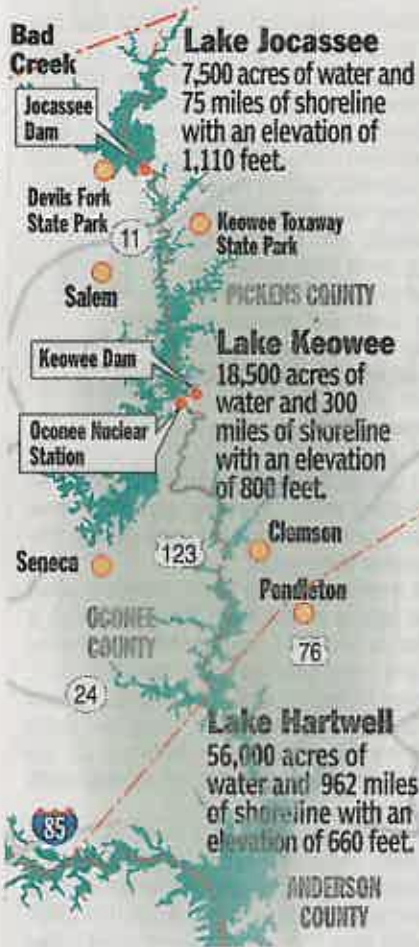


NEW FOCUS ON:

# NUCLEAR PLANT DAMS

## Jocassee Dam has passed inspections, documents show; data closely held



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The top of Lake Jocassee Dam is the width of a two-lane road, separating 7,500 surface acres of water on one side and a 385-foot drop to Lake Keowee on the other, widening beneath the surface to a 1,500-foot base, the

size of five football fields. Failure of the 1,800-foot-long rock and earthen dam, either by earthquake, terrorism or other disaster, is unthinkable. Documents reviewed by GreenvilleOnline.com show the unleashed waters could put the three-reactor Oconee Nuclear Station as much as 16.8 feet deep

in water. The torrent of destruction would take out roads and bridges and could cause flooding to restaurant row on U.S. 123 in Clemson, emergency preparedness officials said in interviews. Officials at Duke Energy, which owns and operates the Keowee-Toxaway complex

that includes the dam and the nuclear station, said it's safe and is regularly and rigorously inspected. They also said they are confident of the security used to protect the dam and the reactor station. There are experts who believe the nation's nuclear in-

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## DAM

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dustry should think more deeply about the safety of dams and the possibility of failures that could flood reactors and create the type of disaster that unfolded in Japan after an earthquake and tsunami destroyed safety systems previously thought ironclad.

Much of what the government knows about the safety of the Jocassee dam and others like it that it regulates is classified, to keep information from terrorists.

Documents obtained by GreenvilleOnline.com show the dam passed its latest annual inspection by the Federal Energy Regulatory Commission.

"Based on observations during the field inspection and review of data ... the Keowee project is in satisfactory condition and adequately maintained," inspectors wrote.

A U.S. Nuclear Regulatory Commission task force that reviewed the nation's reactor safety systems after Japan's disaster recommended that more attention be paid to dam integrity and safety.

"Of all the threats to nuclear power plants, I think dam failure is one that's probably overlooked almost the most," said Tom Clements, former executive director of the Nuclear

Control Institute who now serves as the Southeastern Nuclear Campaign coordinator for Friends of Earth.

A nightmarish combination of earthquake and dam failure is "the worst kind of natural accident I can think of" at Oconee, he said. "That would cause other problems at the site, so the difficulty would be compounded."

Clements hopes the task force recommendations will lead to new evaluation of Oconee's ability to withstand such a disaster.

"The task force report identifies newer technologies that enable us to determine seismic risks better than in the past," he said. "I think the same thing can be said of dam failure and flooding possibilities."

Don Evett, who served as the emergency management director in Pickens County before retiring, said, "A worst-case scenario would probably be a major earthquake. I don't know if there's a real good way to alert everybody, especially the immediate area downstream."

Flooding would depend partly on rate of flow through the breached dam and lake levels downstream, said Larry Murdoch, a hydrogeology professor at Clemson.

Keowee, with 18,500 surface acres, is more than twice the size of Jocassee and could hold some of the water, and opening gates at Keowee and the Hartwell, Thurmond and Russell

dams downstream would help alleviate flooding, Murdoch said.

While there's never been a major dam failure in this state, there's "potential for catastrophic failure," according to the Emergency Management Division.

"The greatest threat is where a significant population is located immediately downstream from a large hydro dam or several dams in succession," states an emergency management document that lists the Jocassee and Keowee dams as "examples of large-scale threats."

Thousands of people live in Lake Keowee communities, and both lakes are popular with boaters.

In addition to annual federal inspections, Duke inspects all dams and dikes in the Keowee-Toxaway project every two weeks and immediately after seis-

mic activity or rain of two or more inches in a 24-hour period, said Brad Keaton, chief dam safety engineer. They're also examined by independent engineers every five years.

Emergency notification was a flaw in a major emergency drill based on failure of the Jocassee dam about seven years ago, said Evett and Scott Krein, acting director of Oconee County Emergency Management.

Notification systems have been upgraded since then, Krein said.

"There are still upgrades we want to move to. We hope that we will have enough time to do the best notification to limit loss of life and loss of property and keep residents and people who visit as safe as possible," Krein said.

Numerous "micro earthquakes" have occurred around Jocassee — all but

one below magnitude 3 on the Richter scale, said Pradeep Talwani, who founded the South Carolina Seismic Network at the University of South Carolina and has studied seismic activity around Jocassee since 1975. The exception, west of Jocassee in 1979, was a 4.3.

The large Brevard Zone fault passes through the northwest corner of Lake Jocassee, however the type of rock there "inhibits seismic activity," Talwani said.

The Jocassee Dam meets all federal criteria for safe operation and performance in the event of an earthquake, Keaton said.

It's designed to withstand a once-in-2,500-year seismic event estimated by the U.S. Geologic Survey for the area, and studies show compacted rock and earth-filled dams like Jocassee can withstand "sub-

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stantial" shaking," he said.

Duke spokeswoman Sandra Magee can't go into detail about strategies to handle major flooding at the nuclear station. "Some of our mitigation is security sensitive," she said.

Improved monitoring at the dam would more quickly allow operators to take preventative action, and Oconee has "alternate methods to provide water to the reactors and the spent fuel pools to protect the public," Magee said.

"We continue to pursue modifications and make investments to enhance public safety," Magee said.

Part of \$2 billion Duke is spending at Oconee includes raising the height of barriers around critical equipment and strengthening walls to protect against flooding, high winds, earthquakes, fire and other forces, Magee said.