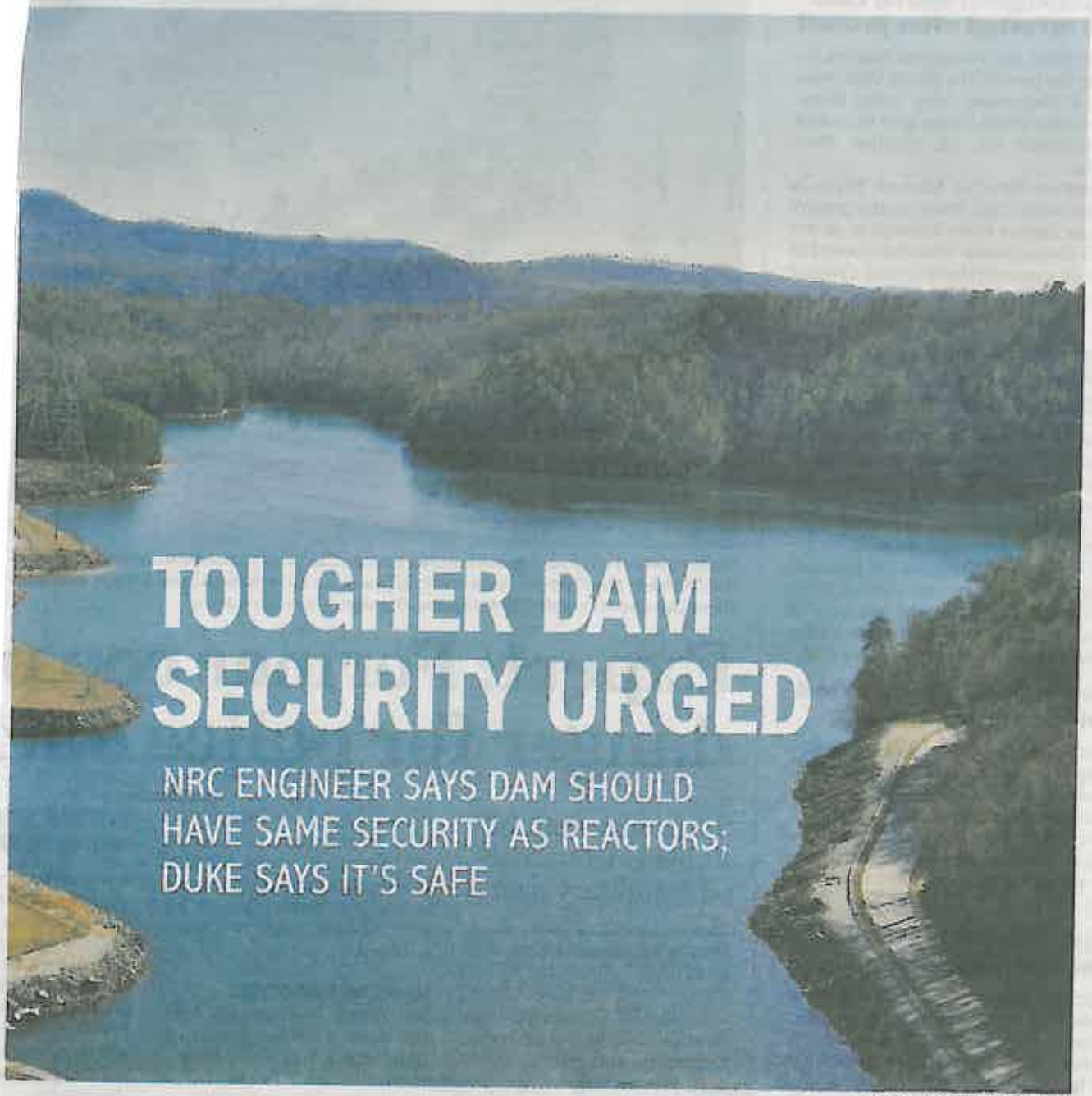


TOUGHER DAM SECURITY URGED

NRC ENGINEER SAYS DAM SHOULD HAVE SAME SECURITY AS REACTORS; DUKE SAYS IT'S SAFE

MYKAL MCELDOWNEY / STAFF

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As majestic a wonder as Lake Jocassee is, the dam that holds its emerald waters at bay is a marvel itself, a testament to humanity's power over its natural environment.

Looking down from its 385-foot-high peak, it's difficult to imagine how this massive structure could fail — an unlikely event, but one that scientists say could cripple the Oconee Nuclear Station downstream and alter life in the Southeast for at least a generation.

OUR NATURAL BEAUTY

How can we know? The power company, Duke Energy, says it has its methods — some that its officials will share, others they won't.

It's these undisclosed measures that one federal regulator — who before has spoken out on the threat a Jocassee dam failure could pose — says the public should hold the government and the power company accountable for.

And he said the government should require the dam to have

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INSIDE LOOK
See the view from atop Lake Jocassee Dam and take a tour inside the Jocassee Pumped Storage Hydro Station in a video at GreenvilleOnline.com.



the same level of rigorous security requirements as those that exist for Oconee's three reactors. The owners and operators of the nuclear station said the dam is vigorously protected and safe.

The nuclear station is well-guarded, but what of its support systems, particularly the dam? What is the threat of terrorism? Or sabotage from within? These are questions Nuclear Regulatory Commission reliability and risk engineer and whistle-blower Larry Criscione says can be answered.

Or, if they can't be answered, shouldn't they be? And should the plant continue to operate if the same heightened level of security it employs inside the station isn't the same as outside?

"In terms of security regulations, they stop at the fence," Criscione told GreenvilleOnline.com. "They're internal to the fence that surrounds the nuclear plant."

Duke said security is adequate. A dam failure, they say, is nearly impossible.

The circumstances that could lead to failure, Duke spokeswoman Sandra Magee said, "are hard to even imagine."

Still, questions circle.

Massive dam

Looking up at the looming rock structure from the surface of Lake Keowee, the dam holding back Jocassee's waters is the equivalent of a narrow, two-way gravel county road 385 feet high. It provides a vantage point from either side of the so-called Keowee-Toxaway Hydroelectric Project built 40 years ago.

The virtually unspoiled Lake Jocassee is fed by four dammed rivers on one side, the recreational and retirement haven Lake Keowee farther below on the other.

Its height ranks as the 38th tallest dam in the U.S., the third tallest east of the Mississippi.

The "toe" of the 1,800-foot-wide dam — where the face of a dam reaches ground level below — stretches far beneath the water, 1,500 feet.

At the foot of the dam, looking up from the Jocassee Pumped Storage Hydro Station, a mass of rock and earth casts a towering shadow both imposing and comforting, depending on your imagination.

Water is released through the dam to create electricity. When demand is high, especially in the summer, turbines are reversed to pump water back to Lake Jocassee so that its force can generate more electricity.

Downstream from the dam, on Lake Keowee, the Oconee Nuclear Station relies on the waters to cool its three reactors that provide the bulk of electricity in the Upstate.

It also relies on the dam to hold, so that nuclear meltdown doesn't happen.

Security questions

In a letter to federal legislators and regulators and nuclear watchdog groups, Criscione raised questions about the security of the Jocassee Dam and the threat of flooding.

In particular, Criscione questions why so many details of how the dam is protected are withheld from the public under the auspices of security-related concerns.

Since 2007, he wrote in the letter, the NRC has stamped security issues related to potential failure — a prospect the NRC and Duke have expressed concern over since at least 2006 — as "safety-related information" meant for "official use only."

"This indicates to me that, after five years, the NRC has not been able to adequately ensure the security of the Jocassee Dam," Criscione wrote.

In his letter, Criscione said that if the government believes there is a credible threat to the dam, then it should require the same level of security as that provided within the nuclear station.

The nuclear station requires multiple layers of verification and high-tech detection. Guards armed with assault rifles patrol the reactors.

However, only the nuclear station is regulated by the NRC. The Federal Energy Regulatory Commission inspects and oversees the dam, but doesn't require the same security measures that a nuclear plant does, Criscione wrote.

Government studies show that a dam failure could inundate Oconee's backup power system under more than 16 feet of water, well above its capability to withstand a flood.

In 2010, the NRC required Duke by the next year to build up the flood wall protecting its "standby shutdown facility." The NRC granted an extension to 2016.

Duke could lower lake levels in Jocassee and Keowee until the flood wall is improved or shut down the reactors until the concerns are addressed, Criscione wrote.

Late last year, Criscione and a fellow NRC engineer protested the withholding of information that they said was less about protecting security and more about avoiding embarrassment over how long the NRC and Duke feared a problem of dam failure.

"I am not convinced that there is a credible security concern regarding Jocassee Dam," Criscione wrote. "Obviously, all man-made structures can be demolished. But that fact in and of itself does not cause a security threat to exist."

What is the minimum threat that could jeopardize the dam's integrity?

"Is it a half-dozen drunken teenage vandals with some stolen dynamite and a canoe?" Criscione asked in his letter. "Or is it a platoon of trained underwater demolition experts from a technologically advanced nation-state?"

Whatever the answer, Criscione told GreenvilleOnline.com, the plant should either be shut down or more information assuring the public released.

Safeguards

"We are firmly committed that (the dam) is a secure facility and that the Oconee site is a secure facility," Terry King, Oconee's security manager, told GreenvilleOnline.com during a tour of the dam. "We still feel like some of the details associated with the security plan and requirements are better [illegible]

space."

On the Jocassee side, birds perch on a floating barrier that marks where boats can't pass any farther. The front gate is monitored by surveillance, and keyed entry is required.

The dam "is patrolled by trained security officers," Duke's Magee said.

In terms of background checks for the keepers of the dam, Magee said the standard for checks is governed by the Southeastern Reliability Corp., under the direction of the Federal Energy Regulatory Commission.

The standards for background checks at the nuclear station are governed by the NRC, she said.

However, she said, "The information obtained in the background checks would be the same. The background checks are conducted when an employee is hired and updated periodically. The rigor of the program components applied to a given job is graded based on the position's access to critical systems, components or information."

Beyond those security details, Duke officials offered little else.

"Even though we have secure facilities, we don't typically release the details associated with what makes us feel like it's a secure facility, or what vulnerabilities could exist or the consequences of what could happen," King said.

The reason, he said, is that "one report could be put with another" to piece together a strategy of attack, that those with bad intentions could "extrapolate other concerns or other potential security issues."

"You would not want details out for potential bad guys to draw from," King said.

Every year, the dam is inspected by federal regulators and then every five years by independent engineers. Duke inspects all dams and dikes in the Keowee-Toxaway project every two weeks or after significant seismic or rainfall events.

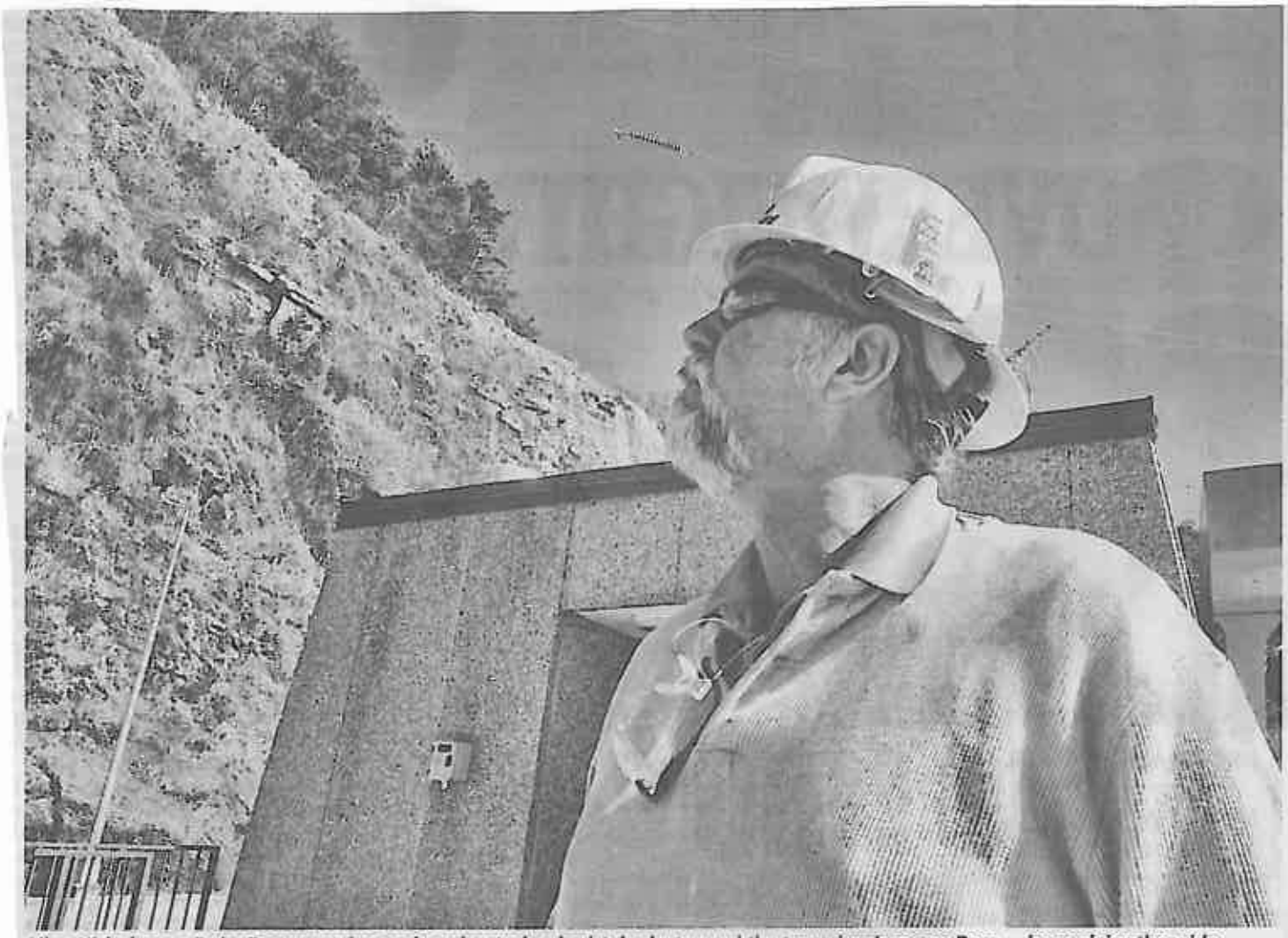
Inspection techniques vary from complex to elementary, said Allen Nicholson, a Duke senior engineering technologist. In one test, Duke will use a stopwatch and sample a pint of stream measured for the past 40 years and take into account rains and elevation changes over the years.

Lake Jocassee offers a challenge to any potential attacker, Nicholson said. The lake is largely undeveloped, and the only convenient access is from Devil's Fork State Park, unlike Keowee or Lake Norman near Charlotte, he said.

The security issue is but one dam concern expressed by Criscione and fellow NRC engineer Richard Perkins.

Last fall, the pair authored papers calling into question the intentions of Duke and the NRC in withholding information on what threat a Jocassee dam failure might pose.

The message was that the NRC and Duke know more than they are telling the public and that the secrets they keep are less about safety and more about just how long they have known and discussed their concerns.



Allen Nicholson, a Duke Energy senior engineering technologist, looks toward the towering Jocassee Dam as he explains the wide variety of safety testing the dam undergoes each year. MYKAL MCELDOWNEY/STAFF

Documents released through the Freedom of Information Act include government talking points to communicate the message with those outside the circle and a timeline detailing NRC concerns shared with Duke and actions both taken and not taken.

Final safety measures will be put forward in 2016 as part of the nation's response to the March 2011 Fukushima tsunami and nuclear meltdown.