Seismologists say Bay Area is due for major earthquake that could cripple region

Alastair Bland, San Francisco Examiner, 4-3-11

There is no question the Bay Area will suffer a devastating earthquake again. The only question is when.

Seismologists say the Hayward fault, which runs directly under the East Bay's western lowlands and last gave way in 1868, is due for a dramatic lurch — an earthquake powerful enough to cripple transportation systems, destroy neighborhoods and kill hundreds of people. Though authorities say local tectonic and seafloor dynamics reduce the likelihood of a destructive tsunami hitting San Francisco like the one that ravaged Japan, they warn that a large temblor could still do major damage to The City.

"We're entering the time window for the next big Hayward quake," said John Rundle, a professor of physics and geology at UC Davis who has helped design a quake-forecasting system.

Rundle said the Hayward fault slips every 140 to 150 years, and the odds of a 7.0-magnitude temblor striking within 150 miles of San Francisco in the next 12 months are one in 10. For a 24-month window, those odds double.

In 2003, the U.S. Geological Survey gave its own prediction: a 62 percent chance a large quake would strike either the San Andreas or Hayward faults within 30 years.

Even with such dark clouds looming, The City is not entirely ready to bear the brunt of a big one. If a 7.2-magnitude earthquake on the San Andreas fault occurred today, 27,000 buildings in San Francisco — almost one-fifth of the total — would be rendered uninhabitable, according to a city report completed in December as part of the Community Action Plan for Seismic Safety project. Property owners could face $30 billion in damage. Dozens of fires might erupt, and reconstruction could take a decade. The same quake has the potential to kill as many as 300 people, the report said.

These estimates are for San Francisco alone. They do not figure in other cities or potential damage to the BART tube in the Bay or the Bay Bridge's eastern span — each of which, experts say, could fail entirely during violent shaking. If the next big one hits before upgrades to those structures happen — seismic improvements to stabilize the tube are under way and are expected to be done by 2014, while completion of the eastern span is forecast for 2013 — the result could be a deadly commute.

Some crucial retrofitting has already occurred. The East Bay's main water conduit from the Sacramento-San Joaquin Delta, for example, is said to be sound. But Mary Lou Zoback, a seismologist at Risk Management Solutions in Newark, said many important projects are years away from completion.

"We just need to keep our fingers crossed until the Bay Bridge, our Hetch Hetchy water supply and the BART tube are retrofitted," said Zoback, who co-chaired the advisory committee that helped produce the CAPSS report.

The San Andreas fault might be capable of producing a stronger earthquake than the Hayward, but it is less likely to slip soon, according to experts. Seismologists believe a century could pass before the San Andreas slips again.

But the Hayward fault is widely believed to be overdue. Worse, its location poses danger that the San Andreas fault, which veers out to sea just south of San Francisco, does not. It could slip 6 feet or more, according to Rundle, and sever every east-west roadway, railway, sewer line, gas line and water line that crosses its path.

Along this lateral break, the East Bay could explode into flames, possibly overwhelming response teams, according to Nicholas Sitar, a UC Berkeley professor of geotechnical engineering who warns that a large quake could produce devastating results. Weeks and months after the event, he said, reconstruction could be a nightmare in neighborhoods built on landfill, such as the Marina and Treasure Island. Here, Sitar said, “liquefaction makes everything subject to destruction.”

Sitar pointed out that most structures in the Bay Area have never withstood a powerful temblor. The epicenter of the 1989 Loma Prieta quake, which caused $3 billion of damage in San Francisco and killed about 62 people, was in the mountains 10 miles northeast of Santa Cruz and 60 miles south of San Francisco. Sitar believes a powerful earthquake on the Hayward fault could strike much closer to the Bay Area’s urban center.

“It would be a huge mistake for people to believe the 1989 earthquake was a significant test of the quality of construction,” Sitar said. “It was a relatively small earthquake and it was far away.”

Yet Bay Area residents tend to believe they and the buildings around them have proven resistant to tectonic upheavals, Zoback said.

“I tell those people, ‘You ain’t seen nothing yet,’” she said.

Many locals lack essentials for disaster situations

Erik Burke guesses it would take him 30 minutes to learn how to turn off the main gas valve feeding his Russian Hill home, but for years he has never bothered.

Burke, who lives with his wife and son, has also considered assembling an emergency kit with water, a flashlight, a radio and other useful items, yet he has shirked what many officials consider an essential step in disaster preparation.

“For no good reason, I’m not prepared,” Burke said.

In the Inner Sunset, homeowner Brian Hughes has talked with his wife since the Japan earthquake about putting together a disaster kit, but he doesn’t know where he would keep it.

“If I put it in the garage, what if the house collapses on it?” Hughes said.

Hughes and Burke aren’t the only ones who aren’t fully prepared.

According to a 2009 American Red Cross survey, only 22 percent of Bay Area residents have taken what Red Cross officials consider three basic steps toward preparing for a disaster: deciding on a meeting place for post-quake regrouping, taking half-day first aid and CPR instructional classes and assembling a disaster kit. American Red Cross spokeswoman Melanie Finke said she keeps a backpack filled with these essentials near the front door of her studio.

Burke thinks such an effort is illogical.

“If I store these things in my house, then I already have access to everything in it,” he said. “The one thing that makes real sense is stockpiling lots of water in case we’re cut off for two weeks.”

Burke has considered securing such an emergency supply to his roof in case the house collapses.

Also, homeowners and landlords are advised to fortify their properties. Bolting a home to its foundation could save the house itself. Hughes said his house is secured to its concrete base, and he has begun to quake-proof his home’s interior using bolts and straps to prevent toppling dressers, crashing televisions and cascading dishes from hurting him or his family.

“But now that I think about it, I don’t think I’ve done enough,” Hughes said.