

From: Cauguiran, Aimee  
Sent: 4/13/2011 8:14:17 AM  
To: Stock, William (/O=PG&E/OU=CORPORATE/CN=RECIPIENTS/CN=WCS3)  
Cc:  
Bcc:  
Subject: Re: San Francisco Chronicle E-Edition Article

Thanks.

**From:** Stock, William [mailto:WCS3@pge.com]  
**Sent:** Tuesday, April 12, 2011 6:13 PM  
**To:** Cauguiran, Aimee  
**Subject:** Re: San Francisco Chronicle E-Edition Article

I will check into this rig away.

**From:** Cauguiran, Aimee [mailto:aimee.cauguiran@cpuc.ca.gov]  
**Sent:** Tuesday, April 12, 2011 06:11 PM  
**To:** Stock, William  
**Cc:** Lee, Dennis M. <dennis.lee@cpuc.ca.gov>  
**Subject:** FW: San Francisco Chronicle E-Edition Article

Bill:

I'm not sure if you're the person to ask but I figured you can point me to where I can get a quick answer to this question.

The SF Chronicle reported that there's a 5-mile section of L-109 where there are no records of previous pressure-testing. I went through PG&E's March 15th filing and on disc 2, I found the following segments where it shows that there are no STPR available. The mileage sums up to a little over 5 miles.

Line Number	Job Number	Footage Per GIS (3- 4 HCA)	MAOP Documentated	Footage Per Test (3- 4, HCA)	Year Installed (GIS)	Historic Beginning Mile Point (GIS)	Historic Ending Mile Point (GIS)
109	137960	67	NOT	01957		4.07	4.08

		AVAILABLE				
109	139002	1,917NOT	01957	8.36	8.72	
		AVAILABLE				
109	142593	1,678NOT	01958	6.72	7.04	
		AVAILABLE				
109	145334	2,529NOT	01959	17.40	18.53	
		AVAILABLE				
109	146370	5,231NOT	01960	7.57	8.36	
		AVAILABLE				
109	150509	975NOT	01961	0.49	0.67	
		AVAILABLE				
109	162010	2,951NOT	01965	4.45	5.03	
		AVAILABLE				
109	163384	1,007NOT	01965	43.14	43.29	
		AVAILABLE				
109	172327	119NOT	1171969	9.98	10.01	
		AVAILABLE				
109	178346	0NOT	0NOT AVAILABLE	0.00	0.00	
		AVAILABLE				
109	1961136	5NOT	01994	45.77	45.77	
		AVAILABLE				
109	1997975	3NOT	01994	46.23	46.23	
		AVAILABLE				
109	4010674	2,049NOT	01992	40.77	41.17	
		AVAILABLE				
109	4240248	243NOT	01980	11.93	11.97	
		AVAILABLE				
109	426412	204NOT	01965	5.16	5.20	
		AVAILABLE				
109	43933	9,781NOT	01932	46.02	48.18	
		AVAILABLE				
109	62447	514NOT	01940	30.01	30.11	
		AVAILABLE				
109	NOT	23NOT	0NOT AVAILABLE	10.01	45.16	
	AVAILABLE	AVAILABLE				

Are these the correct segments referred to in the article that are missing/lacking any pressure-testing records?

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**San Francisco Chronicle 04/10/2011, Page A01**

**SAN BRUNO BLAST**

**2nd PG&E line seen as posing safety risks**

**Missing records, vulnerable welds for pipe from South Bay to S.F.**

**By Jaxon Van Derbeken**

CHRONICLE STAFF WRITER

The other pipeline that Pacific Gas and Electric Co. has long relied on to deliver natural gas up the Peninsula has problems similar to the ruptured line in San Bruno — flawed or missing records and at-risk welds, including 80-year-old technology recognized as prone to earthquake failures, The Chronicle has learned.

Like PG&E transmission Line 132 — the pipe that ruptured and exploded in San Bruno on Sept. 9 — Line 109 runs from Milpitas through the South Bay and Peninsula and up to San Francisco, where it terminates in the Dogpatch neighborhood.

Since the blast that killed eight people and destroyed 38 homes, PG&E has avoided service disruptions in the upper Peninsula by using a part of Line 109 to route gas around the blast site, thus keeping most of Line 132 in service.

Federal investigators have keyed into PG&E's inaccurate records on Line 132 in San Bruno — records that showed the 1956-vintage pipe

**Pipeline continues on A12**



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Dangers seen in 2nd PG&E line

### Pipeline from page A1

had no seam when, in fact, it had a flawed seam weld since tied to the rupture. The company vouched for the line's safety using a method in 2009 that was incapable of finding bad welds.

Line 109 may be equally problematic for the company, documents show. Like all the lines running into San Francisco, PG&E has cut the pressure on Line 109 by 20 percent in the wake of the San Bruno disaster, but experts say that given its questionable state, the cut affords little assurance of safety.

"You don't know the right level of safety to begin with, so you don't know if you are cutting pressure by enough," said Richard Kuprewicz, a pipeline safety expert in Redmond, Wash.

### Missing records

Perhaps the most damaging revelation about Line 109 came last month when the utility acknowledged that it lacks any records for a 5-mile segment in San Bruno that was installed by 1995. The undocumented segment starts south of the rupture site on Skyline Boulevard at San Bruno Avenue, and heads inland to Junipero Serra Boulevard and hooks up to the old route on Skyline at Hickey Boulevard.

The 5-mile part of the line is among 140 miles of transmission pipe for which PG&E has said it has so far found no documents to prove it is operating safely. PG&E has until the end of August to look for the records as part of a \$3 million fine settlement still pending and slated to be argued Monday before the California Public Utilities Commission.

The undocumented part of the line apparently was installed to route around three active earthquake faults in the area on

Skyline Boulevard, PG&E records show. The replacement route is now reflected on PG&E's current maps, but the utility lacks records of construction documents and has no proof that it did legally mandated high-pressure water tests.

UC engineering Professor Bob Bea said the lack of records for a 1995-era project is "astounding."

"To have that long a section of an important pipeline without records on its condition" that would be alarming," he said. "I think we have a problem, Houston."

PG&E has acknowledged that the line has other identified risks, but says it inspected the line in 2009 and found no leaks over the past decade.

### **Brittle welds**

PG&E has noted that a 2-mile portion of Line 109 along Alemany Boulevard in San Francisco dates from 1932 and was constructed using oxyacetylene welds, notoriously brittle and susceptible to failure in earthquakes. The at-risk part of the line runs under the street roughly from Sickles Avenue to Rousseau Street.

Oxyacetylene technology "which dates to the early part of the 20th century" is problematic because the hot gases used in the welding process generate bubbles in the welding bond, Bea said.

"It's difficult to get a weld with high integrity," he said. "You end up with a lot of gas and bubbles trapped in the metal."

Kuprewicz added, "Oxyacetylene welds are like glass. They don't bend, they snap. They are very brittle."

Dozens of those welds failed in the 1971 quake in Sylmar (Los Angeles County), according to a 2008 seismic report done for the U.S. Geological Survey on the vulnerability of that kind of weld.

The report also found that in the 1989 Loma Prieta quake, PG&E had three transmission line failures involving such welds, and in the 1994 quake in Northridge (Los Angeles County), more than two dozen such welds failed

or were damaged.

The 2008 report recommended replacement with upgraded pipes, or at least using automatic shutoff valves, pointing out that oxyacetylene welds were almost 100 times more likely to fail in a quake than more modern technology.

PG&E has long downplayed the usefulness of automatic valves, citing industry data showing most blast damage is done in the first 30 seconds of an explosion, but since the San Bruno blast has said it will install them in many high-risk areas.

### **Rehab versus replace**

PG&E had been replacing dozens of miles a year of old pipes since 1985 — including the 5-mile reroute near San Bruno — but told regulators in 1995 that it now intended to begin finding ways to rehab old lines rather than replace them. One of its first efforts in that vein was to install, that year, a plastic liner in Line 109 under Alemany Boulevard that had 1932-vintage oxyacetylene welds. The purpose of the liner was to create an internal membrane to contain any gas release if vulnerable girth welds failed in an earthquake.

PG&E bought the liner from Paltem Systems Inc. of Missouri, and it was touted as being able to withstand pressures up to 900 pounds per square inch. Paltem is not currently in business in the United States.

“The purpose of this project was to install a safe composite lining, in order to provide additional support and protection,” PG&E spokesman Joe Molica said about the liner.

Before installing the liner, he said, PG&E had tested that part of the line using high-pressure water. At the time, the company said it would track any leaks and inspect the line a year after installation. PG&E recently told San Francisco City Attorney Dennis Herrera, who asked for details about the project, that it did an initial camera inspection but did not do a follow-up inspection.

PG&E says the inspection could have damaged the liner and there had been no leaks in the past decade.

Inspection aside, experts question the value of the liner in a

major quake. Glen Stevick, a Berkeley engineer and pipeline safety expert, said such an interior liner “does provide a lot of flexibility and it can take a certain amount of leakage without rupture.”

But, he said, substantial ground movement during a quake could have a “guillotine” action in severing a circumferential weld, slicing the liner in the process.

Doug Honegger, an Arroyo Grande (San Luis Obispo County) consultant on pipeline seismic safety, agreed the liner’s value is limited.

“The question is why they put the liner in. If the threat was from large ground movement, I’m not sure the (liner) would be what they needed,” he said. “The preferred option would be to replace that section.”

### **Vulnerable welds**

Still other parts of Line 109 were constructed with low-frequency electric resistance welds, considered vulnerable during normal operations and tied to more than 100 failures nationwide.

PG&E inspected Line 109 in 2009 using a method that was incapable of finding flawed seam welds. Yet two stretches of the line have such welds, according to PG&E records. PG&E officials have said they had been intentionally boosting the pressure on lines with such welds every five years or so since 2003, but stopped the practice after the San Bruno explosion. The company says it had been elevating the pressure because federal regulations “based on peak pressure levels” would otherwise kick in and limit its ability to meet peak demand.

Federal officials say they don’t understand why PG&E was boosting pressure on vulnerable lines.

PG&E last spiked the pressure on the San Francisco part of Line 109 on April 12 of last year to 147 pounds per square inch; the line’s maximum capacity is 150 psi. It first spiked the pressure on the line in December 2003 to 150 psi. Experts have questioned the safety of the spiking practice on such vulnerable welds, saying they could make them more prone to failure.

## **Portion above ground**

Outside San Francisco, at the higher-pressure segment of the line, experts point to another potential problem spot: an above-ground, 50-foot span where Line 109 crosses a dry creek bed.

PG&E inspected the line in 2009 and said any safety concerns were addressed.

But UC Berkeley's Bea said erosion on the creek banks during recent storms could potentially weaken support on either side spanning the creekbed. He worries the line has no underpinnings to support the crossing.

Experts point to the totality of Line 109 problems as warning signs that the older, untested lines in PG&E's system are fraught with potential risks. PG&E had largely stopped replacing old lines by 2000, when it cut back on miles replaced in favor of inspection efforts to assure safety, documents show. "With the age and the risk factors they have, why aren't they judiciously replacing these pipes?" pipeline safety expert Kuprewicz said.

"You are playing Russian roulette with a six-shooter, and you have five bullets in the gun."

"I frankly don't feel very comfortable with their whole system," said Robert Eiber, another pipeline integrity expert.

"It's a mess. You need to find out what you have in the ground."

Herrera said he wants to know more about the line before he is satisfied it is safe.

"It's quite clear that we haven't received all the records that would give us that complete confidence," he said. He added that he intends to make every effort to make sure "we are getting the records we need."

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