

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

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In re:

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

License Renewal Application Submitted by

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

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

DPR-26, DPR-64

May 3, 2013

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**STATE OF NEW YORK'S REPLY TO
NRC STAFF'S AND ENTERGY'S PROPOSED
FINDINGS OF FACT AND CONCLUSIONS OF LAW
FOR CONTENTION NYS-16/16A/16B ("NYS-16B")**

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I. INTRODUCTION	1
II. LEGAL STANDARDS	2
III. DISCUSSION.....	3
A. Commuter Population	3
1. NRC Staff’s and Entergy’s Findings Concerning the Commuter Population Are Not Supported By the Record.....	3
B. Census Undercount	11
1. NRC Staff and Entergy Mischaracterize Dr. Sheppard’s Testimony and the Record Concerning Census Undercount	11
2. NRC Staff’s and Entergy’s Conclusions Regarding Census Undercount Are Not Supported By the Record.....	13
C. Materiality Argument.....	14
1. Neither Entergy Nor NRC Staff Has Shown That the Combined Impact Of Contentions 12 and 16 Would Not Materially Alter the SAMA Analysis	14
D. Witness Qualifications	16
1. NRC Staff and Entergy Mischaracterize Dr. Sheppard’s Expertise and Testimony Concerning His Qualifications and Preparation	16
IV. CONCLUSION.....	18

I. INTRODUCTION

Pursuant to 10 C.F.R. § 2.712, the Atomic Safety Licensing Board’s (“Board”) July 1, 2010 Scheduling Order at ¶N, and the Board’s February 28, 2013 Order, the State of New York (“State”) hereby replies to Entergy and NRC Staff’s Proposed Post-Hearing Findings of Fact and Conclusions of Law (“Proposed Findings”) on the State’s admitted Contention 16/16A/16B (“NYS-16B”).

In their Proposed Findings, Entergy and NRC Staff fail to adequately explain why excluding commuters and undercounted minority residents from the population estimate for the area surrounding Indian Point is reasonable under the National Environmental Policy Act (“NEPA”). Instead, while acknowledging that commuters and undercounted minority residents were not included in the Final Supplemental Environmental Impact Statement (“FSEIS”), Entergy and NRC Staff argue that these populations are immaterial to the outcome of the Severe Accident Mitigation Alternatives (“SAMA”) analysis and thus did not need to be considered. NRC Staff’s and Entergy’s Proposed Findings mischaracterize witness testimony, make assertions that are unsupported by the record, and fail to address all of the State’s arguments.

NRC Staff—which bears the burden of complying with NEPA—devotes less than three pages of its Proposed Findings to addressing the State’s claims regarding census undercount and commuters. *See* Staff Proposed Findings at 23-25, ¶¶6.46-6.49. Staff’s terse—and largely unsupported—discussion is not sufficient to meet its burden of showing that its actions were reasonable under NEPA. Both Entergy and NRC Staff rely largely upon purported sensitivity analyses that Entergy presented during this proceeding, but those analyses constitute post hoc rationalizations, and do not excuse the failure to disclose an accurate population figure in the FSEIS and use an accurate population figure in SAMA analysis. As such, NRC Staff’s and

Entergy's Proposed Findings do not support a ruling by the Board that NRC Staff complied with NEPA.

Rather the State's Proposed Findings provide a sufficient basis for the Board to find for the State on all aspects of Contention NYS-16B, and persuasively refute the arguments raised in NRC Staff's and Entergy's Proposed Findings. Therefore, this reply does not respond to arguments raised in NRC Staff's and Entergy's Proposed Findings that were already addressed in the State's Proposed Findings, but instead, clarifies the record on a subset of Staff and Entergy Proposed Findings that either mischaracterize the evidence or are not supported by the record.

II. LEGAL STANDARDS

The State's Proposed Findings explain NRC Staff's NEPA obligations, and the obligation to complete a SAMA analysis, in detail. State Proposed Findings at 8-15, ¶¶16-32. It is Staff's burden to comply with NEPA (State Proposed Findings at 15-16, ¶¶33-36), and courts have cautioned that NEPA review "must not [be] reduce[d] . . . to a 'rubber-stamp' of agency action." *See North Carolina Wildlife Fed'n v. North Carolina Dept. of Transp.*, 677 F.3d 596, 601 (4th Cir. 2012) (citing *Fed. Mar. Comm'n v. Seatrain Lines, Inc.*, 411 U.S. 726, 745-46 (1973)).

The State's Proposed Findings also set forth the NRC's evidentiary standard and explain that unsupported reasoning, allegations, and computations should be afforded no weight.¹ State Proposed Findings at 16-18, ¶¶37-38. In addition, "a party's proposed findings and conclusions

¹ The State also discussed the qualifications of Staff's and Entergy's witnesses, explaining that since their experience with demographics and population modeling pales in comparison to Dr. Sheppard's thirty years of demographic experience, the Board should afford greater weight to Dr. Sheppard's testimony. *See* State Proposed Findings at 18-30, ¶¶40-63. It was appropriate for the State to address this issue in the post-hearing Proposed Findings because the Board explained that "the weight and credibility [it] give[s] to that testimony will be determined after the evidentiary hearing." *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), Order (Granting in Part and Denying in Part Applicant's Motions in Limine) at 24 (Mar. 6, 2012) (unpublished) (ML12066A170).

must be confined to the material issues of fact and law ‘presented on the record.’” *Pub. Serv. Elec. & Gas Co.* (Salem Nuclear Generating Station, Unit 1), ALAB-650, 14 N.R.C. 43, *5-6 (1981) (*citing* 10 C.F.R. § 2.754(c))²; 10 C.F.R. § 2.712(c); 10 C.F.R. § 2.1209. While a party may raise new arguments in its findings, those arguments must be within the scope of the contention and be supported by the evidentiary record. *See Texas Utilities Generating Company, et al.* (Comanche Peak Steam Electric Station, Units 1 and 2), LBP-83-81, 18 N.R.C. 1410 at *19-20 (1983); *Texas Utilities Generating Company*, (Comanche Peak Steam Electric Station, Units 1 and 2), LBP-84-10, 1984 NRC LEXIS 150 at *11-15 (1984) (finding that the board could consider new arguments raised in the proposed findings concerning evidence that is *already* in the record.). Therefore, the Board must reject any proposed findings that are not supported by the record.

III. DISCUSSION

A. Commuter Population

1. NRC Staff’s and Entergy’s Proposed Findings Concerning the Commuter Population Are Not Supported By the Record

In their Proposed Findings, neither NRC Staff nor Entergy deny the existence of approximately one million individuals who commute into the 50 mile zone surrounding Indian Point, but do not reside within the zone. NRC Staff and Entergy assert various reasons for why it was proper to exclude this substantial group from the transient population, but their proposed conclusions are not supported by the record.

NRC Staff’s Proposed Finding 6.49—that including commuters in the population estimate “lends a false sense [of] precision to the data and analysis”—has no evidentiary support.

² 10 C.F.R. § 2.754(c) is now 10 C.F.R. § 2.712(c). *See* 69 Fed. Reg. 2,182 at 2,227 (Jan. 14, 2004).

Staff Proposed Findings at 25, ¶6.49. Staff relies on Mr. Jones’s assertion, without any supporting evidence, that “issues being raised by Dr. Sheppard are on the same order of magnitude that one would expect from the day-to-day fluctuations in the population.” *Id.* (citing the Hearing Transcript (“Tr.”) at 2417-18). However, in the testimony cited by NRC Staff, Mr. Jones is discussing Dr. Sheppard’s *census undercount* population estimate, not his *commuter* population estimate. Tr. 2417:23-2418:9 (Jones) (“We are down to a three percent *undercount* that results in 1.1 percent composite *undercount*. And there are fluctuations in the population on a daily basis such that when we start talking about values as low as one percent . . . we’re just adding an artificial level of confidence to the data that we’re looking at.”) (emphasis added). Furthermore, Mr. Jones—a civil engineer—has no expertise in demographics or population modeling and he does not present any data comparing daily fluctuations in resident population to the commuter population of approximately one million people. For all of these reasons, his mere assertion concerning *census undercount*, provides no basis for a Board finding that including *commuters* in the population estimate “lends a false sense [of] precision to the data and analysis.”

Moreover, Jones’ and NRC Staff’s argument fails to recognize site-specific characteristics that differentiate Indian Point from the less populated nuclear reactor sites such as Grand Gulf, near Port Gibson Mississippi. *Cf.* Tr. 1967:21-1968:6 (McDade). The 50 mile radius surrounding Indian Point has the largest population of any nuclear reactor site. Thus, even one percent of the population surrounding Indian Point is a significant number of people. In fact, for Indian Point 1.1% is approximately 233,000 people. While for other sites this percentage might generate a smaller number of people, NRC Staff’s attempt to recast the argument in terms of percentage has no bearing in the context of Indian Point.

NRC Staff's Proposed Finding 6.49 also presents a new argument that "Dr. Sheppard's analysis never considers the uncertainty applied to the SAMA analysis or how the uncertainty impacts his own analysis."³ Staff Proposed Findings at 25, ¶6.49. Given that this argument was raised for the first time in Staff's March 2013 Proposed Findings, the State has no opportunity to respond with expert testimony or documentary evidence. In another proceeding, NRC Staff itself recognized that prejudice occurs when arguments are introduced for the first time in proposed findings. *See NRC Staff's Response to Pilgrim Watch's Proposed Findings of Fact and Conclusions of Law* at 18 (June 23, 2008) (ML081760204) (*citing Union Electric Co. (Callaway Plant, Unit 1), ALAB-740, 18 N.R.C. 343, 349-50 (1983)*) ("Presentation of new facts, exhibits or arguments for the first time in post-hearing findings deprives interested parties of an opportunity to respond.").

Nonetheless, the record does not support a Board finding that Entergy's uncertainty factors account for or permit the exclusion of commuters and undercounted minority residents from the population estimate. As an initial matter, the uncertainty factors of 2.1 for Indian Point Unit 2 and 1.4 for Unit 3, cited by NRC Staff, were calculated to account for event uncertainty—the uncertainty of predicting the frequency with which internal events leading to core damage will occur (*i.e.* core damage frequency or "CDF"). ENT000459 (IP-RPT-09-00044, Rev. 0, Re-Analysis of IP2 and IP3 Severe Accident Mitigation Alternatives, Dec. 3, 2009) at 9-10. Thus, NRC Staff's argument that these factors can somehow also account for an inaccurate population estimate is incorrect. NRC Staff confuses a mistake Entergy and Staff made in estimating the

³ NRC Staff has previously argued that the uncertainty factors account for the MACCS2 input deficiencies raised in Contention NYS-12C; however, Staff has never before asserted that these uncertainty factors also account for the exclusion of commuters from the population estimate. *See, e.g.,* NRC000041 Staff Test. at 14 (A6b) (Ghosh); Tr. 2230:19-2233:3 (Ghosh); Tr. 2235:6-10 (Ghosh).

population with the concept of uncertainty. By failing to include commuters and undercounted minority residents—which led to a 6.38% underestimate of the population surrounding Indian Point—Entergy and Staff have presented and relied upon an inaccurate population estimate in the SAMA analysis and in the FSEIS. The number of commuters and undercounted minority residents can be—and have been—calculated; they are not uncertainties. The correct population number should be input to the MACCS2 code to calculate the severe accident costs before uncertainty is applied, *i.e.* in the calculation of the mean value.⁴

Furthermore, NRC Staff has not presented any testimony, analysis, or documents to support its argument that the uncertainty factors used by Entergy somehow account for a mistake in estimating the population. The citations provided by Staff in Proposed Finding 6.49⁵ simply explain that uncertainty factors were applied—they do not state that the uncertainty factors account for population underestimation or explain how they could account for such underestimation.⁶ Indeed, the uncertainty factors of 2.1 for Indian Point Unit 2 and 1.4 for Unit

⁴ Entergy presents two calculations of benefits in its tables comparing the costs and benefits of SAMA candidates: “Benefit” and “Benefit with Uncertainty.” ENT000459 at 21-32, 34-35. Entergy should correct any MACCS2 input errors before calculating the severe accident costs. These costs are included in the “Benefit” column. The uncertainty factor is applied to the “Benefit” to then calculate the “Benefit with Uncertainty.”

⁵ NRC Staff’s citations are: NRC000041 (Pre-Filed Testimony of NRC Staff Experts Nathan E. Bixler, S. Tina Ghosh, Joseph A. Jones, and Donald G. Harrison Concerning NYS’ Contentions NYS 12/16 (“Staff Test.”), Mar. 30, 2012) at 22; NRC000004/NYS00133I (NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, Supplement 38, Volumes 2 and 3* (“FSEIS”) (Dec. 2010) at Appendix G, G-45.

⁶ Furthermore, the external event multipliers (3.8 for Indian Point Unit 2 and 5.5 for Unit 3), cited in NRC Staff’s footnote 36 (Staff Proposed Findings at 25), are not even uncertainty factors. These multipliers were calculated to take into account external events that lead to core damage, not uncertainty. *See* NYS00133I at G-44 to G-45. Thus, the multiplier of 8 cited by NRC Staff (Staff Proposed Findings at 18, ¶6.38), represents a combination of the uncertainty factors for the Level 1 and 2 PRA and the external events multipliers. It does not account for uncertainties in the Level 3 PRA. Tr. 2324:10-20 (Lemay). NRC Staff notes that the multiplier

3 were calculated to account for uncertainties in predicting the frequency of internal events that lead to severe accidents causing reactor core damage in the Level 1 and Level 2 PRA. *See* ENT000459 at 9-10. They do not account for uncertainty in the Level 3 PRA (where the MACCS2 code and population are used). Tr. 2324:10-20 (Lemay). In fact, nothing in the record suggests that Entergy or Staff even considered uncertainty in the Level 3 PRA. *See* ENT000459 at 9-10; Tr. 2324:10-20 (Lemay). Consequently, there is no support for NRC Staff's notion that these uncertainty factors account for any and all potential uncertainty in the SAMA analysis—including errors in estimating the population.

NUREG/BR-0184 (ENT00010A-D), "Regulatory Analysis Technical Evaluation Handbook," was cited by Entergy and NRC Staff as providing guidance on how to perform SAMA analyses. *See* Tr. 2198:11-16 (O'Kula) and 2285:9-22 (Ghosh). That guidance addresses uncertainty, explaining that "NRC's Final Policy Statement on the use of probabilistic risk assessment (PRA) in nuclear regulatory activities (NRC 1995b) states that sensitivity studies, uncertainty analysis, and importance measures should be used in regulatory matters, where practical within the bounds of the state-of-the-art." ENT000010A at 5.3. NUREG/BR-0184 describes seven categories of uncertainties in PRAs including data, analyst assumptions, modeling, scenario completeness, accident frequencies, accident consequences, and interpretation. ENT00010A at 5.3 to 5.4. Entergy's uncertainty factors of 2.1 and 1.4 account only for uncertainty in accident frequency (*i.e.* core damage frequency). ENT000459 at 9-10. As noted, nothing in the record suggests that NRC Staff or Entergy considered uncertainty in the Level 3 PRA. *See* Tr. 2324:10-20 (Lemay). Accounting for uncertainty in the Level 3 PRA,

was "rounded up to 8 for some additional conservatism" (Staff Proposed Findings at 25, n.36), however as Staff stated in the FSEIS, this is a "small" amount of conservatism (0.02 for Indian Point Unit 2 and 0.27 for Unit 3). NYS00133I at G-45.

however, could account for some of the other categories listed in NUREG/BR-0184, such as uncertainty in accident consequences.

Despite Entergy's and Staff's failure to do so, it is possible to account for some of the uncertainty in the Level 3 PRA by following the method used to quantify uncertainty in the Level 1 and 2 PRA and using the exhibits submitted by Entergy (*e.g.* ENT000464, Entergy Calculation No. IP-CALC-09-00265, Rev. 0, Re-analysis of MACCS2 Models for IPEC, Dec. 2, 2009). As explained in NEI 05-01, uncertainty may be quantified through the use of an uncertainty factor, which is derived from the ratio of the 95th percentile to the mean point estimate. NYS000287 (NEI 05-01 [Rev A], Severe Accident Mitigation Alternatives Analysis, Guidance Document, Nov. 2005) at 30. For PRA Levels 1 and 2, Entergy calculated an uncertainty factor by taking the ratio of the 95th percentile to the mean value of the core damage frequency. ENT000459 at 9-10. In the same way, for Level 3 PRA, an uncertainty factor could be derived from the 95th percentile and mean values of the population dose and the offsite economic cost.⁷

In addition, NRC Staff Proposed Finding 6.51 is not supported by the record. That finding asserts: "Entergy's SAMA analysis considered commuters and other transient populations, performing sensitivity analyses that demonstrate that variation in these populations does not change which SAMAs are potentially cost-beneficial." Staff Proposed Findings at 28, ¶6.51; *see also* Staff Proposed Findings at 24 ("Entergy Appropriately Accounted for the Commuters Within 50-Mile Modeled Zone"). Contrary to this assertion, the record shows that

⁷ The 95th percentile and mean values for the population dose and offsite economic cost are already available as they are calculated by the MACCS2 code. *See* ENT000464. Thus, accounting for some uncertainty in the Level 3 PRA is possible and could change the outcome of the SAMA analysis.

commuters were not included in the population estimate used in the SAMA analysis.⁸ Even the FSEIS—prepared by NRC Staff—shows that while Entergy included tourists, commuters were not included. NYS00133I at G-25. Moreover, Entergy conducted its sensitivity analyses years after the SAMA analysis was completed and the FSEIS was released, in order to justify its exclusion of commuters from the SAMA analysis. *See* ENT000003 Entergy Test. at 48 (A87) (O’Kula, Teagarden). The sensitivity analyses are in no way part of the SAMA analysis in Entergy’s Environmental Report or NRC Staff’s review of the SAMA analysis in the FSEIS; they simply serve as post hoc rationalizations for the population omissions.

Entergy Proposed Finding 176 asserts that “an ‘accurate’ accounting of commuters also would need to consider commuters *out* of the 50-mile region surrounding IPEC,”⁹ but there is no evidence in the record to support this position. There is no evidence that applicants typically rely upon a so-called “daytime” or “workday” population that subtracts from the population estimate those permanent residents who commute out of the 50-mile region. Nor does NEI 05-01 guidance recommend such an estimate. *See* NYS000287 (NEI 05-01) at 13. Instead, it directs licensees to include *all* of the permanent population and *all* of the transient population. *Id.* Furthermore, Entergy’s argument that the reduced exposure of persons commuting out of the 50-mile radius equals the increased exposure of persons commuting into the 50-mile radius (*see* Entergy Proposed Findings at 91-92, ¶¶179-181) is an allegation unsupported by any evidence or

⁸ State Proposed Findings at 49, ¶115; Tr. 2494:21-24 (Teagarden); Tr. 2499:12-15 (Teagarden); ENT000003 (Pre-Filed Testimony of Entergy Experts Lori Potts, Kevin O’Kula, Grant Teagarden, and Jerry Riggs on Consolidated Contention NYS-16B (“Entergy Test.”), Mar. 28, 2012)) at 28 (A55) (Potts, Riggs); NYS000207 (Initial Pre-filed Testimony of New York State Expert Dr. Stephen C. Sheppard, Ph.D. on Contention NYS-16B (“Sheppard Initial Test.”), Dec. 16, 2011)) at 6:17-7:2; NYS000404 (Rebuttal Pre-filed Testimony of New York State Expert Dr. Stephen C. Sheppard, Ph.D. on Contention NYS-16B (“Sheppard Rebuttal Test.”), June 29, 2012)) at 7:5-12.

⁹ Entergy Proposed Findings at 89, ¶176.

analysis in the record. Finally, given the fact that decontamination costs are input to the MACCS2 code on a per capita basis, Entergy has not shown how the costs of decontaminating the workplaces of those commuting into the 50-mile radius will be accounted for if those commuters are not included in the population estimate. *See* State Proposed Findings at 55-56, ¶132); *see also* NYS000404 Sheppard Rebuttal Test. at 32-33 (the number of commuters contributes to decontamination costs because they increase building density).

Entergy Proposed Finding 183 is also unsupported. It asserts that it is improper to include the entire commuter population because the SAMA analysis “is not intended to model a single radiological release at a single moment in time” and including the full population constitutes a “worst-case” impacts analysis. Entergy Proposed Findings at 92-93, ¶183. However, Entergy has not provided any guidance or case law suggesting that it is appropriate to decrease certain segments of the population based on speculation that they might not be present in the event of an accident.

While NEPA does not require analysis of a “worst-case scenario,” NEPA’s “hard look” requirement obligates the agency to evaluate “reasonable foreseeable significant adverse impacts on the human environment.” *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016, 1033 (9th Cir. 2006), *cert. denied*, 549 U.S. 1166 (2007). Such impacts “include[] impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.” 40 C.F.R. § 1502.22(b)(4); *cf. New York v. NRC*, 681 F.3d 471, 482 (D.C. Cir. 2012) (“Only if the harm in question is so ‘remote and speculative’ as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the [NEPA] analysis.”).

Nor has Entergy explained how including the population that commutes into the region on an average day is a “worst-case” scenario when it is a scenario that occurs on a daily basis. To the contrary, the large commuter population is one of the site-specific factors that must be included in the SAMA analysis. *See Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719, 738-39 (3d Cir. 1989) (“the population distribution in the vicinity of the site affects the magnitude and location of potential consequences from radiation releases. . . . This is particularly true for plants . . . which were built near densely populated areas.” (internal citations omitted)); *cf.* 10 C.F.R. Part 100 (population density must be taken into consideration in nuclear reactor siting).

B. Census Undercount

NRC Staff and Entergy do not deny the existence of the phenomenon of census undercount. State Proposed Findings at 43, ¶91. However, they argue that the 2000 census resulted in a net overcount of the population, and therefore, any undercount of the minority population is compensated for by overcount of the majority (white) population. Both NRC Staff’s and Entergy’s Proposed Findings mischaracterize Dr. Sheppard’s testimony and reach conclusions that are unsupported by the record.

1. NRC Staff and Entergy Mischaracterize Dr. Sheppard’s Testimony and the Record Concerning Census Undercount

Staff Proposed Finding 6.47 mischaracterizes the record and Dr. Sheppard’s testimony concerning census undercount. It states “Dr. Sheppard’s only reason for dismissing the conclusions of the Census Bureau on the overcount is that he is not able to understand why someone would want to be counted more than once or in multiple locations.” Staff Proposed Findings at 23-24, ¶6.47. Contrary to this assertion, Dr. Sheppard relied on data from the Census Bureau that called into question the finding of a net overcount in the post enumeration sampling.

He cited the A.C.E. Revision II, which noted that the demographic analysis of the 2000 census showed a *net undercount* of .12% nationwide. NYS000404 Sheppard Rebuttal Testimony at 22-23 (*citing* ENT000016 at 33-35, Table 13). Furthermore, Dr. Sheppard explained that there are incentives at the individual level to avoid being counted, but demographers are not aware of incentives to be overcounted. Tr. 2423:3-23 (Sheppard).

Entergy Proposed Finding 153 also mischaracterizes Dr. Sheppard's testimony concerning census undercount by claiming that "Dr. Sheppard did not dispute the U.S. Census Bureau's finding that the March 2001 A.C.E. estimates overstated the net undercount and agreed that A.C.E. Revision II determined there to be a net overcount of 0.49 percent." Entergy Proposed Findings at 78, ¶153. The citation provided by Entergy for this assertion is a cross-examination question in which Entergy's attorney Ms. Stolley requested that Dr. Sheppard read a sentence from the A.C.E. Revision II aloud. Ms. Stolley did not ask Dr. Sheppard if he disputed the A.C.E. Revision II finding nor did she give Dr. Sheppard the opportunity to state whether or not he agreed with it:

MS. STOLLEY: If you could pull up Entergy Number 000018, please? Page 2, please? If you could pull up the first paragraph underneath "Results of A.C.E. Revision 2?"

Dr. Sheppard, if you could please read out loud the sentence beginning with "The results of A.C.E. Rev II?"

DR. SHEPPARD: Yes, I see the one. You mean the one that refers to the net undercount rather than the undercount of minority populations?

MS. STOLLEY: I mean the sentence that begins with "The results of A.C.E. Revision II."

DR. SHEPPARD: Oh, I see. "The results of A.C.E. Revision II are substantially different from those of March 2001, changing the net coverage of the total household population from a net undercount of 1.18 percent to a net overcount of 0.49 percent." That applies to the entire population, not exclusively to the minority population.

Tr. 2532:18-2533:12 (Stolley, Sheppard).

Contrary to Entergy's assertion, Dr. Sheppard's testimony explains that the A.C.E. Revision II found an undercount of minority populations. State Proposed Findings at 44, ¶95. His testimony also explains that any potential overcount of the white population was not large enough to account for the undercount of the minority population in the region surrounding Indian Point. State Proposed Findings at 45, ¶¶99-100. This is because approximately forty percent of the population surrounding Indian Point is black or Hispanic, which is nearly double the national average. State Proposed Findings at 45-46, ¶¶99-101. Furthermore, Dr. Sheppard disputed the existence of an overcount. NYS000404 Sheppard Rebuttal Test. at 22-27.

2. NRC Staff's and Entergy's Conclusions Regarding Census Undercount Are Not Supported By the Record

NRC Staff's Finding 6.47 that "any overcount in a portion of the population off-sets any potential undercount in the population"¹⁰ and Entergy's Finding 156 that there is a "net overcount of minorities within the IPEC SAMA analysis region"¹¹ are not supported by the record. Neither NRC Staff nor Entergy has offered any documented analysis comparing any purported overcount of white residents with the undercount of minority residents. The calculations referred to by Mr. Riggs at the evidentiary hearing (Tr. 2420:14-2422:2) were vaguely explained, and not documented or submitted as an exhibit. As such, this testimony does not provide the evidentiary basis for Entergy's Finding 156. To the contrary, the record shows that the March 2001 A.C.E., the A.C.E. Revision II, and demographic analyses all found that minorities were *undercounted* in the 2000 census, not *overcounted*. NYS000213 (U.S. Census Monitoring Board, Presidential Members Final Report to Congress, Sept. 1, 2001) at 29, Table 2;

¹⁰ Staff Proposed Findings at 23, ¶6.47.

¹¹ Entergy Proposed Findings at 80, ¶156.

ENT000016 (U.S. Census Bureau, Technical Assessment of A.C.E. Revision II, Mar. 12, 2003) at 12, Table 1 and 33-35. The record also shows that even the purported overcount of the white population mentioned in the A.C.E. Revision II is not large enough to overcome the undercount of minorities in the region surrounding Indian Point because that region has a relatively large minority population when compared to the national average. State Proposed Findings at 45-46, ¶¶ 99-101.

C. Materiality Argument

1. Neither Entergy Nor NRC Staff Has Shown That the Combined Impact Of Contentions 12 and 16 Would Not Materially Alter the SAMA Analysis

In their Proposed Findings, Entergy and NRC Staff effectively argue “no harm, no foul” with regard to the omission of commuters and undercounted minority residents. Under their reasoning, even if they improperly omitted these groups, there is no NEPA violation because the omission would not render any additional SAMA candidates cost-beneficial. Entergy Proposed Findings at 96-99, ¶¶ 188-196; Staff Proposed Findings at 23, ¶ 6.46 and 24, ¶ 6.48. As the State explained in its Proposed Findings, it does not agree that materiality is the correct standard by which to adjudicate a NEPA claim. State Proposed Findings at 75-77, ¶¶ 179-183. Furthermore, the record shows that an increase in population leads to an increase in SAMA benefit. State Proposed Findings at 61-62, ¶ 147 and ¶ 150. Thus, for SAMA candidates that are already cost-beneficial, an increase in population and benefit renders them more cost-beneficial. State Proposed Findings at 77-78, ¶¶ 184-185. Nonetheless, even if materiality were the correct standard, NRC Staff and Entergy have failed to show that NYS-16B is not material when it is combined with the MACCS2 input deficiencies outlined in NYS-12C. State Proposed Findings at 18, ¶ 39; 62, ¶ 148; and 64, ¶ 153.

NRC Staff does not mention, much less address, the State’s claim that it view the MACCS2 input deficiencies alleged in NYS-12C and NYS-16B together in assessing whether Entergy’s SAMA analysis is adequate. Entergy argues that focusing its MACCS2 sensitivity studies “exclusively on Dr. Sheppard’s population increases . . . is entirely reasonable given the discrete, site-specific nature of Entergy’s 2035 population estimate.” Entergy Proposed Findings at 99-100, ¶197. But this statement fails to acknowledge the fact that both NYS-16B and NYC-12C concern site-specific inputs to the MACCS2 code. It stands to reason that all of the issues with inputs should be corrected before evaluating the effect on code outputs. *See* State Proposed Findings at 18, ¶39. Entergy cites to no evidence, NRC regulation, or case law dictating that the Board should view two contentions addressing inputs to the MACCS2 code in isolation. To the contrary, NRC case law shows that boards often review the merits of similar contentions together. State Proposed Findings at 18, ¶39. Since Contentions NYS-12C and NYS-16B both allege NEPA violations due to deficiencies in the inputs to the MACCS2 code, their materiality should be viewed in tandem. State Proposed Findings at 77, ¶183. As Staff and Entergy have failed to show that the outcome of the SAMA analysis would not change if the input deficiencies alleged in NYS-12C and NYS-16B were remedied, it has failed to show they are immaterial. *Id.*

In essence NRC Staff and Entergy argue that it is acceptable under NEPA for an EIS to contain an inaccurate description of the number of persons who could be affected by an accident should the federal action be approved. Such an argument undermines NEPA, Council on Environmental Quality (“CEQ”) regulations, and NRC regulations and is inconsistent with *Limerick*, 869 F.2d 719, and *New York*, 681 F.3d 471. While it is important to use an accurate population count in the SAMA analysis, it is equally important that the FSEIS make the correct

population numbers available to NRC Commissioners and the public.¹² See State Proposed Findings at 72-73, ¶¶172-173. The environmental analysis is not just a bureaucratic burden—it should inform the NRC’s decision. See 40 C.F.R. § 1500.1(c) (“Ultimately, of course, it is not better documents but better decisions that count. NEPA’s purpose is not to generate paperwork—even excellent paperwork—but to foster excellent action. 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.”); see also *Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752, 768-69 (2004).

D. Witness Qualifications

1. NRC Staff and Entergy Mischaracterize Dr. Sheppard’s Expertise and Testimony Concerning His Qualifications and Preparation

Finally, NRC Staff’s and Entergy’s Proposed Findings: (1) improperly discount Dr. Sheppard’s expertise; (2) fail to recognize that Dr. Sheppard’s testimony concerning the MACCS2 code properly relies on Staff and Entergy testimony; and (3) make statements about Dr. Sheppard’s preparation that are unsupported by the record.

Staff’s Proposed Finding 6.32 mischaracterizes Dr. Sheppard’s expertise by stating: “Dr. Sheppard does not have any expertise nor has he conducted any PRA analyses.” Staff Proposed Findings at 13, ¶6.32. While Dr. Sheppard does not have expertise with regard to SAMA analyses, he has significant expertise in demography and population modeling. NYS000207 Sheppard Initial Test. at 2:1-22. Since population is a critical input parameter in a SAMA

¹² Contention NYS-16B concerns the population omissions in *both* the SAMA analysis and the FSEIS. See NYS000206 (New York State Initial Statement of Position Contention NYS-16B, Dec. 16, 2011) at 3, 4, 10, 12, 17, and 21-22; NYS000403 (New York State Revised Statement of Position Contention NYS-16B, June 29, 2012) at 2 and 11-12; and State Proposed Findings at 8-11, 15, 67-68, 72-73, 76, and 79-80.

analysis, Dr. Sheppard's expertise is relevant in discussing the proper population estimate for the Indian Point SAMA analysis. Tr. 2406:4-15 (Sheppard).

In addition, Entergy's Proposed Finding 110 mischaracterizes the nature of Dr. Sheppard's testimony. It states that the Board should accord "no weight to any opinions or criticisms that Dr. Sheppard offered concerning the adequacy of the IPEC SAMA analysis methodology unrelated to population data inputs, including Entergy's use and application of the MACCS2 code." Entergy Proposed Findings at 56, ¶110. Contrary to Entergy's assertion, Dr. Sheppard does not form independent conclusions about how the MACCS2 code works; instead, he properly relies on statements made by NRC Staff's and Entergy's witnesses. For example, his testimony that it is appropriate to include the commuter population in the SAMA analysis because "commuters could be exposed to radiation or lose income as a result of interdiction" and "[c]ommuters also have an impact on building density" is supported by NRC Staff's and Entergy's testimony. See NYS000404 Sheppard Rebuttal Testimony at 31-35. While the Federal Rules of Evidence are not controlling in NRC adjudicatory proceedings, "Licensing Boards have always looked to the Federal Rules for guidance in appropriate circumstances." Final Rule, Changes to Adjudicatory Process, 69 Fed. Reg. 2,182, 2,187 (Jan. 14, 2004). Federal Rule of Evidence 703 ("FRE 703"), "*Bases of an Expert's Opinion Testimony*," is instructive here. It states: "An expert may base an opinion on facts or data in the case that the expert has been made aware of or personally observed." This includes "having the expert attend the trial and hear the testimony establishing the facts." Notes of Advisory Committee on Proposed Rule 703. As Dr. Sheppard's opinions are based on facts that he has been made aware of in accordance with FRE 703, they do not lack a proper technical foundation.

Furthermore, NRC Staff's Proposed Finding 6.46, concerning Dr. Sheppard's testimony preparation, is not supported by the record. It states that Dr. Sheppard "admitted that he had not carefully examined the Staff's analysis in the FSEIS." Staff Proposed Findings at 23, ¶6.46. However, a review of the citation NRC Staff provides for this finding shows that Dr. Sheppard never made such an admission. In the cited hearing testimony, Dr. Sheppard discusses the different growth rates calculated by Entergy and NRC Staff's consultant, Sandia National Laboratories ("Sandia"). Dr. Sheppard states that he did not calculate the 2035 population using Sandia's estimate that the population will increase by 15.98 percent, but that according to Sandia, the higher growth rate it used resulted in an increase of 3.5 percent over Entergy's 2035 population estimate. Tr. 2438:2-7 (Sheppard). If anything, Dr. Sheppard's statement shows that he carefully examined the discussion of population growth rates in the FSEIS. As Dr. Sheppard's report did not give an opinion on Entergy's growth rate, it was not necessary for him to calculate the 2035 population using Sandia's higher growth rate.

IV. CONCLUSION

For the foregoing reasons, and those expressed in the State's Proposed Findings, NRC Staff's and Entergy's proposed Findings of Fact and Conclusions of Law provide no basis in fact or law for the Board to find in favor of Entergy and/or NRC Staff on Contention NYS-16B. The Board should find for the State of New York on Contention NYS-16B and remand to NRC Staff to correct the deficiencies in the FSEIS.

Respectfully submitted,

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