UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of	)	
	)	
ENTERGY NUCLEAR OPERATIONS, INC.	)	Docket No. 50-247-LR/50-286-LR
	)	
(Indian Point Nuclear Generating Units 2 and 3)	)	

NRC STAFF'S ANSWER TO "STATE OF NEW YORK PETITION FOR REVIEW OF ATOMIC SAFETY AND LICENSING BOARD DECISION LBP-13-13 WITH RESPECT TO CONSOLIDATED CONTENTION NYS-12C"

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INTRODUCTION

Pursuant to 10 C.F.R. § 2.341(b), the staff of the U.S. Nuclear Regulatory Commission ("Staff" or "NRC Staff") hereby files its answer in opposition to the State of New York's ("State") or "New York") petition for review[1] of the Atomic Safety and Licensing Board's ("Board") "Partial Initial Decision (Ruling on Track 1 Contentions)," LBP-13-13, 78 NRC ___ (Nov. 27, 2013),[2] regarding its resolution of Contention NYS-12C (SAMA Decontamination and Clean-Up Costs).[3]

In its Petition, New York asserts that the Board committed legal, factual, and procedural error in finding that the SAMA analysis for Indian Point Units 2 and 3 ("IP2" and "IP3" or "Indian

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[1] State of New York Petition for Review of Atomic Safety and Licensing Board Decision LBP-13-13 With Respect to Consolidated Contention NYS-12C (Feb. 14, 2014) ("Petition").

[2] *Entergy Nuclear Operations, Inc*. (Indian Point Nuclear Generating Units 2 and 3), LBP-13-13, 78 NRC ___ (Nov. 27, 2013) (slip op.) ("LBP-13-13" or "PID").

[3] By Order of February 28, 2014, the Commission held New York's Petition in abeyance, pending the Board's resolution of New York's December 7, 2013 motion to reopen and to reconsider. *See* Order (Granting Entergy's Motion to Hold in Abeyance New York's Petition for Review of Board's Ruling on Contention 12C) (Feb. 28, 2014) (unpublished), at 2. On April 1, 2014, the Board denied New York's motion to reopen and reconsider, thereby triggering the 25-day filing period for answers to New York's Petition. *See* Order (Denying New York's Motion to Reopen the Record; Setting Deadline for New or Amended Contention) (Apr. 1, 2014) (unpublished).

Point") was sufficiently site-specific and reasonable under the National Environmental Policy Act ("NEPA").[4] Further New York argues that the Commission should order the Staff to supplement its Final Supplemental Environmental Impact Statement ("FSEIS") for license renewal of Indian Point,[5] and allow for a full public comment process on that requested supplement.

As discussed below, the Staff submits that the Board correctly resolved Contention NYS-12C in favor of the Staff. The Board gave appropriate weight to the substantial evidence presented by all parties, and correctly determined that the Indian Point SAMA analysis utilized reasonable and acceptable input parameters, resulting in an appropriate site-specific SAMA analysis. For these reasons, as discussed more fully below, New York's petition for review of the Board's PID should be denied.

BACKGROUND

Procedural Background

This proceeding concerns the license renewal application ("LRA") for Indian Point Units 2 and 3, which was submitted by Entergy Nuclear Operations Inc. ("Entergy" or "Applicant") on April 23, 2007, on behalf of itself, Entergy Nuclear Indian Point 2, LLC, and Entergy Nuclear Indian Point 3, LLC. Indian Point Units 2 and 3 are located at the "Indian Point Energy Center" ("IPEC"), situated on the east bank of the Hudson River in Buchanan, NY, approximately 24 miles north of the northern boundary of New York City.[6] Units 2 and 3 are pressurized water reactors ("PWRs") supplied by Westinghouse Electric Corp.; each reactor is authorized to operate at 3216 megawatts thermal (MW_t), which corresponds to a turbine generator output of

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[4] National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321, *et seq.*

[5] NUREG-1437, Supplement 38, Vols. 1-3, Final Report, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 38, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3" (Dec. 2010) ("FSEIS") (Ex. NYS000133A-J).

[6] NUREG-1930, Vols. 1-2, "Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3" (Nov. 2009) ("SER") (Ex. NYS000326A), at 1-1.

approximately 1080 megawatts electric (MWe). *Id*. The current licenses for Indian Point Units 2 and 3 authorize operation until September 28, 2013, and December 12, 2015, respectively; the license for Unit 2 is currently in timely renewal under 10 C.F.R. § 2.109(b). Entergy's LRA seeks to authorize operation of Units 2 and 3 for an additional 20 years beyond the period specified in the current licenses, *i.e.*, until September 28, 2033, and December 12, 2035, respectively. *Id.*

On August 1, 2007, the NRC published a notice of acceptance for docketing and notice of opportunity for hearing on the LRA.[7] On October 18, 2007, the Board was established to rule on petitions for leave to intervene and hearing requests, and to preside over any proceeding that may be held. Petitions for leave to intervene were timely filed by various petitioners, including New York, Riverkeeper, Inc. ("Riverkeeper"), and Hudson River Sloop Clearwater, Inc. ("Clearwater"). On July 31, 2008, the Board granted New York's, Clearwater's and Riverkeeper's petitions to intervene, and admitted many of their contentions concerning the LRA or the Environmental Report ("ER") incorporated therein;[8] one of those contentions was Contention NYS-12, which challenged the decontamination and cleanup cost inputs used in the SAMA analysis in the Applicant's ER.[9]

Following the docketing of the Indian Point LRA, the Staff proceeded to conduct its review of pertinent safety and environmental issues related to the LRA. With respect to safety issues, on August 11, 2009, the Staff issued its Safety Evaluation Report (later published in November 2009), finding that the IP2/IP3 LRA satisfies the requirements of 10 C.F.R.

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[7] "Entergy Nuclear Operations, Inc., Indian Point Nuclear Generating Unit Nos. 2 and 3; Notice of Acceptance for Docketing of the Application and Notice of Opportunity for Hearing Regarding Renewal of Facility Operating License Nos. DPR-26 and DPR-64 for an Additional 20-Year Period," 72 Fed. Reg. 42,134 (Aug. 1, 2007).

[8] *Entergy Nuclear Operations, Inc*. (Indian Point, Units 2 and 3), LBP-08-13, 68 NRC 43 (2008).

[9] *See id.* at 100-02 and 218.

§ 54.29(a), such that a renewed license may be issued.[10] On August 30, 2011, the Staff issued Supplement 1 to the SER, documenting the Staff's review of additional information that was provided by Entergy in its annual updates, its LRA amendments, and its responses to Staff requests for additional information ("RAIs") since issuance of the SER.[11]

With respect to environmental issues, in December 2008, the Staff published its draft evaluation of the site-specific environmental impacts of license renewal for IP2 and IP3, in Draft Supplement 38[12] to the "Generic Environmental Impact Statement for License Renewal of Nuclear Plants."[13] Consistent with its responsibilities under 10 C.F.R. §§ 51.73 and 51.95(a), the Staff requested comments from the public concerning the evaluation of environmental impacts contained in its Draft SEIS. Voluminous comments were then filed by members of the public and various governmental entities concerning the Draft SEIS; in addition, new and amended contentions regarding the Draft SEIS were filed by the Intervenors, some of which were then admitted for litigation.

On December 3, 2010, the Staff issued its Final SEIS, in which the Staff (a) set out and addressed the public comments that had been timely submitted regarding the Draft FSEIS, (b) provided its final evaluation of the environmental impacts of IP2/IP3 license renewal and alternatives thereto, and (c) presented its conclusion, consistent with 10 C.F.R. §§ 51.95(c)(4),

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[10] In addition, the Advisory Committee on Reactor Safeguards ("ACRS") issued a letter on September 23, 2009, recommending approval of the IP2/IP3 LRA. *See* Letter from Mario V. Bonaca, Chairman, ACRS, to Gregory B. Jaczko, Chairman, NRC (Sept. 23, 2009) (Ex. NYS000325), reproduced in SER, Vol. 2 (Ex. NYS000326E), at 5-2 – 5-5.

[11] NUREG-1930, Supp. 1, "Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3" (Aug. 2011) ("SER Supp. 1"") (Ex. NYS000160).

[12] NUREG-1437, Supplement 38, Vols. 1-2, Draft Report, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 38, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, Draft Report for Comment" (Dec. 2008) ("DSEIS" or "Draft SEIS") (Ex. NYS000132A-D).

[13] NUREG 1437, Vols. 1-2, Main Report, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (May 1996) ("GEIS") (Ex. NYS000131A-I).

that "the adverse environmental impacts of license renewal for IP2 and IP3 are not so great that preserving the option of license renewal for energy planning decision makers would be unreasonable."[14] As in the case of the DSEIS, publication of the Final SEIS was followed by the filing of new and amended contentions on environmental issues, some of which were admitted for litigation.

Evidentiary hearings on all nine "Track 1" contentions were held in Tarrytown, New York, on October 15 through 18, October 22 through 24, and December 10 through 13, 2012. An additional evidentiary hearing was held in Rockville, Maryland on November 28, 2012. Witnesses appeared for the Staff, the Applicant, New York, Clearwater and Riverkeeper. At the hearing, the witnesses' oral testimony was transcribed, and the Board ruled on the admissibility of evidence proffered by the parties.

Contention NYS-12C and its Predecessors

As admitted by the Board in LBP-08-13, Contention NYS-12 challenged the SAMA analysis contained in the Applicant's ER, asserting as follows:

> Entergy's SAMAs for IP2 and IP3 do not accurately reflect decontamination and cleanup costs associated with a severe accident because specific inputs and assumptions made in the MACCS2 code regarding decontamination and cleanup costs may not be correct.[15]

More specifically, the Board admitted Contention NYS-12 to the extent that it "challenge[d] the cost data for decontamination and clean-up used by MACCS2."[16]

In December 2008, the Staff published its Draft SEIS, in which the Staff presented its evaluation of the environmental impacts of IP2 and IP3 license renewal – including the impacts of postulated design basis and severe accidents, and the Applicant's severe accident mitigation

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[14] FSEIS (Ex. NYS000133A-J). § 9.3, at 9-8.

[15] LBP-08-13, 68 NRC at 218.

[16] *Id.* at 102.

alternatives (SAMA) analysis. In pertinent part, the Staff observed that the Commission had determined generically in the GEIS that the impacts of design basis accidents and the probability-weighted consequences of severe accidents are "SMALL" for all nuclear power plants.[17] The Staff further found that there are no site-specific impacts related to design-basis or severe accidents at Indian Point Units 2 and 3 beyond those already considered in the GEIS.[18] The Staff summarized its evaluation of Entergy's SAMA analysis, as modified in response to Staff RAIs,[19] and concluded that "the methods and the implementation of those methods were sound, and that the treatment of SAMA benefits and costs support the general conclusion that the SAMA evaluations performed by Entergy are reasonable and sufficient" for license renewal.[20] Following publication of the DSEIS, New York filed Contention NYS-12A, amending Contention NYS-12 to apply to the Staff's DSEIS.[21] The Board admitted Contention NYS-12A and consolidated it with Contention NYS-12, on June 16, 2009.[22]

In November 2009, the Staff informed Entergy that it had identified a discrepancy in the meteorological data inputs for wind direction in the Applicant's MAACS2 code SAMA analysis. In response, Entergy committed to correct the meteorological data inputs to the MACCS2 code, re-run the SAMA analysis, and provide the new results to the NRC; on December 11, 2009, the

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[17] *See* DSEIS (Ex. NYS000132B) at 5-2 - 5-3.

[18] *Id.* at 5-4.

[19] DSEIS (Ex. NYS000132D), Appendix G, at G-1 – G-2.

[20] DSEIS (Ex. NYS000132B), at 5-10.

[21] State of New York Contentions Concerning NRC Staff's Draft Supplemental Environmental Impact Statement (Feb. 27, 2009) ("NYS DSEIS Contentions").

[22] Order (Ruling on New York State's New and Amended Contentions) (June 16, 2009) (unpublished), at 3-4.

Applicant submitted its SAMA reanalysis, utilizing its revised meteorological data.[23] On March 11, 2010, New York filed Contention NYS-12B, amending this contention to apply its previous assertions to Entergy's newly submitted SAMA reanalysis.[24] On June 30, 2010, the Board admitted Contention NYS-12B and consolidated it with Contention NYS-12/12A.[25]

As noted above, the Staff published its Final Supplemental Environmental Impact Statement in December 2010, in which the Staff, *inter alia*, provided its final evaluation of the environmental impacts of postulated accidents at Indian Point Units 2 and 3, as well as its evaluation of Entergy's SAMA analysis. In addition, the Staff considered the soundness of its SAMA evaluation in light of the issues raised in Contentions NYS-12 and NYS-16, and New York's timely-filed comments on the Draft SEIS – and concluded that Entergy's SAMA analysis was reasonable even when New York's contentions and comments were considered.[26]

Following publication of the FSEIS, New York filed Contention NYS-12C, applying its previous assertions to the FSEIS.[27] In Contention NYS-12C, New York (and its former consultant) challenged the FSEIS evaluation of Entergy's SAMA analysis, based on the assertion that the Staff had allegedly failed to scale-up data to accurately reflect an urban area such as New York City, and had assumed only moderate decontamination efforts to address

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[23] *See* Letter from Fred Dacimo (Entergy) to NRC Document Control Desk, NL-09-165 (Dec. 11, 2009), Attachment 1 (Ex. ENT000009).

[24] 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) ("Amended Contention NYS-12B").

[25] *Entergy Nuclear Operations, Inc*. (Indian Point, Units 2 & 3), LBP-10-13, 71 NRC 673, 683-84 (2010).

[26] *See, e.g.,* FSEIS (Ex. NYS000133G), Appendix A, at A-984 – A-1024.

[27] State of New York New Contention 12-C Concerning NRC Staff's December 2010 Final Environmental Impact Statement and the Underestimation of Decontamination and Clean Up Costs Associated with a Severe Reactor Accident in the New York Metropolitan Area (Feb. 3, 2011) ("Amended Contention NYS-12C").

heavy decontamination events.[28] Further, New York took issue with the Staff and its experts' analysis that the plutonium clean-up costs identified in New York's references were not directly applicable to nuclear reactor accident and once the data were adjusted to account for this material difference, they did not provide any information that would challenge Entergy's SAMA analysis.[29] On July 6, 2011, the Board admitted Contention NYS-12C and consolidated it with Contention NYS-12/12A/12B (collectively, "Contention NYS-12C").[30]

Evidentiary Hearing and Post-Hearing Developments

On December 21, 2011, New York filed its Initial Statement of Position, exhibits, and the pre-filed testimony of its testifying expert (Dr. François Lemay).[31] On March 30, 2012, Entergy and the Staff filed their Initial Statements of Position, exhibits, and the pre-filed testimony of their expert witnesses; in this regard, Entergy filed the testimony of three experts (Mr. Grant Teagarden, Dr. Kevin O'Kula, and Ms. Lori Ann Potts), and the Staff filed the testimony of four experts (Dr. Tina Ghosh and Mr. Donnie Harrison of the Staff, and Dr. Nathan Bixler and Mr. Joseph Jones from Sandia National Laboratories ("Sandia")). On June 29, 2012, New York filed a revised statement of position, additional exhibits, and rebuttal testimony by Dr. Lemay. Evidentiary hearings on this contention were then held on October 17 and 18, 2012.

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[28] See Amended Contention NYS-12C at 7; *see also id*., Attachment (David I. Chanin, Errors and Omissions in NRC Staff's Economic Cost Estimates of Severe Accident Mitigation Alternatives Analysis Contained in December 2010 Indian Point [FSEIS], at 1, 3 (Feb. 2011)).

[29] New York's testifying expert took a different position, agreeing that the Site Restoration Study and other information related to nuclear weapon accident clean-up was not particularly useful for evaluating whether the decontamination values used by Entergy were appropriate. Transcript ("Tr.") at 2012.

[30] Memorandum and Order (Ruling on Pending Motions for Leave to File New and Amended Contentions) (July 6, 2011) (unpublished), at 3-9.

[31] The Staff and Entergy filed motions *in limine* seeking to exclude portions of the pre-filed testimony and exhibits. As pertinent here, the Board denied those motions with respect to Contention NYS-12C. *See* Order (Granting in Part and Denying in Part Applicant's Motion *in Limine*) (Mar. 6, 2012) (unpublished), at 4-7, 36.

On November 27, 2013, the Board issued its PID, in which it, *inter alia*, resolved Contention NYS-12C in favor of the Applicant and Staff. In this regard, the Board concluded as follows:

> We find that a preponderance of the evidence submitted regarding this contention supports the conclusion that Entergy's SAMA analysis is sufficiently site specific and a reasonable method under NEPA standards given that key input parameters are per capita based and multiplied by a site-specific population distribution. Furthermore, Entergy's use of and the NRC's approval of the TIMDEC and CDNFRM values was reasonable and satisfies the requirements under NEPA and 10 C.F.R. § 51.53(c)(3)(ii)(L). It was reasonable for Entergy to use the selected TIMDEC values given its technical basis and what the values represent. Additionally, it was not unreasonable for Entergy to rely on the CDNFRM value given the level of review of NUREG-1150 and its predecessor documents. Accordingly, NYS-12C is resolved in favor of the NRC Staff and the issues raised by this contention do not prevent the Commission from issuing the requested renewal licenses.[32]

On December 7, 2013, New York filed a motion before the Board, seeking to reopen the record to admit a new exhibit, and for reconsideration of the decision on Contention NYS-12C.[33] On February 14, 2014, while its motion to reopen and reconsider was pending before the Board, New York filed the instant Petition.[34] On February 28, 2014, the Secretary of the Commission issued an Order holding New York's Petition in abeyance, and directing New York to file a motion, if New York decides to amend or withdraw its Petition after the Board has ruled on the

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[32] LBP-13-13, slip op. at 293. As stated by the Board, "CDNFRM" defines the non-farmland decontamination cost per individual for each level of decontamination modeled in the MACCS2 code, while "TIMDEC" defines the time required for completion of each of the decontamination levels. *Id.* at 272. New York's challenge to Entergy's SAMA analysis focused principally on these two inputs to the MACCS2 code, and the Board's decision likewise focused on these two inputs. See id. at 272-73.

[33] State of New York Motion to Reopen the Record and for Reconsideration on Contention NYS-12C ("Motion to Reopen") (Dec. 7, 2013).

[34] Also on February 14, 2014, the State of Connecticut ("Connecticut") filed an amicus brief in support of New York's Petition. *See* Amicus Brief of the Attorney General of Connecticut ("Amicus Brief") (Feb. 14, 2014). The Staff is filing, simultaneously herewith, a separate answer to Connecticut's amicus brief. *See* NRC Staff's Answer to "Amicus Brief of the Attorney General of Connecticut" (Apr. 28, 2014).

motion to reopen and reconsider.[35] On April 1, 2014, the Board denied New York's motion to reopen/reconsider;[36] and on April 4, 2014, New York notified the Commission that it would not seek to amend the instant Petition, but would instead file a separate petition for review of the Board's Order denying its motion to reopen/reconsider.[37]

ARGUMENT

In its Petition, New York challenges each of the Board's three principal determinations regarding the acceptability of Entergy's SAMA analyses and the Staff's FSEIS evaluation thereof, *viz*: (a) that Entergy's use of the TIMDEC inputs in its MACCS2 code SAMA analysis was reasonable, (b) that Entergy's use of the CDNFRM inputs in that analysis was reasonable; and (c) that Entergy's SAMA analysis was acceptable, in that it is sufficiently site-specific and a reasonable method under NEPA given that key input parameters are per capita based and multiplied by a site-specific population distribution. As set forth below, the Board's resolution of Contention NYS-12C rests upon substantial, reliable and convincing evidence, and New York's Petition fails to demonstrate any material error in the Board's decision that would warrant the review and reversal thereof. Accordingly, the Board's decision in LBP-13-13, resolving Contention NYS-12C in favor of the Applicant and Staff, should be affirmed.

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[35] Order (Feb. 28, 2014) (unpublished), at 2.

[36] Order (Denying New York's Motion to Reopen the Record; Setting Deadline for New or Amended Contention) (Apr. 1, 2014) (unpublished).

[37] State of New York's Notice Pursuant to the Secretary's February 28, 2014 Order, (Apr. 4, 2014). The Staff will provide its views with respect to New York's decision not to file an amended petition for review of the Board's PID in light of the Board's ruling on its motion to reopen/reconsider, in response to any further petition for review that New York may file.

I. Legal Standards Governing Petitions for Review

Pursuant to 10 C.F.R. § 2.341(b)(4), the Commission may, grant review of a Board decision, in its discretion, "giving due weight to the existence of a substantial question with respect to the following considerations":

> (i) A finding of material fact is clearly erroneous or in conflict with a finding as to the same fact in a different proceeding;
>
> (ii) A necessary legal conclusion is without governing precedent or is a departure from or contrary to established law;
>
> (iii) A substantial and important question of law, policy or discretion has been raised;
>
> (iv) The conduct of the proceeding involved a prejudicial procedural error; or
>
> (v) Any other consideration which the Commission may deem to be in the public interest.

10 C.F.R. § 2.341(b)(4). *Accord, Honeywell Int'l, Inc.* (Metropolis Works Uranium Conversion Facility), CLI-13-01, 77 NRC 1, 17 (2013) (the petitioner had "identified a substantial question as to whether the Board decision reaches at least one 'necessary legal conclusion without governing precedent' or addresses at least one 'substantial and important question of law, policy or discretion'"); *Entergy Nuclear Vermont Yankee, L.L.C. & Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 13 (2010) ("the challenged portions of [the Board's decision] address significant issues of law and policy that lack governing precedent and raise issues that could affect other license renewal determinations").[38]

In *Southern Nuclear Operating Co.* (Early Site Permit for Vogtle ESP Site), CLI-10-5, 71 NRC 90, 98 (2010), the Commission summarized its standards for review as follows:

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[38] *Accord, Louisiana Energy Services, L.P*. (National Enrichment Facility), CLI-06-15, 63 NRC 687, 690 (2006); *Northeast Nuclear Energy Co.* (Millstone Nuclear Power Station, Unit 3), CLI-01-3, 53 NRC 22, 28 (2001); *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-01-9, 53 NRC 232, 234 (2001); *cf. Pa'ina Hawaii, LLC* (Materials License Application), CLI-10-18, 72 NRC 56, 73 (2010).

> . . . . We do not exercise our authority to make *de novo* findings of fact "where a Licensing Board has issued a plausible decision that rests on carefully rendered findings of fact." As we have stated on other occasions, "[w]hile [we have] discretion to review all underlying factual issues *de novo,* we are disinclined to do so where a Board has weighed arguments presented by experts and rendered reasonable, record-based factual findings." We defer to a board's factual findings and "generally step in only to correct 'clearly erroneous' findings – that is, findings 'not even plausible in light of the record viewed in its entirety'" – where there "is strong reason to believe that . . . a board has overlooked or misunderstood important evidence." "Our standard of 'clear error' for overturning a Board's factual finding is quite high."
>
> "As for conclusions of law, our standard of review is more searching. We review legal questions *de novo.* We will reverse a licensing board's legal rulings if they are 'a departure from or contrary to established law.'"
>
> Decisions on evidentiary questions fall within our boards' authority to regulate hearing procedure. "[A] licensing board normally has considerable discretion in making evidentiary rulings." We review decisions on evidentiary questions under an abuse of discretion standard.

Id. at 98-99 (footnotes omitted).[39]

II. The Board Correctly Determined that the TIMDEC Inputs Used by Entergy in the MACCS2 Code Are Reasonable

In its Partial Initial Decision, the Board determined that the TIMEDEC inputs selected by Entergy in its SAMA analysis, *i.e.,* 60-days and 120-days, were reasonable in light of the nature of the analysis.[40] Specifically, the Board determined that a SAMA analysis is intended to consider a probability-weighted average of "numerous postulated accident scenarios, spanning

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[39] Under the "clearly erroneous" standard in 10 C.F.R. § 2.341(b)(4)(i) and former § 2.786(b)(4)(i), the Commission generally declines to second-guess plausible Board decisions that rest on carefully rendered findings of fact, but will undertake review where the Board decision contains "obvious error." *See Dominion Nuclear Connecticut, Inc*. (Millstone Power Station, Unit 3), CLI-02-22, 56 NRC 213, 222 (2002); *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), CLI-01-11, 53 NRC 370, 382 (2001).

[40] LBP-13-13 at 283.

a spectrum of potential initiating events, accident sequences, and severity of consequences."[41] The Board emphasized that the input variables need to be reasonable for use over the entire set of modeled accidents for a range of meteorology conditions over a large geographic area, and were not meant to represent a "single, specific accident scenario."[42] In approving Entergy's use and the Staff's acceptance of the TIMDEC input parameters, the Board emphasized that New York's presentation and reliance on extreme events including Chernobyl and Fukushima Dai-ichi were not credible because they represented individual unlikely events that would need to be appropriately weighted to be included in the input values.[43] Further, the Board found that the Staff has been examining the appropriately weighted clean-up times of nuclear plant accidents for 37 years, beginning with the 1975 Reactor Safety Study, and continuing through NUREG-1150 to the present.[44] Moreover, the Board determined that the selected values for TIMDEC need to represent a frequency-weighted average decontamination time over all of the modeled accidents and not just a worst case accident scenario.[45] Thus, citing the Staff's expert testimony, the Board determined that for the SAMA analysis to produce "a reliable and reasonable analysis, the decontamination times must represent all the modeled severe accidents including ones that require little decontamination."[46]

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[41] *Id*.

[42] *Id.* at 283-84.

[43] *Id.* at 285.

[44] *Id.* at 285-86.

[45] *Id.* at 286-87.

[46] *Id*. at 287 (*citing* NRC Staff NYS-12C/16B Testimony, Ex. NRC000041, at 90). Citing the Staff's expert testimony, the Board also recognized that "it is likely that an actual decontamination effort would depart from the modeled inputs based on the extent of the accident, environmental conditions during the clean-up, and actual resources expended during the clean-up." *Id.*

New York's Petition seeks review and reversal of the Board's decision with respect to the TIMDEC input parameters used in Entergy's SAMA analysis.[47] Specifically, New York argues that (1) the Board erred when it found that the NRC Staff has examined decontamination times for 37 years,[48] (2) the values used by Entergy are based on a document with unrealistic and inconsistent assumptions,[49] (3) Fukushima Dai-ichi is not a worst-case scenario,[50] and (4) the Board incorrectly applied the concept of averages in the SAMA analysis.[51] For the reasons set forth below, New York's arguments fail to demonstrate any material error in the Board's determinations such that Commission review of the Board's decision would be warranted under 10 C.F.R. § 2.341. Accordingly, the Petition should be denied.

A. The Board Correctly Found that NRC Has Examined Decontamination Times for 37 Years

New York argues that the Board erred when it found that the NRC Staff had examined decontamination times for 37 years.[52] New York asserts that instead of finding that Staff had examined decontamination times for 37 years, the Board should have found that the NRC stopped examining decontamination times in 1984.[53] New York's assertion, however, ignores the NRC's continuing effort to protect public health and safety, and its long-standing use of these accepted decontamination times in SAMA analyses and other studies for the past several decades.[54] However, even assuming *arguendo* that New York is correct regarding the Board's

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[47] Petition at 18-29.

[48] *Id*. at 19.

[49] *Id*. at 21.

[50] *Id*. at 23.

[51] *Id*. at 27.

[52] *Id*. at 19.

[53] *Id*. at 20.

[54] Tr. at 2158-61.

reference statement, this asserted error is harmless and not material to the issue before the Board or the reasonableness of the selected inputs.

New York also asserts that the Board committed a factual error by relying on introductory language in NUREG/CR-4551[55] regarding the review of MACCS inputs that had been conducted in preparation of that study, and committed a "legal error by relying upon testimony to which it should have afforded no weight."[56] New York's arguments are not supported by the record. With respect to New York's asserted legal error, the Petition argues that the Staff's witnesses only pointed to NUREG/CR-3673 as a basis for the selected TIMDEC inputs and made vague unsupported conclusions regarding studying decontamination times for 37 years.[57] The record shows, however, contrary to New York's arguments, that there is substantial evidence that the NRC has examined decontamination times for the past several decades – including in studies such as NUREG-1150, which was described by Entergy's and the Staff's witnesses as being a "seminal" accident consequence study.[58] Further, the Staff's testimony described in detail various studies that have been performed, including the review of MACCS input values in NUREG/CR-4551.[59] While New York claims that the Staff's witnesses were not qualified to address this point, New York neither filed a motion *in limine* nor raised any objection to Entergy's and the Staff's reference to NUREG-1150 as seminal study on these issues, and their testimony on this issue was uncontroverted by New York or its witness.[60]

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[55] NUREG/CR-4551, SAND86-1309, Vol. 2, Rev. 1, Part 7, "Evaluation of Severe Accident Risks: Quantification of Major Input Parameters – MACCS Input" (Dec. 1990) (Ex. NYS000248).

[56] Petition at 20-21.

[57] *Id*. at 20-21.

[58] Tr. at 1950-52, 2158-61, 2186-89).

[59] NRC Staff NYS-12C/16B Testimony (Ex. NRC000041), at 89-90.

[60] In New York's Proposed Findings, the State argued for the first time that Entergy's and the Staff's witnesses were not properly qualified to testify on this matter. *See* State of New York's Proposed

New York also states that it was a factual error for the Board to rely on the introductory language in NUREG-4551.[61] New York is mistaken. The Board, in LBP-13-13, did not rely solely on the language in NUREG-4551 but also relied on the uncontroverted testimony of the expert witnesses who testified on this subject. The Board was correct in relying the witnesses' uncontroverted testimony regarding the NRC Staff's historical efforts regarding the identification and use of appropriate decontamination times. As the finder of fact, the Board is entitled to substantial deference when determining the credibility of witnesses and the appropriate weight to assign their testimony.[62] New York has shown no reason why the Commission should undertake review of the Board's determinations regarding the witnesses' testimony.

B. Entergy's Use of TIMDEC Values Was Consistent With NUREG-1150 and Constitute Realistic Assumptions For Modeling A Range of Accidents

In challenging the Board's finding that Entergy's use of the TIMDEC inputs was acceptable, New York presents various arguments regarding the assumptions and alleged inconsistencies in NUREG-1150.[63] New York's arguments, and its reasons for requesting review and reversal by the Commission, are not entirely clear. First, New York asserts that Entergy and Staff should not be able to point to NUREG-1150's use of the same TIMDEC input parameters that were used in Entergy's analysis, to support their selection by Entergy, because NUREG-1150 and its references contain insufficient explanation of the selection process. New

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Findings of Fact and Conclusions of Law for Contention NYS-12/12A/12B/12C ("NYS-12C") (Mar. 22, 2013), at 37, 125-129; *cf.* NRC Staff's Reply to State of New York's Proposed Findings of Fact and Conclusions of Law for Contention NYS-12/12A/12B/12C ("NYS-12C") (May 3, 2013), at 1-5. Although the Board did not specifically address New York's argument in its decision, the Board rejected the State's late objections to qualifications and credibility. New York's current argument regarding the Staff's witnesses' qualifications and credibility fail to show any abuse of discretion by the Board, as required in seeking review of an evidentiary ruling. *See Vogtle ESP Site*, 71 NRC at 98-99.

[61] Petition at 20.

[62] *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-03-8, 58 NRC 11, 26-27 (2003); *David Geisen*, CLI-10-23, 72 NRC 210, 225-26 (2010).

[63] See Petition at 21-23.

York then argues that an examination of NUREG-1150 and its referenced documents,[64] shows that (a) NUREG-1150 contains assumptions that are unrealistic for conducting an actual clean-up after an accident, and (b) the times for beginning a clean-up after an accident are slightly different in .each reference.[65] Central to New York's claims is its assertion that using NUREG/CR-3673 assumptions for the modeled accidents would require "*1.5 million workers* for 90 days."[66] New York's expert explains that in order to get a reasonable number of workers for clean-up, one would need to expand the TIMDEC parameter to several years.[67]

New York's arguments were adequately addressed in the record by the Staff's and Entergy's witnesses, and fail to show any error by the Board. Thus, the Staff's experts explained that the MACCS2 code runs were not trying to simulate an actual accident clean-up scenario but, instead, were conducted to account for the costs of clean-up.[68] The Staff's witnesses explained at length that using extended decontamination periods in a MACCS2 code run would upset the delicate balance utilized in the MACCS2 code decontamination process; specifically, extending TIMDEC beyond 1 year would introduce a number of inconsistencies in the MACCS2 code function, such as failing to properly account for the net present value of decontamination efforts expended in years beyond the first year, and (b) selecting the decontamination effort based on the initial decontamination level without considering radioactive

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[64] The documents referenced in NUREG-1150 include NUREG/CR-4551 and NUREG/CR-3673 among others.

[65] Petition at 22

[66] *Id.* (emphasis in the original).

[67] *Id.*

[68] *See, e.g.,* LBP-13-13 at 284 (citing NRC Staff NYS-12C/16B Testimony at 90 (Ex. NRC000041) ("As with any modeling effort, it is likely that an actual decontamination effort would depart from the modeled inputs based on the extent of the accident, environmental conditions during the clean-up, and actual resources expended during the clean-up."); Tr. at 2189).

decay during the decontamination efforts.[69] In addition, use of a period longer than 1 year had not been tested, and the failure to test and verify the code's function in the new extended time ranges would produce an unreliable outcome.[70] Further, as the Staff explained, the costs for a severe accident are assigned to different categories including clean-up, population dose risk, and relocation costs, among others.[71] By extending the TIMDEC input beyond 1 year, the effective impact is to shift the costs among these different categories, resulting in double counting and other potential errors in calculating those costs.[72]

Second, New York suggests that NUREG/CR-3673 (published in 1984) and NUREG-1150 (published in 1990) used different timelines for beginning decontamination efforts after a modeled accident – *i.e.*, 30 days and 7 days, respectively.[73] New York has not shown, however, that this variation in decontamination start times renders either document unreliable, or that any analysis that uses NUREG-1150's input values is therefore invalid.

Finally, New York dismisses NUREG-1150 as a source of reliable information because it does not contain a sufficient discussion of the particular issue raised in New York's Petition.[74] This criticism is unfounded; the authors of NUREG-1150 were not tasked with addressing potential comments that New York would file many years after the document's publication. Moreover, the Staff's testimony showed that NUREG-1150 was a seminal study, underwent substantial peer review, and utilized the same analytical method that was used in Entergy's

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[69] Tr. at 2251-52, 2131-35, 2143-45, 2148-49, 2176-77; NRC Staff's Proposed Findings on NYS-12C at 21.

[70] *See* Entergy's Testimony on NYS-12C (Ex. ENT000450), at 75-77.

[71] *See, e.g.,* Tr. at 2215-17.

[72] *Id.* at 2195-2202.

[73] Petition at 22.

[74] *Id*. at 19-21.

SAMA analysis.[75] As a seminal study on consequence analysis, Entergy's use of this study in its SAMA analysis was reasonable and reliable.[76]

C. The Accident at Fukushima Dai-ichi Was a Worst-Case Type of Accident and Was Appropriately Considered By the Board

In its Petition, New York argues that the Board committed factual and legal error by failing to properly address New York's evidence regarding Fukushima Dai-ichi and Chernobyl.[77] New York argues that it presented evidence that was "uncontroverted by Entergy or the NRC Staff."[78] New York's arguments do not properly characterize the evidentiary record before the Board, and fail to show any error by the Board.

In particular, New York argues that the Board's failure to "discuss Fukushima, and afford[] no weight to Chernobyl" contradicted established case law and indicates that the Staff acted arbitrarily and capriciously by not looking at the relevant data in its review.[79] New York complains that the Board improperly dismissed Chernobyl as a single extreme scenario and that the Board should have given more weight to Dr. Lemay's testimony regarding the difficulty of decontamination following the accident at Fukushima Dai-ichi. Further, New York describes the Staff's actions as ignoring information from actual accidents that falls within the range on accidents being modeled in the SAMA analysis.[80]

The evidence of record and the Board's decision show that both Entergy and the Staff considered severe accidents as part of the Indian Point SAMA analysis and assigned these low-

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[75] Tr. at 2370-72; *see also id.* at 1950-52, 2158-61.

[76] Tr. at 2158-61; *see also* Tr. at 1950-52, 2186-89.

[77] Petition at 23.

[78] *Id*.

[79] *Id*. at 26.

[80] *Id*. at 25-26.

probability high-consequence events their appropriate weighting based on their expected frequency.[81] The Board's decision examined the methodology utilized in Entergy's SAMA analysis and determined, based on the testimony of the Staff's and Entergy's witnesses, that it was a reasonable and reliable method for producing results reflective of the entire spectrum of modeled accidents.[82] Indeed, as New York readily admits, the SAMA analysis performed by Entergy and accepted by the Staff modeled severe accidents with larger releases than Fukushima Dai-ichi.[83]

Inasmuch as Entergy's SAMA analysis included consideration of accidents with consequences more severe than Fukushima, New York's actual complaint appears to be that severe accidents should have been afforded greater weight in the SAMA analysis. More specifically, New York claims that the inputs should be weighted based on the expected consequences of the modeled accidents instead of the frequency of those accidents;[84] further, New York asserts that the Board misunderstood the use of averages in the Indian Point SAMA analysis, and therefore incorrectly concluded that the TIMDEC was reasonable.[85] In support of this assertion, New York states that the Board used a simple mean for evaluating the SAMA analysis instead of a frequency weighted average,[86] and that Entergy had used frequency weighting in the other portions of the SAMA analysis.[87] Absent from New York's argument,

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[81] Staff's Testimony on NYS-12C, Ex. NRC000041, at 89-90; Entergy's Testimony on NYS-12C, Ex. ENT000450, at 12; Tr. at 2139-40, 2146, 2153-55.

[82] LBP-13-13, slip op. at 286-87; *see* NRC Staff NYS-12C/16B Testimony (Ex. NRC000041) at 89-90.

[83] Petition at 23-25.

[84] *Id*. at 27-30.

[85] *Id*. at 27.

[86] *Id*.

[87] *Id*. at 27-29.

however, is any evidence that the Board's reference to an average value was anything other than a frequency-weighted average.[88] Indeed, all of the testimony and exhibits submitted by the parties indicated that the inputs should be frequency weighted,[89] and that is the evidence upon which the Board relied in LBP-13-13.

New York further argues that inputs to the SAMA analysis should be weighted based on the off-site economic cost risk ("OECR").[90] New York asserts that "because the more severe release categories make the largest contribution to the total OECR, the values for input parameters should more closely align with the accidents that are relatively more severe."[91] New York's method, however, improperly skews the SAMA analysis to the worst case results and therefore would not provide a reasonable and reliable evaluation of the full range of accidents modeled in a SAMA analysis.[92] As the Staff explained, the selected input parameters need to be representative of all the modeled accidents, including accidents with small releases that are predicted to occur with significantly higher frequencies.[93] To put that issue in perspective, the

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[88] LBP-13-13 , slip op. at 285-87.

[89] *See, e.g.,* Entergy NYS-12C Testimony (Ex. ENT000450) at 18 ("SAMA analysis evaluates a wide range of potential long-term severe accident consequence scenarios for the purpose of making reasonable cost-benefit evaluations under NEPA. Because it is concerned with mean annual consequences, a SAMA analysis is not designed to model a single radiological release event under specific meteorological conditions at a single moment in time. Instead, it models numerous accident release conditions that could, based on probabilistic analysis, occur at any time under varying weather conditions during a one-year period. The goal is to estimate annual average impacts for the entire 50-mile radius study area." (emphasis added)).

[90] Petition at 29-30.

[91] *Id.* at 30.

[92] *See* Tr. at 1937, 2179-80; *cf.* Tr. at 2139-40, 2146-53.

[93] *Id.* at 2139-40, 2146-53; Staff's Testimony on NYS-12C (Ex. NRC00041), at 88-90.

Staff's experts explained that the frequency-weighted area contaminated by all the modeled accidents amounted to an area on the order of a small yard.[94]

New York claims that Entergy and the Staff did not "meaningfully respond to the State's argument" that the input should be weighted to primarily account for the worst case accident scenarios.[95] However, New York's Petition contradicts its assertion that the Staff and Entergy did not meaningfully address that assertion, in that its Petition shows that the Indian Point SAMA analysis did in fact address a range of accidents including high-consequence, low-frequency accidents.[96] New York's main complaint regarding the Board's use of a frequency weighted average in its decision is that it relied on the arguments of Entergy, the Staff, and their experts' testimony.[97] As discussed above, however, the Board had credible expert testimony upon which to base its decision to accept frequency weighted averages rather than New York's assertion that consequence weighting was more appropriate. As the finder of fact, the Board, as appropriate, weighed the evidence presented by the parties and the credibility of their witnesses, and found that Entergy's selection and the Staff's approval of the TIMEDEC input parameters were reasonable, in light of the purpose of the SAMA analysis.

In sum, the Board's determination that the use of 60-day and 120-day average clean-up times was reasonable is fully supported by the record.[98] New York has not shown any error in the Board's rejection of New York's arguments that Entergy and the Staff (as well as the Board) should have used inputs skewed towards the worst-case accidents.

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[94] NRC Staff's Proposed Findings of Fact and Conclusions of Law Part 5: Contention NYS-12C (Severe Accident Mitigation Alternatives Analysis Decontamination and Cleanup Costs) at 25.

[95] Petition at 30.

[96] *Id*. at 27-28.

[97] *Id*.

[98] *See* LBP-13-13, slip op. at 285-87.

III. The Board Correctly Determined that the CDNFRM Values Used By Entergy Were Reasonable and Produced Reliable Results

In its MACCS2 code SAMA analysis, Entergy utilized the input value for CDNFRM *(i.e.*, non-farmland decontamination cost per individual) that had been used in NUREG-1150. The Board found that Entergy's use of this input in its analysis was reasonable.[99] New York challenges the Board's determination that Entergy's use of the CDNFRM input value was reasonable. In particular, New York argues that the Board's decision should be overturned because (1) the CDNFRM input value in NUREG-1150 is not a site-specific value; (2) a source document (a study conducted at Sandia by Robert Ostmeyer and Gene Runkle ("the Ostmeyer Report")), cited in NUREG-1150,[100] is no longer in the Staff's possession, and New York was unable to locate the document on its own.[101] (3) the Board erred in finding that the missing document had received "secondary peer review,"[102] (4) the Staff allegedly failed to meet its discovery obligations, and (5) Dr. Lemay's analysis purportly shows a larger CDNFRM than was used by Entergy and accepted by the Staff. As explained below, these assertions are lacking in merit and should be rejected.

A. The Board Correctly Determined that the Entergy's SAMA Analysis Was Site-Specific Notwithstanding Its Use of the CDNFRM Input Value

New York asserts that Entergy's use of the CDNFRM value in its SAMA analysis was inadequate, inasmuch as Entergy did not calculate a site-specific input value.[103] In this regard, New York points to the testimony of its witness, who explained how "the State's experts

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[99] *Id.* at 288, 291-92.

[100] *Id.* at 290.

[101] Petition at 31-37.

[102] *Id.* at 37-41.

[103] *Id.* at 45.

calculated site-specific cost and time values without relying upon SAMPLE Problem A."[104] Similarly, New York states that its experts' use of site-specific CDNFRM values in a benchmarking study resulted in higher values that were used in Sample Problem A, and that the CDNFRM input did not account for the high population and building density in the vicinity of the Indian Point site.[105]

As discussed in further detail *infra* at 36-38, New York's claims fail to show any reason to disturb the Board's finding that "Entergy's SAMA analysis is sufficiently site specific," given the per capita nature of Entergy's analysis.[106] In particular, the Board found the TIMDEC and CDNFRM input values used by Entergy and approved by the Staff to be "reasonable and appropriate."[107] The Board based its determination that Entergy's SAMA analysis was sufficiently site-specific on the methodology implemented in the SAMA analysis, the use of per capita input parameters that scale in proportion to the population density associated with any modeled element. By using the estimated population for 2035 for the modeled area in combination with the per capita input parameters, the Board determined that the analysis was sufficiently site-specific.[108] In other words, the Board found that there is no need for the input parameter to be site-specific since it is a per capita number and utilizes the actual population to determine the overall cost; in sum, "the ultimate decontamination cost estimate (that results

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[104] *Id.*

[105] Id. at 46-47.

[106] LBP-13-13, slip op. at 280, 293.

[107] *Id.* at 280-81.

[108] New York did not appeal from the Board's decision disposing of its challenge to Entergy's population estimate, set forth in Contention NYS-16B. *See* LBP-13-13, slip op. at 294-313.

from multiplying the per capita input values by the site-specific IPEC region population) results in a site-specific decontamination cost estimate."[109]

B. The Parties' Inability to Locate A 30-Year Old Reference Document that Has Been Relied Upon in NRC-Approved Analyses for 30 Years Does Not Render the Indian Point SAMA Analysis Unreasonable or Unreliable

In its Petition, New York argues that because a reference cited in NUREG/CR-3673 could not be found in the Staff's or Sandia's possession, NUREG-1150 and every study that references the missing document or relies on a document that references this missing source is inherently unreasonable and unreliable.[110] With respect to the missing source, New York argues that the Board erred because (1) no primary source is locatable; (2) no secondary peer review occurred; and (3) acceptance of values when the source document is missing violates scientific integrity.[111]

1. The Inability to Locate a Reference Does Not Render the Board's Decision Erroneous

In its argument regarding the parties' inability to locate a primary source, New York asserts that "All parties agree that the ultimate source of Sample Problem A's decontamination cost values (CDNFRM) does not exist and, thus, cannot be verified."[112] New York misstates the Staff's and Entergy's positions on this matter. At no point did the parties agree that the New York's missing reference did not exist. Indeed, New York cites

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[109] LBP-13-13, slip op. at 283.

[110] Petition at 32-40.

[111] *Id*. at 32-33. New York also argues in this section of the petition that values used by Entergy in its SAMA analysis are entirely unreasonable because they "are much lower than values calculated using available realistic data." *Id.* at 33. As discussed below, however, the values calculated by New York's expert using "realistic data" were so flawed as to be unreliable without correcting for systemic errors. *See* discussion *infra* at 33-35. Further, once New York's calculations were corrected for these systemic errors, the values calculated by New York were similar to and often less conservative than values used by Entergy. *Id*.

[112] Petition at 33.

the testimony of Staff witness Dr. Ghosh, who stated simply that the Staff could not locate a copy of the document at this time; similarly, Mr. Jones of Sandia testified simply that Sandia had been unable to locate a copy of the document.[113] The only thing to be gained from the Staff's statements is that the referenced document could not be found in the possession or control of the Staff.

New York has provided no reason to believe that the Staff was required to retain a reference document for 30 years, for use in this proceeding. Further, there is no basis for its claim that any document or analysis that relies on a missing reference is unreliable;[114] indeed, the Board addressed this issue at length, and found that a SAMA analysis may reasonably utilize input values derived from NUREG-1150, despite the parties' inability to locate a document referenced therein.[115] Moreover, the availability of a 30-year old reference is not the issue before the Board; the issue is whether the selected inputs are reasonable and reliable.[116] Significantly, as discussed *infra* at 34-38, New York's own expert confirmed the reasonableness of the selected inputs through his independent analysis. Accordingly, the unavailability of this 30-year old reference is immaterial to issue decided by the Board.

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[113] See Petition at 33 n.28, and 34-35; Tr. at 2010 (Ghosh); *cf.* Tr. at 2011 (Jones).

[114] *See generally,* Petition at 32-37.

[115] LBP-13-13, slip op. at 289-91.

[116] NRC Staff's Reply to State of New York's Proposed Findings of Fact and Conclusions of Law for Contention NYS-12/12A/12B/12C ("NYS-12C") at 29. *See also id.* at 14-20 (explaining that New York's failed to present evidence regarding the ultimate issue before the Board).

2. The Board Correctly Found that the Document Had Implicitly Received Secondary Peer Review

The Petition argues that the Board erred when it afforded weight to the testimony regarding the substantial peer review that was conducted on subsequent studies utilizing the per capita decontamination cost estimates used by Entergy in its SAMA analysis. New York's main complaint is that "there is no record evidence to show that such a review ever took place."[117] In this regard, New York dismisses the substantial testimony from Entergy and the Staff's expert witnesses regarding the review that would likely have been conducted on these published reports as mere speculation and "'educated guesses' that lack a foundation in fact and are unsupported by analysis or any other documentation." [118]

New York's arguments should be rejected. First, New York waived any objection to the admission of this testimony when it failed to raise any objections to it during the hearing.[119] Second, the Staff's expert witnesses were not "speculating" on the type and depth of review that is performed by the NRC and its contractors prior to publishing a scientific report regarding an analysis of potential severe accidents. These reports received more than just a peer review; most were published in draft form and solicited public comments on the analysis. Each of the Staff's witnesses has had substantial personal experience with the publication of similar scientific analysis in journals and through NRC-sponsored documents, including NUREG

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[117] Petition at 37.

[118] *Id.* at 39.

[119] *Macsenti v. Becker*, 237 F.3d 1223, 1231 (10th Cir. 2001); *Marbled Murrelet v. Babbit*, 83 F.3d 1060, 1066 (9th Cir. 1996); *see also Maritime Overseas Corp. v. Ellis*, 971 S.W.2d 402, 410 (Tex. 1998); *Garcia v. Health and Human Services*, No. 05-0720V, 2010 WL 2507793 (Fed.Cl. May 19, 2011); *see also Vermont Yankee Nuclear Power Corp.,* (Vermont Yankee Nuclear Power Station), ALAB-179, 7 AEC 159, 179 (1974)*; Houston Lighting & Power Comp.* (Allens Creek Nuclear Generating Station, Unit No. 1), ALAB-629, 13 NRC 75, 81 n. 8 (1981).

publications.[120] As such, their opinions regarding the type and kind of review that would have been performed by the NRC and its contractors on studies regarding severe accidents were entitled to considerable weight and could reasonably be relied upon by the Board.[121] Further, there is no merit in the Petition's assertions regarding the need for a peer review conducted decades ago to have explicitly discussed New York's concerns regarding the SAMA analysis conducted by Entergy two decades later. Apart from the unreasonableness of that argument, the documents' reliability is demonstrated by their own terms and by the expert review and use of those documents during the past several decades.

Finally, New York's challenge regarding the performance of a secondary peer review is immaterial to the issue that was before the Board. The issue before the Board was whether the decontamination cost inputs selected by Entergy were reasonable. Entergy's and the Staff's witnesses provided substantial testimony regarding the reasonableness of those inputs, which was actually confirmed by the analysis conducted by New York's witness, once that analysis was corrected for its substantial errors.[122] As such, the Board did not err in relying on the expert opinions of the Staff's and Entergy's witnesses regarding the reasonableness of the cost inputs used in Entergy's SAMA analysis or the nature of the review that would likely have been conducted on the earlier published studies. .

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[120] *See* Dr. Nathan E. Bixler, Professional Qualifications (Ex. NRC000042); Dr. Tina Ghosh, Professional Qualifications (Ex. NRC000043); Joseph Jones, Professional Qualifications (Ex. NRC000044); and Donald G. Harrison, Professional Qualifications (Ex. NRC000045).

[121] *See generally, Private Fuel Storage, L.L.C*. (Independent Spent Fuel Storage Installation), LBP-05-21, 62 NRC 248, 295-97 (2003); *Florida Power and Light Co.* (Turkey Point Plant, Units 3 and 4), LBP-86-23, 24 NRC 108, 116, 123(1986).

[122] *See* discussion *infra* at 34-35.

C. New York's Own Analysis Demonstrated that Entergy's Input Values Were Reasonable for Use in a Site-Specific SAMA Analysis for Indian Point

New York claims that Board erred by failing to "take up the State's objection … based on the absence of scientific integrity and reliability."[123] Apart from presenting its views regarding the need for scientific integrity and the Staff's obligations, New York's sole argument appears to be summed up in the following conclusory assertions:

> The acceptance of the plainly identified and critically relevant shortcomings in Sample Problem A and CDNFRM values by NRC Staff and the Board is contrary to CEQ regulations and applicable NEPA case law. 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.[124]

In this regard, however, New York overlooks the substantial testimony of the Staff's and Entergy's expert witnesses regarding the reasons for selecting and accepting the CDNFRM input value in Entergy's SAMA analysis. Namely, the CDNFRM values reflect the average costs for all modeled accidents over the entire modeled area, as is required for use in a proper SAMA analysis.[125] As the Board found, the CDNFRM input values are reasonable for use in Entergy's SAMA analysis; in contrast, New York's proposed input values, which are skewed to reflect only

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[123] Petition at 40. New York's assertions regarding the missing reference and peer review are addressed *supra* at 25-28.

[124] Petition at 42. The Petition also asserts, without any citation to the record, that "the NRC knows that 'key assumptions' underlying Sample Problem A/NUREG-1150 MACCS2 code inputs are unfounded and inapposite, yet has offered no defense of its continued reliance on those inputs." *Id*. at 41. There is no basis for these assertions, nor has New York provided any support thereof. While New York's intent in this statement is unclear, if it meant to refer to a statement regarding the "pedigree" of the NUREG-1150 input values, contained in Ex. NYS000441, (cited at page 42 of its Petition), its assertion is unfounded. As explained by Staff witness Dr. Ghosh, that statement was made in a document attached to an E-mail message concerning proposals for long-term research activities. Any member of the Staff may submit his or her proposals; the particular proposal cited by New York was evaluated by an eight-member NRC agency-wide review committee, and was ranked among the lowest of all proposals submitted that year. Tr. at 2286-88; 2327-32

[125] NRC Staff NYS-12C/16B Testimony, Exhibit ("Ex.") NRC000041, at 89.

the worst possible modeled accidents, are not appropriate for use in a SAMA analysis – and indeed, were not intended to replace the input values used by Entergy. [126]

Further, while New York contended that Dr. Lemay's suggested input value calls into question the reasonableness of Entergy's values,[127] his proposed value did little to discredit Entergy's analysis or the Staff's evaluation thereof. In fact, Dr. Lemay admitted that he made substantial errors in his analysis that are not reflected in either his report or testimony. For example, Dr. Lemay admitted that his analysis failed to conserve mass during the accident modeling because he mistakenly believed that the MACCS2 code did not apply conservation of mass for the accident source term during deposition.[128] In other words, he treated the radioactive plume from the accident as having an infinite source term. Further, he admitted to making modifications to the MACCS2 source code without testing the modifications for functionality in the new and extended modeling range.[129] Once New York's witness's analysis was corrected for these substantial errors, his analysis actually confirmed that Entergy's selected value for CDNFRM was reasonable for the Indian Point SAMA analysis.[130] In fact, as

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[126] LBP-13-13, slip op. at 291-92; *cf. id*. at 285-88 (regarding the TIMDEC input value).

[127] *See id*. at 292.

[128] Tr. at 2132-33, 2177.

[129] Dr. Lemay modified the MACCS2 source code to extend the allowed input for decontamination time from 1 year to 30 years. Decl. of Dr. François J. Lemay, at (Feb. 17, 2012). However, he did not perform any functionality tests in the new extended range. *Id*. Instead, he only verified that this newly modified code continued to function when decontamination times were limited to one year. *Id.*. As Sandia expert Dr. Bixler explained, Dr. Lemay's use of an extended decontamination time scenario upsets the delicate balance implemented by the code to perform decontamination, including assumptions that decontamination expenses are all incurred in the first year, and selecting the level of decontamination based on the initial level of contamination instead of the contamination that would remain after the substantial delay. Tr. at 2199-2202, 2273-74; Entergy Testimony on NYS-12C, Ex. ENT000450, at 15, 73-75, 77-80.

[130] NRC Staff's Proposed Findings of Fact and Conclusions of Law Part 5: Contentions NYS-12C (Severe Accident Mitigation Alternatives Analysis Decontamination and Cleanup Costs) at 36-40.

discussed *infra* at 35, the CDNFRM values selected by Entergy were conservative (*i.e.,* higher) when compared to the values calculated by New York, as corrected.

D. New York's Arguments Regarding the Staff's Disclosures Should Be Rejected

In its Petition, New York makes repeated claims that the Staff somehow failed to meet its obligation to disclose documents.[131] In particular, New York complains that the Staff should have disclosed an E-mail message from a former NRC Staff member proposing an idea for long-term research,[132] and a 1990 report authored by a former NRC contractor (the "Tawil report").[133] Further, New York argues that the Board committed legal error because it failed to discuss the Staff's non-disclosure of the cited E-mail message – which New York claims was "applicable to, directly contradicted, and undermined the arguments [of] NRC Staff and Entergy.[134] As explained below, these claims should be rejected.

New York does not appear to assert that its claims regarding the Staff's discovery disclosures entitle it to a decision on the merits[135] -- and indeed, its arguments afford no basis for disturbing the Board's decision.[136] Significantly, New York fails to acknowledge in its Petition that the Board admitted each of the proposed documents into evidence, asked questions

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[131] Petition at 43.

[132] "NRO Suggestions for FY13 Long-Term Research Plan," attached to E-mail message from Mahmooda Bano to Christiana Lui, *et al,* (Jan. 10, 2011) (Ex. NYS000441). *See* n.124, *supra*.

[133] *See* Petition at 43, *citing* NUREG/CR-5148, PNL-6350, "Property Related Costs of Radiological Accidents," Tawil, J.J. and Bold, F.C. (Feb. 1990) (Ex. NYS000424A-BB).

[134] *Id*. at 42.

[135] *See, e.g.,* Petition at 43.

[136] New York asserts that the Staff was required to disclose the 1990 Tawil report, which it describes as a site-specific severe accident study at Indian Point (Petition at 56), but it fails to indicate any reason why the Staff was obliged to produce a 20-year old document in this proceeding, that was unrelated to the license renewal application under review, and it provides only a conclusory assertion that the document fit within the Staff's disclosure obligations. *Id.* at 56-57.

regarding the documents, and afforded New York the unprecedented opportunity to conduct cross-examination – by two of its attorneys – on all issues in which it was interested.[137]

New York also argues that the Board committed error by failing to discuss this E-mail message.[138] However, New York was in possession of that document and utilized it at the hearing, and it cannot argue that the Board was not aware of the document prior to rendering its PID. Moreover, by not addressing the E-mail message, the Board appears to have given it appropriate weight, based on its reliability, relevance and materiality, and the witnesses who addressed the document in their testimony. Thus, New York's witness did not discuss this document, and New York did not ask him any questions regarding the document. The only testimony concerning the E-mail message came from the Staff's witness, Dr. Ghosh -- who explained that the NRC's Long Term Research Program had evaluated the proposal to conduct additional research, and ranked it as one of the lowest rated proposals that year.[139] As such, the Board's decision to the give both the E-mail message and Dr. Tawil's analysis little or no weight was completely within its discretion when evaluating the evidence as the finder of fact.

Nonetheless, it should be noted that New York incorrectly characterizes the Staff's discovery obligations, [140] as set forth in 10 C.F.R. §§ 2.336(b) and 2.1203(b). Moreover, New York ignores the fact that its assertions regarding the Staff's discovery obligations in this Subpart L proceeding were rejected by the Board, in ruling on the Intervenors' motions to compel. For example, the Board specifically addressed the scope of the Staff's discovery obligations in its Order of March 16, 2012 – which New York has not challenged on appeal – where the Board explained that the scope of the Staff's disclosure obligations is not unlimited.

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[137] *See* Tr. at 2315-16, 2321-51.

[138] Petition at 41-43.

[139] Tr. at 2286-88; 2327-32. *See* n.124, *supra*.

[140] *Id*. at 41.

In rejecting claims that the Staff had failed to disclose other documents that were unrelated to its review of the Indian Point LRA, the Board held as follows:

> Generically applicable documents or documents that the NRC Staff simply did not use in its review might be useful to other parties in this and other proceedings, but that does not bring such documents within the scope of Sections 2.336(b) and 2.1203(b). Nevertheless, simply because such documents are not legally required to be placed into a proceeding's hearing file does not mean that they are hidden from public view. On the contrary, the NRC provides multiple avenues for litigants to access its generically applicable materials and reports, including its website, ADAMS, and its Public Document Room. Moreover, in this proceeding the NRC Staff appears to have acted in a professional spirit of cooperation to assist the Intervenors in reviewing such materials.[141]

In sum, the Staff was under no duty to disclose the cited E-mail message, because it was not used in the Staff's review of the Indian Point license renewal application.[142]

E. Dr. Lemay's Analysis Was Incomplete, Flawed, and Unreliable.

As the Board observed, New York's witness, Dr. Lemay, undertook his own limited analysis to determine appropriate CDNFRM input parameters based on four sources, which are identified in the State's filings as Approach A, B, C, or D.[143] New York asserts that these input parameters have a well-articulated basis that can be examined and in all cases the State's values greatly exceed the input values used by Entergy.[144] Finally, New York claims that a decontamination factor ("DF") greater than 10 "may not be possible or realistic."[145]

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[141] Order (Granting in Part and Denying in Part State of New York and Riverkeeper's Motion to Compel) (March 16, 2012) (unpublished), at 8-9. New York's Petition fails to mention or acknowledge the Board's ruling on the Staff's discovery obligations.

[142] *Id*.

[143] Petition at 49.

[144] *Id*. at 50.

[145] *Id*.

As discussed above, the Board determined that the analysis performed by Entergy and approved by the Staff was reasonable.[146] As such, the Board did not have to carefully examine Dr. Lemay's analysis in order to determine whether the Staff had satisfied its NEPA obligations. Further, the Board determined that "New York does not appear to be proposing the alternate CDNFRM values as replacement values. Instead, New York's witness, Dr. Lemay, only suggests that his proposed CDNFRM values call into question the reasonableness of Entergy's values."[147] In its Petition, New York argues that by giving Dr. Lemay's analysis only a cursory review, the Board failed to recognize that the CDNFRM used by Entergy was significantly below the range of values Dr. Lemay calculated for the Indian Point SAMA analysis.[148]

New York's arguments concerning the Board's treatment of Dr. Lemay's analysis should be rejected, in that Dr. Lemay's analysis was so flawed as to be unreliable absent significant corrections to account for errors in his methodology and assumptions. Thus, after Dr. Lemay provided his pre-filed initial written testimony and report on Indian Point's SAMA analysis, both Entergy's and the Staff's expert witnesses provide substantial critiques and identified significant errors in New York's proposed analysis.[149] In response to those critiques, Dr. Lemay, in his pre-filed rebuttal testimony made some changes to his analysis that drastically reduced his estimates; however, he left most of the major errors identified by Entergy and the Staff unaddressed.[150] For example, remaining errors in Dr. Lemay's analysis (and New York's arguments) include: Dr. Lemay's failure to conserve mass in his calculations; to properly adjust

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[146] LBP-13-13, slip op. at 293.

[147] *Id.* at 292.

[148] Petition at 46.

[149] Staff's Testimony on NYS-12C, Ex. NRC000241, at 44-48, 69-74.

[150] NRC Staff's Proposed Findings of Fact and Conclusions of Law Part 5: Contentions NYS-12C (Severe Accident Mitigation Alternatives Analysis Decontamination and Cleanup Costs) at 36-40.

the decontamination costs calculated during his proposed extended clean-up to its net-present value; and to properly account for the decreased decontamination that would be required to be addressed during a multi-year clean-up effort, among others.[151]

Under Board questioning, Dr. Lemay explicitly admitted that he did not think that mass was conserved in the SAMA analysis model using the MACCS2 code, and by corollary, he did not account for conservation of mass in his analysis.[152] Surprisingly, Dr. Lemay and New York seem to claim that this violation of basic physical principles has no impact on a SAMA analysis, in that "in this case we're dealing with averages that may represent very complex situations."[153] The Staff, however, upon correcting Dr. Lemay's errors, concluded that correcting for the conservation of mass problem and accounting for expending the estimated decontamination costs over 15-30 years produces decontamination costs that are $1,364-$4,295 for a decontamination factor ("DF") of 3, and $6,478-$10,260 for a DF of 15. In other words, when Dr. Lemay's analysis was corrected, it resulted in input values that are smaller than values used by Entergy in its SAMA analysis ($5,184 for a DF of 3, and $13,824 for a DF of 15).[154] In other words, New York's own analysis, as corrected, suggests that the values selected by Entergy, accepted by the Staff, and approved by the Board in LBP-13-13, are conservative. In sum, Dr. Lemay's analysis does not call into question the reasonableness of Entergy's values.

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[151] Dr. Lemay did address some of the less consequential errors in his analysis, like his misclassification and use of the land area associated with open bodies of water. Revisions to Tables in ISR Report 13014-01: Review of Indian Point Severe Accident Offsite Consequence Analysis (Dec. 21, 2011) (Ex. NYS000430), at 6; *see* NRC Staff's Proposed Findings of Fact and Conclusions of Law Part 5: Contentions NYS-12C (Severe Accident Mitigation Alternatives Analysis Decontamination and Cleanup Costs) at 38-39.

[152] Tr. at 2132-33, 2177.

[153] Tr. at 2177.

[154] NRC Staff's Proposed Findings of Fact and Conclusions of Law Part 5: Contentions NYS-12C (Severe Accident Mitigation Alternatives Analysis Decontamination and Cleanup Costs) at 36-40.

IV. The Indian Point SAMA Analysis Is Appropriately Site-Specific

In its Petition, New York argues that the Board erred when it determined that Entergy's SAMA analysis for Indian Point was appropriately site-specific.[155] Specifically, New York challenges the Board's findings on the asserted grounds that (1) the use of per capita input parameters do not make the SAMA analysis "site-specific", (2) Sample Problem A is inconsistent with the endorsed guidance, (3) the Board's failure to discuss Dr. Tawil's 1990 report was erroneous, and (4) the use of similar techniques in other proceedings and studies is not relevant to Indian Point's SAMA analysis.[156] As discussed below, these assertions are without merit.

A. Entergy's Use of Per Capita Inputs in Combination with Site-Specific Population Resulted in Appropriate Site-Specific Input Parameters

New York argues that the Board erred (1) in finding that decontamination costs scale with the population size, (2) failing to recognize that the correlation between population and decontamination costs is not valid for the 50-mile radius surrounding Indian Point, and (3) accepting a purported mischaracterization of Dr. Lemay's testimony.[157] Contrary to New York's arguments, its witness confirmed the validity of the approach that was taken by Entergy, accepted by the Staff, and approved by the Board. Thus, Dr. Lemay's analysis of the proper input variables assumed the same linear relationship between population and decontamination costs that New York now asserts as error. For example, Dr. Lemay's analysis produced

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[155] Petition at 52. In challenging the Board's findings regarding the site-specific nature of Entergy's SAMA analysis, New York claims, for the first time on appeal, that the NRC is not complying with the Court of Appeals' decision in *Limerick,* requiring site-specific SAMA analyses . *Id.* The Board's decision, however, specifically explained that Entergy's SAMA analysis was a site-specific analysis, in that it utilized appropriate per capita input values; thus, the higher population density in the Indian Point site vicinity was appropriately accounted for in the analysis.

[156] Petition at 52-58.

[157] *Id.* at 53-54.

CDNFRMs on a per capita basis,[158] and used the same linear relationship that was utilized by Entergy.[159] Further, New York repeatedly informed the Board that it is not challenging the MACCS2 code – but the MACCS2 code, itself, explicitly assumes that decontamination costs will scale linearly with population size, up to the condemnation value of the affected property.[160] New York's arguments, analysis, and testimony thus demonstrate that the issue is not the linear relationship between population and decontamination costs that is at issue but the per capita cost estimates.

There is likewise no merit in New York's claim that the Board was confused by Entergy's characterization of Dr. Lemay's testimony regarding the use of per capita inputs. In this regard, New York asserts that the Board erred because it failed to address Dr. Lemay's concern that per capita relationship may break down when buildings increase in size.[161] New York's arguments are not supported by the record. Thus, even though Dr. Lemay expressed some concerns about the per capita relationship,[162] his own analysis produced a per capita value that assigned the same cost for decontamination per person, regardless of whether they were living

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[158] Id. at 59.

[159] Pre-filed Written Testimony of Dr. François J. Lemay Regarding Consolidated NYS-12-C (NYS-12/12-A/12-B/12-C) at 31-32, ISR report (Ex. NYS000242) at 13-14; State of New York's Proposed Findings of Fact and Conclusions of Law for Contention NYS-12/12A/12B/12C ("NYS-12C") at 85.

[160] State Of New York's Proposed Findings Of Fact And Conclusions Of Law For Contention NYS-12/12A/12B/12C ("NYS-12C") at 42 ("The State is not challenging Entergy and NRC Staff's use of the MACCS2 code for the Indian Point SAMA analysis. See NYS000420 Lemay Rebuttal Test. at 6 ('ISR has not commented on the use of the MACCS2 code itself or any limitations of the MACCS2 code.'); Tr. 2175:10-16").

[161] Petition at 54.

[162] Tr. at 2136.

in a high-rise building or a small, single story dwelling.[163] Moreover, Dr. Lemay testified that the code's data inputs based on a per capita as a "brilliant insight."[164] As such, New York's claims that Entergy's SAMA analysis was not appropriately site-specific, based on its use of a combination of the site-specific population and per capita inputs, and that the Board failed to understand Dr. Lemay's testimony, due to an alleged mischaracterization of that testimony by Entergy, are unsupported by the record.

B. New York Mistakenly Argues that Entergy Failed to Comply with Applicable Guidance Documents

In its Petition, New York asserts that Entergy failed to follow certain guidance documents and user guides, which it characterizes as mandatory requirements. Thus, New York states:

> NEI 05-01 provides only "[s]ample MACCS2 economic data," and nowhere does NEI 05-01 instruct the applicant to use Sample Problem A values. NYS000287 at 14. Likewise, the MACCS2 User Guide warns "that the user now has to prepare much more data, involving multiple disciplines, for input. . . . [which] introduces the potential of an inexperienced user to produce distorted results because of improper or inconsistent data." Consequently, Entergy did not follow NEI-01-05 or the MACCS2 User Guide. [165]

As the Board found, however, Entergy used the NUREG-1150 per capita input values, multiplied by a site-specific population distribution (increased to account for the 2035 population), thus producing site-specific decontamination costs for use in its SAMA analysis.[166] Further, as Entergy's witnesses explained, it is standard practice for SAMA analyses to use these same

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[163] Pre-filed Written Rebuttal Testimony of Dr. François J. Lemay Regarding Consolidated NYS-12-C (NYS-12/12-A/12-B/12-C) (Ex. NYS000420), at 31-32, ISR Report (Ex. NYS000242), at 13-14; State of New York's Proposed Findings of Fact and Conclusions of Law for Contention NYS-12/12A/12B/12C ("NYS-12C"), at 85. In developing a per capita estimate, Dr. Lemay may have implicitly agreed that use of a per capita value is a reasonable and appropriate method for calculating decontamination costs within the MACCS2 code.

[164] Tr. at 2136; New York's Rebuttal Testimony on NYS-12C, Ex. NYS000420, at 6.

[165] Petition at 56.

[166] LBP-13-13, slip op. at 293.

NUREG-1150 input values.[167] New York has not shown that the Staff's (and the Board's) approval of Entergy's use of those values was erroneous.[168]

C. The Board Gave the Appropriate Weight to Dr. Tawil's 1990 Report and the E-mail Message

New York argues that the NRC Staff failed to disclose Dr. Tawil's 1990 report in the Indian Point FSEIS or in discovery.[169] New York further asserts that the Board erred by failing to give weight to Dr. Tawil's E-mail message, opining on why his report was not published.[170] In addition, New York claims that Dr. Tawil's report shows that the Staff can perform a site-specific decontamination cost analysis without resorting to the NUREG-1150 input values.[171] These assertions are without merit. As discussed below, Dr. Tawil's E-mail message is not applicable to a SAMA analysis and was entitled to no weight in the Board's resolution of this contention..

1. Dr. Tawil's E-mail Message is Entitled to No Weight

Dr. Tawil's E-mail message speculates as to the reason(s) his report was not published. Significantly, however, Dr. Tawil's statement was entirely speculative and was unsupported by any knowledgeable witness' testimony or other evidence. New York did not, offer Dr. Tawil as a witness in this proceeding; nor did New York seek to produce any other witness or evidence establishing why his report was not published. Dr. Tawil's E-mail message constitutes mere unsupported speculation regarding a matter as to which he was not shown to be

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[167] *See id*. at 289; Tr. at 1951.

[168] Of course, compliance with regulatory guidance documents, including NUREGs and regulatory guides, is not mandatory. *Curators of University of Missouri*, CLI-95-1, 41 NRC 71, 98, 100 (1995). *See also Duke Energy Corp.* (Catawba Nuclear Station, Units 1 & 2), CLI-04-29, 60 NRC 417, 424 (2004), *reconsid. denied*, CLI-04-37, 60 NRC 646 (2004) ("Guidance documents are, by nature, only advisory. They need not apply in all situations and do not themselves impose legal requirements on licensees.").

[169] Petition at 56.

[170] *Id*. at 56-57.

[171] *Id*.

knowledgeable, and New York failed to make Dr. Tawil available for examination by the Board or parties, Accordingly, Dr. Tawil's E-mail message should have been given no weight by the Board. Accordingly, New York has not shown that the Board erred in not addressing this information.

2. Dr. Tawil's Unpublished 1990 Report Is Inapplicable to a SAMA Analysis

New York substitutes attorney argument for evidence regarding Dr. Tawil's unpublished draft analysis.[172] While New York describes Dr. Tawil's report as a "site-specific study,"[173] New York's witness, however, did not refer to Dr. Tawil's analysis as a SAMA analysis.[174] Indeed, the pre-filed rebuttal testimony of New York's witness, Dr. Lemay, appeared to cite Dr. Tawil's analysis only to support his (Dr. Lemay's) use of the CONDO code.[175] The only testimony that addressed the substance of Dr. Tawil's analysis was provided by Entergy and the Staff's witnesses; they explained that Dr. Tawil's analysis was not a site-specific SAMA analysis because it did not properly account for variability of the weather or the likelihood of all the accident scenarios.[176] The Staff's experts further explained that Dr. Tawil's analysis assumed one of the worst accident source terms and forced the wind to blow the radioactive plume directly to New York City.[177] These worst-case assumptions prevent any meaningful comparison of his analysis to Entergy's SAMA analysis for Indian Point.

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[172] *See* Petition at 56-57.

[173] *Id.* at 56.

[174] *See* Tr. at 2256-58; *see also* Tr. at 2252-55.

[175] NYS' Pre-Filed Rebuttal Testimony on NYS-12C at 27-28.

[176] Tr. at 2252-55, 2258-59.

[177] Tr. at 2252-55. *See* NRC Staff's Reply to State of New York's Proposed Findings of Fact and Conclusions of Law for Contention NYS-12/12A/12B/12C ("NYS-12C") at 24-25 (May 3, 2013).

Moreover, while New York claims that Dr. Tawil's report shows that site-specific input values could have been developed for Indian Point's SAMA analysis, the issue on review is not whether there was an alternative method for developing input parameters, but whether the record supports the Board's finding that Entergy's input parameters were reasonable. The Board's decision correctly describes the evidence upon which it relied, and that evidence clearly and overwhelmingly supports the Board's conclusions, As such, New York's argument that alternative methods may have been used does not demonstrate any reversible error by the Board.

D. The Use of Similar Per Capita Input Values in SAMA Analyses Conducted for Other Sites is Relevant and Supports Their Use in the Indian Point SAMA Analysis

New York claims that because other licensees used the NUREG-1150 values for license renewal and the Staff has accepted these values in multiple proceedings, they cannot be site-specific.[178] New York, however, fails to address the substance of the Board's holding, in which the Board recognized that even though the per capita input parameter is not site-specific, the combination of a site-specific population with a per capita CDNFRM value renders the SAMA analysis sufficiently site-specific.[179] Moreover, the fact that numerous license renewal applicants have used the same CDNFRM values in their SAMA analyses demonstrates the acceptability of those values, when used in conjunction with a multiplier to account for site-specific differences in population size and distributions.[180] New York fails to show any reason to believe that the Board's determination that Entergy's use of this input value was unreasonable.

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[178] Petition at 57.

[179] LBP-13-13 at 293 ("Entergy's SAMA analysis is sufficiently site specific and a reasonable method under NEPA standards given that key input parameters are per capita based and multiplied by a site-specific population distribution.")

[180] Tr. 1950-52.

V. New York Waived Any Challenge to the Indian Point SAMA Analysis Inputs Other Than the TIMDEC and CDNFRM Inputs

In its Petition, New York asserts that the Board erred by limiting its challenge to the decontamination time (TIMDEC) and non-farm decontamination cost (CDNFRM) input values.[181] In particular, New York argues that Board should have explicitly addressed New York's assertion of errors in the per capita cost of long-term relocation (POPCST) and the per capita value of nonfarm wealth (VALWNF).[182] The record does not support New York's claims. Thus, in response to Board questioning, New York's expert admitted that "CDNFRM and TIMDEC were the most important ones, and the rest had minimal impact of the calculation of the offsite economic cost."[183] Putting aside the issue of whether these other parameters were within the scope of the original contention, New York and its expert chose to limit its challenge to these two parameters and dismissed the other parameters as immaterial to the ultimate issue.[184] Accordingly, New York cannot now assert that the Board's acceptance of New York's own logic and approach constitutes reversible error.

VI. The Board Correctly Determined that Supplementation of the FSEIS Is Not Necessary

In its Petition, New York asserts that the only remedy for a deficient environmental impact statement is to conduct a reanalysis of site-specific environmental impacts and to publish a "revised and supplemental environmental impact statement" with a full public comment process. There is no merit in these assertions.

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[181] Petition at 58.

[182] *Id*. at 58-59.

[183] Tr. at 2054-55; emphasis added. Dr. Lemay further described CDNRFM and TIMDEC as being the "crux of the matter" if one seeks to get to "the parameters that are really at play." *Id*. at 2055.

[184] Neither New York nor its witness ever objected to limiting the discussion of evidence to the CDNFRM and TIMDEC values, and they never claimed any need to address the other "minimal impact" parameters. *See* Tr. at 2054-55; *see also* Tr. at 2195.

Setting aside the fact that New York is wrong in asserting that Entergy's SAMA analysis or the Staff's FSEIS were deficient, its views regarding the need for supplementation of the FSEIS are incorrect. As New York acknowledges, the Board did not reach of the issue of supplementation with respect to NYS-12C, because it found that the Staff's FSEIS did not violate NEPA. Even if the FSEIS had been deficient, however, consideration of the entire adjudicatory record, including any testimony and exhibits presented during the hearing process, provides an acceptable means for supplementing the EIS.[185] The Commission has found that "the hearing process itself allows for additional and more rigorous public scrutiny of the [environmental impact statement] than does the usual circulation for comment."[186] Indeed, multiple federal courts have upheld the NRC's practice of supplementing environmental impact statements through the adjudicatory process.[187] Thus, New York has not shown any error by the Board in not requiring supplementation of the Staff's FSEIS for Indian Point.

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[185] *See, e.g., Entergy Nuclear Generation Co.* (Pilgrim Nuclear Power Station), CLI-12-01, 75 NRC 39, 61 (2012) (*citing Louisiana Energy Servs., L.P.* (Nat'l Enrichment Facility), CLI-05-28, 62 NRC 721, 731 (2005)); *Pacific Gas & Elec. Co.* (Diablo Canyon Power Plant Indep. Spent Fuel Storage Installation), CLI-08-26, 68 NRC 509, 526 (2008); *Dominion Nuclear North Anna, LLC* (Early Site Permit for North Anna ESP Site), CLI-07-27, 66 NRC 215, 230 (2007); *Hydro Res., Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-04, 53 NRC 31, 53 (2001) ("to the extent that any environmental findings by the Presiding Officer (or the Commission) differ from those in the FEIS, the FEIS is deemed modified by the decision").

[186] *Hydro Res.,* CLI-01-04, 53 NRC at 53 (*quoting Philadelphia. Elec. Co.* (Limerick Generating Station, Units 1 & 2), ALAB-819, 22 NRC at 707).

[187] *See Citizens for Safe Power, Inc. v. NRC*, 524 F.2d 1291, 1294 n. 5 (D.C. Cir. 1975) (holding that the "deemed modified" principled did not depart "from either the letter or the spirit" of NEPA); *Ecology Action v. AEC*, 492 F.2d 998, 1001–02 (2d Cir. 1974) (omissions from an FEIS can be cured by subsequent consideration of the issue in an agency hearing); *New England Coalition on Nuclear Pollution v. NRC*, 582 F.2d 87, 94 (1st Cir. 1978) (the court had "no trouble finding" that the NRC's supplementation process satisfies NEPA). *See also Public Serv. Co. of N.H.* (Seabrook Station, Units 1 & 2), CLI-78-1, 7 NRC 1 (1978); *Limerick*, ALAB-819, 22 NRC at 705-07).

CONCLUSION

For the foregoing reasons, the Staff respectfully submits that New York's Petition fails to demonstrate any reason for the Commission to undertake review of the Board's decision on Contention NYS-12C or to require revision and recirculation of the Staff's FSEIS discussion of SAMA issues for further analysis and comment. New York's Petition should therefore be denied.

Executed in accord with 10 C.F.R. 2.304(d),

/Signed (electronically) by/

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Dated at Rockville, Maryland
this 28th day of April, 2014

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of	)	
	)	
ENTERGY NUCLEAR OPERATIONS, INC.	)	Docket No. 50-247-LR/50-286-LR
	)	
(Indian Point Nuclear Generating Units 2 and 3)	)	

CERTIFICATE OF SERVICE

Pursuant to 10 C.F.R. § 2.305, I hereby certify that copies of the foregoing "NRC STAFF'S ANSWER TO 'STATE OF NEW YORK PETITION FOR REVIEW OF ATOMIC SAFETY AND LICENSING BOARD DECISION LBP-13-13 WITH RESPECT TO CONSOLIDATED CONTENTION NYS-12C,'" dated April 28, 2014, have been served upon the Electronic Information Exchange, the NRC's E-Filing System, in the above-captioned proceeding, this 28th day of April, 2014.

/Signed (electronically) by/

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