

# Seismic review set for reactors

Duke says Oconee plant built to withstand quake forces

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The nation's 104 commercial nuclear reactors will undergo further seismic reviews as a result of events in Japan, including reactors at the Oconee Nuclear Station and another South Carolina plant that had previously been picked for additional study following an earthquake risk assessment last year.

Roger Hannah, U.S. Nuclear Regulatory Commission spokesman, told GreenvilleOnline.com that officials don't yet know how the seismic review will proceed or whether it would replace follow-up assessments ordered after an earthquake risk study last August.

After that study, which examined the risk of core damage from an earthquake, the NRC selected Oconee and the V.C. Sumner Nuclear Station in South Carolina for further review.

Oconee, a three-reactor plant on Lake Keowee, is owned by Duke Energy. V.C. Sumner, 26 miles outside of Columbia, is owned by South Carolina Electric and Gas and Santee Cooper, the state-owned utility.

Duke Energy said its reactors are built to withstand earthquakes and have backup systems to prevent what happened in Japan.

Joey Ledford, another NRC spokesman, said the August study didn't find any South Carolina plant was unsafe in the event of an earthquake but some had increased risk of damage.

"There was some updated seismic information that indicated that the earthquake risk in that region might be a bit more than had been

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historically recognized," he said. "However, my understanding is that it is not a great amount, and the operative feeling is that the design basis of the plant still adequately protects it from anticipated seismic events."

The worst earthquake on record in the Carolinas occurred in 1886 in Charleston, with an estimated maximum 7.3 magnitude. The quake damaged 2,000 buildings and killed dozens.

The NRC's risk assessment generally looks not at the magnitude of an earthquake but the ground motion from a quake and how that might affect a particular nuclear plant. The ground motion is expressed in G-force rather than the Richter scale.

Sandra Magee, spokeswoman for Duke, said all of its plants are built to withstand the ground motion of an earthquake similar to the Charleston quake.

None of the state's nuclear plants use the boiling water reactors found in Japan.

Ledford said the study didn't rank plants and wasn't meant to compare plants' risk to each other.

"There is no reason for concern," Ledford said of the study. "The NRC continues to believe the plants are safe from earthquake risk. However, we are always looking at new data and evaluating the situation at every plant."

## Japan review

An NRC task force created as a result of the events in Japan has asked for the seismic review of all plants, Hannah said.

"We are undertaking an extensive review as an agency of all nuclear plants in this country to see if there are lessons learned from those events that need to be applied," Hannah said. "There will be some kind of review of seismic information and earthquake design features for all 104 operating units."

Exactly how the review will be conducted or when, he said, will depend on

events in Japan and when "there is a clearer picture" of the situation there.

Oconee's reactors went online in 1973 and 1974, while V.C. Sumner began operations in 1984.

Robert Yannity, spokesman for SCE&G, said the relevant risk is the chance of any radiation accident as a result of an earthquake, which he said is low.

Regardless of where a plant lies on the list, there is an extremely low risk for damage to any nuclear plant in the United States, he said. "V.C. Sumner Nuclear Station is designed to withstand an earthquake greater in size than the area has ever experienced."

He said the plant is at low risk for any damage, in part, because of the geology of the region.

Ledford said the purpose of the August study was as a "screening tool" to see what additional steps might be necessary for further analysis, not to issue a final report on potential threats.

"What we have found thus far is that the somewhat heightened risk at some of the plants are still more than offset by the margins built in above historical earthquakes on the design basis," he said.

NRC officials say American reactors have ample back-up systems to prevent the type of situation that occurred in Japan, where a tsunami overwhelmed a six-reactor plant and shut down power and the pumps that cool the reactors and spent fuel rods in storage pools.

"The NRC's primary responsibility is to ensure adequate protection of the

public health and safety of the American people," NRC Chairman Gregory Jaczko testified last week before Congress.

"Toward that end, we have been very closely monitoring the activities in Japan and reviewing all currently available information. Review of this information, combined with our ongoing inspection and licensing oversight, gives us confidence that the U.S. plants continue to operate safely."

### Back-up protections

Tom Clements, who studies nuclear issues for the environmental group Friends of the Earth, said he hasn't reviewed the NRC report but does believe there is reason to examine the potential impact from an earthquake on South Carolina reactors.

"I'm not convinced the reactors in South Carolina could withstand another earthquake the magnitude of the Charleston earthquake," he said.

Officials with the Union of Concerned Scientists, a national group that studies nuclear issues, say concerns about earthquake damage on U.S. reactors in light of what has happened in Japan shouldn't be easily dismissed.

"It's a little bit unfair for us to say that Japan has weaker regulations or lower regulations," David Lochbaum, director of the organization's nuclear safety program, said last month.

"They just had worse luck than we did. In some sense, the reactors' designs are similar, the regulations are similar. If faced

with a similar challenge, it's unlikely that our reactors would come out any differently. We would have the same response," he said.

"Unfortunately, they were faced with a challenge and came up empty. Our reactors haven't been tested to that degree and, therefore, haven't had a chance to come up empty yet."

Dr. Edwin Lyman, senior scientist at the organization, told the U.S. Senate last month that 23 U.S. plants have the same design as those in Japan, many are just as old, and some U.S. nuclear plants have experienced blackouts, where power has failed both from the main electrical supply and the backup generators.

Duke officials say the Oconee reactors are protected with multiple back-up systems.

Independent backup power supplies to maintain cooling of the fuel include Duke's Keowee hydro station that has overhead and underground lines to the nuclear station, Duke's combustion turbine at its steam station in Williamston, Oconee's on-site standby shutdown facility, and a pump driven by the steam from Oconee's turbines so it doesn't need electricity to

operate, Magee said.

The plant's backup sources would also provide cooling for spent fuel rods in its temporary storage pool, she said.

Cooling the spent fuel pools in the event of an earthquake is a major concern of the Union of Concerned Scientists. The organization has proposed that fuel rods that have been removed from reactors for more than five or six years be moved into dry cask storage to minimize

the number kept in ponds.

"By thinning the pools down, you reduce the consequences of an event should workers fail to successfully restore cooling or the water inventory," Lochbaum said.

"Simply because there's less material in the pools, the radioactive cloud that comes out of a spent fuel pool accident is much, much lower. So, the risk, the consequences, go down as well."