system of record."
[82] Ex. PG&E 61, p. 3-53 and 3-54, and statement of PG&E counsel, PHC 5, pp. 167 and 168. Counsel for PG&E does not appear to agree fully with his witness that GIS is used for integrity management, and has goes so far as to say that 'pipeline engineers can identify where there is reused pipe by looking at those

At the time of the San Bruno explosion, PG&E had no construction records in its Walnut Creek engineering facility or elsewhere for Job Number GM 136471. After the pipeline explosion in September 2010, PG&E did locate a Job File for GM 136471 in historical accounting records kept at the Bayshore Records Center in San Francisco, a facility where PG&E kept inactive records.[83] The file contains accounting records that provide some information regarding requisitions for pipe, but no actual design or construction records.[84] The job file contains nothing to identify the source of the pipe used in the job, pipe specifications, previous pipe service (if any), or anything pertaining to its installation.[85]

The job file does provide erroneous specifications of the pipe, however. PG&E claims that Western Consolidated is the likely manufacturer of the failed pipe.[86] PG&E's accounting records show a X52 SMYS material requirement for this pipe. PG&E's GIS shows the pipes with X42 requirements.[87] The NTSB found that four pups did not meet the X42 requirement shown in GIS, and two pups met all requirements. One of the pups had a chemical composition consistent with scrap material.[88] PG&E has no idea today how or why it installed in 1956 such pipes, completely unsuitable for transmission gas service. This lack of knowledge is a direct result of PG&E's poor records.

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.[89] It is hard to believe PG&E would have allowed a third party to fill the canyon, covering 90 feet of active 30 inch gas transmission line, and would not have created or maintained any explanatory or supporting documentation[90]. These records typically would have been added to the Job Files for

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job files", and that "[i]t doesn't matter what GIS says. The job file contains that information [the location of reused pipe]." PG&E's gathering of reused pipe information from PG&E's job will continue until sometime in 2013, almost three years after the San Bruno pipe failure. No evidence explains how PG&E should use PG&E's job files to prioritize pipeline replacement based on reused pipe that could be located virtually anywhere in PG&E's system.

[83] Exhibit No Joint-010, File for GM 136471. File folder is stamped "Closed", "Return to Plant Accounting Dept." and "Return to Records Center Bayshore and Geneva Brisbane #465741."

[84] CPSD Exhibit 4, Page 5, Lines 17-23

[85] Ibid.

[86] CPSD Ex. 2, p. 2, fn. 3

[87] CPSD Joint Ex. 10

[88] CPSD Exhibit 6, fn 1, Attachment 1 Page 46 (NTSB August 30, 2011 Accident Report).

[89] CPSD Exhibit 4, Page 6, fn 31.

[90] CPSD Exhibit 4, Page 6, lines 2-4

GM 136471 and/or GM 98015. But, a thorough review of both files shows that no records relevant to this issue were retained.

None of the construction drawings for either of the projects showed anything like the pipe that actually failed on September 9, 2010. In effect, PG&E employees were operating and maintaining Segment 180 of Line 132 with no knowledge of the actual details of its design or construction and with no available records to verify data displayed in the GIS system. Further, PG&E operated this segment of Line 132 for years without construction drawings showing the details of installation.

PG&E's job files contain whatever construction records exist. As this brief describes, locating material in PG&E's job files, especially before 2010, was a daunting challenge for anyone. PG&E's job files are virtually unusable for those requiring accurate information accessibly and promptly, as PG&E demonstrated at its Cow Palace MAOP validation exercise.

The absence of records detailing the construction of Segment 180 created an unsafe condition because PG&E lacked sufficient basic information to specify safe operating parameters for the pipe, such as the maximum allowable operating pressure (MAOP) and maximum operating pressure (MOP).[91] PG&E endangered its employees and the public by operating Line 132 without knowing the details of the construction of Segment 180 and made no effort to find or recreate the original construction file from 1956 to 2010. Nor, evidently, did PG&E ever review the job file to ascertain what missing information it would be necessary to obtain or reconstruct for integrity management purposes.

d. Discussion of PG&E Defenses

PG&E's testimony "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.[92] CPSD does not expect perfectly detained drawings and data from 1956, but there should be drawings that describe the basic pipe configuration including pups, pipe specifications and manufacturer, and hydrostatic test results. PG&E evidently believes that this would have been asking too much from PG&E in 1956. CPSD disagrees.[93]

[91] 49 CFR 192.620
[92] PG&E Exhibit 61, p. 4—4, underlining emphasis added and TR. Vol 12 p. 1851-1852, l. 22
[93] CPSD Exhibit 4, Page 5, Lines 4-16.

PG&E notes that it is common in the industry to be missing historical records.[94] We have already noted that, while this argument may be acceptable for records that have no bearing on the safe operation of high pressure pipelines, nothing excuses a practice that results in operation of a pipeline without knowledge of its basic design, and thus exposing the pipeline to operating conditions for which it was not designed. PG&E is clearly in violation of Sec. 451 for the loss of the Job File for GM 136471 and key records that should have been in the Job File for GM 98015.

Good records, if created and maintained, would have been a source of accurate information that could have prevented the San Bruno explosion. First, reasonable information from 1956 should have either provoked PG&E to reject or to visually inspect the pipe that failed at San Bruno. CPSD does not believe that § 451 asks too much of PG&E. In 1956, PG&E should have kept records showing the source of the pipe and the fact that it was made partly of scrap metal, with half a weld. After 1956, if PG&E had looked at even minimally accurate construction records at any time within 55 years after installation, the company would have had good reason to dig up the pipe and examine it.

PG&E argues that "[t]to assert that a recordkeeping system for reconditioned pipe would have prevented the pups from being used in the Segment 180 project is both speculative and revisionist. In hindsight, having a tracking system for the history of each piece of pipe used or in inventory would have been a valuable practice". [95] CPSD certainly agrees that a tracking system for each piece of pipe used or in inventory would have been a valuable practice. CPSD cannot agree that "hindsight" after San Bruno was required in order for PG&E to have reached that conclusion PG&E simply needed reasonable engineering and records practices for its contemporaneous and ongoing transport of hazardous gas.

e. Duration and Scope of Violation

The GM 136471 installation of the section of pipe that ultimately failed was completed in July 1956. However, GM 98015 that installed the span was completed in 1949.[96] Since the missing records from the 1949 project GM 98015 could have informed PG&E about the

[94] PG&E Exhibit 61, p. 4-5
[95] PG&E Exhibit 61, p4-3
[96] Note on MAOP05395311 (reuse of 90 ft of pipe) states that the pipe was originally installed in 1949.

condition of the section of pipe that failed, this violation extends from 1949 to September 9, 2010. [97]

f. Summary of Violation's Negative Effect on Safety

PG&E operated Line 132 at high pressures without knowing critical information about the design and construction of Segment 180, placing employees and the general public in danger. The effect of this records violation made it impossible for PG&E to conduct integrity management analyses on Segment 180, in 1964 or 2004. In addition, construction records are critical to the analysis of the causes of the San Bruno pipe failure. The unavailability of those records hindered investigations related to the pipe explosion as well as subsequent determinations as to the safety of the portions of Segment 180 pipe remaining in the system after the explosion.

Violation 3: Pressure Test Records

a. Summary of Violation

PG&E failed to retain pressure test records for Segment 180 of Line 132 for the life of the facility. PG&E admits that it has not located records showing that a post-installation pressure test was conducted on Segment 180.

PG&E neglected to create or maintain pressure test records for the Segment 180 installation, and was therefore unable to confirm the integrity of the segment before it failed in 2010. Pressure test records are essential to confirm the integrity of a pipeline, as designed and constructed. [98] Pressure test records are basic facility records that a gas transport operator should always retain for the operating life of the pipe.[99] Pressure test records provide basic information and proof that the pipe is fit for service at a specific operating pressure.

PG&E was legally required in 1956 to follow good industry practice to create and retain records of the pressure test, if any, for the life of the Segment 180 pipe. That is a basic safety

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[97] This is true irrespective of whether 1949 span pipe was reused on the 1956 Segment 180 project. The file contains enough of this possibility to ensure that the information should have p[rovoked a search for other data , or have caused an inspection or test (with the records retained).

[98] 49 CFR 192.505

[99] ASA B31.1.8, Section 841.417 (1955) and 49 CFR 192. 517 (after 1970)

practice required by § 451, a good engineering practice, and required by PG&E's commitment to the Commission that it was following good engineering practices as codified by the American Standard of Mechanical Engineers.

b. Laws that PG&E Violated

As stated in the discussion of Violation 1, above, California Public Utilities Act, Article II, section 13(b), and later, California Public Utilities Code section 451, required that "Every public utility shall furnish, provide and maintain such service, instrumentalities, equipment and facilities as shall promote the safety, health, comfort and convenience of its patrons, employees and the public. . ." In addition, ASA B31.1.8 section 841.4, incorporated into State and Federal laws, required a test to prove strength of pipelines and mains that will operate at hoop stresses of 30% or more of the specified minimum yield strength of the pipe. Code section 841.417 requires the operating company to maintain in its file for the useful life of each pipeline and main, records showing the type of fluid used for the test and the test pressure. PG&E's own records retention guidance requires retention of construction and engineering records six years beyond the useful life of the facility.[100] A pressure test to prove the intended MAOP is an essential part of the initial construction process, and the records and data to prove that the test was done correctly – or done at all in PG&E's case – must by law be retained for the life of the asset.

c. Discussion of Violation

Years before the 1956 construction, PG&E and the industry knew the value of pipe pressure testing to confirm pipe strength. During the 1930s and 1940s, PG&E was conducting various kinds of pressure tests of pipes before installation. These tests included pressuring the pipe with a gas and soaping welds, in order to identify leaks. The 1948 construction project for Line 132 called for air pressure soap tests for the pipes and joints before they were coated and wrapped. [101] In its June 20, 2011 Response in this proceeding, PG&E stated 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 this

[100] PG&E P2-2, FERC 36A (18 CFR 125); ASME B31.8; General Orders 112, 112A, and 112 B, § 107 (all incorporating B31.8)
[101] CPSD Exhibit 4, Page 30, Lines 4-16

era."[102]. If PG&E contends that in 1956 a gas leak test would have sufficed to replace a hydrostatic strength (pressure) test, it is wrong. Both tests are used to confirm the integrity of welds under pressure. However, the two tests are distinct from each other, and were done in different periods of time for different purposes and under different standards and effectiveness.[103]

By 1956, a universally respected and widely used engineering practice code (ASA B 31.8 1955 Version) became available for use. In 1955 and later, PG&E represented to the Commission, in safety proceedings, that the company and other gas operators followed the ASA Code.[104] The ASA Code, and PG&E's repeated statements, required PG&E both to conduct a hydrostatic test (water forced into pipe under pressure) on all pipe prior to being placed into service, and to create written pressure test results and maintain each of them for the operating life of the facility.[105] However, PG&E failed to retain pressure test records for the pipe installed in Job No. 36471, the project that installed a segment of pipe within PG&E's pipeline system referred to as Segment 180 for the period from July 1956 to September 2010.[106] PG&E admits that it has not located records showing that a post-installation hydrostatic pressure test was conducted on Segment 180.[107]

The absence of pressure records for the pipe installed in Job No. 36471 created an unsafe condition because PG&E was operating the high pressure pipeline without the benefit of knowing the construction limitations of Segment 180 of Line 132, placing its employees and the public at risk of exposure to a pipeline failure under normal operating conditions.

[102] PG&E June 20, 2011 Response to OII, p.6D-4
[103] ASA B31.1.8 §841.42 sets out parameters for a strength test and §841.43 sets out parameters for leak tests.
[104] PG&E Response to DR 15 Q 6
[105] CPSD Exhibit 4, Page 30, Lines 22-25 and P3-30006, p. 26
[106] PG&E June 20, 2011 Report, Page 6D-4, lines 8-10.
[107] PG&E Response page 4-6, lines 9-10

d. Discussion of PG&E Defenses

PG&E brings up two defenses relating to its failure to produce segment 180 strength test records in this proceeding. First, PG&E claims that compliance with industry codes was voluntary in 1956, and no law required the company to do any strength testing or to maintain test records of the segment 180 pipe that later failed.[108] Second, PG&E claims that it actually conducted a hydrostatic test of Segment 180 in 1956.[109] Neither defense is valid.

In 1955 PG&E represented to this Commission that it followed the ASME B31.8 standard[110]. PG&E again assured the Commission in 1959 and 1960 that it continued to comply with ASME engineering standards. [111].

PG&E cannot turn its claimed compliance with an engineering safety standard on and off like a light switch. When PG&E represented in 1955 testimony that it complied with ASME standards, PG&E became responsible for doing exactly that, until the Commission relieved PG&E from that responsibility. Otherwise the safety assertions of PG&E – and the decisions of the Commission which rely on those assertions – would be meaningless and false.

In any case, PG&E's argument that the B31.8 standard was "voluntary" is primarily a semantics defense. By 1956 engineering practices that promoted safety required hydrostatic testing of all new pipe installations.[112] Because good engineering practice and the promotion of safety required testing and maintaining records, there is nothing "voluntary" about a utility's decision to do so. In California, when a utility fails to use available, appropriate, and proven engineering practices to promote safety, the Commission must hold the utility responsible under the law. Thus, even if the practice of testing and keeping records had not been codified by ASME, it would have been required as a good engineering safety practice under section 451.

PG&E also claims that, although a test was not required by law, PG&E conducted a hydrostatic test on Segment 180 during installation in 1956.[113] Under this alternative scenario, PG&E says it cannot locate the test results.

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[108] CPSD Exhibit 6, fn 1, Attachment 1 Pages 5-12 (NTSB August 30, 2011 Accident Report)
[109] CPSD Exhibit 4 p. 6 l. 15-19 and footnote 34
[110] PG&E Ap. 29548, 1955, Tr. Vol 1, p.124, Smith/PG&E (PG&E Response to DR 15 Q6 Atch 3)
[111] Statement of PG&E, Case 6352, re GO-112 (PG&E response to DR 15 Q6 Atch 4) and PG&E response to DR 15 Q 6
[112] PG&E Ap. 29548, 1955, Tr. Vol 1, p.124, Smith/PG&E (PG&E Response to DR 15 Q6 Atch 3)
[113] PG&E Response page 4-6, fn 13

The evidence that PG&E conducted a hydrostatic test is less than compelling. PG&E refers to testimony given in the San Bruno civil cases by a former PG&E employee, who recalls viewing a pressure test done on Segment 180 when it was installed.[114] The PG&E employee was not involved in the test, but recalls observing the test pressure as 1000 psi. A pressure of 1000 psi would have been 2.5 times greater that the pipe's design pressure of 400 psi. This test pressure was much greater than the engineering test standard of PG&E or ASME at the time. It is likely, for that reason and others, that whatever test was observed by the PG&E employee during 1956 was not a test of the pipe that failed in 2010.

The NTSB has found that PG&E did not conduct a hydrostatic test on Segment 180, and that a proper hydrostatic test might have caused the defective pipe to fail at the time, thus preventing the San Bruno failure years later.[115] That represents another good reason why it is unlikely that PG&E conducted a hydrostatic test on Segment 180. PG&E suggests that such a test could have weakened the pipe weld, which led to its ultimate failure. A 1956 PG&E standard Form for Strength Test Pressure Reports (STPR) was used for both hydro and gas pressure tests.[116] According to this form, the test pressure for a hydrostatic test was approximately 1.10 times the design pressure of the line and the gas test pressure was about 1.15 times the design pressure.[117] PG&E has not produced a completed form documenting the test that the PG&E employee recalls, and, based on PG&E's standard procedure in effect in 1956, it is highly unlikely that PG&E performed a hydrostatic test on Segment 180 at 1000 psi.

Finally, PG&E has itself made it impossible to ascertain whether it conducted a hydrostatic test in 1956. The best evidence of the test would have been contemporaneous test records. However, if there ever were records of a hydrostatic test on segment 180, PG&E has either discarded or lost them. In the absence of records, the most reasonable inference, consistent with burden of proof, is that PG&E did no test for Segment 180.

Nevertheless, if there was a test of any kind, ASME and § 451 required PG&E to retain a record of the test results and, by its own admission, PG&E failed to do so.

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[114] PG&E Response page 4-6, fn 13.
[115] CPSD Exhibit 6, fn 1, Attachment 1 Page 95 (NTSB August 30, 2011 Accident Report).
[116] CPSD Exhibit 4, Pages 6, Lines 20-21 and 7, Lines 1-3
[117] Example Standard Forms #75-27. Also, see ABA 31.1.8 Sec. 841.42, which sets out the tests required to prove strength for pipelines and mains.

e. Duration and Scope of Violation

The GM 136471 project installing Segment 180 in Line 132 was completed in July 1956. If a pressure test was conducted and a report was created at that time, there is no indication in the record of when it disappeared. CPSD assumes a report was either not created or not retained and should be considered missing since 1956. For purposes of this proceeding, the violation is from 1956 to 2010. As with all gas pipe violations, the violation is daily, matching the daily use of gas transport and the daily harm to public and employee safety.

f. Summary of Violation's Negative Effect on Safety

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 the absence of a test record, it is impossible to verify the condition of the pipe integrity, or the design pressure, upon installation. As a result, PG&E operated Line 132, Segment 180 without sufficient information to verify that it could be operated safely at the typical operating pressure for Line 132. The result was catastrophic failure on September 9, 2010 that caused deaths, injuries and destruction of properties.

Violation 4: Underlying Records Related to Maximum Allowable Operating Pressure for Segment 180

a. Summary of Violation

From 1978 to 2004, PG&E operated Segment 180 of Line 132, at a Maximum Allowable Operating Pressures (MAOP) of 390 psi. PG&E's Pipeline Survey Sheets, GIS and Official MAOP list for pipelines, called Drawing 086868,[118] required a 390 psi MAOP for the part of Line 132 that included Segment 180.

Starting in 2004, and continuing until September 2010, PG&E operated the line at an MAOP of 400 psi. This change violated the law and was unsafe. In 1978 PG&E personnel in the San Francisco Division directed an MAOP of 390 psi for a northern section of line 132 and that

[118] See example at P2-963

lower MAOP should have continued to take safety precedence over the 400 psi established by PG&E under the "grandfather clause" using 1968 data from the Milpitas station.

PG&E operated the pipeline using these values for 26 years and through at least nine engineering reviews. PG&E'S long operation at 390 psi, along with PG&E's history of deficient records, establishes a likelihood that PG&E engineers in the 1970s had good reason, supported by data that no longer exists or remains inaccessible, to set a 390 psi MAOP for Segment 180. PG&E has evidently lost or cannot locate the records which once existed and supported the 390 psi MAOPs for sections of Line 132.

In the absence of the underlying records for the 390 psi, PG&E decided in 2004 to uprate the MAOP of Line 132 to 400 psi. The company operated Line 132 Segment 180 line at a sustained pressure of 400 psi in 2003 and 2009, potentially weakening the defective weld in Segment 180. Had PG&E followed regulations for uprating the MAOP on a line, a hydrostatic test would have been performed[119] and the weld would have failed under controlled test conditions, thus averting the San Bruno explosion.

Regardless of whether the uprating and a test would have prevented the San Bruno explosion, PG&E's actions were patently unsafe.

b. Laws that PG&E Violated

PG&E violated §451 of the Public Utilities Code, by failing to retain the records and data which PG&E had used in 1978 to set MAOP at 390 for the next 26 years. In addition, PG&E's actions to reassert the 400 MAOP after 30 years of operation at a more conservative MAOP constituted unsafe practice, especially in the absence of the MAOP data that PG&E had relied on in 1978 to set MAOP to 390 MAOP. Further, without this data PG&E was required to follow regulations for uprating the MAOP on the line, which would have included a hydrostatic test, but PG&E failed to comply with the requirement.

c. Discussion of Violation

PG&E engaged in unsafe practices when it failed to create or retain the underlying records supporting the Maximum Allowable Operating Pressure for Segment 180 of Line 132.

[119] 49 CFR 192.555

Good engineering practices and regulations require the creation and retention of engineering and construction records for gas transmission facilities for the life of the facility, including pipeline specifications and any other information necessary to safely establish the maximum allowable operating pressure for each section of pipe installed.

PG&E's records supporting the Maximum Allowable Operating Pressure (MAOP) for Segment 180 have been difficult to evaluate because PG&E's record system lacks organization and because many records and data are missing.

Specifically, PG&E is missing the underlying records to support an MAOP of 390 on Segment 180, which was carried in PG&E's records for over 26 years.[120] CPSD believes the San Francisco Division may have relied on pressure records from a pressure monitor installed in 1948 with a gas flow meter at a point on line 132 at the border between the San Jose and San Francisco Division areas to obtain inter-division accounting on gas deliveries. The actual monitoring data was recorded at the Potrero Gas Plant.[121] Presumably, the San Francisco Division would have referred to its own records to establish the MAOP for its section of Line 132 under the grandfather clause. The loss of the records that supported a Division's recommendation to reduce the MAOP from 400 psi to 390 psi in 1974, on the section of line 132, which included Segment 180, created an unsafe condition when PG&E increased the maximum pressure to 400 in 2004 and thereafter.[122]

In 2003, PG&E decided that an "error" had led to the decision almost 30 before to reduce the line 132 MAOP, for a 46 mile length of the line, from 400 psi to 390 psi.[123] Despite a lack of records and data that PG&E personnel may have reviewed to justify the 1978 MAOP reduction, PG&E increased the MAOP in 2004.

This 2004 MAOP increase was implemented without a hydrostatic test of the involved portion of line 132 between mileposts 35.84 and 46.59. A hydrostatic test was required by regulations written to ensure the integrity of the pipeline at the higher pressure rating.[124] The operation of Segment 180 at an MAOP of 400 psi placed employees and the public at risk of exposure to a pipeline failure. PG&E should have acknowledged the loss of the underlying records and, at least, recognized the possibility that personnel 30 years earlier may have had

[120] CPSD Exhibit 4, Page 7
[121] PG&E Response to DR 18 Q 17 Atch 6)
[122] CPSD Exhibit 2, Page 3, Lines 3-9
[123] CPSD Exhibit 2, Page 3, Lines 18-20
[124] 49 CFR 192.553

good reason, later unavailable, to reduce Line MAOP for a 46 mile length of pipeline. If the company had done so and had followed regulations for uprating the MAOP on a line, a hydrostatic test would have been performed[125] and the weld would have failed under controlled test conditions, thus averting the San Bruno explosion.

d. Discussion of PG&E Defenses

PG&E defends its use of the1970 grandfather clause and its available historical records to establish an MAOP of 400 psi on Line 132. PG&E did so without officially uprating and hydrostatic testing the section of the line from MP 35.84 to MP 46.59.[126]

PG&E contends that the higher pressure was supported by the grandfather clause, which allowed PG&E to operate the line at the highest operating pressure recorded between 1965 and 1970. However, the code specifies that the utility must use the lowest MAOP for the line. Since PG&E had documented an MAOP of 390 psi for a section of the Line 132, that lower MAOP should override the 400 psi established by the grandfather clause. 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.

There is no evidence that such an error was uncovered by PG&E now or in 2004. The reduced MAOPs recorded for several segments of line 132, appear to have been purposely entered into the Pipeline Survey Sheets.[127] MAOPs of 400, 375 and 390 were entered for line 132. These Pipeline Survey Sheets were initially created in 1974 and modified from 3 to 9 times,[128] 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 use.[129] 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 psi that is not within the San Francisco Division. Because PG&E lacks any information to support the apparent arbitrary revision of the MAOP on one segment of Line 132 from 375 to 400 psi, and from 390 to 400 psi, PG&E should have hydrostatically tested both segments prior to the MAOP uprating.

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[125] 49 CFR 192.555
[126] PG&E Exhibit 61 pp.4-8 through 4-12.
[127] DR 7 Q 12 attachments 60 through 65: Survey Sheets showing various MAOPs for Line 132.
[128] Modifications with dates are shown in the title block at the lower right hand corner of each Survey Sheet.
[129] CPSD Exhibit 4, Pages 7- 8

From 1974 to 1998 several revisions were made to the Pipeline Survey Sheets, which means PG&E personnel reviewed the data on the sheets each time a change was made. For instance, Sheets number 12 and 13, each showing an MAOP of 390, list "data updates" in 1978, 1989, 1992 and 1998. Sheet number 11, 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, which were often not readily accessible to PG&E personnel.[130] Thus, it is likely that engineers and operating personnel used 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 long before 2003. 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, that PG&E changed the MAOP to 400 psi for the entire Line 132 in 2004 by editing historical records.[131]

A utility gas transporter loses flexibility and ability to meet high customer demand if it unable to transport gas at its maximum safe pressure. CPSD suggests it is unlikely that PG&E would have allowed an error to hamper delivery capabilities and flexibility, and gas sales, for an important Bay Area pipeline for 30 years.

PG&E cannot and does not deny that it had conflicting MAOP records for Line 132 from 1978 to 2004. Even today PG&E cannot produce underlying records to explain why it set the MAOPs of some parts of Line 132 at 390 psi and some at 375 psi and operated its system with these values in place for at least 26 years. If PG&E indeed relied on conservative assumptions when data is unknown - as PG&E has repeated claimed it has - it would have tested Segment 180 after 2004. In the absence of underlying records documenting the reasons for the 390 psi 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

[130] CPSD Exhibit 4 Page 8, Lines 9-10
[131] CPSD Exhibit 4, Page 8, Lines 17-19

Line 132.

PG&E's experts stated that it was industry practice to dispose of pressure test records after it was determined that the utility could rely on the Grandfather clause to establish the MAOP of an older line. CPSD recommends that the Commission reject this argument. Standards were in place by 1956, including ASME B. 31 and PG&E's own 1956 standard for documenting and retaining pressure test results.[132] PG&E was, and continues to be, responsible for preserving all engineering and construction records, including records related to establishing the correct MAOP for a pipeline. The record of this proceeding contains no evidence of any utility, other than PG&E, destroying records. But, even if others in the industry had disposed of legally required records, it would have no bearing on this investigation of PG&E's practices and records.

In D.12-12-030, pp.96-97, the Commission rejected PG&E's argument that it had no obligation to maintain accurate and accessible records of the components of its natural gas transmission system because the historical exemption provision of 49 CFR 192.619(c), also known as "the Grandfather clause," did not require these records. The Commission explicitly found in this regard:

> We disagree with PG&E's reading of the PHMSA regulations and we want to disabuse PG&E and other California natural transmission gas system operators of the notion that superficial compliance with regulations is acceptable. We require our natural gas transmission system operators to exercise initiative and responsible safety engineering in all aspects of pipeline management. Simply because a regulation would not prohibit particular conduct does not excuse a natural gas system operator from recognizing that such conduct is not appropriate or safe under certain circumstances.
>
> Turning to the specific federal regulation upon which PG&E bases its claimed exemption from a duty to create and maintain accurate and reliable natural gas transmission system records, we find that the regulation presupposes an engaged and evaluating system operator, questioning system operating parameters, examining records, and exercising professional engineering judgment. Specifically, the regulation states:
>
> "(c) The requirements on pressure restrictions in this section do not apply in the following instance. An operator may operate a segment of pipeline found to be in satisfactory condition,

[132] Tr. 12, p. 1752 l. 5-10, Zurcher/PG&E

considering its operating and maintenance history, at the highest actual operating pressure to which the segment was subjected during the 5 years preceding [July 1, 1970]".[133]

To comply with this provision, a natural gas system operator must undertake four separate affirmative obligations:

1. Examine and determine that the pipeline segment is in satisfactory condition;
2. Obtain and evaluate its operating history;
3. Obtain and evaluate its maintenance history; and;,
4. Determine the highest actual operating pressure during the five year period.

No natural gas system operator can comply with these requirements without creating and preserving accurate and reliable system installation, operating, and maintenance records. Thus, we find that PG&E has failed to demonstrate that long-standing regulations excuse incomplete and inaccurate natural gas system record-keeping.

e. Duration and Scope of Violation

It appears that records were created to support the MAOP of the part of Line 132 that included Segment 180 sometime around 1978, although PG&E has not been able to locate the records underlying the MAOP of 390 psi. A conclusion that there were no records supporting requires adopting the unproven PG&E assumption that the 1978 MAOP change was entirely baseless although it remained in effect for over 26 years. In view of PG&E's volume and scope of missing records, this assumption cannot be sustained. CPSD believes the more credible conclusion – consistent with the evidence and with PG&E's burden of proof - is that the records were created, but not retained, and have been missing since at least 1978. Thus, for Violation 4, CPSD PG&E violated section 451 from 1978 to 2010.

f. Summary of Violation's Negative Effect on Safety

In the absence of the underlying records, PG&E decided to uprate the MAOP of a portion of Line 132 to 400 psi and proceeded to operate the line at a sustained pressure of 400 psi in 2003 and 2009, potentially weakening the defective weld in Segment 180. Had PG&E followed

[133] Footnote 98 in Decision 12-12-030 referring to 49 CFR 192.619(c).

regulations for uprating the MAOP on a line, it would have performed a hydrostatic test and the weld would have failed under controlled test conditions, thus averting the San Bruno explosion.

Violation 5: ClearanceProcedures

a. Summary of Violation

On September 9, 2010, the day when an overpressured pipe failed, in San Bruno, PG&E maintenance personnel were performing maintenance on the electronic systems of the fully operating Milpitas Terminal. PG&E personnel did their maintenance 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.

An adequate Clearance Procedure could have prevented the electrical problem that led to the over pressuring of the Peninsula pipelines and, thus, might have averted the San Bruno explosion. At the least, an adequate Clearance Procedure could 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 are lists of numbers scribbled on two pages without context or apparent order,[134] written by the contract electrical engineer who was overseeing the work.[135]

b. Laws that PG&E Violated

As stated in the discussion of Violation 1, above, California Public Utilities Act, Article II, section 13(b), and later, California Public Utilities Code section 451, have required that "Every public utility shall furnish, provide and maintain such service, instrumentalities, equipment and facilities as shall promote the safety, health, comfort and convenience of its patrons, employees and the public." In addition, PG&E's Utilities Work Procedure WP4100-10 outlines the Clearance Procedure, which includes specific steps to be taken when preparing and submitting a clearance for work to be performed at any facility if the work could potentially

[134] PG&E Response to DR 3 Q13 atch 1.
[135] PG&E Response to DR 3 Q 13

effect ongoing gas supply operations.[136] PG&E failed to promote safety as required by § 451 when it failed to follow its own clearance requirements.

c. Discussion of Violation

PG&E engaged in unsafe practices when it failed to follow its well-defined procedures to create records required for a clearance for work performed at Milpitas Terminal on September 9, 2010.

Good engineering practices, as identified in PG&E's own standards, require the creation of step-by-step plans for every maintenance project that could potentially disrupt the communication of operating data between an operating facility and gas control operators. Disruption of communications creates an unsafe operating situation because Gas Control Operators lack vital information about the operating system as they try to control the flow and pressure of gas in the high-pressure gas transmission system. PG&E failed to follow its own safety procedures to create a clearance record for the electrical work performed at the Milpitas Terminal on September 9, 2010.[137]

The absence of a detailed Clearance for the project, which if done properly would have identified the supervisor and would have provided step-by-step guidance for the project, created an unsafe condition.[138] Employees lacked the instructions and required record of work to be performed. When a problem occurred, employees were therefore unable to trace the changes made to the system and could not readily troubleshoot the problem, resulting in a dangerous operating situation of over-pressuring on PG&E's high pressure lines that served the Peninsula.

PG&E failed to follow its records procedures, called the "clearance process," for planning the September 9, 2010 work at Milpitas Terminal. The clearance process is PG&E's detailed procedure for maintenance projects that can potentially disrupt service. The work procedure provides very specific instructions designed to lead operating and maintenance personnel through a project in a way that will ensure the safety of the worker, the plant and the public. The procedure requires extremely detailed documentation to be recorded and accessed electronically, and also reproduced and filed in hard copy. For the uninterruptible power supply project that started on September 9, 2010, PG&E did not follow its own clearance procedures.

[136] PG&E Response to DR 47 Q 23 Atch 1
[137] CPSD Exhibit 4, Page 9
[138] CPSD Exhibit 4, Page 9, Lines18-26

The clearance application was initially submitted in the computer system for approval on August 27, 2010. This clearance application was substantially incomplete, leaving the maintenance crew and control room operators without the required step-by-step plan for the work they were doing. If PG&E personnel had followed the clearance procedure, on September 9, 2010 drawings would have been readily available to the maintenance crew doing the work and to Gas Control personnel who were attempting to help once problems arose. PG&E's clearance procedure is an important record system designed to ensure the safety of employees and the public when work is being done to the operating system. PG&E's failure to require strict adherence to this safety procedure is an important record system failure.

d. Discussion of PG&E Defenses

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 required clearance procedure.[139] PG&E also acknowledges that the clearance application did not designate a clearance supervisor or fully describe the work to be performed or the sequence of operations that would be undertaken.[140]

PG&E claims its operators followed good communication practices and took actions that focused on and furthered the safety of the work.[141] Good communication practices and additional actions are not substitutes 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.

e. Duration and Scope of Violation

According to PG&E's standard, a Gas Systems Control Supervisor must receive complete clearance package at least 10 business days before starting the work. Since PG&E personnel failed to file a completed clearance package with Gas Systems Control, including failure to identify a Clearance Supervisor for the work to be performed at Milpitas Terminal, this violation runs for 10 days preceding the maintenance work at the Milpitas Terminal on September 9, 2010.

[139] PG&E Exhibit 61, p. 4-15, lines 4–6.
[140] PG&E Exhibit 61, p. 4-13, lines 16-19.
[141] PG&E Exhibit 61, p. 4-13, lines 20-22.

CPSD has not recommended a longer period for the violation, because the investigation did not ascertain whether training and procedures related to the process were adequate.

f. Summary of Violation's Negative Effect on Safety

When problems arose during the electrical maintenance work being performed at the Milpitas Terminal, PG&E personnel at the terminal lacked the required documentation of the steps that were taken to reconstruct the work performed. This lack of records impeded them from addressing and solving the electrical and overpressure problem. In addition, it was impossible for control room operators to assist in the troubleshooting process, because they had no written plan for the work that was being conducted at Milpitas. The result was an overpressure condition in the gas transmission lines serving the Peninsula and the catastrophic failure of Line 132 in the San Bruno area. It is impossible now to ascertain with certainty whether good clearances would have prevented the San Bruno explosion on September 9, 2010. PG&E failed to promote safety regardless of the answer to that question.

Violation 6: Operations and Maintenance Instructions

a. Summary of Violation

The Operating and Maintenance Instructions manual at the Milpitas Terminal was out of date on September 9, 2010, possibly by as much as 19 years. The manual was a useless reference when the emergency occurred on that day and PG&E lost control of its electrical controls and its ability to control rising Segment 180 pressures.

When PG&E schedules work to be performed on its electrical system, especially a system that powers pipeline instrumentation such as automatic and control valves and the data transmission system, it is essential both to have competent and knowledgeable personnel doing the work, and for those personnel to have all of the relevant maps, drawings, and manuals at hand before beginning the work. All of those records must be up-to-date so that they accurately reflect the system as it exists on the day of the project. PG&E has never verified that the latest Operating and Maintenance Instructions manual was at the Milpitas Terminal on September 9, 2010. PG&E personnel were unable to use the manual to cope with the emergency, because the pipe failed about an hour after PG&E lost control of Line 132 pressure.

b. Laws that PG&E Violated

Section 451 of the PU Code requires "Every Public Utilities shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities……as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public". PG&E created unsafe operating conditions when it failed to store an updated and current operating and maintenance manual at the Milpitas Terminal. CPSD also notes that 49 CFR 192.615 requires that PG&E maintain effective emergency procedures and written material, and effective training in implementing them.

c. Discussion of Violation

Good engineering practices require a gas operator to maintain hard copies of Operating & Maintenance Manuals that accurately reflect the current design, construction and equipment at each operating facility in the gas transmission system.[142] The absence of a current O&M Manual at a facility, or the presence of an outdated O&M Manual puts the operating engineers and maintenance personnel at risk of making critical operational and/or maintenance decisions based on inaccurate information, which in turn can lead to unsafe operations of the facility. During an emergency, such as occurred on September 9, 2010, inaccurate information can lead to the inability to safely bring an emergency under control.

There is no doubt that an emergency, as identified in 49 CFR 192.615 occurred on September 9, 2010. On that day, after 5PM and about an hour before Segment 180 failed catastrophically, PG&E electrical work at Milpitas caused a complete loss of PG&E's ability to control pressure building up on the peninsula lines.

PG&E had failed to keep an updated Operating & Maintenance Manual at the Milpitas Terminal. The manual at the facility on September 9, 2010 was outdated, possibly by as much as 19 years. Failure to have an up-to-date Operating & Maintenance Manual at a terminal creates an unsafe condition because the O&M Manual provides vital design and operating information that must be readily available for the safe maintenance and operation of the Terminal. In the event of a disruption in normal operations and/or loss of communication with the San Francisco Control Room, the only resource available to local personnel is the O&M Manual. In the

[142] CPSD Exhibit 2 page 7-8

absence of operating guidance, incorrect decisions may be made, exposing employees and the public to potential catastrophic pipeline and/or equipment failures at the Terminal and/or within PG&E's gas pipeline system.

There should be no doubt that a manual many years out of date cannot be used effectively to cope with an emergency. Procedures and equipment at a particular facility change over time, certainly between 1991 and 2010.

d. Discussion of PG&E Defenses

PG&E suggests that CPSD has misinterpreted its data responses regarding the version of the Operations & Maintenance manual that was at the Milpitas Terminal on September 9, 2010.[143] 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 had the statement, "issued 1991, January 2011 update."[144] Because the January update was not issued until 2011, the evidence supports a finding that the manual available at the Terminal on September 9, 2010 was Version 0, the 1991 manual without the 2011 update.[145] Other than the manual included in the records inventory, there appears to be no record of any other manual being available at the Terminal on September 9, 2010.

PG&E did not identify the 2009, Version 6, O&M manual as the emergency manual 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. 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. And, because PG&E admits it cannot conclusively determine that the then-current version of the respective O&M manual was at the Milpitas Terminal on September 9, 2010, the Commission should conclude that the O&M manual was not current and may have been as old as Version 0 from 1991.[146]

[143] PG&E Exhibit. 61 p.4-18
[144] PG&E Response to DR 1 Q 7 Atch. 2, Summary Inventory, Page 3
[145] CPSD Exhibit 2 Pages 7-8
[146] CPSD Exhibit 4, Page 10, Lines 20-22

e. Duration and Scope of Violation

Based on the cover page on the 2009 manual, the first time the 1991 manual was updated was in 1998. Thus, it can be assume the original 1991 manual was up-to-date until 1998. Therefore, the maximum time the manual could have been out of date was from 1998 through the date the 2011 version was placed at the Terminal. For purposes of this proceeding, the outdated manual violation constituted a continuing violation from December 1998 to September 2010.

f. Summary of Violation's Negative Effect on Safety

In the absence of operating guidance during a gas emergency, incorrect decisions will be made that expose employees and the public to potential catastrophic pipeline and/or equipment failures. An emergency occurred at the Terminal and/or on PG&E's gas pipeline system on September 10, 2010. Maintenance personnel challenged with unusual maintenance and operating decisions were disadvantaged by the lack of a current copy of the operating and maintenance instructions manual. This situation exacerbated the emergency. CPSD does not contend that the emergency would have been averted if a proper manual had been available - only that the lack of the manual diminished safety, and was contrary to law.

Violation 7: Drawing and SCADA Diagrams of the Milpitas Terminal

a. Summary of Violation

On September 9, 2010, PG&E personnel at the Milpitas Terminal had access to an outdated map and control room personnel had access to an incomplete diagram of the Milpitas Terminal.[147] No evidence exists that these personnel had access to any relevant map or diagram that was up to date on the day the emergency occurred. When working to attempt to regain control of pipe pressure by manually opening or closing valves, PG&E personnel needed access to current and accurate drawings. To the extent that on September 9, 2010 the personnel at the Milpitas terminal and the San Francisco control room referred to the piping and instrumentation drawings available at the Milpitas Terminal during that crisis, they were using a drawing that was incomplete and inaccurate. Failure to maintain accurate drawings and diagrams of its

[147] CPSD Exhibit 2, Page 9.

facility is inherently unsafe because operators and maintenance personnel rely on the drawings and diagrams as accurate representations of the system when they make routine and emergency operating decisions.

This violation is similar to Violation 6, in that it pertains to records useful and necessary to cope with gas emergencies. They are separate violations, however, in that Violation 7 applies to different data and records (map and diagram) than Violation 6 (emergency manual).

b. Laws that PG&E Violated

Section 451 of the PU Code requires that Every Public Utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public. In addition, PG&E's own internal policies required PG&E to retain, for the life of the facilities, all engineering records pertinent to the facilities.[148] PG&E's failure to follow its own safety regulations itself violates section 451and its own internal policies.

c. Discussion of Violation

Good engineering practices require a gas operator to maintain accurate drawings and electronic (SCADA) diagrams of all operational facilities. By failing to do so, PG&E created unsafe operating conditions. Inaccurate representations of the system, either in hard copy, or electronic, can lead to inappropriate and unsafe operational decisions during regular operations as well as during emergencies.

PG&E failed to keep an updated hard copy drawing of the Milpitas Terminal pipelines system at the Milpitas Terminal and failed to update electronic SCADA diagrams the Milpitas Terminal to accurately display the pipelines and valve positions. The electronic diagram was available to control room operators on their computer displays. During this investigation, PG&E admitted that a corrected version of the drawing that shows a schematic of piping and valves for the Milpitas Terminal was submitted to NTSB because the drawing existing at the Terminal on September 9, 2010 was inaccurate. In addition, PG&E admitted that the computer diagram for

[148] In particular, PG&E internal policies shown in its documents P2-212, P2-225, and P2-227 each require that "Records pertinent to the constructed facility retain until superseded or 6 years after the facility is retired". Moreover, PG&E internal policy in its documents P2-230 mandates retaining engineering records for 6 years after the facility is retired.

the Milpitas Terminal that was used by San Francisco Control Room operators on September 9, 2010 was inaccurate and incomplete. The inaccuracies in both the drawing and the computer diagrams were significant in relation to the operational emergency on September 9, 2010. At least some of the confusion experienced at the Milpitas Terminal and the Control Room appears to have been related to inaccurate reference drawings and diagrams.[149]

No gas operator can maximize its ability to avoid an emergency, or to deal with a known emergency successfully, without up to date and accurate data. A gas operator may need to open and close valves quickly and effectively to avert a potentially catastrophic failure. If accurate data in diagrams and is not at hand for personnel, pipe failure may occur.

d. Discussion of PG&E Defenses

PG&E admits that it revised the operating drawing #383510 after the San Bruno explosion, but claims that the changes made were not relevant to the crew's actions at Milpitas Terminal to address the pressure increase or electrical problems.[150] However, PG&E fails to explain why the errors were not relevant, especially the depiction of valves in normally open position when they should have been normally closed. It is CPSD's position that when employees are trying to analyze the source of a pressure increase in outgoing pipelines under emergency conditions, inaccurate drawings are unacceptable.[151] It is a fact that PG&E's record, i.e. its operating drawing, was inaccurate, creating an inherently unsafe operating situation.

PG&E also admits that, after the San Bruno explosion, it had to correct the Milpitas Terminal computer diagram displayed to the Control Room on September 9, 2010.[152] Although PG&E argues that CPSD was incorrect about the number of revisions PG&E made, the fact remains that the computer diagram was inaccurate and missing information. The diagram is a line schematic that shows the pipelines, open/closed status of valves, and other information relevant for operating the gas system.

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&E has two by-pass lines associated with the Milpitas

[149] CPSD Exhibit 2, Page 9, Lines 11-16
[150] PG&E Response, p. 4-20
[151] CPSD Exhibit 4, Pages 11-14
[152] PG&E Response Pages 4-20

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.

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 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. 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.[153]

Although the 30-300 By-pass line was installed for use when there was an emergency at Milpitas Terminal, this line was not visible to control room operators on the SCADA display diagram on September 9, 2010.[154] PG&E says that the line was omitted from SCADA displays because it is a "normally-unused bypass system."[155] 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.[156] Drawing #383510 shows the 30" By-pass line.[157] Safe operating conditions require that the diagrams available to Gas Control operators include all gas 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 event.[158] 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 transport gas from Lines 107, 300A, or 300B around the Milpitas Terminal and discharge it into lines 109, 101 and 132 on the Peninsula side of the Terminal.[159] PG&E states that the 30-300 By-pass line was valved closed on September 9, 2010

[153] CPSD Exhibit 4 Pages 11-12
[154] Ibid
[155] Ibid
[156] Ibid
[157] CPSD Exhibit 4 Page. 12 incorrectly identified the drawing as #282067. The correct drawing number is #383510.
[158] PG&E Exhibit 61, Pages 4-21
[159] CPSD Exhibit 4, page 12, Lines 18-19

but kept no records that can be used to confirm this statement.[160] This absence of records on the operation of a By-pass line installed for use during emergencies exemplifies PG&E's haphazard recordkeeping.[161]

Based on the records that PG&E did keep of the events leading to the San Bruno rupture, it is possible that that the By-pass line was not valved closed at least part of the time leading up to the San Bruno pipe explosion. Access of gas to the by-pass line, uncontrolled by a monitor valve, as well as other events before the failure, are consistent with this possibility[162]

Due to PG&E's recordkeeping shortfalls, operators lacked the data essential for fully understanding what was happening in its gas transmission system when things went wrong at the Milpitas Terminal on September 9, 2010.

e. Duration and Scope of Violation

It remains unknown how long the drawing and diagram for Milpitas Terminal were out of date, inaccurate and incomplete. For purposes of this proceeding, CPSD finds a continuing violation from 2008 to 2010. The basis for beginning the violation in 2008 is that the previous change to drawing #383510 was made in 2008. CPSD makes the conservative assumption that the drawing was accurate at that time.

f. Summary of Violation's Negative Effect on Safety

In the absence of accurate drawings of the Milpitas Terminal, PG&E personnel may make incorrect decisions can that could expose employees and the public to potentially catastrophic pipeline and/or equipment failures at the Terminal, and/or elsewhere affecting Line 132. On September 9, 2010, maintenance personnel challenged with unusual maintenance and operating conditions and by a nascent and worsening emergency were disadvantaged by an inaccurate and outdated drawing, and inaccurate and outdated computer diagrams of the Milpitas Terminal piping and valves. This records violation clearly created an unsafe situation. CPSD does not contend that the emergency would have been averted if a accurate drawings and diagrams had been available - only that the lack of the accurate drawings and diagrams diminished safety, and was contrary to law.

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[160] PG&E Exhibit 61, Page 4-21
[161] CPSD Exhibit 4, page 13, Lines 3-5
[162] CPSD Exhibit 4, Pages 11 and 12

Violation 8: Back-upSoftware at Milpitas Terminal

a. Summary of Violation

PG&E conducted electrical work at the Milpitas Terminal without appropriate back-up software available for valve controllers on Line 132 segment 180.[163] This represented an unsafe practice. When electrical power was lost, the valve controllers no longer functioned properly to control line pressure.

PG&E's policy and practice, as stated in its Operating & Maintenance Instructions Manual, is to store a copy of back-up software on site at the Milpitas Terminal. Apparently, whatever software was required to restore the controllers was not stored at the Terminal, therefore violating PG&E's own policy and creating a safety risk.

b. Laws that PG&E Violated

Section 451 of the PU Code requires that "Every Public Utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities……as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public." PG&E created unsafe conditions at the Milpitas Terminal by failing to maintain back-up software for critical programmed equipment at the terminal.

c. Discussion of Violation

Good engineering practices require a gas operator to maintain back-up software for all programmed equipment at the site where equipment is installed.[164] Loss of programming for any instrument or equipment, such as operating valves, creates an unsafe operational situation. The inability to immediately correct the problem by reloading programming prolongs the equipment outage and the unsafe operating condition. The ready availability of back-up software on site is critical to the quick re-programming of failed equipment.

PG&E failed to keep back-up software at the Milpitas Terminal. Failure to maintain current software for vital automated equipment in the Milpitas Terminal system created an

[163] CPSD Exhibit 2, Page 10
[164] CPSD Exhibit 2, Page 11, Lines 11-14

unsafe condition because at any time software programming for any equipment can fail or be lost due to power interruption. Loss of programming that cannot be immediately restored renders equipment inoperative, which affects the ability of PG&E control operators to safely manage the operations of the high pressure pipeline system. Loss of control over pressure exposes employees and the public to potential catastrophic pipeline and/or equipment failures at the Terminal and/or on PG&E's gas pipeline system.

The first indication of a problem at the Milpitas Terminal was described by the PG&E maintenance personnel on site as a loss of controllers.[165] In subsequent interviews, PG&E's maintenance person stated that they lost programming to three controllers and that he had lacked the software to reload the program so that the controllers could be put back into service.[166] In a late response to a data request, PG&E stated that the missing software was iconfig, which is a standard Microsoft module that allows configuration of a USB connection. This software is readily available over the internet.

d. Discussion of PG&E Defenses

PG&E acknowledges that the gas technician at Milpitas Terminal on September 9, 2010 did not have the software or cable connection needed to reprogram the three valve controllers that experienced problems on September 9, 2010.[167]

PG&E contends that the loss of the valve controllers was unrelated to the pressure increase.[168] Whether PG&E's contention is correct or not, 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 belief.[169] Had the maintenance technician at Milpitas been able to restore the programming to the controllers immediately, Gas Control operators and the maintenance technician may have been able to focus on other causes, thus possibly resolving the high pressure problem successfully.

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[165] CPSD Exhibit 2, Page 10, Lines 5-7
[166] CPSD Exhibit 2, Pages 10-11, fn 45
[167] PG&E Exhibit 61, p. 4-25, lines 7-10. Based on the response to DR 67 Q 46, we assume the cable PG&E references was a standard USB cable.
[168] Response Page 4-25, Lines 16-19.
[169] CPSD Exhibit 4, Page 14

Regardless of whether the lack of software backup contributed to the San Bruno rupture, PG&E's practice was unsafe. When working on electrical matters that could affect the control of high pressure piping, any gas operator must have available the tools and personnel needed to cope with an emergency.

e. Duration and Scope of Violation

It is unknown how long the back-up software and USB connection for the controllers was missing from the Milpitas Terminal. For purposes of this proceeding, CPSD finds a continuing violation from 2008 to 2010. The beginning date of 2008 represents a conservative assumption that PG&E had the proper back-up software in 2008.

f. Summary of Violation's Negative Effect on Safety

In any continuously operating system that carries hazardous materials, such as a system of natural gas transmission pipelines, the ability to maintain control of valves that regulate the flow of gas is critical to safe operations. Where valves are controlled by computer components, safe practices require the ability to quickly restore programming that might be lost in an emergency. The loss of control of valves can cause any number of problems that could impact the safe operation of a high pressure system, including causing an unplanned increase in pressure. The ready availability of back-up software is critical to the safe operation of the PG&E gas transmission system and to the protection of employees and the public.

Violation 9: Supervisory Control and Data Acquisition System

a. Summary of Violation

The data transmission collection and display system for PG&E's gas transmission system is referred to as Supervisory Control and Data Acquisition (SCADA). The SCADA system provides data to the control rooms.

PG&E's SCADA did not provide to PG&E personnel the information needed in the control room and elsewhere to deal effectively with the gas emergency that began after 5PM on September 9, 2010. SCADA did not provide PG&E personnel with sufficient information to determine the best course of remedial action to take.

b. Laws that PG&E Violated

Section 451 of the PU Code requires that, every Public Utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities……as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public. PG&E created unsafe conditions when it failed to provide control room operators with accurate and useable SCADA displays.

c. Discussion of Violation

Good engineering practices and regulations require a gas operator to monitor the operations of its gas transmission system at all times to promote safety.[170] A company that chooses to monitor its system using electronic communications is therefore required to create, operate and maintain an electronic system that will promote safety in the operation of the transmission system. PG&E's electronic SCADA system, in use on September 9, 2010, did not display critical information in a way that was readily recognized by Gas Control Operators working under abnormal operating conditions, making the system unsafe during an emergency – both for averting a rupture and for limiting damage after a rupture. Deficient SCADA information is one reason that it took PG&E one hour and 35 minutes to shut off the gas after the rupture. The unsafe condition of the SCADA system contributed to the inability of the Gas Control Operators to timely evaluate data related to the pipeline explosion in San Bruno.

On September 9, 2010, San Francisco Gas Control operators were alerted by "Hi-Hi" alarms from instruments at the Milpitas Terminal and along the Peninsula pipelines indicating high pressures.[171] PG&E's control room policy is to acknowledge all alarms and then the operator has 10 minutes to analyze the problem and respond to the alarm. On September 9, 2010, after controllers were lost and pressure went out of control at the Milpitas Station, many alarms went unacknowledged and repeated regularly, creating long screens of repeating alarms.[172]

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[170] CPSD Exhibit 2, Pages 11-12

[171] ibid

[172] PG&E Response to DR 1 Q 14, Atch 2

When the emergency occurred, no remote valves were installed in Line 132. Control room "operators did not know if there were any valves that could be used to shut off the gas."[173] Thus, they clearly could not advise field personnel on valves to open or shut, either before or after the rupture.

A few minutes after the pipeline in San Bruno ruptured there was a "Low-Low" alarm that came in from Martin Station at 6:15 PM. This alarm was an indication of the San Bruno pipe failure. Control room operators failed to acknowledge the alarm and did not recognize the drop in pressure until almost 30 minutes later, when someone from another location called in and asked them to look for the pressure drop on their SCADA screens.[174] This is strong evidence either that the SCADA system was inadequate to inform control room operators quickly of the drop in pressure, or that operators were poorly trained in use of SCADA, or both.

The NTSB agrees with CPSD. It found that "PG&E's supervisory control and data acquisition system limitations contributed to the delay in recognizing that there had been a transmission line break and quickly pinpointing its location."[175]

d. Discussion of PG&E Defenses

The unsafe condition of the SCADA system contributed to the inability of the Gas Control Operators to timely evaluate data related to the emergency. 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.[176] However, PG&E's expert, Mr. Leewis, 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."[177]

PG&E contends that Gas Control operators determined the leak was in San Bruno,[178] but fails to explain adequately why Gas Control operators could not then promptly and accurately 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.[179]

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[173] CPSD Exhibit 2, Page 12, Lines 8 and 9 and fn 54
[174] PG&E Response to DR 1 Q 14, Atch 2, 18:15 PM
[175] CPSD Exhibit 6, fn 1, Attachment 1 Page 124, Finding 124 (NTSB August 30, 2011 Accident Report).
[176] PG&E Response Page 4-27, line 20 through Page 4-28, line 3.
[177] Declaration of Keith Leewis, Page 7.
[178] PG&E Response Page 4-28, line 18-21, but, there are miles of gas pipeline in San Bruno.
[179] PG&E Response, Page 4-26, lines 6-7.

e. Duration and Scope of Violation

It is unknown how long the SCADA system has been designed in a way that makes it difficult for control operators to see and respond to alarms during a pipeline emergency. For purposes of this proceeding, CPSD finds a continuing violation from 2008 to 2010.

f. Summary of Violation's Negative Effect on Safety

The unsafe condition of the SCADA system contributed to the inability of the Gas Control Operators to timely evaluate data related to the San Bruno emergency.

Violation 10: Emergency Response Plans

a. Summary of Violation

PG&E's Emergency Response Plans were difficult to use and were a source of confusion for the Control Room operators, likely contributing to PG&E's inability to mount a credible response to the incident on the evening of September 9, 2010. PG&E's emergency plan is very complex and was apparently difficult for personnel to implement during the San Bruno emergency. Emergency Response Plans are useful only if they are written and implemented in a way that makes the information immediately accessible and easy to understand and to follow in situations when events are overwhelming. The plans must be updated regularly so an employee or contractor will not rely on obsolete information or call invalid phone numbers to reach key personnel. PG&E's Emergency Plan failed to support a safe and efficient response to the San Bruno explosion and contributed to a longer than necessary response time to close off the gas so the site could be rendered safe for entry by emergency responders.

b. Laws that PG&E Violated

Section 451 of the PU Code requires that Every Public Utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities……as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public. PG&E created unsafe conditions during the September 9, 2010 San Bruno emergency by failing to maintain a clearly defined Emergency Response Plan.

The Code of Federal Regulations 49 CFR section 192.615 requires operators to establish written procedures needed for a "prompt and effective response to a notice of each type of emergency… "[180] CPSD relies on section 451 as authority for the violation, however, the Commission also should take note of the CFR emergency requirement as guidance for effective plans needed to promote safety during a gas emergency.

c. Discussion of Violation

Good engineering practices and regulations require a gas operator to maintain an Emergency Response Plan that can be implemented in response to an emergency to promote safety through quick and reasonable actions by response personnel.[181] PG&E's Emergency Response Plans were too complicated, too voluminous, and too difficult to use under actual emergency conditions. PG&E's plans were clearly inadequate to deal "effectively" with the gas emergency of September 9, 2010. The ultimate proof of this is PG&E's inexcusably tardy response time to the pipeline explosion in San Bruno.

For almost two hours, PG&E control room and Milpitas personnel struggled with the gas emergency, made no headway in solving it, and the pipe ruptured at 6:11 PM. Emergency conditions were in effect as early as 4:18 PM on that day, when the electrical work caused a loss of SCADA data. High-pressure alarms went off at 5:25 PM, and the Milpitas technician said they "look real," and he also realized that pressure and valve controller displays had lost all data.[182] High-pressure readings on the control room console showed almost 500 psi at 5:52 PM. The pipe ruptured at 6:11 PM.[183]

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[180] 49 CFR section 192.615 (a)(3).
[181] CPSD Exhibit 2, Page 12
[182] CPSD Exhibit 4, Page 16, footnote 86. Communications are based on Transcript of SF control room calls Sept 9, 2010
[183] CPSD Exhibit 6, fn 1, Attachment 1 Pages 5-12 (NTSB August 30, 2011 Accident Report).

The explosion and fire started almost immediately. By 6:12 police were on the scene, and by 6:20 firefighters had begun to arrive. By contrast, it took PG&E until 6:41 for any personnel to arrive at the valves. However, none of these PG&E personnel dispatched to the scene were qualified to operate the valves. By 7:46 PM PG&E finally closed all valves needed to isolate the rupture. At 7:57 PM a PG&E employee had identified the rupture as on Line 132 at milepost 39.33.[184]

These facts alone are sufficient to find that PG&E's emergency plan was ineffective, deficient, and unsafe. It should also be noted that PG&E's emergency training, required under CFR section 192.615, may have been deficient. In this proceeding, CPSD has limited the allegation to violations associated with written material.

d. Discussion of PG&E Defenses

PG&E has provided an expert witness, Dr. David Bull, who has concluded that the company's Gas Emergency Plan meets regulatory criteria.[185] 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 emergency.[186] Even if an emergency response plan includes all required elements, the proof of its value is in how well it serves those handling an emergency. The 95 minutes that PG&E took to stop the gas flowing from the rupture site might have been significantly less if PG&E had had better emergency planning and materials. The NTSB believes, as does CPSD, that it was avoidable. The NTSB stated that "the 95 minutes that PG&E took to stop the flow of gas by isolating the rupture was excessive."[187]

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." Other accounts say that only one on-call first responder was asked to go to the

[184] Id at pp. 12 and 15
[185] PG&E Response, Page 4-55, lines 21-26.
[186] CPSD Exhibit 4, Page 16, Line 14
[187] Id at p. 124, finding 12.

scene.[188] This first responder was delayed in traffic and there is no indication that dispatch called out a second person. Two measurement and control mechanics saw the story on the news around 6:30 PM and responded on their own initiative. It appears from audio records and transcripts 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.[189]

As written, PG&E's emergency plan was not useful for responding to the catastrophic gas line break and fire.[190] A review of the 2009 Emergency Plan reveals checklists for both overpressure situations and fire/explosion situations.[191] 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, an effective response plan must require 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 PG&E's responders only responded because they happened to see the fire on a TV news broadcast,[192] it is evident that the emergency plan failed to serve the needs of PG&E employees and the public.

PG&E argues that its employees were not confused about how to respond to the emergency on September 9, 2010.[193] However, when managers off-site must explain the emergency process to gas control operators, as they did during the San Bruno emergency, then there is a problem in the way the emergency plan is written and/or accessed.

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[188] Interview of M. Hickey, 16 Sep 2010.
[189] CPSD Exhibit 4, Page 16, Lines 10-13.
[190] CPSD Exhibit 4, Page 16, Lines 14-15.
[191] CPSD Exhibit 4, fn 90.
[192] CPSD Exhibit 4 Page 16, fn 89
[193] PG&E Response Page 4-55 through 4-56.

e. Duration and Scope of Violation

The latest update to the Emergency Response Plan is dated April 2010. Therefore, for purposes of this proceeding, CPSD alleges this violation to be continuing from April 2010 to September 2010.

f. Summary of Violation's Negative Effect on Safety

The Emergency Response Plans failed to promote safety, contributed to the rupture, and contributed to delays in responding to the pipeline explosion in San Bruno.

Violation 11: Incidents of Operating Line 132 in excess of 390 Maximum Allowable Operating Pressure

a. Summary of Violation

Federal regulations implemented in 2004 required PG&E to set the MAOP of a line at the highest operating pressure experienced on the line during the preceding five years.[194] Before 2004, Line 132 had not operated at 400 psi, which was the MAOP PG&E wanted to establish for that line after 2003. PG&E records established an MAOP of 390 psi for a portion of the line and the maximum operating pressure for the preceding five years was 375 psi. The federal law required hydrostatic testing of the line if PG&E uprated it to 400 psi.

Instead of following the applicable uprating rules federal regulations and GO 112, PG&E edited historical documents to change 390 to 400 psi for Line 132. PG&E defends its change in MAOP based upon an alleged PG&E error made by personnel in the 1970s that the company now contends caused it to under-operate Line 132 at 390 psi for more than 25 years.

PG&E then developed a plan to operate Line 132 at 400 psi for 2 hours in 2003 to establish the higher MAOP under the new rules. PG&E repeated the two-hour operation at 400 psi in 2008 (to set the MAOP for the next five years) and planned to continue this process every five years.

Had PG&E hydrostatically tested Line 132 to uprate it in compliance with state regulations, Segment 180 would have been tested to a pressure well above 400 psi, and it would have failed under controlled testing conditions, requiring replacement of the pipe. Instead, when

[194] CPSD Exhibit 4. Page 17

Line 132 was overpressured due to problems at the Milpitas Terminal on September 9, 2010, Segment 180 failed catastrophically, resulting in deaths, injuries and extensive property destruction.

b. Laws that PG&E Violated

On three occasions, PG&E violated Public Utilities Code section 451 by operating Line 132 at pressures greater than safety and specific law permitted. The violations occurred in 2003, 2008, 2010. PG&E also engaged in unsafe operations by operating all of Line 132 above the 390 psi allowable operating pressure, without first hydrostatically testing the line as required by GO 112 and by the Code of Federal Regulations.

c. Discussion of Violation

Good engineering practices and regulations require the operation of all high pressure transmission pipelines at pressures below the lowest maximum allowable operating pressure calculated (or established by the grandfather clause) for any individual section of pipe installed in that pipeline.[195] Operating a high-pressure gas transmission line above the Maximum Allowable Operating Pressure (MAOP) is inherently unsafe because a pipeline is designed to withstand operating pressures up to a specified maximum pressure and operating in excess of that maximum may damage the integrity of the pipe and can result in pipe failure. For more than 25 years, beginning in 1978, PG&E operated Line 132 with a 390 psi limit for reasons that are now lost, along with any data that supported PG&E's 1978 decision to reduce the pressure. After PG&E changed the MAOP to 400 by editing historical records in 2003, it operated Line 132 in excess of 390 psi MAOP on at least three occasions. It operated the line at the higher pressure without following regulations that required hydrostatic testing of the line segment before increasing the MAOP. On the third occasion of operating the line above 390 MAOP, Line 132 failed, resulting in the pipeline explosion in San Bruno.

d. Discussion of PG&E Defenses

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 overpressure events on

[195] CPSD Exhibit 2, Page 2, Lines 21 – Page 6

Line 132: December 11, 2003,[196] December 9, 2008[197] and September 9, 2010. [198] 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 psi and held it at this level for 2 hours, each time PG&E's goal was to trigger a five-year period in which it could operate Line 132 at an MAOP of 400 psi.[199] This process was based on PG&E's interpretation of federal regulations that became effective in 2004.[200] On September 9, 2010, PGE allowed Line 132 to be overpressured to at least 394 psi as a result of problems at the Milpitas Terminal.[201] This high-pressure event ended when the pipe in San Bruno failed.[202]

PG&E claims that it had made an "error" by operating Line 132 Segment 180 for more than 25 years at an MAOP of 390 psi.[203] (Also see discussion regarding Violation 4, above.) PG&E provides no evidence that an error was actually made, instead of good engineering judgment in 1978 that in 2003 was no longer available to review along with the now missing data that supported that judgment. Regardless, in the absence of records necessary to assure PG&E that personnel in the 1970s had merely made an "error" perpetuated for a quarter century of operation - the conservative and safe course of action would have been to conduct a hydrostatic test.

e. Duration and Scope of Violation

When PG&E first overpressured line 132 to 400 psi in 2003, violating GO 112 by not first hydrostatically testing the line, it subjected Line 132 to a stress that may have weakened the segment 180 pipe. This was a violation that continued daily because the pipes were filled with pressurized gas every day. The 2008 pressure spikes also exceeded 390 psi. In fact, both the 2003 and the 2008 pressure spike exceeded 400 psi, but even then PG&E did not test the pipe.[204]

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[196] PG&E Response to DR 15 Q 1 Atch 358.
[197] PG&E Response to DR 15 Q 1 Atch 253.
[198] 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).
[199] DR 15 Q 1 atch 6, atch 53, atch 136, atch 138, atch 188, atch 255, atch 358-CONF.
[200] ibid
[201] PG&E Response to CPUC DR 188 Q 13, Atch 1, Page 13.
[202] PG&E Response to DR 7 Q1 09.09.2010-4, Investigation & Documentation Report (for Documenting Abnormal Operations).
[203] PG&E Exhibit 61, Page 4-11, Line 21
[204] These actions are named as violations in the San Bruno proceeding, I.12-01-007

The pipe finally failed under the pressure of 396 psi, as noted by a Milpitas technician after 6 PM on September 9, 2010. Thus, these violations continued from 2003 through September 9, 2010. The third violation is a one-day violation and constitutes an involuntary operation above 390 psi.

f. Summary of Violation's Negative Effect on Safety

PG&E operated Line 132 in excess of 390 psi MAOP on at least three occasions without following regulations that required hydrostatically testing the line before upgrading it to 400 psi MAOP. On the third occasion of operating above 390 MAOP, Line 132 failed, resulting in the pipeline explosion in San Bruno.

Violation 12: Preservation of Records Related to Brentwood Camera Six Video

a. Summary of Violation

PG&E's control room in Brentwood, California monitored events at San Bruno and participated in PG&E's crisis management on the day of September 9, 2010. A video camera at Brentwood had a view of events within the control room. PG&E set security video cameras to record.

Within a day of the San Bruno event, the Commission and PG&E directed that all evidence relevant to the San Bruno incident be preserved. Despite these directives, the evidence proves that PG&E destroyed highly relevant evident.

b. Laws that PG&E Violated

PG&E violated Commission Resolution Number L-403 Preservation Order from Commission Executive Director 2010-2012, by destroying evidence form the control room.

In D.09-08-029, the Commission adopted Rule 19 of General Order 95 (addressing overhead power lines) effective on August 20, 2009.[205] Rule 19 states that: "Each utility shall provide full cooperation with the Commission staff in an investigation of any major accident or reportable incident." Similarly, in the Order Instituting Investigation in the San Bruno OII in I.12-01-007, the Commission clarified that "even without the compulsion of a subpoena, the

[205] D.09-08-029, p. 26.

Commission hereby confirms that under Public Utilities Code sections 313, 314, 314.5, 315, 591, 582, 584, 701, 702, 1794 and 1795, the Commission staff may obtain information from a public utility, like PG&E, and the staff is already deemed to have the investigatory authority of the Commission."

In D.09-08-029, the Commission explained: "When Commission staff investigates major accidents, such as fires, staff must have access to all information relevant to an investigation with little or no delay."[206] In that proceeding, the Commission did not find it was a legitimate excuse for Respondents that their failure to cooperate with CPSD and preserve evidence occurred in part before the Commission issued D.09-08-029. With respect to their conduct before August 29, 2009, even if there was not an explicit Commission requirement to preserve physical evidence relating to a CPSD investigation, in the Fire OIR, the Respondents stated that such a rule was not necessary, because it was already required anyway. The Commission agreed with Respondents' contention, but adopted Rule 19 anyway. As the Commission stated in D.09-08-029 at p. 25:

> Parties argued that including Rule 19 in General Order 95 is unnecessary. Specifically, parties contend that the Commission and CPSD already have access to evidence relevant to utility-related incidents and *evidence preservation* pursuant to existing rules, code provisions, and common law requirements. These parties also *correctly* point out that failure to cooperate with the commission or its staff can result in monetary, evidentiary, and even criminal sanctions. *These arguments have merit.* However, to the extent that this rule will assist CPSD in investigating fires and enhance cooperation during staff investigations, the rule will contribute to improved public safety in the upcoming fall fire season in California. (Emphasis added).

Thus, the fact that evidence was destroyed prior to the issuance of D.09-08-029 is irrelevant, since it occurred while SCE was reporting to CPSD that the Malibu Fire was a reportable incident, which prompted CPSD's informal investigation. In any event, spoliation is the destruction of evidence in anticipation of its relevance to pending or future litigation.[207]

As the court found in *Wise v. Pacific Gas & Electric Co.*, 77 Cal. App. 4th 287, 300 (1999), given that Commission is "not an ordinary agency, but a constitutional body with broad

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[206] *Id.* at 25.
[207] *Williard v. Caterpillar, Inc.,* 40 Cal. App. 4th 892, 907 (1995).

legislative and judicial powers," it is "inconceivable" that the Legislature intended the Commission be unable to fashion a remedy in the event of fraud committed by a public utility in order to provide a remedy for the fraud and to serve as a deterrent to future misconduct. This Commission, like a court, should exercise its inherent administrative and supervisory powers to preserve order in its proceedings, to prevent abuses of the litigation process and to ensure a fair trial.[208]

CPSD will seek additional remedies in this proceeding for Respondents' destruction of evidence: "The traditional remedies for spoliation of evidence include: (1) a discretionary jury inference against the spoliator; (2) a charge of obstruction of justice; and (3) various discovery sanctions."[209]Another recognized principle is the evidentiary inference that "evidence which one party has destroyed or rendered unavailable was unfavorable to that party."[210] Cal. Civ. Code § 3517 is clear: "No one can take advantage of his own wrong."[211]

c. Discussion of Violation

On September 9, 2010, two PG&E control rooms were available to provide command and control to PG&E's system and for the San Bruno situation that developed on that day. The San Francisco control room had primary responsibility for the control functions that day. The Brentwood control room was the backup control room for PG&E on September 9. At the time of the San Bruno explosion, personnel were in the process of moving primary control of the gas transmission system from the San Francisco Control Room to the Brentwood Control Room. PG&E has said that this transition was due to a policy of operating the backup facility in Brentwood quarterly. The first shift for the quarterly operation at Brentwood began on the evening of September 9, 2010. For a period of several hours that evening, there were PG&E personnel at both control rooms.[212]

"Control room activities and actions on September 9, 2010 are important subjects for the recordkeeping investigation. Records problems with the control room on that date include clearances, Supervisory Control and Data Acquisition (SCADA) used in the control rooms and

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[208] *Peat, Marwick, Mitchell & Co.,* 200 Cal. App. 3d 272, 287-88 (1988)
[209] *Id.* at 97 (citations omitted).
[210] *Cedars-Sinai Med. Ctr. v. Superior Court*, 18 Cal. 4th 1, 11 (1998)
[211] *Galanek v. Wimas*, 68 Cal. App. 4th 1417, 1428 (1999)
[212] CPSD Exhibit 65 (Recording and Transcript), Explained by PG&E during a site visit to the Brentwood Control Room.

PG&E's Emergency Response Plans available to control room operators".[213] CPSD's investigation includes also the identity of persons in the control room, their demeanor and effectiveness during the crisis, and other matters that could be ascertained by a visual recording of the control room.

During a CPSD site visit to the Brentwood Control Room, PG&E told the visiting group that it had video surveillance cameras in both the Brentwood and San Francisco control rooms and pointed out the camera in the Brentwood Control Room. On October 10, 2011, PG&E responded to a data request that asked for copies of the videos. PG&E said it has no camera in its San Francisco Control Room. Regarding the Brentwood facility, PG&E said "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."[214]

During a site visit to PG&E's security center, investigators viewed the live feed from the camera at the Brentwood Control Room, which is monitored 24 hours per day. On January 18, 2010 PG&E was asked to provide the name and job title of each PG&E employee or agent who had visually seen, between September 9, 2010 and November 10, 2010, any of the September 8-10, 2010 video tapes for either the Brentwood or San Francisco Control rom. On February 6, 2012, PG&E responded that "[t]here is no video tape system at the San Francisco Gas Control room. PG&E does not believe that a PG&E employee or agent reviewed, between September 9, 2010 and November 10, 2010, what is on the security video tape from the Brentwood alternate gas control facility."[215]

On March 9, 2012, PG&E provided a revised response to the data request, stating that it had been mistaken, that the digital video recorder had not been configured to record as of September 9, 2010. Therefore, according to PG&E a video recording of the control room on that day had never existed.[216]

CPSD believes it important to understand the strain in logic and PG&E credibility that these PG&E data responses raise. When PG&E asserts in one data response that a video was

[213] CPSD Exhibit 3, Page 2, Lines 1-5
[214] PG&E Response to DR 8 Q 16
[215] PG&E Response to DR 43 Q 5, also Response to CPSD DR_CPUC_210
[216] Amended Response to DR 8 Q 16, Rev 1

over recorded, the recipient of the data response has every reason to believe that PG&E personnel looked at a video and ascertained that it contained no video of the control room at Brentwood. There can be no other reasonable basis for PG&E's data response. We also note the problem of credibility raised by one camera – the only one relevant to this investigation – not recording for some months supposedly because a contractor forgot to turn a switch on. No other recorder had this problem.

As shown here, a series of inferences based upon PG&E's data responses leads to the conclusion that PG&E violated records preservation requirements.

First, recordings on Camera 6 would have been part of an ongoing recording loop. This inference can be made because the other five cameras at Brentwood were found to contain 110 days of video only before the time they were examined.

Second, the video recording loop from Camera 6 would last between 60 days (the average length of time PG&E says its security camera systems retain video) and 110 days (the length of time the five other cameras were found to have video before they were examined).

Third, the video recording loop from Camera 6 would have lasted at least 60 days after the San Bruno tragedy happened on September 9, 2010, which means it would have lasted until November 8, 2010.

Fourth, the Commission's Executive Director ordered PG&E to preserve its records on September 13, 2010. On September 23, 2010, the Commission issued a Resolution No. L-403 to ensure the safety of the public in California in connection with the operation of PG&E's natural gas transmission system. In particular, Mandate 7 of this resolution required PG&E to "Preserve all records related to the incident, including work at the Milpitas Terminal during the month of September 2010."Therefore, PG&E had at least 56 days to comply with the Executive Director's order and 46 days to comply with the Commission issued Resolution No. L-403 by preserving the recorded video in Camera 6.

Fifth, on September 11, 2010, in recognition of PG&E's responsibility to preserve records, PG&E's own General Counsel issued instructions to preserve and retain all paper and electronic documents, and to prevent its DVR from automatically deleting.[217]

[217] PG&E's General Counsel's Instructions, Appendix A to Felts Supplemental Report March 30, 2012

d. Discussion of PG&E Defenses

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).[218]

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.*"[219]

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 alleges that it 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 subsequently claimed that it 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.*"[220]

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[218] PG&E Response Page 5-3, lines 18-23.
[219] PG&E Exhibit 5-8; PG&E Response to DR 8 Q 16.
[220] 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."[221]

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, and viewing this matter for PG&E most favorably, 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, regardless of whether PG&E's statement that no video from Camera 6 was recorded onto the DVR is true or false, PG&E violated Rule 1.1 of the Commission's Rules of Practice and Procedure. Due to its contradictory responses. it may deprive staff of evidence of destruction of the videotape. But one or both of PG&E's contradictory responses must be false.

e. Duration and Scope of Violation

This violation began in September 2010 and continues to the present date.

[221] Ibid.

f. Effect of Violation

The effect of this violation is to impede a full and complete investigation of all evidence relevant to San Bruno tragedy.

Violation 13: PG&E's Data Responses Regarding Brentwood Camera Six Video

a. Summary of Violation

PG&E provided CPSD and the Commission with data responses that were contradictory and misleading, and that impeded the investigation of important and relevant issues in this proceeding.

b. Laws that PG&E Violated

As discussed above, PGE's contradictory answers to CPSD's data requests, means that PG&E has mislead the CPSD in Violation of Commission Rules of Practice and Procedure Rule 1.1. Decision 01-08-019, imposing $200,000 in penalties against Sprint PCS for Rule 1 violations[222] (*"Sprint PCS"*) provides guidance in addressing many of the Rule 1.1 issues raised by PG&E. In *Sprint PCS* the Commission found that Sprint PCS had violated Rule 1 by failing to disclose relevant information that it had certain NXXs (telephone prefix numbers) in its possession. Like SCE, when confronted, Sprint PCS claimed the omission was due to unintentional error and differences in interpretation regarding the intent of staff's data request. In claiming that it did not intend to deceive the Commission, Sprint PCS also pointed out that it made the information available to staff through other means. In response to this claim, the Commission astutely observed that later disclosure does not correct the Merely because a party initially withholds information from the staff for a particular purpose and then later discloses the information in some different or unrelated context(s) does not necessarily mean that the initial nondisclosure was purely unintentional. The timing or manner in which information is disclosed could potentially have a material effect on the outcome desired by the disclosing

[222] Rule 1 was the predecessor of Rule 1.1.

party. If a party is able to simply claim ignorance of the initial omission, the party would benefit from the initial nondisclosure and escape any sanctions or penalties.[223]

The Commission then clarified that intent to deceive is not required to prove a Rule 1.1 violation, but goes to the weight of the penalty:

> In any event, the question of intent to deceive merely goes to the question of how much weight to assign to any penalty that may be assessed. The lack of direct intent to deceive does not necessarily, however, avoid a Rule 1 violation. We address this question further in the section below dealing with the size of the penalty to be assessed.[224]

After making these findings, the Commission turned to the question of the penalty to impose on Sprint PCS. The Commission recognized that Sprint PCS's actions "did not cause any physical or economic harm to others" and that Sprint PSC did not significantly benefit from its conduct.[225] The Commission concluded that the most significant harm was the harm to the regulatory process caused by Sprint PCS' misinformation:

> We conclude that Sprint PCS' conduct harmed the regulatory process by failing to report material information in response to a staff data request. In this instance, the staff was carrying out its regulatory duties to ensure that scarce numbering resources were properly allocated based upon legitimate need. Without true and complete responses to the data request, the staff's ability to properly assess and act upon Sprint PCS' request for codes was undermined.[226]

Thus, while Sprint PCS' conduct did not harm any customer or competitor, and caused no physical or economic harm to anyone else, the Commission found that its omission of critical information harmed the regulatory process *because it undermined staff's ability to do its job.* Focusing on staff's need for accurate information, the Commission explained:

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[223] *Sprint PCS,* D.01-08-019, *mimeo,* at 8-9.
[224] *Sprint PCS,* D.01-08-019, *mimeo,* at 9.
[225] *Sprint PCS,* D.01-08-019, *mimeo,* at 14.
[226] *Sprint PCS,* D.01-08-019, *mimeo,* at 14.

> The relevant point, however, is that staff must be able to rely upon the representations made to it in response to data requests in order to carry out its duties of protecting the public interest effectively. Whether the requested information may be independently available from other sources of which staff may or may not be aware does not relieve a party from its Rule 1 obligations. Sprint PCS was required to provide truthful and complete answers to the data requests propounded and to exercise due professional care to ensure the integrity of information transmitted to the Commission and its staff.[227]

In summary, the Commission found that Sprint PCS violated Rule 1 because it withheld material information that Sprint PCS *should have known* staff needed to do its job. To reiterate: "staff must be able to rely upon the representations made to it in response to data requests in order to carry out its duties of protecting the public interest effectively. the Commission fined Sprint PCS $200,000 because the violation undermined the regulatory process.

c. Discussion of Violation

PG&E's data response from October 10, 2011 stating that the Brentwood facility video recording for September 9 and 10 was overwritten after 60 days is contradicted by PG&E's own later data response from March 9, 2012 that no video was recorded onto its DVR. Because PG&E's October 10, 2011 and the March 9, 2012 data responses are contradictory, one or both of them must be false.

PG&E's data response from March 9, 2012 also says that recent examination showed that recorded video on the five other cameras in Brentwood lasted approximately 110 days. It is likely that Camera 6 also would have had recorded video lasting for 110 days, just as the other five cameras had. This either suggests that PG&E never checked to see if video from Camera 6 was recorded and deleted after 60 days, in spite of its October 10, 2011 data response, or that PG&E failed to preserve the video.

d. Discussion of PG&E Defenses

PG&E contends that its first response contained the known facts at the time, and that its second response contained new facts that PG&E later learned about the security camera at the

[227] *Sprint PCS,* D.01-08-019, *mimeo,* at 16.

Brentwood Alternate Gas Control facility.[228] PG&E asserts that it self-disclosed the new facts to CPSD and revised prior responses, making the alleged Rule 1.1 violation unwarranted.[229]

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."[230] 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.

e. Duration and Scope of Violation

Since CPSD cannot definitively determine which PG&E statement was false or misleading, this violation is deemed to have commenced on both dates of the two responses, one in 2011 and one in 2012 and have continued to the present date.

f. Effect of Violation

The effect of this violation is the harm to the Commission's regulatory process. Besides the delays, this has caused in this investigation, PG&E's contradictory answers have been particularly disruptive to the fact-finding process. This is because it appears that PG&E is choosing a penalty from violating Rule 1.1 rather than be consistent in its response to the data requests and therefore, deprives the Commission of ever learning the truth about whether there really was a videotape of the Brentwood Control Room.

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[228] PG&E Response Page 5-3, lines 18-23.
[229] PG&E Response Page 5-3, lines 23-24.
[230] PG&E Response Page 5-3, lines 18-19.

Violation 14: PG&E Data Responses Regarding Personnel at Milpitas Terminal on September 9, 2010

a. Summary of Violation

In several data responses to CPSD PG&E failed to identify all personnel for whom CPSD sought identification. These utility actions can impede CPSD's investigation and compromise the Commission's ability to make a fully informed decision.

b. Laws that PG&E Violated

CPSD incorporates by reference the law and authority identified for Violation 12. Both violations pertain to requires to provide complete and accurate data responses to CPSD's data requests, so that the Commission can rely on a fully developed and accurate evidentially record tendered by CPSD, PG&E, and all other parties to the proceeding.

c. Discussion of Violation

Despite several CPSD data requests, PG&E failed to respond accurately to identify all of the people present at the Milpitas terminal who were working on the pressure problem of September 9, 2010. First, Data Request 8, Question 8(d) asked PG&E to identify all personnel who had access to Geographic Information Systems (GIS) and Supervisory Control and Data Acquisition (SCADA) diagrams at the Milpitas Terminal on September 9, 2010. In response, PG&E identified only three personnel who had such access.[231]

Second, Data Request 30, Question 2 asked PG&E to "[p]rovide 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." In response, PG&E identified three employees who were present on the evening of September 9, 2010 (after 5 PM when problems at the Terminal arose),[232] but omitted the Supervisor for the Milpitas Terminal. According to the San Francisco Control Room transcript,

[231] PG&E Response to DR 8 Q 8(d) was submitted by PG&E on October 10, 2011.
[232] PG&E Response to DR 30 Q 2 was submitted by PG&E on December 17, 2011.

the Supervisor was present after 5 PM at the Milpitas Terminal.[233] However, there are no records of the Supervisor being drug tested on September 9 or 10 of 2011, and he was not deposed after the incident, perhaps because the NTSB and private parties to lawsuit never learned he had been present. The omission of the Supervisor's presence at the time of the incident prejudiced the Commission's investigation. CPSD would have had reason, earlier in the proceeding when time was available, to follow up on a full and accurate answer.

d. Discussion of PG&E Defenses

PG&E asserts that CPSD alleges this violation based on a question that was not asked.[234] 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." 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 that access." This question sought the names of all personnel who had access to operating diagrams at Milpitas Terminal, and did not limit its inquiry to field crew personnel. However, PG&E's answer did not identify all personnel as the question specified.[235]

Second, CPSD asked in Data Request 30-Q02, "[p]rovide 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."[236] PG&E specifically represented in its response that "[named employee] 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." The only way to interpret PGE's response is that [named employee] 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 [named employee] work day was over at 4:30 p.m. and that he left without returning.

[233] SF_9.9.2010_2.05.43_PM_11.57.23 PM_20110113
[234] PG&E Response Page 5-4, lines 13-14.
[235] CPSD Exhibit 3 Page 8
[236] PG&E Exhibit 5-14; PG&E Response to Data Request 30, Question 02.

As shown by the transcripts, [named employee] 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 "[n]either 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."[237] As can be seen by the data requests quoted above[238] and below,[239] 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 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.[240]

e. Duration and Scope of Violation

PG&E made two false or misleading statements. Therefore there are two violations, one on October 10, 2011 and one on December 17, 2011. These are violations that may hinder the Commission's ability to reach a full and informed decision. For that reason, CPSD requests that the Commission consider them daily violations until the date of the Commission decision. In the alternative, the Commission should consider the violations daily ones until the date that CPSD learned that the PG&E's information was incorrect. This date was approximately January 15, 2012.

f. Summary of Violation's Negative Effect on Safety

For whatever reason, PG&E chose to not answer this CPSD data request correctly and to mislead the Commission, it has hurt the regulatory process.

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[237] PG&E Response Page 5-4, lines 10-13.
[238] PG&E Exhibit 5-13; PG&E Response to Data Request 8, Question 8(d).
[239] PG&E Exhibit 5-14; PG&E Response to Data Request 30, Question 2.
[240] 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 [named employee], showing he was present after 8:30 PM on the 9th.

[Violation 15: WITHDRAWN]

A. Alleged General Records Violations for all Transmission Lines including Line132

Violation 16: Job Files[241]

a. Summary of Violation

PG&E's job files are the company's primary source of data and information essential to the promotion of system safety. Long before 2010, PG&E's job files created an unsafe condition in PG&E's transmission system. That condition continues today. Many PG&E job files are missing. Some job files contain accounting information but are missing essential engineering information.

PG&E's job files are un-indexed files that contain millions of pages of data. Many jobs have multiple job files in multiple locations. These files often contain different data and information not found in the other files for the same job. Before 2010, these job files were spread over 40 PG&E document locations.

For these reasons and others, it has been impossible for PG&E engineers with safety responsibilities to efficiently and timely use job files to promote safety. This is a systemic problem and violations that will take many years for PG&E to mitigate. Complete correction of the violations is unlikely, because missing or incorrect information cannot always be obtained or rectified except by expensive pipe replacement or testing.

[241] This violation is related to but independent of the Duller / North violations presented in section VI of this document. The primary purpose of Violation 16 is to state a violation for the reduction in safety engineering caused by the problems with the job files. The Duller / North violations in Section VI of this document are based upon an in depth analysis of how and why the job files are deficient from a recordkeeping perspective. Therefore, for Violation 16, CPSD incorporates by reference the Duller / North references to job files, in section VI Of this document.

b. Laws that PG&E Violated

CPSD has charged PG&E with violations of Public Utilities Code section 451, ASME Code section B31.8 and PG&E's own internal policies requiring retention of engineering records.[242]

c. Discussion of Violation

Since the beginning of this proceeding, PG&E has identified its job files as its primary source of engineering data for its pipelines. PG&E describes its job files as the "basic building block of PG&E's gas transmission and pipeline records . . . which may relate to a single pipeline segment for an entire pipeline or multiple segments of a pipeline."[243] On another occasion PG&E's counsel stated that the accuracy or completeness of the location of reused pipe in GIS did not matter, because the "official records for doing pipeline engineering" are PG&E's job files.[244]

Good engineering practices and regulations require the retention of engineering and construction records for gas transmission facilities for the life of the facility. Further, safety requires that engineers be able to gain prompt access to these records. Engineering and construction records[245] are critical to the ongoing safe operation and maintenance of a gas transmission system because the operator will depend on these records when making operating and maintenance decisions over the life of the facility, such as determining the maximum allowable operating pressure or the depth one must dig to reach the pipe. The records and data are also critical to ensure that PG&E can make informed and proper integrity management risk management decisions for both its pipeline system and for particular pipes.[246] PG&E states that its construction records are kept in job files and that job files are the primary source of pipeline information.

From at least 1929, PG&E kept engineering documents related to completed projects in job files. Each job file was labeled with a job file number assigned to the project by the

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[242] 49 CFR whatever requires gas operators to follow their own safety rules and policies. Therefore PG&E's violation of its own rules constitutes a violation of the federal gas regulations and GO 112.
[243] PG&E counsel statement, May 9, 2011, PHC-2, p.62
[244] November 1, 2011 PHC-5, p.167
[245] Records include, but are not limited to, the design and specifications of the pipe and equipment installed, contracts for installation, the location of the pipe underground, pressure test results, weld information, x-rays, and records related to salvaged pipe and materials
[246] See Violation 25

accounting department.[247] According to PG&E, it keeps a master job file, which includes a specific set of original documents.[248] The master job file is the file of record.[249] There are also individual job files maintained by various persons working on a project. According to PG&E, documents in an individual job file generally do not become a part of the master job file.[250]

Despite PG&E's reliance on master job files, many master PG&E job files are missing. Those job files that do exist are frequently missing leak and pressure test results, x-ray results for field welds, field inspection logs and notes, and specific information about how the pipe itself was constructed.[251] PG&E's files sometimes lack any clear and unambiguous record or notation regarding the source of piping – i.e. whether it was purchased new or originated from a salvaged and reconditioned pipe from another PG&E pipeline. Obviously, if the pipe had been previously used, its history and pipe characteristics would be critically important to assessing the remaining life of the pipe when it is placed back into service. This concept seems to elude PG&E because it specifically excludes previous pipe history from its risk assessment models.

PG&E has a history of destroying or discarding important records. PG&E readily admits that records may have been discarded or misplaced as early as 1980 and continuing through 1996. In Table 2A-2 of PG&E's June 20, 2011 filing, PG&E states "Moves require recordkeeping decisions to be made, based on current operational needs, engineering judgment and recordkeeping requirements, [1980-1996]" and "some pipeline records were misplaced or discarded around this time frame [1995-1996]."

When questioned about the missing records, PG&E explained:

> "Based on available information, we have concluded that some records went missing or were destroyed during this time frame. However, we have been unable to conclusively determine which records are missing or the time period in which they were lost. Moreover, it is also possible that during these (sic) time frame or other time frames, additional records, including so called "life of the pipeline" records may have been misplaced or discarded."[252]

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[247] Based on review of PG&E's job files that include project and accounting records.
[248] PG&E Response to DR 51 Q 4
[249] PG&E Response to DR 17 Q 5
[250] PG&E Response to DR 17 Q 5
[251] CPSD Exhibit 4, Page 23, Lines 8-11
[252] Response to DR 4 Q 5-6, PG&E repeats this response for several time frames in Table 2A-2 of its June 20, 2011 filing.

Missing job files, which are the primary source of information about the construction of PG&E's pipelines, means that PG&E is missing data required for a successful risk assessment of its pipelines.

Missing job files, and missing information in job files that do exist, do not constitute anything close to the full measure of PG&E's job file deficiencies that severely hamper PG&E engineering of a safe gas system. Such deficiencies can be seen by reviewing the job file for Segment 180 construction in 1956. The job file exists today, but does not have adequate information to conclusively determine the manufacturer of the ruptured pipe or the year of manufacturer. As discussed by CPSD's records manager expert testimony, the problem includes not only missing job files, but also a host of other deficiencies.[253]

d. Discussion of PG&E Defenses

PG&E agrees with CPSD that the company "has not located some historic pipeline records, including strength test reports that should have been retained. And, it recognizes that its recent records management practices have come up short."[254] CPSD cannot agree that PG&E's admission adequately reflects the great damage to safety and lives that its records and data practices have caused.

In its Response,[255] PG&E fails to specifically address the issue of missing job files, a primary subject of section 4.2 of the March 16, 2012 CPSD testimony and of Violation 16. Felts notes that many job files are missing from PG&E records,[256] 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 would contain detailed records of individual construction projects.[257] 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

[253] CPSD Exhibit 6, Pages. 6-53 through 6-59
[254] PG&E Exhibit 61 Page 1-1,
[255] PG&E Response testimony.
[256] CPSD Exhibit 2, Page 32, Line 11 and fn 128
[257] Tr. Vol 3 Joint, Harrison/PG&E

a job file represents the loss of virtually all 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.[258] 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 that had been in 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.[259] Since January 2011, PG&E 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.[260] 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.[261] 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.[262]

e. Duration and Scope of Violation

It is impossible to determine the exact date that PG&E lost control of the contents of its job files. However, while the company had its Pipeline History Files (see Violation 17) much less harm occurred from its job file deficiencies. Therefore, for purposes of this proceeding, this

[258] CPSD Exhibit 4, Page 23, Line 19.
[259] CPSD Exhibit. 4, Page 23, Line 24-25
[260] PG&E orally described the process to CPSD as virtual "walking the pipelines" on drawings to find GM numbers.
[261] PG&E Response to DR 67 Q 26.
[262] 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.

violation continues from 1987 about the time when PG&E believes it stopped using Pipeline History Files.

f. Summary of Violation's Negative Effect on Safety

Engineering and construction records are critical to the ongoing safe operation and maintenance of a gas transmission system because the operator will depend on these records when making operating and maintenance decisions during the life of the facility.

Missing or inaccessible records can lead to incorrect assumptions about the design, construction and integrity of PG&E's pipelines, and to skewed priorities for replacing pipe, all leading to unsafe operations of PG&E's pipeline system.

Violation 17: Pipeline History Records

a. Summary of Violation

PG&E created a set of Pipeline History Records, which were the source of the data used to develop its Pipeline Survey Sheets. PG&E says the data from the Pipeline Survey Sheets is the data that was ultimately transferred into the GIS system. Many of the errors found in GIS can be traced to the Pipeline Survey Sheets. However, since PG&E lost or destroyed the underlying Pipeline History Files, it was impossible for PG&E to verify the quality of the GIS data. As a result, PG&E personnel have relied on incorrect GIS data in the day to day operations of the Transmission System.

Pipeline history files were an invaluable asset to PG&E to use to promote safety. These records were capable of increasing safety, and were essential for integrity management, especially considering the state of PG&E's job files. However, PG&E stopped using pipeline history files at some uncertain time, perhaps as early as 1987. PG&E's pipeline safety has suffered for that reason.

b. Laws that PG&E Violated

PG&E engaged in unsafe practices when it failed to retain its pipeline history records. Discarding these records violates section 451 of the California Public Utilities Code, ASME

Code section B31.8, and PG&E's internal policies requiring retention of engineering records for the life of the facility.[263] In addition, PG&E violated General Order 112-B (1967) through General Order 112-E (1995).

c. Discussion of Violation

In CPSD's expert witness report and testimony of Margaret Felts, served on March 16, 2012, CPSD expert witness Felts stated that good engineering practices and regulations require the retention of engineering and construction records for gas transmission facilities to be retained for the life of the facility.[264] CPSD expert witness Felts further reported that in 1967, PG&E provided the Commission with "Pipeline Surveillance Procedures and Records, and History File Description" to comply with a request for copies of standard procedures, as required under the Commission's General Order 112-B.. By December 1969, PG&E formalized its pipeline history policy into Standard Practice 463.7, "Pipeline History File, Establishing and Maintaining." The purpose stated was "to provide a current and uniform history record for pipelines (and mains) that have a Maximum Allowable Operating Pressure (MAOP) resulting in a hoop stress equal to or greater than 20% of the Specified Minimum Yield Strength (SMYS)."[265] This Pipeline History file was to include various reports relative to inspection and maintenance, as required by applicable portions of PG&E's Standard Practices, including:

1) Pipeline or main number
2) Dates of original installation and subsequent changes requiring work orders
3) Design and construction data covering the original installation and subsequent revisions requiring work orders or GM estimates
4) MAOP of each section
5) Type of protective coating originally or subsequently installed and the existing condition of the coating
6) Cathodic protection installations showing locations, ratings, and installation dates.
7) Record of pipeline or main inspections
8) Record of pipeline or main leakage surveys and repairs
9) Record of location class surveys

[263] CPSD Exhibit 1.
[264] CPSD Exhibit1, Page. 26.
[265] CPSD Exhibit1, Pages 27-28 citing PG&E's data response, P2-400 Pipeline Survey manual, 1986, p. 90.

10) Record of pipeline or main sections where hoop stress corresponding to MAOP exceeds that permitted for new pipelines or mains in the particular class location.
11) Initial or most recent strength test data.
12) Special studies and surveys made as a result of unusual operating or maintenance conditions, such as earthquakes, slides, floods, failures, leakage, internal or external corrosion or substantial changes in cathodic protection requirements.
13) Annual summary of existing condition of pipelines and mains based upon available records as per Exhibit A.[266]
14) Specifications for materials and equipment, installation, testing, and fabrication shall be included or cross-referenced to this file.[267]

These Standard Practice 463.7 Pipeline History Files, if implemented and maintained annually to the present as described above, would have provided an ongoing record of each pipeline and would have been retained for the life of the facility.[268] Accurate and complete pipeline files would have provided a means to accurately prioritize pipe replacement using the risk assessment model approach. This 1969 Standard Practice was included in PG&E's 1986 Pipeline Survey Manual, which also included detailed instructions for creating records titled "Pipeline Survey Sheets." A PG&E Vice-President directed and authorized that the records be created and maintained.[269]

When asked to produce Pipeline History Files, PG&E responded that it "believes" SP 463.7 became inoperative in the early 1990's when PG&E initiated the transition to its electronic Geographic information System (GIS).[270] PG&E also stated that it "no longer maintains Pipeline History Files."[271] Moreover, PG&E did not produce any pipeline history files in response to the data request. PG&E has not explained when or how it stored or disposed of these files. However, a record produced by PG&E dated October 9, 1987, shows that PG&E discontinued the policy of maintaining the pipeline files via a memo sent out from the PG&E Organization Planning and Development to PG&E Department Heads. The memo stated "[w]e have been asked to cancel

[266] P2-400, Pipeline Survey Manual, p. 92 refers to Exhibit A - Form 75-352. "Annual Report for Pipeline and Mains Operating at or Over 20% SMYS", See also P2-2 p. 37 (Form 75-352 is S.P. 463-7. Record retention is for Life of Facility).
[267] P2-400 p. 91
[268] P2-400 p. 92, SP 463.7 Supplement, Page 2, "Records," Sec 12: "The complete and main history files shall be maintained up to date by the Division or department for the life of the operating facility."
[269] P2-400 p. 91, SP 463.7 Page 1.
[270] PG&E Response to DR7 Q9.
[271] PG&E Response to DR7 Q9.

the following Standard Practices . . . Please remove and discard these SP's from your SP books."[272]

d. Discussion of PG&E Defenses

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.[273] Although that policy required keeping the Pipeline History Files for the life of the facility,[274] 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.[275] 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."[276] 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.[277] 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 actually discarding the only copy of some records. PG&E also discarded the only reference and documentation that existed before GIS that pertained to a particular pipeline and all pipelines. This meant that PG&E in effect discarded the only effective tool it had to conduct integrity management. In a reflective comment, PG&E notes that "[i]n retrospect, the company wishes it had retained the Pipeline History Files."[278]

Further, it seems highly unlikely that PG&E could have selectively and completely discarded all of the Pipeline History files given that they were maintained by District Offices. In addition, these were the only files that contained the historical data underlying PG&E's GIS data.

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[272] Response to DR 34 Q 1 Atch 5.
[273] CPSD Exhibit 2, page 29, section 4.1.2.
[274] Standard Practice 463.7 "Pipeline History Files, Establishing and Maintaining."
[275] PG&E Response, page 2-21, line 27.
[276] PG&E Response, page 2-21, lines 29-31.
[277] Based on review of thousands of records in the ECTS database.
[278] PG&E Response, page 2-23, lines 3-4.

PG&E's engineers must have known that Job Files were not updated with annual survey-type data that was stored in the Pipeline History Files. If PG&E did knowingly and purposely purged the Pipeline History files from all offices, it did so knowing it was destroying unique records underlying the Pipeline Survey Sheets, the GSAVE data base and, ultimately, GIS data.

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).[279] 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).[280] 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,[281] 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

[279] PG&E Response, page 2-20, fn. 19 and line 5 through page 2-21, line 28. GO 112-C with its accompanying D.78513, is PG&E Ex. 5 in the record herein, which was useful for cross-examination. GO 112-E, Commission's Decision No..95-08-053, as modified by Decision No.95-12-065, and its Appendix A, is Exhibit No. PG&E-7..However, hereinafter , the CPUC shall simply refer to these General Orders as GO 112-C or GO112-E without mentioning the specific "Ex." Numbers.
[280] PG&E Response, pages 2-7, line 26, through 2-10, line 17.
[281] PG&E Response, page 2-11, lines 7-9.

had anything to do with PG&E's unreasonable position in its Response.

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 "Gas Branch" of the "Utilities 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.[282]

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 regulator jurisdiction over the intrastate pipelines; and 3) can enforce the standards by injunctive relief and civil penalties.[283] 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

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

Standards.[284]

The Commission's adoption of the federal standards in GO 112-C did not provide PG&E with an excuse for failing to maintain 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).[285] 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. In addition, the Commission's GO 112-C § 122, explicitly provided: "Specifications for material and equipment, installation testing and fabrication shall be maintained by the utility." And GO 112-C § 123.1, explicitly provided: "Plans covering operations and maintenance procedures, including maximum allowable operating pressure to which the line is intended to be subjected, shall be maintained by the utility."

PG&E also fails to acknowledge that one of the minimum federal pipeline standards, that the Commission had adopted in General Order 112-C, pp. 114-115, was 49 CFR Part 192.517 (1970) Records. This federal rule 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.

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

[285] In Decision No. 78513, which adopted GO 112-C, 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."

(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."[286]

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 Safety Standards. Therefore, the Commission issued its General Order No. 112-E, p.2,which included a new section 104.1 that automatically adopts any revisions to the Federal Pipeline Safety Standards., 49 CFR Parts 190,191, 192, 193, and 199. 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, p.1 in the Preamble, contains a requirement in § 101.4 that the utilities shall maintain necessary records to ensure compliance with these rules and the Federal Pipeline Safety Standards, and the records shall be available for inspection at all times by the Commission or Commission staff. GO 112-E, p.2 also provides in § 103.3 that compliance with these rules is not intended to relieve a utility of statutory requirements. Because GO 112-E § 104.1, provides that all revisions to the Federal Pipeline Safety Standards are automatically updated and incorporated in GO 112-E, it contains the same requirements provided in 49 CFR Part 192.517 (2012).

In view of the above, no support exists for PG&E's argument that the Commission authorized PG&E's destruction of its historic pipeline safety records. Therefore, PG&E's attempt to excuse its destruction of documents 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.

[286] See GO 112-C, pp.. 114-115, adopting,49 CFR Part 192.517 (1970) (Emphasis added).

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 recordkeeping requirements, or for preservation of records for periods longer than those prescribed in this part.[287]

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.[288]

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 regulations. However, the Commission could not be certificated if it had not adopted or tried to negate any of the minimum federal regulations. 49 U.S.C. § 60105(f). During cross-examination, PG&E witness Phillips conceded this point. (RT 1052:8-18, Phillips). PG&E witness Phillips further admitted that even though the Commission had adopted its Finance and Account Division's Resolution FA-570, PG&E was still required to comply with the federal DOT's Part 192 regulations, including the record retention requirements under section 517 of Part 192. (RT 1099: 23-1100:4 Phillips).

e. Duration and Scope of Violation

Although it is impossible to determine the exact date that PG&E lost control of the contents of its Job Files, CPSD believes PG&E had comprehensive records until about 1987. That was the year that PG&E's pipeline history files were destroyed as indicated by Mr. Phillips'

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[287] 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.

[288] 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.

prepared direct testimony.[289] Therefore, for purposes of this proceeding, this violation continues from 1987 to 2010.

f. Summary of Negative Effect on Safety of Violation

Regulations as well as good engineering practice require PG&E to retain engineering and construction records for the life of the facility. Even if the Pipeline History Files may have been duplicative of Job Files, they were the source records for the Pipeline Survey Sheets, which served as the source of data for PG&E's GIS and integrity management model. Engineering and construction records are critical to the ongoing safe operation and maintenance of a gas transmission system because the operator will depend on these records when making operating and maintenance decisions during the life of the facility. Missing records can lead to incorrect assumptions about the design, construction and integrity of PG&E's pipelines, possibly leading to operating pipelines under conditions for which they were not intended. By destroying the Pipeline History Files, PG&E eliminated one source of traceable and verifiable records that should have been retained to ensure the safety of pipeline operations.

Violation 18 - Design and Pressure Test Records Missing

a. Summary

Since 1955, PG&E has borne a responsibility imposed by law to test the strength of all its newly installed transmission pipes. Since 1955 the law also required PG&E to retain, for the operational life of each installed transmission pipe, the written records and recorded data and graphs of each required strength test.

Since 1955, and until September of 2010, PG&E failed thousands of times either to do the required strength tests, or to retain the strength test records and required data of tests that it conducted. PG&E admits to thousands of failures to retain strength test records that are required by law. Because it failed to retain the data and records, PG&E made it impossible to ascertain whether tests were done, or whether conducted test results were recorded and records were retained, but subsequently were discarded, misplaced, or otherwise lost.

[289] PG&E Exhibit 61, Page 2-21, Lines 24-28.

These failures are violations that undermine and diminish the safety of its pipeline system that PG&E owes to the California public, its ratepayers, and to its own employees and contractors. PG&E's failures to test and to maintain test records diminished gas safety and resulted in a dangerous level of uncertainty about the strength of transmission pipes that continuously transport large volumes of potentially flammable and explosive natural gas through pipes in residential neighborhoods and other populated areas. Violation of strength testing and record maintenance requirements was a factor in the San Bruno tragedy of September 9, 2010, and remains to this day an impediment to maximizing current and future PG&E gas safety at reasonable cost.

b. Applicable Law

Since 1955, federal laws, state laws, and industry standards required PG&E to, a strength test for each newly installed transmission pipe and to create and retain records of each strength test for the operating life of the asset.

c. Discussion of the Violation

From 1956 and continuing through 2010, as a matter of routine, PG&E violated the law by:

1. Failing to conduct required strength tests, or
2. Failing to record specific required information about the strength test, or any information at all, or
3. Failing to retain the test results for the life of the pipe, as required by law, or
4. Failing to maintain test records, assuming PG&E possessed them at all, in a manner that the records could be promptly located and accessed.

CPSD's report states that "PG&E is missing many pipeline design & pressure records, which are vital to the successful implementation of the company's integrity management risk assessment model." [290] CPSD also notes that PG&E pressure records remain missing despite PG&E's formal Standard Practices, dating from at least as early as 1965, providing that "[t]he copy of the Strength Test Pressure Report filed with the completed foreman's copy of the

[290] CPSD Exhibit 2, Page 33, Lines 16-17

estimate shall be retained for the life of the facility."[291] Regarding the years before PG&E adopted its own standard for retaining strength test records, PG&E has represented more than once that it followed ASME standards calling for maintaining pressure test records for the operating life of the asset.[292] After 1965, and to the present, other PG&E Standard Practices continued to require test records to be maintained for the life of the pipeline asset.[293] [294]

CPSD's Duller/North report also provides evidence of PG&E's inability to locate pressure test and leak records promptly and efficiently.[295] PG&E provided its own evidence of missing and inaccessible pressure test records, via the massive Cow Palace records search in 2011. In early 2011, after the NTSB and the Commission had directed PG&E to validate its MAOP for various pipelines, PG&E brought about 100,000 boxes of job files to the Cow Palace in San Francisco for a review of about 1500 PG&E staff volunteers.[296] Those personnel devoted a total of about 7500 staff-days to the task, primarily in searching through job files in an attempt to locate strength test records.[297] PG&E kept its pipe strength test records in its "job files," rather than in pipeline files which would be more conveniently accessible.[298] Hence PG&E needed to gather 100,000 boxes containing un-indexed job files.[299] After the Cow Palace records search, the Commission issued an Order to Show Cause related to the lack of information that PG&E had provided to the Commission. The Cow Palace exercise alone proved that PG&E could not locate strength pressure data promptly and efficiently, and in many cases it could not locate records at all.

PG&E's response to a joint TURN-CPSD data request provided the record of this case with more complete information about missing records. [300] The joint DR asked PG&E to provide a searchable spreadsheet to identify each transmission pipeline segment installed

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[291] Id at 33
[292] PG&E responses to CPSD DR 15, Q.6 and CPSD DR 33, Q 10
[293] Id at 33, footnotes 134-137, citing PG&E responses to CPSD DRs 18 Q.8 and , Attachments 1, 6(1983), P2-939 (1986), and .14 (2003 through current as Aug. 20, 2012 report date.
[294] Standard Practices have continued to require test records to be maintained for the life of the pipeline asset. Id at 33, footnotes 134-137, citing PG&E responses to CPSD DRs 18 Q.8 and , Attachments 1, 6(1983), P2-939 (1986), and .14 (2003 through current as Aug. 20, 2012 report date.
[295] CPSD Exhibit 6 Page. 6-49_Inability to locate safety critical pipeline information Table 6.7.
[296] CPSD Exhibit. 6 Page 5-23 § 5.3.1 lines 9-26
[297]. Ibid
[298]. Ibid, and Reference Harrison Admission.
[299] Ibid
[300] The exhibits are TURN Ex. 4, and PG&E's massive response to CPSD-TURN Joint DR 1-1

between January 1, 1952 and January 1, 2011 for which PG&E lacks strength pressure records showing test pressure and testing medium (water, air, or gas) (for segments installed before 1970) and test pressure, testing medium, and test duration (for post-1970 installations). TURN and CPSD chose the date of 1970 because in that year the Code of Federal Regulations added more stringent recordkeeping requirements. TURN and CPSD chose 1952 as a *conservative* starting date considering PG&E's own Integrity Management records show it commonly pressure-tested pipes as far back as the 1930's. [301]

PG&E provided its data response to the Joint Data Request on August 30, 2012, which included an Excel sheet attachment. [302] The attachment consists of approximately 1000 pages of listings of pipeline segments that do not have a written pressure test located by PG&E, or which do not have a written pressure test with the proper data recorded. The attachment identifies each of 23761 segments or lengths of pipe by segment, milepost, and by date of installation, for which PG&E had not located records of a pressure test as of the end of August 2012. Each listed segment or length of pipe - as defined by PG&E - is located in a Class 3 or 4 or an HCA Class 1 or 2 area. [303] These are areas where people work or live near transmission pipes. PG&E's data response also makes clear that it would be unable to complete its list of missing strength records for non-HCA pipe segments until April of 2013.[304] When a PG&E witness testified on September 12, 2012, PG&E had completed its search for strength test records for 2,088 miles of pipeline. Another 4,660 miles of pipeline remained to be done.[305] Again, CPSD believes the amount of work remaining speaks volumes about the state of PG&E's records.

Whatever the final tally of missing PG&E strength test records becomes in April 2013 or later, for this violation alone, the current identification of missing test records for pipes in populated areas merits maximum affordable penalties imposed on PG&E. A spreadsheet manipulation and review of the attachment to Ex. TURN 4 demonstrates the following:

1. PG&E is missing large numbers of strength test records for tests that were or should have been done from January 1, 1956 through January 1, 2011. ASA B.31.1.8 was published in 1955.

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[301] CPSD Exhibit 4 Pages 30 and 31, Lines 4-6, and footnotes 147, 148, and 149
[302] TURN Exhibit 4
[303] TURN Exhibit 4, Page 2, and Tr.6, pp.966 and 967, Singh/ PG&E
[304] Id. at p. 2
[305] Tr. Vol 6, p. 963, Singh/PG&E

2. PG&E is missing large numbers strength test records for tests that were or should have been done from January 17, 1961 through January 1, 2011. Commission Decision 61269 set January 17, 1961 as the date by which it expected utility compliance with GO-112.
3. PG&E is missing strength test records for tests that were or should have been done from August 19, 1970 through January 1, 2011. On August 19, 1970 sections 192.503, 192.505, and 192.507 of Title 49 of the Code of Federal Regulations were enacted into law.

The information summarized from Ex. TURN 4 above demonstrates the following: (1) the violations of law requiring strength test records from 1956 through 2010 were massive in number and, in CPSD's view, document scant PG&E regard for industry safety Codes, California safety law, or for federal safety law, (2) PG&E's violations occurred over a period of well over 50 years, (3) significant numbers of violations occurred in the last 20 years, including after San Bruno, and (4) each of the multiple violations of law affected pipeline safety in an area in which people worked or lived.

PG&E confirmed CPSD's testimony about missing pressure records that the company is required by law to maintain for the life of the asset. PG&E's testimony states that it "recognizes that it has not located some historic pipeline records, including strength test reports that should have been retained."[306] PG&E also acknowledged that "[s]ome records to validate the Maximum Allowable Operating Pressure (MAOP) are still under investigation and may be missing." [307]

However, PG&E constructed these admissions in language that is too tepid to accurately inform the Commission of the degree, scope, quantification, and harm to safety caused by its violations of law.

Any violation of safety regulations is the most serious type of violation, meriting the most severe fines (See Decision __98-12-075, 84 CPUC 2nd 155, 183). PG&E's admitted failures to retain strength test records, assuming PG&E actually did such tests and recorded them, are violations of safety regulations. The ASA/ASME codes, and state and federal law, are clear as to PG&E's duties to conduct strength tests and to create and maintain related records. PG&E failed to implement these legally mandated responsibilities.

[306] PG&E Exhibit 61, Page1-1
[307] PG&E response to CPSD DR 4, Q 5 and 6

CPSD will not seek violations of strength test recordkeeping requirements for tests performed prior to 1956, although evidence shows that PG&E has conducted various kinds of pressure tests (gas and liquid pressure, soaping welds under pressure to detect leaks) for post-installation testing since the 1930's.[308] PG&E cannot seriously dispute that, beginning in 1956, it was required to hydrostatically test, to record the results accurately and fully, and to retain the test results for the entire operational life of the pipe installed.

d. PG&E Defenses to Violation

PG&E offered virtually no defense to the missing strength test records violations asserted by CPSD. PG&E never claimed that the evidence CPSD relies on pertaining to this issue is incorrect. CPSD previously responded to several of PG&E's general defense claims in section III of this brief. We wish to make a few points here regarding PG&E's asserted defenses as applied specifically to strength test records.

First, PG&E asserts that other utilities and companies have difficulty maintaining their own records. However, PG&E has not even made an effort to demonstrate that any other utility's strength test records are similarly missing. No specific or quantifiable evidence of that kind exists in the record. Anecdotal references to recordkeeping problems in other companies, or in the industry in general, do not constitute relevant evidence. Also, as a hypothetical, if other companies that transport flammable and explosive gas in pipes could not locate multiple thousands of strength test records that they are required by law to maintain, then those companies should be prosecuted for their violations. However, evidence of another company's violations would not relieve PG&E of its own public utility obligations. As discussed above, federal and state laws and industry codes stating strength test requirements for new installations have been in effect for years. PG&E's implied suggestion that gas operators in general dismiss safety laws remains unproven, but even if there were a showing to that effect, it would be irrelevant to this investigation.

Second, PG&E claims that it cannot have violated section 451 or ASME, apparently because 451 lacks specificity and because PG&E compliance with ASME was merely

[308] CPSD Exhibit 4, Page 30, Lines 4-6, and footnotes 147 and 148

"voluntary."[309] CPSD will not repeat its earlier discussion of section 451 and ASME, however, we note that in the instance of strength testing the two sections fully complement each other. Even without ASME or any specific law, engineers in the 1950s and later would seek to "promote safety" by using proven, available, and economically feasible strength testing. ASME standards were adopted in 1955 and PG&E's engineer, Roscoe Smith, was an active participant in developing those standards.[310] PG&E management agreed to comply with those ASME standards, and even told the Commission it had no reason to adopt a General Order mandating those standards.[311]

Third, PG&E appears to claim as a defense, that CPSD cannot prove whether a strength test was conducted or omitted, when the strength test data was lost, or whether it was simply misplaced and PG&E has not located it yet (more than two years after the San Bruno tragedy). This is PG&E's attempt to distance itself from the situation that it alone has created. It is true that CPSD does not know which if any strength tests were actually conducted, which if any strength test reports were written, which if any reports that once existed were thrown out or destroyed (or when), or which reports may remain somewhere in a storage box among millions of PG&E documents in dozens of locations. Nor can PG&E provide those answers. The question the Commission must answer is – who should bear the responsibility for and the cost of that uncertainty? The answer to that is provided by law and is unequivocal. PG&E maintained and owned the data and documents that would have provided proper evidence on these matters. Because PG&E failed to comply with legal requirements to keep the data for the life of the pipe asset, any inferences that must be drawn from the data's absence must be drawn against PG&E. That is the holding of Cedar Sinai and other allied authority.

Another statement appears to be offered as a defense of sorts. A PG&E witness, responding to the CPSD finding that PG&E is missing post-installation test records, simply stated that "PG&E's efforts to locate strength test records have been the subject of numerous filings in the OIR 11-02-019"…, and "the detailed contents of those filings do not need to be

[309] CPSD Exhibit 6, fn 1, Attachment 1 Pages 5-12 (NTSB August 30, 2011 Accident Report).
[310] Response to DR 15 Q 6, Atch 3, p. 124-125
[311] Response to DR 15 Q 6

restated here [in PG&E's testimony]".[312] This statement is offered without an explanation of why PG&E would elect to keep relevant evidence out of this record.

CPSD recommends that the Commission find that thousands of strength test records are missing from the period 1956 through 2010. PG&E was required to conduct the testing and to create and maintain the records. PG&E does not dispute that these records are missing. Neither CPSD nor the Commission is required to determine why the records are missing, whether it is because no test was done, because the result was never reduced to writing or pressure graph data, or because it was destroyed or misplaced immediately after the test, or even long after. Regardless of the exact nature or timing of each violation, each missing record represents one or more testing and/or record maintenance violations that have continued for decades.

e. Effect on Safety

PG&E's failure to maintain strength test records has seriously harmed both public and employee safety. In the absence of pipe strength test results as required by law at the time of installation, PG&E cannot ensure the safety of the pipe without digging it up and testing it again. Any party who suggests otherwise ignores the clear safety purpose of codes and laws requiring specified testing and records for each new pipe installation.

CPSD testified that pressure records, among others, are "vital to the successful implementation of the company's integrity management risk assessment model."[313] A strength pressure test record can confirm the soundness of workmanship, materials, installation, and the accuracy of pipe specifications and their ability to safely transport gas at certain pressures.

In assessing this harm, the Commission should review the evidence that establishes the violations have occurred from at least as early as 1956, and have continued to today. The failure to keep pressure tests is a continuing, daily violation.[314] Each utility violation of failing to test, record test record results, or failure to maintain the record – all required by law – constitutes a separate, daily violation. PG&E transports gas daily through its pipes – each day it does so without the lawfully required information causes a diminishment of gas safety.

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[312] PG&E Exhibit 61, Page 3
[313] CPSD Exhibit. 2, Page 33, Lines 16-17
[314] California Public Utilities Code § 2108

Additionally, PG&E's violations are the most serious ones possible, of the kind that this Commission has held that it will fine most severely. Each of the thousands of violations shown in TURN 4 are safety violations, either which harmed or threatened harm to thousands of persons over many years. Finally, the San Bruno tragedy killed eight persons, injured over 50 others, and destroyed dozens of homes. The Commission has decided that "violations which caused actual physical harm to people and property are generally considered the most severe, with violations that threatened such harm closely following."[315]

It is established that PG&E has never located any test results from its 1956 installation of Segment 180. If PG&E actually conducted a test, it either never recorded the results, or it failed to maintain them as required by the ASME Code even though PG&E represented to the Commission that it followed ASME at the time. While it remains impossible to re-create the past to ascertain whether test results would have prevented the explosion, PG&E's omission for over 55 years to note the absence of a pressure test record for the segment, represents a missed opportunity to have established safety and to have saved lives.

Violation 19: Weld Maps and Weld Inspection Records

a. Summary of Violation

PG&E failed to retain weld maps and weld inspection records. Safe operation of high pressure gas transmission pipelines is contingent on good original construction, including good quality welds in the piping. Welds must be adequate to meet the stresses that will occur during normal operations. In addition, if PG&E changes or uprates a pipeline to a higher MAOP, it must have data and records to ensure that the pipe welds are sufficient to serve safely under the higher operating pressure. Thus, historical records of the weld inspections and the weld maps are critical to the ongoing safe operation of the transmission pipelines. Some surviving records of welds in PG&E's transmission lines show that substandard welds were accepted for service, suggesting there may be pipe in the present transmission system that do not meet criteria for safe, ongoing gas transmission service. By failing to retain, or discarding these important weld inspection records, PG&E violated basic engineering and regulatory requirements for safety.

[315] D 98-12-075, 84 CPUC 2nd at 184

b. Laws that PG&E Violated

PG&E's failure to retain weld maps and inspection records violated Public Utilities Code section 451, (1951-2010), ASME Code section B31.8.(1955-2010), California Public Utilities Act Article II section 13(b)(1930-1951), 49 CFR 192.241 and 192.243 (1970-2010), General Orders 112, 112A, and 112B section 107 (1961-1970), and its own standard practice.

Regulatory requirements for pre-service weld inspections changed over time. Prior to General Order 112 (1961), there were no explicit regulatory requirements to inspect girth welds, but doing so would have been a necessary practice to ensure the integrity of installed pipe and safe operations. In 1955, ASME Code B31.1.8 included a procedure for weld inspections. Before the implementation of General Order 112, PG&E told the Commission that it followed ASME standards.[316] Therefore, PG&E was committed to inspecting pipe welds and retaining such records in job files or elsewhere, along with other construction and pre-service records.

The first General Order 112 required natural gas utilities to inspect 30% of welds in Class 3 and 4 locations, and 20% in Class 1 and 2 locations. General Order 112-C (1971) increased these percentages to 100% for Class 3 and 4 locations where practicable, but, in no case, required less than 90%.

In 1970, 49 CFR 192.241 and 243 incorporated ASME B31.8 standards, thereby incorporating the ASME requirement for weld inspections into the federal code.

c. Discussion of Violation

PG&E engaged in unsafe practices when it failed to retain weld maps and weld inspection records for pipe installed in its transmission system.

Good engineering practices and regulations require the retention of engineering and construction records for gas transmission facilities for the life of the facility, and weld inspection records that document the integrity of the installed pipe, including weld maps which are an integral part of a weld inspection report. PG&E's own 1963 Standard Practice requires that the company "establish a minimum weld check by radiographic or visual examination procedures on

[316] PG&E Response to DR 15 Q 6

all gas piping systems, in accordance with General Order 112." The same document required that PG&E retain weld inspection reports for the life of the facility."[317]

Weld inspection reports and weld maps are important sources of information if they are available to a utility. Weld reports are "an important source of information about the quality of welds."[318] Weld maps – assuming they were not missing from PG&E's files – "would provide invaluable information to PG&E in its current efforts to locate and evaluate welds."[319]

One of PG&E's witnesses, 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.*[320](emphasis added)

Despite the safety value of these records, and despite requirements that it retain them for the operating life of the pipe for which the records were created, PG&E has not retained most of these records.[321]

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, in theory, 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.[322] Weld inspection records would serve as an alternative source of information in situations where other source records were not created 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

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[317] P2-1286 and SP 1605
[318] CPSD Exhibit 2, Page 36
[319] CPSD Exhibit 2, Page 35
[320] PG&E Response Page 3-12, lines 11-18
[321] CPSD Exhibit 2, Pages 34-37
[322] Based on Felts review of PG&E job files in ECTS

provide a basis for conservative assumptions about welds in the integrity management model.[323] PG&E says it reviewed tens of thousands of weld inspection reports.[324] PG&E produced 6,935 individual pages identified as weld inspection reports, which are listed in an index that provides dates and GM numbers.[325] PG&E fails to say that multiple pages are often associated with one individual GM number, which significantly diminishes the total number of reports PG&E has produced and/or retained. There are 10,051 job files associated with the transmission pipe currently installed in PG&E's system.[326] For each of those job files there should be a weld inspection report that summarizes the results of an inspection conducted when the pipe was installed. As a conservative estimate, PG&E has produced weld records for less than 50% of the job files. Some of the existing weld records are incomplete.[327] Some weld records are missing entirely.[328]

The San Bruno incident alone demonstrates how important it is for PG&E to understand all historical information about its welds. In the case of the San Bruno pipe that ruptured, PG&E's GIS did not show a longitudinal weld in that pipe, even though the failure on September 9, 2010 was along a longitudinal weld. PG&E's GIS records show that the pipe was "seamless." For that reason, PG&E never considered the integrity of that weld.

Another important inspection report for Line 132, apparently buried in PG&E's job files from 1948 to 2010 sheds additional light on the importance of a utility retaining (and considering) weld inspection reports. The report identifies a "number of longitudinal and circumferential welds that were cracked or that contained anomalies or inclusions. Some of the welds were repaired. Other circumferential and longitudinal welds, characterized as sloppy, containing gas pockets and inclusions, were checked off as accepted, allowing the pipe with defective welds to remain installed in the transmission system."[329] Only 10% of the welds in the

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[323] 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.
[324] PG&E Response Page 3-56, lines 10-15.
[325] P7-0047 Index of documents produced with PG&E's June 20, 2011 Report.
[326] CPSD Exhibit 6, Chapters 1-6..
[327] Based on Felts review of job files in ECTS.
[328] CPSD Exhibit. 4, Page 32, Lines 6-7
[329] CPSD Exhibit 2, Page 36, Lines 17-20

line were x-rayed, so there is no way to determine how many bad welds there are in line 132, or in lines where PG&E reused pipe from the 1948 installation of line 132.[330]

In summary, PG&E's failure to retain weld maps and reports constitutes a serious violation of law and compromises safety.

d. Discussion of PG&E Defenses

PG&E's defense to this violation consists of three arguments. First, PG&E argues that "the integrity management rules and ASME B31.8S were drafted in full contemplation of the fact that operators would not possess complete records, particularly for [pipelines in existence]."[331] However, whatever records deficiencies were noted by ASME or PHMSA and considered in adopting regulations, nothing in the code purports to excuse the deficiencies. Also, there is no showing that any governmental agency could have expected or even imagined the scope, scale, and duration of the records deficiencies identified in this case.

Second, PG&E claims that the ASME code "left the number and location of welds to be examined to the discretion of the operating company, and did not specify any recordkeeping requirement."[332] It is true that the number and location of the welds examined was left to PG&E's discretion. Safety laws characteristically do not micromanage how an operator seeks to make its system safe. But the failure to conduct needed weld inspections, or to create and retain records of the tests done, is unsafe and violates the law.[333]

Finally, PG&E claims that the weld maps and reports are unnecessary for its integrity management. CPSD notes that PG&E may not have used these records for integrity management, but it surely should have.

PG&E's integrity management witness, Ms. Keas, testified that PG&E did not normally retain pre-service weld inspection records, because once the welds were proven to comply with requirements, the records were no longer useful.[334] CPSD assumes that Ms. Keas was unaware of the Line 132 weld records from 1948 which show acceptance for service of pipe that contained welds that were cracked and contained voids. These records are an indication of the low standard PG&E applied in accepting welds in the past. If this is no concern to PG&E's

[330] CPSD Exhibit 2, Page 36 and documents cited footnote 148 of Ex. 2
[331] PG&E Exhibit 61, Page 3-53
[332] PG&E Exhibit 61, Page. 3-55
[333] Life of the asset records part of construction Job File to be kept
[334] Tr Vol 11, p. 1634

integrity management department, then the Commission and the public have reason for serious concern about future gas safety practices at PG&E.

e. Duration and Scope of Violation

This violation applies to all weld inspection reports missing from as early as 1930 and is therefore a continuing violation from 1930 to present. For purposes of this investigation, the duration of the violation is continuous from 1930 to 2010.

f. Summary of Violation's Negative Effect on Safety

Weld inspection records are important to prove that the welds in the original pipeline construction were properly made and would be expected to provide safe service under the original conditions for which the pipeline was designed. Such records may also have shown anomalies in construction such as the pups in Segment 180 of Line 132 that PG&E says it was not aware of. Had PG&E kept weld inspection records, including weld maps, it would have been able to look at those historical records to determine the locations of welds (how close they were to each other in the case of pups) and the quality of welds when they were accepted. If, by today's standards, the welds appeared to have been less than acceptable, or if the level of service in a pipe has changed (such as uprating to a higher MAOP), such weld information would have been vital to assuring continued safe operation of PG&E's transmission lines. As for the future, even with the completion of the MAOP validation exercise for all transmission lines, PG&E will not be able to conclude with reasonable certainty that all welds in the transmission pipes are sufficient to ensure safe operations.

Violation 20: Operating Pressure Records

a. Summary of Violation

PG&E violated the law by failing to create or maintain the operating records necessary to ensure that its transmission pipelines are safe to operate at high pressures. Primarily, PG&E is missing years of pressure records required for safe operation of the pipes. The pressure records the company has retained are so inaccessible that they are essentially unavailable. The impact this has on safety is that integrity management cannot be meaningfully evaluated, pressure

cycling evaluations required by the law cannot be accurately conducted, and PG&E may not have done required testing in compliance with the law.

b. Laws that PG&E Violated

PG&E violated Public Utilities Code section 451 by engaging in the unsafe practice of failing to create or retain accessible operating pressure records. PG&E's deficiencies also constitute violations of California Public Utilities Act Article II section 13(b), ASME Code section B31.8, General Orders 112, 112A, and 112B section 107, and PG&E internal policies requiring retention of engineering records.

c. Discussion of Violation

Good engineering practice and regulations require retaining operating records, including operating pressure records, for gas transmission facilities for the life of the facility. The operating pressure history over the life of the pipe is a critical record for any piping, including natural gas pipelines.[335] This record should keep track of normal operating cycles showing high and low pressures as evidence of the pressures to which the piping is subjected under normal operating conditions.[336] The highest pressure and duration at the pressure, over specified periods (for instance, daily, weekly, or monthly), should always be recorded because they will be used by engineers to evaluate unusual stresses that could affect the expected life of pipe in service (especially those known to have a manufacturing threat such as Electric Resistance Welded Pipe).[337] Operating pressure over a pipe's lifetime is relevant to any risk associated with continued pipe operation at routine pressures, including the possibility of utility decisions to uprate or increase the MAOP, the risk management of failure, and determining the expected life of the pipe.[338]

In assessing corrosion risk relative to the expected life of the pipe (a pipe wall made thin by corrosion could leak under normal operating pressure), PG&E recognizes the importance of pipeline operating pressures in its Risk Management Procedure, noting that the pipeline operating pressures are "required" for risk assessment and stating that significant changes in

[335] CPSD Exhibit 2, Page 37, Line 10
[336] Ibid.
[337] P3-27410, p. 2.
[338] CPSD Exhibit 2, Page 37, Lines 13-18

pressure may trigger new DB-ICDA regions.[339] The same pressure history recordkeeping is crucial to other considerations (e.g. weld integrity) of integrity management as well.[340]

It is also important to understand that pipe over-pressure damage in the year 1965 poses the same dangers to pipe integrity as does over-pressure damage to the same pipe in 2008. That is why it has always been important, from an engineering point of view, for PG&E to keep complete and accurate records of pipe pressures for the entire service life of the pipe.

PG&E keeps some pressure excursion information in abnormal incident reports, but these reports appear to stand alone, and are not integrated into any particular historical record of operating pressures.[341] Pressure history recorded in SCADA began in 1986, but records are probably only readily accessible back to 2003, when the SCADA system was upgraded to the current program.[342] Generally, PG&E has no "life of the plant" record of operating pressures for the life of its pipelines.[343] Moreover, PG&E acknowledged that it recently lost pressure records for all of 1999 for all pipelines in its system.[344]

Because of this loss of pressure records, PG&E simply cannot give an accurate accounting of pressure excursions above MAOP for any pipeline in its system, which means the company cannot accurately assess the condition of any of its pipelines.

CPSD also notes that, by law, pressure must be considered for purposes of integrity management. CFR 192.617(e)(2) requires that gas operators evaluate whether cyclic fatigue could lead to a failure of its pipes. Cyclic fatigue is a condition that can develop from large differentials over time in operating pressures of a pipe. While PG&E now says that cyclic fatigue is not a factor on its system, missing operating pressure history makes it impossible to verify this claim. In fact, the NTSB found that "it is possible that – "[t]he pup 1 longitudinal seam was progressively weakened by internal pressure/pressure cycling"[345] It is not necessary to debate with PG&E in this proceeding about whether pressure cycling weakened the pipe. The important point here is, from a recordkeeping perspective, the absence of pressure records makes it more difficult for an integrity management engineer to consider the risk of pressure cycling.

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[339] P2-390, p. 26, DG-IGDA is Internal Corrosion Direct Assessment for a dry gas pipeline.
[340] CPSD Exhibit 2. Page 38, Lines 1-2
[341] PG&E Response to DR 7 Q 1, Abnormal Incident Reports
[342] PG&E Response to DR 4 Q 9
[343] CPSD Exhibit 2, Page 38, Lines 7-8
[344] PG&E Response to DR 15 Q 10.
[345] CPSD Exhibit 6, fn 1, Attachment 1 Page 94 (NTSB August 30, 2011 Accident Report).

d. Discussion of PG&E Defenses

PG&E acknowledges that it only has pressure data "from 1998 through the present day" and also that 1999 data is lost.[346] The March 16, 2012 Felts testimony illustrates that specific missing records are needed for PG&E to operate a meaningful and useful Integrity Management (IM) program. CPSD's testimony does not say, and should not be interpreted to mean, that PG&E's only recordkeeping requirements for operating pressure records would be spelled out in IM recordkeeping requirements. Regardless of whether or not the records are used now in the PG&E's new IM program, throughout its history PG&E has always had a responsibility to assess the risk of its pipes and operations.

PG&E fails to refute CPSD's testimony that PG&E lost or discarded historic pressure records and that PG&E's IM procedure requires these historic records to determine risk related to internal corrosion.[347] 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.[348] The absence of data makes it impossible for the Pipeline Engineer to 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.[349]

e. Duration and Scope of Violation

From 1930 and continuing through 2010, PG&E as a matter of routine violated the law by failing to retain operating pressure records for the life of the facility.

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[346] PG&E Response Page 3-59, lines 1-6.
[347] CPSD Exhibit 2, Page 37-38 and footnote 156, citing P2-390, p. 26.
[348] P2-390, Procedure for Dry Gas Internal Corrosion Direct Assessment, page 26 (See fn 59).
[349] CPSD Exhibit 4, Page. 33, Lines 1-4

f. Summary of Violation's Negative Effect on Safety

Without adequate information, there is no means to safely manage pipes other than to test them, inspect them using inline technology, or replace them. PG&E did not favor any of those options before the 2010 events forced it to rely on those actions. Without adequate pressure information, integrity management personnel cannot do their jobs properly, regardless of so-called "conservative PG&E assumptions." A case in point is PG&E's IM directive that "the Incorrect Operations Threat was assumed to exist for all HCAs [pipe segments in populated areas]."[350] This approach of applying the same assumption to all pipes (whether the assumption is conservative or not) leaves PG&E unable to prioritize pipe replacement, testing, or inspection based on operating pressure history. A pipeline that was actually operated improperly will have the same risk value as all other pipes sharing the same generic assumption.

Violation 21: Pre-1970 Leak Records

a. Summary of Violation

PG&E's records of transmission pipe leaks before 1970 is inadequate. This hampers assessment of the integrity of its pipes.

b. Laws that PG&E Violated

PG&E's violations of law pertaining to leak records includes violations of Public Utilities Code sections 45 by failing to retain leak records, violations of California Public Utilities Act Article II section 13, violations of ASME Code section B31.8, and violations of General Orders 112, 112A, and 112B section 107.

c. Discussion of Violation

Good engineering practices, safe engineering judgment, and regulations require the retention of gas transmission facility leak records for the life of the facility.[351] Every company that transports natural gas through pipelines must have an active leak detection program to

[350] RMP 6, p. 29
[351] Pub. Util. Code § 451; Pub. Util. Act Article II § 13(b); ASME Standards § B31.8; General Orders 112, 112A, and 112B, § 107.

protect the public. PG&E has had a leak detection program since at least 1958.[352] Unfortunately, even though it had a leak detection program in place, PG&E failed to document and save data from one of its earliest leak records systems, the A-Forms, in a way that made the data retrievable. This records deficiency made it impossible for PG&E to use its leak detection program to properly care for its pipes and make them safe on an ongoing and long-term basis.

PG&E used A-Forms to capture leak information on site and claims to have retained these records largely in job files.[353] However, A-Forms are frequently only partially completed. Even portions of a single data field are often blank, although, each data field is intended to be filled out by a single individual.[354] Further, leaks are rarely graded on the A-Forms, which begs the question of how a grade is ultimately assigned, and who makes that decision when the leak information is entered into a database. For these reasons, A-Forms are an incomplete record of leaks and the ones that do exist are difficult to use as a resource of leak data for the integrity management program. Although PG&E says it maintains leak records for the life of the facility, it cannot count the total number of leaks that it has had on each transmission line since installation.[355]

CPSD also notes that a leak on a transmission line longitudinal weld in 1968, for example, should be every bit as relevant and important to an engineer charged with safety, as the same kind of leak would be in 2005. As long as PG&E has been transporting pressurized gas in pipes, engineers have known that leaks have consequences to safety. With the added guidance of industry codes such as ASME B. 31.8 and regulations (GO 112), PG&E has no justification for its inadequate leak data and records practices.

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[352] P2-1149, S.P. 460.21-4, 1966, indicates it replaced a 1958 version. CPSD does not comment in this brief about the effectiveness of the pre-1970 leak detection program itself, insofar as it may have been designed to detect and fix leaks before 1970. The deficiencies we allege pertain specifically to the records of leaks from the leak detection program and from other sources. We do note, however, that ultimately the effectiveness of any complex program using data depends on records.
[353] PG&E Exhibit 61, Page 3-60, Lines 23-26.
[354] P3-24246, examples of A-forms
[355] PG&E Response to DR 40 Q2

d. Discussion of PG&E Defenses

PG&E asserts it shares CPSD's concerns regarding the completeness and accuracy of data in some A-Forms.[356] Incomplete forms are equivalent to missing records. If an employee reports a leak, but fails to complete the sketch or to record information sufficient for someone else to locate the leak, the leak cannot be included with any accuracy on maps or in GIS.

PG&E states that the earliest-located leak report form (also called "A-Form") it has located is dated 1979.[357] 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. Also in contradiction to PG&E's claim, the same portion of PG&E's testimony that claims the earliest located A-Form is from 1979 also states that PG&E began to enter information from A-Forms into electronic recordkeeping leak systems, the first of which was a mainframe computer program developed in the early 1970's (before 1979).[358] CPSD cannot explain why PG&E testified that it did not have the earlier forms.

Despite the identification of some earlier A-Forms, leak 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 kept track of the leaks at one time, because there are job file references to tallies of the number of leaks on a pipeline.[359] It is CPSD's understanding that the A-Forms would have been kept in the Pipeline History Files.[360] Thus, if PG&E had retained the Pipeline History Files, it would theoretically have a complete set of leak records for each pipeline. When it discarded those files, it lost that information permanently.

e. Duration and Scope of Violation

Leak records are vital to the safe operation of a gas transmission pipeline. Because leak records are important engineering and facility maintenance records that should be kept for the life of the facility, and PG&E still maintains pipe in the ground that was installed in the 1930's, this violation is continuous from 1930 to 2010.

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[356] PG&E Exhibit 61, Page 3-63, Lines 22-23.
[357] PG&E Exhibit 61, Page 3-61, Lines 2-3, and P2-1152.
[358] PG&E Exhibit 61, Page 3-61, Lines 2-3 and Lines 10-13.
[359] CPSD Exhibit 4, Page 33, Lines 11-14
[360] PG&E Standard Practice 463.7

f. Summary of Negative Effect on Safety of Violation

It is crucial to good integrity management to keep a good track of leaks on a certain pipe and pipeline. PG&E has long known that leaks are a fundamental measure of when a pipe must be replaced[361]. Because PG&E's A-Forms are incomplete as a set, and because many of them are missing information, many of PG&E's leaks go unattended. The safety risks of allowing leaks to go unattended include exposing people to harmful gas, the potential for explosions where gas accumulates in closed areas, and total pipe failures resulting in catastrophic damage like the San Bruno pipe failure in September 2010.

Violation 22: Leak Records from 1970 Forward

a. Summary of Violation

Leak record history is critical for transmission pipeline safety, both for immediate attention and repair and for integrity management assessment and decisions. PG&E has an incomplete and inaccessible set of post 1970 leak records.

PG&E has failed to migrate all of its leak records into its current IGIS system, making the set it has difficult to access.[362] PG&E has also failed to properly map jobs that were necessary to perform leak surveys.[363] In addition, many of PG&E's individual post-1970 leak records are inaccurate and incomplete.[364] Large numbers of leak records that may technically exist are completely unknown and unavailable for PG&E integrity management personnel to review and consider. PG&E also has known for quite some time that its leak records were largely inaccurate and under-recorded.[365] PG&E has also experienced difficulty checking the accuracy of its leak data.[366]

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[361] CPSD Exhibit 55, The Bechtel report "Engineering Consulting Services for Pacific Gas and Electric Company", dated January 1984, Job 16253, Revision O 1984 Bechtel Report, Pages 7 and 8, and Appendix C.
[362] PG&E Response to CPSD Data Request 69, Question 6.
[363] PG&E Response to CPSD Data Request 25, Question 2(i) Supp 02Atch17
[364] PG&E Response to CPSD Data Request 25, Question 2(i) Supp02Atch02, Page 2-3
[365] PG&E Response to CPSD Data Request 25, Question 2(i) Supp02Atch02, Page 2-3.
[366] CPSD Exhibit 55, Pages 7 and 8, and Appendix C. The Bechtel report "Engineering Consulting Services for Pacific Gas and Electric Company", dated January 1984, Job 16253, Revision O 1984 Bechtel Report,

b. Laws that PG&E Violated

Violation 22 is distinguished from Violation 21 in that additional regulatory requirements apply to leak records created after 1970. Accordingly, violations include violations of Public Utilities Code section 451 because PG&E engaged in unsafe practices when it failed to retain leak records for its transmission pipelines,[367] ASME code section B31.8, PG&E internal policies requiring retention of leak repair records,[368] and PG&E internal policy requiring retention of leak survey maps 2010.[369]

c. Discussion of Violation

Good engineering practices, regulations, and PG&E standard practices require the retention of leak records for gas transmission facilities for the life of the facility.[370] As discussed under Violation 21 above, leak records are important to the safe operation of PG&E's pipelines. And, although PG&E produced some leak records during this investigation, it failed to keep a complete set of accurate leak records that could be readily accessed by engineers, operators and maintenance personnel.

Several examples illustrate PG&E's failure to keep a complete set of leak records. First, PG&E did not migrate approximately one million leak records from its Mainframe Leaks system into its current IGIS system, [371] and did not retrieve leak data from its locally archived "PC Leaks" secondary storage systems. [372] Second, PG&E failed to properly map jobs and therefore failed to perform timely leak surveys of individual gas facilities.[373] Third, PG&E had reports showing that a large portion of its leak records were inaccurate, and that it believed its leaks were under-recorded.[374] Finally, a recent audit shows PG&E has experienced problems checking and

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[367] Calif. Pub. Util. Code section 451.
[368] CPSD Exhibit. 2, Appendix 8 (Inspection Records-Leak Repair of Pipe Exposure Row). In particular, PG&E internal policies shown in its documents P2-212, P2-225, P2-227, and P2-230 each require that inspection records for leak repairs or pipe exposure be kept for the life of the facility. These policies apply from 1994 to 2010.
[369] CPSD Exhibit 2, Appendix 8 (Leak Survey Maps row). In particular, PG&E policy P2-220 requires keeping leak survey maps for nine years. This policy is effective as of 2010.
[370] Calif. Pub. Util. Code section 451; ASME Code § B31.8; General Orders 112, 112A, and 112B, section 107.
[371] PG&E Response to CPSD Data Request 69, Question 6.
[372] PG&E Response to CPSD Data Request 69, Question 6.
[373] PG&E Response to CPSD Data Request 25, Question 2(i) Supp 02Atch17.
[374] CPSD Exhibit 8, 55, Page 8. The Bechtel report "Engineering Consulting Services for Pacific Gas and Electric Company", dated January 1984, Job 16253, Revision O.

ensuring the accuracy of leak information in IGIS.[375] For a detailed discussion of these points, please refer to violation C3.

d. Discussion of PG&E Defenses

Rather than defending its leak data, PG&E'S testimony seems to capture the problems with it:

> "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 from pipeline survey sheets, rather than A-Forms or IGIS."[376]

Leak data noted 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 a report or discovery of a leak.[377] In the testimony quoted immediately above, PG&E should have had a separate and independent record of each leak shown on the annotation of a survey sheet, but did not reference it. [378] In short, 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.[379] However, PG&E reduced 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.[380] In 2009, leak history made up 0.5% of the weighted data.[381] The shift to diminish the

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[375] PG&E Response to CPSD Data Request 25, Question 2(i) Supp02Atch02, Page 2.
[376] PG&E Exhibit 61 Page 3-63, line 34 through 3-64, lines 1-4.
[377] See CPSD Exhibit 6 for more specific discussion of how leak data was handled.
[378] The annotation on a pipeline survey sheet was simply the placement of an icon on a row in the table shown above a sketch on that pipeline survey sheet. For example, see PG&E Response to DR 7 Q 12 atch 51, See icons on line labeled "Leaks".
[379] PG&E Exhibit 61, Page 3-64 line 32.
[380] CPSD Exhibit 2, Page 19, Lines16-24.
[381] CPSD Exhibit 4, Page 34, Line 15

importance of leak data appears to reflect PG&E's inability to locate valid leak data to use in its risk assessments.[382]

e. Duration and Scope of Violation

Leak records are vital to the safe operation of a gas transmission pipeline. Because leak records are important engineering and facility maintenance records that should be kept for the life of the facility, and PG&E has missing, incomplete, and inaccessible leak records from 1970 to present, this violation is continuous from 1970 to 2010.

f. Summary of Negative Effect on Safety of Violation

Because PG&E's post-1970 leak records are incomplete as a set, and because many of PG&E's individual post 1970-leak records are inaccurate, incomplete, or both, many of PG&E's leaks go unattended. The safety risks of poor control of data and records concerning leaks, includes exposing people to harmful gas, the potential for explosions where gas accumulates in closed areas, and total pipe failures resulting in catastrophic damage.

Violation 23: Records to Track Salvaged and Reused Pipe

a. Summary of Violation

Before 1970, PG&E commonly reused pipe. PG&E removed the pipe from service and installed this pipe in service elsewhere. After the reinstallation, PG&E could not identify the location of the pipe and its characteristics and specifications. PG&E's failure of records and data has created a system of pipelines that remains unsafe today, and will continue to be so until and unless PG&E identifies with certainty the location of each piece of reused pipe in its system.

b. Laws that PG&E Violated

PG&E violated California Public Utilities Code section 451 from 1954 to September of 2010. PG&E also violated its internal policies requiring retention of engineering records from April 1994 to September of 2010. PG&E engaged in unsafe practices when it failed to keep records of the use of salvaged pipe within its pipeline system.

[382] CPSD Exhibit 2, Page 26, Lines10-18

c. Discussion of Violation

For gas pipelines, the life of the facility includes the entire life of the pipe, even when it is moved from one place to another within the pipeline system. Over the years, PG&E has moved pipe (often pipe that had been in service for many years) from one location to another within its system. This reuse occurs, for instance, when a highway or development project requires the relocation of a gas transmission line.[383] However, PG&E has not kept track of where the used pipe has been reinstalled in the transmission system. This makes it impossible to accurately determine the correct age of pipe in any segment,[384] and makes it impossible for PG&E to identify, test, inspect or remove its most risky pipes and pipelines . PG&E decreased reused pipe safety by failing to properly inspect, test, and recondition pipe before reuse.

In 1957, PG&E commented on the Commission's proposed General Order:

> "These paragraphs stipulate that no used pipe or pipe of unknown specification should be used at pressures exceeding 300 psig. The American Standard Code details complete and adequate procedures to be followed to qualify such materials for use and to insure that safe installations result. It has been Company experience that pipe salvaged from gas lines in service for many years under severe conditions is in general good pipe. With proper inspection, repair and test, reuse of this material should be permitted. The staff's draft does not consider the effect of the actual working stress in connection with reused pipe. The 300 psig pressure limit is arbitrary in that it fails to take into consideration the thickness of such pipe. For example, salvaged 16" x 1/2" wall thickness pipe could not be used for a 300 psig operating pressure even though the steel stress would be only 4800 psig. On the other hand, 16" x 1/4" salvaged pipe could be used for a 299 psig pressure although the steel stress would be 9568 psig."[385]

According to this comment PG&E believed that it was acceptable to reuse pipe, but also stated that proper inspection, repair and testing was required prior to reuse.[386] Unfortunately,

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[383] CPSD Exhibit 2, fn 174

[384] PG&E says that it currently requires pipeline materials to satisfy specifications and standards set forth in its own Standards A-16 and A-34, and currently has a policy that prohibits the installation of reconditioned or used transmission pipeline fittings, such as elbow, tees, reducers and caps. See PG&E Response to DR 10 Q5 and DR 10 Q5, Attachment 3.

[385] PG&E Response to DR_033-Q10, Attach 2, p. 3.

[386] For instance, PG&E had a special inspection process for A.O. Smith pipe that was initially installed in the 1920s-30s as "PG&E Spec Pipe", then later salvaged and reused in the 1950's – 60's. Response to DR10 Q 5 Attachment 06.

PG&E never implemented a program to inspect, repair and test pipe before reusing it.[387] In fact, in the process of reviewing PG&E records, it has become apparent that PG&E has salvaged and reused transmission pipe now operating in its system that may not be satisfactory for continued service. This conclusion is based on weld radiography reports that show acceptance of marginal and bad welds on pipe that was subsequently salvaged and sent to the company storage yard for reuse elsewhere in the system. [388] It is also based on PG&E's inability to locate any standards for the reconditioning of used pipe until 1988, long after the practice of installing this pipe ceased.[389]

However, even if it is inspected, it would always be prudent to keep track of where the older pipe is within the system in case an issue arises later related to the earlier fabrication of the pipe or prior abnormal operating events involving the pipe.

From PG&E's ECTS database, CPSD discovered and disclosed records documenting that PG&E took pipe it used during original construction of Line 132 in 1948, and reused it elsewhere in the system even though the pipe had bad welds. [390] It is impossible to determine where this salvaged pipe ended up in the system.

After CPSD's October, 2011 disclosure about PG&E's reuse of pipe on Line 132, PG&E attempted to track pieces of salvaged pipe on the line. In its response dated November 15, 2011, PG&E repeatedly stated "[a]s part of PG&E's MAOP validation project, reconditioned pipe currently installed in the gas transmission system is being catalogued and tracked."[391] However, PG&E was largely unsuccessful in its belated efforts to track salvaged pipe, for reasons described here. First, a column for reconditioned/salvaged pipe was added to PG&E's pipeline features list (PFL) spreadsheet on September 1, 2011.[392] However, by that time, PG&E already had over 2.2 million job file documents scanned into the ECTS database, viewed and catalogued.[393]

Most of the records identified during this investigation by CPSD were found during

[387] PG&E Response to DR 16, Q1; Response to DR 10 Q 5 and DR 10 Q 2.
[388] CPSD Exhibit 2, Page 43, Lines 6-8
[389] PG&E Exhibit 61
[390] Project Number GM 98015.
[391] PG&E's Updated Supplemental Response to LD's "Notice and Disclosure of Safety Evidence and Companion Motion for Public Release of Evidence", I.11-02-016, filed Nov 15, 1011.
[392] PG&E Response to DR 16 Q 5.
[393] PG&E Response to DR 39 Q1.

random checks of pages of job files listed in PG&E's ECTS "non-Pipeline Features List" category.[394] To find and add all of the relevant pages to the PFL, someone would have to find the documents in ECTS and catalog them. Second, the task of finding and adding relevant pages to the PFL is not an easy task because there are millions of pages that were already scanned in as unsearchable images. To find the salvaged pipe in PG&E's system, each page of ECTS must be individually opened and viewed.[395]

PG&E's new program of implementing a tracking system to identify and track reconditioned and salvaged pipe is an effort to address the deficiency in its previous recordkeeping programs. Unfortunately, the great amount of time it will take to identify and account for used pipe in the system could be punctuated by additional pipe failures. And, even if the pipe is located, PG&E still must ascertain the pipe's age, when it was originally purchased, what its design characteristics are, and the service conditions it was exposed to over time. Because PG&E has moved pipe from one location to another within its system without keeping track of where the pipe went, it is now difficult to state in the integrity management risk assessment model the actual age of pipe in any pipeline segment.

The erroneous information in PG&E's GIS system about reused pipe represents one of the worst violations of the law in this proceeding. GIS shows the date of pipe installation to be the date of pipe manufacture. Therefore, if a pipe was manufactured in 1929, was in service for 35 years, and was then dug up and reinstalled in 1965, GIS identifies the date of pipe manufacture as 1965. There should be no doubt that integrity management engineers assign a higher different degree of risk of failure to a pipe manufactured in 1929 than a pipe manufactured in 1965. But PG&E's records have provided no means for PG&E to take into account the totally different risk characteristics of different vintage pipes.

d. Discussion of PG&E Defenses

PG&E states that it did not in the past "capture data identifying reconditioned pipe."[396] PG&E also says,"PG&E has not, as best it is aware, lost records about reused pipe.

[394] CPSD Exhibit 2, Page 46, Lines 12-14
[395] Ibid, l. 13-18
[396] PG&E Exhibit 61, Page 3-28, lines 19 -20.

Where older records of this kind are lacking, it more likely is because they were not created."[397] However, PG&E also acknowledges that "PG&E does not in all instances know where reconditioned pipe has been placed in its transmission system."[398] So PG&E agrees with CPSD that the company currently cannot track its reused pipe, whatever its past capabilities may have been.

First, as discussed above in regarding Violation 1, it appears that PG&E was creating accounting records that could have been used well before 2000 to determine where salvaged pipe was reused within its pipeline system., including on Line 132 Given that PG&E was creating these records, it should by law 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.[399]

PG&E has not produced the filmed records referenced or the originals. In short, these records are missing. In light of the statement to the Railroad Commission in 1944, quoted

[397] PG&E Exhibit 61, Page 3-33, lines 26 – 28.
[398] PG&E Exhibit 61, Page 3-32, Lines 1-2.
[399] 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.

above, it now appears that PG&E had voluminous accounting records that included annotations showing pipe that was salvaged. PG&Ealso 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.[400]

The record shows a second example of missing accounting records that PG&E could have used to track reused pipe. During this investigation, CPSD discovered job file GM 119689 in the ECTS system. This job file number was used for an accounting inventory file that ran continuously from 1952 through 1967.[401] The stated purpose of account GM 119989 was to transfer from Materials and Supplies Division to Construction Work In Progress, pipe that had been assigned to specific installations.[402] 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.[403] Monthly reports were to be generated.[404] 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).[405] 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 all 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.)[406] 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.

e. Duration and Scope of Violation

The duration of this violation is from 1954-2010.

[400] CPSD Exhibit 4, Page 35, Lines 28-29
[401] CPSD Exhibit 4, Page 36, Lines 1-2
[402] CPSD Exhibit 4, Page 35, fn 174
[403] CPSD Exhibit 4, Page 35, fn 175
[404] CPSD Exhibit 4, Page 35, fn 176
[405] CPSD Exhibit 4, Page 35, fn 177
[406] CPSD Exhibit 4, Page 35, fn 178

f. Summary of Violation's Negative Effect on Safety

Even today, PG&E is operating a high-pressure gas transmission system without knowing the age, source or history of sections of pipe that have been salvaged and reused over the decades. Without records to provide this information, it is impossible to be sure that another pipe failure will not occur on a line where a reused pipe, not suited for the new operating conditions, was installed. The loss of records that tracked the history of reused pipe pieces represents a serious breach of safety that will not be remedied until PG&E has inspected all of its lines and documented traceable, verifiable and complete records for every pipe in its system.

Moreover, the loss of records about the location of salvaged pipe means that PG&E cannot determine whether pipe specifications data entered into its integrity management risk assessment model are accurate for every pipe segment. This uncertainty creates an ongoing safety risk associated with using the integrity management risk assessment model to prioritize pipe projects based on likelihood of failure or highest risk without having full information about the installed pipes.

Violation 24: Data in Pipeline Survey Sheets and the Geographic Information System

a. Summary of Violation

Important pipeline data in PG&E's GIS is erroneous and incomplete, and diminishes safety. The erroneous and incomplete information pertains to a myriad of characteristic – pipe specifications, pipe manufacturer, reused of pipe, weld characteristic or seamlessness, pipe location, MAOP, populations near the pipe, and others. The absence of accurate information greatly impedes pipe safety

b. Laws that PG&E Violated

This is a violation of California Public Utilities Code section 451, and PG&E's internal policies requiring retention of engineering records, from 1974 to 2010. In particular, PG&E engaged in unsafe practices when it failed to quality check GIS data and continued the use of a GIS system that contained data errors.

c. Discussion of Violation

Good engineering practices, safe engineering judgment, and regulations require a transmission pipeline operator to create and retain accurate data for its gas transmission facilities for the life of the facility.[407] PG&E began to develop its Gas Transmission Geographic Information System (GIS) in the early 1990's to provide a central access point for pipeline information within many groups in Gas Transmission,[408] and currently stores its gas transmission system data in GIS.

When asked to state the number of miles of pipeline in PG&E's transmission system that have one or more assumed or unknown values in the GIS and the pipeline survey sheets, PG&E answered approximately 5,324 miles.[409] Indeed, PG&E produced a list showing the assumed and blank values in the GIS system for every segment of each pipeline.[410] Thus, important data for pipelines throughout PG&E's system is either assumed or unknown.

PG&E's Geographic Information System (GIS) replaced most of PG&E's paper records for documenting facility data, but the database was populated with faulty data, including assumed and missing elements[411] from earlier databases making it an unreliable source of data for the integrity management risk assessment models.[412] In spite of GIS's critical importance to engineering and operations, the database cannot be more reliable than the data from the records used to populate it. Because PG&E's GIS system is populated with many erroneous information, and, blank and assumed entries,[413] its usefulness is limited and in some instances counterproductive.

When PG&E was asked about its Quality Assurance/Quality Control (QA/QC) program

[407] Cal. Pub. Util. Code section 451.
[408] PG&E Exhibit 62, Page 3-66, Lines 16-18.
[409] PG&E Response to DR 27 Q 12 and 13.
[410] PG&E Response to DR 27 Q 12 Attachments 1 and 2.
[411] For more discussion and references to the record showing assumed, missing, and inaccurate elements in GIS, please refer to subsections vii, viii, xi, and xii, of section VI.A.Violation A1.3.b.
[412] GSAVE stands for "Gas System Asset Visual Explorer, was PG&E's first gas transmission GIS program, and was deployed in May 1998. GSAVE was a customized program composed of scripts and tools built using ESRI's ArcInfo 7.x and ArcView 3.x software base. GSAVE was operational until November 2003. GasMap 1.0 and GasView 1.0 replaced GSAVE in November 2003. (See PG&E Response to CPSD Data Request 30, Question 15). GasMapand GasViewwere alsocustomGIS applications developed by PG&E using ESRI ArcGIS 8.x software. GasMap and GasView migrated to ArcGIS version 9.x in 2005. PG&E deployed GasMap 2.0 in July 2011. GasMap2.0 is based on ArcGIS 9.3.1.
[413] For more discussion and references to the record showing assumed, missing, and inaccurate elements in GIS, please refer to subsections vii, viii, xi, and xii, of section VI.A.Violation A1.3.b.

related to the transition of data from hard copy records to the electronic GIS, it stated:

> "PG&E has been unable to locate or identify any documentation or formal procedures relating to quality control and/or quality assurance of the data transfer from hardcopies to pipeline survey sheets, and from pipeline survey sheets to GIS. Given the passage of time, it is difficult for PG&E to identify what QC/QA processes may have existed."[414]

As stated above, PG&E has no record of a QA/QC program for the transfer of data into the GIS. Errors in records have been carried forward from one system to the next without checks for accuracy or, in some cases even reasonableness. For example, there is an error in GIS that comes directly from the GIS rendition of the pipeline survey sheet for L-132, dated 9/11/2011, which shows a gas pressure test was performed in 1961.[415]

PG&E initially and incorrectly stated that Segment 180 was pressure tested with gas in 1961. PG&E believes this pressure test information came from a 1968 report filed with the PUC that indicates a gas test occurred in 1961. However, careful inspection of that record finds that in 1968 PG&E reported that the piece of L-132 between MPs 39.04 and 39.37, which represents the current location of Segment 180, was installed in 1948. Thus, by 1968 PG&E had apparently already misplaced its records that showed the 1956 project relocation of Segment 180.

PG&E now admits it has not identified any records related to a 1961 gas test, and there are no records of such a test in the job file[416]. In a response to a request for test records PG&E said, "with respect to the 1956 installation of Segment 180, PG&E has not located pressure test or x-ray documentation."

d. Discussion of PG&E Defenses

In parts of its testimony, PG&E argues that GIS ". . .is not our system of record for pipeline records) and did not replace engineering records."[417] However, other parts of the same exhibit state that the GIS database "serves as a primary source of information in the integrity management program."[418] In other words, PG&E has conflicting views about the purpose of its own GIS system. The evidence shows that PG&E's GIS system is the most accessible source of

[414] PG&E Response to CPSD DR 64, Q3. This is PG&E's response to CPSD DR 215 Q6 in I.12-01-007.
[415] Response to DR 7 Q 12 atch 83
[416] PG&E response to DR 45 Q 8
[417] PG&E Exhibit 61, Page 3-66, Lines 14-15.
[418] PG&E Exhibit 61, Page 3-54, Lines 3-4.

data and, therefore, the source most likely to be used and relied upon by those who need to exercise engineering safety judgment.

Joint hearings demonstrated a huge number of changes in GIS since 2010. This is symptomatic of both the degree of error and missing pipeline data that characterizes GIS, and of PG&E's neglect of its duty, prior to San Bruno, to populate GIS with good data.

e. Duration and Scope of Violation

The duration of this violation is 1974 to 2010.

f. Summary of Violation's Negative Effect on Safety

The accuracy of the GIS data is critical to safe operation and maintenance of PG&E's gas transmission system because gas control operators, engineers, maintenance personnel, and emergency responders rely on this data in making their decisions. 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. Data errors in GIS present a safety problem for PG&E because 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.

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. Thus, relying on GIS data for the Integrity Management model is not a safe practice.

Violation 25: Data Used in Integrity Management Risk Model

a. Summary of Violation

Good PG&E data and records are essential to maximize and prioritize gas pipe safety and pipe safety risk. However, PG&E data and records essential to manage the integrity of its gas system are incomplete, inaccurate, and inadequate. Accordingly, PG&E's integrity management model, and the critical prioritization of pipeline risk that is the product of the model, reflect the inadequacy of the data and, thus, are incomplete, inaccurate, and inadequate. As a result, PG&E's integrity management decisions have been skewed and unsafe.

Since at least as early as 1985, PG&E has known that its data and records were incomplete, inaccurate, and inadequate. Instead of addressing this problem and reconstructing the required information and ensuring better quality information from that time forward, PG&E developed an integrity management program that, in effect, dismissed risk associated with missing data, and that developed largely meaningless assumptions that PG&E deemed to be conservative. In fact, PG&E dismissed the risk of dangers such as those that manifested themselves so terribly on September 9, 2010. Likewise, PG&E's claimed conservative pipe assumptions have also been both wrong and meaningless, and have undermined PG&E's ability to effectively prioritize pipe replacement or other pipeline safety work.

b. Laws that PG&E Violated

PG&E violated Public Utilities Code section 451 from.2004-2010, by developing and fostering an Integrity Management (IM) Model skewed by massive PG&E data and records deficiencies and by the assumptions PG&E employed to compensate for the missing data.[419] The IM Model, distorted as such, failed to accurately reflect actual safety risks – for Line 180 and elsewhere - on PG&E's transmission system.

CPSD could have justified violations of 451 far earlier than 2004, and after 2010 and continuing until today. CPSD also could have justified violations of the Code of Federal Regulations, 49 CFR Part 192 beginning in 1984 when PG&E first developed a model for PG&E to use to prioritize the replacement of high pressure gas pipeline segments. We chose not to seek these violations, but instead to limit alleged violations to section 451 during the years between

[419] Although CPSD has chosen not to charge PG&E with violations until the effective date of the IM additional to the CFR. PG&E's actions justify a starting date in the early 1980's for this violation

when PG&E was first explicitly required by the Code of Federal Regulations to consider certain factors and data in developing its IM Model, and ending in 2010 when the San Bruno explosion occurred and PG&E began to change its IM Model.

Although CPSD does not seek violations for earlier than 2004, the Commission should not forget that PG&E was doing IM modeling in the 1980's and had knowledge of data and recordkeeping deficiencies long before 2004, when the violations are charged to begin based on the adoption of the CFR IM requirement. PG&E's long-standing knowledge of recordkeeping deficiencies is exactly why PG&E's IM Model was irresponsibly developed beginning in the 1980's to accommodate the records and data deficiencies that had existed for years.

c. Discussion of Violation

CPSD here defines integrity management (IM) as the process by which PG&E evaluates the safety risk to its gas pipes, and prioritizes the replacement of pipe or other safety measures to most effectively reduce that risk and the danger to the public of gas pipe failure[420] Integrity management effectiveness – safety in short – depends almost entirely on the quality of the data used as inputs to the integrity management process and model. If the data PG&E uses, accurately and fully models and describes its pipes and system, then PG&E can make competent and knowledgeable engineering judgments and establish priorities to promote safety.

Good engineering practices and regulations require a transmission pipeline operator to create an integrity management program that includes design and construction details of the pipeline system as well as specifications and operating parameters. The operator is also required to create an Integrity Management Risk Model utilizing the data collected to evaluate the relative risk of continued operation of each segment of pipe in its pipeline system.[421] Both PG&E's IM model inputs, and the skewed output that virtually ignored real risks, prove that PG&E failed to meet applicable requirements. As the NTSB found, San Bruno is one consequence of this failure.[422] Another consequence, that continues today, is diminished public safety on PG&E

[420] PG&E defines the integrity management procedure as one "designed to provide the best methods and implementation to ensure the safety of gas transmission pipelines located where a leak or rupture could do the most harm" P2-158, p.9. CPSD suggests that this is also a good and useful definition, and that by PG&E's own goals and terms, the company has failed to meet its own test.
[421] 49 CFR 192 Subpart O
[422] CPSD Exhibit 6, fn 1, Attachment 1 (NTSB August 30, 2011 Accident Report – 140pp)

lines, and the necessity for PG&E to restore public safety at considerable expense for ratepayers, shareholders, or both.

In the absence of good pipeline records and data for design, manufacture, construction, and operations, PG&E cannot meet or maintain the level of gas safety expected by the Federal and California Legislatures, the Commission, and the public. Engineering safety on a gas system is, by its very nature, a data and records intensive process. Engineers' decisions are only as good as the data that supports them. The record evidence shows that poor PG&E data, data assumptions, and recordkeeping greatly contributed to distorted and unsafe PG&E decisions and omissions pertaining to its entire gas transmission system, including Line 132, Segment 180.

CPSD has identified specific inadequate data and has described its effect on PG&E's integrity management program as follows:

> "The combined lack of data, assumed, unknown values, and questionable quality of the data entered into the model spreadsheet, suggests the model is of only minimal practical use and is more likely entirely useless in calculating total risk. PG&E's risk modeling efforts have always suffered from a deficiency in basic historical data and its current risk management model suffers from the same problem. As a result, the rankings generated from the model [risk priority] cannot be an accurate representation of the real likelihood of failure of segments. The pipes most likely to fail are not being identified accurately due to a lack of relevant, accurate, complete, and accessible data. Thus, PG&E's current integrity management program itself presents a safety risk to PG&E's field and station employees and the public."[423]

CPSD's report identifies the evidence that supports our conclusions and recommendations on this issue.[424] CPSD is not alone in reaching these conclusions. The NTSB found in its report on the September 9, 2010 San Bruno explosion that "[t]he PG&E gas transmission integrity management program was deficient and ineffective."[425] The NTSB also found and stated that "[t]he foundation of risk assessment is accurate information ….The lack of complete and accurate pipeline information in the GIS prevented PG&E's integrity management program from being effective."[426]

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[423] CPSD Exhibit 2, Pages. 24 and 25
[424] CPSD Exhibit 2, sections 3 and 4
[425] NTSB September 9, 2010 Preliminary Report, p. 125
[426] Id at p. 110

PG&E's Risk Management Procedure RMP-08 is one of many documents that establish the strong and necessary connection between data and integrity risk management of PG&E's gas pipes. PG&E lists the first four steps in its Risk Management Procedure:

1) Gather data
2) Review data
3) Integrate data to understand the condition of the pipe
4) Perform risk analysis[427]

PG&E's procedure then provides a "Threat Identification and Risk Analysis Process Flowchart," for assessment of High Consequence Areas (HCA). The flowchart directs that after data is gathered and reviewed, it must be assessed to ascertain "is data sufficient?"

PG&E also acknowledges that "[d]ata integration for integrity management is an ongoing process," and that "[n]ew or revised information regarding new pipe segments, pipe properties, pipe location, inspection information, and assessment information shall be incorporated in GIS on an on-going basis." PG&E's risk management procedure further recognizes that the "[q]uality and consistency of the data must be verified once information is collected."[428]

Lastly, PG&E's procedure recognizes that it maintains and stores in its GIS pipe characteristics important to Integrity Management:

> "Pipe properties (size, specification, location, inspection data, and assessment data are updated on an ongoing basis by the Mapping Department and are stored in GIS."[429]

Pipe Age and Integrity Management

Pipe age is a critical factor to determine safety risk of a pipe or pipe segment. In other words, pipe age data is critical to integrity management of pipes, of the system as a whole, and to prioritizing pipe replacement consistent with both safety and cost. PG&E has known the importance of pipe age for many years.

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[427] P2-159, p. 18.
[428] P2-159 p. 22, underline added. CPSD underlined this material to note that, before the San Bruno explosion, PG&E internally had ordered verification of data quality and consistency. PG&E now argues that verifiable data represents a brand new standard. This argument is contradicted by PG&E's risk management procedure. – see Ex. PG&E 61, pp 1-10 through 1-15.
[429] P2-159 , p. 23.

In January 1984, Bechtel prepared the first in a series of reports for PG&E to develop a pipeline replacement program. The report makes the following finding:

> "Every mechanical system has a finite life span after which the reliability becomes statistically so uncertain as to warrant replacement even under Circumstances of a trouble-free past. Simple exponential decay of the reliability function is often used as a model for physical systems conforming to the assumed conditions of constant load and restricted maintenance upgrading due to inaccessibility. These conditions also describe our [PG&E] system …"[430]

The 1984 Bechtel report assigns 40% of the total weighting emphasis to pipe age. Age is the largest factor in pipe replacement in the Bechtel report, several times greater than the next highest risk factor, leaks, which is assigned 15%.[431]

Pipe age is important to integrity management risk assessment because certain other pipe characteristics are associated with older pipe[432]. For example, Electric Resistance Welds (ERW) are associated with older pipe. ERW welds can be problematic to safety and to integrity management. This may be confirmed by CFR 192.917 (e)(4). To locate and consider such welds for integrity management, PG&E pipe data must be accurate, complete, and accessible.

Pipe age is also important to assess operational conditions the pipe has been subjected to for the life of the pipe. These conditions pertain to ground movement, third party damage or interference, pipe pressure over the pipe's operating life, and possible pressure cycling problems. Thus, knowing the age of pipe allows engineers to consider whether it has been subjected to significant historical conditions or events. There is no evidence that PG&E has recorded and maintained adequate records of such historical data, any more than it has recorded and maintained pipe age data.

PG&E's actual performance in maintaining and accessing useful and accurate records of pipe age is similar to its performance for other data. In short, PG&E's performance is poor, and cannot support integrity management of PG&E's pipeline system. There are reasons for this.

First, PG&E's job files are the primary source of pipe age data.

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[430] CPSD Exhibit 55, Pages 6 and 7 (January 1984 Bechtel Report).
[431] CPSD Exhibit 2, p.19, l. 18-19.
[432] CPSD Exhibit 2, p. 19, l. 25

For years PG&E's job files have been a mess, as has been described in the Testimony of Dr Duller and Ms North (CPSD Exhibit 6) and in Violation 1.A (pp.172) of this brief. PG&E's abandonment of its pipeline history files further exacerbated the information deficit related to integrity management. The pipeline files had made possible a timely pipeline-by-pipeline review of the system, using information highly relevant to risk management of pipes. PG&E lost that resource when it discarded its pipeline files. Job files remained as the disorganized, unwieldy, inaccurate, and incomplete substitute for the pipeline history files. PG&E now testifies that "[i]n retrospect, the Company wishes it had retained the Pipeline History Files."[433] CPSD suggests that the application of reasonable foresight should have provoked PG&E to keep its pipeline history files intact and current, as a PG&E employee in 1992 strongly advised his company to do.

Other evidence also supports a finding that PG&E cannot locate the age of the pipe in its system. Even now, PG&E salvages pipe previously in service, and then returns the pipe to service in a different location[434]. PG&E's system contains an unknown and undocumented amount of reused pipe. PG&E's Integrity Management Model assumes that the date of pipe re-installation represents the date of pipe manufacture.[435] In CPSD's view, an integrity management program that location and age of reused pipe in the system, falls well short of meeting the company's statutory duty to promote safety.

Pipe Manufacturer - Integrity management

The identity of the pipe manufacturer is an important factor in maintaining the safety of a pipe and pipe system. The record shows clearly why this is true.

PG&E has identified problems associated with particular manufacturers of pipe – for example, A. O Smith. The problems with A.O. Smith pipe pertain to longitudinal welds made by this manufacturer that in 1984 Bechtel described as "unusual" and that can evidently lead to pipe failure.[436] After 2000, a PG&E integrity management document warned about A.O. Smith and unknown manufacturer "flash welds" installed from 1952 through 1957. The same document identified additional problem pipes from particular manufacturers - Bethlehem, Republic, Kaiser,

[433]PG&E Exhibit 61, Page 2-23.
[434] Tr. Vol 3 Joint, p. 431, Harrison/PG&E
[435] Tr. Vol 3 Joint, p. 431, Harrison/PG&E
[436] CPSD Exhibit 55, Page 11 (1984 Bechtel Report)

and unknown manufactures of DSAW welds installed between 1949 and 1957,[437] and ERW welds for Youngstown Sheet and Tube or unknown manufacturers.[438]

In 1984 Bechtel also warned PG&E to evaluate the pipe of manufacturers which manufactured pipes with particular types of joints such as "Bell-Bell with chill ring." These pipes were manufactured before 1950 and "constitute a certain risk due to their fracture potential."[439]

These examples show that a particular manufacturer may produce pipes which have characteristics that diminish pipe safety. Also, as noted above, PG&E is explicitly aware of this

Pipe Manufacturer Data and Records - PG&E's Performance

At hearings, PG&E's counsel informed the Commission that PG&E had no information for pipe manufacturer in approximately 22,480 out of a total of 22.856 pipeline segments.[440] Clearly, PG&E had no more success keeping records of pipe manufacture, and no more priority to do so, than it did with any other information, such as hydrostatic testing, that is essential to ensure safety. PG&E's counsel did not underestimate the scope of his client's problem.

PG&E has known, since at least as early as 1984, that its data establishing pipe manufacturer was grossly inaccurate. In that year, the report Bechtel prepared for PG&E found that pipe manufacturer represented the lowest accuracy of PG&E data available to calculate failure probabilities.[441] Twenty-five years later, when the San Bruno explosion occurred, PG&E evidently had not addressed this problem. In 2011, the NTSB found that "[t]he manufacturer of the pipe was unknown ("NA") for 40.6 miles (78.81 percent) of Line 132."[442]

Pipe manufacturer is information that can ultimately be gleaned, if at all, only from PG&E job files. However, other sections of this brief and the record prove that the job files are not useable for an integrity management engineer to locate pipe manufacturer definitively – in fact, apparently not at all in about 22,480 instances. Given the significance of pipe manufacturer

[437] This describes the pipe that failed on September 9, 2011, installed in 1956, DSAW, and unknown manufacturer
[438] P2-158 RMP-06, p.29
[439] CPSD Exhibit 55, Page 11 (1984 Bechtel Report).
[440] Tr. Vol. 3, p482-483
[441] CPSD Exhibit 55, Page 11 (1984 Bechtel Report)
[442] CPSD Exhibit 6, fn 1, Attachment 1 Page 60 (NTSB August 30, 2011 Accident Report)

for risk management, having an unknown pipe manufacturer for a large part of the system unavoidably degrades safety.

Pipe Hydrostatic Testing –Integrity Management

Hydrostatic testing and the associated records of testing required by law are essential to the integrity management of PG&E's entire pipe system.[443] That is the reason why the law and related codes have required PG&E, since at least 1956, to maintain all hydrostatic test records of each pipe for the entire operating life of the asset.

The very fact that a pipe has been hydrostatically tested is important to integrity management personnel. Records conforming to the law show the fact of the test, the date, the pipe tested, the test medium (water under pressure) and any leaks or other problems which occurred during the test. Without both the test and the complete records required by law, PG&E cannot safely or lawfully operate the pipe.

Further, PG&E integrity management engineers cannot consider test information that is either missing or filed away somewhere in any one of thousands of job files at multiple locations. PG&E engineers simply cannot consider information they do not have and cannot easily locate.

PG&E either cannot locate thousands of records of hydrostatic pipe testing, or cannot locate records with the required information in them. Perhaps the tests were never done. Perhaps PG&E never kept written records of the tests, or perhaps PG&E lost or discarded them, but it cannot locate them in its job files or other records even now, two years or more after the San Bruno gas pipeline rupture and fire. Because PG&E failed to create or retain these important and legally required records – for whatever reason – its IM program is and has been seriously compromised.

Pipe Leaks –Integrity Management

Pipe leaks are critical for PG&E to assess the remaining life and the safety of its pipes. The more leaks on a pipe or segment, the more likely it is that pipe replacement will become necessary.

In the 1980's PG&E retained Bechtel to develop a pipe replacement program and to develop criteria for replacement. In 1984, Bechtel produced a report named "Pipeline Replacement Program Transmission Line Risk Analysis." The report states:

[443] CPSD Exhibit 2, Page 20, l. 14-23

> "The number of leaks a line has experienced since its installation is a data variable that could have also have been classified under the next category to be discussed in this report, the Quality of installation. This variable is not only an aid in comparing degradation states between lines having the same age but it also serves as a description of certain installation-quality variables such as cathodic protection and coating condition. The importance of this data variable is reflected in its numerical value assignment which received the second highest weighting emphasis of 15%... [after pipe age].....Though the area engineers expressed little confidence…in the accuracy of this data variable, they were of the belief that the leak history was under-recorded not over. Taking this into account, after a total number of leaks greater than 3 has been reached a ceiling value of 15 risk points is assigned…It was our experience that the number of leaks experienced by any given transmission line segment rarely exceeded two."[444]

The Bechtel material is important for several reasons. First, the Bechtel report establishes that leaks were an important factor for PG&E to consider in its transmission pipe replacement program. – a type of integrity management program. Second, Bechtel stated that three leaks on a line meant that the line should be replaced.[445] If nothing else were known, this alone would demonstrate how important leaks are to integrity risk management.[446] Lastly, as early as 1984 or before, PG&E's knew that its leak data was both inaccurate and undercounted.

Sections of this brief pertaining to Violations 21 and C.3 - and the Bechtel report cited above - support CPSD's conclusion that PG&E's leak data is significantly inaccurate, incomplete, and undercounted. Other evidence leads to the conclusion that PG&E's leak data is skewed and cannot be relied on for safety purposes. For example, PG&E's current leak database does not consider leaks that occurred before 1999. Nor has PG&E even considered the 1988 leak in the longitudinal weld that occurred on Line 132, in order to assess risk on Segment 180.[447] The NTSB identified these factors to explain why PG&E has not effectively incorporated its leak data into its integrity management program.[448]

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[444]CPSD Exhibit 55, Pages 7 and 8

[445] Id, see figure 5.

[446]In reports after 1984 PG&E and Bechtel retreated from their "three leaks and you're out" pipe replacement. In CPSD's view, this retreat was poorly considered, and result and cost driven, rather than safety oriented.

[447] See Violation 26 for discussion of 1988 leak report – PG&E's integrity management engineer charged with the responsibility of reviewed Line 132, Segment 180, testified that he would have wanted to see records of the 1988 failure when assessing Segment 180.

[448] CPSD Exhibit 6, fn 1, Attachment 1 Pages 109-110 (NTSB August 30, 2011 Accident Report)

Also, reasons exist why PG&E personnel may choose to undercount or underreport leaks. These reasons include performance signals, and controls that PG&E auditors found in 2008 were "insufficient to ensure that gas leak surveying is planned to effectively identify leaks and to reduce risks to employee and customer safety," and were "insufficient to determine the system-wide performance of the leak detection program."[449] The audit report also noted that "from 1999 to 2006, the number of Grade 1 leaks found by Utilities leak surveys has decreased by 68 percent. A decrease of this magnitude over seven years should have triggered a critical review of the leak survey planning process."[450]

In other words, PG&E auditors had good reason to distrust their company's leak data. No good reason now exists to view PG&E's historic leak data as even minimally accurate or complete, and clearly could not have been relied upon as a factor in assessing and prioritizing integrity management risk.

Pipe Specifications - Importance to Integrity Management

Gas pipelines transport flammable and potentially explosive gas under pressure. Pipes are manufactured to meet certain specifications. Specifications differ depending on the date of manufacture, the legal requirements at the time of manufacture, the pipe's purpose and location within the gas system, and expected operating conditions such as pressure.

Pipe specifications include maximum design pressure of the pipe, metal composition, diameter and wall thickness, SMYS, long seam joint efficiency, and type of weld used to construct the pipe's long seam, sometimes called a longitudinal weld or seam. Many of these specifications were listed and discussed in the 1984 Bechtel pipe replacement report.[451] CPSD also defines specifications for the purposes of briefing to include the condition of manufactured long seam welds, as determined by tests or inspections.

Pipe specifications are essential for any gas transporter to manage its pipe, and to ascertain pipe replacement and priority. Pipe specifications are key determinants of pipe capabilities, strengths, and weaknesses. And if a manufacturing defect occurs in a pipe – such as a poorly welded long seam – written records pertaining to the defects are essential to steer

[449] April 9, 2008 PG&E audit report, p.1
[450] Id at p. 2
[451] CPSD Exhibit 55, Appendix B. (January 1984 Bechtel report),

engineers to consider the defect in integrity management decisions.[452] In the absence of accurate and complete knowledge about pipe specifications – let alone other factors discussed – PG&E's integrity management of its pipes became largely meaningless and unsafe.

The San Bruno event illustrates a list of poor practices with respect to pipe specification records and data. No reason exists to believe that Segment 180 was a unique indicator of PG&E performance on pipe specification data and records.

At the time of the San Bruno pipe failure, PG&E's GIS recorded the pipe that failed as "seamless" 30-inch diameter pipe. The pipe that failed was, in fact, double submerged arc welded (DSAW) pipe, seamed with a longitudinal weld, not seamless.[453]

PG&E's GIS or other records did not reflect "any indication that segment 180 contained six short pups welded together," nor did records reveal that the GIS inaccurately identified correct class locations for 550 miles of its pipelines, which "indicates that such pipelines could have been operating with inappropriate MAOPs."[454]

PG&E job file records include 1948 weld inspections of the new construction of Line 132. PG&E rejected 19 welds after x-ray inspection, and then re-examined 4 and determined that the weld quality was acceptable for service.[455] This information remained in the job files after 1948. No evidence exists that PG&E ever reviewed or considered the information about these welds in its integrity management risk assessment of Line 132 or any other pipe.

As noted above, in 1988, a leak developed on a longitudinal weld on Line 132.[456] PG&E never transferred any information about the leak to GIS.[457] The NTSB found that "[t]his situation suggests that additional leaks from the time prior to the late 1990s may not be reflected as part of the risk assessment for the affected segments, despite PG&E's stated intent to include leak history in its inventory of pipeline attributes."[458]CPSD is aware of no evidence that

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[452] The only alternatives to written records establishing safety, are to replace the entire system of problematic pipes, or to dig up the pipes and either hydrostatically test them, pig test them, and/or get the needed information by inspection. This is expensive, as PG&E ratepayers and shareholders have learned in the PSEP proceeding and will learn more in coming years.
[453] PG&E June 20, 2011 response to OII p. 4-1, and 5-1 through 5 -5.
[454] CPSD Exhibit 6, fn 1, Attachment 1 Page 110 (NTSB August 30, 2011 Accident Report)
[455] CPSD Exhibit 6, fn 1, Attachment 1 Page 25 (NTSB August 30, 2011 Accident Report)
[456] See Violation 26
[457] See Violation 26
[458] CPSD Exhibit 6, fn 1, Attachment 1 Pages 109-110 (NTSB August 30, 2011 Accident Report)

demonstrates PG&E ever took into account any leaks prior to 2000 in its integrity management risk program for Line 132 or any other pipeline.

PG&E's GIS also inaccurately describes the SMYS requirement as X42 for Segment 180. The proper requirement, according to PG&E's pipe purchase specification documents, was X52 strength, a stronger requirement. The yield strength of two of the pups failed to meet the X52 standard. Four of the pups were rolled in a non-standard manufacturing direction. One of the pups has elevated levels of "phosphorous, copper, and tin, consistent with steel made from recycled scrap material."[459] Again, no evidence exists that PG&E personnel conducting integrity management of pipes ever reviewed data which even hinted at these serious pipe safety deficiencies.

PG&E's SMYS records and data were also inaccurate on at least two portions of line 132. The NTSB pointed out two instances in which PG&E used assumed SMYS values of 52,000 and 33,000, rather than the strength value of 24,000 required by law in 49 CFR 192.107.[460] CPSD is quite certain that the NTSB never learned that in over 2500 instances, PG&E has assumed SMYS values in excess of 24,000 psi, in direct violation of the law. These assumed and incorrect values on the key pipe parameter of pipe strength renders largely useless PG&E's integrity management model.

The NTSB has found that:

> "[t]he foundation of risk assessment is accurate information. The NTSB is concerned that the PG&E GIS still has a large number of assumed, unknown, or wrong information for Line 132 and likely its other transmission pipelines as well…….The lack of complete and accurate pipeline information in the GIS prevented PG&E's integrity management program from being effective. "[461]

CPSD agrees. The evidence in this proceeding supports precisely the same finding as the NTSB has made.

Pipe Reuse – Importance to Integrity Management

PG&E's transmission network includes a currently unknown number of transmission pipes in the ground that were installed after having been used previously in gas service. After

[459] CPSD Exhibit 6, fn 1, Attachment 1 Page 46 (NTSB August 30, 2011 Accident Report)
[460] CPSD Exhibit 6, fn 1, Attachment 1 Pages 61 and 108 (NTSB August 30, 2011 Accident Report)
[461] CPSD Exhibit 6, fn 1, Attachment 1 Page110 (NTSB August 30, 2011 Accident Report)

years of service, PG&E dug these pipes up, re-conditioned them,[462] and then reinstalled them for additional service.

PG&E's responsibility to competently manage the safety of its pipe system is critically tied to its reuse of pipe. CPSD does not contend that the reuse of pipe is either unlawful or per se unsafe. However, PG&E's records and data failures make it impossible for PG&E to even consider the existence and location of reused pipe in its integrity management of its pipes.

PG&E has taken pipes manufactured in the 1920's and used in gas service for years, dug them up and "re-conditioned" them, and then placed again into service. In this proceeding, PG&E has told the Commission that in 1965 the company re-installed transmission pipes manufactured in 1929 and in service for years before 1965.[463] The quality of pipes manufactured in 1965 greatly exceeds the quality of pipes manufactured in 1929. The 1984 Bechtel report also establishes that the age of pipes is one of the most important factors driving pipe replacement priority decisions.

If PG&E reuses marginal or defective pipe, integrity management engineers must be able to take this into account in their integrity management risk assessment decisions. If pipe welds in the ground are known to be defective by current standards, it provides scant comfort and safety for people living near the pipeline in the year 2000 to know that the welds may have met applicable legal standards in 1948.

PG&E's data and records showing its reuse of pipe are totally inadequate to ensure safe and effective integrity management of its transmission pipe system. The evidence supporting this conclusion is indisputable.

Before San Bruno, PG&E did not track reused or reconditioned pipe within its system PG&E has stated that it "did not in the past capture data identifying reconditioned pipe in the gas transmission system in its databases…."[464]

PG&E has dug up Line 132 pipe, and has reused it. This pipe has documented bad welds in it.[465] PG&E cannot track the current location of that pipe in its system, and has represented

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[462] PG&E believes that the reconditioning of pipes consisted of cleaning the pipe , grinding down the ends, and re-wrapping the pipe before installation in the ground. PG&E's belief apparently stems from conversations with personnel, because the company lacks documentation showing reconditioning requirements during the time re-conditioning was done. (PG&E Response to DR3 Question10).
[463] See November 1, 2011 prehearing conference, pp. 162 and 163.
[464] PG&E response to DR 16, Q.1 and DR 10 Qs2 and 5.. and Ex. 61, p. 3-28
[465] November 1, 2011 Prehearing Conference

instead that PG&E's MAOP validation will catalogue and track reconditioned pipe in the system. For years before San Bruno, PG&E's engineers had no such data available to them to consider for integrity management.

The Commission should consider the example of the San Bruno explosion. No one now knows whether the failed pipe was re-conditioned, brand new, scheduled to be junked, or had had been in service prior to installation. This lack of knowledge is fully a function of inadequate PG&E records. PG&E has never been able to establish even the most basic information about the failed pipe.

Pipe Construction – Importance to Integrity Management

Pipe construction data and records are important to integrity management. By pipe construction, CPSD means the actual installation of the pipe, such as trenching, welding, wrapping pipe and covering the pipe with earth. Pipe construction normally includes girth welds, which typically are welded by PG&E at the site.

In 1984, Bechtel brought to PG&E's attention the relationship between construction data and integrity risk management.

> "The relation between the practices followed during a pipeline's installation and its performance reliability is indisputable. A poor weld [girth], insufficient cathodic protection, shallow cover depth, badly applied coating – all are factors that contribute to a pipeline's early failure"[466].

The report further stated that, in the absence of "costly test inspections," engineers investigating construction and its relation to early failure "had to look for clues contained in PG&E's files and survey charts."[467] Unfortunately, gas pipe safety requires more than "clues" – it requires good records and complete and accurate data collected and accessible in those records.

PG&E's job files contain whatever construction records exist. As this brief describes, locating material in PG&E's job files, especially before 2010, was a daunting challenge for anyone. PG&E's job files are virtually unusable for those requiring accurate information accessibly and promptly, as PG&E demonstrated at its Cow Palace MAOP validation exercise.

[466] CPSD Exhibit 55, Page 8 (1984 Bechtel report).
[467] Id at 9

Depth of cover is a pipeline construction attribute that is a safety element in PG&E's care of its pipes. If ground cover above the pipe is too shallow, the danger of pipe damage increases.[468] After the 1984 Bechtel report at the latest, PG&E knew that its records on depth of cover were without doubt inadequate. Most of PG&E's reporting regions were assigned a level of 0% to represent the confidence in the accuracy of ground cover data.[469].

The NTSB found that in 2010, "[t]he pipeline depth of ground cover was also unknown for 42.7 miles (82.79 percent) of Line 132."[470] The NTSB also noted that for Line 132, PG&E assumed the same value for ground cover as new construction requirements.[471] The NTSB made a finding that records for "[s]ix consecutive segments, totaling 3,649 feet, specified an erroneous minimum depth of cover of 40 feet."[472]

Girth welds are used to join pipes lengthwise, and are normally done at the construction site by utility personnel or contractors. The NTSB found that "[a]ll girth welds exhibited incomplete fusion, slag inclusion, and porosity defects at one or more locations." Some of the girth welds exhibited a "lack of penetration defects" and "undercutting defects."[473] PG&E's records do not reflect the reasons why PG&E's welding and other work on this project was so sub-standard.

Operations – Importance to Integrity Management

Pipe risk management engineers must consider the operating conditions of the pipes to consider whether to replace them. Although not each operating factor has been bookmarked for assessment by specific law, operating conditions are important. In this section, we will discuss only two operating condition; pressure and ground movement.

Pressure can cause pipe metal stress and pipe failure. MAOP restrictions are based on this fact. PG&E also explicitly recognizes the cause and effect of pressure and damage, by its theory that a hydrostatic test in 1956 stressed Segment 180 so that it failed without exceeding

[468] CPSD Exhibit 55 Page 8 (1984 Bechtel Report)
[469] Id, Appendix B.
[470] CPSD Exhibit 6, fn 1, Attachment 1 Page 61 (NTSB August 30, 2011 Accident Report)
[471] Exhibit 6, fn 1, Attachment 1 Page 108 (NTSB August 30, 2011 Accident Report)
[472] CPSD Exhibit 6, fn 1, Attachment 1 Page 108 (NTSB August 30, 2011 Accident Report)
[473] CPSD Exhibit 6, fn 1, Attachment 1 Page 43 (NTSB August 30, 2011 Accident Report)p. 43

MAOP in 2010.[474] Ground movement (from earthquakes, ground settling, erosion, or construction) can also cause stresses and pipe failure.

The Code of Federal Regulations gas rules in place since 2004 explicitly require PG&E to consider pressure cyclic fatigue[475] and ground movement in its system integrity management consideration of potential threats.

PG&E does not maintain the essential, accurate, and complete operating pressure records necessary to assess the potential for pipe cyclic fatigue. Even PG&E's modern records are inadequate. PG&E has incomplete pressure records. Among other missing data, PG&E has "inadvertently and irretrievably lost" its pressure data form 1999, and has lost 2007 pressure data due to a "computer malfunction" for the years 1999 and 2007.[476] Pressure cycling or other pertinent pressure events that may have occurred during those years, has either been lost forever or simply never reconstructed by PG&E.

As noted above, the law requires PG&E to study and ascertain the effect of cycling on manufacturing or other threats. PG&E kept no records permitting the identification of such threats, for example, the 1988 leak in Line 132 noted above.

The record evidence in this proceeding demonstrates that PG&E has failed to maintain the records necessary to assess cyclic fatigue. Nor has PG&E maintained the records needed to assess whether pressure about MAOP has weakened its pipe.

d. Discussion of PG&E's Defenses

In this section, CPSD will address four PG&E's defenses asserted against CPSD's violations pertaining to the absence of records and data needed to do integrity management effectively. The defenses made are that (1) even if the data and records had existed and had been reasonable accessible, PG&E's integrity management program would have reached the same results, and (2) when data records were unavailable, PG&E used conservative and safe values, and (3) the Commission should not be surprised that PG&E has lost the ability to know where its most potentially dangerous reused pipe was located in its system.

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[474] CPSD disagrees with PG&E's contentions that in 1956 the company hydrostatically tested the pipe that failed in 2010, or that it failed without exceeding MAOP. CPSD's point is that PG&E recognizes that pressure – water or pressure induced – can and does cause pipes to fail.

[475] CPSD understands cyclic fatigue to be the potential for metal damage caused by significant changes in pressure over time

[476] CPSD Ex. 2, pg.38, line 10-24

The Commission should reject each of these PG&E defenses because they are factually and legally wrong. Above all, the defenses are an effort to negate PG&E's responsibility to ensure and promote safety for its employees, its customers, and the California public.

The Effect of Data and Records on Integrity Management

Better Data Would Have Helped a Viable Integrity Management Program. PG&E has claimed that additional or better data, or records, and organization, would not have changed its integrity management decisions. For example, PG&E engineers after 2004 had no knowledge of records and data analyzing a 1988 longitudinal weld leak on Line 132. A PG&E witness testified that information about this weld leak "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 132 in 1948."[477]

If true, this reflects badly on PG&E's integrity management consideration of information and decisions. PG&E's 1988 memorandum of the failed weld inspection found that the "x-ray and subsequent 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 joint….Overall , the x-ray inspection showed the weld to be of low quality, containing shrinkage cracks and voids, lack of fusion, and inclusions."[478] If it is true that this information would have provoked no interest in an integrity management risk engineer, then that would raise serious questions about the effectiveness of PG&E's entire integrity management program.

Neither PG&E's integrity management engineer on Line 132 for the year 2009 nor the NTSB agree with PG&E's testimony claiming that accurate and complete information would have had no effect on risk management decisions. The PG&E engineer who assessed Line 132 testified that he would have reviewed and considered records about this longitudinal weld leak, if they had been available to him.[479] The NTSB also noted that PG&E should have considered the 1988 weld failure in Line 132 for its risk management of the line.[480] The NTSB further noted that "PG&E's failure to consider evidence of seam defects discovered during both construction and operation of Line 132" was one of the reasons why PG&E selected an assessment

[477] PG&E Exhibit 61, Page 3-65
[478] PG&E Exhibit 61, Page 3-44 Figure 3C-2
[479] Tr. Vol. 12, p. 1893.
[480] CPSD Exhibit 6, fn 1, Attachment 1 Page 109 (NTSB August 30, 2011 Accident Report).

technology that was incapable of detecting seam flaws like the one that led to this accident [San Bruno]."[481] The NTSB does not share PG&E's conviction that the San Bruno explosion was inevitable.

PG&E's Integrity Management Program Rationalized PG&E's Loss of Data and Records. In a perverse way, PG&E makes a point when it argues that additional information would not have changed its integrity management risk plans. The NTSB found that, even when PG&E possessed data inconsistent with its risk management weighting of threats, PG&E chose to ignore the data and stick with its inaccurately weighted threat assessment management.[482] After 2004 PG&E's threat assessment weighted third party damage and corrosion damage more heavily than PG&E's data warranted.[483] Conversely, PG&E under-weighed design and construction threats.[484]

A significant history precedes the disconnect between PG&E's actual experience and its development of an integrity management program after 1999. This history discloses a result-oriented process and integrity management program.

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 PG&E needed to replace, rather than replacing whole pipelines on a calendar basis.[485] The idea was to create a more efficient use of capital while replacing pipe that presented the highest safety risk. Although the concept was good, PG&E's current 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&E's 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 to the top 100 segments for replacement.

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[481] CPSD Exhibit 6
[482] CPSD Exhibit 6
[483] CPSD Exhibit 2, p. 26
[484] CPSD Exhibit 2, p. 26
[485] CPSD Ex. 55, p. 1, "The purpose of this Risk Analysis is to aid PG&E in selecting the order of replacement for the various lines that fall under the scope of their pipeline replacement program

In 1984, Bechtel Engineering explained to PG&E that it was missing data in key areas of integrity risk assessment. Bechtel also explained to PG&E that the age of the pipe, the number of leaks the pipe had experienced, its weld and joint characteristics, and other pipe characteristics were strong indicators of the need to replace pipe.[486]

In the next 10 years Bechtel conducted other integrity management studies for PG&E. During these years, PG&E retreated from the effect of the missing data that Bechtel had pointed out in 1984. PG&E did so by de-emphasis of both the fact and importance of missing data, and by heightened weighting priority to corrosion and third party damage, areas not so dependent on data.[487] In 1995, Bechtel provided another revision to PG&E's Gas Pipeline Replacement & Rehabilitation Program. Bechtel arrived at much different conclusions than it had reached in 1984.

In 1984, Bechtel had given a high rating of 16% to leak history. Bechtel changed this to 4% in 1995. Bechtel said that "[t]he primary reason for this change was due to the relatively low incidence of any reportable leakage on gas transmission pipelines."[488] CPSD notes that every Bechtel report before then had expressed PG&E engineers' "little confidence" in leak data and, the engineers had expressed their understanding that leaks were under-recorded.[489] Neither PG&E nor Bechtel has explained the basis for the new conclusion that the lack of leak data now meant that PG&E's pipes simply were no longer leaking. In view of the number of leak documents now in IGIS, and other evidence, Bechtel's revised conclusion appears to be unsupportable.[490] The 1984 Bechtel report deemed that pipe age was the most important single factor for integrity management consideration. The report gave a weighting of 40 % to the age variable.[491]

By 1995, Bechtel had reduced the pipe age weight factor to 4%. Bechtel asserted that "[p]ipe that was otherwise in good condition should remain in service until some other factor, such as joint or weld type, increases its replacement priority." [492] Bechtel did not explain how PG&E's incomplete and missing data and records on joint or weld type could be sufficient to

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[486] Exhibit 55, Pages 6-13 (1984 Bechtel Report).
[487] CPSD Exhibit 2, Page 26
[488] CPSD Exhibit 2, Page 22, fn 89 Page 3-4, (May 1995 Bechtel Report).
[489] CPSD Exhibit 55 Page 8, (1984 Bechtel report).
[490] Refer to section on leak data
[491] Id at 7.
[492] Exhibit 55 (1984 Bechtel report)

increase the replacement priority of a pipe. PG&E has never explained this, either. PG&E's records on joint and weld type are tied closely with the age of pipe. Before 2010, and probably continuing through today, PG&E's records and data for pipe age, joint, and weld type were as inaccessible as records and data for pipe age and location.[493]

Post San Bruno Status of the Integrity Management Model and Results. Over the course of this investigation, PG&E has gone from touting its IM program and the process of ranking the top 100 segments for replacement, to abandoning its ranking process in 2012.[494]

There are 19,963 segments identified in PG&E's 2009 IM model.[495] 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 the 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 had been accurate in PG&E's model prior to the San Bruno explosion, PG&E would not have inspected or replaced Line 132 Segment 180 as a result of its Integrity Management prioritization.[496]

The priorities that result from running the Integrity Management model with inaccurate, incomplete, and assumed data are erroneous. Thus, PG&E may or may not be replacing the pipe that presents the highest risk. This approach to pipeline management is inherently unsafe. Regardless of how PG&E has changed its weighting priorities in its model it uses today, there remains a safety problem stemming from inadequate records and data. CPSD hopes and trusts that PG&E will re-construct its data and records to fill in the great gaps in its safety information. The Commission should reject PG&E's proposed defense suggesting that accurate and complete data would not have improved the results of its IM modeling.

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[493] Exhibit 2, Page 19.
[494] PG&E Response to DR 57 Q 6.
[495] CPSD Ex. 4, p. 38.
[496] Ibid.

Assumed Conservative Values

A primary PG&E defense to lack of data and records is PG&E's claim that it used "conservative" assumed values to replace unknown values caused by missing data. PG&E's defense simply fails for several reasons.

First, PG&E has been less conservative than it has claimed to be when faced with unknown values. The evidence proves this. One important example pertains to SMYS, a measurement of pipe strength. The lower the SMYS number, the weaker the pipe is expected to be, and MAOP and service must be set accordingly. The Code of Federal Regulations requires PG&E to use the 24000 psi default value when the SMYS value of a pipe is unknown.[497] Despite the law, PG&E has systematically set its SMYS values greater than 24000 psi when it lacks the records that provide the detailed specifications for the pipe. The NTSB investigation found that PG&E at least twice set SMYS too high for Line 132 segments. PG&E assumed a SMYS value of 33000 psi for one segment, and assumed a value of 52000 for another segment. These values are less conservative assumed values (less safety margin) than the 24000 assumed SMYS value that PG&E should have used. The NTSB noted that PG&E's values violated 49 CFR 192.107.[498]

The current recordkeeping investigation has proven that PG&E has systematically assumed values of greater than 24000 psi when SMYS values for the pipe were unknown. In fact, PG&E has used assumed pipe SMYS values greater than 24000 psi at least 25 times.[499]

PG&E appears to justify its actions by comparing unknown SMYS value pipes with other known pipes to extrapolate an assumed SMYS value. Neither 49 CFR 192.107 nor any other law provides for the approach that PG&E took to set assumed SMYS higher than the lawfully required value of 24000 psi. In PG&E's system, that kind of assumption is especially unsafe. PG&E has missing critical data on virtually every important pipeline characteristic, and is even missing data about the location in the ground of its most problematic old pipes.

There is another reason why "conservative" values cannot support quality integrity management, even if they are truly conservative values. Integrity management assessments and decisions ascertain relative risk of a particular pipe or segment as compared to the relative risk of other pipes or segments. Replacement of PG&E's entire gas system is uneconomic. PG&E, like

[497] 49 CFR 192.107
[498] CPSD Exhibit 6, fn 1, Attachment 1 Page 108 (NTSB August 30, 2011 Accident Report).
[499] PG&E Response to Joint DR 1 Q 2, atch 1

other utilities, needs to rank the highest risk pipes for replacement. That is the essential a primary goal of integrity management – to inspect and replace the pipes that have the highest risk priority.

When PG&E does integrity management of large numbers of pipes that have been assigned the same so-called conservative value, a risk comparison between the pipes becomes largely meaningless for integrity management purposes. Each segment's conservative assumed values are identical to the conservative assumed values of each other segment. Thus, no meaningful ranking can be based on those assumed criteria. This is true, no matter how conservative the assumed value is.

PG&E has provided evidence that shows the futility of using conservative default values for integrity management. PG&E's Risk Management Procedure document decrees that "the Incorrect Operation Threat was assumed to exist for all HCAs."[500]
PG&E does not define the parameters of "incorrect operation" in its Risk Management Procedure document. In CPSD's view, incorrect operations should include pressure above MAOP, operations without a hydrostatic test or without maintaining test records, or operations without required utility population surveys or records. Apparently, PG&E's records and data are inadequate to document such incidents of "incorrect operation" for each individual pipeline or segment. Stringent federal and state safety requirements have long applied to HCA pipelines. (HCA's are pipelines with populations of people living or working around them.) PG&E's failure to gather and maintain proper data and records about pipelines in populated areas cannot be justified, and should be a matter of great concern for the Commission.

PG&E has assumed that each and every HCA has experienced "incorrect operations." This assumption provides PG&E with no capability to prioritize pipe inspection, testing, or replacement based on this factor. If a pipe has suffered actual incorrect operations – as opposed to all pipes suffering assumed incorrect operations – PG&E should prioritize the pipe for attention. However, the ability to prioritize is lost if the entire system assumed is to be suffering from incorrect operations.

[500] P2-158, RMP-06, p. 29.

PG&E's Lack of Information about Location of Reused Pipe in System

Even today, PG&E is unable to locate and describe all reused pipe in its system. This represents an unsafe PG&E practice.[501] PG&E should know where it's used pipes are, so that it can properly consider when to test, inspect, or replace them.

PG&E admits that it "does not in all instances know where reconditioned pipe has been placed in its transmission system."[502] PG&E also admits that "Segment 180 job file documents do not foreclose the possibility that some of the pipe used on the Segment 180 job may have been reconditioned pipe"[503]

PG&E has raised two defenses relating to this point. First, PG&E states that the reuse of pipe was common in the industry and at PG&E for many years and throughout the 1960s.[504] CPSD has never disputed PG&E's point, and has never claimed that the reuse of pipe is an inherently unsafe practice. In 2011, CPSD informed the Commission that it did not consider the reuse of pipe an unsafe practice.[505] CPSD explained, with PG&E present, that it was PG&E's failure to track its reused pipe within its system that was the unsafe practice.[506]

PG&E's second defense is that "the fact that an operator does not know where it has placed reconditioned pipe would come as no surprise to policymakers from an earlier era." PG&E then again discusses that Commission's knowledge of PG&E's proposals to reuse pipe.[507]

CPSD disagrees. We believe that policymakers of any era after written data was developed would be shocked and dismayed to learn that PG&E does not know 'where it has placed reused pipe. Again, a clear distinction exists between the proper reuse of pipe and the failure to track the reused pipe's location. The latter makes it impossible for a utility to meaningfully consider the history of a pipe's use, maintenance, testing, or inspection.

e. Duration and Scope of Violation

CPSD has chosen to limit its alleged violations to the years 2004-2010. We did so because, by that time, PG&E had received over 20 or more years of clear notice that its data and

[501] CPSD does not contend that the reuse of pipe is an unsafe or unlawful practice. We do contend that PG&E's loss of information about the location and characteristics of reused pipe is a clear violation of § 451 and a patently unsafe practice.
[502] PG&E Exhibit 61, Page 3-32.
[503] PG&E Exhibit 61, Page 4-2
[504] PG&E Exhibit 61, Pages 3-28 through 3-31
[505] PHC 5, November 1, 2011 transcript, pp. 156 and 157
[506] Ibid
[507] PG&E Exhibit 61, Page 3-32

records essential to integrity management were missing, erroneous, or inaccessible. We also deliberately limited our charges to section 451, because CPSD believes that basic engineering judgment and sound data and records practices would have reduced or eliminated the data and record deficiencies that so badly reduced the efficiency and essential safety of PG&E's integrity management program.

f. Summary of Violation's Negative Effect on Safety

Integrity Management is, by definition and by fact, the lynchpin necessary to promote safe PG&E gas service. When PG&E permits its integrity management program to try to function despite extensive use of data and records that are incomplete, assumed, and erroneous, pipes can and do explode and cause terrible events such as the one that occurred on September 9, 2010 at San Bruno.

Violation 26: Missing Report for 1988 Weld Failure

a. Summary of Violation

At the time of the San Bruno explosion, PG&E was not aware of a 1988 weld failure on another section of Line 132. During the subsequent investigation, CPSD found that PG&E had repaired a leak on Line 132 that resulted from a manufacturing defect in the longitudinal weld of the pipe. Instead of acting on this report and inspecting similar pipe welds, PG&E lost the report. PG&E's poor recordkeeping practices led to the loss.

Because it lost the report, and the report identified a manufacturing threat to Line 132, PG&E did not include that information in its Integrity management model. Because the report is an engineering record directly relevant to the integrity of PG&E's transmission pipelines, PG&E should have retained it for the life of the facility. Moreover, proper retention and use of the 1988 Weld Failure report could have led to discovery and repair of the bad welds in Segment 180. Thus, the loss of this report is a violation of Public Utilities Code section 451.

b. Laws that PG&E Violated

PG&E engaged in unsafe practices when it failed to retain a weld failure report from 1988, a violation of Public Utilities Code section 451.

In October 1963, PG&E developed a Standard Practice to "establish a minimum weld check by radiographic or visual examination procedures on all gas piping systems, in accordance with General Order 112."[508] In this same Standard Practice, PG&E's records retention policy calls for retaining weld inspection reports for the life of the facility. [509] Presumably, PG&E's retention policy would extend to the weld inspection reports generated from its Technical Services unit when they report results from inspections of welds in PG&E's the gas transmission piping.

c. Discussion of Violation

Good engineering practices and regulations require the retention of engineering records for gas transmission facilities for the life of the facility, including weld failure reports.[510] However, at the time of the San Bruno explosion, PG&E was not aware of a 1988 weld failure on another section of Line 132. Reference to the earlier repair did not occur until the subsequent investigation.

PG&E originally took the position that its current employees remember that the repaired leaks were on a circumferential weld. However, CPSD's review of PG&E's records revealed more documents that clearly show the repaired leak was on a longitudinal weld.[511] In fact, CPSD discovered that PG&E's own technical analysis from the report identified a manufacturing problem as the cause of the leak, which meant Line 132 Segment 180 had a manufacturing threat. Instead of acting on this report, inspecting similar pipe welds, and including the manufacturing threat to Line 132 Segment 180 in its Integrity management model, PG&E lost the report.

PG&E's claims it would not have needed to inspect similar longitudinal seems of pipe even if it had known of the 1988 pinhole leak. In PG&E's view,

> "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

[508] P2-1286, S.P. 1605, Felts March 16, 2012 Testimony, p. 34
[509] P2-1286, S.P. 1605.
[510] For example, PG&E Standard Practice 1605 required keeping Weld Inspection Reports for the life of the facility. See P2-1286.
[511] CPSD Ex. 3, p. 17, Item 37, fn#154 and PG&E Response to DR 41, Q 5 Supp. 1 Atch 1

> 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 132 in 1948."[512]

This statement is troubling. For one thing, in spite of this statement, PG&E finally considered the pinhole leak serious enough to remove 12 feet of pipe and replace it on an emergency project.[513]

Even though PG&E may have lost the full report, it still has the summary report from the report's cover letter that identifies manufacturing 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- 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.

PG&E's decision not to consider replacing shrinkage cracks like the ones detected in the pipe in other sections of the same vintage (or purchase order) of pipe was 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.[514] Cracks tend to occur at the areas on either side of the stringer bead. This could propagate through the weld.[515] J.F. Kiefner, Bechtel 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.[516] So, a

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[512] PG&E Response Page 3-65, lines 20-25.
[513] MAOP09002459.
[514] Pipeline Rules of Thumb Handbook, 7th Edition, 2009, page 71.
[515] Pipeline Rules of Thumb Handbook, 7th Edition, 2009, page 71.
[516] "Welding Criteria Permit Safe and Effective Pipeline Repair", Pipeline Rules of Thumb Handbook, 7th Edition, 2009, page 74.

very cursory look at a typical, currently available, industry reference suggests it would have been 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.

Given that the pipe in Segment 180 that failed was found to have a cracked weld that grew under pressure to the point of rupture, proper retention and use of the 1988 Weld Failure report could have led to discovery and repair of the bad welds in Segment 180. PG&E's poor recordkeeping practices led to the loss of this important report, or at least a report summary's accessibility in files before 2010. Since the report is an engineering record directly relevant to the integrity of PG&E's transmission pipelines, it should have been retained for the life of the facility. Thus, the loss of this report is a violation of Public Utilities Code section 451.

d. Discussion of PG&E Defenses

PG&E says 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.[517] PG&E provides only one other example of what it calls a "report by letter," which is a report of an investigation of a possible leak in a pipe within an active pipeline.[518] However, this report cannot be considered a valid example for comparison 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,[519] 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.[520] The March 5, 1989 letter shows that it had an attachment. From this evidence, CPSD concludes that there was a report which PG&E lost or discarded.[521]

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[517] PG&E Response, Page 3-48
[518] P7-7076
[519] These offices have always been located in San Ramon, and their name has changed from the Pipeline System Engineering of Gas System Design Department, to Applied Technology Services (ATS), to TES over time.
[520] For example, see P7-7075 (cover letter) and P7-7074 (Report), both dated 1986.
[521] In response to DR 19 Q 3, PG&E provided copies of all of the San Ramon records indexes. CPSD

e. Duration of Violation

Since it is impossible to determine when the 1988 weld report disappeared, CPSD assumes it has been missing since 1988. For purposes of this proceeding, the term of this violation is from 1988 to 2010.

f. Summary of Violation's Negative Effect on Safety

PG&E's poor recordkeeping practices led to the loss of this important report. Given that the pipe in Segment 180 that failed was found to have a cracked weld that grew under pressure to the point of rupture, proper retention and use of the 1988 Weld Failure report could have led to discovery and repair of the bad welds in Segment 180.

Violation 27: Missing Report for 1963 Weld Failure

a. Summary of Violation

PG&E failed to retain a weld failure report that could have provided information to its engineers and managers concerning the expected service life and potential integrity of pipe installed in its transmission pipeline system.

b. Laws that PG&E Violated

PG&E engaged in unsafe practices when it failed to retain the weld failure report from 1963, a violation of Public Utilities Code section 451.

In October 1963, PG&E developed a Standard Practice to "establish a minimum weld check by radiographic or visual examination procedures on all gas piping systems, in accordance with General Order 112."[522] In this same Standard Practice, PG&E's records retention policy calls for retaining weld inspection reports for the life of the facility. Presumably, PG&E's retention policy would extend to the weld inspection reports generated from its Technical Services unit when they report results from inspections of welds in PG&E's the gas transmission piping.

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reviewed the indexes which span the entire life of PG&E, but found no index for reports produced in 1988.

[522] P2-1286, S.P. 1605, Felts March 16, 2012 Testimony, p. 34

c. Discussion of Violation

Good engineering practices and regulations require the retention of engineering records for gas transmission facilities for the life of the facility, including weld failure reports.[523] In February 1963, PG&E requested a report from a Consulting Metallurgist, on the quality of a circumferential weld, and the probable causes of its rupture, in a 26 inch gas line taken from the vicinity of Alemany Boulevard and Crescent Avenue, San Francisco, where a fire and explosion occurred in January 1963. The report was transmitted to PG&E with a letter dated March 1963. The was letter found in PG&E's records, but, PG&E cannot find the referenced weld failure report.

As a result, the probable cause of the rupture was not incorporated into PG&E's inspection program and was not included as a manufacturing threat in PG&E's integrity management model. Theoretically, if the report had been properly retained as a reference, it may have triggered inspections of circumferential welds in similar type pipe in PG&E's transmission system. Since the report is an engineering record directly relevant to the integrity of PG&E's transmission pipelines, it should have been retained for the life of the facility. Thus, the loss of this report is a violation of Public Utilities Code section 451.

d. Discussion of PG&E Defenses

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

e. Duration and Scope of Violation

The duration of this violation is 1963 to 2010 because there is no evidence that PG&E retained the 1963 report.

f. Summary of Violation's Negative Effect on Safety

In 1963, PG&E had in its possession a detailed technical analysis of a circumferential weld that failed, resulting in an explosion on one of the three Peninsula lines. Had PG&E retained the report, the information might have been used in the ongoing inspection and preventative maintenance of pipe of similar manufacturing history that is installed in the PG&E

[523] For example, PG&E Standard Practice 1605 required keeping Weld Inspection Reports for the life of the facility. See P2-1286.

transmission system. The report also may have informed PG&E's Integrity Management engineers of potential manufacturing threats to be considered in the development of the IM program. Proper retention of the report and response to its findings may have led to inspections and repairs to pipe welds in the PG&E pipeline system where bad welds have so far remained undetected. Until detected, potential bad welds present an ongoing risk of pipe failure.

VI. ALLEGED VIOLATIONS PREDICATED ON THE REPORTS AND TESTIMONY OF Dr. PAUL DULLER AND ALISON NORTH[524]

A. Alleged General Records Management Violations

Violation A.1: Gas Transmission Division Records Management Practices

1. Summary of Violation A.1

PG&E's systemic, comprehensive and sustained records management failure has resulted in substandard records and poor quality data. Both elements have compromised system safety over many years. A large portion of PG&E's records and data has been and remains missing, inaccurate, incomplete or a combination of these. Many of these records were also untraceable and unverifiable. PG&E did not maintain a definitive and complete master set of job files relating to its gas pipelines, or a definitive index of the location of all job files for all of its jobs. PG&E's job files were duplicative in part or whole and spread across its gas transmission division without any uniform organization. PG&E stored many job files in multiple office locations. When PG&E added records to or made changes to a job file in one location, it did not always make the same changes to other copies of the same job file. As such, the contents of any given job file could vary from location to location, and PG&E could make a decision based upon contents of one job file without reviewing the other variations of it. Because of all of these things, and because records and data are essential for safety engineering, PG&E could not safely

[524] CPSD Exhibit 16. The list of these alleged violations is drawn from the Revised Table of Violations from Dr. Paul Duller and Alison North Supplement to March 12th Report, PG&E Violations, submitted September 10, 2012

operate or maintain its gas transmission pipeline system. This summary contains four subheadings with brief explanations. Each subheading and explanation supports the violation, and will be explained thoroughly with documented support from the record under the "Discussion of Violation" section below.

Subheading A. PG&E Has Failed to Prove Facts or Inferences Associated with Records that are Missing, Inaccurate or Incomplete

Both statutory and case law provide for the inference that evidence which one party has destroyed or rendered unavailable is unfavorable to that party.[525] In that light, this subsection explains that because PG&E possessed and controlled all of the evidence in the form of its records, PG&E must provide that evidence to show a fact, or else reasonable inferences can be drawn against PG&E. Later sections identify the specific reasonable inferences to be drawn against PG&E in each instance.

Subheading B. Many of PG&E's various types of records were missing, inaccurate, incomplete or duplicative records; and therefore, were also not traceable or verifiable.

PG&E's missing record types include: strength test records, weld records, job files, operating pressure records, GIS records, pipeline history files, records showing reused pipe, and metallurgical reports. PG&E's inaccurate records include GIS records. PG&E's incomplete records include: job files, GIS records, leak records, and metallurgical reports. Because records of these types are either missing, inaccurate, incomplete, or a combination of these, they are also untraceable and unverifiable.

Subheading C. PG&E's Management Has Failed to Comprehensively Address Mandatory Recordkeeping Requirements

All violations to date are symptomatic of a systemic failure of PG&E executive management to comprehensively address its mandatory recordkeeping requirements.

Subheading D. PG&E Practiced Substandard Records Management.

[525] Cedars-Sinai Medical Center v. Superior Court, 18 Cal. 4th 1, 11.

PG&E exemplified substandard records management through its lack of oversight, failure to identify staff with record-keeping responsibilities that spanned the gas transmission part of the company, failure to make key records easily identifiable and accessible to employees, failure to manage information as a corporate asset, failure to retain important, safety-related record types and failure to educate staff about records management.

2. Statutes and Requirements PG&E has violated

PG&E has violated 49 CFR, section 192.709; California Public Utilities Code section 451; California Public Utilities Commission General Orders 112, 112A, and 112B, section 107; and ASME Code B31.8.

Also, Commission precedent has required that operators must create and retain records in order to determine Maximum Allowable Operating Pressure ("MAOP") under 49 CFR section 192.619(c), also known as the "grandfather clause". The decision stated, "No natural gas system operator can comply with these requirements (about the grandfather clause) without creating and preserving accurate and reliable system installation, operating, and maintenance records." D.12-12-030 (Dec. 20, 2012), p. 96, 2012 Cal. PUC LEXIS 600, at *168-169. As shown in the next subsection below, many of PG&E's installation, operating, and maintenance records, are missing, inaccurate or incomplete.

3. Discussion of Violation (including evidence and circumstances establishing the violation).

a. Many of PG&E's various types of records were missing, inaccurate, incomplete or duplicative records; and therefore, were also not traceable or verifiable.

i. Missing Strength Test Records

As discussed in the subsection above, Commission precedent requires creating and preserving records before an operator can establish MAOP under the grandfather clause. Id. However, in PG&E's own words, "PG&E recognizes that it has not located some historic pipeline records, including strength test reports that should have been retained."[526] In fact, many

[526] PG&E Exhibit 61, Page 1-1, Lines 20-21.

of PG&E's mappers also observed that some of its gas transmission line jobs were missing 'as-built' information and pressure test data as early as 2004, or even earlier.[527]

On August 30, 2012, PG&E identified 23,760 of its pipe segments, constituting approximately 435.7 miles, within Class 3 and 4 High Consequence Areas, which lacked strength test records from 1953 through 2010 required by law and sound engineering practice.[528] In particular, PG&E acknowledges that it "has not located records showing that a post-installation pressure test was conducted on Segment 180".[529] However, PG&E suggests there was evidence that a pressure test was done on Segment 180 when it was installed.[530]

By applying the Cedars-Sinai case and California Evidence Code section 413 as articulated in section III of this brief, it is reasonable to infer that PG&E's strength test records, including and especially those for Line 132 Segment 180, are missing, not merely that PG&E has not located them yet. Moreover, several reasonable inferences can be drawn about PG&E's missing strength test records. Either: 1) PG&E never hydrotested and never created strength test records to begin with; 2) PG&E hydrotested for these 23,760 pipe segments, but never actually created the records; or 3) PG&E created strength test records and destroyed them the next day.

On January 10, 2011, the Pipeline Hazardous Materials Safety Administration ("PHMSA") issued Advisory Bulletin 11–01.1 This Advisory Bulletin reminded operators that if they are relying on the review of design, construction, inspection, testing and other related data to establish MAOP and MOP, they must ensure that the records used are reliable, traceable, verifiable, and complete.[531] Regardless of which of the above three inferences are true, PG&E failed to ensure that the aforementioned 23,760 strength test records, each of which was necessary to establish MAOP for a pipeline,[532] were traceable, verifiable, or complete.

ii. Missing Weld Records

[527] PG&E Response to CPSD Data Request 25, Question 2(i) Supp 02Atch17.
[528] TURN Exhibit 4.
[529] PG&E Exhibit 61, Page 4-6, Lines 9-10.
[530] PG&E Exhibit 61, Page 4-6, fn 13.
[531] Federal Register / Vol. 77, No. 88 / Monday, May 7, 2012, 26822.
[532] Applying the Cedars-Sinai standard here, it is reasonable to infer that each missing record was necessary to establish MAOP for a pipeline.

PG&E reports finding weld records in only 5000 Job Files in its Emeryville storage facility, which represents only 5.7% of the 87,018 transmission Job Files held there.[533] Given that PG&E's Job Files held in Emeryville form a representative cross-section of all of PG&E's Job Files,[534] the majority of PG&E's other Job Files clearly also are missing weld records.

The Commission possesses evidence, and there is a lack of PG&E responsive evidence, to find that for different pipes: 1) PG&E's gas transmission pipe welding never met applicable standards; 2) PG&E's gas transmission pipe welding met proper standards, but records of the welds were never created; and/or 3) PG&E's created records of proper gas transmission pipe welds, but destroyed or discarded them at some time after creating them.

iii. Incomplete Job Files

As the following shows, PG&E believed it had a complete, definitive master set of job files in Walnut Creek, but did not. On February 15, 2012, prior to its MAOP validation review efforts, PG&E mistakenly considered completed Job Files stored in its Walnut Creek engineering library, also called the Walnut Creek Records Office, to be the official files; and PG&E mistakenly believed that the records filed in its Walnut Creek Records Office and subjected to document control procedures were its master files.[535] In fact, as of February 15, 2012, as part of its post San Bruno, MAOP Records Validation Project, PG&E provided CPSD with information from a set of more than 132,000 job folders, of which only 30.3% were from Walnut Creek, 63.3% were from its Bayshore facility, and the remaining 6.4% were distributed across 42 other PG&E locations.[536]

Also, the fact that PG&E found weld records in only 5.7% of the 87,018 transmission Job Files held in Emeryville,[537] leads to an inference that at least 94% of PG&E's transmission Job Files in Emeryville were incomplete because they lacked necessary weld records.

All of these facts support a finding that a large percentage of PG&E's job files were incomplete dating back to the date the company installed its earliest pipelines.

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[533] CPSD Exhibit 6, Page 6-64, Line 9; CPSD Exhibit 8, Page 36 of 72, Lines 8-11.

[534] On February 15, 2012, PG&E provided CPSD information relating to a set of more than 132,000 job folders, of which 63.3% were from its Bayshore facility, only 30.3% were from Walnut Creek, and the remaining 6.4% were distributed across 42 other PG&E locations; See PG&E Response to CPSD DR 48, Question 1, Attachment 1.

[535] PG&E Response to CPSD DR 51, Question 5, Page 2.

[536] PG&E Response to CPSD DR 48, Question 1, Atch1.

[537] CPSD Exhibit 6, Page 6-64, Line 9; CPSD Exhibit 8, Page 36 of 72, Lines 8-11.

iv. Missing Job Files

Numerous facts prove that PG&E is missing copious amounts of Job Files.

1. Missing Job Files from PG&E's Emeryville Collection

There are large numbers of job files missing from PG&E's current master collection in Emeryville.[538] There are several sources of evidence to support that finding.

First, in PG&E's own words, "PG&E's Emeryville facility now serves as a central repository for many (but not all) gas transmission pipeline construction and testing records."[539] However, at the time PG&E began its MAOP validation effort, PG&E did not know how many total jobs or job folders it had,[540] how many pipeline job files it was missing,[541] or how many job folders it had stored in each of its local sites.[542]

Second, when PG&E's MAOP validation effort was underway in December 2011, PG&E could not tell how many job folders it still had located outside of its Emeryville facility.[543]

Third, more than one year after PG&E began its MAOP Records Validation Project it still had approximately 875 boxes in Emeryville containing an unknown number of job folders to be processed and inventoried.[544]

Each of these facts leads to a finding that PG&E's master collection of Job Files in Emeryville is incomplete and that PG&E is missing numerous Job Files for pipelines throughout its system.

2. Missing Job Numbers Mean Missing Job Files

CPSD analysis of PG&E's Emeryville job file index identified missing job file numbers from a number of continuous job number sequences.[545] These missing job numbers or 'sequence gaps' were inferred to correspond to missing job files. PG&E claims this inference lacks support,[546] but does not provide any concrete evidence to show its claim.[547] Instead, CPSD

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[538] CPSD Exhibit 8, Page 39 of 72 Lines 29-31 and Page 41 of 72 Line 11.
[539] PG&E Exhibit 61, Page 2-19, Lines 13-15.
[540] CPSD Exhibit 6, Page 6-53, Line 24.
[541] CPSD Exhibit 6, Page 6-58, Lines 5-8.
[542] CPSD DR 25, Question 1.
[543] CPSD Exhibit 6, Page 6-71, Lines 24-26.
[544] CPSD DR 25, Question 1.
[545] CPSD Exhibit 6, Page 6-58, Lines 8-15.
[546] PG&E Exhibit 61, Page 3-37, Lines 11-13.

provides several examples on the record to confirm this inference. First, 1619 (35%) of the 4669 Job Numbers recorded in PG&E's new GIS (Intrepid) correspond to 'sequence gaps' in the Emeryville job file index, as they do not have a matching job number, and at least one physical job folder in PG&E's Emeryville Records Center.[548]

Second, after submitting its response testimony and several days before CPSD's rebuttal testimony due date, PG&E informed CPSD of another 2,149 job numbers that corresponded to job files that it was missing, and had only found in Iron Mountain as of July, 2012.[549] Moreover, PG&E acknowledged that 711 job file numbers corresponded with job files that PG&E missed during its MAOP efforts, but "could potentially be located in Iron Mountain".[550] Given that almost two years after the San Bruno explosion, PG&E contends that some of its lost records could potentially be located somewhere.

Third, CPSD found that PG&E was missing 67.5% of the job files associated with PG&E's first 10,000 job numbers.[551]

The appropriate Commission finding is that thousands of job file records are missing, not merely lost, because of PG&E's admittedly terrible Job File system.

3. Prior to the San Bruno Explosion, No Master Index Means No Effective Way to Confirm that Job Files Are Not Missing

In PG&E's own words, "PG&E. . .acknowledges that prior to San Bruno, it did not have a system-wide index of all its pipeline job files."[552] In addition, none of the indexes or covers of physical job files reviewed by CPSD differentiated between a 'master job file' and a 'local job

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[547] PG&E Exhibit 61, Page 3-37, Lines 11-19. PG&E merely suggests here that these missing job files *could* be located in other lines of business than gas transmission, but PG&E provides no concrete showing that this has actually happened.

[548] CPSD Exhibit 8, Page 39 of 72, Lines 21-23.

[549] CPSD DR 85, Page 3.

[550] CPSD DR 85, Page 3.

[551] CPSD Exhibit 6, Page 6-58, Lines 9-11. For a list of additional facts showing that gaps in PG&E's job numbers means that PG&E is missing job files, see CPSD Exhibit 8, Pages 39-40.

[552] PG&E Exhibit 61, Page 3-38, Lines 24-25; For additional evidence showing that prior to August 2010, PG&E did not have a complete and comprehensive master index of pipeline related job files or of job folders associated with each job, see CPSD Exhibit 6, Pages 6-42, 6-56, 6-53, 6-41, 6-55, 6-69, 6-79 and 6-49; See also CPSD Exhibit 8, Page 38 of 72 Lines 17-18; See also CPSD DR 25, A1, p. 10 (December 19, 2011).

file'. Of the tools PG&E claims it used to track job files, it acknowledges that none were comprehensive.[553]

Without such a comprehensive list, PG&E had no means to tell if all of its gas transmission job files were accounted for, where they were stored or how to locate them. PG&E's failure to account for each gas transmission job file leads to a reasonable inference and finding that they were missing prior to the San Bruno explosion.

v. Duplicate Job Files

In December 2011, PG&E could not ascertain exactly how many duplicate Job Files or Job Folders it had.[554] In fact, by February 2012, PG&E's Emeryville data catalog showed 146,227 job folder records relating to only 87,018 unique job numbers.[555] PG&E acknowledges that with respect to job files, even though there were procedures in place, they were not always consistently followed.[556] Without such consistency, PG&E commonly stored multiple duplicate versions of the same job folder in one or more locations and across Gas Transmission Records, Division Offices, Engineering, Construction and Billing.[557]

In the words of CPSD's records management experts, PG&E's "lack of control over the duplication, distribution and storage of Pipeline-related Job Files and folders leaves PG&E exposed to: [558]

"• Inability to locate safety critical pipeline information;"
"• Poor decision making based upon incomplete information leading to costly and potentially fatal mistakes;"
"• Poor management of safety critical assets;"
"• Failure of its integrity management program;"
"• Inaccurate databases, poor data quality and missing pipeline attributes".

[553] PG&E Exhibit 61, Page 3-38, Lines 28-32.
[554] CPSD Exhibit 6, Page 6-61, Lines 21-22; CPSD DR 25, Q1 (December 19, 2011).
[555] CPSD Exhibit 6, Page 6-70 Lines 12-14.
[556] PG&E Exhibit 61, Page 3-38, Line 18.
[557] CPSD Exhibit 6, Page 6-40, Lines 20-26 and 6-41 Lines 1-2; CPSD DR 51 Question 5.
[558] CPSD Exhibit 6, Page 6-68, Table 6-18.

vi. Missing Operating Pressure Records

PG&E has admitted as follows: "PG&E's search for operating pressure records from 1965-1970 revealed that many of the underlying records that had been reviewed from 1973-1975 for grandfathered pipelines were no longer available."[559] . PG&E is also missing data from the year 1999 for all of its pipelines.[560]

vii. Inaccurate and Erroneous GIS Data

PG&E has acknowledged "that data errors exist within the current GIS system, either from original pipeline data or introduced during the transfer".[561] PG&E also has acknowledged that some of its specific GIS records are inaccurate;[562] and has also acknowledged multiple times that other elements of its GIS records could be inaccurate. [563] More generally, PG&E does not contend that its current GIS system accurately or completely describes key attributes for all of its numbered gas transmission lines, including all of the following:[564]

- Pipe data, including joint efficiency,[565] girth welds, long seams, joint type, SMYS, [566] grade, wall thickness,[567] size, and outside diameter;
- Test data, including data, pressure, test medium, test duration, and depth of cover;
- Operating data, including MAOP, percent SMYS at MAOP, MOP, percent SMYS at MOP, pipe coating type and condition;
- Pipe casing diameter and footage; and
- Location data, including class as built and present, GM number, year installed, footage, pipe segment number, route number, stationing from transmission line plats, and approximate point.

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[559] PG&E Exhibit 61, Page 4-9, Lines 19-22.
[560] PG&E Exhibit 61, Page 3-59, Lines 4-6.
[561] PG&E Exhibit 61, Page 3-66, Lines 26-28.
[562] 1/17/2013 Tr. 2129: 19 - 2130: 28.
[563] 1/17/2013 Tr. 2134: 5-10; 1/17/2013 Tr. 2136: 6-16; 1/17/2013 Tr. 2138: 28 - 2141: 8; 1/17/2013 Tr. 2141:15-2142: 19; 1/17/2013 Tr. 2142: 21 – 2143: 13; 1/17/2012 Tr. 2145: 14 – 2147: 25
[564] PG&E Response to CPSD Data Request 67, Question 13.
[565] PG&E admitted to an inaccurate GIS joint efficiency attribute record. See 1/17/2013 Tr. 2134; 13-28.
[566] PG&E admitted that some GIS SMYS attribute records could be inaccurate. See 1/17/2012 Tr. 2145: 14 – 2147: 25.
[567] PG&E admitted that some GIS wall thickness attribute records could be inaccurate. See 1/17/2013 Tr. 2141:15-2142: 19

Moreover, PG&E has found significant percentages of inaccurate records containing key safety attributes found in its GIS. In a recent study of 100 excavated PG&E pipe pieces, PG&E looked at several attributes commonly found throughout PG&E's GIS, including wall thickness and longitudinal seams. After comparing specific data from the field to data in PG&E's records for what should have been the same pieces of pipe, the study found that "Out of all records reviewed, 20% were found to be inaccurate record specifications. . .two instances impacted the MAOP of the line negatively."[568]

Another source of inaccurate GIS records came from PG&E's GIS based assumption that the date of a pipe's installation and the date of its manufacture were the same.[569] Although "age of pipe" and "age of installation" may be similar for new pipe, the record shows they often are not in the case of reused or re-conditioned pipe.[570] Of the 31 pieces of reused pipe PG&E has identified to CPSD, none show the re-install date and manufacture date as the same.[571] In fact, only 10 of the 31 pieces of reused pipe have re-install date and manufacture date identified. Of these, all have discrepancies of at least seven years, and six have discrepancies of more than 20.[572]

PG&E's problem with inaccurate data later migrated to GIS attributes is not new, and should not be surprising to PG&E. In fact, PG&E was aware that it had poor quality pipeline age data from as early as 1984, when PG&E Area Engineers reported age information to be only 94% accurate and leak history data only 60% accurate.[573]

PG&E knew of data quality issues associated with key pipeline information. Nonetheless, PG&E did not take basic steps to ensure the accuracy of its data, such as validating and running quality control of the sources of information used to populate its original GIS. For example, even though PG&E populated GIS with information sourced from many different Pipeline Survey Sheets, PG&E did not check that the content on those pipeline survey sheets

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[568] PG&E Data Response to CPSD Data Request 25, Question 2(i) Supp 05 Attachment 1, Page 1; CPSD Exhibit 8, Page 9 of 72, Lines 26-30.
[569] CPSD Exhibit 8, Page 23 of 72, Lines 7-9.
[570] CPSD Exhibit 8, Page 23 of 72, Lines 10-14.
[571] PG&E Response to CPSD Data Request 24, Question 2, Attachment 1.
[572] PG&E Response to CPSD Data Request 24, Question 2, Attachment 1.
[573] CPSD Exhibit 8, Attachment 108, Page 14, Line 12. The Bechtel report "Engineering Consulting Services for Pacific Gas and Electric Company", dated January 1984, Job 16253, Revision O.

matched PG&E's (now missing) pipeline density survey sheets or the relevant job files, both of which were the original source documents of the Pipeline Survey Sheets.[574]

Significant information about each and every attribute of PG&E's GIS data is inaccurate or erroneous, and has been so since the inception of PG&E's first GIS database.

viii. Missing GIS Data

When CPSD explicitly requested PG&E to identify missing GIS information, PG&E said that it could not do so.[575] Moreover, the current GIS was populated with data from PG&E's Pipeline Survey Sheets, which themselves were derived from Pipeline Density Survey Sheets (the precursor to the Pipeline Survey Sheets), which in turn were compiled with information from Job Files.[576] PG&E has acknowledged that it cannot find the Pipeline Density Survey Sheets that were used to populate the Pipeline Survey Sheets.[577] PG&E also cannot locate all the job files used to originally populate the Pipeline Density Survey Sheets because many of PG&E's Job Files are now missing or incomplete.[578] All of these sources of information had their own problems of missing, erroneous, and inaccessible data associated with them. The Commission should find that a significant amount of PG&E's GIS data is missing, and has been so since the inception of PG&E's first GIS database.

ix. PG&E's GIS is a System of Record for Pipeline Records and a Primary Source of Information for Its Integrity Management Program

In parts of its testimony, PG&E states that its GIS "(. . .is not our system of record for pipeline records) and did not replace engineering records".[579] However, other parts of PG&E's same exhibit states that the GIS database "serves as a primary source of information in the integrity management program".[580] Therefore, the Commission should find that PG&E's GIS is both a system of record for PG&E pipeline records and a primary source of information in PG&E's integrity management program.

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[574] CPSD Exhibit 8, Page 48 of 72, Lines 14-16.
[575] PG&E Response to CPSD DR 67, Question 13.
[576] CPSD Exhibit 8, Page 48 of 72, Lines 11-14.
[577] CPSD Exhibit 8, Page 13 of 72, Lines 24-27; PG&E Response to Data Request 45, Question 7, Page 2.
[578] For discussion of missing job files, see Violation A1, Subsection 3.a.iv. For discussion of incomplete job files, see Violation A1, Subsection 3.a.iii.
[579] PG&E Exhibit 61, Page 3-66, Lines 14-15.
[580] PG&E Exhibit 61, Page 3-54, Lines 3-4.

x. PG&E's Multiple Corrections to GIS Records after the San Bruno Pipeline Explosion Suggest Multiple GIS Errors Before the San Bruno Pipeline Explosion

As of January 18, 2013, PG&E provided an audit change log that showed 267,274 entries, each of which indicated changes to PG&E's GIS database since its creation in 1999. Of these entries, 154,315 (58%) relate to changes that PG&E made to the GIS before the San Bruno incident (1999-2010).[581] The remaining 112,959 (42%) entries represent changes to GIS information made in the two years and several months after the San Bruno incident.[582] The Commission should find that a large number of the 112,959 entries reflect changes necessary to address bad GIS records that existed before the San Bruno pipeline explosion. These entries would include the GIS records discussed in subsections 3.b.vii and 3.b.viii of this violation (shown several subsections above).

xi. PG&E Frequently Does Not Assume the Most Conservative Values When Missing GIS Records

PG&E recently represented to the Commission that where it lacked gas pipeline records, it will make very conservative assumptions about pipeline attributes.

> "Commissioner Sandoval questioned PG&E's Vice President for Gas Engineering and Operations regarding the use of assumptions in the MAOP validation methodology. PG&E's Vice President explained that for pipeline equipment for which PG&E does not have records, it will make very conservative assumptions based on the era during which the pipeline was constructed, the types of material then available, and the type of material PG&E was purchasing."[583]

Yet, within PG&E's GIS database, for gas transmission pipeline attributes of joint efficiency, wall thickness and SMYS, PG&E admitted to examples in which it had changed from

[581] See Joint_DR01Q02_Atch01, "AUDITLOG_01182013 Redacted" provided by PG&E on January 18, 2013 per ALJ's instructions. This is seen by clicking on the heading of the column titled "Report_Date", and seeing that the first 154,315 entries occurred before September 10, 2010.
[582] See Joint_DR01Q02_Atch01, "AUDITLOG_01182013 Redacted" provided by PG&E on January 18, 2013 per ALJ's instructions, "Report_Date" column.
[583] D.12-12-030, Page 94.

less to more conservative assumed values,[584] and also admitted to several other examples in which it had changed from less conservative assumed values to more conservative known values.[585] In two instances for records about Line 132, PG&E admitted that the letters QC in the comment column meant a correction of an inaccurate assumed value to a more conservative value.[586] In most of other cases, PG&E acknowledged that these changes could be due to inaccuracies that were corrected.

In certain instances, PG&E attempted to explain that another reason for changing an assumed value to make it more conservative was that it had replaced the pipe.[587] However, PG&E's audit change log has multiple comments that make explicit when a change in GIS data is due to a pipeline replacement.[588] Based on the evidence in the record, it is reasonable to infer that PG&E did not change values in GIS due to pipeline replacement unless its audit change log explicitly said so. Moreover, in cases where PG&E acknowledged that it changed assumed values to more conservative assumed or known values either because the old assumed value could be inaccurate, it is reasonable to infer that the old assumed value was indeed inaccurate. It is also reasonable to infer that where PG&E changed to a more conservative value, PG&E recognized its own initial assumed values were not conservative enough to safely operate its own system.

PG&E also acknowledged that going from an assumed value to a known one means that PG&E could have found a record that prompted a change.[589] Applying the Cedars-Sinai

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[584] For joint efficiency, See CPSD Exhibit 69, Route_Join Numbers 132 125.005, and 132_125.006; and 1/17/2013 Tr. 2125: 7-28; 1/17/2013 Tr. 2130: 13-28. For wall thickness, See CPSD Exhibit 69, Route-Join Number 1816-01 206.6; 1/17/2013 Tr. 2141: 15 to 2142: 9. For SMYS, See CPSD Exhibit 69, Route Join Number 0619-05_104.5 172A 78.2000; 2143: 20 to 2144: 10.

[585] For joint efficiency, See CPSD Exhibit 69, Route_Join Number X6535 503 3006 476.2700; 1/17/2013 Tr.2135: 26 – 2136: 16. For wall thickness, See CPSD Exhibit 69, Route_Join Number 1881-01 206 103 22.2100; 1/17/2013 Tr. 2142: 21 - 2143: 13. For SMYS, See CPSD Exhibit 69, Route_Join Numbers 1304-01 100.5 021C 51.4100; 1304-01 100.6 021C 51.4100; and 1304-01_100 021C 51.4100; 1/17/2013 Tr. 2153: 20 to 2154:12.

[586] 01/17/2013 Tr. 2130: 13 to 2131: 3. See also CPSD Exhibit 69, Row 26669, Route_Join Number 132 125.005 0.0000; and Row 26670, Route_Join Number 132 125.005 0.0000.

[587] See for example, 01/17/2013 Tr. 2143: 5-13.

[588] See Joint_DR01Q02_Atch01, "AUDITLOG_01182013 Redacted" provided by PG&E on January 18, 2013 per ALJ's instructions. Within this document, several of the multiple examples of explicit pipeline replacements can be seen by looking at the "Review Comments" cell associated with Route_Join numbers 300A_240.6_ _0.0000; 300A_239.4_ _0.0000; and 1816-01_211.4_1816-01_3.4400.

[589] 1/17/2013 Tr. 2136: 25 – 2137: 10.

standard, it is reasonable to infer that in the multiple cases where PG&E changed an assumed GIS value to a more conservative known value, PG&E found a record that showed its initial assumed values were not conservative enough to ensure safe operation of its system.

In fact, PG&E could not identify how many examples of assumed gas pipeline values in GIS were less conservative than their newly corrected or updated values.[590]

In short, PG&E's current GIS database has multiple examples of assumed values that are not the most conservative, despite PG&E's recent representation to the Commission that it is using "very" conservative values as part of its MAOP effort.

xii. Many of PG&E's GIS Assumed SMYS Values Have Not Complied with Federal Regulations

PG&E acknowledged that "Code references that when you don't know anything about the pipe, then you would put in a value of 24,000."[591] [592] In fact, PG&E's audit change log from January 18, 2013 shows 2,521 instances of assumed SMYS values greater than 24,000 PSI.[593] Applying the Cedars-Sinai standard to these 2,521 instances, there are several reasonable inferences. First, PG&E's initial assumed SMYS values were not conservative enough to enable safe operation of its system. Second, PG&E's initial assumed SMYS values were not conservative enough to comply with federal regulation.[594]

In this instance, another standard accompanies Cedars-Sinai. As noted in D.09-08-029 "When Commission staff investigates major accidents. . .staff must have access to all information relevant to an investigation with little or no delay."[595] Here, PG&E acknowledged that ". . .we are aware that data errors exist within the current GIS system. . .".[596] However, on

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[590] 1/17/2013 Tr. 2158: 16 – 2159: 10.

[591] 1/17/2013 Tr. 2149: 1-3.

[592] 49 CFR § 192.107(b)(2) provides that, "For pipe. . . whose specification or tensile properties are unknown", and not tensile tested, a SMYS value of 24,000 psi is to be used. Moreover, ASME Standard B31.1.8 § 811.27(G) (1955) (Page 18) also required that, "When the manufacturer specific minimum yield strength, the tensile strength, or elongation for pipe is unknown and no physical tests are made, the minimum yield strength for purposes of design shall be taken at not more than 24000 PSI."

[593] See Joint_DR01Q02_Atch01, "AUDITLOG_01182013 Redacted" provided by PG&E on January 18, 2013 per ALJ's instructions. This count can be determined by clicking on the column titled "Field_Name", and sorting that column from A to Z. This will group all of the changes to SMYS values together, enabling a count of all assumed values that exceed 24,000 psi.

[594] See 49 CFR § 192.107(b)(2).

[595] D.09-08-029, Page. 26.

[596] PG&E Exhibit 61, Page 3-66, Lines 26-29.

July 19, 2013 CPSD and TURN jointly asked PG&E to account for and describe each error.[597] PG&E initially responded that it "does not maintain all errors in information listed in GIS. . .in a way that the requested data can be readily extracted."[598] Months later, on October 3, 2012, toward the end of the first round of hearings in this case, PG&E for the first time informed CPSD of, "An audit change log reflecting changes to the current GIS between September 10, 2010 and October 3, 2012. ."[599] Moreover, it took PG&E until the very end of the second round of hearings, on January 18, 2013, to produce the audit change log version that showed the 2,521instances of assumed SMYS values greater than 24,000 psi. Had PG&E provided this information in a timely and forthright manner, CPSD would have earlier asserted that each of these instances constituted a violation. In light of this set of facts, CPSD also has considered asserting that PG&E committed a violation of Rule 1.1 of the Commission's Rules of Practice and Procedure for failing to disclose the audit change log in its initial response to the July 19, 2012 joint TURN and CPSD data request. Instead of pursuing either of these assertions at this late stage of this proceeding, CPSD requests that the Commission consider opening an Order to Show Cause for PG&E to explain why it did not disclose the audit change log in its initial response to the CPSD and TURN joint data request of July 19, 2012.

The Commission articulated several factors that weigh into its determination of the amount to fine a utility. The Commission noted that the severity of the violation is a factor, stating "purpose of a fine is to go beyond restitution to the victim and to effectively deter further violations by this perpetrator or others."[600] The Commission also factored in the conduct of the utility stating, "This factor recognizes the important role of the public utility's conduct in (1) preventing the violation, (2) detecting the violation, and (3) disclosing and rectifying the violation."[601]

As it stands, PG&E's failure to forthrightly respond to a data request and to timely disclose its extremely relevant GIS audit change log, with its plethora of data errors,

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[597] CPSD Exhibit 64; PG&E Response to CPSD-TURN Joint Data Request 01, Question 02, Supp. 01.
[598] CPSD Exhibit 64; PG&E Response to CPSD-TURN Joint Data Request 01, Question 02, Supp. 01.
[599] CPSD Exhibit 64; PG&E Response to CPSD-TURN Joint Data Request 01, Question 02, Supp. 01.
[600] *Rulemaking to Establish Rules For Enforcement of the Standards of Conduct Governing Relationships Between Energy Utilities and Their Affiliates Adopted By the Commission* (D.98-12-075), 84 CPUC2d 155, 1998 Cal. PUC LEXIS 1016, pp. 53-54.
[601] Id. at 57.

demonstrates the severity of this violation, and reflects poorly upon PG&E's conduct during this investigation, and should lead to a higher fine.

xiii. Lack of Complete and Comprehensive Inventory of All Gas Leaks Over the Lifetime of Pipelines

In PG&E's own words, PG&E does "recognize the importance of making leak records more accessible" and "ha(s) undertaken an effort to gather and digitize all hardcopy records in a central database.[602] PG&E developed a new leak and repair tracking database called the Integrated Gas Information System (IGIS) in 1999.[603] However, approximately one million (1,000,000) leak records containing leak and leak repair data from 1970 to 1999 were kept in a separate Mainframe database, and were not available in its current IGIS system.[604] Additionally, an untold number of additional leak records from before 1970 could only be accessed from local PG&E offices.[605] To date, PG&E cannot locate any internal documents or memos to explain or justify why certain leak information was not migrated to IGIS.[606]

In stark contrast to the vast number of leak records absent from PG&E's IGIS, as of October, 2011, PG&E's IGIS only held information about 27,771 leaks throughout PG&E's system.[607] To provide further context to the deficiency of PG&E's IGIS system, PG&E's Line 132 was initially installed in 1948, meaning that most of the life of that facility passed prior to IGIS, and almost half of the life of that facility relied upon paper records.

PG&E itself has identified problems with the completeness of its leak records. In a recent post-San Bruno audit, PG&E concluded that "controls for managing and repairing gas leaks need strengthening. In particular, (PG&E) found that the Utility needs to enhance controls for (1) validating the accuracy of the rechecking process, (2) ensuring accurate entry of data into IGIS and retention of source documentation, (3) reviewing and approving leak repair forms, (4) correcting known errors in IGIS; and (5) ensuring that leak survey and repair personnel are qualified for assigned duties."[608] This same audit found that, "Mapping was unable to find about five percent of the A-Forms and approximately seven percent of the recheck documents (PG&E)

[602] PG&E Exhibit 61, Page 3-64, Lines 8-11.
[603] PG&E Exhibit 61, Page 3-61.
[604] PG&E Response to CPSD Data Request 69, Question 6, Page 2.
[605] 10/5/2012 Tr. 1959: 14-25.
[606] CPSD Data Request 69, Question 6.
[607] CPSD Exhibit 6, Page 6-88, Lines 17-19.
[608] PG&E Response to CPSD Data Request 25, Question 2(i) Supp02Atch02, Page 2.

requested. In addition, about ten percent of the leak information in IGIS contained at least one data entry error when compared to the original documents (PG&E) reviewed. The more prevalent errors included incorrect grades entered into IGIS. . ."[609]

In the opinions of CPSD's experts, the state of PG&E's leak records left PG&E exposed to incomplete and inaccurate sets of safety critical information, and inefficient and ineffective information retrieval and time consuming searches.[610]

xiv. Missing Pipeline History Files

1. PG&E's Own Requirement to Keep Pipeline History Files for the Life of the Facility

SP 463.7 stands for Standard Practice 463.7, which is PG&E's own internal policy entitled "Pipeline History Files", that it issued on December 15, 1969.[611] Standard Practice 463.7 requires in part that:

> "History records for numbered transmission lines shall be filed by line number, with all pertinent inclusions of data shown (as required to be included as part of the history file). . .indexed for ready reference, and cross-referenced to other permanent files, such as GM or Work Order files. . .The complete pipeline and main history files shall be maintained up to date by the Division or department for the life of the operating facility".[612]

In PG&E's own words, "In retrospect, the company wishes it had retained the pipeline history files."[613] PG&E also represented to CPSD that it "does not know whether all of the life-of-the-pipeline records that had been saved under SP 463.7 as Pipeline History Files exist elsewhere within PG&E today for all pipe that is still in its system".[614] However, PG&E earlier

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[609] PG&E Response to CPSD Data Request 25, Question 2(i) Supp02Atch02, Page 3.
[610] CPSD Exhibit 6, Page 6-89, Table 31.
[611] CPSD Exhibit 6, Page 6-37, Lines 27-28; and PG&E Responses to CPSD Data Request 7 Question 9; CPSD Data Request 4 Question 6; CPSD Data Request 34 Question 1; CPSD Data Request 66 Question 1; and CPSD Data Request 67 Question 11.
[612] P2-1336; Supplement P2-1337; and P2-1477, p. 566
[613] PG&E Exhibit 61, Page 2-23 Lines 3-4.
[614] CPSD Exhibit 8, Page 45 of 72, Lines 26-28; PG&E Data Response to CPSD Data Request 67, Question 11.

stated that, "PG&E no longer maintains Pipeline History Files".[615] Moreover, when asked for a summary list with locations of all pipeline files kept and maintained in response to Standard Practice 463.7, PG&E was unable to provide any.[616]

2. PG&E Is Confused About When and Whether Standard Practice 463.7 Became Ineffective

PG&E is confused about both when and whether the company's own Standard Practice 463.7 became no longer effective. In testimony, PG&E asserts that its own internal requirement (Standard Practice 463.7) to keep its pipeline history files was rescinded no later than *October 1987*.[617] As support for its assertion, PG&E cites to an internal letter on October 9, 1987 that states "We have been asked to cancel the following Standard Practices", and this letter includes SP 463.7.[618]

In counterpoint to its own testimony, PG&E asserted in a data response that "PG&E believes that SP 463.7 became inoperative in the early *1990's* when PG&E initiated the transition to its Geographic Information System (GIS)."[619]

To further confuse PG&E's conflicting assertions, on February 14, 1996, PG&E issued a History File Requirements Manual ("manual") that included Standard Practice 463.7.[620] In PG&E's own words, "The manual is to ensure that all personnel responsible for maintaining (Gas System Maintenance) records are working to the most recent changes in the CPUC General Order 112 (revision "E" was adopted in September, 1995)."[621] General Order 112 revision E is in effect today. PG&E's Standard Practice 463.7 is explicitly called out in the manual as one of the documents to enable PG&E comply with GO 112E section 192.709.[622]

In fact, PG&E's own 1995 manual recognized pipeline history files as a requirement. PG&E has not provided any evidence to explain why, if its requirement had ended in 1987, a company manual continued to recognize SP 463.7 in 1995.

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[615] PG&E Response to CPSD Data Request 7, Question 9, part C.
[616] PG&E Response to CPSD Data Request 34, Question 1.
[617] PG&E Exhibit 61, Lines 3-4 and Line 27.
[618] PG&E Exhibit 64, Page 2-39.
[619] PG&E Response to CPSD Data Request 7, Question 9.
[620] P2-1477, Pages 564-570.
[621] P2-1477, Page 4.
[622] P2-1477, Page 563.

The record shows PG&E's confusion about whether it ever rescinded SP 463.7. Therefore, PG&E has not established that it ever rescinded SP 463.7, or that it did not need to keep Pipeline History Files.

Moreover, regardless of whether PG&E rescinded SP 463.7, PG&E enacted a binding requirement at the outset, in 1969, to keep pipeline history files for the life of the facility. Even if PG&E had rescinded SP 463.7, PG&E still had the duty to keep each pipeline history file for the life of the facility. This will be discussed in more detail in the section that shows that PG&E's defenses to violation A.1 lack merit.

3. PG&E's Requirement to Keep Pipeline History Files for the Life of the Facility Carries the Weight of Law

PG&E incorrectly asserts that PG&E's own requirement that Pipeline History Files be maintained for the "life of the facility" "arose by operation of SP 463.7, not by operation of law".[623] In fact, federal law requires that "Each operator shall maintain, modify as appropriate, and follow the plans, procedures, and programs that it is required to establish under this part."[624] Hence, as a PG&E procedure, SP 463.7 carries the weight of law, and PG&E was required to follow it by retaining its pipeline history files for the life of the facility, but did not. Thus, PG&E violated the law by destroying each of these files.

xv. Missing Records Showing Reused Pipe

The record shows that prior to the San Bruno explosion, PG&E had not maintained any collected and organized set of records showing the location or use of reconditioned pipe within its gas transmission system.[625] PG&E claims "PG&E has not, as best it is aware, lost records about reused pipe."[626] , PG&E's also admits that it ". . . does not in all instances know where reconditioned pipe has been placed in its transmission system.[627] PG&E also acknowledges that

[623] PG&E Exhibit 61, Page 2-21, Lines 24-26.
[624] 49 CFR § 192.13(c).
[625] See CPSD Exhibit 8, Page 22 of 72, Lines 16-17; PG&E Response to CPSD Data Request 24, Questions 1 and 2.
[626] PG&E Exhibit 61, Page 3-33, Lines 26-27.
[627] PG&E Exhibit 61, Page 3-32, Lines 1-2.

the company ". . . did not in the past capture data identifying reconditioned pipe in the gas transmission system in its databases. . ."[628]

In particular, as of January 2012, PG&E acknowledged that it "is currently unable to provide an estimate of the volume of the re-conditioned pipe in the system (of any vintage). . ."[629] As of January 2012, PG&E had identified 25 instances of re-conditioned pipe in its gas transmission system, 18 of which did not have a known date of manufacture.[630] Approximately six months later, as of July 2012, PG&E could only find six more instances of re-conditioned pipe in its system for a total of 31 total instances.[631] Of these 31 instances, 21 still did not have a known date of manufacture.[632]

In spite of the claim that PG&E "has not, as best it is aware, lost records about reused pipe"[633] PG&E clearly cannot find all of its records showing its reused pipe. Of the records PG&E can find, the majority of them are incomplete, lacking date of manufacture information. The evidence supports a Commission finding that PG&E's files are missing an undetermined number of records pertaining to an undetermined number of miles of reused pipe currently in operation, and that the location and characteristics of those pipes remain unknown.

PG&E also cannot confirm either that the particular pipe that ruptured in San Bruno was new or reused pipe. In PG&E's own words, it "cannot conclusively document the origin of the pipe used in the construction of segment 180"[634] and that "segment 180 job file documents do not foreclose the possibility that some of the pipe used on the segment 180 job may have been reconditioned pipe".[635] The Commission should find that it is possible that the pipe that ruptured in San Bruno was reused.

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[628] PG&E Exhibit 61, Page 3-28, Lines 19-20.
[629] PG&E Response to CPSD Data Request 25, Question 6.
[630] See CPSD Exhibit 8, Page 22 of 72, Lines 18-20; PG&E Response to CPSD Data Request 24, Question 2, Attachment 1.
[631] PG&E Response to CPSD Data Request 70, Question 5; and PG&E Response to CPSD Data Request 70, Question 5 Attachment 1.
[632] PG&E Response to CPSD Data Request 70, Question 5 Attachment 1.
[633] PG&E Exhibit 61, Page 3-33, Lines 26-27.
[634] PG&E Exhibit 61, Page 4-1, Lines 11-12.
[635] PG&E Exhibit 61, Page 4-2, Lines 6-8.

xvi. Missing and Incomplete Metallurgical Reports

PG&E failed to keep all gas pipeline failure metallurgical reports at its metallurgical laboratory in San Ramon.[636] In fact, when an outside company conducted a metal failure analysis of a PG&E pipeline rather than PG&E, the report would not be kept at PG&E's San Ramon metallurgical laboratory. Instead, it may be at a local office, outside the company, or missing.[637]

Of those metallurgical analytical reports PG&E did have in San Ramon dated between 1915 and 1995, the only way to access them was via a manual search, because PG&E only kept hard copies of them and did not make the information from those reports available in digital form.[638] Finally, PG&E did not check those records at its metallurgical library (known as the Analytical Report Library) in San Ramon to determine they were complete.[639] The Commission should find that many of PG&E's pipeline failure metallurgical reports are missing and that the Analytical Report Library is incomplete.

b. PG&E's Management Has Failed to Comprehensively Address Mandatory Recordkeeping Requirements

All violations identified to date are proof of a systemic failure of PG&E management to comprehensively address mandatory recordkeeping requirements across PG&E's gas transmission system. CPSD's experts observed that PG&E's executive management's lack of involvement in the gas transmission recordkeeping process, stating specifically that PG&E lacked the following:

- A strategy to deliver a company-wide record-keeping program;
- A senior executive actively involved in monitoring records management across all PG&E departments, divisions, offices; and
- Clear lines of delegation for either managing the company-wide systems for recordkeeping, or for supervising the people who completed the record-keeping activities.[640]

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[636] CPSD Exhibit 6, Page 6-81, Lines 32-34.
[637] CPSD Exhibit 6, Page 6-80, Lines 20-22; PG&E Response to Data Request 4, Question 12, Page 4.
[638] CPSD Exhibit 6, Page 6-81, Table 26 and Lines 8-9; PG&E Response to Data Request 4, Question 12, Page 4.
[639] CPSD Exhibit 6, Page 6-81, Lines 21-22.
[640] CPSD Exhibit 6, Page 7-95, Lines 16-20.

PwC also recognized the gas transmission related shortcomings of PG&E's executive management, recommending that PG&E, "Develop and execute a Gas RIM Program Communications plan that helps to enhance and sustain executive support for the RIM initiative. . ."[641]

c. PG&E Practiced Substandard Records Management.

In PG&E's own words, "(PG&E) recognizes that its recent records management practices have come up short."[642] Moreover, in the words of PwC, PG&E's own records management consultants, "There is little formal RIM [Records and Information Management] Governance within (PG&E's) Gas Operations".[643] Applying the Cedars-Sinai standard here, it is reasonable to infer that PG&E has practiced substandard records management presently, recently, and all the way back to its inception. A few examples shown below provide support for this inference.

First, prior to and at the time of the San Bruno pipeline rupture and fire, PG&E did not have a company-wide strategy for managing its records.[644] Also during that time, no one in PG&E's Gas Transmission Division had formal responsibility for coordinating records management across all of that Division's different business units and offices.[645] As one example to illustrate this lack of records management responsibility during this period, when asked what information and records management committees/councils it had looking at information and records management between 1955 and 2010, PG&E responded that it is "currently unaware of any information and records management committees or councils that, prior to the San Bruno incident, looked at information and records management issues".[646]

Second, PG&E could not identify any staff with record-keeping responsibilities across the gas transmission part of the company between 1948 and 1967.[647] Moreover, PG&E provided a list of relatively junior staff, each of whom had some responsibility for gas transmission recordkeeping during the period from 1968 to 2010.[648]

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[641] TURN Exhibit 16, Appendix B, Pages 57, and 89.
[642] PG&E Exhibit 61, Page 1-1, Lines 21-22.
[643] CPSD Exhibit 8, Page 15 of 72, Lines 4-5; TURN Exhibit 16 ; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 8.
[644] CPSD Exhibit 6, Page 6-26, Lines 11-13.
[645] CPSD Exhibit 6, Page 6-27, Lines 25-26.
[646] CPSD Exhibit 8, Page 14 of 72, Lines 9-14; PG&E Response to CPSD Data Request 66, Question 2.
[647] CPSD Exhibit 6, Page 6-29, Lines 4-5; PG&E Response to CPSD Data Request 25, Question 2.
[648] CPSD Exhibit 6, Page 6-29, Lines 5-7, PG&E Response to CPSD Data Request 25, Question 2.

Third, one observation by PwC shows the end result of substandard records management. Namely, "Employees have challenges easily and efficiently identifying and accessing key records for their work."[649]

Fourth, in the words of PwC, "Information is not managed throughout its lifecycle; nor is it managed as a corporate asset."[650]

Fifth, prior to the San Bruno rupture, PG&E could not educate or train staff in records management, and did not support staff who had specific record-keeping responsibilities.[651] Again, in the words of PwC, "There is a lack of clear standards, work procedures, and training for how staff should create, manage, transfer, store and dispose of records and information."[652]

The Commission should find that PG&E practiced substandard records management across its gas transmission system.

4. PG&E's Defenses to Violation A.1 Lack Merit

a. Common Industry Practice Is Not a Valid Legal Defense

PG&E notes that it is common for companies operating in this industry to be missing historical records.[653] This argument does not excuse PG&E against a violation that means unsafe operation of its transmission pipeline system. Indeed, so many of PG&E's installed pipeline design and manufacturing records are inaccurate or not locatable. Without such records, PG&E cannot operate its pipeline system safely.

As one example of PG&E's argument, PG&E attempts to support its defense by stating that "the use of recondition(ed) pipe without specific inspection practices was common within the gas industry in the late 1960's".[654] PG&E's assertion of "common industry practice" is not a

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[649] CPSD Exhibit 8, Page 15 of 72, Lines 10-11; TURN Exhibit 16; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 8.

[650] CPSD Exhibit 8, Page 15 of 72, Lines 20-21; TURN Exhibit 16; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 8.

[651] CPSD Exhibit 6, Page 6-30, Lines 21-23, and Lines 27 to 36; Page 6-31, Lines 1-5; PG&E Response to CPSD Data Request 25, Question 02(i), (Preliminary January 18, 2012 draft of PG&E's Pricewaterhouse Cooper's Internal Report on Recordkeeping).

[652] CPSD Exhibit 8, Page 15 of 72, Lines 12-14; TURN Exhibit 16; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 8.

[653] For example, PG&E Exhibit 61, Page 3-35, Line 23 to Page 3-36, Line 3 shows PG&E claiming that others in the industry are missing strength test pressure records as a defense for its own missing records.

[654] PG&E Exhibit 61, Page 3-12, Lines 22-23.

defense here. In fact, the lack of records to prove that PG&E inspected or tested its reused pipe exacerbates PG&E's inability to locate all of its reused pipe in operation today. PG&E's lack of both installation and reconditioning standards records of these 1960's and earlier re-conditioned pipes further compromises the safety of those pipes.

In another case, PG&E claims that ". . . practical challenges with respect to document storage, relocation and inadvertent destruction or misplacement have contributed to the records gaps that PG&E and operators throughout the industry confront."[655] A careful parsing of this statement first shows it is unclear whether PG&E means to suggest that the entire gas pipeline industry suffers from practical challenges such as document storage, relocation and inadvertent destruction or misplacement. If PG&E asserts this, it provides no evidence to support that statement. Moreover, the mere fact that everyone in this industry has records gaps, even if true, does not excuse PG&E from the ones it has, and the resulting violations.

b. PG&E Should Have Complied with ASME Standard B31.8 as it Represented the Best Industry Standards At the Time and Because PG&E Committed to Doing So

i. ASME Requires Keeping Strength Test Records for the Life of the Facility

ASME Code section B31.8 requires that "The operating company shall maintain in its file for the useful life of each pipeline and main, records showing the type of fluid used for test and the test pressure".[656] Section III of this brief explains the basis for CPSD's conclusion that ASME Code section B31.8, including this particular standard, carries the weight of law.

ii. ASME Required PG&E to Retain Leak Records for the Life of the Facility

ASME Code section B31.8 states that leak records should be kept in the file of the operating company involved, PG&E, as long as the section of line involved remains in service.[657] Section III will discuss the point that ASME Code section B31.8, including this particular standard, carries the weight of law.

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[655] PG&E Exhibit 61, Page 4-5, Lines 8-11.
[656] PG&E Exhibit 47, § 841.417.
[657] PG&E Exhibit 47, § 851.5.

c. The Commission Has Made It Clear that a Utility Must Promote the Safety of Its System Regardless of Specific Prescription or Prohibition

This subject has been discussed generally in section III of this brief. However, PG&E has asserted a specific records defense that lacks merit, which shall be discussed here briefly. Namely, PG&E has stated that "It is difficult to identify in the Commission's recordkeeping rules or elsewhere significant past guidance about the retrievability (as opposed to retention) of records."[658] This is a classic example of where PG&E suggests there must be explicit requirements for PG&E's records to be retrievable before there can be a violation, even though it is obvious that having irretrievable records would compromise the safety of PG&E's gas transmission pipeline system. Indeed, even if every PG&E gas transmission record was perfectly traceable, verifiable, and complete, those very records would not promote system safety if they were also irretrievable. No safety record or data can be used for safety if it is irretrievable. Any public utility is charged with knowing ordinary things - that data and records are only useful if they can be accessed. If PG&E finds more safety engineering value in records and data that are irretrievable than in those that are missing entirely, it has presented no evidence to demonstrate this unusual value of records that may exist but cannot be located to use.

Therefore, PG&E's argument that it cannot identify the Commission's past recordkeeping rules requirements about retrievability of records is not a valid defense.

d. PG&E's proposals for future improvement are not a defense to past PG&E violations of the law

PG&E has articulated multiple proposals of future recordkeeping improvements. However, PG&E's future improvements are not a defense to PG&E's past violations of law. This heading has been discussed generally in section III of this brief.

e. Contrary to PG&E's Statements, CPSD's Expert Assessment of the State of PG&E's Records and Recordkeeping Program in 2010 Also Applies As an Assessment of PG&E's Records and Recordkeeping Program Dating Back to the Installation of PG&E's Gas Transmission Pipelines

[658] I.11-02-016, "Pacific Gas and Electric Company's Response", June 20, 2011, Page 1-29, Lines 15-17.

PG&E consistently and thematically opines that CPSD's experts should not use its recordkeeping evaluation criteria - the Generally Accepted Recordkeeping Principles, known as "GARP®" or "the Principles" to assess PG&E's records management history.[659] In response, CPSD's experts pointed out,

> "the current state of PG&E's records have made it impossible for a completely accurate snapshot of PG&E's state of recordkeeping at any particular time or period, especially decades ago, or right up to September 2010, particularly given PG&E's post San Bruno relocation of its records from Walnut Creek, Bayshore and regional offices to either Emeryville or Iron Mountain."[660]

Because PG&E relocated and reorganized its own records after San Bruno and before CPSD's recordkeeping experts could assess them in place, PG&E has rendered them unavailable in the state they existed prior to the San Bruno pipeline explosion. However, CPSD's experts assessed PG&E's records management at the time of the San Bruno incident. Moreover, CPSD's experts recognized that the state of PG&E's records in September 2010 was a culmination of PG&E's recordkeeping activities over the prior six decades.[661]

As to the state of PG&E's records at the time of the San Bruno incident, a great amount of evidence demonstrates the exact state of disorganization, and missing and erroneous data that characterized PG&E's gas safety-related records at that time. Therefore, it is reasonable to infer that the CPSD experts' assessment is a valid assessment of PG&E's records both at the time of the San Bruno explosion, and also dating back to the installation of PG&E's gas transmission pipelines from as early as 1948.

f. Notwithstanding PG&E's Confusing Statements About the Appropriateness of Generally Accepted Recordkeeping Principles (GARP®) to Assess PG&E's Records, PG&E Kept Poor Gas Transmission Records

PG&E's recordkeeping witness argues that the Generally Accepted Recordkeeping Principles ("GARP®) framework used by CPSD in its assessment of PG&E is a relatively new construct for the records management industry and that ARMA first published the principles in

[659] See PG&E Exhibit 62, Page MD-15, Lines 14-15; Page MD-7, Lines 16-21; See also PG&E Exhibit 61, Page 1-2, Line 7; Page 0-1, Line 17; Page 1-1, Line 28; Page 1-1, Line 31; and Page 1-3, Line 7.
[660] CPSD Exhibit 8, Page 30 of 72, Lines 27-31.
[661] CPSD Exhibit 8, Page 30 of 72, Lines 23-26.

March 2009."[662] However, this same witness also recognizes that the "GARP® principles themselves are fairly innocuous and do not represent anything new or earth shattering in the industry. It is hard to object to the statements that these principles make about how records should be created, maintained or destroyed".[663] Clearly, these records principles can be understood by laypersons, and have been recognized principles for many years before ARMA existed. The ARMA Generally accepted recordkeeping principles are accountability, compliance, transparency, availability, integrity, protection, retention, and disposition. Every one of these principles would have been recognized and accepted by a records manager within a utility or a pipe manufacturer decades ago.

CPSD's experts clarify this confusion about the GARP® principles. They note, "GARP® was selected for this investigation as it was based upon these long-standing and accepted key standards and best practices. GARP offered the most complete and clearly documented framework in the US for such a review. However, none of these other frameworks (to evaluate PG&E's records) would have changed our main findings."[664]

In short, the GARP® principles were an appropriate framework for CPSD's experts to evaluate PG&E's recordkeeping. Indeed, even PG&E's acknowledges that its own records management consultant, PwC, used GARP to assess PG&E's Gas Operations' records management practices.[665]

Regardless of whether CPSD's experts used GARP® or not, CPSD's experts would have still assessed that PG&E's records and recordkeeping practices were poor based upon the facts uncovered during their investigation, regardless of the framework used to assess PG&E's recordkeeping.

5. Scope and Duration of Violation A.1

The duration of this violation is from 1955 to 2010. CPSD's recordkeeping experts focused upon PG&E's recordkeeping deficiencies that existed during this period of time.[666]

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[662] PG&E Exhibit 62, Page MD-8, Lines 1-2.
[663] PG&E Exhibit 62, Page MD-9, Lines 10-13.
[664] CPSD Exhibit 8, Page 29 of 72, Lines 25-28.
[665] PG&E Exhibit 61, Page 1-29 Lines 6-8. PG&E asserts at this cite that PwC used GARP to assess PG&E's current records management practices, but the Cedars-Sinai principle supports CPSD's reasonable inference that an assessment of PG&E's current practices reflect PG&E's past records management deficiencies since its inception.
[666] CPSD Exhibit 7, Page 2 of 5.

The scope of this violation includes the following:

- Missing strength test records;
- Missing weld records;
- Incomplete, missing and duplicate job files;
- Missing Operating Pressure Records;
- Missing, inaccurate, erroneous, and incomplete GIS data;
- Frequent failure to use conservative assumed GIS values;
- Incomplete leak records
- Missing pipeline history files;
- Missing and Incomplete Records that Show Reused Pipe;
- Missing and Incomplete Metallurgical Reports; and
- Substandard Records Management

6. Violation A.1 Has Negatively Affected Safety

a. General Overview of PG&E's Gas Pipeline Record Deficiencies Negatively Impacting Safety

PG&E's deficient management of its safety records clearly diminished safety significantly. Erroneous data, missing records, and inaccessible written information pertaining to pressure testing, operations, metal reports, leaks, GIS information, reused pipe, pipe manufacturer, and the like, simply means big trouble. Each and all of these pipeline history attributes and characteristics is important to the engineers who are responsible for the safety of the pipeline system. PG&E's arguments that it does not need such records for integrity management constitute rationalization and are unworthy of a public utility, especially after the San Bruno disaster.

As part of the final report of Pricewaterhouse Coopers (PwC), PG&E's own gas pipeline records management consultants found that "Information is often incomplete, unreliable, and not fully traceable".[667] [668] [669] PG&E has even acknowledged that "Going forward PG&E's records

[667] TURN Exhibit 16; PG&E's Supplemental Data Response to CPSD Data Request 25 Question 2(i), Page 8.

must deliver real time and accurate (traceable, verifiable and complete) information about its gas pipeline system."[670] CPSD's recordkeeping experts have found, "Reliable, traceable, verifiable and complete records are necessary for PG&E to promote the safety of its gas transmission system."[671] The Commission has more than ample evidence to support a finding that the overall state of PG&E's gas pipeline records and information has been insufficient to promote safety.

In PG&E's own words, "PG&E recognizes that it needs to improve its records and information management practices at an enterprise level and within its gas transmission organization."[672] Related to PG&E's admission, CPSD's recordkeeping experts have inferred that, "PG&E's recordkeeping practices have been deficient and have diminished pipeline safety."[673]

PwC provides an overview of one of PG&E's fundamental recordkeeping problems when it states "[b]oth paper and electronic populations (of records) contain gaps and errors".[674] In the assessment of CPSD's recordkeeping experts, "(PG&E's) historical lack of control regarding how records were managed has been a major source of risk for PG&E."[675] PG&E elected not to cross-examine CPSD's recordkeeping experts about any of their safety-related findings.

b. Specific Aspects of PG&E's Gas Pipeline Deficiencies and Their Negative Impacts on Safety

The Commission should find that PG&E operated and maintained its pipelines using poor quality information and, therefore, in an unsafe manner each day and each instance in which PG&E had missing, incomplete, duplicate, inaccurate, inaccessible, or erroneous records.

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[668] PG&E accepts that this final report and recommendations of PwC's assessment of Gas Operations and Information Management "were based on their observations about the state of the Gas Transmission Organizations records management practices at the time the assessment was conducted." (November 2011 to February 2012). See CPSD Exhibit 8, Page 14 of 72, Lines 26-30. See also PG&E Response to CPSD Data Request 71 Question 7.

[669] PG&E also has noted that it "intends to address the Records Management assessment recommendations it received earlier this year for its external records management consultant, PricewaterhouseCoopers (PwC). See PG&E Exhibit 61, Pages 1-19, Lines 18-21.

[670] PG&E Exhibit 61, Page 1-19, Lines 6-8; CPSD Exhibit 8, Page 9 of 72, Lines 10-12.

[671] CPSD Exhibit 8, Page 16 of 72, Lines 19-20.

[672] PG&E Exhibit 61, Page 1-19, Lines 3-5.

[673] CPSD Exhibit 8, Page 4 of 72, Lines 12-13 and Page 7 of 72 Lines 18-19.

[674] CPSD Exhibit 15 of 72, Line 19; TURN Exhibit 16; PG&E's Supplemental Data Response to CPSD Data Request 25 Question 2(i), Page 8.

[675] CPSD Exhibit 6, Page 6-26, Lines 13-14.

PG&E's missing records included:

- Strength test records;
- Weld records;
- Job Files;
- Operating Pressure Records;
- Various attributes of GIS;
- Pipeline History Files;
- Records of Reused Pipe; and
- Metallurgical Reports

PG&E's incomplete records included:

- Job files;
- GIS data;
- Leak records;
- Record showing reused pipe; and
- Metallurgical reports

PG&E's inaccurate or erroneous records included:

- GIS data including, but not limited to, joint efficiency, SMYS, and wall thickness values

PG&E's duplicate records included:

- Job files

Similarly, in each case and for each day where PG&E assumed inaccurate or improper "conservative" values in GIS, PG&E could not accurately rank the relative risk and resulting replacement prioritization strategy of pipelines within its integrity management program. Hence, each day that PG&E inaccurately assumed a GIS value, PG&E operated an unsafe gas transmission pipeline system.

PG&E's substandard records management also led to unsafe working practices for several reasons. First, PG&E's historic lack of formal or management level company-wide recordkeeping responsibility lead to inconsistent recordkeeping. As a result, PwC found that PG&E employees could not easily and efficiently identify and access key records for their work.[676] This means PG&E employees did not have the necessary means to operate or maintain the system safely.

PG&E's failure to train staff in records management meant that staff typically did not have the knowhow for managing one of PG&E's most critical and necessary resources to safely operate its gas pipeline system: its information.[677]

As noted in the section about missing job files, PG&E believed it had a complete, official, master set of job files in Walnut Creek, but did not.[678] The safety of PG&E's gas transmission system was compromised whenever PG&E staff consulted what they believed were official job files in Walnut Creek and incorrectly believed that they had retrieved all of the information available related to a given job file or pipeline.

B. Alleged Records Retention Violations

Violation B.1 Leak Survey Maps;
Violation B.2: Line Patrol Reports;
Violation B.3: Line Inspection Reports;
Violation B.4: Pressure Test Records; and,
Violation B.5: Transmission Line Inspections.

Violations B1 through B5 are similar to each other except that each one addresses PG&E policies regarding different types of documents. Therefore, these five violations are grouped together so that they all have one summary subsection, a second discussion subsection, a third subsection addressing PG&E's defenses, and a fourth subsection about negative effects on

[676] CPSD Exhibit 8, Page 15 of 72, Lines 10-11; TURN Exhibit 16; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 8.
[677] For further discussion about lack of PG&E records management training, see CPSD Exhibit 8, Page 15 of 72, Lines 12-14; See also TURN Exhibit 16; See also PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 8.
[678] See Violation A1, Subsection 3.a.iii.

safety. A fifth subsection addresses applicable statutes and requirements, as well as scope and duration of each violation.

1. Summary of Violations B1 through B5

PG&E needed to retain each gas transmission record long enough to comply with all requirements. However, some of PG&E's retention requirements (for how long to keep certain documents) did not comply with the law. Therefore, PG&E did not necessarily have enough information to inform some of its decisions about how to safely operate its system.

PG&E's deficient requirements pertain to: leak survey maps;[679] line patrol reports;[680] line inspection reports;[681] gas high pressure test records;[682] and transmission line inspections, including patrol maintenance reports, trouble reports and line logs.[683]

2. Discussion of Violations B1-B5.

Some of PG&E's retention requirements (for how long to keep certain documents) did not comply with the law. As CPSD's recordkeeping experts have identified in testimony, PG&E's approach may have resulted in incorrect interpretation of laws and regulations, which in turn exposed PG&E to unsafe working practices, and inaccurate pipeline data.[684] In other words, PG&E did not necessarily have enough information to inform some of its decisions about how to safely operate its system.

In spite of CPSD's points, PG&E does not attempt to claim these five retention requirements followed these laws. Instead, PG&E's response testimony largely mischaracterizes CPSD's expert witnesses' testimony, claiming that CPSD's witnesses assert PG&E's *corporate* records retention requirements do not follow the law, but that CPSD's witnesses do not substantively discuss the standards that actually govern how PG&E's *gas organization* retained records.[685]

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[679] Violation B1.
[680] Violation B2.
[681] Violation B3.
[682] Violation B4.
[683] Violation B5.
[684] CPSD Exhibit 6, Page 6-38, Table 6-5.
[685] PG&E Exhibit 61, Page 2-23 Line 12 to Page 2-24 Line 15.

ViolationNumber	Record Type	PG&E's Minimum Retention Requirement	Legal Minimum Retention Requirement	Corporate Policy Indicated on PG&E Document?	Other Purpose Indicated on PG&E Document?	PG&E Source Document and Page Number	Beginning Date of Policy	CPSD References
B1	Leak Survey Maps	10 Years	Life of Facility(ASME B31.8, Section 851.6)	Yes. USP-4	No.	P2-230, Page 1, Line 15	4/16/10	Exhibit 6, Pages 6-34, Lines 21-22 and 9-158
B2	Line Patrol Reports	3 Years	Life of Facility(ASME B31.8, Section 851.5)	No.	Yes. "Records in the Divisions".	P2-195, Page 12 of 26.	9/1/64	Exhibit 6, Pages 6-35, Lines 5-6 , and 9-161
B2	Line Patrol Reports	Life of Facility for all numbered transmission lines. 3 years for all others.	Life of Facility(ASME B31.8, Section 851.8)	No. Corporate policies are only indicated in Section 1 of this document.	Yes. Customer Energy Services (CES)- Transmission and Distribution.	P2-212, Page 41.	4/6/94	Exhibit 6, Page 6-35, Lines 5-6 and 9-161
B2	Line Patrol Reports	Life of Facility for all numbered transmission lines. 3 years for all others.	Life of Facility(ASME B31.8, Section 851.8)	No. Accounting and Corporate Records are only indicated in Section 1 of this document.	Yes. Operations, Maintenance and Construction.	P2-225, Page 6 of 12 of Operations, Maintenance and Construction Section. Page 43 of 55 of pdf document.	3/14/05	Exhibit 6, Page 6-35, Lines 5-6 and 9-161
B2	Line Patrol Reports	Life of Facility,but only for all numbered transmission lines.	Life of Facility(ASME B31.8, Section 851.8)	Yes. USP-4	No.	P2-230, Page 14, Line 203.	4/16/10	Exhibit 6, Page 6-35, Lines 5-6 and 9-161
B3	Line Inspection Reports	3 Years	Life of Facility(ASME B31.8, Section 851.5) (ASME B31.8, Section 851.8 as of 1985)	No.	Yes. "Records in the Divisions".	P2-195, Page 12 of 26.	9/1/64	Exhibit 6, Page 6-35, Lines 27-28 and 9-161
B3	Line Inspection Reports	3 years (Gas Transmission and Distribution)	Life of Facility(ASME B31.8, Section 851.8)	No. Corporate policies are only indicated in Section 1 of this document.	Yes. Customer Energy Services (CES)- Transmission and Distribution.	P2-212, Page 41 of 55	4/6/94	Exhibit 6, Page 6-35, Lines 27-28 and 9-161
B3	Line Inspection Reports	3 years (Gas Transmission and Distribution)	Life of Facility(ASME B31.8, Section 851.6)	No. Accounting and Corporate Records are only indicated in Section 1 of this document.	Yes. Operations, Maintenance and Construction.	P2-225, Page 6 of 12 of Operations, Maintenance and Construction. Page 43 of 55 of pdf document.	3/14/05	Exhibit 6, Page 6-35, Lines 27-28 and 9-161
B3	Line Inspection Reports	3 years (Gas Transmission and Distribution)	Life of Facility(ASME B31.8, Section 851.8)	Yes. USP-4	No.	P2-230, Page 14, Line 202.	4/16/10	Exhibit 6, Page 6-35, Lines 27-28 and 9-161
B4	Gas High Pressure Test Records	6 years in the office.	Life of Facility(ASME B31.8, Section 841.417) (Section 841.327 as of 1975)	No.	Yes. "Records in the Divisions".	P2-195, Page 9	9/1/64	Exhibit 6, Page 6-36, Lines 1-2 and 9-163
B4	Gas High Pressure Test Records	3 Years	Life of Facility(ASME B31.8, Section 841.326)	No. Corporate policies are only indicated in Section 1 of this document.	Yes. Customer Energy Services (CES)- Transmission and Distribution.	P2-212, Page 39.	4/6/94	Exhibit 6, Page 6-36, Lines 1-2 and 9-163
B4	Gas High Pressure Test Records	3 Years	Life of Facility(ASME B31.8, Section 841.326)	No. Accounting and Corporate Records are only indicated in Section 1 of this document.	Yes. Operations, Maintenance and Construction.	P2-225, Page 5 of 12 of Operations, Maintenance and Construction Section. Page 42 of 55 of pdf document.	3/14/05	Exhibit 6, Page 6-36, Lines 1-2 and 9-163
B5	Line Trouble Reports	3 years	Life of Facility(ASME B31.8, Section 851.5)	No.	Yes. "Records in the Divisions".	P2-195, Page 12 of 26.	9/1/64	Exhibit 6, Pages 6-35, Line 27 and 9-162
B5	Trouble Report	6 Years	Life of Facility(ASME B31.8, Section 851.6)	No.	Yes. "Customer Energy Services (CES)".	P2-212, Page 46 of 56.	9/6/94	Exhibit 6, Pages 6-35, Line 27 and 9-162
B5	Trouble Report	6 Years	Life of Facility(ASME B31.8, Section 851.6)	No.	Yes. "Operations, Maintenance and Construction".	P2-225, Page 48 of 55.	3/14/05	Exhibit 6, Pages 6-35, Line 27 and 9-162
B5	Trouble Report	6 Years	Life of Facility(ASME B31.8, Section 851.6)	No.	Yes. "Operations, Maintenance and Construction".	P2-227, Page 47 x 55	5/22/08	Exhibit 6, Pages 6-35, Line 27 and 9-162

Table 1 - Source Documents Showing PG&E Policies that are the Basis Violations B1 through B5

As shown by Table 1 (above) CPSD has only referenced one of PG&E's corporate retention standards, which is from April, 2010. Otherwise, PG&E's statement mischaracterizes

all of the retention standards that are the focus of CPSD's asserted violations, which date back to 1964.

PG&E's recordkeeping witness goes on to assert in excessive detail that PG&E has other retention requirements.[686] In particular, PG&E's recordkeeping witness's testimony provides a colorful Appendix that superimposes CPSD's violations (in a pink-purple box) onto a series of PG&E Standards Practices (in a larger blue box), all of which is inside a larger blue box that says "Retention Information Life of Facility".[687] However, PG&E's Appendix does not show that any of the standard practices in the blue box trump, or even qualify, the PG&E requirements (in the pink-purple box) that are the basis for violations B1 through B5.[688] In short, PG&E misses the point that some of its retention policies violated other regulatory requirements.

PG&E suggests that 96 documents regarding creation and retention were not considered by CPSD.[689] However, the record shows that it was PG&E that failed to identify these 96 documents in response to multiple CPSD data requests asking for all of PG&E's retention requirements.[690] CPSD merely relied upon PG&E's incomplete data responses in its testimony. PG&E's claim that CPSD's experts missed certain recordkeeping requirements omits this vital fact. However, PG&E's position does not change the fact that PG&E had some retention schedules that were inconsistent with the law, or that PG&E apparently became confused about which schedules it failed to provide CPSD.

3. PG&E's Defenses to Violations B1-B5 Lack Merit.

In an apparent reference to retention requirements, PG&E's recordkeeping witness appears to attempt to justify PG&E's attempt follow its own retention requirements, even if it means getting rid of documents before the law allows. She notes,

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[686] PG&E Exhibit 62, Page MD-41, Lines 8-22 and generally § E.2.c.

[687] PG&E Exhibit 62, Appendix D.

[688] CPSD referenced documents P2-195, P2-212, P2-225, P2-227 and P2-230 as the source of violations B1 through B5. None of these documents are referenced by PG&E in PG&E Exhibit 62, Appendix D. Moreover, PG&E Exhibit 62, Appendix E appears to show which P2 documents fit under different standard practices. Again, none of the P2 documents that CPSD references are addressed in Appendix E.

[689] PG&E Exhibit 61, Page 2-24, Lines 11-13, referencing P2-1149 to P2-1244.

[690] See PG&E Responses to DR23, Question 26; DR04, Questions 02 and 12; DR18, Question 15: DR25, Questions 02 and 08: DR46, Questions 03 and 04: DR45, Q05

> "In sifting through these various regulatory requirements, as well as industry best practices and standards such as ASME B31.8, one must make judgments based on balancing the potentially conflicting requirements of meeting all legal requirements, supporting all operational needs and incorporating those best practices that make the most sense. PG&E determined that a distributed approach to identifying and implementing record retention requirements best supported the distributed nature of their organization."[691]

By balancing potentially conflicting requirements, it appears that this witness is suggesting that PG&E is allowed to break the law in the name of "best practices" that make the most sense in PG&E's view. CPSD understands this cavalier opinion to mean that if everyone else in the industry is getting rid of documents before they are legally allowed to, it is okay to do this when someone opines that it is a "best practice".

PG&E elected to have this witness sponsor testimony instead of PwC, which advised PG&E of the correct view on this matter. Indeed, the PwC final report, which was available to PG&E well before PG&E's response testimony was due, advises that although both a legal and business retention schedule may apply to the required retention period of a particular document, whichever schedule is longer should dictate the minimum time period that document should be retained.[692]

In short, PG&E must follow the law, regardless of its own decisions to the contrary, its own operational needs, or of its unsubstantiated suggestion that others might fail to follow the law in the same way.[693]

As a second apparent defense to these five violations, PG&E claims that CPSD's experts did not substantively discuss PG&E's record retention requirements.[694] In fact, CPSD's experts

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[691] PG&E Exhibit 62, Page MD-40, Lines 9-16.

[692] See TURN Exhibit 16; PG&E's Supplemental Data Response to CPSD Data Request 25A 2(i), Page 68, Figure 25.

[693] For a more thorough discussion about the point that "everyone else is doing it", is not an excuse for violating the law, see Section III of this brief, specifically referencing *People v. Casa Blanca Convalescent Homes* (1984) 159 Cal.App.3d 509, 527-528; and also referencing *Huntington Memorial Hospital v. Superior Court* (2001) 131 Cal.App.4th 893, 911.

[694] PG&E Exhibit 61, Page 2-24, Lines 1-3.

refer to and discuss PG&E's retention schedules at length in testimony.[695] In addition to that discussion, CPSD also found additional PG&E retention requirements that did not follow other regulations, which are the source of violations B1 through B5.

PG&E also references 96 documents that it alleges govern the creation and retention of records.[696] In fact, only 13 of these 96 documents actually discuss PG&E's retention requirements. Moreover, none of these 13 documents these are not the documents CPSD references as the source of violations B1 through B5.

In fact, Violations B1 through B5 do indeed substantively discuss PG&E's retention requirements over multiple decades. The Commission should find that by *attempting* to follow five of its own retention requirements, PG&E failed to keep five different types of records for a period necessary to comply with the law.[697] For each of these five violations, a comparison of PG&E's standards with the minimum legal requirements is shown in Table 1 (above).

4. Violations B1-B5 Have Negatively Affected Safety

PG&E's own record retention requirements did not prompt PG&E to keep records in compliance with other regulatory requirements. Although CPSD only focuses on five document types, it is also reasonable to infer that PG&E disposed of thousands of documents before it was appropriate to do so. Therefore, PG&E prematurely disposed of information that regulators deemed was still necessary for PG&E to safely run its system.

5. Violations B1-B5 Statutes, Requirements, Scope and Duration

The applicable statues and requirements for violation B.1 (Leak Survey Maps) include 49 CFR section 192.709, and California Public Utilities Code section 451.[698] The duration of violation B1 is from April 16, 2010 to September 9, 2010.[699] Since PG&E is missing the data now, the Commission should find that PG&E prematurely disposed of hundreds of leak survey

[695] CPSD Exhibit 6, Appendix 7, Pages 8-144 to 8-150 discusses multiple PG&E retention schedules, including documents P2-191 to P2-196; P2-199 to P2-201; P2-206; P2-208 to P2-215.
[696] PG&E Exhibit 61, Page 2-24, Lines 12-13.
[697] This recommendation in no way excuses PG&E from missing its strength test pressure reports. By losing those, it apparently failed to follow its own requirement to retain those.
[698] These are all referenced in CPSD Exhibit 8, Page 3 of 5.
[699] CPSD Exhibit 8, Page 3 of 5.

maps beginning on April 16, and needed those maps to safely operate its system each day until September 9, 2010.

The applicable statutes and requirements for violation B.2 (Line Patrol Reports) include the various versions of ASME Code B31.8 in effect from September 1964 until September 2010; 49 CFR, section 192.709 from August 1970 to April 2010; section 107 of General Orders 112, 112A, 112B which were sequentially and continuously in effect between 1960 and 1970; and California Public Utilities Code section 451, which was continuously in force between September 1964 and September 2010.[700]

The duration of violation B2 from September 1, 1964 until September 9, 2010.[701] The Commission should find that PG&E prematurely disposed of hundreds of line patrol reports beginning on September 1, 1964 and needed each of those reports to safely operate its system each day until September 9, 2010.

The applicable statutes and requirements for violation B.3 (Line Inspection Reports) include each version of ASME Code B31.8 in effect between April 6 1994 and September 2010; 49 CFR section 192.709; and California Public Utilities Code section 451.[702]

The duration of violation B3 is from April 6 1994 until September 2010.[703] The Commission should find that PG&E prematurely disposed of hundreds of line inspection reports beginning on April 6, 1994, and needed each of those reports to safely operate its system each day until September 9, 2010.

The applicable statutes and requirements for violation B.4 (Pressure Test Records) include each version of ASME standard B31.8 in effect between April 6 1994 and September 2010; 49 CFR section 192.709; and California Public Utilities Code section 451.[704]

The duration of violation B.4 is from April 6 1994 until September 2010.[705] The Commission should find that PG&E prematurely disposed of hundreds of pressure test records beginning on April 6, 1994, and needed each of those reports to safely operate its system each day until September 9, 2010.

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[700] These are all referenced in CPSD Exhibit 8, Page 3 of 5.
[701] CPSD Exhibit 8, Page 3 of 5.
[702] These are all referenced in CPSD Exhibit 8, Page 3 of 5.
[703] CPSD Exhibit 8, Page 3 of 5.
[704] These are all referenced in CPSD Exhibit 8, Page 3 of 5.
[705] CPSD Exhibit 8, Page 3 of 5.

Additionally PG&E's search for operating pressure records from 1965-1970 revealed that many of the underlying records that had been reviewed in 1973–1975 for grandfathered pipelines were no longer available.[706] Therefore, PG&E's failure to retain pressure test records dates back to 1965, and exacerbates the safety problem of prematurely discarded records associated with this particular violation.

The applicable statutes and requirements for violation B.5 (Transmission Line Inspections) include each version of ASME Code B31.8 in effect between September 1964 to April 2010; 49 CFR, section 192.709 between August 1970 to June 1996; Commission General Orders 112, 112A, and 112B section 107 from 1960 to 1970; and California Public Utilities Code section 451.[707]

The duration of violation B.5 ranges from September 1, 1964 until September 2010.[708] The Commission should find that PG&E prematurely disposed of hundreds of transmission line inspection documents at some time before San Bruno, and needed each of those documents to safely operate its system each day until September 9, 2010.

Violation B.6: Failures to Comply with Specific Record Retention Requirements

1. Summary of Violation B.6.

As CPSD's recordkeeping experts have identified in testimony, PG&E's failure to follow multitudes of its own record retention requirements from 1955 to 2010 may well have exposed PG&E to unsafe working practices and inaccurate pipeline data.[709] Several subsections below show PG&E's failure to follow its own retention requirements, including: 1) Several examples; 2) PwC's findings; and 3) PG&E's admissions. Each of these sections shall be addressed in order in the discussion section.

[706] PG&E Exhibit 61, Page 4-9, Line 1.
[707] These are all referenced in CPSD Exhibit 8, Page 4 of 5.
[708] CPSD Exhibit 8, Page 4 of 5.
[709] CPSD Exhibit 6, Page 6-38, Table 6-5.

2. Laws Violated

Requirements violated include 49 CFR 192.13(c), California Public Utilities Code section 451, General Orders 112, 112A, and 112B section 107, ASME Code section B31.8, and PG&E's own internal requirements.

3. Discussion of Violation B.6 (including evidence and circumstances establishing the violation).

a. Examples on the Record Show That PG&E Did Not Follow Its Own Retention Requirements.

Several examples on the record show that PG&E did not follow its own retention requirements. First, PG&E did not follow its own requirement to keep pressure test records. In PG&E's own words, PG&E recognizes that it has not located some historic pipeline records, including strength test pressure reports that should have been retained.[710] Indeed, the record shows PG&E did not follow its own requirement to retain pipeline history files or strength test pressure records.

As discussed in Violation A.1 section, by discarding all of its pipeline history records, PG&E did not follow its own requirement (Standard Practice 463.7) to retain pipeline history files for the life of the facility. For a complete discussion of this, see violation A.1, subsection 3.a.xiv.

Beginning at least as early as 1965, PG&E created multiple requirements to keep strength pressure test records for the life of the facility.[711] However, as discussed in Violation A.1, subsection 3.a.i, on August 30, 2012, PG&E identified 23,760 of its pipe segments, constituting approximately 435.7 miles, within Class 3 and 4 High Consequence Areas, which lacked strength test records.[712] The Commission should find that PG&E failed to retain each of the strength test record reports relating to these 23,760 pipe segments, thereby violating each of its requirements to retain strength pressure test records multiple times.

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[710] PG&E Exhibit 61, Page 1-1, Lines 20-21.

[711] See P2-902 (10/1/1965); P2-906 (2/26/1968); P2-908 (9/10/1970); P2-909 (2/17/1972); P2-918 (1/25/1973)/ P2-933 (3/19/1984); P2-939 (8/6/1990); P2-940 (11/2/1992); P2-942 (2/28/1995); P2-945 (10/19/1998); P2-951 (12/9/2003). All of these documents are identified as strength test pressure record requirements in CPSD Exhibit 7, Page 9-170.

[712] TURN Exhibit 4.

As discussed earlier, PG&E represented twice to the Commission that it voluntarily followed the American Standards Association (ASA) code for gas transmission and distribution piping systems.[713] Consistently from 1955 to 2010, the ASME standards have required keeping test pressure records for the life of the facility.[714] By voluntarily following the ASME standards, PG&E has incorporated these standards by reference into its own requirements. PG&E did not follow these requirements either.

b. PwC's Findings Show That PG&E Did Not Follow Its Own Retention Requirements

In PG&E's own words, "PG&E has at all times endeavored to follow the controlling regulations on recordkeeping."[715] Yet, as shown in the list of PwC's final findings, bulleted immediately below this paragraph, PG&E did not even follow its own retention requirements.[716] [717] PG&E's failure to follow its own retention requirements is also a failure to follow controlling regulations on recordkeeping, including 49 CFR 192.13(c).[718]

- "Gas Operations is retaining documents that may not be necessary to retain after a certain period of time; and organization is missing some records that should be retained."[719]

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[713] D.61269, Page 4. The ASA code for gas transmission and distribution piping systems is also known as the American Society of Mechanical Engineers (ASME) standard B31.8, or § B31.1.8 in 1955; PG&E Response to CPSD Data Request 15, Question 6.

[714] CPSD Exhibit 6, Appendix 9, Page 9-170. Note: As shown in this appendix, the ASME standards in 2010, changed the language to require "Permanent function-testing records of pipeline monitoring".

[715] PG&E Response to CPSD Data Request 67, Question 8.

[716] See TURN Exhibit 16, Appendix B Page 114. Here, PwC defines a Records Retention Schedule as a "Table that describes (1) length of time each document or record will be retained as an active record, (2) reason (legal, fiscal, historical) for its retention, and (3) final disposition (archival or destruction) of the record. Also called record control schedule, record disposition schedule, records schedule, or retention schedule."

[717] In PG&E's Response to CPSD Data Request 71, Question 7, PG&E stated, "PG&E accepts that its consultants' recommendations, as set forth in the PwC final report, were based on their observations about the state of the Gas Transmission Organization's records management practices at the time the assessment was conducted."

[718] 49 CFR 192.13(c) requires "Each operator shall maintain, modify as appropriate, and follow the plans, procedures, and programs that it is required to establish under this part." PG&E's retention requirements are its own procedures, which it is required to follow under this regulation.

[719] See TURN Exhibit 16, Appendix B, Page 44; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 44.

- "The retention schedule is (currently) decentralized into separate documents, is partially outdated and is not enforced organization wide."[720]

- "Retention schedule (currently) exists as separate documents by function with different formats and inconsistencies across functions. Requirements are not clearly understood."[721]

- "(PG&E) lacks leadership support to enforce (its) retention policy".[722]

- "Existing Retention Policy is not effectively nor consistently communicated across all business units."[723]

- "There is a lack of clear standards, work procedures, and training for how staff should create, manage, transfer, store, and dispose of records and information."[724]

- "There is no clearly defined process to regularly review and refresh all. . .retention schedule(s)."[725]

- "There is currently no clearly defined, comprehensive process to map regulatory recordkeeping requirements to business processes, record types and procedures. Different functions are responsible for different activities, such as. . .communicating required changes to the retention schedule. . .."[726]

- "Various retention schedules exist with different layouts and scattered throughout the organization."[727]

- "HR utilizes an employee checklist that may not include all steps necessary upon an employee's departure or transfer to ensure business records and information in his

[720] See TURN Exhibit 16, Appendix B, Page 42; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 42.
[721] See TURN Exhibit 16, Appendix B, Page 62; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 62.
[722] See TURN Exhibit 16, Appendix B, Page 43; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 43.
[723] See TURN Exhibit 16, Appendix B Page 44; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 44.
[724] See TURN Exhibit 16, Appendix B, Page 8; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 8.
[725] See TURN Exhibit 16, Appendix B, Page 64; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 64.
[726] See TURN Exhibit 16, Appendix B, Pages 64-65; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Pages 64-65.
[727] See TURN Exhibit 16, Appendix B, Page 44; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 44.

custody (paper and electronic) is appropriately transitioned to Corporate for retention, preservation and management."[728]

- "Information is not managed throughout its lifecycle. . ."[729]

PwC's findings from its draft report,[730] bulleted immediately below, also show PG&E did not follow its own retention requirements.[731]

- ". . .some (PG&E) employees are not aware of how long to keep specific records. . ., where to find this information, or even if a records retention schedule exists."[732]
- "Most PG&E employees were unaware of specific record retention guidelines. . .".[733]
- "(PG&E's) employees lack sufficient training on records retention requirements and processes. . .".[734]

c. PG&E Admissions Also Support the Reasonable Inference That PG&E Did Not Follow Its Own Retention Requirements

PwC's statements, shown above, are consistent with the problems PG&E, and a PG&E witness, acknowledges it has in following its retention requirements. These problems are listed in bullets below.

- PG&E's claims that its 2008 internal audit of data management practices found that within the company "many business leaders, systems owners, and compliance champions do not have any data retention procedures in place, do not monitor

[728] See TURN Exhibit 16, Appendix B, Page 63; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 63.
[729] See TURN Exhibit 16, Appendix B, Page 8; PG&E's Supplemental Data Response to CPSD Data Request 25 A 2(i), Page 8. Failure to manage information throughout its lifecycle is a failure to follow any retention policy that requires keeping records for the life of the facility.
[730] PwC's draft report is PG&E's Response to CPSD Data Request 25 Question 2(i) Supp 1, Atch 9.
[731] In PG&E's Response to CPSD Data Request 71, Question 7, PG&E stated, "(PwC) summarized information and themes emerging as of specific dates in the course of the engagement. Accordingly, PG&E neither accepts nor rejects observations set forth in (PwC's) draft and preliminary documents".
[732] CPSD Exhibit 6, Page 6-30, Lines 28-32; PG&E Response to CPSD Data Request 25 Question 2(i) Supp 1, Atch 9, Page 9.
[733] CPSD Exhibit 6, Page 6-30, Lines 28-32; PG&E Response to CPSD Data Request 25 Question 2(i) Supp 1, Atch 9, Page 10.
[734] CPSD Exhibit 6, Page 6-30, Lines 28-32; PG&E Response to CPSD Data Request 25 Question 2(i) Supp 1, Atch 9, Page 9.

compliance with the data retention policies or periodically confirm that the specified retention periods are still valid, and have experienced issues concerning obsolete data in key systems they use".[735]

- PG&E agrees that it needs to incorporate better and stronger audit oversight features into its records retention program.[736]

- PG&E recognizes that it has not located some historic pipeline records, including strength test pressure reports that should have been retained.[737]

- In retrospect, the Company wishes it had retained the Pipeline History Files.[738]

4. PG&E's Defenses to Violation B.6 Lack Merit

PG&E claims that it responds to violation B.6.[739] However, despite PG&E's lengthy response to this assertion, PG&E does not dispute CPSD's assertion that it did not follow many of its retention requirements.

PG&E does assert that it rescinded its own requirement to keep pipeline history files for the "life of the facility", thereby making it acceptable to dispose of these records.[740] This defense must be invalid. Otherwise, PG&E's requirements to keep records for life of the facility are only unenforceable and meaningless words that give PG&E the option to dispose of its own records whenever it suits PG&E to rescind its policy. Worse yet, if PG&E finds it prematurely disposed of records in spite of its own "life of the facility" policy, it can simply rescind the policy, and law enforcement and the general public would be unable to ascertain whether PG&E disposed of records before or after it rescinded its policy. If PG&E's defense was valid, regulators and the general public would be ignorant as to whether PG&E discarded records in violation of its own policy.

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[735] PG&E Exhibit 61 Page 2-13 Line 17; PG&E Exhibit 61, Exhibit 2-28.
[736] PG&E Exhibit 61, Page 2-11, Line 14.
[737] PG&E Exhibit 61, Page 1-1, Lines 20-21.
[738] PG&E Exhibit 61, Page 2-23, Lines 3-4.
[739] PG&E Exhibit 61, Pages 2-1 to 2-2. See also PG&E Exhibit 61, Chapter 2A, Pages 2-3 to 2-24; Chapter 2B, Page 2-25; and PG&E Exhibit 62, Pages MD-6, and MD-38 to MD-55.
[740] PG&E Exhibit 61, Page 2-22, Lines 5-14.

The only reasonable reading of a "life of the facility" policy is that PG&E must be required to enforce that policy for the life of each facility in place. The only facilities exempt from the policy must be those installed after the policy was rescinded.

PG&E's testimony also omits certain of its key safety promoting requirements for keeping pipeline history files. For example, PG&E's testimony omits the fact that vital organization is required of the pipeline history files. PG&E suggests that its pipeline history files were merely copies of underlying documents.[741] This completely ignores the fact that PG&E required that these files be well organized in files by line number, indexed for ready reference, cross referenced to other pertinent files, and maintained up to date.[742] All of these requirements made for quick and easy access to pipeline information, which was vital for promoting system safety.

As another key omission, PG&E testimony fails to discuss multiple safety elements required of pipeline history files that are not in job files. In particular, PG&E suggests CPSD acknowledged that "the Pipeline History Files were 'derived from a variety of primary sources such as the job folders[.]'"[743] Of course, pipeline history files were required to retain many more types of pipeline information than Job Files, including, but not limited to, records of pipeline or main inspections, record of location class surveys, cathodic protection installations, and leak surveys and repairs.[744]

In spite of PG&E's statements to the contrary, PG&E's past records retention program lacked auditing and oversight. PG&E suggests that the CPSD report inaccurately suggests that PG&E's past retention program lacked audit and oversight features.[745] In support, PG&E states, "PG&E has had some form of records retention program in place since at least 1938. . .The program has had some (albeit basic) audit and oversight features."[746] However, PG&E then ". . .

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[741] PG&E Exhibit 61, Page 2-21, Lines 17-18.

[742] P2-1477, Page 566, Points 10 and 12.

[743] PG&E Exhibit 61, Page 2-21, fn. 20.

[744] For a full comparison of the elements required for a pipeline history file versus those of a job file, please see P2-1477, Page 565 (Pipeline History File Required Elements) and PG&E Data Response to CPSD Data Request 42, Question 11, and Data Request 42, Question 11, Attachment 1, (Job File Required Elements are shown in point 10).

[745] PG&E Exhibit 61, Page 2-11, Line 16.

[746] PG&E Exhibit 61, Page 2-3, Lines 4-5, and 8-9.

agrees that it needs to incorporate better and stronger audit and oversight features into its records retention program".[747]

PG&E goes on to state that it performed records audits, but the record of this proceeding shows that PG&E cannot produce them. For example, PG&E states that "As early as April 1950, the Company decided to have 'travelling auditors' review the condition of records in the Divisions to determine if responsible parties had been complying with the FPC's 1938 records retention regulations."[748] PG&E also claims it performed a 2008 internal audit of electronic data management practices.[749] However, CPSD requested PG&E's audit reports, including the one from 2008 that PG&E mentions in its response testimony, but PG&E provided none.[750]

Moreover, without providing the actual 2008 internal audit, PG&E asserts multiple findings resulted from that audit.[751] However, even if the 2008 audit was conducted, as CPSD's experts point out, PG&E has not shown that it acted to correct the records deficiencies PG&E claims that the audit found.[752]

Because PG&E's failed to produce any records audits when asked, the Commission should find that PG&E had, in fact, not performed any of them. Even if the Commission assumes the 2008 audit or any other audit was conducted, the reasonable inference is that PG&E did not act to address any problems with its records retention program.

PG&E's records witness states that PG&E's newly hired Director of Information Management and Compliance had a "top priority. . .to create an enterprise records retention schedule, eliminating the confusion that currently exists with the many different sources of records retention guidance throughout the organization."[753] It is reasonable to infer from this statement that the confusion that currently exists has also existed since the inception of the company. Other than that, for the same reasons discussed toward the end of section III, PG&E's future endeavors in records retention are irrelevant to this proceeding. Therefore, this point, and points like this one, should be afforded no weight.

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[747] PG&E Exhibit 61, Page 2-11, Lines 14-15.
[748] PG&E Exhibit 61, Page 2-12, Lines 10-12.
[749] PG&E Exhibit 61, Page 2-13, Lines 11-12, referencing PG&E Exhibit 2-28.
[750] CPSD Exhibit 8, Page 34 of 72, Lines 3-4; PG&E Response to CPSD Data Request 70, Question 13.
[751] PG&E Exhibit 61, Page 2-13, Lines 11-22.
[752] CPSD Exhibit 8, Page 33 of 72, Lines 28-29, and Page 34 of 72 Lines 1-2.
[753] PG&E Exhibit 62, MD-68, Lines 10-13.

5. Scope and Duration of Violation B.6.

PG&E failed to follow its own requirements to retain its records from at least as early as 1955 consistently until 2010.[754]

6. Violation B.6 Has Negatively Affected Safety

By failing at a company-wide level and on a systematic basis to comply with its own record retention requirements, PG&E has failed to keep pipeline information that remains essential to promote the safety of its gas transmission pipeline system. [755]

C. Other Alleged Safety/Pipeline Integrity Violations

Violation C.1: Wrong Year Used as Upper Limit in Gas Pipeline Replacement Program

1. Summary of Violation C.1.

PG&E's 1995 Gas Pipeline Replacement Programs ("GPRP") and associated records incorrectly excluded Lines 132 and 151 for replacement because PG&E failed to identify problematic "Bell Bell with Chill Ring" ("BBCR") and "Bell-Spigot" ("BLSP") joints installed on those lines. PG&E was informed of this mistake via a memo dated March, 2007, which was based upon a review of job estimate files that PG&E apparently did not access when creating its GPRP.

In 1984, PG&E also was informed that BBCR joints were problematic, but still failed to realize it had installed them on Line 132 until receiving the March 2007 memo 23 years later.

If PG&E had included Line 132 in its 1995 GPRP, or even acted promptly in response to the March 2007 memo, it could have avoided the San Bruno rupture and fire on September 9, 2010.

2. Statutes and Requirements PG&E has violated

This is a violation of California Public Utilities Code section 451.

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[754] CPSD Exhibit 7, Page 4 of 5; Exhibit 8, Pages 6-37 and 6-37..

[755] CPSD Exhibit 6, Page 6-38, Table 6-5.

3. Discussion of Violation C.1 (including evidence and circumstances establishing the violation).

a. PG&E's 1995 Gas Pipeline Replacement Program Incorrectly Excluded Lines 132 and 151 for Replacement Because PG&E Did Not Properly Access Its Job Files to Identify the Correct Types of Joints on Those Lines

PG&E's pipeline replacement program was developed to replace major gas transmission and distribution pipelines which had higher potential for failure, and where there would be high potential for injury and/or property damage should a failure occur.[756]

In 1995, as part of its GPRP, PG&E decided to assess whether to replace excavation threats to all of its gas transmission pipelines installed in 1947 or earlier.[757] According to a memo authored by PG&E's consultant and former employee ("author") dated March 2007 (2007 memo), PG&E chose 1947 as the final cut-off year for this exercise.[758]

However, the 2007 memo pointed out that PG&E mistakenly selected 1947 as a cut-off date, and should have also considered replacing lines installed in 1948 containing BBCR or BLSP joints in its GPRP.[759] Based upon the author's review of PG&E's job estimate files, the 2007 memo provided several critical pieces of information. First, PG&E placed Line 132 into operation on December 6, 1948; completed work on December 5 1951; and installed more than 15,000 feet of pipe containing BBCR type joints.[760] Second, PG&E placed Line 151 into operation on December 12, 1947; completed work on June 17, 1948; and installed more than 68,000 feet of pipe containing BLSP type joints.[761]

This also means that PG&E used the wrong characteristic from its job estimate files to determine whether Lines 132 and 151 had problematic joints. Specifically, the date of completion of work, rather than the beginning of work, would have been much closer to the manufacturing date of the pipe, and determined whether the pipes had the problematic

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[756] PG&E Response to CPSD Data Request 34, Question 2, Atch 1, Page 1.
[757] PG&E Response to CPSD Data Request 44, Question 1, Atch 32.
[758] CPSD Exhibit 6, Page 6-50, Lines 3-14; PG&E Response to CPSD Data Request 44, Question 1, Atch 32, Page 1.
[759] CPSD Exhibit.6, Page 6-50, Lines 26-28; PG&E Response to CPSD Data Request 44, Question 1, Atch 32, Page 2.
[760] PG&E Response to CPSD Data Request 44, Question 1, Atch 32, Page 1.
[761] PG&E Response to CPSD Data Request 44, Question 1, Atch 32, Page 2.

manufactured joints. The 2007 memo specifically referred to Line 132 as one of the pipelines that that should have been considered for replacement in 1995 but was not because the date of manufacture of problem joints was not apparent from the job files. This misunderstanding and failure to consider replacement, as identified by the 2007 PG&E memo of Line 132 records, represents a records deficiency that pertained to Line 132.

While these job estimate files existed since the time PG&E initially completed work on each line, apparently PG&E could not or did not access the relevant information in them to inform its GPRP's.

In light of this evidence, the Commission should find several things. First, PG&E failed to properly use records to identify problematic joints on Lines 132 and 151 in its 1995 GPRP, which meant the 1995 GPRP failed to properly consider whether to replace Lines 132 and 151. Second, PG&E failed to re-consider replacing Lines 132 and 151 even though a 2007 memo to the company identified problematic joints in both lines. Third, in 2007, PG&E used the wrong characteristics from its records to determine whether Lines 132 and 151 had problematic joints, thereby misinforming its decisions about whether to replace portions of these lines prior to the San Bruno pipeline explosion.

b. PG&E Was Informed that BBCR Joints Were Problematic in 1984, But Did Not Realize It Had Installed Such Joints on Line 132 for 23 Years

Bechtel Petroleum Inc. ("Bechtel") prepared a report for PG&E in 1984, in which it specifically explained to PG&E that BBCR joints "constitute a certain risk due to their fracture potential".[762] Bechtel also explained to PG&E in 1988 that BBCR type joints "have a higher leak occurrence potential due to their fracture tendency".[763] The 1984 version of the Bechtel Report prepared for PG&E noted that BBCR joints appear in lines prior to *1950*,[764] and a 1986 version of the Bechtel report prepared for PG&E changed this statement to say that BBCR joints appear only in lines prior to 1947.[765]

[762]CPSD Exhibit. 8, Attachment 108, Page 11. (108_Redacted.pdf)
[763] PG&E Response to CPSD Data Request 5, Question 11, Attachment 4, Page 14.
[764] CPSD Exhibit. 8, Attachment 108, Page 11. (108_Redacted.pdf)
[765] PG&E Response to CPSD Data Request 5, Question 11, Atch 3, Page 8.

Nonetheless, PG&E did not access the information in its own job estimate files to determine that Line 132 had problematic BBCR joints until it received the 2007 memo, 23 years after the 1984 Bechtel report.

4. PG&E's Defenses to Violation C.1 Lack Merit

a. PG&E's Assertion that Line 132 Would Not Have Been a Candidate for Replacement Under the GPRP Is Not Valid

PG&E claims that Line 132, Segment 180 would not have been a candidate for replacement under the GPRP for several reasons. First, PG&E asserts that Line 132, Segment 180 was constructed in 1956.[766] Second, PG&E claims that the welding on Line 132 Segment 180 was a different and superior method to the BBCR and BLSP girth welds,[767] which the 2007 memo identified as problematic.

However, PG&E already acknowledged that it "cannot conclusively document the origin of the pipe used in the construction of segment 180"[768] and that "segment 180 job file documents do not foreclose the possibility that some of the pipe used on the segment 180 job may have been reconditioned pipe".[769]

Given PG&E's uncertainties about whether segment 180 has reconditioned pipe and of the origin of segment 180, PG&E's assertions in this particular defense have no factual basis and should be afforded no weight.

b. PG&E's Assertion that Segment 180 and Sections of Line 132 Did Not Meet Other Criteria in the GPRP Focuses too Narrowly

PG&E asserts that Violation C1 is without merits, as Segment 180 and other sections of Line 132 did not meet other criteria in the GPRP, and would not have been replaced regardless of the cutoff date.[770] This assertion has several problems.

First, PG&E's own GPRP had a transmission subprogram that divided pipe replacement into three categories. Line 132, Segment 180 fell into the top one because it was within 30 feet

[766] PG&E Exhibit 61, Page 3-52, Line 13.
[767] PG&E Exhibit 61, Page 3-52, Lines 14 through 19.
[768] PG&E Exhibit 61, Page 4-1, Lines 11-12.
[769] PG&E Exhibit 61, Page 4-2, Lines 6-8.
[770] PG&E Exhibit 61, Page 3-52, Lines 1-4.

of a dwelling (indeed, multiple dwellings).[771] PG&E's assertion that it would not have replaced Line 132 counters its own program placing the highest priority on that very line.

Second, PG&E's assertion fails to account for the large number of other indicators PG&E could have and should have had that Line 132, Segment 180 was problematic.[772] To choose one example to illustrate this point here, PG&E discarded its pipeline history files.[773] By discarding them, PG&E lost the opportunity for a timely pipeline by pipeline review of information highly relevant to risk management, and ultimately replacement, of its pipes. If PG&E still had the pipeline history file for Line 132, it could have viewed other historic problems with Line 132 and Segment 180.

The problematic joints on Line 132 Segment 180 were merely one more indicator about the problems with Line 132, Segment 180 that PG&E did not see. In light of this, PG&E's assertion that it would not have replaced Line 132 regardless of the cutoff date appears to be made with the assumption that PG&E could ignore the complete set of facts about Line 132, Segment 180. For this reason, PG&E's assertion should be given no weight.

5. Scope and Duration of Violation C.1.

The duration of this violation begins at least as early as PG&E's omission of Lines 132 and 151 from its 1995 GPRP.[774] PG&E compromised the safety of its system each day of the omission between 1995 and September 9, 2010. PG&E's 2007 memo only exacerbates the problem, because it became aware of the problem and still did nothing. The scope of the violation includes public safety along Lines 132 and 151, particularly the areas that could have

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[771] PG&E Data Response to CPSD Data Request 52, Question 1 identifies that "CPUC_100" originated from a source other than CPSD. However, PG&E's response to CPUC_100 is part of PG&E's Data Response to CPSD Data Request 52, Question 1 in this proceeding. As part of this response, the title of PG&E's document is "CPUC_100, Q04, Atch04, Page 5".

[772] Many examples of the problems PG&E had with accurately identifying appropriate pipelines to replace can be see under Violation 25 of this brief.

[773] For a more thorough discussion of PG&E's discarding of its pipeline history files, see Violation 17, and Violation A1,(3)(a)(xiv).

[774] CPSD could assert that the duration of this violation begins in 1984, when PG&E first learned from the Bechtel report that BBCR joints appear in Lines from before 1950, but CPSD asserts 1995 as a beginning date that reasonably shows that PG&E's 1995 GPRP ignored the information from the 1984 Bechtel Report.

been harmed by any pipeline failure along those sections containing the bad joints, as PG&E incorrectly omitted these lines from its 1995 GPRP.

6. Violation C.1 Has Negatively Affected Safety

CPSD experts pointed out that if PG&E had included Line 132 in its GPRP, and replaced the line, then PG&E could have avoided the San Bruno rupture and fire on September 9, 2010.[775] It follows that one reason PG&E could not avoid the San Bruno rupture and fire was that it did not include Line 132 in its GPRP. Moreover, each day PG&E failed to act upon the information in the 2007 memo also negatively affected safety.

Violation C.2: Impact of Inferior Records on Predicting Earthquake Damage

1. Summary of Violation C.2.

Certain types and ages of pipe are more susceptible to earthquake damage than others. As shown in this section, PG&E did not have an accurate record of all pipelines in the ground, and PG&E also does not know where all of its reconditioned pipe is. Therefore, PG&E has not been able to precisely identify which pipelines are prone to earthquake damage and take the necessary corrective action to replace them. This problem compromises the safe operation of PG&E's gas transmission pipeline system because of the harm that could result to areas near pipes that are prone to damage and failure during a large earthquake.

2. Statutes and Requirements PG&E has violated

Statutes and requirements violated include California Public Utilities Code section 451 and ASME Code section B31.8.

3. Discussion of Violation C.2 (including evidence and circumstances establishing the violation).

a. Study Shows Older Installed Pipelines Have Experienced Severe Earthquake Damage

[775] CPSD Exhibit 7, Page 4 of 5.

In 1992, a Federal Emergency Management Agency (FEMA) study showed that that pipelines built between 1930 and 1950 suffered disproportionately severe damage during past large earthquakes. The study also provided justification for the replacement of pipelines from this vintage. In short, the study highlights the importance of accurate pipeline manufacturing age, construction and installation date to safety and risk assessment.

Several passages from the study, shown in CPSD testimony, illustrate this point.

Passage 1 provides,

> ". . .the overall performance record of gas and liquid fuel pipeline systems in past earthquakes was relatively good. However, catastrophic failures did occur in many earthquakes, particularly in areas of unstable soils. Modern, welded steel pipelines, with adequate corrosion protection, have a good performance record. Older pipelines, including welded pipelines built before 1950 in accordance with quality control standards less stringent than those used currently, as well as segmented case iron pipelines, have been severely damaged. . ." [776]

Passage 2 also provides as follows:

> Extensive damage occurred to underground welded-steel transmission pipelines during the 1971 San Fernando earthquake. The most serious damage occurred to anoxy-acetylene-welded pipeline installed about 1930. In the same general area of the San Fernando Valley that experienced extensive ground failures, several newer pipelines installed after 1960 did not experience failure. Before the early 1930s, steel pipelines in California were often constructed under quality control less stringent than that imposed today. The newer pipelines were characterized by higher yield strengths (x-grade) and modern arc welding." [777]

b. PG&E Does Not Know the Manufacturing Dates of Many of Its Reused Pipeline Segments

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[776] CPSD Exhibit 6, Page 6-91, citing Yokel, F.Y. and Mathey, R.G. (1992) Earthquake Resistant Construction of Gas and Liquid Fuel Pipeline Systems Serving, or Regulated by, the Federal Government. Federal Emergency Management Agency, FEMA- 233, July 1992.

[777] CPSD Exhibit 6, Page 6-91, citing Yokel, F.Y. and Mathey, R.G. (1992) Earthquake Resistant Construction of Gas and Liquid Fuel Pipeline Systems Serving, or Regulated by, the Federal Government. Federal Emergency Management Agency, FEMA- 233, July 1992.

PG&E does not know the manufacture dates of many of its pipeline segments. One illustration of this problem is discussed in Violation A1, subsection 3a.vii. To briefly summarize that discussion, PG&E wrongly assumed that a pipe's installation date and manufacture date were the same.[778] During hearings, PG&E acknowledged that its GIS system does not show the year a pipe, or reconditioned pipe was manufactured.[779]

To exemplify the discrepancy between the two dates, PG&E has only identified 31 pieces of reused pipe to CPSD, and none show the re-install date and manufacture date as the same. [780] Only 10 of the 31 pieces of the identified reused pipe have re-install date and manufacture date identified. Of these, all have discrepancies of at least seven years, and six have discrepancies of more than 20.[781]

As further context for the discrepancy between the manufacture and installation dates, in the 1950's and early 1960's, PG&E removed a considerable amount of pipeline originally installed in the late 1920's and 1930's and sent it to the Decoto Pipe Yard where it was reconditioned and placed in "stock" for use in future projects.[782]

Exacerbating the problem shown by the discrepancy in dates is the company's acknowledgements that "PG&E does not in all instances know where reconditioned pipe has been placed in its transmission system";[783] and ". . .PG&E did not in the past capture data identifying reconditioned pipe in the gas transmission system in its databases. . .".[784]

The Commission should find that the manufacture date of PG&E's reused pipe is unknown, and different from the installation date. The Commission should also find there are a significant number of pieces of reconditioned pipe in PG&E's system.

c. PG&E's Multiple Errors Means that Many of Its Transmission Lines Have Inaccurate Manufacture Dates and Inaccurate Weld Information

PG&E has multiple errors about the many characteristics of its transmission pipelines, including installation dates and weld types. As early as 1984, PG&E knew it had poor quality

[778] CPSD Exhibit 8, Page 23 of 72, Lines 7-9.
[779] 09/19/2012 Tr. 1868 : 15-23.
[780] PG&E Response to CPSD Data Request 24, Question 2, Attachment 1.
[781] PG&E Response to CPSD Data Request 24, Question 2, Attachment 1.
[782] CPSD Data Request 10, Question 5, Attachment 6,
[783] PG&E Exhibit 61, Page 3-32, Lines 1-2.
[784] PG&E Exhibit 61, Page 3-28, Lines 20-22.

pipeline age data, because at that time PG&E Area Engineers reported age information to be only 94% accurate and leak history data only 58% accurate.[785] Indeed, PG&E has stated that it is "aware that data errors exist within the current GIS system, (either from original pipeline data or introduced during the transfer). . .".[786] PG&E also does not believe that its current GIS system is accurate or complete or that it contains a full set of required information for all numbered gas transmission lines.[787]

Moreover, PG&E specifically does not know the manufacture date for Line 132, segment 180. In PG&E's own words, "PG&E acknowledges that it cannot conclusively document the origin of the pipe used in the construction of Segment 180."[788]

The Commission should find that PG&E's large number of errors about its pipeline characteristics include manufacture dates and types of welds.

4. PG&E's Defenses to Violation C.2 Lack Merit

a. PG&E Omits Critical Information from the FEMA Earthquake Study

PG&E claims that the 1992 FEMA study referenced above, "highlighted the experience in the 1971 San Fernando Valley earthquake in which the most serious pipeline damage was to an oxyacetylene welded pipeline installed about 1930. Line 132 is not pipe installed in this era and its girth welds are not of this type."[789] This claim mischaracterizes what the study highlights and omits half of its critical facts. As shown above, the study also finds that older pipelines, including welded pipelines built before 1950, and cast iron pipes have been severely damaged. Indeed, Line 132 was installed initially in 1948, which means the pipe was manufactured no later than 1948, and perhaps significantly before then. Therefore, Line 132 appears to be within the scope of the FEMA study.[790] The Commission should find that Line 132 is older pipe of the

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[785] CPSD Exhibit 8, Attachment 108, Pages 7-8, "The Bechtel report "Engineering Consulting Services for Pacific Gas and Electric Company", dated January 1984, Job 16253, Revision O.
[786] PG&E Exhibit 61, Page 3-66, Lines 26-27.
[787] PG&E Response to CPSD Data Request 67, Question 13.
[788] PG&E Exhibit 61, Page 4-1, Lines 11-12.
[789] PG&E Exhibit 61, Page 3-51, Lines 20-24.
[790] CPSD Exhibit 6, Page 6-91, citing Yokel, F.Y. and Mathey, R.G. (1992) Earthquake Resistant Construction of Gas and Liquid Fuel Pipeline Systems Serving, or Regulated by, the Federal Government. Federal Emergency Management Agency, FEMA- 233, July 1992.

vintage that is within the scope of the FEMA study, and is therefore prone to damage and potential failure during large earthquakes.

b. PG&E Mischaracterizes the CPSD Report

PG&E mischaracterizes the CPSD recordkeeping report, asserting that it lacks mention of facts in the discussion supporting this violation, merely quotes the FEMA report and makes broad conclusory statements.[791] However, the CPSD recordkeeping report identifies the need for accurate, comprehensive and quickly accessible records in the earthquake section.[792] Moreover, CPSD's rebuttal testimony responds to PG&E's concern by explicitly reiterating, in the context of this violation, already identified concerns with lack of records of the location of reconditioned pipe; incomplete reconditioned pipe information due to misplaced or missing job files, and a completely missing collection of historical pipeline records that would have also contained relevant, safety-critical information.[793]

c. Other PG&E Efforts Do Not Address CPSD's Identified Problem of Missing or Inaccurate Pipeline Information

PG&E claims it has conducted a number of other efforts to manage the risks associated with ground movement, including earthquakes, and claims CPSD's report does not address the sufficiency of them.[794] However, PG&E's efforts to manage risk are predicated upon its detailed knowledge of the age, installation date and weld types of its pipelines in the ground. Prior to September 2010, PG&E's other alleged efforts did not address the problem of missing or inaccurate manufacture date or weld type information for various PG&E transmission lines. PG&E's missing and inaccurate pipeline information left its risk management activities with deficiencies.

5. Scope and Duration of Violation C.2.

PG&E's lack of necessary accurate and readily locatable gas transmission line records (including age of pipe and weld types) spans from 1992 to September, 2010. PG&E's lack of

[791] PG&E Exhibit 61, Page 3-49, Lines 14-16.
[792] CPSD Exhibit 6, Page 6-92, Lines 13-15.
[793] CPSD Exhibit 8, Page 22 of 72, Lines 16-25.
[794] PG&E Exhibit 61, Page 3-51, Lines 11-13.

accurate records, and its awareness of that problem, pre-dates 1992.[795] Nonetheless, CPSD chose 1992 because that is the publication date of the FEMA study that demonstrably informed PG&E of these earthquake-related safety problems. PG&E's poor quality data and records compromised the safety of its gas transmission pipeline system on a daily basis.

Given that PG&E does not know where all of its reconditioned pipe is, and PG&E does not know the manufacture date for much of its reconditioned pipe, the Commission should find that this violation covers thousands of records that affect the safety of each and every transmission line that is prone to ground movement or earthquakes.

6. Violation C.2 Has Negatively Affected Safety

As shown in this violation, PG&E is missing large amounts of necessary information to identify which of its transmission pipelines are prone to severe damage in a large earthquake, or to take appropriate corrective actions. These include the following:

- PG&E does not know manufacture dates for the pipe used in a significant number of its transmission lines.
- PG&E has a significant amount of reused pipe in its transmission lines
- PG&E does not know the location of all reused pipe in its transmission lines.
- PG&E does not know manufacture dates for all reused pipe.

These omissions have a significant safety impact, because they leave the transmission system at risk of severe damage, and because they put people at risk of suffering from pipeline-related failure during earthquakes or other ground moving activity.

Violation C.3: Leak Records

1. Summary of Violation C.3.

For several reasons, PG&E failed to maintain a definitive, complete and readily accessible database of all gas leaks for their pipeline system. First, PG&E did not migrate all historical leak records from system to system. Consequently, PG&E's current database, IGIS, is missing significant amounts of leak information. Second, PG&E has experienced problems

[795] CPSD Exhibit 8, Attachment 108. The Bechtel report "Engineering Consulting Services for Pacific Gas and Electric Company", dated January 1984, Job 16253, Revision O.

checking and ensuring the accuracy of leak information in IGIS. Third, PG&E failed to properly map many of its jobs on its gas transmission lines, leading to non-compliance leak survey programs and missing leak survey records. Finally, the first three points mean that PG&E's integrity management model was ineffective because PG&E based its decisions upon poor quality, incomplete and inconsistent leak information. Because PG&E's leak records are incomplete, PG&E has compromised pipeline safety.

2. Applicable Statutes and Requirements

Federal regulations violated include 49 CFR section 192.709. State statutes violated include California Public Utilities Code section 451. State regulations violated include section 107 of California Public Utilities Commission General Orders 112, 112A, and 112B. Other requirements violated include ASME Code section B31.8.

Also, Commission precedent has recognized particular NTSB recommendations that PG&E use leak data that informs PG&E's integrity management program. The Commission has noted,

> "Among the many recommendations for PG&E, the NTSB issued this comprehensive directive regarding PG&E's integrity management program and risk analysis: Assess every aspect of your integrity management program, paying particular attention to the areas identified in this investigation, and implement a revised program that includes, at a minimum, (1) a revised risk model to reflect PG&E's actual recent experience data on leaks, failures, and incidents; (2) consideration of all defect and leak data for the life of each pipeline, including its construction, in risk analysis for similar or related segments to ensure that all applicable threats are adequately addressed. . ." D.12-12-030 (Dec. 20, 2012), p. 10, 2012 Cal. PUC LEXIS 600, at *37.

3. Discussion of Violation C.3 (including evidence and circumstances establishing the violation).

a. PG&E Did Not Migrate All Historical Leak Information from System to System

Historical leak records provide safety-related indicators of pipelines and pipeline segments that have exhibited leaks. Pipeline and pipeline segments exhibiting leaks may have more issues and require closer attention than those that do not.

PG&E has used different physical and electronic systems to record, maintain and track leak data over the past 55 years, starting with paper-based A-Forms. PG&E used A-Forms to capture leak information on site. PG&E claims to have retained them largely in job files.[796]

Since the 1970's, PG&E has managed its leak records in some form of electronic leak tracking system. Beginning in 1970 and continuing until 1987, PG&E exclusively used a centralized Mainframe computer program called "Mainframe Leaks". Between 1987 and 1999, PG&E used a combination of the Mainframe Leaks system and a distributed PC-based leak management system called "PC Leaks". PG&E had PC Leaks installed in local offices and staff in each office could enter leak and repair data locally on PC Leaks. PG&E then had this data uploaded to the Mainframe Leaks system every month. The local offices would archive data about inactive leaks to a secondary storage system when the local PC needed the disk space or the local office otherwise determined to archive closed leaks. The degree to which local offices archived leak data varied from office to office.

In 1999, PG&E replaced both "Mainframe Leaks" and "PC Leaks" with a single, leak and repair tracking database called the "Integrated Gas Information System" (IGIS). PG&E continues to use IGIS today.[797] In addition, PG&E had some of its leak records copied from IGIS and also held in it GIS system.

PG&E openly states in testimony that it migrated data for open leaks (leaks that had not yet been repaired) from PC Leaks to IGIS in 1999.[798] However, PG&E omits from its testimony that it did not migrate approximately one million (1,000,000) leak records from the Mainframe Leaks system into IGIS;[799] or that it did not retrieve leak data from its locally archived "PC Leaks" secondary storage systems.[800] This meant that PG&E had difficulty accessing many of its leak records, making it more difficult to consider leaks as a factor in its integrity management model. In fact, likely reflecting its difficulty accessing all of its leak history data, PG&E chose to reduce the weighting of its leak history data from 15% of the weighted data in its 1984 risk assessment model,[801] to 0.5% in 2009.[802] [803]

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[796] PG&E Exhibit 61, Page 3-60, Lines 23-26.
[797] PG&E Exhibit 61, Page 3-61.
[798] PG&E Exhibit 61, Page 3-61, Lines 25-26.
[799] PG&E Response to CPSD Data Request 69, Question 6.
[800] PG&E Response to CPSD Data Request 69, Question 6.
[801] CPSD Exhibit 2, Page 19, Lines 16-24.

Moreover, PG&E is unable to locate any internal documents or memos to explain or justify why it did not have certain information migrated to IGIS.[804] The Commission should find that PG&E's current leak database, IGIS, lacked at least 1,000,000 of PG&E's historic leak records.

b. PG&E Failed to Properly Map Jobs and Therefore Has Failed to Perform Timely Leak Surveys of Individual Gas Facilities

In 2012, many of PG&E's mappers observed that some of its gas transmission line jobs were missing as-built and pressure test data from as early as 2004, or even earlier.[805] One of PG&E Principal Gas Mappers has highlighted that a "major problem" exists due to the fact that "tens of thousands if not a hundred thousand jobs or more were and/or remain unmapped". [806]

PG&E has also recognized its failure to perform timely leak surveys on a large percentage of its individual gas facilities. In particular, PG&E staff identified a non-compliance leak survey issue recognizing that "gas jobs. . . may have been missing from the maps prior to (the past few years) for up to 8 years or more. . .". [807] PG&E also recognized that "unmapped facilities not indicated on the reduced gas plat maps (were) given to Gas Leak Surveyors".[808] PG&E further noted that some leak surveys "must be performed within 63 months of the original pressure test date of a facility", but were not undertaken within that time frame.[809] As leak surveys depend on accurate job mapping, PG&E has recognized, "For the old gas jobs still not mapped, this is particularly a troublesome non-compliance issue."[810]

The Commission should find that, as a result of PG&E's failure to map tens of thousands if not a hundred thousand jobs, PG&E has failed to perform timely leak surveys. The Commission should also find that PG&E's failure to perform timely surveys is another reason for a large number of missing or uncompleted leak survey records.

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[802] CPSD Exhibit 2, Page 26, Lines 10-18.
[803] For more discussion about PG&E's integrity management problems resulting from bad leak information, see Violation 25.
[804] PG&E Response to CPSD Data Request 69, Question 6.
[805] PG&E Response to CPSD Data Request 25, Question 2(i) Supp 02Atch17.
[806] PG&E Response to CPSD Data Request 25, Question 2(i) Supp 02Atch17.
[807] PG&E Response to CPSD Data Request 25, Question 2(i) Supp 02Atch17.
[808] PG&E Response to CPSD Data Request 25, Question 2(i) Supp 02Atch17.
[809] PG&E Response to CPSD Data Request 25, Question 2(i) Supp02Atch17, Page 2.
[810] PG&E Response to CPSD Data Request 25, Question 2(i) Supp 02Atch17, Page 2.

c. PG&E Knew That A Large Portion of Its Leak Records Were Inaccurate and Believed Its Leaks Were Under-Recorded

PG&E knew it had poor quality leak records from at least as early as 1984, when PG&E Area Engineers reported leak history data to be only 58% accurate. These engineers "expressed little confidence…in the accuracy of this data variable" and "were of the belief that the leak history was under-recorded not over".[811] The Commission should find that PG&E knew from at least as early as 1984, that a significant portion of its total leak history data was inaccurate, and that PG&E also believed at that time that it had under-recorded leaks in its system.

d. PG&E Has Experienced Problems Checking and Ensuring the Accuracy of Leak Information in IGIS

In a recent post-San Bruno internal audit, PG&E concluded that "controls for managing and repairing gas leaks need strengthening. In particular, (PG&E) found that the Utility needs to enhance controls for (1) validating the accuracy of the rechecking process; (2) ensuring accurate entry of data into IGIS and retention of source documentation; (3) reviewing and approving leak repair forms; (4) correcting known errors in IGIS; and (5) ensuring that leak survey and repair personnel are qualified for assigned duties."[812]

This same audit found that "Mapping was unable to find about five percent of the A-Forms and approximately seven percent of the recheck documents requested. In addition, about ten percent of the leak information in IGIS contained at least one data entry error when compared to the original documents (PG&E) reviewed. The more prevalent errors included incorrect grades entered into IGIS. "[813]

CPSD believes that PG&E's findings indicate that PG&E has historically maintained many inaccurate and incomplete leak records, and recommends the Commission make such a finding.

[811] CPSD Exhibit 55, Page 8. The Bechtel report "Engineering Consulting Services for Pacific Gas and Electric Company", dated January 1984, Job 16253, Revision O.
[812] PG&E Response to CPSD Data Request 25, Question 2(i) Supp02Atch02, Page 2.
[813] PG&E Response to CPSD Data Request 25, Question 2(i) Supp02Atch02, Page 3.

4. PG&E's Defenses to Violation C.3 Lack Merit

CPSD already pointed out in testimony that none of PG&E's statements to date refute CPSD's contention that PG&E failed to maintain a definitive, complete and readily accessible database of all gas leak records for its pipeline system as it failed to migrate all historical leak information from system to system.[814] CPSD stands by this statement.

5. Scope and Duration of Violation C.3.

PG&E failed to maintain a definitive, complete and readily accessible database of all gas leak records for its pipeline system since 1957, the time PG&E states it began formally documenting the discovery and repair of gas leaks. However, PG&E also does not claim it has maintained detailed leak records for the period prior to 1957, 44 years since the formation of the utility in 1913.[815] Nonetheless, CPSD believes it is reasonable to assert that the duration of this violation dates from 1957 to September 9, 2010.[816]

The scope of this violation includes an untold number of leak records that were either improperly migrated, abandoned in legacy databases or secondary stores, inaccurate, incomplete, inaccessible, unavailable for leak surveyors, problematic for its integrity management model or any combination thereof.

6. Violation C.3 Has Negatively Affected Safety

CPSD has already noted that good records management is vital to help achieve maximum safety in the case of a utility transporting potentially flammable and explosive gas in pipes.[817] CPSD has also pointed out that reliable, traceable, verifiable, and complete records are necessary for PG&E to promote the safety of its gas transmission system.[818] CPSD has also mentioned that PG&E's historical lack of control regarding how records were managed has been a major source

[814] CPSD Exhibit 8, Page 24, Lines 28 to 30.
[815] CPSD Exhibit 8, Page 24, Line 28 to 25 Line 3.
[816] CPSD Exhibit 7, Page 5 of 5 had noted this violation began in 1955, but CPSD modifies the beginning date of this violation in PG&E's favor now.
[817] CPSD Exhibit 6, Page 4-19, Lines 14-15.
[818] CPSD Exhibit 8, Page 16 of 72, Lines 19-20.

of risk for PG&E.[819] PG&E's problems with leak records exemplify all of the safety concerns PG&E generally has with deficient records.

Also, PG&E has reduced the weighting of its leak history data in its risk management models over time, a likely result of PG&E's difficulty accessing all of its leak data. This reduction in weighting of such a critical factor has compromised the safety of PG&E's pipeline replacement decision making.

VII. Allegations Raised by CCSF Testimony*

VIII. Allegations Raised by TURN Testimony*

IX. Allegations Raised by City of San Bruno Testimony*

[819] CPSD Exhibit 6, Page 6-26, Lines 13-14.

X. CONCLUSION

As the NTSB and this Commission discovered while investigating the tragedy caused in San Bruno when PG&E's high-pressure transmission pipeline exploded, PG&E's inadequate recordkeeping was not only one of reasons that the San Bruno explosion had occurred. PG&E's missing or inaccurate records were so extensive that more ruptures and explosions could occur in PG&E's service territory unless immediate action was taken. Therefore, the NTSB issued "Urgent" safety alerts on January 3, 2012 and the Commission immediately issued interim orders requiring PG&E to diligently search for the missing records. The Commission followed the interim orders by issuing on February 24, 2012 both this OII and the Order Instituting Rulemaking in R.11-02-019.

As discussed above, through decades of neglect by not retaining critical engineering records or destroying records which may have established PG&E had no valid reasons for establishing its MAOP, PG&E did not fulfill its basic obligation of protecting the public from PG&E's hazardous facilities. For all of the above-mentioned reasons, PG&E must be held accountable for the consequences that have already occurred in San Bruno and that potentially could still occur, or at least could have occurred but for the NTSB's urgent recommendations and Commission's immediate actions following the NTSB's recommendations.

Respectfully submitted,

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Appendix – Proposed Findings of Fact

[SEE ATTACHMENT]