A Question of Competence: Will Indian Point be Safe for Decades?

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By Roger Witherspoon

Robert Aleksick was emphatic.

“FAC is like roaches,” he said, spreading his arms wide in a gesture of exasperation. “Where you see one, there are bound to be more hidden away.”

Aleksick should know about these hidden pests. As president of CSI Technologies, Inc., he is one of the nation’s foremost experts on FACs, or Flow Assisted Corrosion, a condition of degradation on the inside of pipes carrying superheated, radioactive water under high pressure conditions. If undetected, FACs could lead to pipe ruptures and, in a worse case, loss of coolant to a nuclear reactor.

Whether or not technicians at the Indian Point nuclear power plants could spot where those roaches or FACs could be hiding, or predict where they might try to hide over the next 20 years was the subject of an intense dispute at the opening of months of judicial hearings last week. A three judge panel of the Atomic Safety and Licensing Board, meeting in Tarrytown, is wading through arguments over a dozen challenges to applications from Entergy Nuclear to renew the licenses of its twin plants, Indian Point 2 and 3, for another 20 years. Entergy purchased Indian Point 2 from Consolidated Edison and Indian Point 3 from the New York Power Authority in 2000, and their current 40-year licenses expire in 2013 and 2015,

respectively. The board's findings will be presented to the five members of the Nuclear Regulatory Commission, who can accept or reject their ruling.

The challenges, buttressed by more than 1,400 exhibits, were filed by the New York Attorney General's office, and the non-profit environmental groups Clearwater and Riverkeeper. New York's challenges, or contentions, are backed up by Connecticut Attorney General Robert Snook, whose office is also represented at the legal proceeding.

Collectively, the contentions challenge different aspects of Entergy's plans for ensuring the safe operation of the twin nuclear reactors over the next 20 years and the maintenance of the spent fuel pool for decades after the plants finally retire. Under current NRC rules, the highly radioactive fuel rods could sit at the plant site for a century after the plants shut down, whether or not Entergy, as a company, is still in existence and capable of taking care of them.

The opening arguments presented a sharp contrast between the confidence Entergy has in its approach to long term management of ageing pipes and wiring, and the skepticism the state of New York and the environmental groups have in those monitoring systems.

Aleksick, an expert witness for Entergy, dueled with Joram Hopenfeld, who testified for Riverkeeper and Clearwater that the primary system for predicting and detecting deterioration in the wall thickness in critical pipe systems was flawed. Hopenfeld a specialist in pipe corrosion, who once worked for the NRC, pointed to the results of sonic tests by Entergy showing wall thickness readings of 1.3 inches and .5 inches in a curve in a 1.5-inch thick pipe.

Hopenfeld said the data supplied by Entergy showed that "the tests Entergy is relying on are designed to show overall averages. But the actual sonic tests show there is uneven wear due to FAC and the pipe is not going to hold."

But Aleksick said the uneven readings were due to lamination, or flaws in the metal, which caused the sonic probe to bounce back prematurely. "When you come across lamination," Aleksick said, "it will give an erroneous reading. The example here of different thicknesses is

due to lamination, not to actual wall thinning.

“I completely reject the assertion that this data set represents huge variations in the thickness and strength of the pipe wall.”

Whenever Entergy’s ultrasound probes find apparent variation, Aleksick explained, the company proceeds with a series of more extensive tests to determine for certain if the pipe wall has been corroded or if the metal has flaws that are similar to the way knots in a tree trunk would mar the symmetry of the wood.

The argument seemed to resonate with Judge Richard Wardwell, who holds a doctorate in civil engineering from ColoradoStateUniversity and has served as Maine’s Chair of the Board of Environmental Protection.

“It seems to me that this is an anomaly,” said Wardwell to Hopenfeld. “I’m thinking that what we heard from Entergy was that they took the data, looked at the anomaly, and they don’t believe that it measures wall thickness. I am struggling to see how you arrive at the different conclusion.”

Undeterred, Hopenfeld asked “supposed you were buying a new piping system for your home, Judge, and the plumbing company said they have this pipe system, but there were anomalies in the metal pipes wall and the probes could not be relied upon to tell you how they were holding up over time. Would you buy it?”

It was a question which Wardwell, in his capacity as a law judge, could not answer. But the protracted exchange typified the complexity and minutiae facing he and his colleagues – Lawrence McDade, panel chairman and a former Department of Justice attorney specializing in hazardous substances; and Michael Kennedy, who holds a doctorate in nuclear engineering from the University of Virginia, and spent 30 years in the nuclear industry specializing in safety issues associated with light water reactors. McDade made it clear early on that the panel intended to hear all arguments, rather than allow either side to use technicalities to block arguments from their opponents.

As the hearings opened, Clearwater and Riverkeeper sought to withdraw a contention dealing with the negative impact the plants' once-through cooling system has on the Hudson River's aquatic environment. Manna Jo Greene, environmental director for Clearwater, said that after three months of negotiations, they had reached an agreement with Entergy to drop their challenge if the company agreed to monitor radioactive contamination in the water and fish in Haverstraw Bay, on the opposite side of the river from the plants. Currently, the plant monitors radioactivity in the water and fish upstream and at the plant site itself where the water leaks or is intentionally discharged.

Indian Point is the state's largest water user, pulling some 2.5 billion gallons of water daily from the river, nearly double the 1.3 billion gallons used by the nine million residents and visitors to New York City and Westchester County daily. The plants then run the river water through a heat exchanger to cool the steam used to turn its 40-ton, electric generating turbine. The heated water is then returned to the river. In the process, billions of fish are sucked into the plant's 40-foot-wide intake pipes and killed. The National Marine Fisheries Service stated in an analysis that Indian Point's massive fish kills are more to blame for declines in commercial fish stocks along the North Atlantic coastal seaboard than overfishing from factory fleets.

Those fish kills are the subject of a separate hearing before the state Department of Environmental Conservation, which has stated it will deny Indian Point a water use permit unless it changes to a closed cycle cooling system, which employs a radiator-like installation to recycle water. That system would drop the amount of water used and fish killed by 95%.

"Our board thought long and hard about this," said Greene. "But in the end we had to look at what was the most economic thing for us to do. It costs a lot of money to fight Entergy and the state has a significant challenge here covering pretty much all of the issues."

Riverkeeper president Paul Gallay said his organization needed to "get the biggest bang for their buck" and concurred in the decision to negotiate an agreement on this issue.

Their request, however, was not immediately accepted. Judge McDade to first talk with the

town of Cortlandt and get their input. No decision would be made until Cortlandt agreed with the decision. It was a strong signal from the bench that the judicial trio believed the public has a significant stake in the outcome of these proceedings.

The decision of Clearwater and Riverkeeper to seek a settlement, where possible, was not a total surprise. The NRC has approved the first 70 license renewal requests with no problems and no state opposition. All four of the nuclear plants in New Jersey, for example, were approved within two years because the state supported them.

Norm Cohen, head of the non-profit group, Salem Watch, said "we could not afford to challenge PSEG and Exelon," the owners and operators of Hope and Oyster Creek, Salem 1 and 2 nuclear power plants.

"We had to limit our role to that of watchdogs."

By contrast, the New York Attorney General, under Andrew Cuomo, set up an environmental division which has grown to some 28 members and has a budget to hire expert consultants including physicists, mathematicians, meteorologists, and even volcanologists to wade through the technical aspects of nuclear power plant operations. When Eric Schneiderman took over thee office after Cuomo became governor, he expanded the environmental division. As a result, Entergy has been fighting a protracted legal dispute to renew their licenses for more than five years.

A key part of the state's challenge involves the Severe Accident Mitigation Assessment, a 300-page document in which nuclear plant operators look at the possible impacts stemming from a reactor meltdown and the steps they can take to minimize the damage should that accident occur.

While all nuclear plants have been required to have SAMAs as part of their license, the NRC never examined them in detail before the multiple reactor meltdowns at Japan's Fukushima reactors last year. The NRC found inadequacies in many of them.

At Indian Point, for example, the NRC found that while its reactor building was designed to

withstand an earthquake of a magnitude 5.2, its fire equipment was in a concrete building that was not designed to withstand such an earthquake, nor were the water mains coming into the site from the town of Buchanan. As a result, if an earthquake caused a fire at Indian Point, the reactor building could survive, but there might not be any water to put the fire out or any usable equipment to fight a fire with.

In one major contention, the nuclear group in the NY Attorney General's office, led by John Sipos, found that Entergy's contention that a meltdown would cost about $403 million per square mile was flawed because:

- The company claimed through its mathematical meteorological models that winds from the east and west cancelled each other out, and winds blowing south to north were so predominant that they only had to consider the impact of radioactive fallout along the upper Hudson River. If so, that would exclude possible contamination of New York City, Connecticut as far east as Hartford; New Jersey south to NewarkAirport; and across the Delaware Water Gap into the Pennsylvania Poconos. New York contends that the winds, in fact, blow in all directions and contamination would impact urban New York City, costing trillions of dollars to clean up.
- Entergy contends that most of the heavy radioactive elements in an escaping radiation cloud would fall out within the first few miles, thus minimizing the extent and cost of the most rigorous cleanup. The Attorney General's office states that experience from Chernobyl and Fukushima clearly show that that is not true and all of the region would be at risk.

The hearings will continue in Tarrytown this week and then will break until mid November.