

## IPRenewalCEmails

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**Cc:** Joan Matthews; John Parker; Janice Dean; Lisa Feiner  
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Dear NRC Chief of Rulemaking, Directives, and Editing Branch and NRC Staff:

Attached please find written comments submitted by the New York State Office of the Attorney General concerning the December 2008 DSEIS (Supplement 38) for the requested renewal of the operating licenses for Indian Point Unit 2 and Indian Point Unit 3. The New York State Department of Environmental Conservation also will submit written comments on the DSEIS.

Please do not hesitate to contact us if you have difficulty opening the document or locating any of the cited references.

Respectfully submitted,

Janice Dean  
Lisa Feiner  
John Sipos

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COMMENTS SUBMITTED BY THE NEW YORK STATE OFFICE OF THE ATTORNEY GENERAL ON  
THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT PREPARED BY THE STAFF  
OF THE NUCLEAR REGULATORY COMMISSION FOR THE RENEWAL OF THE OPERATING  
LICENSES FOR INDIAN POINTS UNITS 2 AND 3, BUCHANAN, NEW YORK

submitted to the United States Nuclear Regulatory Commission  
March 18, 2009

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COMMENTS SUBMITTED BY THE NEW YORK STATE OFFICE OF THE ATTORNEY GENERAL ON  
THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT PREPARED BY THE STAFF  
OF THE NUCLEAR REGULARLY COMMISSION FOR THE RENEWAL OF THE OPERATING LICENSES  
FOR INDIAN POINTS UNITS 2 AND 3, BUCHANAN, NEW YORK

March 18, 2009

**PRELIMINARY STATEMENT**

On April 30, 2007, the Nuclear Regulatory Commission (“NRC”) received an application from Entergy Nuclear Operations (“Entergy” or the “applicant”) dated April 23, 2007, for renewal of the operating licenses of Indian Point Units 2 and 3 in the Village of Buchanan, New York. As part of its license renewal application obligations, the applicant submitted an Environmental Report which informs, but does not supplant, the NRC’s obligation to assess the potential environmental impacts of granting the license pursuant to the National Environmental Policy Act (“NEPA”).

**The 1996 Generic Environmental Impact Statement**

The NRC has created a dual-track NEPA system which includes a generic look at certain issues which NRC believes to be applicable to every licensed reactor regardless of site-specific conditions (called Category 1 issues), and a site-specific supplement which addresses other issues local to each facility’s environmental conditions (Category 2 issues). In May 1996, the NRC produced a Generic Environmental Impact Statement (“GEIS”) for License Renewal of Nuclear Plants. *See* NUREG-1437, “*Generic Environmental Impact Statement for License Renewal of Nuclear Plants*” (May 1996); *see also* 61 Fed. Reg. 28,469 (June 5, 1996); 61 Fed. Reg. 66,546 (Dec. 18, 1996). According to the

NRC, “[a]n applicant for license renewal may adopt the conclusions contained in the GEIS for Category 1 impacts, absent new and significant information that may cause the conclusions to fall outside those of the GEIS.” NRC, Environmental Impact Statement Scoping Process Summary Report Indian Point Nuclear Generating Station Unit Nos. 2 and 3, Village of Buchanan, New York (Dec. 2008), ML083360115 (“Scoping Summary Report”).<sup>1</sup> Despite its age and the many changes that have taken place since its creation, the GEIS still forms the basis for the NRC’s NEPA review of relicensing applications. Moreover, the Commission has failed to undertake a ten-year review of the GEIS as it obligated itself to do when it promulgated the GEIS in 1996. *See* Part 51, Subpart A, Appendix B. Accordingly, the Commission must thoroughly review all environmental impacts associated with license renewal.

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<sup>1</sup>The GEIS defines the purpose of the major federal action of renewing a nuclear power plant license as providing “an option that allows for power generation capability” beyond the term of the current license “as such need may be determined by State, utility and, where authorized, Federal (other than NRC) decision makers. GEIS at § 1.3. While this statement of purpose may be an accurate description of the process that occurs in other states, this statement of purpose is inapplicable to New York State. Under the current legal system in this State, the New York State Public Service Commission does not commence a separate process to review the renewal of an operating license of a power reactor. By inaccurately defining the purpose of license renewal as giving an option to a non-existent state determination of need, the NRC may be shirking its responsibility to fully analyze the impacts of license renewal because it assumes that the plant may never operate into its license renewal term if another party determines there is no need for its capacity.

## **The Draft Supplemental Environmental Impact Statement**

On August 10, 2007, the NRC published a Notice of Intent in the Federal Register to notify the public of the Staff's intent to prepare a draft plant-specific supplement to the GEIS ("DSEIS") regarding the renewal application for the Indian Point Unit 2 and Unit 3 operating license. 72 Fed. Reg. 45075 (Aug. 10, 2007). In this Notice, the NRC sought scoping comments from the public and interested governmental agencies.

On October 31 and November 30, 2007, New York State Executive Agencies and the New York State Office of the Attorney General (the "State") submitted extensive scoping comments to the Nuclear Regulatory Commission ("NRC") arguing, among other things, that: the National Environmental Policy Act ("NEPA") required the NRC to perform an Indian Point-specific environmental impact statement ("EIS"); the Generic EIS on which NRC has relied for over a decade is stale and void; and that the NRC must fully assess issues including: the environmental consequences of a terrorist attack or other unplanned release of radioactive materials from the facility; the potential impacts of an earthquake in the New York region, which has recently been shown to be more likely than the NRC had previously believed; the potential long-term environmental impacts of keeping spent fuel on the Indian Point site for many decades; and the alternatives to keeping Indian Point open for another 20 years. The State also reminded the NRC of its obligation to assess the potential impacts of low-level radioactive waste in light of the closure of the nation's only disposal facility for such waste.

On December 31, 2008, NRC Staff noticed the DSEIS in the Federal Register for public comment. *See* 73 Fed. Reg. 80440 (Dec. 31, 2008). The State now submits comments on the DSEIS.<sup>2</sup>

**Background: The National Environmental Policy Act**

The National Environmental Policy Act of 1969 (“NEPA”) “places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action,” and “ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process.” *Baltimore Gas & Elec. Co. v. Natural Res. Def. Counsel, Inc.*, 462 U.S. 87, 97 (1983). NEPA requires that federal agencies take a “hard look” at the environmental impacts of proposed actions, specifically

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and irretrievable commitments of resources which would be involved if the proposed action should be implemented.

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<sup>2</sup>Today, the New York State Department of Environmental Conservation also submits under separate cover written comments on various aspects of the DSEIS including impacts to aquatic organisms and habitats, emergency planning and evacuation, and security issues. The Office of the New York State Attorney General adopts by reference those additional comments.

## COMMENTS

### **I. The DSEIS Should Examine the Potential Environmental Impacts From Long-Term On-Site Storage of Spent Nuclear Fuel, Since the NRC Has Recently Changed Its Position on Waste Storage**

The Commission has determined that the applicant's Environmental Report need not discuss any aspect of storage of spent fuel for the facility that is within the scope of 10 C.F.R. § 51.23(a)'s generic determination that spent nuclear fuel can safely be left on-site, and in accordance with 10 C.F.R. § 51.23(b). The Commission based its determination based on the Nuclear Waste Policy Act of 1982 and the Commission's Waste Confidence Rule, 10 C.F.R. § 51.23. However, the Commission has recently "updated" its Waste Confidence Decision in a way that fundamentally changes its underpinnings with respect to the long-term storage of nuclear power plant spent fuel. The State submitted extensive comments challenging the Commission's Waste Confidence Decision Update and proposed changes to 10 C.F.R. § 51.23 on February 6, 2009. As the State argued in its February 6, 2009 comments, the Waste Confidence Decision Update violates NEPA, the Administrative Procedure Act, and the Atomic Energy Act, and as a result, the NRC is obligated here to consider the potential environmental impacts from leaving spent nuclear fuel on the Indian Point site, 24 miles north of New York City, and in proximity to 20 million people, for an indefinite period of time.

10 C.F.R. § 51.23(a) states that the NRC has confidence that a mined geologic disposal site for spent fuel would be available by 2025 and that no adverse environmental impacts would be associated with the continued storage of spent fuel at power reactor sites for 30 years after cessation of operation. *See* 10 C.F.R. § 51.23(a); 55 Fed. Reg. 38472 (Sept. 18, 1990). Based on this confidence, 10 C.F.R. § 51.23(b) does not require the environmental impacts of spent fuel storage to be examined in connection with the issuance of an operating license for a power reactor. *See* 10 C.F.R. § 51.23(b). This finding is reflected in the 1996 Generic Environmental Impact Statement (NUREG-1437) and 10 C.F.R. Part 51, Appendix B, Table B-1. However, on October 9, 2008, the Commission “remove[d] its expectation that a repository will be available by 2025.” *See* 73 Fed. Reg. 59551 (Oct. 9, 2009)(Waste Confidence Decision Update). At the same time, the Commission also stated that it “retains confidence that spent fuel can be safely stored with no significant environmental impact until a repository can reasonably be expected to be available and that the Commission has a target date for the availability of the repository in that circumstance.” *See* 73 Fed. Reg. 59558. The Commission proposed amending 10 C.F.R. § 51.23 to reflect these revised policies, stating in an open-ended fashion and without a date certain that “spent fuel generated in any reactor can be stored safely and without significant environmental impacts beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel

storage installations until a disposal facility can reasonably be expected to be available.”  
73 Fed. Reg. 59547 (Oct. 9, 2008)(Temporary Storage Rule).

The October 9, 2008 statements constitute new and significant information as that term is defined under NEPA and regulations promulgated by CEQ and the NRC. Pursuant to 10 C.F.R. § 51.95, post-construction supplemental environmental impact statements at the license renewal stage must address the same issues as required by § 51.71. *See* 10 C.F.R. § 51.95(c)(1). 10 C.F.R. § 51.71 requires a draft environmental impact statement to including “consideration of major points of view concerning the environmental impacts of the proposed action and the alternatives, and contain an analysis of significant problems and objections raised by other Federal, State, and local agencies, by any affected Indian tribes, and by other interested persons.” 10 C.F.R. § 51.72(a)(2) requires an update to the supplemental environmental impact statement if “[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. 10 C.F.R. § 51.72(a)(2); *see also* 10 C.F.R. § 51.95.

NRC Staff, in the DSEIS, did not acknowledge that the NRC had changed its view concerning the length of time for which spent fuel is expected to be stored on the Indian Point site. Thus, NRC Staff did not consider significant new information as it is required to do under NEPA and its regulations.<sup>3</sup> Since the NRC has now removed the

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<sup>3</sup>In fact, in Section 6.1 of the DSEIS, NRC Staff states that it “has not identified any new and significant information during its independent review of the IP2 and IP3  
(continued...)

basis that existed for the findings contained in § 51.23 and the GEIS but has yet to legally replace them with any new findings, the Staff is obligated to address any unresolved environmental impacts that may be caused by the indefinite storage of spent fuel at Indian Point. The failure to examine such new and significant information violates NEPA and regulations promulgated by CEQ and the NRC. 42 U.S.C. § 4332(2)(C); 40 C.F.R. § 1502.9(c)(1)(I); 10 C.F.R. § 51.72(a)(2).

The State of New York recognizes that this Board, as well as other Atomic Safety and Licensing Boards have rejected contentions based on the storage of spent fuel at power reactor sites. See *In the Matter of Entergy Nuclear Operations, Inc.*, Docket Nos. 50-247-LR and 50-286-LR, ASLBP No. 07-858-03-LR-BD01 (Indian Point Units 2 and 3), Memorandum and Order (Dec. 18, 2008); *In the Matter of Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.*, Docket No. 50-271-LR; ASLBP No. 06-849-03-LR; LBP-06-20 (Vermont Yankee Nuclear Power Station), Memorandum and Order (Sept. 22, 2006); *Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc.*, Docket No. 50-293-LR; ASLBP No. 06-848-02-LR; LBP-06-23 (Pilgrim Nuclear Power Station), Memorandum and Order (Oct. 16, 2006). However, no court has had the opportunity to evaluate the sufficiency of an environmental impact statement in the context of license renewal since the NRC has changed its course

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<sup>3</sup>(...continued)

ER, the site audit, the scoping process, or evaluation of other available information” that must be brought to the Board’s attention. DSEIS at 6.1. That statement reflects a total disregard of the significant new information reflected by the Commission’s October 9, 2008 finding.

regarding waste disposal and the length of time for which spent fuel will remain on-site. The State submits that earlier caselaw, based on 10 C.F.R. § 53.21 as it contemplated the availability of a waste repository within a finite period of time, is no longer applicable to the current, changed circumstances regarding waste storage at Indian Point. As discussed below, the DSEIS's discussion of potential impacts on land use is also insufficient, both because it fails to discuss off-site land use impacts, and it fails to take into account new information regarding the length of time for which waste will remain on-site.

## **II. The DSEIS's Discussion of the Environmental Impact of Possible Long-Term On-Site Storage of Low-Level Radioactive Waste is Insufficient**

The State brought issues related to the storage of low-level waste to the NRC Staff's attention in its scoping comments dated November 23, 2008, but the NRC Staff failed to respond to them in the Scoping Summary Report. *See generally* Scoping Summary Report. In the Environmental Report, Entergy described how low-level radioactive waste is temporarily stored on-site and then ultimately shipped to disposal facilities in Barnwell, South Carolina and Clive, Utah after the wastes have been processed at facilities in Tennessee. *See License Renewal Application, Appendix E* at page 3-19. However, on November 2, 2007, after Entergy's ER had been completed, the State of South Carolina announced that the Barnwell facility would only accept low-level radioactive waste from generators in the three states, Connecticut, New Jersey and South Carolina, that are part of the Atlantic Low-Level Waste Compact. On the same

date, the NRC issued a press release acknowledging the challenge of handling low-level radioactive waste:

Those challenges include the anticipated closure to most of the nation in 2008 of the Barnwell, S.C., LLW disposal facility. Barnwell is currently the nation's only commercial disposal option for certain wastes, and its closure could force licensees to store waste on-site until other disposal options become available. In addition, operation of new uranium enrichment facilities, potential nuclear fuel reprocessing facilities and commercial nuclear power plants will create additional demand for LLW disposal capacity.

NRC Press Release 07-146 (Nov 2, 2007).

Barnwell's closure coupled with the increased demand for disposal space triggered by the construction or renewal of facilities that also will generate additional low level radioactive waste, underscore the need to examine the environmental impacts caused by the storage, disposal, or transportation of low level radioactive waste generated by Indian Point during the 20 to 27 year term of a renewed license – as well as the low level radioactive waste already stored at the site from previous and ongoing operations.<sup>4</sup> Commissioner Jaczko recently stated that “it is important that the generation, management, and disposal of low-level waste be done in a manner that has the confidence of the public” and that “[t]he only way to gain that confidence is to have an honest and open debate that ensures the public understands these issues.” *See Public*

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<sup>4</sup>Indeed, according to Edward Sproat, then-director of the Energy Department's Office of Civilian Radioactive Waste Management, low-level waste is a “bigger issue than high-level nuclear waste.” *See* Katherine Ling, N.Y. Times, Low-level waste emerges as hurdle for new nuclear reactors, *available at* <http://www.nytimes.com/gwire/2009/03/16/16greenwire-lowlevel-waste-emerges-a-s-hurdle-for-new-react-10146.html> (Mar. 16, 2009).

Confidence Needed for Successful Low-Level Waste Management, Prepared Remarks for The Honorable Gregory B. Jaczko, Commissioner, USNRC, Waste Management Conference, Phoenix, Arizona (Mar. 2, 2009). The State submits that public confidence in low-level waste management cannot be achieved without NRC Staff making explicit, to communities surrounding each reactor and the nation as a whole, through vehicles like the instant DSEIS, what will become of each reactor's low-level radioactive waste.

The DSEIS gives only the most cursory attention to this challenging problem. NRC staff apparently learned in discussions with Entergy during an NRC environmental site audit that Entergy is considering storing all future low level radio waste on-site, despite the fact that one disposal facility in Utah remains open to receive Class A wastes. DSEIS at 2-20 - 21. According to the DSEIS, Entergy assured NRC staff that it would be able to safely store its low level radioactive waste on site in existing buildings in the near term. There is no analysis for the basis of this assurance, which NRC staff apparently accepted at face value.

The DSEIS states that Entergy is "developing a comprehensive plan to address the potential need for long-term storage." *Id.* Long-term, on-site storage of low-level nuclear waste at Indian Point is an environmentally substantial change from Entergy's previous operations, when much of its low-level radioactive waste was moved off-site to disposal facilities. However, the DSEIS provides no details or analysis of Entergy's

undefined plan to store low-level radioactive waste.<sup>5</sup> Before relicensing Indian Point and allowing it to accumulate low-level radioactive waste on-site for 20 years, the NRC should analyze, in the DSEIS, the possible environmental consequences of long-term storage.<sup>6</sup> The DSEIS's incomplete approach to this problem is insufficient.

### **III. The DSEIS Does Not Analyze Off-Site Land Use Impacts, Including the Impact of the Continued Operation of IP2 and IP3 for Another 20 Years on Real Estate Values in the Surrounding Areas**

In its Environmental Report, Entergy limited its analysis of the impact of license renewal on off-site land use to plant-related population growth or to land development driven by tax revenues generated by the plant during the license renewal period and concluded that the impact of relicensing on off-site land use would be small. The Licensing Board in this case rejected Entergy's narrow focus and determined that Entergy should have considered the effect of license renewal on the real estate values in the surrounding area, as New York urged in its Contention 17. Memorandum and

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<sup>5</sup>The management of low-level radioactive waste is in active litigation in other licensing proceedings as well. For example, a contention alleging that an applicant's combined operating license is incomplete because the FSAR fails to consider how the applicant will comply with NRC regulations governing storage and disposal of LLRW in the event an off-site waste disposal facility remains unavailable when the facility begins operation was recently admitted in the Vogtle proceeding. *See In the Matter of Southern Nuclear Operating Co.*, Docket Nos. 52-025-COL and 52-026-COL, ASLBP No. 09-873-01-COL-BD01 (Vogtle Electric Generating Plant, Units 3 and 4), Memorandum and Order (Mar. 5, 2009), at 20-27.

<sup>6</sup>For example, this increased presence of low level waste at the Indian Point site coupled with the additional high level waste at the site could exacerbate the adverse impact on the adjacent land values and underscores the substantial benefit that would accrue to the adjacent land owners from the no-action alternative. *See* Section III.

Order, *In the Matter of Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3)(July 30, 2009) at 83.

In its DSEIS, NRC Staff also concluded that the impact of relicensing on off-site land uses would be small by limiting its analysis to the same two impacts that Entergy considered – a cramped analytical approach that the Licensing Board has already rejected. The DSEIS is thus defective because it fails to consider the negative impact of relicensing on real estate values and the positive impact on real estate values of the no action alternative – not relicensing IP 2 and 3. The DSEIS also ignored the impact on real estate values of additional storage of radioactive waste on site for another 20 years.

A more detailed description of the impact on real estate values that will occur under either relicensing or the no-action alternative is set forth in the report of Stephen A. Sheppard, PhD., *Potential Impacts of Indian Point Relicensing on Property Values*, November 2007 (appended to Declaration of Stephen C. Sheppard, sworn to November 28, 2007).<sup>7</sup> In sum, based on studies in peer reviewed scholarly journals of the effect of electric utility generating unit location on adjacent land values, Dr. Sheppard concluded that the current operation of IP2 and IP3 has suppressed land values below what they would otherwise be for a distance of up to two miles from the plant.<sup>8</sup> These properly

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<sup>7</sup>The declaration of Stephen A. Sheppard, Ph.D. and its appendices were submitted to the ASLB in support of New York's Contention 17 and are incorporated in these comments.

<sup>8</sup>The Commission's existing waste confidence findings stated that by 2025 there will be a permanent off-site high level waste repository sufficient to handle all the  
(continued...)

done studies support the contention that a nuclear power plant may have a significant, not a small, impact on adjacent land values.

Data from the 2000 Census demonstrate that, at the time of that census, the total value of residential property within 2 miles of the facility was about \$2.2 billion.

*Potential Impacts of Indian Point Relicensing on Property Values. Id.* at 4. According to Professor Sheppard's calculations, the current market value of residential property within 2 miles of the facility is slightly over \$4.3 billion (an increase of 93% from the first quarter of 2000). *Id.* Professor Sheppard calculated, conservatively, that removal of the facility and its spent fuel would increase property values within 2 miles of Indian Point by \$576,026,601. *Id.* Plainly, land use impacts of more than a half billion dollars cannot be considered "SMALL" or even "MODERATE."

In addition, extending the license for an additional 20 years will require additional storage for spent fuel generated during the extended period. The spent fuel pools at Indian Point are not sufficient to contain this additional spent fuel and thus on-site dry cask storage is required. This dry cask storage of high level nuclear wastes will create further impacts on the value and potential use of adjacent lands beyond the impacts of the operating nuclear plants. The DSEIS contains no analysis of the impact on adjacent land values that will be associated with the construction and long term

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<sup>8</sup>(...continued)

wastes that will have been generated by IP1, IP2 and IP3 during their years of operation through 2015. The NRC is now reconsidering this expectation, raising the possibility that nuclear waste will be stored on-site indefinitely into the future. In that event, adjacent land values may be suppressed even more than they now are.

operation of a dry cask storage facility at the Indian Point site of a size sufficient to handle the spent fuel from extended operation of either reactor.

In contrast to the continued operation of IP2 and IP3, the no-action alternative will increase rather than suppress adjacent land values. If IP2 and IP3 are not relicensed, they could be decommissioned within 6 years after their current license expires. The purpose of decommissioning nuclear facilities “is to take the facility safely from service and to reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of license.” FGEIS on decommissioning of nuclear facilities, NUREG-0586 (Aug. 1988) § 1.3. Under current regulation, the Commission has decided, *see* 10 C.F.R. § 51.23, that by 2025 there will be a permanent off-site high level waste repository sufficient to handle all the wastes that will have been generated by IP1, IP2 and IP3 during their years of operation through 2015. Therefore, once the plants are decommissioned and the stored waste is removed from the site, the no action alternative will substantially increase the beneficial uses for land adjacent to (within 2 miles) of the Indian Point site and will increase the value of that land. In other words, under the current regulatory structure, if the licenses for IP2 and IP3 are not extended, owners and potential purchasers of land adjacent to Indian Point can contemplate that the site will be cleared of all nuclear materials and facilities by 2025. Thus, they can begin now to consider development of the adjacent property without concern that the site remains either an operating nuclear facility and/or a storage site for nuclear wastes beyond 2025.

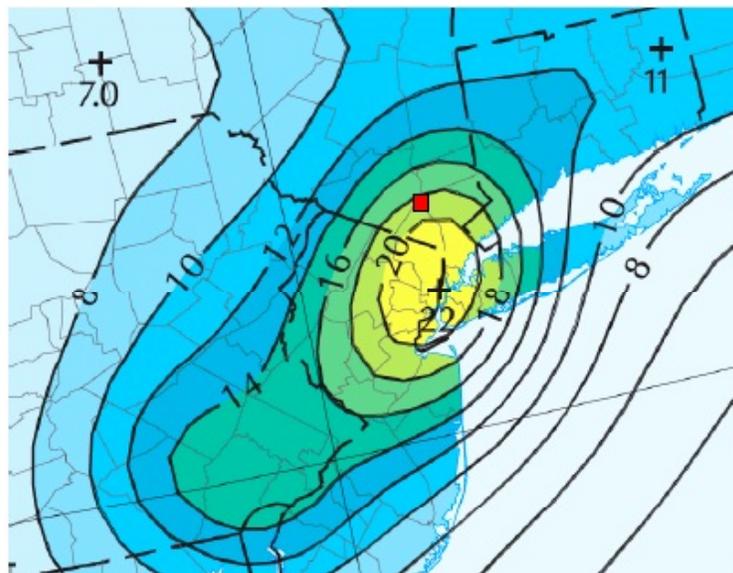
On the other hand, extended operation of IP2 or IP3 will deprive adjacent lands of the economic recovery that they would otherwise enjoy under the no action alternative. Thus, the DSEIS fails to consider reasonable alternatives to mitigate off-site land use impact as required by 10 C.F.R. § 51.53(c)(3)(ii)(I) such that the commission cannot find that the applicable requirements of Appendix B of Subpart A of 10 C.F.R. Part 51 have been satisfied. 10 C.F.R. § 54.29(b).

Moreover, as discussed in Point I *supra*, the NRC has recently changed its position regarding waste storage, indicating a preference for longer-term on-site storage than has previously been contemplated. Previously, and when 10 C.F.R. § 51.23 was adopted and the GEIS prepared, the NRC's policy was that the wastes would be transported from the reactor sites within a relatively short period of time to a repository or an Independent Spent Fuel Storage Installation. Now, the Commission has adopted, or plans to adopt, an alternative approach that essentially disregards when the waste repository will be ready because the NRC is confident that the spent fuel can stay at the site for a longer, if not indefinite, period of time without any safety or radiological concerns. The NRC must now address the impact on off-site land use of the indefinite storage of spent fuel at the site of each reactor since it has never been addressed. The need for this analysis has only recently arisen, since the NRC's former policy did not involve long-term storage on the reactor site. As Appendix B to 10 C.F.R. Part 51 acknowledges, a site-specific analysis is required to address all impacts on off-site land use value including the potentially significant impacts of this long-term storage of spent

fuel at the Indian Point site, as well as the benefits that would flow from the no-action alternative, that is, denial of the renewed license and restoration of the site.

#### **IV. The DSEIS Does Not Take Into Account New Information About the Increased Seismic Hazard Around Indian Point**

The DSEIS omits any mention of noteworthy new seismic information released last year. For example, it does not mention recent efforts by the United States Geological Survey (USGS), which has developed probabilistic seismic ground motion map for the New York Seismic Zone including the area around Indian Point. The contoured values which appear on the map reflect peak ground accelerations (PGA measured as % of the Earth's gravitational acceleration,  $g$ , for an exceedance probability of 2% in 50 years). The USGS tabulated PGA for the IP site is 0.19 $g$ . An excerpt of the USGS seismic map follows:



*Source:* Portion of the USGS probabilistic seismic ground motion map for the region including the Indian Point site (red square).

The DSEIS also does not account a recent study published by scientists at Columbia University. In August of 2008, seismologists at Columbia University's Lamont-Doherty Earth Observatory published the results of their study on earthquakes in the greater New York City Area, indicating the existence of a new fault line that could "significantly increase" the probability of an earthquake in the greater New York City Area. Lynn R. Sykes, John G. Armbruster, Won-Young Kim, and Leonardo Seeber, *Observations and Tectonic Setting of Historic and Instrumentally Located Earthquakes in the Greater New York City-Philadelphia Area*, Bulletin of the Seismological Society of America, Vol. 98, No. 4, pp. 1696-1719 (Aug. 2008). More significantly, the study found that the Indian Point nuclear power plants sit at the previously unidentified intersection of two active seismic zones. *Id.* The recently identified seismic feature runs in northwest-southeast line from Stamford, Connecticut to Peekskill, New York where it intersects the southwest-northeast oriented Ramapo Fault a few miles north of the Indian Point site. As stated by Dr. Lynn Sykes of Columbia University's Lamont Doherty Earth Observatory, "Indian Point is situated at the intersection of the two most striking linear features marking earthquake activity in [the New York City Seismic Zone] and also in the midst of a large population that is at risk in case of an accident to the nuclear plants. This is clearly one of the least favorable sites in the [the New York City Seismic Zone] from an earthquake perspective." Statement of Lynn R. Sykes, Ph.D.(Nov. 29, 2007), at p. 6 (submitted in support of New York State's Petition).

The study also found that historic activity of earthquakes of a magnitude more than 5 has been higher in southeastern New York than in many other areas of the central and eastern United States, and that the fault lengths and stresses suggest magnitude-6 quakes, or even 7 – which would be 10 and 100 times bigger than magnitude 5 – are “quite possible.” *Id.*; see also Robert Roy Britt, *Large Earthquake Could Strike New York City* (Aug. 21, 2008), available at <http://www.livescience.com/environment/080821-new-york-earthquakes.html>.<sup>9</sup> The DSEIS omits discussion of any of this new and significant information, in violation of NEPA.

It is particularly important to evaluate this new seismic information in light of Indian Point’s aging systems, structures, and components some of which are part of the Indian Point Unit 1 facility which was constructed in the late 1950's – before the Atomic Energy Commission promulgated seismic siting criteria. Although the NRC approved the mothballing of the reactor in IP1, the Indian Point Nuclear Power Station continues to use various IP1 components. According to the 1980 decommissioning plan for the IP1 reactor, “Unit 1 contains *extensive common facilities that are required for the continued operation of Units 2 and 3.*” See Decommissioning Plan for Indian Point Unit 1, § 2.1 (October 1980) (emphasis added). For example, the Indian Point Nuclear Power Station uses several IP1 systems, including without limitation: water supply, service boilers,

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<sup>9</sup>The report correctly states that “[m]uch new seismological information is available since their initial approvals in 1973 and 1975. Nevertheless, the U.S. Nuclear Regulatory Commission so far has not permitted any new information to be used or old information on which the original licenses were based to be contested in considering extensions of licenses.” *Id.* at 1717.

electricity, integrated radwaste system, and nuclear steam generator blowdown purification system. *Id.* In 1988, ConEd told the NRC that Unit 1 “constitutes an *integral part* of power generating operations at the Indian Point site.” See Supplemental Environmental Information in Support of Indian Point Unit No. 1, p. 2 (March 1988)(emphasis added).<sup>10</sup> The seismic fragility of Unit 1 was confirmed by a recent submission to NRC about a spent fuel crane wherein Entergy stated: “No response spectra were specifically generated for the Unit 1 site during original design.” See Reply to Request for Additional Information (RAI) Regarding Indian Point 1 License Amendment Request (LAR) for Fuel Handling Building Crane, p. 12 of 24 (October 3, 2007) Indian Point, Unit No.1, Docket No. 50-003, ML073050247.

The DSEIS should have examined the seismic risks and hazards posed by the continued use of the systems, structures, and components used in Unit 2 and Unit 3, whose construction began in the late 1960's. As confirmed by a 1977 Atomic Licensing Appeal Board decision concerning Indian Point operating licenses, IP2 and IP3 were constructed to meet a design safe shutdown ground acceleration of 0.15g.<sup>11</sup> However, the recently developed USGS probabilistic seismic ground motion map for the New

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<sup>10</sup>Both of the referenced 1980 and 1988 documents may be found in the License Renewal Application within “Indian Point No. 1 Safety Analysis Report,” which can be found under the file entitled “unit-1-ufsar.pdf.”

<sup>11</sup>*Consolidated Edison Co., (Indian Point Units 1, 2 and 3) 6 N.R.C. 547, 550 (ALAB 1977).* This decision also confirms that IP1's seismic construction was built to “a lesser value” and that, as constructed, it could not sustain an acceleration of even 0.15g. 6 N.R.C. at 550 & 585.

York Seismic Zone posits a peak ground acceleration of 0.19g, which exceeds the design criteria that was confirmed in the 1977 ALAB decision.

**V. The DSEIS Does Not Adequately Analyze Energy Alternatives, Including Conservation, Efficiency, Transmission, and Connection Enhancements**

Pursuant to 10 C.F.R. § 51.71(b), a draft environmental impact statement must include “consideration of major points of view concerning the environmental impacts of the proposed action and the alternatives, and contain an analysis of significant problems and objections raised by other Federal, State, and local agencies, by any affected Indian tribes, and by other interested persons.” 10 C.F.R. § 51.71(b). 10 C.F.R. § 51.71(a) explains that the scope of the Staff’s environmental review encompasses the requirements to which the Applicant is held in its Environmental Report, which under 10 C.F.R. § 51.53(c)(3)(iv) requires the Applicant (and by reference, Staff) to examine significant new information. *See* 10 C.F.R. § 51.71(a); 10 C.F.R. 51.53(c)(3)(iv); 10 C.F.R. Part 51, Subpart A, Appendix B; *see also* 10 C.F.R. § 51.95.

Appendix A to Subpart A to Part 51 requires analysis of the no-action alternative. Part 51, Subpart A, Appendix A, Section 4. Pursuant to 10 C.F.R. § 51.71 the DSEIS must analyze the evidence offered regarding the availability and environmental impacts of alternatives which would likely be implemented if no action were taken to relicense either IP2 or IP3. Appendix A to 10 C.F.R. Part 51 emphasizes the importance of the examination of alternatives: “This section is the heart of the environmental impact statement. It will present the environmental impacts of the proposal and the

alternatives in comparative form.” Appendix A to 10 C.F.R. Part 51 at Section 5. CEQ regulations also require the agency to “include the alternative of no action.” 40 C.F.R. § 1502.14(d)

In addition, CEQ’s regulations require the agency to “[r]igorously explore and objectively evaluate all reasonable alternatives.” 40 C.F.R. § 1502.14(a). Likewise, CEQ requires a supplement to a draft environmental impact statement if “[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.” 40 C.F.R. § 1502.9(c)(1)(I).

Contrary to these regulatory obligations, the December 22, 2008 DSEIS ignores or fails to include consideration and analysis of substantial comments and information provided by the State of New York relating to the “no-action” alternative and the benefits of certain measures that would be taken if the no-action alternative were chosen compared to the detriments that would be caused by relicensing of IP2 and IP3.

Among the items which were identified by the State of New York in its previous filings in this proceeding and in scoping comments that have been ignored or not considered and analyzed in the DSEIS are the following:

- Information on the potential for energy efficiency and renewable energy resources, combined heat and power, and power plant repowering that was provided in the November 27, 2007 Report prepared by Synapse Energy Economics, Inc., and David Schlissel in support of the State of New York’s Petition to Intervene (Supporting Declarations and Exhibits, Volume I, November 30, 2007 (“Synapse Report”));
- New York’s 15x15 plan that has the goal of reducing the state’s electricity usage by 15 percent by 2015, and the steps that are being taken by state agencies, such

as the Public Service Commission, to implement that plan. Evidence of the efforts already underway to achieve these goals can be found at [http://www.dps.state.ny.us/Phase2\\_Case\\_07-M-0548.htm](http://www.dps.state.ny.us/Phase2_Case_07-M-0548.htm), which is ignored in the DSEIS. For example, on January 16 2009, the New York State Public Service Commission issued combined Orders Approving “Fast Track” Utility-Administered Electric Energy Efficiency Programs with Modifications. See PSC Case 08-E-1003 - *Petition of Orange and Rockland Utilities, Inc. for Approval of an Energy Efficiency Portfolio Standard (EEPS) "Fast Track" Utility-Administered Electric Energy Efficiency Program*. In addition, in his January 2009 State of the State speech to the Legislature, Governor Paterson pledged to expand the 15x15 Program and the Renewable Portfolio Standards Program;

- The potential capacity and energy from combined heat and power;
- The potential capacity and energy that could be provided by repowering existing power plants in New York State (Synapse Report at 12-14);
- The potential for importing additional power from the PJM area<sup>12</sup> and/or New England (Synapse Report at 14-15);
- The potential for additional transmission system upgrades that would increase the capability to import power into downstate New York from PJM and NE, including increases in the capability to import power from PJM (*id.*);
- The reduced energy sales and peak loads being experienced by utilities in downstate New York as a result of the current economic recession (Schlissel Declaration).

### **Energy Conservation and Efficiency and Reduced Energy Consumption**

In its November 30, 2007 petition for intervention, the State of New York presented evidence to the NRC concerning the State’s program to increase energy efficiency and reduce energy use. Since then, the State has devoted significant time and resources to implement this program. On June 23, 2008, the Public Service Commission

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<sup>12</sup>The “PJM Area” is a interconnected regional electric system in 13 states and the District of Columbia. Pennsylvania and New Jersey are two states within PJM.

adopted a goal of reducing electricity usage (as forecast in 2007) by 15% statewide by 2015. An Energy Efficiency Portfolio Standard (“EEPS”) program was created for New York State to develop and encourage cost-effective energy efficiency over the long term, and immediately to commence or augment near-term efficiency measures. See PSC Case 07-M-0548, *Energy Efficiency Portfolio Standard (EEPS)*, Order Establishing Energy Efficiency Portfolio Standard and Approving Programs (issued June 23, 2008). Eight weeks ago, on January 16, 2009, the Public Service Commission Approved “Fast Track” Utility-Administered Electric Energy Efficiency Programs with Modifications. See PSC Case 08-E-1003, Orders Approving “Fast Track” Utility-Administered Electric Energy Efficiency Programs with Modifications. These orders will increase energy efficiency, including in the southern areas of New York near the Indian Point power reactors (including Zones H, I, J, and K).

The DSEIS artificially limits its analysis of energy conservation to a single study, the National Research Council of the National Academy of Sciences’ report entitled *The Alternatives to the Indian Point Energy Center for Meeting New York Electric Power Needs* (“NAS 2006”), which while a useful document, is only one of many sources addressing the energy conservation potential in New York State. Information, including recent data that has become available since the 2006 NAS Report and that has been cited – today and previously in this proceeding – by the State of New York, demonstrates that: (1) with the volatile energy costs of the last few years, additional energy conservation is even more financially viable; (2) with strong directives from the Governor of New York

State, institutional and other non-technical barriers to energy conservation are less of a problem; (3) with the recent shift in emphasis by the federal government and private business, energy conservation and efficiency will increase; and (4) with the current economic climate, the demand for energy will remain flat for several years, or, perhaps decline, thus prolonging the date by which energy conservation and renewable energy will have to be available to fully displace some or all of the demand now being met by IP2 or IP3. The DSEIS does not address this information. Contrary to the clear regulatory obligation imposed by 10 C.F.R. § 51.71(d), the DSEIS incorrectly assumes that energy conservation would only result in a savings of 800 MW and, based on that arbitrary conclusion that is contrary to recent evidence, fails to consider energy conservation as a full replacement for one or both of the units under the no-action alternative.

Moreover, the likelihood of the availability of energy efficiency and conservation measures (as well as alternative and renewable energy sources and transmission enhancements) has recently been greatly increased as a result of the recently-enacted American Recovery and Reinvestment Act of 2009, Public Law 111-5 (signed February 17, 2009). Although no final allocation has yet been made, the State of New York could receive approximately \$120 million for the State Energy Program, approximately \$18 million for Energy Efficiency and Conservation Block Grants to small cities and additional hundreds of millions for Energy Efficiency and Conservation Block Grants to large cities and counties – which would include Westchester County and the New York

metropolitan area – and approximately \$390 million for weatherization assistance, which has the potential to greatly reduce energy consumption through energy efficiency and conservation. *See* American Recovery and Reinvestment Act of 2009, Public Law 111-5. In addition, New York would be eligible to compete for an approximate \$5 billion available nationwide for improvements in transmission and smart grid technology. *Id.* Furthermore, the State of New York’s Regional Greenhouse Gas Initiative (RGGI) auction is anticipated to generate additional money to promote energy efficiency and increase renewable energy use. The New York State Energy and Research Development Authority (NYSERDA) recently released an *Operating Plan for Investments in New York under the CO2 Budget Trading Program and the CO2 Allowance Auction Program* (draft, Feb. 25, 2009). In the draft plan, NYSERDA estimates that \$525 million in projected funds received from the RGGI carbon dioxide auctions could be allocated to further energy efficiency and renewable energy use within the State. The DSEIS should be substantially revised to include this new and significant information.

One the most significant pieces of significant new information which was not available when the GEIS was written and is ignored in the DSEIS is the central role of energy conservation in energy planning and its growing importance in providing for energy needs. For example, the State of New York has taken the lead in pressing the federal government to implement stronger efficiency standards for home appliances. *See* NYS Petition at 116-118; *see also* *NRDC v. Abraham, Secretary, U.S. Department of Energy*, 355 F.3d 179 (2d Cir. 2004); *State of New York v. Bodman, Secretary of U.S.*

*Department of Energy*, No. 05 Civ 7807, Consent Decree (S.D.N.Y. Nov. 3, 2006). The DSEIS paid no attention to New York's efforts to improve energy efficiency and its actions to encourage the federal government to improve appliance efficiency standards. The fruits of these efforts by the State of New York can be found in actions taken by the New York State Public Service Commission ([http://www.dps.state.ny.us/Phase2\\_Case\\_07-M-0548.htm](http://www.dps.state.ny.us/Phase2_Case_07-M-0548.htm)) and the recent actions by the White House urging the U.S. Department of Energy to consider accelerating the dates on which these new standards for all appliances will be implemented. See February 5, 2009 White House Memorandum For The Secretary Of Energy Subject: Appliance Efficiency Standards. Like the State's own programs, these accelerated federal efficiency standards will further conserve energy within New York State and in Zones H, I, J, and K.

The enacted regulations and actual programs for energy efficiency undoubtedly will reduce energy consumption. Although the December 2008 DSEIS looks to 2006 and early 2007 data prepared by the U.S. Energy Information Administration (EIA), DSEIS 8-32 to 8-33, it does not take into account recent EIA projections which contain reduced demand projections. See *EIA Annual Energy Outlook 2008 with Projections to 2030 (AEO 2008)*, Report # DOE/EIA-0383 (2008) (released June 2008); *EIA Annual Energy Outlook 2009 Early Release Overview (AEO-2009)* Report # DOE/EIA-0383(2009) (released Dec. 17, 2008); EIA Press Release: *New EIA Energy Outlook Projects Flat Oil Consumption to 2030, Slower Growth in Energy Use and Carbon Dioxide Emissions, and Reduced Import Dependence* (Dec. 17, 2008), available at <http://www.eia.doe.gov/neic/press/press312>.

html. Also, the DSEIS fails to take into account the current economic situation and the likelihood that energy consumption will decrease as a result. Nor does it account for the impact of the Federal Energy Independence and Security Act of 2007. *See* Public Law 110-140; *see also* 42 U.S.C. § 6295.

Energy conservation produces no carbon, no pollution, and requires the use of no fuel. Once an energy conservation measure is in place, its benefit continues without further capital or maintenance costs for a substantial period of time into the future. The DSEIS acknowledges that there is virtually no adverse environmental impact associated with energy conservation measures. DSEIS at 8-66 (“Impacts from conservation measures are likely to be negligible, as the NRC staff indicated in the GEIS (1996).” The DSEIS, however, ignores other information from credible sources, including those identified in the State of New York's previous submissions, that the energy conservation potential between now and 2012 equals at least 1,000 MW -- equivalent in size to the capacity of at least one of the IP units. By wholly failing to address this new information, which greatly enhances the potential benefits and substantially reduces the perceived adverse impacts of the no action alternative, the DSEIS violates NEPA.

### **Renewables**

The DSEIS erroneously concludes, without any critical analysis and with only bare assertions regarding Staff beliefs, that there are too many obstacles to implementing sufficient renewable energy resources such that these sources could not provide anything more than 200 to 400 MW toward replacing the IP units. *See* DSEIS 8-

65 to 8-66 (Combination Alternatives 1 and 2). By making this assumption, the DSEIS's analysis incorrectly constrains and limits the potential benefits of the no-action alternative by undervaluing the ability of wind and other renewables to provide power in New York in general and southeastern New York area in particular. The DSEIS ignores recent projections by the federal Energy Information Administration that the coming years will see the increased use of renewable energy, including strong growth in the use of renewables for electricity generation. *See EIA Annual Energy Outlook 2009 Early Release Overview (AEO-2009) Report # DOE/EIA-0383(2009) (released Dec. 17, 2008); EIA Press Release: New EIA Energy Outlook Projects Flat Oil Consumption to 2030, Slower Growth in Energy Use and Carbon Dioxide Emissions, and Reduced Import Dependence (Dec. 17, 2008).*

The DSEIS's assertions ignore substantial evidence, offered by the State of New York and generally available, that the potential for renewable resources is much more viable. *See Synapse Report at 7-12.* By way of example, on February 26, 2009, the New York Independent System Operator announced that the combined wind energy generation output within New York State has reached 1,000 MW and that such output is expected to increase. *See NYISO's February 26, 2009 statement concerning wind generation capacity in New York State, available at [http://www.nyiso.com/public/webdocs/newsroom/press\\_releases/2009/NYISO\\_Marks\\_Wind\\_Power\\_Milestone\\_02262009.pdf](http://www.nyiso.com/public/webdocs/newsroom/press_releases/2009/NYISO_Marks_Wind_Power_Milestone_02262009.pdf).* The DSEIS also ignores the fact that New York has considerable wind resources as demonstrated by the wind resource maps prepared by AWS Truewind for

the New York State Energy Research and Development Authority.<sup>13</sup> At present, there is 8,081 MW of additional wind power proposed for connection to the grid in New York State. See *Interconnection Requests and Transmission Projects/New York Control Area by the New York Independent System Operator* (Updated 3/2/09), NYISO Interconnection Queue, available at [http://www.nyiso.com/public/services/planning/interconnection\\_studies\\_process.jsp](http://www.nyiso.com/public/services/planning/interconnection_studies_process.jsp) (last visited Mar. 16, 2009).

The DSEIS also incorrectly discounts and then eliminates any contribution from hydro power or distributed geothermal energy. DSEIS at 8-61, 8-62, 8-65 to 8-66. The DSEIS minimizes the opportunity provided by solar energy resources. DSEIS at 8-62. The State of New York is also moving forward to increase the utilization of its solar energy resources. On February 27, 2009, the Long Island Power Authority announced plans to purchase 50 MW of solar energy generated on Long Island and for deliveries to begin between June 1, 2009 and May 1, 2011. See *Governor Paterson Announces Plans for the Largest Solar Energy Project in State History*, available at [http://www.lipower.org/newscenter/pr/2009/022709\\_gov.html](http://www.lipower.org/newscenter/pr/2009/022709_gov.html). By eliminating consideration of these energy sources in the portfolio of alternatives to IP2 and/or IP3, the DSEIS no action alternative analysis is skewed and arbitrary.

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<sup>13</sup>The New York Wind Resource Explorer (WRE) was developed by AWS Truwind LLC for NYSERDA. AWS Truwind has produced maps of mean annual wind speed at 30, 50, 70 and 100 meters above ground level. The New York Wind Resource Explorer and related maps prepared for NYSERDA may be accessed at <http://windexplorer.awstruwind.com/NewYork/NewYork.htm>.

Indeed, as discussed in the November 28, 2007 Declaration of former Commissioner Peter Bradford, it would be reasonable to assume that a determination that one or both of the IP units will not be available after 2013 or 2015 would further stimulate the development and use of renewable energy sources in New York. *See* November 2007 Bradford Declaration at ¶¶ 10, 11, 12. Such a decision would increase the development of wind, solar, geothermal, hydro, biomass and wood energy sources.

The DSEIS also does not take into account Governor Paterson's recently-announced initiative to expand the 15x15 Program and the Renewable Portfolio Standards Program to further improve energy efficiency and the generation of renewable energy. In his January 7, 2009 State of the State Speech, the Governor unveiled the "45x15" Program:

Today, I announce one of the most ambitious clean energy goals in America. By 2015, New York will meet 45 percent of its electricity needs through improved energy efficiency and clean renewable energy. We call this our "45 by 15" program.

Working in concert with this program, the New York Power Authority ("NYPA") will increase funding to school districts, local governments, and hospitals to increase energy efficiency. As part of the State's energy efficiency program, NYPA will provide capital for school districts, as well as eligible local governments and hospitals to retrofit and install clean distributed energy resources. NYPA's trustees have approved increasing financing for these projects to \$185 million per year – up from \$100 million – in support

of the State's clean energy agenda. *See generally* Energy Efficiency Fact Sheet, *available at* <http://www.ny.gov/governor/press/fact-sheet0107092.html>.

## **Energy Transmission**

Based on a 2006 U.S. Department of Energy determination, the DSEIS assumes that the Zones H, I, J, K are a so-called "critical congestion area" and that this situation will continue indefinitely. *See* DSEIS at 8-32. The DSEIS however, fails to acknowledge that this DOE decision is the subject of a judicial challenge,<sup>14</sup> and more importantly that additional transmission capacity either has been installed, is in the process of being installed, or has been approved to be installed in Zones H, I, J, and K. For example,

- the Neptune Cable links the LIPA service area with New Jersey and energy sources in the PJM area. It provides up to 660 megawatts of electricity to Long Island. *See* LIPower.com.
- LIPA and Connecticut Light & Power Company are replacing the 300 megawatt electric transmission cable system that connects Long Island with southwest Connecticut. *See* LIPower.com.
- the Cross-Sound cable from Connecticut to Shoreham (Long Island) has been operating for several years.
- In addition, trans-Hudson and trans-Arthur Kill connections and interconnection upgrades are in the ISO interconnection queue. These projects currently include the Brookfield Power U.S. Harbor Cable Project II (200 MW), the East Coast Power LLC interconnection upgrade (300 MW; Linden, Staten Island), and the Hudson Transmission Partners interconnection upgrade (660 MW) (linked to Sayreville, NJ). *See* NYISO Interconnection Queue *available at* [http://www.nyiso.com/public/services/planning/interconnection\\_studies\\_process.jsp](http://www.nyiso.com/public/services/planning/interconnection_studies_process.jsp) (last visited Feb. 27, 2009).

The DSEIS does not address these transmission avenues.

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<sup>14</sup>*Wilderness Society et al. v. U.S. Department of Energy* (9th Cir. No. 08-71074).

## Combinations

In discussing the no action alternative, the DSEIS acknowledges that “[t]he power not generated by IP2 and IP3 during license renewal term would likely be replaced by (1) power supplied by other producers (either existing or new units) using generating technologies that may differ from that employed at IP2 and IP3, (2) demand side management and energy conservation, or (3) some combination of these options. DSEIS at 8-27. The DSEIS also primarily relies on the assumption, initially adopted more than 12 years ago, that the only way to replace a large generating unit like a nuclear power plant is with another similarly large generating unit. DSEIS at 8-33 to 8-55. Regardless of the validity of that assumption 12 years ago, it is definitely not valid today in the New York metropolitan area. *See, e.g., EPRI, Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S. (2010 - 2030)* (published Jan. 14, 2009).

Rather than preparing a comprehensive and detailed analysis of the development of a portfolio of means to provide power in lieu of IP2 and IP3, the DSEIS devotes considerable effort to proving that a 2,200 MW coal plant is not a good option in this service area. DSEIS at 8-33 to 8-45. The analysis of the impacts flowing from the construction of a new coal plant in Zones H, I, J, or K is besides the point and appears to be a “strawman” analysis. This analysis of the coal alternative (1) fails to acknowledge that no New York-based utility has a pending application for the construction of new

coal generation in Zones H, I, J, and K and (2) ignores objective evidence demonstrating the existence of other (*i.e.*, non-coal) sources of power generation and conservation.

To the extent that the DSEIS discusses natural gas production, DSEIS at 8-46 to 8-56, the NRC Staff tacitly acknowledges that IP2 and IP3 power reactors could be replaced by natural gas-fired combined-cycle generation either at the Indian Point site or elsewhere. Indeed, the record reflects that utilities have developed natural gas capacity in New York. For example, the Long Island Power Authority is completing the construction of its Caithness facility which is expected to come on line in the summer of 2009 (350 MW) and other new sources are coming on line or have been permitted. *See Synapse Report*, at 15-16 (identifying additional new generation facilities); *see also* LIPower.com; Independent System Operator 2008 Load and Capacity Data (Goldbook) (Apr. 2008). NRC Staff's analysis of natural gas is a tacit recognition that the continued operation of the IP2 and IP3 power reactors are not necessary. Thus, the DSEIS is flawed because it relies on outdated information about how utilities meet their energy needs. As a result of this flaw, the DSEIS is deficient in how it addresses new and significant information and how it addresses the consequences of the no-action alternative.

Moreover, Staff's comparative weighing of natural gas and two operable IP power reactors notes that a gas fired power plant would operate at higher thermal efficiencies, require less water, and need smaller cooling towers than the existing reactors. DSEIS at 8-46. Because of these differences, the DSEIS is flawed when its no

action alternatives analysis concludes (DSEIS at 8-78) that a gas fired power plant would have “similar” impacts to the continued operation of IP2 and IP3.

Staff is required to consider and incorporate in the DSEIS significant new information with regard to any findings in the GEIS, which applies to the GEIS conclusion that only gas or coal are viable alternatives and that the only option must be stand-alone, single solution alternatives. While the DSEIS does suggest a couple of options in which combinations of energy sources are used, the options include one Indian Point reactor as part of the mix and/or a single 300 or 400 MW combined-cycle gas-fired plant at the Indian Point site. *See* DSEIS at 8-65 to 8-66. The two “combination alternatives” proffered by the DSEIS are artificially narrow and arbitrary and fail to take into account additional combinations of alternatives in violation of NEPA. A proper no-action alternative would consider a broader range of combinations.

For example, the following combinations, which are derived from the November 2007 Synapse Report, of energy options are achievable and environmentally-preferable to operating IP2 and IP3 and demonstrate that the no-action alternative is the preferable alternative to the two already selected by the DSEIS:

**Combination 3:**

- 1000-1200 MW from renewable resources like biomass and wind
- 1200-1400 MW from energy efficiency programs being implemented as part of New York State’s 15x15 plan
- 100-200 MW from combined heat and power

**Combination 4:**

- 400-600 MW from repowering an existing fossil-fired power plant in downstate New York as an efficient new gas-fired combined cycle unit
- 1200-1500 MW from energy efficiency
- 600-800 MW from renewable resources such as biomass and wind

See Synapse Report at 3 to 15. Already existing and identified New York State programs are in place to achieve these results. See February 27, 2009 Declaration of David Schlissel, at ¶ 8. In addition, many other achievable combinations are environmentally preferable to the relicensing of Indian Point, including the construction of new, efficient natural-gas fired generation and transmission line alternatives and interconnection upgrades. See generally State of New York, Proposed Contention No. 33 (submitted Feb. 27, 2008); November 2007 Synapse Report.

The DSEIS's no-action alternatives analysis fails under NEPA because it fails to consider:

- The no-action alternative as to the relicensing of only one unit;
- The option of repowering existing power plants in the combination of alternatives that can be used if the no-action alternative is chosen and the environmental benefits of repowering existing power plants (see Declaration and Report of David A. Schlissel (Nov. 28, 2007), attached to the New York State Notice of Intention to Participate and Petition to Intervene);
- Combined heat and power as one of the combinations of alternatives that can be used if the no-action alternative is chosen and the environmental benefits of this choice (see Synapse Report);
- Purchase power as a viable stand alone alternative rather than the DSEIS analysis which is based upon a pessimistic and speculative group of assumptions about inter-state and intra-state transmission options. DSEIS at 8-56-8-57. In reaching

this conclusion the DSEIS ignores the considerable contrary evidence contained in the Synapse Report and recent transmission enhancements;

- The demonstrated feasibility of providing upgraded transmission capability and interconnection upgrades that, in turn, would facilitate the use of alternatives to IP2 and IP3. On this point, the DSEIS accepts, without any evaluation, the assumption that various institutional restraints will impede the implementation of improved transmission capability and solely on that basis dismisses improved transmission capabilities. *See* DSEIS at 8-57. Thus, the DSEIS's dismissal of purchase power alternatives or the use of wind power generated outside of the IP2 and IP3 service area, based on the alleged constraints on transmission capabilities, is not rational because it does not address substantial evidence which contradicts the evidence upon which it relies. *See* Synapse Report.

For all of the above reasons, the alternatives analysis contained in Chapter 8 of the DSEIS is deficient and therefore does not comply with NEPA, CEQ regulations, and NRC's own Part 51 regulations.

#### **VI. The DSEIS Incorporates Defects in the SAMA Analysis and the Use of an Inappropriate Air Dispersion Model With Inaccurate Input of Population Figures**

The DSEIS improperly adopted Entergy's SAMA analysis and ignored deficiencies in its air dispersion modeling which were raised by New York's Contention 16 and accepted as a subject of litigation by the Licensing Board. *See* Memorandum and Order, *In the Matter of Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3)(July 31, 2008). Pursuant to the FGEIS, an analysis of alternative methods of reducing the risk of severe accidents is a Category 2 issue, which must be specifically conducted for all plants, such as IP 2 and 3, that have not engaged in this analysis before. However, a risk mitigation method must only be considered for

implementation by the license renewal applicant if is cost-beneficial – that is, if the value of its reduction of risk expressed in monetary terms is greater than the cost of implementing the risk mitigation measure. The monetized cost of human exposure to radiation is expressed as \$2,000 per person rem. In a SAMA analysis, the more people that are hypothetically exposed to radiation released in a severe accident, the more likely a risk mitigation method will be cost-effective because the dollar value of the risk reduction to which the mitigation cost will be compared will be higher than if fewer people are exposed.

Therefore, an accurate SAMA analysis depends on the accuracy of the estimates of human exposure to radiation from a severe accident. The accuracy of the human exposure estimate will critically depend on the validity of air dispersion models which predict the manner in which radiation will be geographically dispersed through the atmosphere and in what concentrations. The FGEIS recognizes that meteorological phenomena such as plume rise, precipitation and fallout from the plume “all have considerable impact on the magnitudes of early health consequences along with the distances from the reactors where these consequences would occur.” GEIS, Vol. 1, § 5.3.4.3.

Entergy’s SAMA analysis was defective because it incorporated an outdated air dispersion model that will not accurately predict the dispersion of radionuclides traversing a complex terrain over long distances. Because population densities vary substantially within a 50 mile radius of IP 2 and 3, an inaccurate air dispersion model

may greatly underestimate the numbers of people exposed and therefore reduce the dollar value of the reduction in exposure that a mitigation measure may achieve.

In accepting New York State's Contention 16, the Licensing Board concluded that New York's challenge to the use of the ATMOS model raised questions about whether it would accurately estimate the numbers of people exposed. NRC staff brushed off these questions, adopted Entergy's SAMA analysis without any independent verification and accepted Entergy's rejection of most of the mitigation measures it analyzed on the ground that they were not cost-effective.

A detailed description of the deficiencies of the ATMOS model is set forth in the accompanying declaration of Dr. Bruce Egan, presented in support of New York's Contention 16. Those deficiencies and their impact on the SAMA analysis will be summarized here.

The ATMOS air dispersion model is one of the modules within the Melcor Accident Consequence Code System ("MAACS2 Code"), a model created by SANDIA National Laboratory for estimating the probabilities of a severe accident - *i.e.*, an escape of radionuclides from the containment building - and the severity of its consequences.

ATMOS uses a steady state straight line Gaussian plume model to calculate concentrations of radioactivity downwind of a release point. In effect, ATMOS assumes that any emissions from the Indian Point Station are embedded in an air mass having a single wind speed that flows for each period of simulation in a single straight line direction. The concentrations of contaminants within the plume are assumed to have a

maximum value along the plume centerline and to fall off in a bell shaped, Gaussian distribution curve with distance away from the plume centerline.

The ATMOS model does not accurately depict the dispersion of pollutants from a source, because it does not accurately account for the complexity of the relationships of the processes that drive dispersion – wind speed, wind direction and atmospheric turbulence. It relies on dispersion rates developed in 1961 which do not take into account more recent scientific knowledge about how turbulence is created in the atmospheric layer directly above the earth’ surface and how that affects the dispersion of a release of pollutants. As set forth below, ATMOS’s simplistic assumptions directly affect its ability to accurately model the dispersion of radioactivity from the Indian Point Station.

#### **ATMOS Cannot Accurately Model Dispersion in Complex Terrain**

For purposes of categorizing appropriate air dispersion models for regulatory application, USEPA defines a complex terrain as a setting where nearby terrain heights exceed a facility’s stack height. The Indian Point Station is located in such a “complex terrain.” It is in the northwest corner of Westchester County on a point of land on the eastern bank of the Hudson River that protrudes into the river as it bends west. Dunderberg Mountain rises to a height of 1086 feet above sea level on the west side of the river approximately 2.5 miles north of the Indian Point Station. The eastern bank of the river north of the Station is formed by high ground reaching an elevation of 800 feet; to the west across the river, the Timp Mountains reach an elevation of 864 feet.

Environmental Report, Appendix E at 2-1. Releases from the Station would be within 1-2 miles of the Dunderberg and Timp mountains that rise well above the facility and well above the top of the meteorological tower located onsite.

The use of a steady state straight line Gaussian plume model, such as ATMOS, is inappropriate for the complex terrain in which the Indian Point Station is located. Complex terrain will alter the turbulent diffusion rates and the flow trajectories that pass up and over or around hills and mountains, thus making a straight line flow assumption inaccurate. The straight line flow assumption will not account for the formation of local air circulations associated with mountain-valley upslope and down slope wind systems. An air dispersion model that ignores the presence of such air flows will provide erroneous information on the dispersion of the radioactivity.

#### **ATMOS Cannot Accurately Calculate Dispersion Within a 50 Mile Radius of the Indian Point Station Beyond**

In the DSEIS, NRC staff accepted Entergy's use of the ATMOS model to predict the dispersion of radionuclides in a 50 mile radius around the Indian Point Station. However, the US EPA does not consider steady state Gaussian plume models to be accurate for setting emissions limitations beyond 50 kilometers, or 32 miles. For distances beyond 50 kilometers, US EPA recommends using a "long range transport" model capable of simulating the effects of spatially varying wind directions. Such "long range transport models" generally use more than one source of meteorological data to

define the spatial variations of the winds because the likelihood of observing changes in wind direction increases with downwind distances.

Since the determination of the cost effectiveness of a mitigation alternative is based in part on the total population radiation dose, and since the number of affected people increases substantially with the radial distance from the Indian Point Station, the SAMA results are disproportionately influenced by impacts at large distances from the source and those impacts will not be accurately estimated by the ATMOS air dispersion model.

#### **Inaccurate Population Figures Were Input into the ATMOS Model**

In addition, Entergy's projections of the 2035 population likely to be living within 50 miles of Indian Point appear to underestimate the potential exposed population. And the NRC accepted these projections without any further examination, despite the fact that the Licensing Board agreed that New York's Contention 16 raised a valid issue about the accuracy of Entergy's future population estimates.

For example, Table 2-5 State and County Population, 50-Mile Radius of IP2 and IP3 on page 2-36 of the ER contains a projection that in 2035 the population of New York County (Manhattan) will be 1,570,657. Entergy does not provide any explanation of the basis for this projection and it appears to contradict data from the U.S. Census. For example, the United State Census estimates that in 2007 Manhattan's population was 1,620,867, over 50,000 more than Entergy asserts would be at risk 29 years later. *See, e.g.,* U.S. Census Bureau, State and County QuickFacts, New York County, New York,

available at <http://quickfacts.census.gov/qfd/states/36/36061.html>. Entergy provides no explanation for its projection that the population of Manhattan will actually shrink from 2000 to 2035.

Moreover, based on trends in population growth in New York City, there is every reason to believe that the population of New York in 2035 will be substantially more than the U.S. Census's estimate of the 2007 population. For example, comparisons of U.S. Census data for Manhattan in 2000 with the census estimates of the 2007 Manhattan population concludes that the population of Manhattan grew by 83,672 in 7 years, a growth of 0.7 percent per year. See <http://www.nyc.gov/html/dcp/html/census/popcur.shtml>. Entergy's future population estimates are inexplicably low when compared to the U.S. Census estimates of future population in the New York metropolitan area.

In sum, Entergy's SAMA analysis almost certainly understated the cost of a severe accident by reducing the number of people who might be exposed. The DSEIS should not have accepted these population estimates as an appropriate input into the ATMOS air dispersion model.

## **VII. The NEPA and SAMA Review Should Include an Accurate Assessment Of the Clean up and Decontamination Costs Associated with a Radiological Release from Indian Point**

As the State noted in its scoping comments of November 23, 2008, the cost formula contained in the MELCOR Accident Consequence Code System (MACCS/MACCS2) computer program underestimates the costs likely to be incurred as a result

of a dispersion of radiation. NRC Staff did not incorporate the State's comments in the DSEIS, which remains inadequate as to decontamination costs, despite stating in its Scoping Summary Report that the State's comments on this point were "noted . . . [and that] Chapter 5 of the SEIS will discuss Environmental Impacts of Postulated Accidents and Severe Accident Mitigation Alternatives." See Scoping Summary Report at 188.

As the State suggested in its scoping comments and in Contention 12, which was accepted by the Board (see Memorandum and Order (July 31, 2008) at 61-65), the NRC should use the analytical framework contained in the 1996 Sandia National Laboratories report concerning site restoration costs. See D. Chanin and W. Murfin, "*Site Restoration: Estimation of Attributable Costs from Plutonium-Dispersal Accidents*," SAND96-0957, Unlimited Release, UC-502, (May 1996). The *Site Restoration* study analyzed the expected financial costs for cleaning up and decontaminating a mixed-use urban land and Midwest farm and range land. The decontamination costs identified in the report could be extrapolated to apply to the four counties in the 10-mile Emergency Planning Zone as well other cities and towns in the New York City-Connecticut-New Jersey metropolitan area that are within 50-mile Emergency Planning Zone.

The Sandia study recognized that it is extremely difficult to clean up and decontaminate small radioactive particles (*i.e.*, particles ranging in size from a fraction of a micron to a few microns). See SAND96-0957, at p. 5-7.<sup>15</sup> Such small-sized particles

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<sup>15</sup>Although SAND96-0957 studied a scenario in which plutonium from a nuclear weapon is dispersed as a result of an accident resulting from a fire or non-nuclear

(continued...)

adhere more readily to objects and become more easily lodged in small cracks, crevices, masonry, fabric, or grass and other vegetation. *Id.*, at 5-7 to 5-10. The study examined the costs for extended remediation for mixed-use urban land (defined as having the national average population density of 1,344 persons/km<sup>2</sup>), Midwest farmland, arid western rangeland, and forested area, and concluded that accident costs would be highest for urban areas. *Id.*, Executive Summary, at x, xiii. Earlier estimates (such as those incorporated within the MACCS codes) of decontamination are incorrect because they examined fallout from the nuclear explosion of nuclear weapons that produce large particles and high mass loadings (*i.e.*, particles ranging in size from tens to hundreds of microns). *Id.*, 2-9 to 2-10, 5-7. In the words of SAND96-0957, "Data on recovery from nuclear explosions that have been publicly available since the 1960's appear to have been misinterpreted, which has led to long-standing underestimates of the potential economic costs of severe reactor accidents." *Id.*, at 2-10.

For an extended decontamination and remediation operation in an mixed-use urban area with an average national population density, the Sandia study predicted a clean up cost of \$ 311,000,000/km<sup>2</sup> with on-site waste disposal and \$402,000,000/km<sup>2</sup> with off-site disposal. SAND96-0957, at p. 6-4. For a so-called expedited clean up of a heavily-contaminated urban area, *i.e.*, one that it finished within one year, the cost was

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<sup>15</sup>(...continued)  
detonation of the weapon's explosive trigger device, as the Board has noted in admitting Contention 12, the study's methodology and conclusions to estimate decontamination costs are directly useful to the license renewal application. *See* Memorandum and Order (July 31, 2008), at 64.

predicted to be \$398,000,000/km<sup>2</sup> using off-site disposal and \$309,000,000/km<sup>2</sup> using on-site waste disposal. *Id.*, at 6-5.<sup>16</sup>

The costs could be much higher. For a tourism, educational, transportation, and financial center such as the New York metropolitan area, the economic losses stemming from the stigma effects of the dispersion of radioactive material would likely be staggering. The Sandia study further recognized that:

In comparing the numbers of cancer health effects that could result from a plutonium-dispersal accident to those that could result from a severe accident at a commercial nuclear power plant, it is readily apparent that the health consequences and costs of a severe reactor accident could greatly exceed the consequences of even a “worst-case” plutonium-dispersal accident because the quantities of radioactive material in nuclear weapons are a small fraction of the quantities present in an operating nuclear power plant.

*Id.*, at 2-3 to 2-4. These costs must be taken into account.

In addition, many areas in the Indian Point EPZ have higher population densities and property values than those examined in the Sandia report. Accordingly, as part of its analysis, the NRC should revise the Sandia results for the densely populated and developed New York City area, incorporate the region’s property values, and ensure that the resulting financial costs are expressed in present value (in 2008/2009/2010 dollars) and future value (until 2035, the likely term of any renewed operating license).

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<sup>16</sup>These Sandia projections are in 1996 dollars for an area of average population density and did “not include downtown business and commercial districts, heavy industrial areas, or high rise apartment buildings. Inclusion of these areas would increase costs.” SAND96-0957, at p. 6-2.

Two recent studies provide additional information concerning the appropriate cost inputs for evacuation, temporary housing, decontamination, replacement, and disposal activities. Beyea, Lyman, von Hippel, *Damages from a Major Release of <sup>137</sup>Cs into the Atmosphere of the United States*, Science and Global Security, Vol. 12, p. 125-136 (2004) (discussing Indian Point and four other sites); Lyman, *Chernobyl on the Hudson? The Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Power Plant*, Union of Concerned Scientists (September 2004).

These two studies and the economic model found in SAND96-0957 are currently available to NRC,<sup>17</sup> and yet Staff has apparently disregarded both the State's scoping comments and the Board's statements in admitting Contention NYS-12 in drafting the SEIS, which did not take this information into account. The results from this readily-available model, as updated and revised for the New York- Connecticut-New Jersey metropolitan area, should be included in the environmental review and incorporated into any SEIS for the consideration of federal decision makers.

#### **VIII. NRC Staff is Required to Assess the Potential Environmental Impacts from a Terrorist Attack in the DSEIS**

In its October 31, 2008 scoping comments, the State of New York identified extensive new information, not taken into account in the GEIS, related to the potential impacts from an act of terrorism, and sought consideration of these issues on a site-specific basis in the DSEIS. NRC Staff explicitly declined to consider "deliberate

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<sup>17</sup>See [http://www.osti.gov/bridge/product.biblio.jsp?osti\\_id=249283&query\\_id=2](http://www.osti.gov/bridge/product.biblio.jsp?osti_id=249283&query_id=2).

malevolent acts or terrorism” because this issue is either “outside the scope of the license renewal process . . . addressed by other NRC regulatory processes, or . . . fall[s] under the jurisdiction of other agencies or actors.” Staff Scoping Summary at 315.

Staff’s arguments are unpersuasive in the context of NEPA: NEPA requires analysis of all environmental impacts from the proposed action, including any adverse environmental effects which cannot be avoided should the proposal be implemented and alternatives to the proposed action (42 U.S.C. § 4332(c)(i-iii)), and requires discussion of those impacts to be submitted for public comment. 10 C.F.R. § 51.73. And NRC has examined the impacts of sabotage in other contexts, including, but not limited to, the mixed oxide fuel context in the 1970's. Moreover, at least one federal circuit court has concluded that consideration of terrorism is proper in a NEPA review and not solely in another safety-related forum. *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016 (9th Cir. 2006), *cert. denied*, 127 S. Ct. 1124 (2007).

**The NRC is Obligated to Consider the Environmental Impacts From an Airborne Terrorist Attack in the DSEIS**

As the State argued in its scoping comments, much has changed since the completion of the GEIS in 1996. As the world knows, on September 11, 2001, terrorists hijacked four jet airliners and crashed three of them into their intended targets. The impact of the fuel-laden planes caused explosions and large, long-lasting fires. Those explosions and fires destroyed a portion of the Pentagon in northern Virginia and caused the collapse of the World Trade Center towers and nearby buildings in New

York City. See *Nat'l Comm'n on Terrorist Attacks Upon the U.S. ("9/11 Commission")*, *The 9/11 Commission Report* (2004).

Two of the hijacked planes flew over or near Indian Point. *Id.* at 32. As late as July 2001, the terrorists were considering attacking a specific nuclear facility in New York, which one of the pilots "had seen during familiarization flights near New York." *Id.* at 245. This was most likely Indian Point.

Since then, government decision makers have recognized the risks to nuclear power facilities. Based on this information, it is imperative that the Supplemental EIS analyze the potential environmental impacts of a terrorist attack on Indian Point. A number of publicly known examples establish the need for this analysis. In his 2002 State of the Union address, President Bush stated that "diagrams of American nuclear power plants" had been found in Afghanistan, suggesting that Al-Qaeda may have been planning attacks on those facilities. *The President's State of the Union Address* (Jan. 29, 2002).<sup>18</sup> On September 4, 2003, the United States General Accounting Office ("GAO") issued a report noting that the nation's commercial nuclear power plants are possible terrorist targets and criticizing the NRC's oversight and regulation of nuclear power plant security. GAO, *Nuclear Regulatory Commission: Oversight of Security at Commercial Nuclear Power Plants Needs to Be Strengthened*, GAO-03-752 (2003); see also GAO, *Testimony Before the Subcomm. on Nat'l Security, Emerging Threats, & Int'l*

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<sup>18</sup>Available at <http://www.whitehouse.gov/news/releases/2002/01/20020129-11.html>.

Relations, House Comm. on Gov't Reform, *Nuclear Power Plants Have Upgraded Security, But the NRC Needs to Improve Its Process for Revising the DBT*, GAO-06-555T, at 1 (2006).

Five major airports (Stewart, Westchester, Newark, Laguardia, Kennedy) are located within a few minutes flying time of Indian Point. The Federal Emergency Management Agency ("FEMA"), a federal agency responsible for assessing terrorist threats and for assuring the safety and security of the public, has taken actions signifying that it considers an aircraft attack on a nuclear power plant to be a credible threat. For instance, during a June 2004 exercise to assess emergency preparedness at Indian Point, the agency simulated a suicide attack by a large cargo jet. Fed. Emergency Mgmt. Agency, *Final Exercise Report: Indian Point Energy Center*, at 101-02 (Oct. 25, 2004). Last May, NRC conducted a similar aircraft drill at the San Onofre power station in California.

Based on this information, it is imperative that the NRC's Supplemental EIS analyze the potential environmental impacts of a terrorist attack on Indian Point. Of particular concern are the potential widespread environmental impacts if a terrorist attack damaged the reactor core, spent fuel pools, the storage casks, or other areas. *San Luis Obispo Mothers for Peace*, 449 F.3d 1016. This is particularly important at Indian Point, where the NRC at Entergy's request has relaxed fire safety standards. *See* 72 Fed. Reg. 55,254 (Sept. 28, 2007), 72 Fed. Reg. 56,798 (Oct. 4 2007) (exempting certain locations in Indian Point Unit 3 from the one-hour fire resistance requirement imposed by the NRC's fire safety regulations and, instead, imposing resistance requirements of

thirty minutes for some of its electrical equipment and twenty-four minutes for other electrical equipment). This exemption could potentially make the facility more vulnerable to a fire that could disable safety systems designed to control nuclear fission and ensure the prompt shut down of the reactor in the case of an emergency, ultimately leading to a major radiation release. The NRC has granted other fire safety waivers to Indian Point in the past.

The NRC has implicitly recognized the gravity of the consequences of a terrorist air attack by requiring applicants for certain new nuclear reactors to consider such attacks. *See, e.g.,* 72 Fed Reg. 56,287 (Oct. 3, 2007). This concern over the damage that could be caused by an aircraft impact is reflected in other NRC documents as well. *See* NRC, *Evaluation of Aircraft Crash Hazards Analyses for Nuclear Power Plants*, NUREG/CR-2859 (1982); NRC, *Relay Chatter & Operator Response After a Large Earthquake*, NUREG/CR-4910 (1987); NRC, *Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants*, NUREG-1738, at § 3.5.2 (2001); NRC: *Nuclear Power Plants Not Protected Against Air Crashes*, Associated Press (Mar. 28, 2002). The NRC has acknowledged that almost every power reactor was not designed or built with the requirement that the facility withstand the impact of an aircraft impact. *See, e.g.,* NRC: *Nuclear Power Plants Not Protected Against Air Crashes*, Associated Press (Mar. 28, 2002).

It has long been known that an airborne attack on a nuclear power plant could be catastrophic. A 1974 peer-reviewed study by a General Electric engineer, for example,

concluded that if a plane weighing more than 12,500 pounds – a tiny fraction of the weight of today’s commercial airliners<sup>19</sup> – were to hit a reactor building in the right place, it would likely breach the containment structure and damage the reactor core and cooling systems. Ian B. Wall, *Probabilistic Assessment of Aircraft Risk for Nuclear Power Plants*, 15 Nuclear Safety 276 (1974) [hereinafter *GE Study*].

Researchers at the Argonne National Laboratory reached similar conclusions in a 1982 study conducted for the NRC. NRC, *Evaluation of Aircraft Crash Hazards Analyses for Nuclear Power Plants*, NUREG/CR-2859 (1982) [hereinafter *Argonne Study*]. The report explained that “[n]umerous systems are required in order to provide reactor shutdown and adequate long-term cooling of the core. Although many of these safety-related systems are well protected within hardened structures (containment system, auxiliary building), some are not.” *Id.* at 50. Thus, an aircraft crash that caused “rapid depressurization of the plant’s secondary cooling system” as well as loss of electrical power would likely set off an accident sequence resulting in “serious damage if not total meltdown” of the core. *Id.* at 51-52.

The *Argonne Study* also determined that a Boeing 707 aircraft – slightly smaller than some of today’s commercial aircraft – hitting a nuclear power plant could produce vibrations exceeding those experienced during an earthquake. *See id.* at 70.

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<sup>19</sup>A fully loaded Boeing 767 weighs nearly 400,000 pounds. *See* Boeing, *Technical Characteristics–Boeing 767-200ER*, at [http://www.boeing.com/commercial/767family/pf/pf\\_200prod.html](http://www.boeing.com/commercial/767family/pf/pf_200prod.html). The A-380, Airbus’s new superjumbo airliner, has a maximum takeoff weight of 1,235,000 pounds. *See* Airbus, *Aircraft Families/A380 Specifications*, at <http://www.airbus.com/en/aircraftfamilies/a380/a380/specifications.html>.

This finding is significant because of a 1987 study commissioned by the NRC on the effects of earthquake forces on relays — electrical switches — at nuclear power plants. NRC, *Relay Chatter & Operator Response After a Large Earthquake*, NUREG/CR-4910 (1987). This study demonstrated that the vibrations associated with an earthquake could cause the relays to switch from the opened to closed position, from the closed to the open position, or even to cycle back and forth between positions. The relay repositioning would cause operating equipment to stop and standby equipment to start. The study concluded that if an earthquake were strong enough to cause loss of offsite power and relay chattering, core damage almost certainly would result. *See id.* at 6-5. Thus, because an aircraft crashing into a nuclear plant structure produces vibrations similar to those of an earthquake, the crash would have a high likelihood of causing reactor core damage — even without considering the effect of fires, explosions, or penetration of the aircraft through the containment structure.

Other studies conducted by or for the NRC prior to September 11, 2001 also concluded that an aircraft hitting a nuclear power plant could cause a reactor meltdown, damage spent fuel pools, and lead to the release of radiation. A study of safety at the Indian Point Energy Center in New York, for example, determined that a core meltdown could occur if either of the control buildings at the Indian Point nuclear power plant were hit by even a light aircraft. *See Power Auth. of the State of N.Y. & Consol. Edison Co., Indian Point Probabilistic Safety Study*, at 7.6-3 to 7.6-6 (1982). And an NRC study of spent fuel pools at decommissioning nuclear power plants, the final

results of which the NRC published in 2001, concluded that aircraft damage could affect the structural integrity of spent fuel pools – which contain highly radioactive uranium and plutonium and are located outside the reactor’s protective containment shells – or the availability of nearby support systems. NRC, *Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants*, NUREG-1738, at § 3.5.2 (2001) [hereinafter *2001 NRC Spent Fuel Pool Study*]. The NRC further found that one of two crashes would damage the spent fuel pool enough to uncover the stored fuel, which could lead to serious consequences from a zirconium cladding fire. *See id.*

Other studies identify the threat as a significant issue. Ian B. Wall, *Probabilistic Assessment of Aircraft Risk for Nuclear Power Plants*, 15 *Nuclear Safety* 276 (1974); Power Auth. of the State of N.Y. & Consol. Edison Co., *Indian Point Probabilistic Safety Study*, at 7.6-3 to 7.6-6 (1982). In 2005, the National Academy of Sciences released a report from a study it conducted at the request of Congress, with the sponsorship of the NRC and the Department of Homeland Security, of the security risks posed by the storage of spent fuel at nuclear plant sites. *See Nat’l Acad. of Scis., Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report* (2006). Based upon information provided by the NRC, the National Academy of Sciences judged that “attacks with civilian aircraft remain a credible threat.” *Id.* at 30; *see also* German Reactor Safety Org., *Protection of German Nuclear Power Plants Against the Background of the Terrorist Attacks in the U.S. on Sept. 11, 2001* (Nov. 27, 2002).

Following 9/11, NRC amended all existing reactor licenses, including the license for the Unit 3 reactor at Indian Point, “to address the generalized high-level threat environment in a consistent manner throughout the nuclear reactor community.” *See generally* 67 Fed. Reg. 9,792 (Mar. 4, 2002). The amended licenses required the identification of mitigative measures to reduce the potential consequences of explosions or fire at nuclear plants, “including those that an aircraft impact might create.” *See* Letter from J. Boska, NRC, to M. Balduzzi, Entergy Nuclear Operations (July 11, 2007) ML 071920023; *see also* February 23, 2002 Interim Compensatory Order, 67 Fed. Reg. 9,792 (Mar. 4, 2002) (also referred to as the “B.5.b Order”). Thus, NRC cannot maintain that aircraft impacts are not foreseeable and it must examine the environmental consequences of such strikes not only to the spent fuel pools, but to the all aspects of the power generating facilities.

**The NRC Has Established Mitigation Measures Regarding Spent Fuel Pool Safety Without Conducting a NEPA Analysis Subject to Public Comment in Violation of NEPA**

The NRC has curiously established mitigation measures for spent fuel safety, while simultaneously maintaining that it need not analyze the potential impacts from a spent-fuel pool-related terrorist attack under NEPA. This “cart-before-the-horse” approach does nothing but deprive the public of review of a crucial environmental and

public safety issue, and fails to meet NEPA's requirements of analysis before mitigation.<sup>20</sup>

According to the DSEIS, "[a]s set forth in the GEIS, Category 1 issues are those that meet *all* of the following criteria:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.

(2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

DSEIS at Section 6.0, p.6-1 (emphasis added). "For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required unless new and significant information is identified. Category 2 issues are those that do not meet one or more of the criteria for Category 1; therefore, additional plant-specific review of these issues is required." *Id.*

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<sup>20</sup>NEPA has "twin aims:" to give an agency "the obligation to consider every significant aspect of the environmental impact of a proposed action;" and to ensure "that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process." *San Luis Obispo Mothers for Peace*, 449 F.3d at 1020 (quoting *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983)).

According to this definition, the environmental impacts of on-site storage are no longer Category 1 issues because, as the NRC recently indicated in a rulemaking concerning its policy regarding on-site storage of waste, it has required the implementation of site-specific mitigation measures at all of the nation's facilities. *See* 73 Fed. Reg. 59568 (Oct. 9, 2008) ("the NRC has approved license amendments and issued safety evaluations to incorporate mitigation measures into the plant licensing bases of all operating nuclear power plants in the United States"), *citing Denial of PRMs*, 73 Fed. Reg. 46207-08 (Aug. 8, 2008).

Mitigation measures are only necessary to address adverse impacts. *See* 40 C.F.R. §§ 1502.14(f), 1502.16(h). Yet, although NRC in the DSEIS takes the position that it need not analyze the impacts of a terrorist attack at all, it has required implementation of mitigation measures, indicating that it has looked at such impacts in some fashion and concluded them to be adverse. The public has the right to know what impacts NRC has considered, and what the nature of its mitigation measures are. At least one federal circuit court of appeals has recognized that NRC's own efforts undercut its position that terrorism need not be examined. *See San Luis Obispo Mothers for Peace*, 449 F.3d at 1030-31.

Accordingly, New York State requests that the NRC analyze the environmental impacts of such acknowledged security risks, including an intentional air attack at the Indian Point facilities.

## CONCLUSION

For the above reasons, and the reasons set forth in the Department of Environmental Conservation's submission of today's date, the State of New York maintains that the December 2008 Draft Supplemental Environmental Impact Statement is inconsistent with the National Environmental Policy Act, the Council on Environmental Quality's regulations, and the NRC's own Part 51 regulations. Accordingly, the DSEIS needs to be thoroughly revised and reissued for additional public review and comment.

Respectfully submitted,

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