

# Energy Matters

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## [Explosion Forces Eighth Nuclear Plant Shut Down](#)

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**By Roger Witherspoon**

An explosion and fire in a transformer at the Indian Point power station Sunday evening forced the eighth shutdown in two years of one of the site's twin nuclear reactors.

There were no injuries resulting from the blast, and Entergy Nuclear Northeast, which owns the site, did not report any immediately detectable damage to its nuclear reactor safety systems. But the blast, at 6:39 PM Sunday, triggered the declaration of a "nuclear alert," which prompted officials in the four surrounding counties – Rockland, Westchester, Putnam and Orange – to open their emergency response centers in preparation for a regional evacuation if the situation deteriorated. But the damage was confined to the transformer system, which connects the nuclear plant to the regional electric grid, and the alert was lifted about 11 PM.

The "alert" is the second lowest of the four stages of emergency declarations at the nuclear site. Officials emphasize that there was no danger to the public at any time during this event.

But if the situation had escalated, it would have affected all of North Jersey as far south as Newark.

Neil Sheehan, spokesman for the federal Nuclear Regulatory Commission, said the huge transformer sits in the open next to the non-nuclear, electric generating building.

“These transformers fail occasionally,” Sheehan said, “and there is a blast wall adjacent to the transformer and a deluge water system that activated and tamped down the fire. The company’s fire brigade on site responded and sprayed foam to ensure the flames were out.”

Indian Point 2 and 3 are located in Buchanan, NY, on the site of a sprawling, former amusement park on the bank of the Hudson River opposite Bear Mountain, about 25 miles north of Manhattan. The twin reactors produce a combined 2,000 Megawatts of electricity, most of which is sold into the NYC-Westchester service area of the power grid. Their output is about 16 percent of the 9,000 to 12,000 MW delivered daily by Con Edison, the regional electricity distribution company which sold Indian Point 2 to Entergy in 2001.

The Buchanan fire department responded to the blast, but its firemen were not allowed on the restricted site. The explosion occurred in a 900,000-pound transformer serving Indian Point 2. The transformers take the electricity coming out of the plant’s generators at 22,000 volts and step it up to 345,000 volts to feed into the regional power grid. The transformer serving the adjacent nuclear plant, Indian Point 3, exploded in 2007.

David Lochbaum, the nuclear safety engineer with the Union of Concerned Scientists and a former consultant to the NRC, said the key components in the transformer – called bushings – at IP 3 had been in service since 1976, when the plant opened.

“When the plant operates the bushing is energized and heats up,” Lochbaum explained, “and when it shuts down the bushing cools and shrinks. Entergy’s later analysis stated that the thermal cycling apparently caused a failure to be introduced so electricity leaked out, caused a spark and lit the oil.

“Their report said they had tested the bushing a few months before the explosion and found it was unusually warm, but not outside the manufacturer’s limits, so there was no reason to fail it and replace it.”

Lochbaum said there are about six transformer explosions annually, with about two thirds caused by parts wearing out and the remaining third caused by “power uprates,” in which the plants are allowed to operate at higher temperatures than their original design plans called

for. These uprates typically increase the power output of the nuclear plant 10 percent to 20%, with corresponding increases in temperatures.

“When you increase the power output,” said Lochbaum, “you put more electricity through the lines, more flows through the bushings, and you can cause them to expand more than they have in the past. That puts stress on parts that did not handle stress well.”

While the NRC’s records show that Entergy replaced the bushing in its IP 3 transformer, there is no indication that they replaced those serving the sister plant, though IP 2 is actually three years older. Entergy is already being investigated by the NRC for possible systemic issues in its program to manage ageing equipment and systems that are common to both facilities.

Lochbaum, who spent 2009 working for the NRC upgrading its safety manuals and training reactor operators, said currently “the NRC tracks incidents at Indian Point 2 and 3 on an individual basis even though they are on the same site and there are common factors affecting both units.

“But the NRC does try to look at how the plant is being maintained and what their procedures are to see if they are up to the industry norms. When they start having events, the agency looks closer to see if perhaps Entergy has the same procedures as the rest of the industry, but aren’t as skillful at implementing it. So far, however, they haven’t found a common link other than that events are occurring at Indian Point.”