BEFORE THE PUBLIC UTILITIES COMMISSION OF THE

STATE OF 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)

DIRECT TESTIMONY OF

JOHN GAWRONSKI

ON BEHALF OF

THE CITY AND COUNTY OF SAN FRANCISCO

INVESTIGATION 11-02-016

CALIFORNIA PUBLIC UTILITIES COMMISSION

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Q.1 Please state your name and business address.

A.1 My name is John Gawronski. I am a consultant affiliated with the Hudson River Energy Group. My business address is 2079 County Route 47, Salem NY 12865.

Q.2 Please summarize your education and experience.

A.2 I have over 40 years of natural gas pipeline industry expertise in the areas of transmission and distribution pipeline integrity management, pipeline codes and standards, as well as monitoring and regulatory compliance reviews. I hold a BS in Mechanical Engineering and MME in Engineering Management from City College of NY. For the period 1977 – 2003 I was Chief of Investigations for the Gas Division, Chief of Safety and Reliability for the Office of Energy & Water, and later Gas & Water for the New York Public Service Commission, supervising a staff of up to 30 employees including senior supervisory responsibility for staff investigations of significant incidents and accidents, and other unusual events, and serving as a senior technical advisor to the Commission primarily on gas matters. I have reviewed the engineering, asset planning and operations of all major New York combination companies and gas utilities. I have evaluated cast iron and steel pipe replacement programs of utility operators and have participated in Transmission Integrity Management Plan reviews and inspections with the USDOT of transmission pipeline operators.

My resume is included as Exhibit 1.

Q.3 On whose behalf are you testifying in this proceeding?

A.3 I am testifying on behalf of the City and County of San Francisco ("CCSF" or "San Francisco").

Q.4 What is the purpose of your testimony?

A.4 The purpose of this testimony is to identify practices or instances where PG&E's record keeping represents deficient engineering practice that has fostered unsafe PG&E decision making about its transmission lines and how these record keeping practices have interfered with the regulatory process. The Consumer Protection and Safety Division ("CPSD") issued two reports on March 16, 2012. The testimony of Duller and North found "[g]as transmission records and safety related documents were scattered, disorganized, duplicated, and were difficult if not impossible to access in a prompt and efficient manner."[1] The testimony of Margaret Felts addressed how PG&E's record keeping practices affected PG&E's pipeline engineering. My testimony complements these two reports and incorporates by reference my testimony submitted on April 23, 2012 in Investigation ("I.") 12-01-007.

While many violations are framed in terms of failure to comply with federal regulations, the underlying actions also constitute violations of PG&E's obligation to furnish such service "necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public."[2]

Q.5 What materials did you review in preparing this testimony?

A.5 I reviewed the National Transportation Safety Board Report ("NTSB") Accident Report dated August 30, 2011, the Independent Review Panel report dated June 24, 2011, the CPSD Incident Investigation Report into the San Bruno rupture dated January 12, 2012, the CPSD reports issued in CPSD's investigation into PG&E's record keeping practices dated March 12, 2012, PG&E's annual transmission reports to USDOT for 2008 and 2009, PG&E's response to data requests from various parties and other materials made available to the public, and portions of the transcripts from the March 2012 hearings in the gas safety rulemaking.

Q.6 Can you summarize your testimony?

[1] Testimony of Duller and North, at p. 1-10.
[2] Cal. Pub. Util. Code § 451.

A.6 Yes. When the grandfathering provision was enacted in 1970, there was an expectation that pipeline operators would have pressure test records to substantiate their pipelines' historic maximum operating pressure. There was also an understanding that certain levels of safety were being provided by means of class location design factors that limited the maximum pressure based on test pressures and the population density of the route along the pipeline. The Department of Transportation believed operators had a working knowledge of the requirements of the industry safety code ANSI B31.8 applicable to gas pipelines and had applied these requirements to their design, construction and operating practices.

The investigations and rulemaking following the San Bruno pipeline failure have found that numerous records concerning the basis for PG&E's maximum operating pressures and code compliance activities are unaccounted for, misplaced or just missing. For example, pressure test records for many pipelines are missing and instead statements about operating pressures (and not actual test pressure charts and related test pressure or operating pressure documents) form the basis for establishing maximum pressures.

Further, certain records and reports may not have been available for review when important safety evaluations were being made and when safety process steps were being taken. PG&E's record keeping appears to have prevented it from considering relevant weld defect documents in its Transmission Integrity Management Program ("TIMP"). CPSD witness Felts identified how PG&E's poor record keeping contributed to re-used pipe being used for segment 180 of Line 132 and how the grandfathered MAOP for Line 132 was changed based on conflicting records The disorganization identified by CPSD witnesses Duller and North appears to extend to PG&E's organization of the documents governing its TIMP procedures.

Q.7 Do you know why the Commission instituted this investigation?

A.7 This proceeding was opened to “assess PG&E’s compliance with the law pertaining to safety-related record keeping for natural gas transmission pipelines.”[3] The Commission responded to the NTSB’s January 3, 2011 urgent recommendations and inferred that “the state of PG&E’s records regarding critical infrastructure (in particular, its high-pressure gas transmission pipelines) may have been inadequate to make critically important ongoing safety decisions about PG&E’s natural gas transmission pipelines, particularly welded pipelines.”[4] The purpose of this investigation is to determine “whether PG&E’s record keeping represents a deficient engineering practice that has fostered unsafe PG&E decision making about its transmission lines. ... and decide whether PG&E’s record keeping pertaining to its gas transmission lines, including San Bruno, has violated good and accepted engineering standards and practices, and thus whether PG&E violated Section 451 of the Public Utilities Code or other laws and regulations.”[5]

Q.8 How is the grandfathering provision related to record keeping?

A.8 The grandfather provision was introduced when the federal minimum safety regulations were enacted in 1970. The federal register published on August 19, 1970 includes an extensive discussion on the purpose of the grandfathering provision. Initially, the Department of Transportation proposed a rule that would have required MAOP to be determined by the lower of either (1) the design pressure in the weakest element in the pipeline system, or (2) the pressure obtained by dividing the pressure to which the pipeline was tested after construction by the appropriate class location factor.[6] The Department of Transportation, however, recognized “since some pipelines have been operated above 72 percent of specified minimum yield strength (the highest design stress allowed by Part 192) and since many were tested to no more than 50 pounds above

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[3] 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, at p. 1.
[4] *Id.*, at p. 8.
[5] *Id.*
[6] 35 Federal Register 13248 (August 19, 1970) (Exhibit 1).

maximum allowable operating pressure, these proposed regulations would have required a reduction of operating pressures" for those pipelines to comply with the new regulations.[7]

After the Department of Transportation proposed the regulations in 1968 in draft form, the Federal Power Commission submitted a letter stating that the proposed new requirements would require operators to reduce the pressure on "thousands of miles" of pipeline installed between 1935-1951 because many pipelines installed during those years in compliance with the then existing codes, were only tested to 50 psi above the proposed maximum operating pressure.[8] The Federal Power Commission stated that it had "reviewed the operating record of the interstate pipeline companies and found no evidence that would indicate a material increase in safety would result from requiring wholesale reductions in the pressure of existing pipelines which have proven capable of withstanding present operating pressures through actual operation."[9] The Federal Power Commission concluded "[i]f it is the intention of the Office of Pipeline Safety to require the retesting of all existing pipelines to the higher standards proposed ... it is our suggestion that this section be revised to permit the development of an orderly testing program that will allow the jurisdictional pipeline companies the necessary time to obtain from this Commission such certificate authorizations as may be necessary."[10]

In response, the Department of Transportation stated "in view of the statements made by the Federal Power Commission, and the fact that this Department does not now have enough information to determine that existing operating pressures are unsafe, a "grandfather" clause has been included in the final rule to permit continued operation of

[7] *Id.*
[8] *Id.*
[9] *Id.*
[10] *Id.*

pipelines at the highest pressure to which the pipeline had been subjected during the 5 years preceding July 1, 1970."[11]

Q.9 What do you infer from these statements in the federal register?

A.9 These statements identify principles underlying the Department of Transportation's safety regulations approach: first, that when the Department of Transportation enacted the regulations, it expected that operators would have detailed records of its pipe and components to either be able to calculate MAOP based on the weakest element in the pipeline system, and that operators would have pressure test records to validate the MAOP. Second, that the Department of Transportation allowed grandfathered pressures because it assumed the pipelines that would operate pursuant to the grandfather clause would primarily be those pipelines that:

- had been installed from 1935 to 1951; and
- either applied lower class location design factors than the industry applied since 1952 up until the 1968,[12] or
- only been tested to 50 psi above the MAOP.

In other words, the Department of Transportation assumed that operators would have pipeline design, construction, operating history, material and component records and pressure test records to validate the integrity of the pipeline to at least 50 psi above the MAOP of the line. Older pipelines installed before 1935 would be limited to actual pressures experienced within a more recent 5 year defined period (1965-70). The Department of Transportation reasoned that this would prevent an operator from using a theoretical maximum operating pressure which may have been determined under some formula used 20, 30, or 40 years ago (prior to 1970).

[11] *Id.*

[12] The requirements of the 1968 ANSI B31.8 code was being essentially implemented as interim federal safety standards following enactment of the US Natural Gas Pipeline Safety Act of 1968.

These facts are relevant because the grandfather provision is based on the assumption that an operator had records of its pipeline materials as well as pressure test records to validate the historic MAOP, and the fact that the Department of Transportation could not determine that the historic pressures were unsafe. If the operators lacked pressure test records and the operator could not determine the MAOP based on the weakest element, it is doubtful that the Department of Transportation would have considered the historic operating pressure to be safe.

Q.10 Are there ways an operator can establish a historic MAOP under 192.619(c) other than records that empirically substantiate the historic maximum operating pressure?

A.10 Yes, in order to accommodate operators that may be missing pertinent records, an operator may use a notarized affidavit to determine the historic MAOP. Although this method of determining historic MAOP may be acceptable at the discretion of regulatory agencies, using a notarized statement in lieu of pressure charts or inspection reports increases the level of uncertainty associated with gas pipeline operations.

Q.11 Does PG&E use affidavits to establish the historic MAOP for its pipelines?

A.11 Yes. In the hearings on PG&E's Pipeline Safety Enhancement Plan, PG&E's witness stated that of its pipelines located in high consequence areas operated pursuant to the grandfather clause, the MAOP for 50-70% of those pipelines is established by affidavit.[13]

Q.12 Is this common in the industry?

A.12 No. As I described in my testimony in Investigation 12-01-007, using notarized statements to establish the MAOP for any pipelines is the exception. In my 40 plus years of experience working in the gas industry and as a gas safety regulator, I have participated in audits of pipelines operating in many states and reviewed the basis for MAOPs of pipelines. I have not seen any pipelines where the MAOP was determined by

[13] OIR 11-02-019, Reporter's Transcript, March 23, 2012 Volume 12 1612:2-1613:12.

historic affidavits under the grandfather provision. Only on a few occasions, through word of mouth from other State regulators have I even heard that an operator would determine its MAOP based on an historic affidavit. Usually, these circumstances would not be applied to transmission pipelines in populated locations.

The fact that PG&E used affidavits to establish the MAOP for the majority of grandfathered pipelines located in high consequence areas is unusual and a reflection on the state of PG&E's records. If PG&E had to use affidavits to establish the historic MAOP, it should have taken extra precautions to ensure the integrity of its pipeline system. As discussed earlier, when the grandfather provision was enacted it was intended to avoid having to *re*-test lines that did not meet current class location design limits or had only been tested to 50 psi above MAOP. It was not intended to be used as carte blanche for operators lacking important pipeline records.

Q.13 Did the CPSD report make any findings regarding record keeping issues affecting Line 132?

A.13 Yes. CPSD witness Felts many made findings regarding how PG&E's record keeping practices affected its pipeline operations, including how PG&E's poor record keeping contributed to re-used pipe being used for segment 180 of Line 132, and how the grandfathered MAOP for Line 132 was changed based on conflicting records.[14]

Q.14 Are there additional facts that are relevant to the CPSD report's analysis?

A.14 Yes. PG&E recently produced a document showing that Line 132 had suffered a seam failure in 1989. I described this report and its significance in my testimony submitted in Investigation 12-01-007.

Q.15 Can you briefly describe the report?

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[14] Testimony of Felts, at pp. 2-3.

A.15 On March 1, 1989, PG&E's Technological and Ecological Services sent a memorandum which stated that a 30" section of Line 132 had been "removed for failure analysis because of a pinhole leak in the longitudinal seam weld."[15] The memorandum finds that "[o]verall, the x-ray inspection showed the weld to be of low quality, containing shrinkage cracks and voids, lack of fusion, and inclusions. Although the actual leak could not be found, it is likely that it was related to one of the weld defects."[16] The memorandum also states that "the cracks are pre-service defects, i.e. they are from the original manufacturing of the pipe joint."[17]

PG&E should have reviewed this document in the context of its integrity management program, and then evaluated all similar pipeline for potentially unstable manufacturing and construction defects under the data gathering and integration procedures of section 192.917(b) and the analysis of the data required by the TIMP regulations. The report should also have raised concern that PG&E's quality control procedures were deficient at the time the pipe segment was installed in 1948.

Q.16 Has PG&E had difficulty producing documents in this proceeding?

A.16 Yes. As a general matter, PG&E has been unable to produce documents requested by the Commission in a timely fashion. On June 3, 2011, the Commission's Legal Division filed a prehearing conference statement in which it withdrew a request that PG&E:

> "Organize and produce, on a pipeline segment by pipeline segment basis, for each and all of PG&E's transmission pipelines, the following data and documents:
>
> - All as-built drawings, documents, photos
> - All pipe specifications, manufacturer's operating manuals,
> - and instructions
> - All operating history of the pipe, including but not limited to

[15] 1989 TES Memorandum (Exhibit 2, p. 8)
[16] *Id.*
[17] *Id.*

- pressure.
- All maintenance and repair history of the pipe
- All risk assessment done of the pipe"[18]

The Legal Division asserted that the reason for withdrawing the request was that "PG&E would spend months or years reorganizing its documents in the way requested in the data request."[19] In other words, PG&E did not have the relevant information already organized on a segment by segment basis.

Specific to documents concerning weld failure, the prehearing conference statement noted "PG&E has requested additional time to respond to the Commission's directive for PG&E to provide weld failure and flaw information. PG&E asks permission to provide the data on a rolling schedule from September 20, 2011 to sometime at the end of 2012. PG&E's request itself demonstrates just how abysmal its recordkeeping is. PG&E is required by law to consider weld defects and failures for its pipeline integrity program."[20]

Six months later, the ALJ in this proceeding even noted that the delay reflected poorly upon PG&E's record keeping practices.

> "it is troubling that PG&E is apparently unable to respond to Legal Division's data requests in a timely manner. In this proceeding, PG&E has sought and been granted numerous extensions to provide responsive documents. While I recognize that the Commission and Legal Division have requested that PG&E provide a substantial amount of documents, many of these documents are required to be maintained under federal and state statutes and regulations. As such, it is unclear why PG&E is unable to provide these documents in a timely manner."[21]

As I described in my testimony in I.12-01-007, PG&E is required to consider the failure history on its pipelines, including weld failure documents pursuant to TIMP regulations and I support the ALJ's concern. To comply with the TIMP regulations, PG&E needed a

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[18] Legal Division Prehearing Conference Statement, filed June 3, 2011, at p. 1.
[19] *Id.* at p. 2.
[20] *Id.* at p. 3.
[21] Administrative Law Judge's Ruling Granting, In Part, Motion For Extension Of Time And Revising Schedule For Proceeding, issued December 22, 2011, at p. 2.

methodology to integrate data so that it could evaluate the potential risks to the pipelines. The method chosen should have allowed PG&E to gather and integrate existing data and information on the entire pipeline that could be relevant to covered segments.[22] PG&E is required to verify that the necessary pipeline data have been assembled and integrated. At a minimum, PG&E should have evaluated and gathered for each segment information on the operation, maintenance, patrolling, design, operating history, and specific failures and concerns unique to each system and segment.[23]

Basic elements of proper data integration and evaluation include: storage, retrieval, granularity, collection, aggregation, and integration.[24] Data integration consists of more than simply putting several types of information into a single location. "The most important aspect of data integration is the <u>analysis</u> of aggregated data in order to discern integrity threats and risks that would not otherwise be observed from independently reviewing the various individual data elements."[25] Based on findings in my testimony in I.12-01-007 that PG&E did not seriously consider manufacturing and construction defects, it appears that PG&E did not adequately perform this analysis as required.

In addition, based on the findings in the testimony of Duller and North that PG&E's "pipeline records were widely distributed and poorly controlled," that PG&E lacked "necessary document control processes ... to track [the] location, existence or contents [of the records],"[26] that PG&E's records were inaccurate,[27] and PG&E's difficulty in

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[22] 192.917(b).
[23] PHMSA Inspection Protocols with Supplemental Guidance; section C.02.b. The protocols are available publicly at: http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Pipeline/GasIMP%20Protocols%20With%20Guidance%20(8%201%202008).w.disclaimer.pdf
[24] *Id.*
[25] PHMSA Inspection Protocols with Supplemental Guidance; section C.02.a. (emphasis in original).
[26] Testimony of Duller and North, at pp. 1-7.
[27] *Id.* at p. 1-10.

producing the documents in this proceeding, it appears that PG&E did not have a consistent, repeatable basis for gathering and integrating accurate data. PG&E was required to have procedures that considered these types of documents to identify and evaluate the potential threats to its pipelines.

Q.17 Are there other examples where PG&E's record keeping practices have interfered with the regulatory process?

A.17 Yes. As part of its investigation, the NTSB asked PG&E to "[p]lease provide a listing of all other pipelines, along with corresponding dates, SCADA printouts, and pressure charts, where PG&E has applied its practice of reestablishing MAOP every 5 years as PG&E has indicated it has done on Line 132. Please provide copies of all policies, standards, procedures, etc. related to PG&E's practice of reestablishing MAOP on its pipelines."[28] In response, PG&E asserted that it spiked the pressures on its lines "to avoid [pressure testing] and any potential customer curtailments that may result," and therefore "PG&E has operated, within the applicable five-year period, some of its pipelines that would be difficult to take out of service at the maximum pressure experienced during the preceding five-year period in order to meet peak demand and preserve the line's operational flexibility."[29] PG&E also attached a copy of Risk Management Instruction, ("RMI-06") "which describes PG&E's process to increase pressure in certain transmission lines every five years for these operational purposes."[30]

Following the NTSB hearings in early March, PG&E submitted a letter to the NTSB and the CPUC explaining that "the version of PG&E's RMI-06 which PG&E submitted to the NTSB and became NTSB Exhibit No. 2-AG included the cover sheet approval for RMI-

[28] PG&E's Amended Data Response, NTSB Exhibit 2-AI of the San Bruno Investigation (Docket No. SA-534) (Exhibit 3).
[29] *Id.*
[30] *Id.*

06 revision 0 but attached the text for RMI-06 draft revision 1."[31] With that letter, PG&E stated "[t]he approved RMI-06 (Rev. 0) at the time of our original submission is enclosed along with the currently-effective RMI-06 (Rev. 1). Neither of them includes the 10 percent provision found in the unapproved version."[32]

PG&E is required to establish these types of risk management procedures to comply with TIMP requirements. These procedures must be maintained such that they are readily retrievable, protected from damage, and secured sufficiently to prevent unauthorized changes. Gas pipeline operators should keep procedures as well as records in a formal or structured record-keeping system, as opposed to individual working files.

Further, any changes to procedures, gas system, or gas operations, must follow a formal documented management of change process. Pursuant to the TIMP regulations, "an operator must document *any* change to its program and the reasons for the change before implementing the changes."[33] This means that earlier revisions to the program should be included in document files as archived information, and operators should include evidence as to why any program documents have been revised and the effective date of the revisions. If no documentation exists to describe and justify the change, then the operator is not properly managing the change.

The confusion created by "draft revision 1" shows that PG&E has not properly managed the records to identify changes to its TIMP. It shows that PG&E lost version control over a key document related to its pipeline integrity management, and that PG&E was unable to prevent the dissemination of unauthorized versions of its risk management procedures.

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[31] NTSB Revised Exhibit 2-AG Overpressurization Requirement RMI-06 Rev 00 and Rev 1 (Exhibit 4).
[32] *Id.*
[33] 192.909(a) (emphasis added).

It is also unclear how the cover sheet from revision 0 was attached to a "draft revision 1," or why the word DRAFT does not appear anywhere on "draft revision 1."

Q.18 Do you have any other concerns related to PG&E's RMI-06?

A.18 Yes. The face sheet to RMI-06 revision 0 shows that it was first prepared and approved in 2008. This would indicate that PG&E did not have a procedure in place to monitor pressures or prevent MOPs from over-pressurization before 2008. This supports statements in my testimony submitted in Investigation 12-01-009 that PG&E did not adequately monitor the pressures on its pipelines prior to 2008. Because PG&E lacks records of the pressures on its pipelines prior to 2008, PG&E would have been unable to evaluate key safety factors: whether the pressures on its pipelines have exceeded the five-year MOP or the MAOP of the pipeline; justification for whether the manufacturing and construction threats on its lines should be considered stable; the impacts from cyclic fatigue on its pipelines; or the extent of interactive threats on its pipelines.

Q.19 Do you have any conclusions?

A.19 Yes. The facts identified above do not support a finding that PG&E's record keeping practices adhered to sound engineer principles. Specifically:

- Because PG&E lacked adequate records it was required to over-rely on the grandfathering provision (and specifically affidavits of historical operating pressures) to substantiate the MAOP for its pipelines;
- PG&E had conflicting records to establish the MAOP for Line 132;
- PG&E's record keeping practices failed to prevent old pipe from being re-used, and failed to track old pipe that was re-used;
- PG&E's record keeping practices appear to have prevented it from adequately considering weld defect documents evidencing unstable manufacturing and construction defects; and
- PG&E's management of change procedures did not properly track revisions of key integrity management documents.

Q.20 Do you have any minimum recommendations for PG&E's record keeping systems?

A.20 Yes.

- PG&E's record keeping system should act as a central repository server housing all technical documents. To ensure accountability, gatekeepers for each type of document should be identified;
- PG&E should identify the types of associated programs needed to access those documents;
- To assist in the analysis and integration of the data, PG&E's GIS system should be capable of providing maps, on a segment by segment basis, that provide a visual layering (beneath the plan view of the pipeline) of key IMP attributes;
- To further assist in the analysis and integration of key attributes, the GIS system should have links to key documents in the central repository. This will assist individuals in accomplishing their assigned duties and responsibilities;
- The systems provide for access by program engineers and technicians to pull up historical documents related to materials, welding, cathodic protection, leak history, any field inspection reports or metallurgical analyses reports, ILI results, and historical pressure testing and DA inspections performed;
- The system should identify the individuals responsible for accomplishing and documenting key analyses required by PG&E's procedures;
- When issues requiring follow-up, sign off or approvals are identified, the system should be capable of allowing ready identification of the status of any of the procedures or IMP process steps;
- The system should identify when key responses to process steps are pending, and should have the capability of receiving updated interim and final reports and analyses to keep the systems current and filed within the central repository;
- A documented management of change process should be included in the platform and central repository to ensure any change to key pipeline attributes and process

steps are managed and so all key individuals are advised of changes and included in the process.

Q.21 Does that conclude your testimony?

A.21 Yes, it does.