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In the Matter of:	Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3)
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Submitted: December 16, 2011

**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD**

-----X
In re:

License Renewal Application Submitted by

Entergy Nuclear Indian Point 2, LLC,
Entergy Nuclear Indian Point 3, LLC, and
Entergy Nuclear Operations, Inc.
-----X

Docket Nos. 50-247-LR; 50-286-LR

ASLBP No. 07-858-03-LR-BD01

DPR-26, DPR-64

December 16, 2011

**STATE OF NEW YORK
INITIAL STATEMENT OF POSITION
CONTENTION NYS-16/16A/16B (“NYS-16B”)**

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PRELIMINARY STATEMENT

In accordance with 10 C.F.R. Section 2.1207(a)(1) and the Atomic Safety and Licensing Board’s (“Board”) July 1, 2010 Memorandum and Order, the State of New York (“New York” or “the State”) hereby submits its Initial Statement of Position on New York’s admitted Contention 16/16A/16B (“NYS-16B”), concerning Entergy’s underestimation of the 2035 population within 50 miles of Indian Point likely to be exposed to radiation during a severe accident, the potential concomitant underestimation of the costs of a severe accident, and thus, the potential underestimation of the benefit of any given severe accident mitigation alternative (“SAMA”) that would reduce human exposures in the event of a severe accident. It is particularly important that NRC rely on accurate population estimates in the relicensing proceeding given the fact that the Commission has recognized that the population density surrounding Indian Point is higher than that surrounding any other plant in the United States, and “that a severe release of radioactive materials at Indian Point could have more serious consequences than that same release at virtually any other NRC-licensed site.” *Consolidated Edison Company of New York* (Indian Point, Unit 2) and *Power Authority of the State of New York* (Indian Point, Unit 3), CLI-85-6, 21 N.R.C. 1043, 1049-50 (1985). The Board should grant the element of Contention 16 challenging Entergy’s population estimate as improperly excluding commuters and failing to account for census undercount.¹

In this proceeding, the State and other intervenor parties have satisfied the standards contained in 10 C.F.R. § 2.309 governing contention admissibility—standards that NRC has described as “strict by design.” *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power

¹ The State has chosen not to pursue the part of Contention 16 challenging Entergy’s air dispersion model.

Station, Units 2 & 3), CLI-01-24, 54 N.R.C. 349, 358 (2001), pet. for reconsideration denied, CLI-02-1, 55 N.R.C. 1 (2002). The State now submits this testimony to show that Entergy's license renewal application ("LRA") should be denied because NRC Staff's December 2010 Final Supplemental Environmental Impact Statement ("FSEIS") is legally deficient due to its failure to reliably predict the potential exposed 2035 population, which in turn, led it to substantially understate the adverse environmental impacts from relicensing, thus violating the National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4332, and the regulations implementing NEPA adopted by the Council on Environmental Quality ("CEQ") and the Nuclear Regulatory Commission ("NRC").²

SUMMARY OF ARGUMENT AND SUPPORTING EVIDENCE

Because of the enormous population surrounding the Indian Point nuclear reactors, reliably predicting how many people would be exposed to radiation in the event of a severe accident is of critical importance, particularly with respect to the FSEIS and the SAMA analysis.

The purpose of preparing a FSEIS is to focus NRC's attention on the environmental consequences of relicensing so that "important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast." *Robertson*

² Any effort by NRC Staff to remedy this deficiency by either correcting the population estimates and environmental impacts, or requiring Entergy to revise its population estimates and environmental impacts to properly estimate the 2035 population within 50 miles of Indian Point, should be filed with the Board, and all parties should be given a reasonable opportunity to file new contentions based on Staff's or Entergy's submittals. *See* 10 C.F.R. § 2.309(f)(2) ("On issues arising under the National Environmental Policy Act, the petitioner shall file contentions based on the applicant's environmental report. The petitioner may amend those contentions or file new contentions if there are data or conclusions in the NRC draft or final environmental impact statement, environmental assessment, or any supplements relating thereto, that differ significantly from the data or conclusions in the applicant's documents.").

v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1989).³ In addition to ensuring that the agency makes an informed decision, the FSEIS also serves as an informational tool for the public so that it may participate in the decision-making process. *Methow*, 490 U.S. at 349. However, if the FSEIS does not contain accurate information, it fails to serve either purpose because its informational value is lost.⁴

A central feature of the FSEIS is the consideration of alternatives, including the SAMA analysis. The purpose of a SAMA analysis is “to ensure that any plant changes—in hardware, procedures, or training—that have a potential for significantly improving severe accident safety performance are identified and assessed.” *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2) CLI-02-17, 56 N.R.C. 1, 5 (2002). According to the Board, “[T]he FSEIS must demonstrate that the NRC [S]taff has received sufficient information to take a hard look at SAMAs as required by 10 C.F.R. § 51.53(c)(3)(ii)(L), has in fact taken that hard look, and has adequately explained its conclusions” *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), LBP-11-17, at 18 (July 14, 2011) (ML111950712) (“July 14, 2011 Board Order”).

In a SAMA analysis, population is a key input that helps to determine the costs of a severe accident and the benefits of risk mitigation methods that reduce population exposures. If more people are assumed to be exposed to radiation released in a severe accident, the predicted

³ See also 40 C.F.R. § 1500.1(c) (“The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.”).

⁴ To avoid duplication, the State respectfully refers the Board and the parties to the discussion of NEPA at pages 14-20 in the State’s Statement of Position in Support of Contention NYS-37 (filed Dec. 14, 2011).

costs of a severe accident may increase, and it may become more likely that a risk mitigation method that reduces those exposures will be cost-beneficial. Therefore, the accuracy of the SAMA analysis depends, in part, on the accuracy of the estimates of human population that would be exposed to radiation from a severe accident.

The FSEIS accepts Entergy's estimate of the 2035 population within 50 miles of Indian Point despite two significant errors in Entergy's estimate: (1) failure to account for census undercount⁵; and (2) failure to account for the commuter population present within the 50 mile zone. As shown in the December 16, 2011 Report of Dr. Stephen C. Sheppard, Ph.D. (Exh. NYS000209) ("Sheppard Report"), these deficiencies cause the population at risk in the event of a severe accident to be substantially underestimated. Dr. Sheppard shows not only that Entergy's estimate is inaccurate for failing to include census undercount and commuters, but also that the inclusion of those two factors leads to an increase of more than 1.2 million persons to Entergy's estimate, which is approximately a 6.4% increase. Sheppard Report at 1, 7 (Exh. NYS000209). An underestimate of 1.2 million people is significant.

NRC Staff's reliance on, and inclusion of, a flawed population estimate in the FSEIS renders that document legally deficient for two reasons. First, it fails to serve its NEPA-mandated purpose of providing accurate information to decision-makers and the public. The exclusion of over one million persons from the population estimate is not a mere oversight—it is a significant discrepancy that affects relicensing decisions. Second, by accepting a SAMA analysis based on inaccurate data, the FSEIS does not take the NEPA-required "hard look" at

⁵ As explained in the Report of Dr. Stephen C. Sheppard, census undercount refers to the systematic undercount of the population by the U.S. Census Bureau. Sheppard Report at 4-5 (Exh. NYS000209).

mitigation alternatives to the proposed action. And so, for the reasons stated in this pleading and the accompanying Testimony of Dr. Stephen Sheppard (Exh. NYS000207), the State urges the Board to deny Entergy's LRA.

PROPOSED FINDINGS OF FACT

This Statement of Position, along with its supporting evidence, provide the bases for the Board finding the following facts regarding NYS-16B:

1. Since at least the 1990s, the census of population conducted by the U.S. Census Bureau has been subject to a systematic undercount;
2. Entergy's population estimate, which relies solely on census data, fails to include this census undercount, resulting in an underestimation of the 2035 population within 50 miles of Indian Point likely to be exposed in the event of a severe accident;
3. Workers who reside outside of the 50 mile zone, but commute to workplaces within 50 miles of Indian Point are part of the population at risk of exposure due to a severe accident;
4. Entergy's population estimate fails to include such commuters, resulting in further underestimation of the 2035 population within 50 miles of Indian Point likely to be exposed in the event of a severe accident;
5. NRC Staff accepted Entergy's population estimates in the FSEIS without accounting for either census undercount or commuters;
6. Entergy's underestimation of the 2035 population within 50 miles of Indian Point could lead to an underestimation of the costs of a severe accident;

7. An underestimation of the costs of a severe accident could lead to an underestimation of the benefit obtained from implementing a SAMA, thus potentially excluding certain mitigation alternatives from full consideration; and
8. By uncritically accepting Entergy's population estimates, with the attendant underestimation of the costs of a nuclear accident, the FSEIS presented inaccurate information and failed to take the requisite "hard look" at the SAMAs, and is legally deficient.

PROCEDURAL HISTORY

A. New York State Contention 16

On November 30, 2007, the State of New York submitted to this Board a Petition to Intervene, which included proposed contentions regarding critical deficiencies in Entergy's Indian Point relicensing application with respect to public safety, health, and the environment. Among those proposed contentions was Contention 16 ("NYS-16"), which asserted that Entergy's SAMA analysis for Indian Point Unit 2 and Unit 3 was flawed because it "will not present an accurate estimate of the costs of human exposure." *New York State Notice of Intention to Participate and Petition to Intervene*, Contention 16, at 163 (Nov. 30, 2007) (ML073400187).⁶ One of the bases for Contention 16 was that "Entergy's projections of the

⁶ The State also challenged Entergy's air dispersion model as being used beyond its range of validity and not accurately predicting the geographic dispersion of radionuclides released in a severe accident. New York filed a motion for summary disposition for the part of the contention dealing with the air dispersion model. *See State of New York's Motion for Summary Disposition on Use of Straight Line Gaussian Air Dispersion Model for the Environmental Impact Analysis of Significant Radiological Impacts at Indian Point and NYS Contention 16A* (Aug. 28, 2008) (ML092610906). That motion was denied because the Board found an issue of material fact. *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3) ASLBP No.

2035 population likely to be living within 50 miles of Indian Point are suspect and underestimate the potential exposed population,” and that this underestimation might, in turn, lead to an underestimation of the benefit obtained from implementing a SAMA. *Id.* at 164 n.37.

While challenging the admissibility of Contention 16 on several grounds, neither Entergy nor NRC Staff addressed New York’s argument that the population projections are “suspect and underestimate the potential exposed population.” *Answer of Entergy Nuclear Operations Inc. Opposing New York State Notice of Intention to Participate and Petition to Intervene* at 109-113 (Jan. 22, 2008) (ML080300149) and *NRC Staff’s Response to Petitions for Leave to Intervene Filed by the State of New York and others* at 56-58 (Jan. 22, 2008) (ML080230543). The Board admitted NYS-16 with respect to New York’s argument that “the population projections used by Entergy are underestimated,” because population size is “a question of model input data material to the making of accurate SAMA analyses.” *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), LBP-08-13, 68 N.R.C. 43, 116 (Jul. 31, 2008) (ML082130436) (“July 31, 2008 Board Decision”).

B. New York State Contention 16A

After NRC Staff released the Draft Supplemental Environmental Impact Statement (“DSEIS”), in which it failed to address any of the issues raised in NYS-16, New York submitted an amended contention, NYS-16A, to apply to the DSEIS. *New York State Contentions Concerning Staff’s Draft Supplemental Environmental Impact Statement* at 10 n.4 (Feb. 27, 2009) (ML090690303). While Entergy opposed the admission of NYS-16A, it did not address New York’s argument that the population projections are “suspect and underestimate the

07-858-03-LR-BD01, slip op. at 14 (Nov. 3, 2009). As stated (p. 1), the State has chosen not to pursue this aspect of NYS-16.

potential exposed population.” *Answer of Entergy Nuclear Operations, Inc. Opposing New and Amended Environmental Contentions of New York State* at 13-15 (Mar. 24, 2009)

(ML090930204). NRC Staff did not oppose the admission of NYS-16A to the extent that it applied NYS-16 to the DSEIS, and again, did not address New York’s argument that Entergy had underestimated the population that would be exposed in the event of an accident. *NRC Staff’s Answer to Amended and New Contentions Filed by the State of New York and Riverkeeper, Inc., Concerning the Draft Supplemental Environmental Impact Statement* at 12-13 (Mar. 24, 2009) (ML090840116). The Board admitted NYS-16A’s challenge to Entergy’s population projections. *Entergy Nuclear Operations, Inc. (Indian Point, Units 2 and 3)*, at 4-7 (June 16, 2009) (ML091670435).⁷

C. New York State Contention 16B

After Entergy’s December 2009 Reanalysis of Severe Accident Alternatives (“SAMA Reanalysis”) failed to address issues raised in admitted contention NYS-16/16A, New York submitted an amended contention, Contention 16B. *State of New York’s Motion for Leave to File New and Amended Contentions Concerning the December 2009 Reanalysis of Severe Accident Mitigation Alternatives* (Mar. 11, 2010) (ML100780366). Among other things, Contention 16B argued that the population projections used by Entergy in its 2009 SAMA Reanalysis “are suspect and underestimate the potential exposed population.” *See Id.* at 8 n.3. New York specified Entergy’s undercount of tourists and exclusion of commuters as examples of its underestimation. *Id.*

⁷ The Board did not admit the portion of NYS-16A challenging Entergy’s use of an air dispersion model that is not “EPA-approved.” *Entergy Nuclear Operations, Inc. (Indian Point, Units 2 and 3)*, at 6 (June 16, 2009)(ML091670435).

For the first time in the proceeding, after opposing New York’s contention in at least three pleadings, Entergy and NRC Staff finally acknowledged that New York—in every pleading since its Petition in 2007—had challenged the population estimates used by Entergy in its environmental report and by NRC Staff in the DSEIS.⁸ However, Entergy mischaracterized New York’s concern with population estimates as being with the economic impact of lost tourism and business, instead of as an input to the MACCS2 program. *Applicant’s Answer to New York State’s New and Amended Contentions Concerning Entergy’s 2009 Revised SAMA Analysis* at 19-20 (Apr. 5, 2010) (ML101450328). NRC Staff also opposed Contention 16B. *NRC Staff’s Answer to State of New York’s New and Amended Contentions Concerning the December 2009 Severe Accident Mitigation Alternatives Reanalysis* at 12-13 (Apr. 5, 2010) (ML100960165).

The Board rejected Entergy and Staff’s arguments and admitted Contention 16B, finding that it does not address the loss of tourism, but instead, an input to the MACCS2 code used by Entergy in its SAMA analysis, and that the contention was timely because it arose out of the 2009 SAMA Reanalysis. *Entergy Nuclear Operations, Inc. (Indian Point, Units 2 and 3), LBP-10-13*, at 14-15 (June 30, 2010) (ML101810344) (“June 30, 2010 Board Decision”). The Board noted that its rulings on NYS-16 and NYS-16A had established the admissibility of the question “whether the population projections used by Entergy are underestimated.” *Id.* at 14. It concluded that Contention 16B is admissible because the absence of tourists and commuters “might underestimate the exposed population in a severe accident and, in turn, underestimate the benefit achieved in implementing a SAMA.” *Id.*

⁸ NRC Staff also acknowledged the State’s challenge to Entergy’s population estimates in Appendix G of the FSEIS. As explained below on pages 19-20, however, Staff did not question the assumptions on which Entergy based its population estimate.

LEGAL FRAMEWORK

NEPA, 42 U.S.C. § 4332, and the CEQ regulations for implementing NEPA, 40 C.F.R. § 1502, require federal agencies to examine, in an environmental impact statement (“EIS”), the potential adverse environmental impacts of their major discretionary actions. The preparation of an EIS serves two purposes: first, it causes the agency to take the requisite “hard look” at the environmental impacts of the proposed action; and second, by making the relevant information publicly available, it allows the public to participate in the decision-making process. *Hughes River Watershed Conservancy v. Glickman*, 81 F.3d 437, 443 (4th Cir. 1996).

NEPA, NRC’s own NEPA regulations, and CEQ regulations require that NRC Staff evaluate, in the EIS, a reasonable range of alternatives for reducing the adverse environmental impacts of relicensing. 42 U.S.C. § 4332(2)(C)(iii), 10 C.F.R. § 51.53(C)(3)(iii), and 40 C.F.R. § 1502.14. In doing so, NRC Staff must rely on accurate scientific data. 40 C.F.R. § 1500.1(b).

As part of its environmental obligations under NEPA, NRC Staff is obligated to conduct a site-specific SAMA analysis during the review of license renewal applications. 10 C.F.R. § 51.53(c)(3)(ii)(L); Part 51, Subpart A, Appendix B, Table B-1. This requirement dates back to 1989 when the U.S. Court of Appeals for the Third Circuit ruled that NEPA requires NRC to examine the environmental effects of significant accidents at nuclear power plants. *Limerick Ecology Action, Inc. v. U.S. Nuclear Regulatory Comm’n*, 869 F.2d 719, 729-31 (3d Cir. 1989). Moreover, the court held that such evaluation must take place on a case-by-case basis, since differences in plant design and location will cause the risk and environmental impact of severe accidents to vary by plant. *Id.* at 738-39. Thereafter, NRC promulgated regulations requiring significant accident mitigation alternative analyses (“SAMA” analyses) during the Staff’s review

of an application to renew a nuclear reactor's operating license. That regulation provides: "If the [S]taff has not previously considered severe accident mitigation alternatives for the applicant's plant in an environmental impact statement or in an environmental assessment, a consideration of alternatives to mitigate severe accidents must be provided." 10 C.F.R. § 51.53(c)(3)(ii)(L).⁹

Indian Point Unit 2 and Unit 3 were not subject to the SAMA analysis requirement when they received permission to operate in 1973 and 1975. *See* 21 Fed. Reg. 3,085 (May 9, 1956), 31 Fed. Reg. 13,616-17 (Oct. 21, 1966), 34 Fed. Reg. 13,437 (Aug. 20, 1969). Accordingly, NRC regulations require that NRC Staff conduct a SAMA analysis during Staff's review of Entergy's LRA for Indian Point and present the SAMA analysis in the supplemental environmental impact statement ("SEIS," here the DSEIS and FSEIS) prepared as part of the license renewal process. 10 C.F.R. § 51.95(c)(4); *see* 10 C.F.R. §§ 51.53(c)(3)(ii)(L) and 51.71(d).¹⁰ NRC Staff was required to review the SAMA analysis Entergy submitted as part of its 2007 Environmental Report as well as the SAMA reanalysis Entergy submitted in December 2009.

In conducting a site-specific SAMA analysis, NEPA requires that NRC take a "hard look" at the potential environmental impacts of a severe accident, consider a reasonable range of alternatives, and provide a rational basis for rejecting alternatives that are decidedly cost-effective. *Methow*, 490 U.S. at 350; *Limerick Ecology*, 869 F.2d at 737; and *see Bowman*

⁹ The Staff is obligated to evaluate an applicant's SAMA analysis and assure that it has been properly conducted pursuant to 10 C.F.R. § 51.95(c)(4).

¹⁰ *See also* NUREG-1555 Standard Review Plans for Environmental Reviews of Nuclear Power Plants Supplement 1 (October 1999) at 5.1.1-1 (Exh. NYS000220) ("This environmental standard review plan (ESRP) directs the [S]taff's analysis and assessment of the severe accidents for the applicant's plant The intent is to identify additional cases that might warrant either additional features or other actions that would prevent or mitigate the consequences of serious accidents").

Transp., Inc. v. Arkansas-Best Freight Sys., Inc. 419 U.S. 281, 285-86 (1974). According to the Board,

Entergy's licenses cannot be renewed unless and until the NRC Staff reviews Entergy's completed SAMA analyses and either incorporates the result of these reviews into the FSEIS or, in the alternative, modifies its FSEIS to provide a valid reason for recommending the renewal of the licenses before the analysis of potentially cost effective SAMAs is complete and for not requiring the implementation of cost-beneficial SAMAs.

July 14, 2011 Board Order at 17.

NRC's obligation to take the requisite "hard look" required under NEPA is not met if NRC relies on incorrect assumptions or data provided by a licensee because "accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."

Native Ecosystems Council v. U.S. Forest Serv., 418 F.3d 953, 964-65 (9th Cir. 2005); *see also*

40 C.F.R. § 1500.1(b).¹¹ Accordingly, NEPA requires that an EIS must contain "high quality" information and "accurate scientific analysis,"¹² and furthermore obligates NRC Staff to

"independently evaluate and be responsible for the reliability of all information used in the draft

¹¹ In a recent Commissioner's Order, the Commission explained its position regarding the applicability of CEQ regulations to its decision-making processes: "We look to CEQ regulations for guidance. . . [b]ut our longstanding policy is that the NRC, as an independent regulatory agency, is not bound by those portions of CEQ's NEPA regulations that . . . have a substantive impact on the way in which the Commission performs its regulatory functions" (internal citations omitted). *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-11-11, 2011 WL 4896492, 10 (2011). The NRC's policy does not affect the applicability of CEQ regulation 40 C.F.R. § 1500.1(b) because that regulation does not substantively change the way in which the Commission performs its regulatory functions. The NRC has implemented NEPA § 102(2) through its regulations. *See* 10 C.F.R. § 51. 40 C.F.R. § 1500.1(b) does not substantively alter the requirements of NEPA § 102(2), but confirms the purpose of the NEPA requirements—to ensure that high quality information is available to decision-makers.

¹² 40 C.F.R. § 1500.1(b); *Conservation Northwest v. Rey*, 674 F. Supp. 2d 1232, 1249 (W.D. Wash. 2009) (*citing* *Ctr. for Biological Diversity v. U.S. Forest Serv.*, 349 F.3d 1157, 1167 (9th Cir. 2003)).

environmental impact statement.” 10 C.F.R. § 51.70(b); *Native Ecosystems*, 418 F.3d at 964-65. *See also* 10 C.F.R. § 51.92(a); 40 C.F.R. § 1502.24 (Staff must ensure “the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements.”).

According to NRC regulations, the FSEIS must respond to “any comments on the draft environmental impact statement or on any supplement to the draft environmental impact statement.” 10 C.F.R. § 51.91(a)(1); *see also* 40 C.F.R. § 1503.4(a). Responses may include the modification of alternatives, development of alternatives not previously given serious consideration, and factual corrections. 10 C.F.R. § 51.91(a)(1)(i)-(iv). If NRC Staff determines that certain comments do not warrant a further response, they must explain why and cite sources, authorities, or reasons that support this conclusion. 10 C.F.R. § 51.91(a)(1)(v).

Ultimately, the decision-maker—in this proceeding, the NRC—must be able to use the NEPA analysis in evaluating a reasonable range of alternatives and providing a rational basis for its final decision.¹³ *See* 10 C.F.R. §§ 51.53(C)(3)(iii), 51.95(c)(4), and 51.103(a)(5). If the NEPA analysis inadequately evaluates the available evidence and/or ignores relevant facts, as the FSEIS does in this case, then the decision-maker cannot have a rational basis for the ultimate decision.

¹³ Thus the Board concluded elsewhere in these proceedings that the “NRC would be acting arbitrarily and capriciously if it did not look at relevant data and sufficiently explain a rational nexus between the facts found in its review and the choice it makes as a result of that review.” July 14, 2011 Board Order at 11-12, *citing ShieldAlloy Metallurgical Corp. v. NRC*, 624 F.3d 489, 492-93 (D.C. Cir. 2010) (citations omitted).

ARGUMENT

THE FSEIS VIOLATES NEPA, NRC REGULATIONS, AND CEQ REGULATIONS BECAUSE IT ACCEPTS A SAMA ANALYSIS PREDICATED ON INACCURATE POPULATION ESTIMATES

Since its initial pleading in 2007, New York has argued that Entergy’s SAMA analysis underestimated the 2035 population within 50 miles of Indian Point, which may have caused the benefits of implementing a SAMA to be understated. Yet, despite plain deficiencies in Entergy’s population estimate, which New York outlined in its initial and subsequent pleadings, and despite the fact that such deficiencies bring the adequacy of Entergy’s SAMA analysis into question, Staff uncritically accepted Entergy’s flawed estimates in the December 2010 FSEIS. These deficiencies render the FSEIS legally deficient and incapable of supporting a decision on license renewal.

POINT I

ENTERGY’S POPULATION ESTIMATES ARE INACCURATE

“There are two clear and unambiguous deficiencies” in Entergy’s population estimates: (1) the failure to include census undercount; and (2) the exclusion of commuters residing outside of the 50 mile zone of Indian Point, whose workplaces are within the 50 mile zone, as a component of the transient population. Sheppard Report at 4 (Exh. NYS000209); Contention 16B at 8 n.3. Together these two deficiencies led Entergy to ignore 1.2 million persons at risk in the event of a severe accident at Indian Point—persons whose radiation exposures may increase both the cost of a severe accident and the benefit to be obtained by reducing those exposures.

Entergy underestimated the population within 50 miles of Indian Point by failing to account for census undercount. Demographers have been aware of a systematic undercounting

of certain populations, especially minority subgroups, by government censuses. Sheppard Report at 4 (Exh. NYS000209). Although its causes are varied, census undercount is relatively higher in population centers with large minority populations, like New York City, and its effects have been accurately measured. *See Id.* at 4-5.¹⁴ Factoring census undercount into population estimates is uncontroversial, and, indeed, had Entergy conservatively adjusted for census undercount, its estimate would have been higher by approximately 230,000 persons. *Id.* at p.8, Table 1, column 5.

Entergy also underestimated the population within 50 miles of Indian Point by failing to include commuters. According to Dr. Sheppard's report, approximately 1 million persons residing outside the 50 mile radius commute into the 50 mile radius of Indian Point, where their workplaces are located. *Id.* at 8, Table 1, column 6. This is a significant number of people who would be at risk in the event of an accident at Indian Point, yet they were not included in Entergy's population estimate.

¹⁴ This portion of Dr. Sheppard's report may also provide support for Clearwater EC-3, which asserts that Entergy's Environmental Report "fails to acknowledge or describe potential impacts upon the large minority and low-income populations that surround the plant." *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), LBP-08-13, 68 N.R.C. 43, 196 (Jul. 31, 2008).

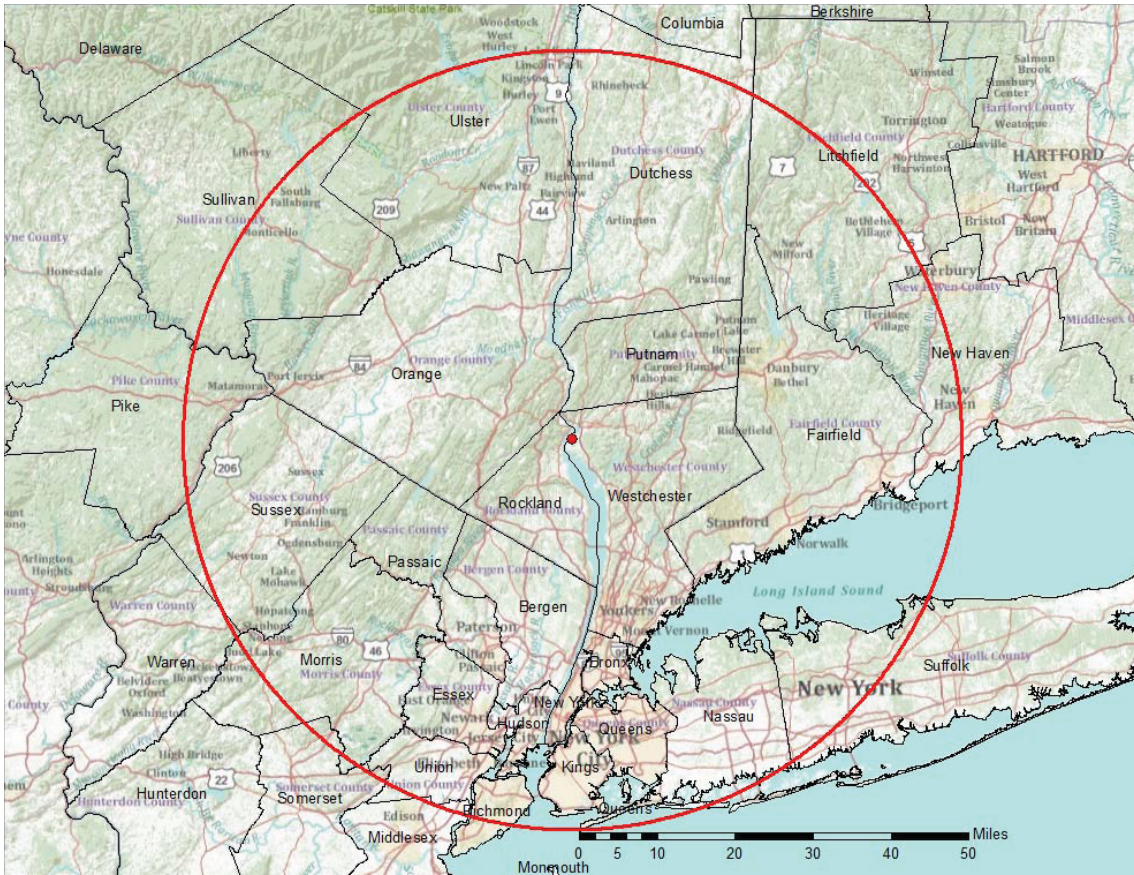


Figure 1. Region within 50 miles of Indian Point. Sheppard Report at 3 (Exh. NYS000209).

Moreover, documents disclosed by NRC Staff show that prevailing weather patterns could cause a severe accident at Indian Point, with the release of radionuclides, to have a disproportionate impact on the New York City Metropolitan population center located to the south of Indian Point.

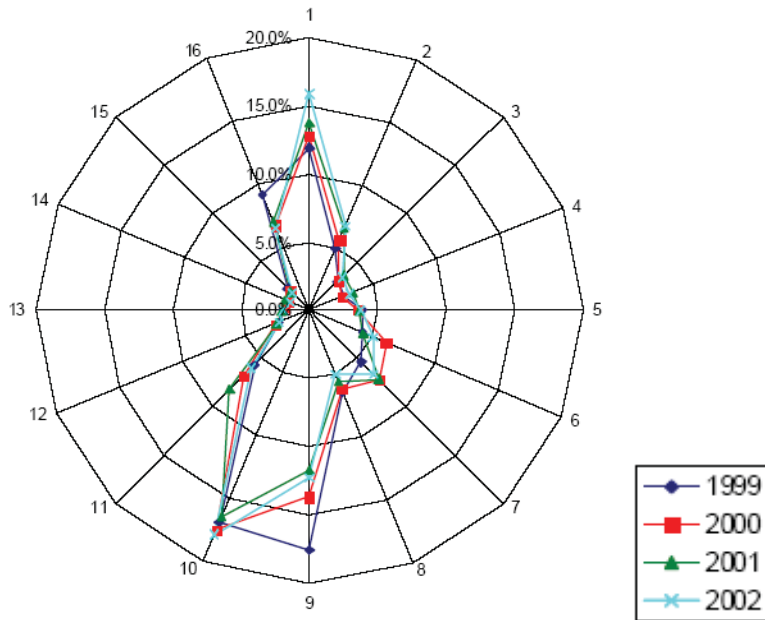


Figure 2. Plot of Weather for Years 1999 – 2002 from the site 10 meter tower showing wind direction (percent by direction). Taken from NRC Staff email, from Robert Palla to Andrew Stuyvenberg, containing document on weather runs (Oct. 29, 2009) (ML093020493) (Exh. NYS000221).

In order for sound environmental decisions to be made during the relicensing process, Entergy, NRC, and the public must have an accurate estimate of the population surrounding Indian Point that would be at risk in the event of a severe accident.¹⁵ Because population size is used to calculate the economic costs associated with a severe accident, which are ultimately compared to the economic costs of implementing each SAMA, Entergy's underestimated population projections could lead to an underestimation of economic costs associated with a

¹⁵ As noted on p. 1, it is particularly important that NRC rely on accurate population estimates in the relicensing proceeding given the fact that the Commission has recognized that the population density surrounding Indian Point is higher than that surrounding any other plant in the United States, and "that a severe release of radioactive materials at Indian Point could have more serious consequences than that same release at virtually any other NRC-licensed site." *Consolidated Edison Company of New York (Indian Point, Unit 2) and Power Authority of the State of New York (Indian Point, Unit 3)*, CLI-85-6, 21 N.R.C. 1043, 1049-50 (1985).

severe accident and call into question the validity of its SAMA analysis. Sheppard Report at 7. The Board admitted NYS-16 for that very reason, describing the challenge to Entergy's population projections as "a question of model input data material to the making of accurate SAMA analyses." July 31, 2008 Board Decision at 112.¹⁶

POINT II

NRC STAFF FAILED TO CONSIDER NEW YORK'S CONCERNS REGARDING ENTERGY'S FLAWED SAMA ANALYSIS AND INSTEAD ACCEPTED THE FLAWED ANALYSIS IN TOTAL

New York brought the issue of Entergy's flawed population estimate to the attention of NRC Staff well before publication of the FSEIS, giving NRC Staff ample time to undertake additional analysis if required. Yet NRC Staff failed to address New York's concerns, thereby violating NEPA, NRC regulations, and CEQ regulations that obligate Staff to respond to comments on the DSEIS. Furthermore, Staff ignored NRC's own guidance¹⁷ on measuring transient populations around nuclear reactors.

In 2007, one year before NRC's publication of the DSEIS, New York brought Entergy's population underestimation to the agency's attention. *New York State Notice of Intention to Participate and Petition to Intervene*, Contention 16, at 163 (Nov. 30, 2007) (ML073400187). Nevertheless, NRC Staff did not address the State's concerns in the DSEIS, and instead, it accepted, without questioning, Entergy's population assumptions. DSEIS, Appendix G, at G-18

¹⁶ Furthermore, in its decision admitting Contention 16B, the Board stated, "It is not clear that Entergy's December 2009 SAMA Reanalysis adds the infusion of tourists and commuters in New York City to the population used for its SAMA analysis—an absence that might underestimate the exposed population in a severe accident and, in turn, underestimate the benefit achieved in implementing a SAMA." June 30, 2010 Board Decision at 14.

¹⁷ See NRC, *Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants, LWR Edition*, Part 1, at Section 2.1.3.3, at 2-4 (Nov. 1978) (ML011340072) (Exh. NYS000222).

(“The NRC [S]taff considers the methods and assumptions for estimating population reasonable and acceptable for the purposes of the SAMA evaluation.”) (Exh. NYS00132D).

Although New York again raised the issue of population underestimation in NYS-16A, Staff failed to question Entergy’s population estimates in the body of the FSEIS, and instead, merely repeated (nearly verbatim) the assessment it made of Entergy’s population estimates in the DSEIS. *See* FSEIS, Appendix G, at G-20 (Exh. NYS00133I). In FSEIS Appendix G, dedicated to addressing issues raised by New York Contentions 12 and 16, Staff purports to review “Entergy’s baseline and projected population values and its population projection methodology.” *Id.* at G-24. NRC Staff employed Sandia National Laboratories (“Sandia”)¹⁸ to verify both Entergy’s population base and the methodology by which it extrapolated that base population out to the year 2035, but neither NRC nor Sandia examined the assumptions through which Entergy arrived at its base population—assumptions, which, as described above, are invalid. First, both NRC’s analysis of Entergy’s population estimates and Sandia’s independent population estimates rely on 2000 census data without factoring in the effects of census undercount. *Id.* at G-24. Second, despite referencing the very pleading in which New York argues that commuters must be included in any credible estimate of the population of the New

¹⁸ In April 2011, the State filed a motion to compel NRC Staff to disclose the Sandia documents they relied upon in the FSEIS. *State of New York Motion to Compel NRC Staff to Produce Documents Relied Upon in Staff’s Final Supplemental Environmental Impact Statement* (April 22, 2011) (ML11132A149). After oral argument before the Board, NRC agreed to provide the documents to settle the State’s motion. *See* Letter from Sherwin E. Turk to Janice A. Dean (May 25, 2011) (ML11146A058). By letter dated November 2, 2011, NRC Staff indicated that they were not asserting deliberative process privilege over the Sandia documents that were provided. Letter from Sherwin E. Turk to Janice A. Dean (November 2, 2011) (ML11306A125). The documents produced concerned various issues including population estimates and air dispersion.

York City metropolitan region, NRC Staff does not question Entergy's exclusion of commuters from the transient population. *Id.*

NRC Staff's failure to respond to the population estimate concerns raised by the State in its comments¹⁹ on the DSEIS violates NRC and CEQ regulations that require Staff to respond, in the FSEIS, to comments on the DSEIS or any supplement to it. *See* 10 C.F.R. § 51.91(a)(1) and 40 C.F.R. § 1503.4(a) (requiring agencies to assess and respond to comments in FSEISs). These regulations specifically obligate NRC Staff to respond by making factual corrections, if called for, or to explain why the comments do not warrant further response, citing sources, authorities, or reasons for such a conclusion. 10 C.F.R. § 51.91(a)(1)(iv) & (v) and 40 C.F.R. § 1503.4(a)(1)-(5). Although New York's comments alerted NRC Staff to Entergy's failure to include commuters in its population estimate, Staff failed to address this point in the FSEIS or explain why it does not warrant a response.

Moreover, NRC Staff's failure to consider the impact of commuters is contrary to NRC guidance, which directs licensees on the proper estimation of transient populations in their plants' final safety analysis reports. Specifically:

If the plant is located in an area where significant population variations due to transient land use [recreational or industrial] are expected, additional tables of population distribution should be provided to indicate peak seasonal and daily populations.

¹⁹ *See State of New York Supplemental Submission Concerning Draft Supplemental Environmental Impact Statement Regarding the License Renewal of Indian Point Units 2 and 3, and Recent Events Including the December 2009 Reanalysis of Severe Accident Mitigation Alternatives Analysis and the Federal Government's Decision to Withdraw the Application for Yucca Mountain* at 28, n. 8 (March 19, 2010) ("The December 2009 SAMA Reanalysis does not adequately take into account tourists and daily commuters – individuals who are not included in New York City's resident population, but who nevertheless could be affected by a severe accident while they are in the City.").

NRC, *Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants, LWR Edition*, Part 1, at Section 2.1.3.3, at 2-4 (Nov. 1978) (ML011340072) (Exh. NYS000222).

While this guidance is not binding on Entergy, it constitutes an admission by Staff (*see* Rule 801(d)(2) of the Federal Rules of Evidence), and thus, should be the basis for rejection of any contrary position now being taken by Staff—at least so long as Staff does not provide a rational explanation of why its previous position was wrong and does not identify steps it took to withdraw the identified guidance as erroneous.

POINT III

BY ACCEPTING ENTERGY'S FLAWED 2035 POPULATION ESTIMATE IN THE FSEIS, NRC STAFF HAS RELIED UPON AND PRESENTED INACCURATE INFORMATION TO THE PUBLIC, VIOLATING THE REQUIREMENT THAT THE FSEIS CONTAIN ACCURATE SCIENTIFIC INFORMATION AND DISREGARDING THE INFORMATIONAL PURPOSE OF NEPA

It is important for an EIS to contain accurate information or else it fails in its purpose of informing federal decision-makers and citizens of the environmental consequences of government actions. NEPA's implementing regulations, and federal and NRC case law have emphasized the NEPA requirement that agencies rely on high quality data in EISs. *See Native Ecosystems*, 418 F.3d at 964-65; 40 C.F.R. § 1500.1(b); and July 14, 2011 Board Order at 12-13. The purpose of this requirement is not to create more paperwork for NRC but instead, to promote sound environmental decision-making by the agency. 40 C.F.R. § 1500.1(c).

By accepting Entergy's population estimate, despite being alerted to its flaws, NRC Staff presented an inaccurate report of the environmental consequences of relicensing the Indian Point facility. Underestimating the at risk population by over a million persons is a significant

oversight, not a mere calculation error. If NEPA is to serve its purpose of promoting sound environmental decisions, NRC Staff must be discriminating in the data on which they rely.

POINT IV

BY ACCEPTING ENTERGY'S FLAWED SAMA ANALYSIS, NRC STAFF HAS FAILED TO TAKE THE REQUISITE "HARD LOOK" UNDER NEPA AND VIOLATED NRC'S OWN REGULATIONS REGARDING SAMA ANALYSES

The requirement that alternatives be studied, developed, and described under NEPA both guides the substance of environmental decision-making and provides evidence that the mandated decision-making process has actually taken place. *Calvert Cliffs' Coordinating Committee, Inc. v. United States Atomic Energy Comm'n*, 449 F.2d 1109, 1114 (D.C. Cir. 1971). NRC regulations require a complete analysis of the cost of "potentially cost-effective" mitigation alternatives, i.e., SAMAs, in the FSEIS. Yet the FSEIS, by uncritically accepting Entergy's population estimates, leaves the NEPA process incomplete and deprives NRC Staff of the ability to take a "hard look" at the consequences of severe accidents and to accurately evaluate whether SAMAs are cost-beneficial. *See Methow*, 490 U.S. at 350 ("The sweeping policy goals announced in § 101 of NEPA are thus realized through a set of 'action-forcing' procedures that require that agencies take a 'hard look' at environmental consequences, and that provide for broad dissemination of relevant environmental information." (internal citations omitted)) and *Limerick Ecology*, 869 F.2d at 737 ("First, to qualify, the [Final Environmental Impact Statement] must contain sufficient discussion of the relevant issues and opposing viewpoints to enable the decisionmaker to take a 'hard look' at the environmental factors and to make a reasoned decision.").

As the preceding authorities amply demonstrate, there is clear legal support from NRC regulations and NRC and federal case law for the proposition that a legally sufficient SAMA analysis in the FSEIS must be based on “high quality” information or the NRC will be deprived of the of the ability to take a “hard look” at environmental impacts in evaluating SAMAs. *See Methow*, 490 U.S. at 350, and July 14, 2011 Board Decision at 17 (“[T]he FSEIS must demonstrate that the NRC Staff has received sufficient information to take a hard look at SAMAs as required by 10 C.F.R. § 51.53(c)(3)(ii)(L) . . .”).

NRC has not met this burden with respect to its review of Entergy’s SAMA analysis because it relies on clearly deficient population estimates.

CONCLUSION

For the above reasons Entergy’s application to renew the operating licenses for Indian Point Unit 2 and Unit 3 should be denied.

Respectfully submitted,

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