

ATTACHMENT A

Amended Appendix A

(Amended Appendix A consists of amendments to Chapters 2A and 7 of
PG&E's Response Filed on June 20, 2011.)

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 2A
PG&E'S RECORDKEEPING POLICIES AND PRACTICES
1955-2010

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TABLE OF CONTENTS

A. Introduction.....	2A-1
B. June 8, 2011 Report of the Independent Review Panel	2A- 21
C. Overview of PG&E's Gas Transmission Safety Record Maintenance and Retention Policies.....	2A- 31
1. PG&E's Document Maintenance Policies.....	2A- 41
2. Document Retention Policies as Applied to PG&E's Gas Transmission Records.....	2A- 51
3. How Document Retention Requirements Relate To PG&E's Gas Transmission Records	2A- 61
D. PG&E's Recordkeeping Practices From 1955-2010.....	2A- 81
1. Introduction and Summary of Historical Developments.....	2A- 81
2. Overview of the Records Generated From Gas Transmission Activities (as of August 2010).....	2A- 181
E. Conclusion.....	2A- 291

1 **PACIFIC GAS AND ELECTRIC COMPANY**

2 **CHAPTER 2A**

3 **PG&E'S RECORDKEEPING POLICIES AND PRACTICES 1955-2010**

4 This Chapter responds to Directive 2. It supplements Chapter 2 (Record
5 Retention Policies), previously submitted on April 18th. This Chapter discusses
6 PG&E's recordkeeping policies and practices for the period 1955-2010 and
7 addresses Legal Division's request for additional information (June 3, 2011,
8 Prehearing Conference (PHC) Statement).

9 **A. Introduction**

10 OII Directive 2 seeks PG&E's policies and practices relating to the
11 maintenance and retention of various types of safety-related gas transmission
12 records. Specifically, Directive 2 asks PG&E to provide its explanation as to its
13 policies and practices for a 55-year period, from 1955 through August 2010, for:

- 14 A. Maintaining the technical instructions, manuals, and
15 technical maps and drawings, manufacturer and designer
16 specifications and operating and maintenance
17 instructions, as-built documents, and all other original
18 technical documents pertaining to transmission pipelines
19 . . .
- 20 B. Maintaining records of operations, including but not
21 limited to gas pressure . . .
- 22 C. Maintaining records of leaks, electronic problems, and
23 other transmission pipeline anomalies . . .
- 24 D. Maintaining records of all inspections, tests, and safety
25 risk analyses done on transmission pipes . . .
- 26 E. Maintaining the records referred to in A-D above in ways
27 that can be identified, accessed, and retrieved efficiently
28 and promptly.

29 Directive 2 further directs PG&E to identify changes in the relevant policies and
30 summarize the reasons for the changes.

1 PG&E has maintained a complete set of its applicable document retention
2 policies dating back to before 1955. PG&E has also maintained a large number
3 of its superseded or retired gas transmission record maintenance policies and
4 practices, some dating back to the 1950s (although they were not mandated to
5 be retained for extended periods of time). PG&E provides an overview of these
6 policies and practices in subsection C, below. Attachment 2A consists of tables
7 that (i) summarize the relevant policies and practices, (ii) identify the changes in
8 the policies and practices over time, and (iii) summarize the reasons for those
9 changes.

10 Directive 2 also seeks information about PG&E's record maintenance
11 practices. As noted above, Directive 2E asks PG&E how its gas transmission
12 safety records are maintained "in ways that [they] can be identified, accessed,
13 and retrieved efficiently and promptly." PG&E responds in detail in subsection
14 D, below.

15 PG&E's recordkeeping policies and practices have sought to ensure that
16 gas safety records are available to those who use them, namely, maintenance
17 personnel working in the field, operators monitoring the flow of gas in a control
18 room or at a load center, and gas pipeline engineers designing and constructing
19 new pipelines and overseeing the integrity of existing ones. PG&E designed
20 record access and retrieval systems to meet the needs of the personnel who
21 used them. Some systems are now old or aging, and do not take full advantage
22 of newer record access and retrieval technologies. And, some data are missing
23 or were not adequately transferred into the latest versions of data management
24 systems. As explained by Edward J. Ondak (a pipeline safety expert) in Chapter
25 2B, these are industry-wide challenges. Although PG&E's recordkeeping
26 practices can be improved, they have historically been pragmatic and functional.

27 **B. June 8, 2011 Report of the Independent Review Panel**

28 PG&E is carefully reviewing the June 8, 2011 report that the Independent
29 Review Panel submitted to the Commission. The report includes statements
30 critical of PG&E's data management practices, including this statement:

31 While we understand the entire pipeline industry has had challenges
32 in digitizing and systematizing all the engineering design, construction

1 and operating data, we find PG&E's efforts inchoate. **The lack of an**
2 **overarching effort to centralize diffuse sources of data hinders the**
3 **collection, quality assurance and analysis of data to characterize**
4 **threats to pipelines as well as to assess the risk posed by the**
5 **threats on the likelihood of a pipeline's failure and consequences.**

6 Report of the Independent Review Panel San Bruno Explosion, p. 8 (June 8,
7 2011) (emphasis in the original).

8 PG&E is evaluating this conclusion (as well as others in the Report). We
9 believe that there is more that PG&E can do to improve the management of
10 information about its transmission pipeline system, and PG&E is committed to
11 taking appropriate actions to confront and overcome the recordkeeping
12 challenges it faces. Over time, PG&E's gas organization has moved from one
13 place to another with the result that some records have been lost, misplaced, or
14 discarded. The gas organization has reorganized several times in past decades,
15 with some functions being moved from one line of business to another. In
16 hindsight, these changes have impacted records management practices. PG&E
17 has developed many records management systems, in different eras of data
18 management technology. Looking back, we see that the Company has
19 struggled to maintain the continuity and reliability of records across these
20 records management systems. These are not excuses or explanations. They
21 are preliminary assessments about the challenges PG&E faces.

22 PG&E will identify industry experts who will assist PG&E in addressing its
23 record maintenance challenges. The Independent Review Panel's work is
24 central to this effort, and PG&E intends to confer further with the Panel's
25 consultants.

26 **C. Overview of PG&E's Gas Transmission Safety Record** 27 **Maintenance and Retention Policies**

28 PG&E has long had enterprise-wide document maintenance policies. The
29 current (as of August 2010) governing standard for providing or creating
30 guidance documents is contained in Corporation Standard GOV-2001S,
31 Guidance Documents Standard Rev.0, issued on 07/12/10 (Attachment P2-6).
32 This standard establishes an enterprise-wide framework for writing, reviewing,

1 approving, canceling, and communicating all guidance documents issued by
2 PG&E Corporation and its affiliates and subsidiaries, including PG&E. GOV-
3 2001S is, in essence, a policy that establishes the standards by which other
4 policies are created, maintained and/or superseded.

5 The distinction that PG&E draws between a policy and a practice is that a
6 policy provides broad direction to the operations on how to perform work;
7 practices, in contrast, are described in guidance documents. For practices,
8 PG&E currently uses three common guidance document types to communicate
9 “what-to-do” and “how-to-do-it”: Standards, Work Procedures, and Bulletins.
10 Policies are the overarching direction provided to the business, standards define
11 what needs to be done to implement the policies, and work procedures provide
12 details on how the work is to be performed. Bulletins are used to communicate
13 interim changes to policies or standards between policy and standard revision
14 cycles. In some cases, guidance documents are presented together in a manual
15 or with other supporting documents such as job aids, numbered documents,
16 forms, drawings, and specifications.¹

17 **1. PG&E’s Document Maintenance Policies**

18 PG&E’s document maintenance policies have evolved over time and
19 adapted to state and federal regulatory changes concerning gas
20 transmission document maintenance policies. Attachment 2A details
21 PG&E’s document maintenance and retention policies related to gas
22 transmission safety recordkeeping, as well as the changes to those policies
23 over time and the reasons for those changes (where such information is
24 available). The policies listed in the Attachment cover many subject areas,
25 but each touches on record maintenance or retention in some way. Until
26 relatively recently (the 1990s), PG&E did not routinely log the changes

¹ Historically, PG&E has had different names for guidance documents, including: Policies, Standards, Design Standards, Guidelines, Work Procedures, Bulletins, Forms, and Manuals. Many of these document types are still in use but are being converted over time to the existing Corporate Standard format and naming convention. In responding to Directive 2, PG&E will refer to all these various document types as “policies.”

1 between and among the versions of its policies, nor did it formally record the
 2 reasons for those changes. Thus, in an effort to respond to Directive 2,
 3 PG&E has created a change log for record-related policies dating back to
 4 the 1950s. PG&E has made diligent efforts to make the log (contained in
 5 Attachment 2A) as accurate as possible given the passage of time.

6 **2. Document Retention Policies as Applied to PG&E’s Gas**
 7 **Transmission Records**

8 Many of PG&E’s policies contain record retention instructions. These
 9 instructions track or implement regulatory requirements, or impose
 10 additional company requirements. Retention obligations during the past 55
 11 years stem from various regulatory sources: PHMSA regulations, FERC
 12 regulations, FPC regulations, and Commission regulations adopting or
 13 incorporating the federal regulations. The retention and destruction rules of
 14 these different agencies are not always easy to harmonize. All of PG&E’s
 15 retention policies can be found in the accompanying produced materials,
 16 which are organized and indexed topically. PG&E’s primary, current (as of
 17 August 2010 or immediately thereafter) retention policies are listed below in
 18 Table 2A-1.

TABLE 2A-1
PACIFIC GAS AND ELECTRIC COMPANY
PG&E PRIMARY POLICIES ASSOCIATED WITH RECORD RETENTION PERIODS FOR GAS
TRANSMISSION PIPELINE

Document Date	Title	Attachment P2-#
10/01/2008	Utility Standard Practice (USP) 4, Record Retention and Disposal	P2-228
05/22/2008	Guide to Record Retention	P2-227
04/16/2010	Records Retention and Disposal Guidance for Transmission & Distribution Systems	P2-230
10/01/2010	GOV-7001S: Record Retention and Disposal Standard	P2-233

1 **3. How Document Retention Requirements Relate To PG&E’s**
2 **Gas Transmission Records**

3 The CPUC’s Legal Division requested PG&E to discuss its
4 recordkeeping practices by category of records as set forth in its June 3,
5 2011, PHC statement. Specifically, Legal Division seeks information
6 concerning how and where five categories of records are kept: (i) as-built
7 drawings, documents, and photos; (ii) pipe specifications; manufacturer’s
8 operating manuals, and instructions; (iii) operating history of the pipe,
9 including but not limited to pressure; (iv) maintenance and repair history of
10 the pipe; and (v) risk assessments done of the pipe. Below, we outline the
11 retention policies applicable to each of these categories.² Section D
12 discusses PG&E’s recordkeeping practices generally, by category requested
13 in Legal Division’s PHC Statement.³

14 As-built drawings, documents, and photos. Starting in 1961, with the
15 adoption of General Order 112, and in 1970 with the adoption of the federal
16 code, as-built drawings and related design and construction information
17 were required to be maintained for so long as the pipe remained in service.
18 18 C.F.R. § 225.3, Index No. 21. PG&E’s policies have required retention of
19 these types of records for the life of the pipeline.

20 Pipe specifications. Pipe specification information is generally subject to
21 a retention requirement for as long as the pipe remains in service. 18
22 C.F.R. § 225.3, Item 21. Pre-existing pipeline facilities were exempt from
23 construction, design, and initial testing requirements when regulations were
24 first introduced. PG&E’s internal policies have also required the retention of
25 these sorts of records for the life of the pipeline.

² For a full discussion of document retention requirements applicable to gas transmission records, and when the regulations became effective, see Chapter 1, Regulatory History.

³ This is not to say that records, once created, must remain in the same format for all time. As discussed in Chapters 1 and 2B, pipeline safety regulations allow operators to use any recordkeeping procedure that produces authentic records.

1 Manufacturer's operating manuals and instructions. There are no
2 manufacturer's operating manuals or instructions for transmission pipe.
3 Therefore, PG&E does not have a document retention policy that is directly
4 applicable. For manufacturer's operating manuals or instructions for station
5 components such as compressors and filters, PG&E's practice is to retain
6 these manuals in the facility where the component is situated and centrally
7 in gas engineering records.

8 Operating history of the pipe, including but not limited to pressure.
9 PG&E understands this request to refer to operating pressure records and
10 other similar records, e.g., operator logs. Under PHMSA subpart L
11 (Operations), these types of records are required to be retained as "records
12 necessary to administer the procedures" set forth in an O&M manual. 49
13 C.F.R. § 192.603(b). There is no time period specified in § 192.603(b),
14 however, and the retention period would be subject to any specific
15 requirements set forth in an operator's O&M manual. PG&E's internal
16 policies set forth the relevant retention requirements.

17 Maintenance and repair history. PG&E understands this request to refer
18 to maintenance and repair records of the kind described in the pertinent
19 parts of PHMSA subpart M (Maintenance). Presently, records of repairs
20 made to a segment of pipe (as opposed to other parts of the pipeline
21 system) must be retained for as long as the pipe segment remains in
22 service. Repair records for non-pipe components generally must be
23 maintained for at least five years. Records related to patrols, surveys,
24 inspections, and tests required by subparts L and M of Part 192 are
25 generally subject to a five-year record retention period, or until the next
26 patrol, survey, inspection, or test is completed, whichever is longer. PG&E's
27 internal policies have also required the retention of these types of records
28 for the same periods.

29 Risk assessments. PG&E understands this request to refer to the
30 integrity management process described in the pertinent parts of PHMSA
31 subpart O (Gas Transmission Pipeline Integrity Management). Subpart O
32 requires retention of records for the useful life of the pipeline in order to

1 demonstrate compliance, and prescribes the retention of specific minimum
2 records. PG&E's internal policies have required the retention of these types
3 of records for the same period as specified above.

4 **D. PG&E's Recordkeeping Practices From 1955-2010**

5 **1. Introduction and Summary of Historical Developments**

6 Directive 2E of the OII asks PG&E to explain how it ensures that its gas
7 transmission documents (referenced in Directives 2A-2D) are "identified,
8 accessed, and retrieved efficiently and promptly." In addition to this
9 directive, CPUC's Legal Division has asked PG&E for a description of the
10 location and retrievability of PG&E's gas transmission records.

11 Historically, PG&E has made pragmatic recordkeeping choices aimed at
12 making important gas safety records available to those who used them:
13 maintenance personnel working with the pipe in the field, operators
14 monitoring the flow of gas at a load center or in a gas control room, and gas
15 pipeline engineers constructing new pipelines or managing or improving
16 existing ones.

17 Many records have been stored in local divisions and districts because
18 that is where the work is done. Local maintenance personnel have
19 generally needed records to perform specific tasks, *e.g.*, to repair a valve.
20 In contrast, gas operations personnel rely on system-wide operational data,
21 such as real time compressor and regulator station data, but generally do
22 not need detailed information about pipe specifications or maintenance
23 history. The needs of gas pipeline engineers straddle those of maintenance
24 and operations. Engineers need access to system-wide databases to
25 quickly orient themselves when problem solving or when defining the scope
26 of an engineering task, and they need access to more detailed pipeline
27 records when performing underlying engineering projects. PG&E's
28 recordkeeping practices have attempted to provide these engineers with
29 ready access to summary data (Pipeline Survey Sheets, and later, GIS
30 applications) as well as access to detailed, source data contained in pipeline
31 job files.

1 Some pipeline records are kept longer than others, and some are kept in
2 different forms (*e.g.*, source versus summary form, paper versus microfilm or
3 electronic form). Source and summary paper and other hardcopy records
4 have generally proven durable and reliable when completed properly, and
5 remain part of PG&E's recordkeeping practices.⁴ However, PG&E, like
6 many other operators in the U.S., has had to confront the problem of
7 physically storing hardcopy records. See Chapter 2B. Over time, PG&E's
8 business has grown and evolved, and the locations where it conducts
9 business have changed and multiplied. As PG&E relocated and
10 reorganized business units and groups, PG&E moved records from one
11 location to another. At the time of those moves, PG&E personnel made
12 decisions to retain some records and discard others. Those decisions as to
13 which records were necessary to keep, and which could be discarded based
14 upon regulations at the time, were influenced by operational needs, storage
15 availability and cost, engineering judgment, and recordkeeping
16 requirements. In some cases, particularly during the course of relocations
17 or business reorganizations, valuable records had the potential to be lost or
18 discarded. Anecdotal information, coupled with some record gaps, suggest
19 that over the 55 year period covered by the OII, some data were lost,
20 transferred to another form, or discarded.

21 Electronic recordkeeping may improve (and at times has improved) the
22 retrievability of source and summary data. However, here too there can be
23 a trade off. With the adoption of each data management improvement

⁴ Everyone is familiar with the power and versatility of modern computer systems. Today's powerful information technology, however, was not available when PG&E first began installing gas transmission pipeline, or even in the 1950s through 1960s, when its gas transmission system expanded dramatically to meet the needs of California's growing population. Thus, in the early years, PG&E's gas transmission recordkeeping was almost entirely paper (or at least hardcopy) based. Job files existed in hardcopy format, as did, *e.g.*, leak logs, leak repair forms, valve maintenance records, and operating pressure records. These practices were consistent with those of the industry, as explained by Mr. Ondak in Chapter 2B. Even today, computers and electronic records have not completely replaced paper records for all purposes.

1 comes the risk that data may be left behind or mis-entered in the migration
2 process (either through human translation error or through software or
3 version transitions). Compatibility issues during the migration process from
4 one information format to another can also present obstacles. A challenge
5 for PG&E (and for other operators) has been to anticipate the information
6 that will be important in the future and to ensure that that information
7 migrates to new electronic management systems in a durable, reliable, and
8 retrievable form.

9 Changes to pipeline safety rules have also altered how pipeline records
10 are used, in ways that have strained existing record management and data
11 retrieval systems. As discussed in Chapter 2B, pipeline safety rules have
12 never given much attention to an individual operator's overall recordkeeping
13 procedures. They have generally mandated that records be maintained,
14 and for how long, but without specific guidance as to how records should be
15 maintained. In contrast, these same pipeline safety rules have made
16 sweeping changes to pipeline transmission safety practices, culminating in
17 the adoption of Transmission Integrity Management Program (TIMP) rules in
18 December 2003 (PHMSA subpart O), effective in 2004. With the benefit of
19 hindsight, it can now be seen that TIMP fundamentally changed how PG&E
20 and other operators need to use their pipeline safety records. The change
21 can be summarized this way: Once pipeline operators maintained records
22 so they were available for use in response to a specific event, such as the
23 need to repair or replace a section of pipe. But pipeline operators now also
24 maintain records as part of a proactive effort to manage the integrity of an
25 entire pipeline system. The shift is from a reactive and static records
26 management system to a proactive and dynamic one. TIMP rules created
27 new demands for accessing, reviewing and integrating historical pipeline
28 information and records, in ways that existing recordkeeping systems and
29 practices were neither designed nor intended to address.

30 PG&E began putting in place more sophisticated records management
31 systems before TIMP. PG&E realizes, however, that it needs to do more to
32 improve its records management practices to support modern pipeline

1 safety practices. It needs to work harder to ensure the durability and
2 reliability of records over time, and it needs to implement records
3 management tools that promote wider and quicker access to, and integrated
4 analysis of, reliable pipeline safety data.

5 The historical developments in PG&E's gas transmission safety
6 recordkeeping, which reflect the general themes identified above, are
7 summarized in the following Table 2A-2.

**TABLE 2A-2
PACIFIC GAS AND ELECTRIC COMPANY
PG&E GAS TRANSMISSION RECORDS EVOLUTION, 1955-2010**

Date	Development	PG&E Organizational Status or Changes	Record Status
1955	Beginning of the relevant time period for the Oil	<p>Most gas transmission engineering (esp. large-scale projects) is centralized in PG&E's San Francisco headquarters</p> <p>Maintenance and construction work is largely done out of field offices</p> <p>Operations work is performed in System Gas Control and in approximately 10 manned "load centers"</p>	<p>Records are maintained in hardcopy format</p> <p>Records search, access, and retrieval functions are necessarily constrained by technological and geographic limitations</p>
1961	GO-112 takes effect; GO-112 requires pressure test information to be kept, on a going-forward basis, for life of facility	Same as above	Records maintained in hard copy format
1968-1969	PG&E creates Pipeline Survey Sheets (PLSSs) that provide in summary form data about pipeline characteristics	Same as above	<p>PLSSs are created and maintained centrally in hardcopy format, and copies are distributed among PG&E local offices</p> <p>Redline updates done in local offices</p>
<u>Late 1960s to early 1990s</u>	<u>Company vital records, including pipeline drawings and other engineering records are backed up on aperture cards</u>	<u>Same as above</u>	<u>Approximately once a year in the 1980s and early 1990s, Gas Design Drafting group delivered a set of aperture cards to Bayshore Records facility. Aperture cards were</u>

Date	Development	PG&E Organizational Status or Changes	Record Status
			<u>then periodically transported to Haas Power Plant where they were stored in a Vital Records Center</u>
1970	PHMSA regulations adopted and incorporated into GO-112-C. PHMSA regulations adopt additional recordkeeping requirements, including requirements for "grandfathered" pipe	Same as above	Records continue to be maintained in hardcopy format only
Early 1970s	PG&E develops a mainframe computer system for gas leaks	Same as above	Leak Repair Forms continue to be maintained in hardcopy format, and are the source documents for leak information, but leak repair information is keypunched into the mainframe system. The system enhances archiving capabilities
1980	Operational records are moved from 29 th floor of 77 Beale Street, San Francisco to Walnut Creek	Pipeline Operations Headquarters moves out of San Francisco, separating engineering from operations	Records continue to be maintained in hardcopy format. Operations' central library relocates to Walnut Creek Moves require recordkeeping decisions to be made, based on current operational needs, engineering judgment, and recordkeeping requirements
1985	Record storage locations change	Engineering Records Unit moves offices	Engineering Records relocates from 77 Beale to 123 Mission Street (San Francisco) Moves require recordkeeping decisions to be made, based

Date	Development	PG&E Organizational Status or Changes	Record Status
			on current operational needs, engineering judgment, and recordkeeping requirements
1984-1988	PG&E implements Supervisory Control and Data Acquisition (SCADA) system	SCADA allows centralized control and monitoring of the gas transmission system, and leads to the gradual elimination of continuous staffing of manned "load centers" and stations	Real-time operations records (pressures, valve settings, etc.) begin to be maintained electronically in the SCADA system
1986-1987	PG&E reorganizes its gas organization and reassigns non-backbone transmission design and construction accountability to the local offices	In a corporate reorganization, local gas transmission engineering work is decentralized. Engineering on the numbered transmission lines (the transmission backbone) continues to be performed centrally	<p>Certain local transmission design basis records and plat sheets are increasingly housed in local divisions to facilitate use by local engineers. They continue to exist in hardcopy format</p> <p>Some records no longer managed and updated centrally</p>
<u>1986</u>	<u>The Napa Service Center Floods as a result of the Napa River overflowing</u>	<u>N/A</u>	<u>Some records are damaged or go missing as a result of the flood.</u>
1987	Creation of the "PC Leaks" computer system to capture leak information from Leak Repair Forms	Same as above	Hardcopy Leak Repair Forms continue to be the source record for leak information, but the new computer system allows access to electronic summary Leak Repair Form data

Date	Development	PG&E Organizational Status or Changes	Record Status
1989	Loma Prieta earthquake; storage at Potrero Power Plant ("Sugar House") no longer viable. Record storage locations change	N/A	Records moved from Sugar House to PSEA Clubhouse (at Potrero Power Plant) Moves require recordkeeping decisions to be made, based on current operational needs, engineering judgment, and recordkeeping requirements
1989-1992	PSEA Clubhouse flooded; some records water damaged. Record storage locations change	N/A	Records moved from PSEA Clubhouse to Bayshore/Geneva facility Moves require recordkeeping decisions to be made, based on current operational needs, engineering judgment, and recordkeeping requirements
1994	Began consolidation of Gas Control	PG&E consolidates 10 field control centers to 4 terminals	Some records moved from 10 field locations to the 4 terminals; some records moved to central record storage; some records no longer required to be retained are discarded
1993-1994	Workforce Reduction effort	Records and Information Coordinator function eliminated	Some records no longer managed and updated centrally
<u>1994</u>	<u>Aperture cards previously stored at Vital Records Center within the Haas Power Plant are transferred back to Bayshore Records Center</u>	<u>N/A</u>	<u>Aperture cards remain at Bayshore Records Center until they are removed and scanned in August 2011</u>
1994-1995	PG&E begins development of a Geographic Information System (GIS) for its gas transmission	N/A	GIS is a useful summary of, or portal to, transmission

Date	Development	PG&E Organizational Status or Changes	Record Status
	pipelines		<p>pipeline information. Design and engineering records continue to be the source record</p> <p>PG&E stops updating former hard copy PLSSs with the adoption of GIS, which causes the hard copy PLSSs to become obsolete</p>
1995-1996	Some gas engineering documents in San Francisco relocated to Walnut Creek	Centralized Gas Transmission Engineering is relocated to Walnut Creek	<p>Records are moved from San Francisco (123 Mission) to Walnut Creek and to PG&E's Bayshore storage facility; some remain in San Francisco</p> <p>Some records previously stored at Bayshore (such as GM records) are transferred to Walnut Creek</p> <p>Some other job files (e.g., at some stations) are consolidated in Walnut Creek</p> <p>Moves require recordkeeping decisions to be made, based on current operational needs, engineering judgment, and recordkeeping requirements</p> <p>Some pipeline records were misplaced or discarded in and around this time frame</p>
1999	Creation of the Integrated Gas Information System (IGIS) as a result of efforts by the Gas Leaks and Records Subcommittee, a partnership of management,	Decentralized engineering of local transmission jobs continues	Hardcopy "A" Forms continue to be the source document for leak information, but IGIS

Date	Development	PG&E Organizational Status or Changes	Record Status
	IBEW, and ESC employees		allows improved, enterprise-wide access to leak information. Some PC Leaks data are migrated and some are archived in legacy systems
2001	Record storage locations change	Transmission engineering work continues to be divided between the centralized Gas Transmission Engineering (larger jobs) and the local divisions (smaller, local transmission jobs)	Records stored in several locations in Walnut Creek are consolidated into one Walnut Creek location
2003	PHMSA adopts Integrity Management regulations (49 C.F.R. Part 192, Subpart O)	Existing risk management organization begins to incorporate Integrity Management requirements	Integrity Management does not fundamentally alter the types of records stored, but it increases the need to obtain relevant information

1 **2. Overview of the Records Generated From Gas Transmission**
2 **Activities (as of August 2010)**

3 PG&E here addresses its current (as of August 2010) gas transmission
4 safety records and recordkeeping.⁵ Below is a table of the activities PG&E
5 performs on its gas transmission lines and a summary of the records that
6 PG&E generates from those activities. The table summarizes, among other
7 things, the type of record, its function and location, and who accesses the
8 record and for what purpose and in what manner. In response to the
9 CPUC's Legal Division's request, PG&E has organized this response to
10 generally correspond to the categories of documents identified by Legal
11 Division in its June 3 PHC statement.

⁵ Through PG&E's MAOP Validation effort, PG&E has gathered a significant portion of its design and construction records to a central location for purposes of validating MAOP on its HCA pipelines. In Phase 3 of the MAOP Validation effort, PG&E intends to gather the same information associated with its non-HCA pipelines to perform the MAOP calculation. That effort will continue into next year. Given this effort, many of PG&E's job files have moved during the records collection activities associated with the MAOP Validation effort.

**TABLE 2A-3
PACIFIC GAS AND ELECTRIC COMPANY
RECORD TYPES CREATED IN CONNECTION WITH GAS TRANSMISSION ACTIVITIES, AS OF AUGUST 2010⁶**

Record Type	Is Record PG&E's Source Record?	Information in Record Contained in Summary Record/Analytic Tool?	Purpose of Record	Record Location	Typically Accessed By	Typically Accessed For	How Accessed	Relation to GIS
Records Associated with Design and Construction of Gas Transmission Pipelines⁷								
"Job files" components: Design drawings* Engineering calculations and certifications Job estimates Bills of materials Accounting documents Pressure test documents Weld inspection reports Information on pipe covering or coating, or cathodic protection	Yes	Plat maps Pipeline Survey Sheets (PLSSs) Geographic Information System (GIS) (Map Guide/Gas Map/Gas View) EDMS Applications: ELS IBM DB2 FileNet Aperature Cards	To record original and as-built design and construction data concerning gas transmission pipelines	Created at engineering location, maintained at job site during construction, and archived centrally in Walnut Creek, in records storage in Bayshore facility, in the local offices, and in Pipeline Engineer files	Engineers Estimators Construction personnel Mappers Integrity Management Project Managers Records Personnel	In-Line Inspection (ILI) assessment External Corrosion Direct Assessment (ECDA) Uprating of pipelines Greenfield or Brownfield planning Construction projects To perform threat assessment for integrity management using historical data MAOP validation	Through retrieval of hardcopy files facilitated by Walnut Creek Central Records personnel Certain station and pipeline drawings can be retrieved using Engineering Library Search (E.L.S) and/or modified using IBM DB2 (vectorized drawing repository for Gas Transmission)	Job file numbers are associated with GIS pipeline segments. This association enables personnel to view a transmission pipeline segment, identify the associated job file numbers, and retrieve the original job files

⁶ Table 2A-3 covers the general record types created in connection with gas transmission activities. Where there is no primary record, the Table displays summary record/analytical tool function and related information.

⁷ This group of records generally corresponds to "As-built drawings (final and red-line), documents, and photos" and "pipeline specifications" in Legal Division's PHC statement.

Record Type	Is Record PG&E's Source Record?	Information in Record Contained in Summary Record/Analytic Tool?	Purpose of Record	Record Location	Typically Accessed By	Typically Accessed For	How Accessed	Relation to GIS
<p>system (if installed as part of job)</p> <p>Original design class location</p> <p>Manufacturing mill test records (for large jobs)</p> <p>Construction standards and specifications (for contractors)</p> <p>Permitting and environmental records</p>								
Welding personnel qualification records	Yes (hard copy)	Welder Qualifications Database (MS Access)	To record PHMSA subpart (E) welding personnel qualification information	Maintained in PG&E's San Ramon offices by the System Support Process Group	Division and district supervisors and superintendents Transmission Specialists	To monitor and verify qualification of welders	Through an electronic tracking system or hard copy	Not related
MAOP List	Yes	No	To record and update MAOP and MOP and future design pressure information for gas transmission lines	Maintained in PG&E's Walnut Creek offices	<p>Risk and integrity management personnel</p> <p>Pipeline Engineers (PLEs)</p> <p>Other engineers</p> <p>Gas system operators</p> <p>Mappers</p> <p>Estimators</p> <p>Design drafters</p>	<p>To safely operate the transmission system</p> <p>Risk and integrity management and system planning purposes</p>	In hardcopy format and electronically on a shared drive	There is no link between the MAOP list and GIS. The GIS MAOP information is listed by segment, rather than by pipeline

Record Type	Is Record PG&E's Source Record?	Information in Record Contained in Summary Record/Analytic Tool?	Purpose of Record	Record Location	Typically Accessed By	Typically Accessed For	How Accessed	Relation to GIS
Records Associated with Operation of Gas Transmission Pipelines ⁸								
Supervisory Control and Data Acquisition (SCADA) records	Yes	<u>No</u> Citect (SCADA software application)	To remotely monitor and/or control major transmission stations and other gas pipeline equipment in real time <u>To access historical SCADA data to support engineering and operations analysis</u>	System Gas Control	Gas Control, gas technicians, maintenance and construction personnel, and engineers Design engineers Mappers Estimators Historical SCADA data are used by gas engineers and gas planners Historical data are also used by Integrity Management	To operate gas pipelines in real time In connection with maintenance work To plan for infrastructure upgrades To forecast gas inventory needs and reliability impacts To calculate risk for integrity management using historical data To assist with design To assist with technician troubleshooting of equipment	Electronically, including through a secure SCADA Web Server	Began adding SCADA Points into GIS (<u>Map Guide</u>) in 2006
System Gas Control Room logs	Yes	No	To record operations or actions taken by System Gas Control	System Gas Control	System Gas Control supervisors	To conduct Gas Control operations For incident investigations and root cause analyses	Electronically	Not related
Clearance records	Yes	No	To ensure the safety of the general public, company personnel,	For clearances that have the potential to affect the overall gas transmission system, clearance forms	Gas technicians and maintenance personnel System Gas Control Transmission and	For safe execution of transmission work	Electronically in Gas Control, in hardcopy format locally	Not related

⁸ This group of records generally corresponds to “operating history of the pipe” in Legal Division’s PHC statement.

Record Type	Is Record PG&E's Source Record?	Information in Record Contained in Summary Record/Analytic Tool?	Purpose of Record	Record Location	Typically Accessed By	Typically Accessed For	How Accessed	Relation to GIS
			and pipeline assets during work that will affect pressure, the flow of gas, and/or the quality of the line, or the ability to monitor these factors	are sent to System Gas Control and also maintained locally For other clearances, clearance forms are maintained locally	Regulation (T&R) personnel			
Current class location and HCA records	Yes	Yes	To record current class location and HCA information	GIS	PLEs and other engineers Integrity Management Maintenance schedulers Mappers	In connection with repair or replacement work In connection with PG&E's Integrity Management Program	GIS	GIS is used as the source record
USA one-call tickets	Yes	Yes	To record information from third parties through the USA one-call number	Maintained electronically in the IRTNet system	Mark and Locate personnel PLEs Damage Prevention personnel Damage prevention process owner (Integrity Management Department)	To perform Mark and Locate work To monitor anything out of the ordinary on a pipeline To identify construction areas and construction activities in connection with risk assessment To assess effectiveness of Damage Prevention program	Electronically through IRTNet	Not related

Record Type	Is Record PG&E's Source Record?	Information in Record Contained in Summary Record/Analytic Tool?	Purpose of Record	Record Location	Typically Accessed By	Typically Accessed For	How Accessed	Relation to GIS
Station and Operating Maps & Diagrams	No	Operating Maps & Diagrams are summary tools SCADA	To display station and piping configuration	System Gas Control Gas transmission compressor and regulator stations and terminals Local districts and divisions Gas Transmission Mapping Walnut Creek Records Center	System Gas Control Operators Maintenance personnel Engineers Mappers	To operate stations and valves To process clearances To conduct maintenance activities Design modifications	Electronically in System Gas Control Electronically in Gas Transmission Mapping In hardcopy format in the local divisions and districts, Mapping and Walnut Creek Records Center Available to PG&E employees via Intranet	Links to E-file are contained in GIS
Station Equipment Manuals	Yes	No	Manufacturer instructions for operation and maintenance of equipment	Compressor and regulator stations and terminals Walnut Creek Engineering Records	Maintenance personnel Station engineers Transmission Specialists	To operate and maintain equipment	In hardcopy format	Not related
Corrosion Control Records	Yes	SAP and PipeLine Maintenance (PLM) program	To measure and monitor the performance of cathodic protection systems	For backbone transmission pipelines maintained by districts, data are entered directly into PLM database For local transmission lines, data are maintained in local divisions in	Corrosion mechanics and technicians Transmission and Regulation (T&R) supervisors and district superintendents Corrosion engineers Integrity	To monitor cathodic protection systems Used in Integrity Management to aid in assessing the condition of the pipe, and to validate assessments	Through PLM in the transmission districts In hardcopy format (CPA files) in divisions unless division has transitioned to SAP	Not related

Record Type	Is Record PG&E's Source Record?	Information in Record Contained in Summary Record/Analytic Tool?	Purpose of Record	Record Location	Typically Accessed By	Typically Accessed For	How Accessed	Relation to GIS
				Cathodic Protection Area (CPA) files, arranged geographically	Management engineers (ECDA and ILI groups in particular) Corrosion Control process owner (Integrity Management Department)			
Records Associated with Maintenance of Gas Transmission Pipelines⁹								
Leak repair records ("A Forms")	Yes	Integrated Gas Information System (IGIS) PC Leaks legacy system (contains historic data) Selected fields from the A form are manually recorded on leak log	To record information regarding leaks and leak repairs To record information regarding the condition of pipeline that is exposed (e.g., when a leak repair is made)	A Forms are stored in the divisions, typically organized by map number / plat number / block number For backbone transmission pipe, A forms are forwarded to Gas Transmission mapping for input into IGIS/GIS For Local Transmission pipe, A Form information is recorded in IGIS by local mappers and input into GIS by Gas Transmission Mappers	Maintenance personnel Engineers Integrity Management Mappers Regulatory Support & Analysis personnel Leak process owner (Integrity Management Department)	To perform maintenance work To conduct leak repairs To calculate risk for integrity management using historical data	In hardcopy format in the divisions and districts Electronically through the IGIS system Selected data are available electronically through GIS system	Selected data from A Forms are manually entered into GIS by mappers.

⁹ This group of records generally corresponds to "maintenance and repair history" in Legal Division's PHC statement.

Record Type	Is Record PG&E's Source Record?	Information in Record Contained in Summary Record/Analytic Tool?	Purpose of Record	Record Location	Typically Accessed By	Typically Accessed For	How Accessed	Relation to GIS
				A Form may reside in job file if created in connection with a specific project				
Leak logs	Yes	Information from leak log is entered into IGIS, which initiates further action	To record information on leaks and potential leaks observed during a leak survey	For local transmission, leak logs are maintained in local division offices	Maintenance personnel (leak surveyors) Maintenance supervisors and superintendents	To perform and track leak survey work	In hardcopy format in the divisions	Leak log information is input into IGIS, and key data are periodically transferred to GIS
Valve and regulator maintenance records	Yes	Transmission records are summarized in PLM Local transmission records are summarized in Gas Facility Maintenance (Gas FM) program	To record manufacturer specification information, serial numbers, and to document that maintenance work is performed according to maintenance schedules and intervals	Backbone transmission records are located in transmission districts Local transmission records are located in local division offices	Maintenance field and supervisory personnel Valve and Regulator process owner (Integrity Management Department) Operations Specialists Local engineers	In connection with maintenance work and for audit and compliance	In hardcopy format Summary information accessed through PLM and/or Gas FM	Not related
Patrol records	Yes	None	To document patrols of pipelines and the findings	For backbone transmission the patrol records are located in the transmission districts	Mappers Maintenance personnel PLEs Integrity	To ensure the integrity and safe operation of the pipeline	In hardcopy format	Not related

Record Type	Is Record PG&E's Source Record?	Information in Record Contained in Summary Record/Analytic Tool?	Purpose of Record	Record Location	Typically Accessed By	Typically Accessed For	How Accessed	Relation to GIS
				For local transmission the patrol records are located in the local division offices Aerial patrol schedules are maintained in PG&E's Walnut Creek offices	Management			
Operator qualification (OQ) records	Yes	Selected fields entered into OQ Database	To record personnel qualification information consistent with regulatory standards in PHMSA Subpart N	Created by OQ evaluator, the original is transmitted to PG&E's San Ramon facility where it is entered into the OQ database and a copy is kept by the local evaluator	Front-line supervisors OQ process owner (Integrity Management Department) Qualified employees PG&E Academy personnel	To ensure the qualification of pipeline personnel and to document regulatory compliance	In hardcopy format and in OQ database	Not related
Records Associated with Integrity Management of Gas Transmission Pipelines¹⁰								
Documents associated with Risk Management Procedure (RMP) compliance, including: ECDA findings SCDA findings	Yes (for integrity management purposes)	LTIMP summary	To conduct PG&E's Integrity Management analyses and to promote pipeline safety and integrity	PG&E's Walnut Creek offices	Integrity Management personnel Pipeline engineers	To conduct PG&E's Integrity Management Program To ensure a safe and reliable gas transmission system To provide background information in connection	In hardcopy format and electronically on shared drives	Not directly related, however the integrity management process may help to validate data

¹⁰ This group of records generally corresponds to "risk assessments" in Legal Division's PHC statement.

Record Type	Is Record PG&E's Source Record?	Information in Record Contained in Summary Record/Analytic Tool?	Purpose of Record	Record Location	Typically Accessed By	Typically Accessed For	How Accessed	Relation to GIS
ILI findings						with project development, design and construction		
Risk committee notes								
Risk rankings								
Other pipeline assessment records								

1 Table 2A-3 distinguishes between source records and summary records
2 or analytical tools. For example, job files are the original source records for
3 design and engineering data for gas transmission pipelines. PG&E's
4 Geographic Information System (GIS) is an electronic tool that contains,
5 among other things, design and construction data, including data drawn
6 from job files. The GIS design and construction data are stored in electronic
7 form and can be accessed virtually instantaneously by gas personnel. GIS
8 assists pipeline engineers and other personnel to access pipeline data.¹¹

9 For example in the case of a Pipeline Engineer (PLE) consulting GIS,
10 the tool is a "portal" to some of the underlying source records and
11 information, and can help orient the PLE. The PLE may find all the
12 information he or she needs by consulting GIS, or the PLE may also need to
13 consult job files for additional, or more detailed, design and construction
14 information (for example in connection with performing an In-Line
15 Inspection). In other cases, all the relevant information from paper records
16 (for example, "A" Forms used to record leaks) is input into an electronic
17 system (IGIS), which is accessible system-wide.

18 However, even in cases where an electronic system is populated with all
19 data from hardcopy files, the hardcopy files remain the source record for
20 most purposes. By source record, PG&E means the record that captures
21 original information. GIS is generally not a source record; it presents data
22 for summary purposes or for use as an analytic tool. There are two primary
23 instances where electronic data systems have emerged as source records:
24 the IRTHNet system, which is used to access USA one-call ticket
25 information, and GIS itself – but only to the limited extent that GIS is used (i)

11 One advantage of PG&E's GIS is that it is searchable electronically, allowing gas pipeline information to be efficiently identified, accessed and retrieved by PG&E's pipeline engineers and other personnel regardless of their office location. The gas transmission GIS contains data for pipelines (pipe design characteristics), stations, and main line valves, and also provides links to pipeline operating maps and facility operating diagrams. Over several hundred types of data are tracked in one or more of the layers of GIS. GIS contains information about each of the approximately 20,000 unique pipeline segments that comprise PG&E's gas transmission system.

1 to calculate High Consequence Areas (HCAs) (geographic areas) and (ii) to
2 prepare pipeline risk rankings for integrity management purposes.

3 In cases where job files need to be retrieved, GIS also facilitates that
4 retrieval, because job file numbers are linked in GIS to pipeline segments.

5 Figure 2A-1 is a simplified flowchart that illustrates how GIS can be used for
6 this purpose.

**FIGURE 2A-1
PACIFIC GAS AND ELECTRIC COMPANY
ACCESSING JOB FILES ASSOCIATED WITH A PARTICULAR GAS TRANSMISSION PIPELINE
SEGMENT**



7
8 A more detailed schematic of how GIS facilitates job file access and
9 retrieval, and how PG&E manages its recordkeeping and information flow in
10 connection with new gas transmission pipeline projects, can be found in
11 Attachment P2-1457 (Gas T&D Custom Pipeline Design Process Map
12 (Level 3) [Applicable to Capital Projects > \$1.0 million]).

13 The Electronic Document Management Systems organization
14 manages a suite of software applications used by PG&E personnel. One
15 application is the Electronic Library Search (ELS). ELS allows any PG&E
16 employee with access to the PG&E intranet to pull the latest version of a
17 drawing for Stations, as well as the archived Pipeline drawings prior to the
18 existence of GIS (Plat Sheets, Construction drawings, Plan and Profile
19 drawings, etc.). Another tool is the IBM DB2 Station Drawing Repository.
20 IBM DB2 contains the vectorized (CAD) files that are utilized to create the
21 construction drawings for issuance to the field. IBM DB2 has revision
22 controls, Check In/Check Out controls, and archival functionality. In

1 contrast, the drawings in ELS are a non-editable read-only file of the
2 vectorized drawings located in IBM DB2.

3 Finally, Table 2A-3 provides some detail about PG&E's gas
4 transmission analysis tools, most particularly about GIS. There are several
5 electronic data management tools used by PG&E. IGIS is the enterprise-
6 wide computer system used by PG&E to track leaks and leak information. A
7 Form (leak) information is input into the IGIS system for the purpose of
8 scheduling and tracking leak repairs. IGIS' historical development is
9 described above in Table 2A-2. PLM is the PipeLine Maintenance program.
10 It is used by PG&E's gas transmission group to schedule and track
11 maintenance work on gas transmission pipelines. Gas FM is the Gas
12 Facility Maintenance program. It is used to schedule and track distribution
13 and local transmission pipeline maintenance work. Finally, SAP (a third
14 party software product) is an asset management system utilized by PG&E.
15 Among other things, it issues "tickets" for certain local transmission pipeline
16 maintenance work, and records certain information concerning the
17 maintenance that needs to be performed.

18 **E. Conclusion**

19 As illustrated above in Tables 2A-2 and 2A-3, PG&E's recordkeeping and
20 retrieval capabilities have significantly evolved over the past 55 years,
21 responding to changing operational needs, engineering judgment, and
22 recordkeeping requirements. PG&E's current recordkeeping and retrieval
23 systems need to be improved in order to more comprehensively and effectively
24 evaluate the integrity of our gas transmission pipelines, as contemplated by the
25 Integrity Management Requirements in Subpart O. PG&E is committed to this
26 improvement, and has begun to implement an improved GIS system.

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 7
PRE-SERVICE AND IN-SERVICE PIPE
WELD DEFECTS AND FAILURES

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 7
PRE-SERVICE AND IN-SERVICE PIPE WELD DEFECTS AND FAILURES

TABLE OF CONTENTS

A. Introduction.....	7-1
B. Responsive Records Produced by PG&E.....	7-1
1. Defining “Pipe Weld Defects and Failures”.....	7-1
2. Pre-Service Weld Defect and Failure Records are Almost Entirely Related to Girth Welds. All Defects and Failures are Repaired or Replaced Before the Pipe is Placed into Service.....	7-3
a. Circumstances of Weld Defects and Failures and Corresponding Records.	7-3
b. Ancillary Pre-Service Weld Defect and Failure Records.....	7-4
3. In-Service Weld Defects and Failures.....	7-5
a. Circumstances of Weld Defects and Failures and Corresponding Records.	7-5
b. Ancillary In-service Pipe Weld Defect and Failure Records.....	7-7
1. Integrity Management Assessments.....	7-7
2. Failure Analysis Reports from PG&E’s Applied Technology Services Group.	7-8
3. Material Problem Reports.....	7-8
4. Additional Records.....	7-9
5. Subsequent Productions.....	7-9

PACIFIC GAS AND ELECTRIC COMPANY
CHAPTER 7
PRE-SERVICE AND IN-SERVICE PIPE WELD DEFECTS AND
FAILURES

A. Introduction

The Commission seeks to ascertain whether PG&E kept and maintained records of gas pipe weld failures or defects found before or after use between 1955 and September 2010 for approximately 5,800 miles of PG&E's DOT-defined natural gas transmission pipe. Additionally, the Commission directs PG&E to "identify the date and circumstances of the failures or defects, and provide all documents and data that pertain to such failures or defects." OII, p.19.

While PG&E maintains such records, what the OII directs is different from PG&E's ordinary use of these records. PG&E may use some of these records for integrity management or other pipeline engineering or maintenance purposes, but it does not generally need to use records dating back 55 years, and it never needs to work with all the records on all approximately 5,800 miles of pipeline at the same time. These records are generally accessed on an as-needed basis by personnel at various locations who perform engineering or maintenance work on the pipeline.

B. Responsive Records Produced by PG&E

1. Defining "Pipe Weld Defects and Failures".

Directive 7 of the OII asks for records of all "pipe" weld defects and failures. This language departs from other parts of the OII which seek records for "pipeline" (Directive 3). For purposes of responding to Directive 7 of the OII, PG&E initially conducted exhaustive searches of its records for weld defects and failures on gas transmission "pipe" as it is defined in federal regulations ("any pipe or tubing used in the transportation of gas, including pipe-type holders.") See 49 C.F.R. § 192.3 (definition of "pipe"). On June 8, 2011, after PG&E had gathered, collected, and reviewed more than 500,000 documents, and had isolated those records relating to pipe

weld defects and failures on federally-defined “pipe,” the definition of records responsive to Directive 7 was expanded to include “pipe, valves, and other appurtenances attached to pipe, compressor units, metering stations, regulator stations, deliver[y] stations, holders, and fabricated assemblies.” Ruling Granting Motion for Extension of Time, pp. 4-5, June 8, 2011.

This expansion of the scope of responsive documents did not leave enough time for PG&E to conduct and complete a second review of its records to locate weld defects and failures on “pipeline,” rather than only on “pipe.” Accompanying this testimony, PG&E is providing records of weld defects and failures on “pipe,” as well as those records of weld defects and failures on “pipeline” it could identify following the June 8 ruling. PG&E will provide additional records of weld defects and failures found on valves, compressor units, metering stations, regulator stations, delivery stations, holders, fabricated assemblies, and other appurtenances attached to the pipe on a rolling basis, but in no event later than September 30, 2011.

PG&E understands “weld” as used in the OII to mean both longitudinal seam welds and girth welds.

PG&E understands “defect” to mean the following: For pre-service weld defects, the term “defect” means any weld that did not meet standards of acceptability set forth in state and federal regulations. For in-service weld defects, the term “defect” means any pipe weld that results in repair or replacement of the pipe.

PG&E understands “failure” to mean the following: For pre-service weld failures, “failure” means any weld that leaked or ruptured during strength testing. For post-service weld failures, “failure” means any pipe weld that results in the release of gas.

PG&E refers to defects and failures discovered before a pipe is placed into service as “pre-service” in this document.

PG&E refers to defects and failures discovered after a pipe is placed into service” as in-service” in this document.

2. Pre-Service Weld Defect and Failure Records are Almost Entirely Related to Girth Welds. All Defects and Failures are Repaired or Replaced Before the Pipe is Placed into Service.

The overwhelming majority of the records produced for pre-service weld defects and failures are found during x-ray inspections of girth welds conducted during an initial construction or repair project. Both girth weld and long seam weld defects and failures discovered during pre-service testing and inspection are repaired to meet regulatory standards or replaced altogether pursuant to PG&E standard practices and government regulations. Thus, records of pre-service defects and failures reflect successful pipeline quality assurance.

a. Circumstances of Weld Defects and Failures and Corresponding Records.

Over the last 55 years, PG&E has generally conducted two types of tests designed to identify weld defects before putting pipe into service.¹ First, PG&E has inspected girth welds using x-ray, visual, ultrasonic, and magnetic particle imaging as appropriate to determine whether welds meet regulatory standards.² Second, PG&E has performed pressure tests. Where these tests are performed, PG&E's practice has been to maintain records of pipeline weld inspections ("X-Ray documents") and Strength Test Pressure Reports ("STPRs") in Job Files associated with specific pipeline construction and repair projects. As part of PG&E's ongoing effort to validate the MAOP for its gas transmission pipelines, PG&E has collected thousands of Job Files associated with the 1,805 miles of HCA pipe. These files contain over 34,000 X-Ray documents and over 80,000 STPRs.

¹ PG&E also has maintained, for certain of its pipe segments, mill test and inspection reports provided by pipe manufacturers, PG&E supplier quality inspectors, and third party inspectors that contain details and information relating to tests conducted at the mill. These reports may include information relating to defects and failures. An index of mill test and inspection reports indicating defects and/or failures is included as Attachment P7-0001. Responsive mill tests are included as Attachments P7-0002 through P7-~~0046~~.0046, and P7-~~7175~~ through P7- 7181.

² Regulatory requirements for pre-service weld inspections have changed over time. Prior to General Order 112 (1961), there were no regulatory requirements to inspect girth welds. General Order 112 called for natural gas utilities to inspect 30% of welds in Class 3 and 4 locations, and 20% of Class 1 and 2 location welds. General Order 112-C (1971) increased these percentages to 100% for Class 3 and 4 locations where practicable, but in no case less than 90%.

PG&E has reviewed each of these documents (as well as nearly 380,000 documents collected by the MAOP effort from Job Files but not yet categorized as any particular type of document) to identify responsive X-Ray documents and STPRs that indicate the discovery of pipe weld defects and failures between 1955 and 2010. These documents relate to the construction of more than 1,800 miles of gas transmission pipeline.

X-Ray documents are most often created by contractors, and contain limited information regarding the circumstances other than the date, results, and PG&E Job File numbers associated with the inspection. PG&E is providing an index of X-Ray documents that indicate pre-service weld defects, and has extracted the date and Job File number associated with the inspection, where available. The index is included as Attachment P7-0047. X-Ray documents relating to the index are included as Attachments P7-0048 through P7-6935.

STPRs may contain information regarding the pre-service failure, such as the date, location, and Job File number associated with the construction job. PG&E is providing an index of STPRs that indicate pre-service weld failures, and has extracted the date and Job File number associated with the test. PG&E has also extracted the line and location of the test, where available. The index is included as Attachment P7-6936. STPRs relating to the index are included as Attachments P7-6937 through P7-6966.

b. Ancillary Pre-Service Weld Defect and Failure Records.

Evidence of pre-service weld defects and failures may exist in other records. PG&E has located and reviewed a population of Construction Inspectors Notes files associated with specific pipeline projects. These files contain observations, forms, progress reports, drawings, and other documents (including X-Ray Documents and STPRs) provided by contractors and/or PG&E inspectors and construction supervisors that relate to the conditions and progression of pipeline construction projects. These Construction Inspectors Notes are not limited to HCA pipe. PG&E has reviewed each of these files, and has identified each file that contains evidence of pre-service pipe weld defects discovered during x-

ray inspection of girth welds (no failures were discovered during hydrotesting in these files). An index of these defects is included as Attachment P7-6967. Construction Inspector's Notes files relating to the index are included as Attachments P7-6968 through P7-7009.

3. In-Service Weld Defects and Failures

a. Circumstances of Weld Defects and Failures and Corresponding Records.

The principal way PG&E identifies weld defects or failures that occur while a pipe is in service is when it detects and repairs a pipe leak. Over the last 55 years, PG&E has documented the discovery and repair of gas leaks on "A-Forms" (previously known as "Leak Test Reports" and "Pipe Shut Down" records). A-Forms have historically called for employees to capture information relating to the source and cause of the leak by entering specific codes on the document. The leak source codes available to employees included girth welds, longitudinal welds, and other welds. Prior to 2008, A-Forms included construction defects and material failures as options for the cause of the leak. In March 2008, PG&E modified the A-Form to enable field employees to record weld failure as the cause of the leak.

i. June 20, 2011 Filing

PG&E maintains A-Forms either in Job Files or in separate files located at approximately 70 of PG&E's local offices. For the June 20, 2011 filing, PG&E has located and reviewed more than 4,500 A-Forms collected from HCA pipe Job Files through the MAOP validation effort. PG&E also maintains two relevant electronic databases that contain leak repair information. The first is PG&E's Integrated Gas Information System ("IGIS"), which includes electronic records of data obtained from A-Forms dating back to the early 1990s. PG&E can query this database for weld-related leaks. The second database is PG&E's Geographic Information System ("GIS"). GIS contains historic leak information derived from pipeline survey sheets. An index of in-service pipe weld defects and failures located in HCA pipe Job File A-Forms, IGIS, and GIS is included as Attachment P7-7010. Corresponding A-Forms and

data from PG&E's electronic databases are included as Attachments P7-7011 through P7-7044.

~~PG&E also had a legacy electronic database that predated IGIS, and contains more detailed information on the source and cause of leaks than GIS. Called "PCLeaks," this legacy database was superseded by IGIS, and has not been in use since the mid-1990s. PG&E is evaluating the leak data in PCLeaks, and will supplement its production if additional responsive information is found.~~

~~PG&E is currently undertaking to collect A-Forms from each of its local offices, and plans to complete collection and review of these documents by September 30, 2011. PG&E will supplement its production with any additional responsive A-Forms.~~

ii. September 30, 2011 Filing

Pursuant to the June 8, 2011 Ruling Granting Extension of Time, PG&E has continued its search of local offices and electronic archives. This effort entailed evaluating data in its legacy electronic database (PCLeaks) and current leak database (IGIS), and conducting A-Form collection efforts in Gas Transmission district offices, Gas Distribution division offices, and Gas Mapping offices. From these efforts, PG&E made two "rolling" productions of A-Forms on July 29 and August 31. With this filing, PG&E is producing additional A-Forms, and filing the two sets of A-Forms from the "rolling" productions. A comprehensive index of the A-Forms produced after June 20, 2011 is included as Attachment P7-7010.³ The A-Forms are included with this filing as Attachments P7-_____7096 through P7-_____7174⁴.

In addition, PG&E identified a number of electronic records of leaks in its databases for which it has not yet been able to locate corresponding A-Forms. These records may be located in Job Files that are scheduled to be collected and reviewed as part of PG&E's ongoing MAOP verification effort. Alternatively, these records may have been incorrectly described or entered as transmission leaks, and therefore the

³ PG&E provided indexes of the A-Forms served on the parties to this proceeding with the two prior "rolling" productions as attachments P7-7095 and P7-7106.

⁴ PG&E notes that in some instances PG&E maintains an electronic record of a leak in PC Leaks or IGIS for which it has not yet been able to locate and confirm a corresponding A form.

hardcopy record was not stored and identified in the same location as transmission leak A-Forms. Finally, a hardcopy A-Form may no longer be available. The electronic records of these weld-related leaks are listed in Attachment P7-7010, beginning at page 4 of 7. PG&E will be in a position to conduct a detailed and comprehensive analysis of the overall population of A-Forms once it has completed its record collection efforts in the MAOP verification effort.

b. Ancillary In-service Pipe Weld Defect and Failure Records.

As with pre-service records, PG&E maintains other records that, while not serving as a primary source of in-service weld defect and failure data, may contain inspection reports that indicate in-service weld defects and failures. These documents include Transmission Integrity Management pipeline assessments, pipe analysis reports conducted by PG&E's Applied Technology Services group, and Material Problem Reports submitted by field employees upon discovery of a pipe weld defect or failure.

1. Integrity Management Assessments.

PG&E conducts Integrity Management assessments of its gas transmission lines to assess risks to the pipelines, including pipe weld defects and failures. These inspections (both in-line inspection and direct assessment) may reveal the presence of pipe weld defects and failures. These assessments have been conducted since ~~2004~~³2004⁵ in compliance with federal regulations implemented at that time. An index of pipe weld defects and failures discovered during Integrity Management assessments is included as Attachment P7-7045. Documents and data corresponding to entries on this index are included as Attachments P7-7046 through P7-7049.

⁵ PG&E conducted some inline inspections prior to enactment of the federal integrity management regulations. Several of the records produced are from one such inspection conducted in 2002. See Attachment No. P7-7046.

2. Failure Analysis Reports from ~~PG&E's Applied Technology Services Group.~~

~~PG&E operates an's gas engineering organization has, depending upon circumstances, conducted failure analysis investigations into gas pipeline incidents, including pipe weld defects and weld failures. The gas engineering group has conducted these investigations internally, and has also used the services of outside vendors and/or a PG&E engineering support services group currently known as Applied Technology Services ("ATS"). This organization has existed since long before 1955, and has performed failure analysis for PG&E's gas and electric operations. ATS's services include testing following the discovery by a field employee of a pipe defect or failure. This testing type of investigation helps to identify the root cause of gas incidents and mitigate the likelihood that such events may occur in the future.~~

An index of pipe weld defects and failures discovered during ~~ATS failure analysis~~ testing is included as Attachment P7-7050. Documents and data corresponding to entries on this index are included as Attachments P7-7051 through P7-~~7089, 7089, and P7-7182 through P7-7190~~.

3. Material Problem Reports.

PG&E's Supplier Quality organization maintains records of Material Problem Reports that may be submitted by field employees upon discovery of equipment or materials that are faulty, that do not meet specifications, or that fail in service. While not intended to be specific records of weld failures or defects, these reports may contain evidence of weld failures and defects. PG&E presently maintains hard copies of Material Problem Reports from 1989-1994, and maintains an electronic database of reports submitted between 1995 and the present day. An index of pipe weld defects and failures indicated on Material Problem Reports is included as Attachment P7-7090. Documents and data corresponding to entries on this index are included as Attachments P7-7091 and P7-7092.

4. Additional Records

PG&E has located additional materials which, while not primary records of pipeline weld defects and failures, are responsive to the Commission's request. Many of these documents are produced in Chapter 6C. An index of additional documents containing evidence of pipe weld defects and failures is included as Attachment P7-7093. Documents and data corresponding to entries on this index are included as Attachment P7-7094.

5. Subsequent Productions

PG&E ~~will produce~~ has produced additional records of pipe weld defects and failures on a rolling basis through September 30, 2011, including defects and failures on "pipeline" that are not produced with this testimony. PG&E ~~will provide supplemental~~ is providing amended indices containing similar details of pipe weld defects and failures where additional records have been located, as well as the additional documents and data corresponding to the defects and failures.