



RIVERKEEPER.

NY's clean water advocate

November 11, 2010

U.S. Nuclear Regulatory Commission
Office of the Inspector General
Mail Stop O5-E13
11555 Rockville Pike
Rockville, MD 20852

Dear Office of the Inspector General:

We are writing on behalf of Riverkeeper, Inc. ("Riverkeeper") to request that your offices undertake an investigation into the recent transformer explosion that occurred at the Indian Point nuclear power plant on November 7, 2010.

Riverkeeper is an environmental advocacy organization dedicated to protecting the Hudson River. Since its inception in 1966, Riverkeeper has used litigation, science, advocacy, and public education to raise and address concerns relating to the Indian Point nuclear power plant, which is located on the eastern bank of the Hudson River in Buchanan, NY. Over the years, a seemingly never ending stream of operational difficulties have plagued Indian Point: frequent component malfunctions and unplanned shutdowns, years of ineffective emergency sirens, leaking spent fuel pools, corroded underground piping, etc. The persistence of such problems has led to ongoing concerns and questions about the safety of the plant, and Riverkeeper, for the benefit of the public and in furtherance of our mission to protect the environmental resources impacted by Indian Point, has been engaged in various efforts throughout the years to ensure that such concerns are addressed.

This most recent unexpected malfunction, which resulted in the explosion of the main electrical transformer for Indian Point Unit 2, has significant implications regarding whether Entergy Nuclear Operations, Inc. ("Entergy"), the owner of the plant, is properly maintaining and operating the plant, and whether the NRC's regulatory oversight of the facility is adequate.

To begin with, this event is apparently similar to a transformer explosion that occurred in 2007 in relation to an Indian Point Unit 3 transformer. A Licensee Event Report ("LER") about this earlier explosion indicates that the failure occurred because of a faulty bushing component.¹

¹ Licensee Event Report # 2007-002-00, "Automatic Reactor Trip Due to a Turbine-Generator Trip Caused by a Fault on the 31 Main Transformer Phase B High Voltage Bushing (June 5, 2007), at pg. 3 of 5, ADAMS Accession No. ML071620122.

While “the root cause was indeterminate [because] the catastrophic failure destroyed most of the evidence,” a factor contributing to the malfunction included the 30-year old age of the bushing.² According to an analysis of this event, “years of service” had resulted in deterioration “until the breakdown was severe enough to result in failure.”³ As a result of this malfunction, Entergy purported to take various corrective actions, including establishing “acceptance criteria for large transformers,” and revising outage procedures “to require Engineering review and trending of test data and to specify acceptance criteria.”⁴ Given this apparent response, it is unclear why conditions which led to the latest Unit 2 transformer explosion were apparently undetected. The 2007 LER does indicate that the Unit 2 transformer was installed in 2006 and had differently designed and manufactured bushing components, which “there has been no industry issues with,”⁵ and so, the recent malfunction may not be associated with the failure of the same component that failed in 2007. However, this does not explain why the ostensibly heightened level of scrutiny afforded to transformers generally as a result of the 2007 event was not effective in preventing another major incident.

Moreover, in 2009 the NRC issued an Information Notice explicitly recognizing an industry problem with failing transformers.⁶ NRC observed “an increasing trend in transformer failures” that “has not decreased and in fact continues to rise.”⁷ The NRC listed seven examples of failures involving main power transformers. Notably, this list reveals that at least two other nuclear plants owned by Entergy have encountered problems with transformers: both River Bend Station and Grand Gulf Nuclear Station experienced loss of cooling on their main transformer in 2007 and 2008 respectively, which resulted in unplanned reactor scrams. It is troubling to say the least that Entergy is having ongoing problems with transformers at multiple plants, over a number of years. The latest incident at Indian Point serves as a clear indication that Entergy is failing to appropriately respond to maintenance and operational issues associated with transformers.

In fact, NRC has explained that the majority of transformer failures “could have been avoided had the licensee fully evaluated and effectively implemented corrective actions and recommendations identified in industry operating experience. These corrective actions included a more effective maintenance program and a more proactive approach to addressing abnormal indications.”⁸ Given the nuclear industry’s problems with transformers, Entergy’s own past problematic history with transformers in particular, and NRC’s subsequent statements on how to avoid such problems, the explosion that occurred this week at Indian Point is inexcusable, and suggests serious deficiencies in Entergy’s maintenance, inspection, and corrective action protocols and programs.

² *Id.*

³ *Id.*

⁴ *Id.* at pg. 4 of 5.

⁵ *Id.*

⁶ NRC Information Notice 2009-10, Transformer Failures—Recent Operating Experience (July 7, 2009), ADAMS Accession No. ML090540218

⁷ *Id.* at pg. 1 of 3; *see id.* at pg. 2 of 3 (“Transformer failures have resulted in eight declared plant events from January, 2007, to February, 2009, making them the second leading reason for such declarations.”).

⁸ *Id.* at pg. 2 of 3; *see id.* at pg. 1 of 3 (stating that industry has “provided recommendations to reduce the chances of [transformer] failure,” including “[i]mproved preventative maintenance and monitoring practices.”)

Based on the foregoing, an *independent* investigation of Entergy's program, or lack thereof, for maintaining electrical transformers is critical, in order to determine why the implementation of relevant NRC-regulated programs has been ineffective at ensuring proper maintenance of transformers, and how to avoid major transformer malfunctions in the future. This is precisely an issue that is appropriate for OIG to review: OIG was established "as an independent and objective unit to conduct and supervise audits and conduct investigations relating to NRC's programs and operations. The purpose of OIG's audits and investigations is to prevent and detect fraud, waste, abuse, and *mismanagement*, and *promote* economy, efficiency, and *effectiveness in NRC programs and operations*."⁹ Since there is clearly a problem with the effectiveness of the maintenance program employed by Entergy in relation to transformers at its nuclear plants, this is an issue that would greatly benefit from an independent review. Allowing Entergy to rely on its own investigation which will be memorialized in an "event report" is clearly not enough given the consistent nature of transformer problems at Entergy-owned nuclear facilities. An independent review, entirely separate from the NRC's regular inspection process, will be the best way to ensure that Entergy has effective programs to be able to accurately and timely ascertain the true condition of plant components at Indian Point and its other plants before explosions, fires, or worse consequences occur.

Such an independent investigation should address, *inter alia*, the following key questions:

- In what ways was the November 7, 2010 transformer explosion similar to the April 2007 Indian Point Unit 3 transformer explosion?
- Why were the "corrective actions" employed after the April 2007 Indian Point Unit 3 transformer explosion ineffective at ensuring that future problems with transformers generally would not occur?
- Was the Unit 2 transformer inspected in accordance with "acceptance criteria" established after the 2007 explosion of the Unit 3 transformer, or otherwise inspected in the normal course of operation, to ensure proper upkeep and maintenance?
- Was age or maintenance of aging components a factor in the November 7, 2010 explosion?
- If the transformer malfunction was related to aging/improper maintenance, should inspections have detected the deteriorating condition of the transformer?
- Do NRC regulations require regular or periodic inspections of the transformers? If not, why not, and should NRC regulations be amended to include provisions to ensure appropriate inspections of transformers? If NRC regulations do call for inspections/maintenance of transformers, had Entergy abided by such regulations?
- Has Entergy employed any of the corrective actions and recommendations identified in industry operating experience, as discussed in the NRC 2009 Information Notice cited herein? If not, why not, especially in view of the rampant problems Entergy has particularly faced in relation to transformers? If so, why did such measures fail to prevent the November 7, 2010 explosion?
- Is the condition of transformers reviewed in the license renewal process for Indian Point, and if not, why not?

⁹ U.S. Nuclear Regulatory Commission, Inspector General, <http://www.nrc.gov/insp-gen.html> (last visited November 10, 2010) (emphasis added).

Furthermore, an inquiry into Entergy's entire maintenance program more generally speaking, is warranted as well. The transformer explosion this past week was the next in a long line of significant component failures that have occurred at Indian Point. The long and pervasive history of operational problems at the plant suggests some kind of systemic deficiency in how Entergy maintains and operates the facility, and/or NRC's regulatory oversight of the operation of Indian Point. Thus, Riverkeeper respectfully requests that OIG to pursue a broader inquiry into the maintenance programs in place at Indian Point for managing and maintaining plant components.

This inquiry should address, *inter alia*, the following key questions:

- Does Entergy commit sufficient financial and manpower resources to properly maintaining its non-utility merchant nuclear plants?
- Does Entergy implement NRC-regulated maintenance programs, or otherwise follow industry guidance regarding maintenance?
- If Entergy does follow NRC regulations regarding maintenance of its nuclear plants, why has such implementation been consistently ineffective at preventatively detecting component malfunctions?
- Are NRC regulations relating to plant maintenance comprehensive enough, and/or conservative enough to ensure that the majority of component malfunctions are detected prior to emergency events occurring? If not, how can NRC regulations be improved to do so?

In sum, for the reasons articulated herein, it is prudent and necessary to conduct a thorough, *independent* inquiry into Entergy's program for addressing maintenance of electrical transformers at its nuclear power plants, as well as Entergy's programs generally speaking related to maintenance and upkeep of plant components, and Riverkeeper respectfully requests that OIG do so.

Riverkeeper appreciates your consideration of the foregoing. Should you wish to discuss this matter, please do not hesitate to contact the undersigned at (914) 478-4501.

Sincerely,



Phillip Musegaas, Esq.
Hudson River Program Director



Deborah Brancato
Staff Attorney