UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

<u>Before the Atomic Safety and Licensing Board</u>

In the Matter of	)	
	)	Docket No. 50-443-LR
NextEra Energy Seabrook, LLC	)	
	)	ASLBP No. 10-906-02-LR
(Seabrook Station, Unit 1)	)	

NEXTERA'S REPLY TO ANSWERS TO NEXTERA'S
<u>MOTION FOR SUMMARY DISPOSITION OF CONTENTION 4D</u>

I.   INTRODUCTION

NextEra Energy Seabrook, LLC ("NextEra") hereby replies to the answers of the NRC

Staff and of Friends of the Coast/New England Coalition ("FOTC/NEC")[1] to NextEra's motion

for summary disposition of Contention 4D.[2] In essence, the NRC Staff takes the position that, in

order to determine whether any additional severe accident mitigation alternatives ("SAMA") are

cost beneficial, the sensitivity (Exposure Index ("EI")) analysis performed by NextEra to gauge

the possible effect of using a more complex atmospheric dispersion model should be added to

upper bound estimates of SAMA benefits derived using the 95th percentile core damage

frequency ("CDF") as an uncertainty analysis. *See, e.g.,* Staff Answer at 1-2, 10-12.

FOTC/NEC essentially copies the NRC Staff's position, making no effort to provide any expert

support of its own to defend any of its original claims. *See* FOTC/NEC Answer at 3. NextEra

respectfully submits that this position is incorrect for two fundamental reasons.

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[1] NRC Staff Answer to NextEra's Motion for Summary Disposition of Friends of the Coast/New England Coalition
Contention 4D (SAMA Analysis Atmospheric Modeling) (July 15, 2013) ("Staff Answer"); Friends of the Coast
and New England Coalition's Answer to NextEra's Motion for Summary Disposition of Contention 4B (SAMA
Source Terms) and Contention 4D (SAMA Analysis Atmospheric Modeling) (July 15, 2013) ("FOTC/NEC
Answer").

[2] NextEra's Motion for Summary Disposition of Friends of the Coast/New England Coalition Contention 4D
(SAMA Analysis Atmospheric Modeling) (May 10, 2013) ("Motion").

First, Commission case law and guidance direct use of mean values (best estimates) in determining whether SAMAs are cost beneficial, consistent with the Commission's obligations under NEPA and its practices in performing cost-benefit analysis. Second, adding the EI sensitivity analysis to the upper bound estimates, which already include a substantial uncertainty factor, is inconsistent with NRC practice and essentially amounts to double counting. The more appropriate conclusion is that the possible impact from using a more complex atmospheric dispersion model is much smaller than, and well within the bounds of, the uncertainty factor that was applied to produce upper bound values.

In addition, even if the Licensing Board were to deny NextEra's motion (which as discussed below, it should not), it would still be appropriate to narrow the scope of the issues remaining in contention. As provided in 10 C.F.R. § 2.710(a), all material facts that have not been controverted must be deemed admitted. Here, FOTC/NEC has not controverted – indeed, has explicitly admitted – a multitude of factual statements not only establishing the reasonableness of using the ATMOS dispersion model (embedded in MACCS2) for the SAMA analysis, but also refuting all of FOTC/NEC's original claims concerning the appropriateness of using MACCS2 for a 50-mile domain; whether it accounts for sea breeze effects, hot spots, terrain effects, and onsite deposition and re-suspension; and whether use of meteorological data from a single anemometer and year is reasonable. Given these admissions by FOTC/NEC (also agreed to by the Staff with additional expert support), all of these issues should be considered resolved.

II. BACKGROUND

As reflected in NextEra's Supplement 2 to Severe Accident Mitigation Alternatives (Mar. 19, 2012) ("SAMA Supplement"), included as Attachment 4D-B to the Staff Answer, the cost-

benefit analysis of SAMAs provided as part of NextEra's application presented a baseline

estimate of SAMA benefits with a multiplier of 2.1 relating to seismic risk, and an additional

estimate reflecting inclusion of uncertainty. *See* SAMA Supplement, Table 1. NextEra described

this approach in its discussion of "SAMA Sensitivity Assessments" (*id.* at 33), which also

included numerous other sensitivity analyses, and under the heading "Sensitivity to Upper Bound

Accident Costs," explained:

> The nominal cost-benefit assessment considers the mean (best estimate) core
> damage/accident release frequencies derived from the Seabrook SB2011 PRA.
> To account for upper bound uncertainty in the PRA model results, the best
> estimate accident costs are multiplied by an uncertainty factor of 2.35 to represent
> the cost-benefit associated with the 95th percentile (upper bound) accident release
> impacts. The increase factor of 2.35 is based on the ratio of the best estimate
> CDF mean value of 1.23E-05/yr to the CDF upper bound (95th percentile) value
> of 2.86E-05/yr. This approach is consistent with the NEI 05-01 industry guidance.
> The upper bound cost-benefit of each SAMA candidate is considered when
> judging the candidate as being potentially cost-beneficial. Although this approach
> is consistent with NRC expectation for identification of potentially cost-beneficial
> SAMAs, it is noted that final determination of cost and benefit would include a
> more realistic assessment of both the cost of a specific modification and its
> associated value in risk reduction.

Id. at 35. As this discussion makes clear, while NextEra considered whether uncertainty might

make additional SAMAs cost beneficial,[3] final determinations of cost benefit are based on

realistic assessment.

In its motion for summary disposition of Contention 4D, NextEra performed an

additional sensitivity analysis to compare the results of wind roses produced using CALMET

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[3] In the Affidavit accompanying the Staff Answer,[3] the NRC Staff states that NextEra identified three SAMAs as
being potentially cost-beneficial in its baseline analysis, three additional SAMA's as potentially cost-beneficial
from its uncertainty analysis, and one further SAMA as being cost-beneficial based on the seismic multiplier.
Affidavit of John G. Parillo Concerning NextEra's Motion for Summary Disposition of Friends of the Coast/New
England Coalition Contention 4D (SAMA Analysis Atmospheric Modeling) (July 15, 2013) at ¶¶ 9-11. It is
unclear why the NRC Staff parsed the potentially cost-beneficial SAMA in this manner. As NextEra's SAMA
analysis shows, six SAMAs were identified as potentially cost-beneficial using the baseline analysis with seismic
multiplier, and the uncertainty analysis indicated that one additional SAMA might be cost-beneficial. *See* SAMA
Supplement, Table 1.

with the annual wind rose for the Seabrook Station used in the MACCS2 analysis. Motion at 65.

This Exposure Index analysis was specifically described as a sensitivity analysis[4] providing an

indication of the change in risk that could result from using the CALMET based trajectory rose

instead of the Seabrook Station wind rose reflected in the SAMA analysis. Motion at 65-66.

The EI sensitivity analysis estimated a potential increase of approximately 32% in total averted

costs (*id.* at 67) and evaluated the potential effect on the SAMA closest to becoming cost-

beneficial (SAMA #77), based on the best estimate with seismic multiplier to quantify this total

benefit. *Id.* at 68. As reflected in the Motion, "[i]ts best estimate (with seismic risk multiplier)

total benefit of $6.41 million would need to increase by more than a factor of two in order to

meet or exceed the expected SAMA cost of more than $15 million." *Id. See also* Joint

Declaration of Dr. Steven R. Hanna and Dr. Kevin R. O'Kula in Support of NextEra's Motion

for Summary Disposition of Contention 4D (SAMA Analysis Atmospheric Modeling) (May 10,

2013) at ¶ 131 ("Joint Declaration"). As discussed below, NextEra's use of best estimate (i.e.

mean) values is consistent with NRC precedent and guidance.

III. SAMA ANALYSIS IS BASED ON MEAN VALUES (BEST ESTIMATES)

Two basic tenets of NEPA law are germane to whether mean (best estimate) or upper

bound estimates should be used to determine whether SAMAs are cost beneficial. First, NEPA

does not require analysis of worst-case scenarios. *Robertson v. Methow Valley Citizens Counsel*,

490 U.S. 332, 333 (1989).

> [Council on Environmental Quality] explained that by requiring that an EIS focus
> on reasonably foreseeable impacts, the new regulation "will generate information
> and discussion on those consequences of greatest concern to the public and of
> greatest relevance to the agency's decision," rather than distorting the decision-

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[4] The analysis was presented in a report entitled "Exposure Index Study Using MACCS2 and CALMET: A Sensitivity Study Supporting the Seabrook Station SAMA Analysis," ("EI Report"), provided as Attachment 4 to the Motion.

making process by overemphasizing highly speculative harms. [The] regulation is entitled to substantial deference.

Id. at 356 (citations omitted).[5] Therefore, a NEPA analysis should estimate realistic consequences, not the worst-case scenario.

Second, NEPA requirements are "'tempered by a practical rule of reason.'" *Entergy Nuclear Generation Co.* (Pilgrim Nuclear Power Station), CLI-10-22, 72 N.R.C. 202, 208 (2010), citing *Communities, Inc. v. Busey*, 956 F.2d 619, 626 (6th Cir. 1992); *Hells Canyon Alliance v. United States Forest Serv.*, 227 F.3d 1170, 1184-85 (9th Cir. 2000). *See also Entergy Nuclear Generation Co.* (Pilgrim Nuclear Power Station), CLI-10-11, 71 N.R.C. 287, 315-16 (2010). Accordingly, NEPA requires only

> a "reasonable" mitigation alternatives analysis, containing "reasonable" estimates, including, where appropriate, full disclosures of any known shortcomings in available methodology, disclosure of incomplete or unavailable information and significant uncertainties, and a reasoned evaluation of whether and to what extent these or other considerations credibly could or would alter the Pilgrim SAMA analysis conclusions on which SAMAs are cost-beneficial to implement."

Pilgrim, CLI-10-22, 72 N.R.C. at 208-09 (citations omitted).

Consistent with these principles, the Commission has explained that:

> NRC SAMA analysis is neither a worst-case nor a best-case impacts analysis. It is NRC practice to utilize the *mean* values of the consequence distributions for each postulated release scenario or category – the mean estimated value for predicted total population dose and predicted off-site economic costs. These mean consequence values are multiplied by the estimated frequency of occurrence of specific accident scenarios to determine population dose risk and offsite economic cost risk for each type of accident sequence studied. There is in SAMA analysis, therefore, an averaging of potential consequences. As a policy matter, license renewal applicants are not required to base their SAMA analysis upon consequence values at the 95th percentile consequence level (the level used for the GEIS severe accident environmental impacts analysis).

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[5] "[W]orst-case" scenarios need not be considered because their consideration involves "the arduous and unproductive task of analyzing conceivable, but very speculative, catastrophes" and diverts NRC's "limited resources" from other more productive efforts. *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-02-25, 56 N.R.C. 340, 354 (2002).

Pilgrim, CLI-10-11, 71 N.R.C. at 316-17 (emphasis in original) (footnote omitted). Further, the

Commission has agreed that use of 95th percentile values are essentially a worst case analysis not

required by NEPA.

> As the Board in LBP-11-18 states, "the 95th percentile is akin to a worst-case
> scenario analysis." And the Supreme Court expressly has held that NEPA does
> not require a "worst case" inquiry. We ourselves have stated that to require
> "worst case" analyses can easily lead to "limitless" NEPA analyses because it is
> always possible to introduce yet another "additional variable to a hypothetical
> scenario" to "conjure up a worse 'worst case.'"

Entergy Nuclear Generation Co. (Pilgrim Nuclear Power Station), CLI-12-1, 75 N.R.C. 39, 56-

57 (2012) (footnotes omitted).[6]

The Commission's admonition to use mean values is consistent not only with NEPA, but

also consistent with Commission policy on probabilistic risk assessment ("PRA") and cost-

benefit analysis. In its Safety Goals Policy Statement (51 Fed. Reg. 30,028, 30,031 (Aug. 21,

1986)), the Commission adopted the use of mean estimates for implementing the quantitative

objectives of the safety goal policy. In its policy statement on the use of PRA in nuclear

regulatory activities, the Commission affirmed that "PRA evaluations in support of regulatory

decisions should be *as realistic as practicable*." 60 Fed. Reg. 42,622, 42,629 (Aug. 16, 1995)

(emphasis added). Thus, the cost-benefit portion of a SAMA analysis looks at the average case,

not the worst case, in determining whether a SAMA would be potentially cost beneficial.

Otherwise, the cost benefit analysis would be skewed.

> In the same vein, the NRC's Regulatory Analysis Guidelines state:
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> Value and impact estimates are to be incremental best estimates relative to the
> baseline case. . . .
> <div align="center">*   *   *</div>

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[6] While these holdings relate to the consequence portion of risk assessment, there is no reason why probability
estimates would be treated any differently.

When possible, best estimates should be made in terms of the "mean" or "expected value." However, depending upon the level of detail available from the data sources employed in the regulatory analysis, acceptable estimates could include other point estimates such as the median. However, the rationale for use of estimates other than mean values should be provided.

NUREG/BR-0058, Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission (Rev. 4, Sept. 2004) ("Guidelines") at 23 (emphasis added).[7] The NRC Handbook implementing these guidelines states:

Section 4.3 of the [Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission] requires the use of best estimates. Often these are evaluated in terms of the mean or "expected value," the product of the probability of some event occurring and the consequences which would occur assuming the event actually happens. Sometimes, measures other than the expected value may be appropriate, such as the median or even a point estimate. *However, the expected value is generally preferred.*

NUREG/BR-0184, Regulatory Analysis Technical Evaluation Handbook (Jan. 1997) ("Handbook") at 4.7, 5.20 (emphasis added).

Both the NRC Regulatory Analysis Guidelines and Handbook also call for uncertainty analysis, which may include presentation of upper and lower bounds or best and worst-case values. *See, e.g.,* Guidelines at 23; Handbook at 5.7 to 5.8. But uncertainty analysis is presented to provide perspective; neither the Guidelines nor the Handbook contemplate using upper-bound estimates to determine if an action is cost-beneficial (which would obviously be inconsistent with the clear direction to use mean values).

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[7] The NRC's Regulatory Analysis Guidelines consider OMB guidelines issued pursuant to various executive orders. For example, OMB Circular A-4, Regulatory Analysis (Sept, 17, 2003) states:

Where there is a distribution of outcomes, you will often find it useful to emphasize summary statistics or figures that can be readily understood and compared to achieve the broadest public understanding of your findings. It is a common practice to compare the "best estimates" of both benefits and costs with those of competing alternatives. These "best estimates" are usually the average or the expected value of benefits and costs. Emphasis on these expected values is appropriate as long as society is "risk neutral" with respect to the regulatory alternatives. While this may not always be the case, you should in general assume "risk neutrality" in your analysis. If you adopt a different assumption on risk preference, you should explain your reasons for doing so.

OMB Circular A-4 at 42.

Consistent with Commission direction, NRC-endorsed guidance on preparation of SAMA analysis indicate that cost-benefit analysis of SAMAs should use baseline risk measures using mean values (NEI 05-01 at 15-17, 22, 27-28).[8] Sensitivity analysis, including a discussion of uncertainty, is then performed to evaluate how changes in assumptions would affect the cost benefit analysis. *Id.* at 30. As explained in that guidance:

> A discussion of CDF uncertainty, and conservatisms in the SAMA analysis that off-set uncertainty, should be included. For example, use of conservative risk modeling to represent a particular plant change may be used to offset uncertainty in risk modeling; use of conservative implementation cost estimates may be used to offset uncertainty in cost estimates; and use of an uncertainty factor derived from the ratio of the 95th percentile to the mean point estimate for internal events CDF may be used to account for CDF uncertainties. Estimate an uncertainty factor based on this discussion and perform a sensitivity analysis using the uncertainty factor on the results. [Based on analysis to date the ratio of the 95th percentile to the mean point estimate for typical internal events CDF values is 2 to 5 (Reference 1).]

> Provide pertinent results and discuss how they affect the conclusions of the SAMA analysis. If SAMAs appear cost-beneficial in the sensitivity results, discussion of conservatisms in the analysis, (e.g., conservatisms in cost estimates discussed in Section 7.2), and their impact on the results may be appropriate.

Id. at 30. Thus, the results of uncertainty analysis may prompt further discussion of the conservatisms in the analysis,[9] but they are not used to determine whether a SAMA is cost-beneficial.

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[8] *See* Notice of Availability of the Final License Renewal Interim Staff Guidance LR–ISG–2006–03: Staff Guidance for Preparing Severe Accident Mitigation Alternatives Analyses, 72 Fed. Reg. 45,466 (Aug. 14, 2007) ("The NRC staff recommends that applicants for license renewal follow the guidance provided in Nuclear Energy Institute (NEI) 05–01, 'Severe Accident Mitigation Alternatives (SAMA) Analysis— Guidance Document,' Revision A, when preparing their SAMA analyses."). *See also* Regulatory Guide 4.2, Supp. 1, Preparation of Environmental Reports for Nuclear Power Plant License Renewal Applications (June 2013) at 44 ("In structuring the analysis, the applicant should consider the methodology presented in NUREG/BR-0184, 'Regulatory Analysis Technical Evaluation Handbook,' issued January 1997, and the guidance provided in NEI 05-01, Revision A, 'Severe Accident Mitigation Alternatives (SAMA) Analysis, Guidance Document,' issued November 2005.").

[9] The discussion of the Seabrook SAMA analysis includes considerable discussion of such conservatism. As the draft SEIS states, "

> The majority of the SAMA evaluations were performed in a bounding fashion in that the SAMA was assumed to eliminate the risk associated with the proposed enhancement. On balance, such calculations overestimate the benefit and are conservative. The NRC staff reviewed NextEra's bases for calculating the

The position taken by the NRC Staff and echoed by FOTC/NEC that upper bound

estimates should be used appears based solely on dicta in one of the Commission decisions in the

Pilgrim license renewal proceeding. Staff Answer at 11-12, citing *Pilgrim*, CLI-12-1, 75 N.R.C.

at 58. In that case, the Licensing Board had ruled that an intervenor's claim that the 95th

percentile of consequence values should be used rather than the mean had not been raised as part

of the admitted SAMA contention in the proceeding. *See Pilgrim*, CLI-12-1, 75 N.R.C. at 55.

After affirming this ruling, the Commission added:

> We further note that in a highly predictive analysis such as a SAMA analysis,
> there are bound to be significant uncertainties, and therefore an uncertainty
> analysis is performed. Baseline analysis results therefore are multiplied by an
> uncertainty factor. The final cost-benefit comparisons are based not on the
> baseline analysis results, but on revised results that take into account an
> uncertainty factor. Pilgrim Watch does not address the additional uncertainty
> analysis.

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risk reduction for the various plant improvements and concludes that the rationale and assumptions are reasonable and generally conservative (i.e., the estimated risk reduction is higher than what would actually be realized).

NUREG-1437, Supp. 46, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 46 Regarding Seabrook Station, Second Draft Report for Comment (April 2013) ("DSEIS") at 5-13. *See also id*. at F-33. Further, in estimating the cost of SAMAs, "[t]he cost estimates, conservatively, did not specifically account for inflation, contingencies, implementation obstacles, or replacement power costs (RPC)." DSEIS at 5-13, F-45. Moreover, the bases for calculating the risk reduction for the various plant improvements are "generally conservative (i.e., the estimated risk reduction is higher than what would actually be realized)." *Id.* at F-34. As also discussed in the draft SEIS, NextEra examined five years of meteorological data and chose the most conservative for its baseline estimates. *Id.* at F-22. Use of the meteorological data from the other years examined would have decreased the population dose risk in the range of 5 to 13 percent and decreased the offsite economic risk by 3 to 12 percent. *Id.* The baseline analysis also included perpetual rainfall in the 40-50 mile spatial segment. *Id.* If measured rainfall had been used, the population dose risk would have decreased by 14 percent and the offsite economic risk would have decreased by 15 percent. *Id.* Increased plume mixing and dispersion associated with the formation of a mixing front was conservatively ignored. Id. at F-24. The evacuation time used in the baseline analysis was based on estimates under adverse weather conditions and assumed a lower percentage of the population evacuating than was assumed in NRC risk assessment. *Id.* at F-23. And NextEra applied a multiplier of 2.1 to its baseline risk estimates (separate from the uncertainty analysis) to account for the potential impact of revised seismic hazard curves. *Id.* at F-18. Moreover, as reflected in the Declaration of Randy Gaunt Concerning NextEra's Motion for Summary Disposition of Friends of the Coast/New England Coalition Contention 4B (July 15, 2013) at ¶¶ 30-31, 33-35, the release fractions used in NextEra's SAMA analysis are also conservative.

Id. at 58 (citing Pilgrim SEIS,[10] Vol. 2, at G-41, where revised baseline benefits were increased

by a factor of 1.62, the ratio of the 95th percentile core damage frequency ("CDF") to the mean

CDF). This statement is dicta because it was unrelated to holding that a challenge to use of mean

values had not been timely raised. Further, the Commission's statement that final cost benefit

comparisons are based on revised results that take into account an uncertainty factor was not

based on any Licensing Board ruling or on the briefs before the Commission,[11] but rather appears

to have been based simply on the Commission's own reading of the Pilgrim SEIS. Moreover,

the Pilgrim SEIS cited by the Commission does not refer to any general practice. To the

contrary, the page of the Pilgrim SEIS cited by the Commission states that "the NRC staff

requested that the baseline evaluation be revised to include only the impact of internal and

external events (without uncertainties), and that the impact of the analysis of uncertainties on the

SAMA evaluation be considered separately. . . ." Pilgrim SEIS, *supra* note 10, Vol. 2 at G-41.

It goes on to discuss the results of uncertainty analysis, and observes:

> Entergy reexamined the Phase II SAMAs to determine if any would be potentially
> cost beneficial if the revised baseline benefits were increased by an additional
> factor of 1.6. No additional SAMAs were identified.

Id. That Entergy chose to consider whether the results of the uncertainty analysis might affect its

cost-benefit conclusions in no way implies that "final cost benefit comparisons are based on

revised results that take into account an uncertainty factor." Thus, the dicta in CLI-12-1 should

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[10] NUREG-1437, Supp. 29, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 29 Regarding Pilgrim Nuclear Power Station (July 2007) ("Pilgrim SEIS").

[11] *See Pilgrim*: Memorandum and Order (Ruling on Timeliness of Mean Consequence Values Issue*)* (Mar. 3, 2011) (ADAMS Accession No. ML110620363); NRC Staff's Answer to Pilgrim Watch's Request for Review of the Licensing Board's July 19, 2011 Partial Initial Decision (LBP-11-18) (Aug. 15, 2011) at 17-20 (ADAMS Accession No. ML11227A290); Entergy's Answer Opposing Pilgrim Watch's Request for Review (Aug. 15, 2011) at 17-20 (ADAMS Accession No. ML11227A296). *See also* NRC Staff Brief Regarding Timeliness of Pilgrim Watch's Raising of Means Consequences Concern (Oct. 1, 2010) (ADAMS Accession No. ML102770491); NRC Staff's Reply to Pilgrim Watch's Brief (Oct. 8, 2010) (ADAMS Accession No. ML102810699).

not overrule the numerous Commission pronouncements that cost-benefit analysis should be based on best estimates (mean values).

The position taken by the Staff also appears inconsistent with its position and the disposition of a similar contention in the Pilgrim proceeding. In assessing whether a more complex dispersion model might change SAMA results in the Pilgrim proceeding, the Staff testified that next most cost-beneficial SAMA was more than a factor of two greater than its benefit.[12] Review of the results of the Pilgrim SAMA analysis, which are contained in Table G-4 of the Pilgrim SEIS, indicates that this next most cost-beneficial SAMA was SAMA #8, with a implementation cost (>$5,000,000) more than twice the benefit ($2,410,000).[13] The $2,410,000 benefit for SAMA #8 in Table G-4 of the Pilgrim SEIS is taken from Pilgrim's Revised Summary of Phase II SAMA Analysis and is the baseline benefit *without uncertainty*.[14] It is therefore very surprising that the Staff is taking a different position in the Seabrook proceeding.

Finally, it should be recognized that a contention advocating use of 95th percentile consequence levels was rejected in this proceeding. *Seabrook*, LBP-11-2, 73 N.R.C. 28, 77 (2011). It is therefore inappropriate to now deny summary disposition of Contention 4D based

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[12] *Pilgrim*, Exhibit NRC-14, NRC Staff Testimony of Nathan E. Bixler and S. Tina Ghosh Concerning the Impact of Alternative Meteorological Models on the Severe Accident Mitigation Alternatives Analysis at ¶ A42 (ADAMS Accession No. ML110330544); *Pilgrim*, Exhibit NRC-15, NRC Staff Testimony of James V. Ramsdell, Jr. Concerning the Impact of Specific Meteorological Conditions On the Severe Accident Mitigation Analysis at ¶ A36 (ADAMS Accession No. ML110600934) ("Using the values in the [Pilgrim] FSEIS, an increase in the value of the offsite consequences by a factor of about 2.5 would be needed to make the next lowest cost SAMA appear cost-beneficial"). (Note that an increase in offsite consequences of about 2.5 translated into an increase of closer to 2 in benefit, because offsite consequences only constituted a percentage of total risk.) *See also Entergy Nuclear Generation Co.* (Pilgrim Nuclear Power Station), LBP-11-18, 74 N.R.C 29, 40-41, 48-50 (2011).

[13] Pilgrim SEIS, *supra* note 10, Vol. 2 at G-28 (Table G-4); *Pilgrim*, Exhibit ENT-1, Testimony of Dr. Kevin R. O'Kula and Dr. Steven R. Hanna on Meteorological Matters Pertaining to Pilgrim Watch Contention 3 at ¶¶ A46-A47 (ADAMS Accession No. ML110030985) (identifying this next most cost-beneficial SAMA as SAMA #8, with a implementation cost (>$5,000,000) of more than twice the benefit ($2,410,000), based on the results in Table G-4 of the Pilgrim SEIS).

[14] *See Pilgrim*, Exhibit ENT-7, License Renewal Application Amendment 4, at 35 (Table RAI.3-2 Revised Summary of Phase II SAMA Analysis) (ADAMS Accession No. ML110600873).

on an argument that 95th percentile values should be used to determine whether SAMAs are cost-beneficial.

IV.   ADDING THE EI SENSITIVITY ANALYSIS TO UPPER BOUND ESTIMATES IS DOUBLE COUNTING

The Staff's position that the EI sensitivity analysis should be added to upper bound estimates is also inconsistent with the manner in which the NRC performed sensitivity and uncertainty analysis. As reflected in the DSEIS, a multiplier of 2.35 was derived from the ratio of the CDF mean value to the 95th percentile to account for uncertainty. Thus, in effect, the upper bound CDF was used as a surrogate for general analytic uncertainty. Multiple other sensitivity analyses were also performed.[15] Other than the sensitivity analysis of the impact of updated seismic hazard curves (which resulted in a seismic multiplier of 2.1 that NextEra factored into its cost-benefit analysis[16]), the results of these sensitivity analyses were small compared to the 2.35 uncertainty multiplier. Aside from the seismic multiplier, none of the other sensitivity-analysis results were added to the uncertainty analysis.

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[15] *See generally* SAMA Supplement at 33-35(describing sensitivity analyses relating to Annual Met Data Set, Meteorology Specification in last Spatial Segment, Sea-breeze Sensitivity, Release Category LE4 Sensitivity to No Evacuation, Sensitivity to Variation in Other Level 3 Parameters, Sensitivity to Variation in Discount Rate, Sensitivity to Extended Period, Sensitivity to Upper Bound Accident Costs, and Sensitivity to Increased Seismic Risk); DSEIS at 5-11 to 5-12. As described in the DSEIS, four sensitivity analyses were performed varying the release height of a plume. DSEIS at F-21. Two sensitivity analyses were performed varying the thermal content of each release. *Id.* Two sensitivity analyses were performed varying building wake effects. *Id.* at F-21 to F-22. Sensitivity analyses were performed using meteorological data from four other years. *Id.* at F-22. Several sensitivity analyses were performed using refined population projections. Multiple sensitivity analyses were performed varying evacuation speed and delays, including analysis assuming no evacuation. *Id.* Sensitivity analyses were performed increasing the frequency of thermal internal boundary ("TIBL") and TIBL lid height. *Id.* at F-24. A sensitivity analysis was performed to consider the impact of updated seismic hazard curves. *Id.* at F-2, F-13, F-18, F-25-26, F-46. Two sensitivity analyses were performed varying the discount rate. *Id.* at F-51, F-57. And, a sensitivity analysis was performed increasing the analysis period to encompass not only the period of extended operation but also the remaining term on the current license. *Id.* at F-51.

[16] In determining whether SAMAs may be cost-beneficial, NextEra applied its baseline estimates with seismic multiplier included, both in its LRA (*see* SAMA Supplement, Table 1), and in its summary disposition motion (Joint Declaration at ¶ 131).

For example, NextEra's sensitivity analysis of extending the analyzed period of extended operation from 20 to 41 years determined that the cost-benefit worth during the extended period would be greater by a factor of 1.3. SAMA Supplement at 35. This increase was not added to the upper bound estimates. Instead, NextEra concluded that the increased benefit was "significantly less than the upper bound (95th percentile) [cost-benefit worth]" (*id.*) and that

> The cost-benefit worth of all SAMA candidates assuming the 41 year extended
> period is shown to be less than the SAMA cost-benefit worth when considering
> the uncertainty (upper bound) benefit.

Id. Thus, the effect of a sensitivity analysis of magnitude very close to that estimated by the EI analysis was considered by comparison to the uncertainty value, not by addition to it.

There is no basis to treat the EI sensitivity analysis results any differently. The potential increase of approximately 30 percent indicated by the EI analysis is well within (less than a fourth of) the uncertainty multiplier and therefore already adequately accounted for in the uncertainty analysis.[17]

Further, there are many sensitivity analysis results that could be added to the uncertainty factor, which would make the upper bound estimates increasingly unrealistic. Indeed, adding the results of every sensitivity analysis to the upper bound estimates, and using those upper bound estimates for cost-benefit determinations, would in the end produce the sort of "worst case" analyses that the Commission has cautioned could easily become "limitless." *See Pilgrim*, CLI-12-1, 75 N.R.C. at 56-57.

In sum, NextEra's summary disposition motion presented a sensitivity analysis to show that a more complex dispersion model would not be expected to produce results significantly

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[17] The potential 30-percent increase suggested by the EI analysis is also similar in magnitude to the conservatisms recognized in the DSEIS. *See supra* note 9.

different than the ATMOS model embedded in MACCS2, and therefore that use of MACCS2

meets the standard of reasonableness. The sensitivity analysis demonstrated this. Further, both

the NRC Staff and FOTC/NEC have admitted that:

- The ATMOS model is reasonable for a SAMA analysis because that analysis is focused on calculating integrated (summed) mean annual consequences over a broad region (50-mile radius). Short-term fluctuations in wind direction and terrain effects have little effect on the summed consequences over the entire geographic domain.

- An extensive study (Molenkamp et al. (2004), NUREG/CR-6853) demonstrates that the MACCS2 ATMOS Gaussian plume segment model results are within the same range as more complex dispersion models that account for variable meteorological and terrain effects.

- More accurate modeling of the sea breeze phenomenon would not significantly alter the overall impacts estimated by MACCS2/ATMOS.

- The CALMET trajectory analysis confirms that consideration of time and spatially variable wind fields, such as sea breezes, would have no significant impact on the SAMA analysis results.[18]

Nothing more is required to address the basic claim in Contention 4D that NextEra used an

inappropriate air dispersion model and meteorological data inputs. *See Pilgrim*, CLI-12-1, 75

N.R.C. at 57 (To be litigable in an NRC hearing, a SAMA contention must identify a "deficiency

that could credibly render the SAMA analysis altogether unreasonable under NEPA standards").

In light of all parties' agreement that the MACCS2 modeling was reasonable, further

proceedings to point out that the EI sensitivity results were well within the bounds of the

uncertainty multiplier (already apparent from the record), or to discuss the conservatisms in the

modeling offsetting uncertainty (already discussed in the DSEIS[19]) would contribute little to the

decision making in this proceeding.

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[18] NRC Staff Response to NextEra's Statement of Material Facts for Contention 4D (SAMA Analysis Atmospheric Modeling) (July 15, 2013) at ¶¶ 6-7, 13-14; Friends/NEC Response NextEra's Statement of Material Facts for Contention 4D (SAMA Analysis Atmospheric Modeling) (July 15, 2013) at ¶¶ 6-7, 13-14.

[19] *See supra* note 9.

V. ALL UNCONTROVERTED STATEMENTS OF MATERIAL FACT SHOULD BE DEEMED ADMITTED

Even if the Licensing Board denies NextEra's motion, it should nevertheless narrow the

scope of the issues remaining in controversy by treating as admitted all uncontroverted

statements of material fact set forth in NextEra's Statement of Material Facts (May 10, 2013),

provided in support of the motion for summary disposition of Contention 4D. Pursuant to 10

C.F.R. § 2.710(a), "[a]ll material facts set forth in the statement required to be served by the

moving party will be considered admitted unless controverted by the statement required to be

served by the opposing party." Thus, the Board may grant summary disposition with respect to

uncontroverted matters. *See, e.g.*, *Texas Utilities Co*. (Comanche Peak Steam Electric Station,

Units 1 and 2), LBP-84-44, 20 N.R.C. 1340, 1353-55 (1984); *Pennsylvania Power & Light Co.*

(Susquehanna Steam Electric Station, Units 1 and 2), LBP-81-8, 13 N.R.C. 335, 341-43 (1981).[20]

Here, both the NRC Staff and FOTC/NEC have admitted NextEra's statements 1-9 and

12-23 of NextEra's Statement of Facts,[21] not only agreeing to the reasonableness of the

MACCS2 modeling but also resolving the underlying claims concerning the appropriateness of

using MACCS2 for a 50-mile domain; consideration of sea breeze effects, hot spots, terrain

effects, and onsite deposition and re-suspension; and use meteorological data from a single

anemometer and year. Indeed, FOTC/NEC copies the NRC Staff's admission of these facts

verbatim and makes no effort to provide any expert support of its own in defense of any of its

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[20] Granting summary disposition with respect to the uncontroverted statements of fact would further the purpose of summary disposition to provide an "efficacious means of avoiding unnecessary and possibly time-consuming hearings on demonstrably insubstantial issues. . . ." *See Houston Lighting & Power Co.* (Allens Creek Nuclear Generating Station, Unit 1), ALAB-590, 11 N.R.C. 542, 550 (1980). *See also Statement of Policy on Conduct of Licensing Proceedings*, CLI-81-8, 13 N.R.C. 452, 457 (1981) (encouraging Boards to use the summary disposition process where the proponent of a contention has failed to establish that a genuine issue exists, so that evidentiary hearing time is not unnecessarily devoted to such issues.)

[21] NRC Staff Response to NextEra's Statement of Material Facts for Contention 4D (SAMA Analysis Atmospheric Modeling) (July 15, 2013); Friends/NEC Response NextEra's Statement of Material Facts for Contention 4D (SAMA Analysis Atmospheric Modeling) (July 15, 2013).

original claims. Given the parties' admission of these facts and FOTC/NEC's failure to make

any effort on its own to defend its contention, all of the uncontroverted statements of fact should

be deemed admitted and resolved in this proceeding.

VI.   CONCLUSION

For all the reasons discussed above, the Board should grant NextEra's motion for

summary disposition of Contention 4D.

Respectfully Submitted,

/Signed electronically by David R. Lewis /

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Dated: July 22, 2013	Counsel for NextEra Energy Seabrook, LLC

In the Matter of	)
	) Docket No. 50-443-LR
NextEra Energy Seabrook, LLC	)
	) ASLBP No. 10-906-02-LR
(Seabrook Station, Unit 1)	)

CERTIFICATE OF SERVICE

I hereby certify that the foregoing NextEra's Reply to Answers to NextEra's Motion for

Summary Disposition of Contention 4D has been served through the E-Filing system on the

participants in the above-captioned proceeding, this 22nd day of July 2013.

/Signed electronically by David R. Lewis/

David R. Lewis