

Hanford nuclear plant's earthquake risk underestimated, group says

November 5 2013, by Sandi Doughton

A new analysis by an anti-nuclear organization says earthquake risks were seriously underestimated when Washington state's only commercial nuclear power plant was built almost 30 years ago on the Hanford nuclear reservation.

Seismic studies since then have uncovered more faults, extended the length of previously known faults and challenged the assumption that large quakes are not likely in the area, says the report from the Washington and Oregon chapters of Physicians for Social Responsibility. Geologists now believe one [fault](#) passes a scant 2.3 miles from the 1,170-megawatt plant called the Columbia Generating Station.

The new evidence suggests that the region could be rocked by shaking two to three times stronger than the plant was designed for, said Terry Tolan, the veteran geologist who prepared the report for PSR.

"No seismic structural upgrades have been made at the Columbia Generating Station despite all of the geologic evidence that has been assembled over the past 30 years which has dramatically increased the seismic risk at this site," Tolan wrote.

The physician's group submitted the report to the Nuclear Regulatory Commission on Friday, along with a letter calling on NRC Chairwoman Allison Macfarlane to shut down the reactor until it is upgraded to withstand stronger quakes.

Macfarlane defended the power plant in her response to an earlier letter. "The NRC continues to conclude that CGS has been designed, built and operated to safety withstand earthquakes likely to occur in its region," she wrote in September.

She also pointed out that the plant is under orders from the NRC to review seismic safety and submit a report by March 2015.

Energy Northwest, the utility consortium that runs the plant, received a copy of the report Thursday. But spokeswoman Angela Walz said no one would be able to discuss it until late Friday afternoon.

The report doesn't present original research, but is one of the first attempts to summarize and synthesize recent discoveries.

"It's an honest, forthright interpretation of what's out there and what's being worked on," said Brian Sherrod, a U.S. Geological Survey scientist who has been a key player in the new research, but is not involved in PSR's efforts.

The Hanford site sits among a series of gentle ridges and broad valleys, running roughly east and west. Geologists now understand that those ridges were created by tectonic squeezing, and that each conceals a fault - a realization that has doubled the number of known faults in the area.

USGS studies also support the argument that larger quakes than previously expected are possible in the area. "Based on length alone, you would estimate that some of the faults out there are capable of producing magnitude 7.5 earthquakes," Sherrod said.

The plant was designed to stand up to the ground shaking expected from roughly a magnitude 6.9 [quake](#), which is eight times less powerful than a magnitude 7.5.

Big quakes are probably more rare in Eastern Washington than in the state's more seismically active west side, Sherrod said. But at least two destructive quakes have struck east of the Cascades in historic times - one in 1872 near Lake Chelan and one in 1936 south of Walla Walla.

Sherrod and other [geologists](#) have also uncovered evidence of quakes within the past 13,000 years - considered recent on a geological time scale - on several of the faults in the area. But they don't have a good handle on how frequently the faults produce quakes.

"I think the more we look, the more we're going to find," he said. "But we really need to get out on the ground ... to understand what the hazard is."

Aerial laser mapping and instruments that "see" under the surface by measuring tiny shifts in gravity and magnetism have also helped geologists construct a more detailed picture and pencil in likely extensions to several faults that were originally believed to be much shorter.

Those data, along with information gathered by oil companies surveying the area for natural gas, appear to overturn the long-standing assumption that faults in the area are shallow, like wrinkles in a rug that don't penetrate the geologic formations below.

"The big revelation that has kind of shaken everything up is that ... these faults appear to extend into the basement, they're not just in the rug," Tolan said.

Deeper faults can produce bigger quakes.

Construction on the Columbia Generating Station started in 1973 and the plant was switched on in 1984. The NRC recently renewed its license

through 2043.

The reactor is the last remnant of the Washington Public Power Supply System's nuclear ambitions. The utility consortium, which later changed its name to Energy Northwest, planned to build five [nuclear power plants](#), but instead spiraled into bankruptcy and defaulted on bonds in the 1980s.

The reactor is a newer version of the General Electric design used in the nuclear power plants in Fukushima, Japan, which melted down after the 2011 tsunami knocked out their cooling systems.

Like the Fukushima plants, CGS stores spent fuel rods in an elevated pool, which is a particular concern for the physician's group. "If an earthquake cracked that spent-fuel facility we could have a Fukushima-like scenario on our hands," said Seattle toxicologist Steven Gilbert, president of PSR's Washington chapter.

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