

### Regulators Cite FP&L For Safety Violations

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Federal regulators have fined Florida Power & Light \$70,000 for improperly maintaining hundreds of tons of highly radioactive spent fuel at their Turkey Point 3 power plant near Homestead, in violation of their operating license.

The fine concludes a six month investigation by the Nuclear Regulatory Commission into the degradation of chemicals in the spent fuel pool designed to prevent fission between the thousands of 12-foot-long fuel rods in an under water storage pool.

This is the second nuclear facility owned by FP&L to come under NRC fire in two months. In May, continuing problems with critical safety systems at the St. Lucie nuclear power plant resulted in the NRC downgrading the site's status to among the worst run facilities in the nation.

The NRC dropped the plant's designation in its color coded rating system from green – which is given to the best run plants – to yellow, the second lowest designation, asserting that the problems at the plant “have substantial safety significance.”

At present, none of the nation's 104 operating nuclear reactors have a “red” rating, the lowest safety classification, and only the Browns Ferry plant operated by the Tennessee Valley Authority currently shares the “yellow” rating. The downgrade means the plant will be subject to the regulatory agency's highest level of scrutiny, with frequent inspections by special teams supplementing the daily reviews by on site, resident inspectors.

The problem cited at Turkey Point 3 by the NRC involves one of the most critical safety functions in a nuclear facility. That is, failure to prevent fission in the 1,200 fuel assemblies in the spent fuel pool would cause them to heat up, just as they would in the operating reactor. If that happened, the water covering the fuel rods would boil away. That would allow the exposed fuel rods to reach “critical mass” and erupt in a nuclear fire and meltdown releasing far more lethal radiation than an actual nuclear explosion.

In this case, both NRC and FP&L officials assert that there was never any danger to the public of possible loss of control of the spent fuel pool. But there were fluctuations in its safety margins, and the methods used at the nuclear plant to restore these margins and maintain control of the pool were not approved as part of FP&L's operating license.

Due to the complexity of commercial nuclear power plants and the wide-ranging ramifications following a catastrophe, every major aspect of the plant's operation must be documented in series of design drawings showing every circuit and system. These form the “design basis” on which a company is licensed to operate a plant. Any deviation from the design basis must be tested by the NRC for its effectiveness and approved as a licensed deviation. Violating the design basis can result in the NRC ordering increased inspections, fines, or a shut down.

In this case, the racks holding the 1,200 fuel assemblies have panels of Boraflex – a neutron-absorbing Boron compound – which slide between the fuel rods and acts like a magnet, capturing the neutrons. A decade ago, the NRC issued a general “information notice” to utilities that the Boraflex may dissolve over time and lose effectiveness. That is of particular concern to older plants like Turkey Point 3, which was designed in the 1950s and 1960s and came on line in 1972. It's fuel pool is licensed to house 1,500 fuel assemblies.

According to NRC spokesman Roger Hannah, Turkey Point 3 officials realized at some point last year that the effectiveness of the Boraflex was waning and they added a soluble boron solution to the spent fuel pool water rather than replace the Boraflex panels in their storage racks. FP&L officials did not notify the NRC when they discovered the problem, nor did they have permission from the regulatory agency to unilaterally use an alternative solution.

In a statement accompanying the announcement of the fine, the federal regulators said that “in December 2009, the NRC became aware that the neutron-absorbing material called Boraflex in the Unit 3 spent fuel pool had degraded below the levels spelled out in the plant's design basis documents. Although FPL had taken compensatory measures including the addition of soluble boron, the regulatory requirements that ensure the spent fuel pool remains safe were not met.

“The company's actions ensured the pool's condition did not pose an immediate safety concern, but the NRC found that FPL did not promptly identify and correct the condition.”

Hannah said “the important thing is that this did not rise to a criticality issue because they added increasing levels of soluble boron. But that was not allowed in the technical specifications and was not in compliance with the regulations.”

The problem with the Boraflex coating is that it flakes off over time, in the form of deposits of silica salts and boron in the pool, and can cause fluctuations in the temperature of the spent fuel pool itself. In this case, the material had been decaying and accumulating for quite some time before Turkey Point 3 operators noticed that there was a problem.

“If they had seen this early on and filed for a license amendment to change the design basis documents,” said Hannah, “or had come back with a different solution which would have been part of the license amendment that would have been OK. But it was some time before they actually noticed and reported this.”

FP&L spokesman Michael Waldron said “we monitor the spent fuel pools on a real time basis and at any given time we understand what is going on in the spent fuel pool.”

Waldron did not, however, address the issue of the reporting delay cited by the NRC, why the company belatedly realized it had a problem, or why it did not seek permission for an unapproved solution to the boron problem.

"We did the appropriate testing," said Waldron. "Through engineering analysis, we determined that there was some degradation out of only one cell (among 1,200). Based on that, we took compensatory measures that more than offset any issues related to this one cell.

"We also inserted control rods to stop the movement of neutrons. There was never any safety issue. We manage our spent fuel pools extremely conservatively."