

[Insurers won't renew some homes, citing risk of earthquake-induced fires. This map shows where](#)

San Francisco Chronicle

The magnitude 7.9 earthquake that struck San Francisco on April 18, 1906, toppled buildings, brought down power lines and fractured water mains. The front page of the Chronicle the next day read “San Francisco in ruins.” But 80% of the property damage, according to a 1972 federal report, was from the massive fires that ripped through the city afterward.

One hundred eighteen years later, memories of the fire have come to the forefront amid the state’s ongoing insurance crisis. Two major insurers, State Farm and Safeco (which is owned by Liberty Mutual), have cited the risk of earthquake-induced fires when cutting back on policies in the Bay Area and beyond. That’s happening even though local and state officials say they’re confident they can prevent such a devastating fire from happening again.

Since 1906, fires have broken out after earthquakes, but never to the same degree. In the 1989 Loma Prieta earthquake, fires fed by broken gas lines engulfed some partially collapsed buildings on fire in the Marina. In 1994, when a magnitude 6.7 earthquake hit Northridge in Los Angeles County, a broken gas line fed a 100-foot-tall fire that scorched five homes, the Los Angeles Times reported.

While home insurance does not cover earthquake damage, insurers are generally on the hook for losses caused by a fire following an earthquake.

In March, State Farm said it would not renew 30,000 homeowner policies statewide, with some homeowners chosen due to their risk of fire following earthquakes. Last fall, Safeco also said in state filings that it would not renew 118 homeowners policies in San Francisco and 837 in the East Bay in order

to reduce its exposure to fire risk following an earthquake.

As insurance companies now consider how a 1906-esque situation could impact the city today, the high cost of construction and increased population density could make it a costly event for insurers, according to Amy Bach, executive director of the consumer advocacy group United Policyholders.

In 1906, everything from downed power lines to tipped-over gas lamps sparked dozens of fires, according to Joanna Dyl, a visiting professor of environmental analysis at Pomona College and author of “Seismic City: An Environmental History of San Francisco’s 1906 Earthquake.” From there, the small fires — fed by natural gas pouring out of broken mains — combined into massive blazes that consumed entire city blocks.

“This was still an era of cooking with open flame,” Dyl said. “It was very early in the morning, commercial kitchens were just getting started. A lot of those fires started not in homes, where there might be somebody there to put it out, but in the business districts.” In total, an estimated 3,000 people died and 60,000 buildings were destroyed, leaving 250,000 people homeless.

Since then, nearly every aspect of the city has seen upgrades to prevent a repeat of such a tragedy.

The cast iron water mains that fractured in the quake have been steadily replaced with more flexible ductile iron, according to Steve Ritchie, the San Francisco Public Utilities Commission’s assistant general manager for water. Pacific Gas & Electric Co. eliminated cast iron from its gas system in 2015, according to Angie Gibson, the utility’s vice president for emergency preparedness and response. PG&E is one of the first utilities of its size and age to do so, according to the company.

Broken water mains were the single biggest problem facing firefighters in 1906, according to Dyl. That left firefighters in the city with no water to douse the towering flames. Instead they attempted to use dynamite to level lots and stop the fire in its tracks — which, in some cases, lit more fires, Dyl said.

Three years after the fires, San Francisco created its first version of the Emergency Firefighting Water System — a network of reservoirs and pipes that act as a backup in case the normal system fails, or isn’t enough. These pipes are thicker and have a higher water pressure than the normal system, Ritchie said.

The emergency system has also been activated in the past when firefighters need backup to put out a

particularly large fire, Ritchie said. But the city also has a third backup option that has never been deployed: dozens of roughly 70,000-gallon cisterns located throughout the city. Each cistern — identifiable from the street by a circle of red bricks — is filled with water waiting to be tapped should a major fire break out, he said. Backup generators at water pump sites also help ensure that power outages won't keep the system from working.

At places where pipelines cross fault lines, additional technology keeps them protected. In Fremont, where an SFPUC pipeline runs through the Hayward Fault, a specially engineered set of joints allow the pipeline to move up to 7 feet without breaking, Ritchie said.

Meanwhile, seismic activity now triggers automatic power shut-offs in affected areas to prevent lines from sparking fires, according to Gibson. After the shaking ends, PG&E deploys crews to survey both its power and gas lines to locate damage before it restores normal service.

At the same time, firefighters would also survey their communities for damage, according to Capt. Justin Schorr, a public information officer for the San Francisco Fire Department. The department's first priority would be to secure its firehouses, Schorr said. One problem in 1906 was that the fire chief died after being injured when his fire station collapsed, according to Dyl.

Then crews would start searching neighborhoods for broken water mains, sewage leaks or fires — all of which would be quickly reported back to the battalion via radio so resources could be deployed, Schorr said.

"This is something we weren't able to do in 1906," he said. "But now that we have the technology to use our radio communications and our backup radio communications, we're confident that those will aid us in helping our neighborhood."

Earlier this year, the San Francisco Fire Department also purchased three Rosenbauer hose tenders — devices that allow firefighters to quickly pump water directly from the bay or one of the city's many lakes and deliver it to the site of a fire.

Even with all the efforts to reduce the probability of a major fire following an earthquake, the magnitude of such a loss may be enough to worry insurers. The Bay Area contains several densely populated cities

situated directly between two major fault lines, noted Janet Ruiz, strategic communications director for the Insurance Information Institute.

Both Bach and Ruiz said homeowners should communicate with their insurer when they take a step to reduce the chance of their house catching fire — such as strapping down their water heater to prevent it from tipping over, or installing an automatic gas shut-off valve.

In some ways, public awareness that a 1906 scenario is possible may be just as important as the technological investments put into preventing it.

“We now have a population that understands what to do if there’s an earthquake. We’ve got folks that are generations deep into knowing what to do if the power goes out, to watch for broken glass, to have three days of food and water,” Schorr said. “It’s a combination of what we’ve learned as a fire department and what our city has learned in the last 118 years.”