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As Clock Ticks, Nuclear Plant Searches for Leak

By **MATTHEW L. WALD**

VERNON, Vt. — At [Vermont Yankee](#), a nuclear reactor on the ropes, the search for a tritium leak that may doom the plant is proceeding as quickly as possible — which is to say, at a painstaking pace.

Over the last few weeks, in the buildup to a [vote](#) Wednesday in which the State Senate approved shutting down the plant, engineers have been digging well after well here in an exploratory strategy that evokes the child's game of Battleship. At each spot, workers measure the level of radioactive tritium found in the water in the hope of triangulating their way to the source of the contamination.

To avoid losing track of the wells under the blanket of snow that renews itself here every few days, the locations are marked with yellow cones like the ones janitors use to warn of wet floors.

Finding and fixing the leak would be a first step toward rebuilding the plant's credibility — crucial if the owner, the Louisiana-based nuclear company Entergy, is to persuade lawmakers to reverse their decision to force the plant to close when its license expires in 2012.

In voting 26 to 4 on Wednesday to shut the plant, senators cited the leak, a collapsed cooling tower and initial denials by company employees that underground pipes carry tritium — even though they do.

Now, based on the tritium levels logged at various spots, a team of several dozen technicians, chemists, hydrologists and others who have been working in shifts around the clock think they may have found their target.

In recent days, they have been digging toward a two-inch steel pipe wrapped in a plastic one that is itself surrounded by concrete. The operation is unfolding in a narrow industrial alley between two plant buildings in a late winter jumble of snow, mud, scaffolding and railings

covered with bright orange plastic mesh to prevent anything from falling in.

In the world beyond the plant fence, digging this trench would take about two days, supervisors say. But as this is an operating nuclear plant, the effort has taken more than two weeks. There are no shovels, but a device that is a cross between a giant Shop-Vac and a Waterpik: it sucks up dirt and squirts a jet of water to loosen the soil when necessary.

This excavation, 13 feet long and 7 feet wide, is now about 15 feet deep. Four essential pipes that are closer to the surface — two carrying fuel for the reactor's emergency diesel generators and two carrying air used to power equipment at the plant — are suspended near the center of the trench, forming obstacles to be assiduously avoided.

To prevent a cave-in, the trench is lined with steel plates on each side that are also handled delicately. On Thursday, one of them, perhaps caught on a rock or other obstruction, was refusing to slide down toward the ever-lowering bottom. So supervisors brought in a huge backhoe on caterpillar treads to try to tap it farther down.

“In the real world, you'd just bang it in,” said Tom Wrinn, a supervisor from Shaw Inc., a contractor digging the trench. “But you can't do that here.”

Mr. Wrinn watched intently as the backhoe operator maneuvered a giant claw under the roofing his men had erected to keep rainwater out of the trench. The operator set the claw down on top of the plate. Nothing happened. So the workers gave up and went back to digging with the giant vacuum. “We're being ultra-careful,” Mr. Wrinn said.

Updates on the operation are issued regularly, and health officials continue to monitor the area's drinking water. No tritium has shown up in any drinking water wells, and there is no evidence that anyone has been exposed to radiation from the leaks.

Strewn with laptop computers, cellphones, beepers, grubby jackets slung on chair backs and heroic quantities of soft drink bottles, a conference room known as the “tritium room” operates 24 hours a day. Blueprints tacked to the walls show underground piping, monitoring wells and other plant equipment. (Another contractor continues to sink more wells around Vermont Yankee, which lies on the western side of the Connecticut River, just north of the Massachusetts border.)

Some technicians and engineers holed up here are long-time employees of Vermont Yankee, which opened in 1972 and is one of the nation's oldest nuclear plants. Others include specialists in finding flaws in buried piping who use ultrasound and other techniques perfected in the oil and gas industries.

For the nuclear industry as a whole, the safety issues raised by tritium leaks have political implications. The dispute over the fate of Vermont Yankee arose just as the Obama administration was promoting a revival of nuclear plant construction backed by billions of dollars in federal loan guarantees.

The push for such construction is cast mainly as a drive to embrace clean and renewable energy sources but is also aimed at drawing Republican support in Congress for a climate and energy bill.

Adding to the urgency over the leak is regulatory pressure. “We expect them to move forward and fix the problem,” said Donald E. Jackson, a branch chief at the [Nuclear Regulatory Commission](#)’s regional office of reactor projects, who was at the site this week.

While the commission is disposed toward extending the plant’s lease for another two decades, Entergy now needs the approval of Vermont’s House and the Senate to reverse itself for that to happen.

“We want to get this behind us,” said Timothy Trask, Entergy’s chief engineer, who grew up in the area and was sent back to oversee the fix.

“We are fixing it,” he added firmly, “and getting ready for the next 20 years.”

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