

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD PANEL

Before Administrative Judges:

SERVED 10/30/07

Ann Marshall Young, Chair¹
Dr. Paul B. Abramson
Dr. Richard F. Cole

In the Matter of:

ENTERGY NUCLEAR GENERATION
COMPANY AND ENTERGY NUCLEAR
OPERATIONS, INC.
(Pilgrim Nuclear Power Station)

Docket No. 50-293-LR

ASLBP No. 06-848-02-LR

October 30 , 2007

MEMORANDUM AND ORDER

(Ruling on Motion to Dismiss Petitioners Contention 3
regarding Severe Accident Mitigation Alternatives)

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¹ Judge Young's dissent from this Order is set out below

I. Introduction

This proceeding involves the application of Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc., (Entergy) to renew its operating license for the Pilgrim Nuclear Power Station (PNPS) for an additional twenty-year period. In LBP-06-23, issued October 16, 2006, this Licensing Board granted the Petition to Intervene of, and admitted two contentions submitted by, the non-profit citizens' organization, Pilgrim Watch.² In this Memorandum and Order we grant Applicant Entergy's Motion seeking Summary Disposition of one of those contentions (Pilgrim Watch Contention 3), finding that the Applicant has demonstrated the absence of any genuine issue of material fact with regard thereto.

II. Background

Contention 3 challenged the Applicant's handling of Severe Accident Mitigation Alternatives [hereinafter "SAMAs"] and, as admitted, reads as follows:

Applicant's SAMA analysis for the Pilgrim plant is deficient in that the input data concerning (1) evacuation times, (2) economic consequences, and (3) meteorological patterns are incorrect, resulting in incorrect conclusions about the costs versus benefits of possible mitigation alternatives, such that further analysis is called for.³

Not at issue here, as discussed below in more depth, because these matters were raised and eliminated at the contention admissibility stage, are issues related to: (1) the adequacy of the computer code (MACCS2) used to perform the SAMA computations; (2) the use for SAMA analyses of probabilistic (as opposed to deterministic) methodologies; and (3) the health effects of low doses of radiation.

² Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station), LBP-06-23, 64 NRC 257 (2006). The Town of Plymouth, Massachusetts, where the Pilgrim plant is located, is also participating in this proceeding as an interested local governmental body, pursuant to 10 C.F.R. § 2.315(c). See id. at 266.

³ Pilgrim, LBP-06-23, 64 NRC at 341.

A. Entergy's Grounds for Motion

Entergy's motion rests upon its argument that it has "performed a series of sensitivity studies to evaluate the effects of changes in the input parameters challenged by Pilgrim Watch on the results of the SAMA analysis," which demonstrate that the effect of the changes to the input parameters are "negligible and immaterial to the results of the SAMA analysis." Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3 at 10 (May 17, 2007) [hereinafter "Entergy Motion"]. Entergy supports its motion with expert declarations arguing that the claims in Contention 3 are without merit, asserting that Pilgrim Watch's claims in Contention 3 are immaterial because the maximum increase in benefit from implementation of additional SAMAs would be less than 4%, while in order for the additional SAMAs to actually become cost effective the benefit would have to increase by over 100%. Id. Entergy asserts, therefore, that pursuant to 10 C.F.R. § 2.710(d)(2) it "is entitled to a decision as a matter of law" since "no genuine issue as to any material fact exists." Id. at 1.

B. NRC Staff's Response to Motion

The Staff in its Response to Entergy's Motion advises this Board that, in its view, "the information Pilgrim Watch sought to have considered in Entergy's SAMA analysis has now been considered, as demonstrated by the additional information supplied by Entergy, thus rendering the first part of the contention moot." NRC Staff Response to Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3 at 6 (July 29, 2007) [hereinafter "Staff Response"]. Furthermore, the Staff agrees that Entergy has adequately shown that the additional factors would not change the results of the SAMA analysis, and, that under 10 C.F.R. § 2.710(b), it is now up to Pilgrim Watch in its Response to show that these conclusions are incorrect. Id. at 6. The Staff advises that its own review of the "reports, declarations and list of material facts that form the basis of Entergy's Motion," indicates that there "are no genuine issues of material fact

that require litigation.” Id. Finally, Staff advise that after examining the 59 material facts listed by Entergy, they agree with 45 and their disagreements with the remaining 14 are minor and would not change the results of the SAMA analysis.

C. Pilgrim Watch Response to Motion and to Staff

Pilgrim Watch responds that Entergy’s Motion raises primarily the same arguments it used in its original response to Contention 3. They aver that Entergy does not bring up “new compelling or overwhelming evidence which would absolutely negate Pilgrim Watch’s issues and concerns already determined by the Board to be litigable,” and therefore the Motion should be denied. Pilgrim Watch’s Answer Opposing Entergy’s Motion for Summary Disposition of Pilgrim Watch Contention 3 at 4 (June 29, 2007). Pilgrim Watch disputes Entergy’s assertion that there is no dispute regarding each of the material facts listed by Entergy to not be at issue, and, in the second portion of their Response, discuss in detail their arguments regarding the three aspects of Contention 3: meteorology, evacuation time estimates, and economic consequences.

Additionally, Pilgrim Watch filed an Answer to the Staff Response in which Pilgrim Watch raises four fundamental issues it sees in the Staff Response: (1) The Staff does not define what are “the parameters, consequences and duration of a ‘severe accident,’” Pilgrim Watch’s Answer to NRC Staff Response to Entergy’s Motion for Summary Disposition of Pilgrim Watch Contention 3 at 1 (July 9, 2007);⁴ (2) the Staff failed to consider the actual meteorology in the area affected by PNPS; (3) the evacuation delay time and times estimates are inaccurate because they (a) are in too narrow a geographic area, (b) do not reflect how people actually

⁴ Pilgrim Watch argues that since a SAMA analysis looks at mitigating effects of a “severe accident,” it is important to define the term. Pilgrim Watch also asserts that there “should be separate SAMA analyses for each level of accident release and duration - from mild to severe.” Id. at 2.

react to disasters, and (c) ignore how the wind blows in a coastal area; and (4) in terms of economic consequences, Pilgrim Watch asserts that important inputs are underestimated or ignored, and that the data is entered into an inappropriate model. Id. at 1-2. Overall, Pilgrim Watch asserts that it has demonstrated that a genuine dispute on a material fact exists because the information it wanted to be considered was ignored by Entergy and the Staff.

III. Legal Standards

A discussion of the legal standards for summary disposition is set out in our ruling on the Motion for Summary Disposition of Contention 1, see Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station), LBP-07-12, ___ NRC ___ (Oct. 17, 2007), and we do not repeat that discussion here. The determinative factor here is whether there is any genuine issue of material fact remaining in dispute - and that determination is made through examination of the filings in respect of the motion. The determination as to materiality in any given instance is controlled by the governing law for the particular issue involved. "As to materiality, the substantive law will identify which facts are material. Only disputes over facts that might affect the outcome of the suit under the governing law will properly preclude the entry of summary judgment. Factual disputes that are irrelevant or unnecessary will not be counted." Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248 (1986) (citing generally 10A C. Wright, A. Miller, & M. Kane, Federal Practice & Procedure § 2727, pp.93-95 (1983)). For this Agency, as we see it, the inquiry becomes whether or not there is at issue any fact which can materially influence the determination the NRC (resting upon the technical evaluation by the Staff) must make;⁵ i.e. in the case of Contention 3 challenging SAMA analyses, the determination rests on

⁵ As we noted in our ruling on the Motion for Summary Disposition of Contention 1, 10 C.F.R. § 2.710(d)(2) provides that a moving party shall be granted summary disposition "if the filings in the proceeding . . . together with the statements of the parties and the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a decision as a matter of law." We believe, therefore, that the regulations of the NRC (which

whether or not there are facts at issue which can affect whether or not a particular SAMA is cost effective.

NRC regulations require specificity and support for the positions parties take in their filings. See, e.g., 10 C.F.R. § 2.710 (b) (requiring that affidavits “set forth facts which would be admissible in evidence,” and that opponents may not rest their arguments on “mere allegations or denials,”); compare 10 C.F.R. § 2.309 (f) (establishing the minimum required support for original contention admissibility).⁶ Of course, a party is not required to prove its case in making or opposing a motion for summary disposition. But if the support a party offers to demonstrate that a genuine dispute exists as to a material fact indicates that, after expanding that support to its logical limits, it cannot support a finding of fact material to the determination the Agency must make,⁷ that party’s position cannot prevail.⁸ The rendering of a determination regarding any

are the governing law for this case and what Anderson requires guide us) clearly teach that a fact cannot be “material” to our ruling here unless its consideration could materially affect the decision of the NRC *vis-à-vis* implementation of any particular SAMA.

⁶ In our view, the conditions set out in 10 C.F.R. § 2.309(f) serve as minimum specificity standards for “specific facts showing there is a genuine issue of fact” (as described in 10 C.F.R. § 2.710(b)).

⁷ Uncontroverted material factual assertions by the moving party shall be admitted. See 10 C.F.R. § 2.710(a).

⁸ “There is no issue for trial unless there is sufficient evidence favoring the nonmoving party for a jury to return a verdict for that party. . . . If th[at] evidence . . . is not significantly probative, summary judgement may be granted.” Anderson, 477 U.S. at 249 (citations omitted). Furthermore, “the judge must ask himself . . . whether a fair minded jury could return a verdict for the [non-movant] on the evidence presented[.]” Id. at 252, and “if there is no evidence upon which a reasonable mind might fairly conclude [for the non-movant], the motion must be granted.” Id. at 253. Finally, the Court said “we agree . . . that the trial judge must direct a verdict (i.e. grant summary disposition) if, under the governing law, there can be but one reasonable conclusion as to the verdict.” Id. at 250. Formerly, it was held that where there was a “scintilla of evidence in support of a [non-movant’s] case, the judge was bound to leave it to the jury, but recent decisions . . . have established a more reasonable rule that . . . there is a preliminary question for the judge . . . whether there is any [evidence] upon which a jury could properly proceed to find a verdict for the [non-movant].” Id. (citing Improvement Co. v. Munson, 14 Wall. 442, 448, 20 L.Ed. 867 (1872)).

motion for summary disposition thus requires a thorough examination of the potential materiality of the support offered by the Parties for their positions.⁹ The foregoing principles have guided our findings herein.

IV. SAMA Analysis - The Requirement and the Methodology

NRC Regulations require, at the operating license renewal stage, that “[i]f the staff has not previously considered severe accident mitigation alternatives for the applicant’s plant in an environmental impact statement or related supplement or in an environmental assessment, a consideration of alternatives to mitigate severe accidents must be provided.” 10 C.F.R. § 51.53(c)(3)(ii)(L).

Several facts that are not in dispute color this requirement:

- a. This is an obligation of the Staff¹⁰ in fulfillment of its National Environmental Policy Act (NEPA) obligations,¹¹ and, therefore it is set out in the environmental portions of NRC regulations, and, because it is part of an environmental effects analysis, the requirement is that the Staff accurately characterize and “consider” these alternatives.
- b. The requirement is made more explicit in Table B-1 of Appendix B to Subpt. A of Part 51 in the section entitled “Postulated Accidents,” wherein NRC regulations require an analysis of “[t]he probability weighted consequences of atmospheric releases, fallout

⁹ “For example, there is no genuine issue if the evidence presented in the opposing affidavits is of insufficient caliber or quantity to allow a rational finder of fact to find [for the non-movant].” *Anderson*, 477 U.S. at 254. A licensing board cannot make such a determination without carefully examining the evidence presented in the parties’ affidavits.

¹⁰ This requirement is implemented, in the first instance, by a requirement for certain information to be included in the Applicant’s Environmental Report.

¹¹ That Part 51 is a part of this Agency’s efforts to satisfy its NEPA obligations is made crystal clear by 10 C.F.R. § 51.2, as well as the fact that the required finding is set out in Table B-1 of Appendix B to Subpart A of Part 51, entitled “Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants.”

onto open bodies of water, releases to ground water, and societal and economic impacts from severe accidents . . . ,” and consideration of “alternatives to mitigate” these sorts of accidents; thus our regulations require the use of probabilistic (as opposed to deterministic) methodology.

- c. The underlying analyses require modeling of extremely complex time and physical condition dependent phenomena, which all those familiar with the field know are generally not amenable to accurate modeling.¹² Therefore, this Agency has wisely determined that these effects and potential benefits of mitigation be examined using “probability weighted consequences.”
- d. The analyses presented here were prepared using the MELCOR Accident Consequence Code System 2 (MACCS2) computer code, whose development was sponsored by the NRC. MACCS2 is the current standard for performing SAMA analysis. In this instance, MACCS2 was used to compute hundreds of scenarios which were then weighted according to their probabilities and then to develop a distribution of probabilities of the consequences and risks. Affidavit of Joseph A. Jones and Dr. Nathan Bixler Concerning Entergy’s Motion for Summary Disposition of Pilgrim Watch Contention 3 ¶ 18 (June 25, 2007) [hereinafter “Jones-Bixler Affidavit”]; O’Kula Decl. ¶¶ 7, 15-17; Radiological

¹² Specifically, for example, actual variations in wind speed and direction are not predictable, nor are actual time-dependent releases from such a hypothetical accident (as the releases are dependent upon the evolution of an accident and how the various components of a power reactor respond). Similarly, the wide seasonal variations in population density can only be treated in a generic sense, the response of the population to actual evacuation efforts may well be fundamentally unpredictable despite all due efforts of law enforcement, and long-term economic effects are dependent upon variables such as individual and mass psychological reaction. Thus, deterministic modeling of these, and many other variables is simply not possible, and therefore such variables are treated probabilistically. The approach taken by users of MACCS2 is to perform numerous computations with the code using a wide variation in code input to develop a set of results with statistical significance. Declaration of Kevin R. O’Kula ¶¶ 7-16 (May 16, 2007) [hereinafter “O’Kula Decl.”].

Dispersion and Consequence Analysis Supporting Pilgrim Nuclear Power Station Severe Accident Mitigation Alternative Analysis, Revision 1 at 4, 5-7 (May 2007) [hereinafter "WSMS Report"]. In our view, it is necessary for the Staff to take a uniform approach to its review of such analyses by license applicants and for performance of its own analyses, and it would be imprudent for the Staff to do otherwise without sound technical justification. Where, as here, these analyses are customarily prepared using the MACCS2 code, and where this code has been widely used and accepted as an appropriate tool in a large number of similar instances, the Staff is fully justified in finding, after due consideration of the manner in which the code has been used, that analysis using this code is an acceptable method for performance of SAMA analysis. Furthermore, a general challenge to the adequacy of this code to make these computations was mounted by Pilgrim Watch *ab initio*, and rejected by this Board. Pilgrim, LBP-06-23, 64 NRC at 340.

- e. The manner in which this Agency meets its obligation to "consider" these alternatives is to perform a cost-benefit analysis, comparing the estimated equivalent dollar amount of computed reduction in the risk of a severe accident associated with implementation of a particular mitigation alternative with the estimated potential cost of implementation of that alternative.¹³

V. The Instant Dispute

We are presented with a Motion for Summary Disposition with regard to Pilgrim Watch

¹³ In the instant case, Staff advises that it considered 281 potential mitigation alternatives, using Probabilistic Risk Assessment techniques to evaluate the reduction in probability (core damage frequency - and therefore in population dose and property damage, etc.) which would be associated with implementation of each alternative and comparing the estimated dollar value of the reduced societal and economic impact with the cost of actual implementation of that alternative. See NRC Staff's Response to Request for Hearing and Petition to Intervene Filed by Pilgrim Watch at 26-27 (June 19, 2006).

Contention 3, which, as admitted and expressly limited at the time of its admission by this Board, states: “Applicant’s SAMA analysis for the Pilgrim plant is deficient in that the input data concerning (1) evacuation times, (2) economic consequences, and (3) meteorological patterns are incorrect, resulting in incorrect conclusions about the costs versus benefits of possible mitigation alternatives, such that further analysis is called for.” Pilgrim, LBP-06-23, 64 NRC at 341. Thus what remains at issue in this part of this proceeding are three explicit challenges to “input” to the MACCS2 code.

We begin by noting that certain matters are not at issue here, having been eliminated at the contention admissibility stage. The original contention was considered in light of the submitted bases (technical, legal, factual, and expert information) supporting its admission, and narrowed to the specific statement set out above. Pilgrim Watch, for example, initially: (a) argued that probabilistic modeling was insufficient (arguing, therefore, that deterministic modeling must be used), Request for Hearing and Petition to Intervene by Pilgrim Watch at 28-31 (May 25, 3006) [hereinafter Pilgrim Petition]; (b) mounted a generalized attack on the computer code used by the Applicant to perform the SAMA computations (including explicit references to work of David I. Chanin), Id. at 31; and (c) urged that cancers caused by low doses of radiation should be considered. Id. at 79, 84, 87-88. All of these matters were considered by this Board at the contention admissibility stage and rejected. See Pilgrim LBP 06-23, 64 NRC at 338-341 (wherein we expressly admitted the contention “as so limited” and expressly reformulated the admitted contention to be as set out above). Thus, to the extent that Pilgrim Watch recycles these arguments in opposition to the Motion for Summary Disposition of the narrowed, as-admitted contention, they are inapplicable, as they offer no information which supports the opposition to the particular matters remaining at issue. Furthermore, it is clear on the face of the Pilgrim Petition that the only economic impact computations it intended to

challenge were those relating specifically to loss of economic activity, loss of economic infrastructure and loss of tourism income (and not the economic costs relating to the effects of low levels of radiation upon human health). See Pilgrim Petition at 43-45.

In addressing the Motion and the opposition thereto, we must, as we stated above, examine the substance of the information provided by the parties, for, at its heart, such a motion rests upon whether or not there is evidence upon which a trier of fact might reasonably find for Pilgrim Watch. For a fact to be “material” in the present context, we have, as noted, taken our guidance from the procedures for contention admissibility, which provide that the issue proffered by a petitioner must be “material to the findings the NRC must make to support the action that is involved in the proceeding.” 10 C.F.R. § 2.309(f)(1)(iv). Similarly, we find foundation for our threshold criteria regarding the level of support required for summary disposition in those same contention admissibility provisions - requiring a proponent of a position to provide facts or expert support for its position. See, e.g., 10 C.F.R. § 2.309(f)(1)(v). And, for the express purposes of summary disposition, mere allegations are insufficient - and we take that to include allegations which are in the nature of speculation or bare conclusory statements by an expert. See, e.g., 10 C.F.R. § 2.710(b); See also Southern Nuclear Operating Co. (Early Site Permit for Vogtle ESP Site), LBP-07-3, 65 NRC 237, 253 (2007); Duke Cogema Stone & Webster (Savannah River Mixed Oxide Fuel Fabrication Facility), LBP-05-4, 61 NRC 71, 80 (2005) (citing Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 589-90 (1993)); Fansteel, Inc. (Muskogee, Oklahoma Site), CLI-03-13, 58 NRC 195, 203 (2003). With the foregoing as background for our ruling, we now address the three specific matters at issue here.

A. Evacuation Times

As to the first of Pilgrim Watch’s challenges - regarding the time assumed for evacuation, the Applicant’s MACCS2 Sensitivity Case 6 assuming no evacuation at all, was

performed by the Applicant after admission of the subject contention, and forms a material portion of the foundation for the instant motion. This analysis, whose results are not substantively challenged by Pilgrim Watch, when considered together with the other analyses in the record, convincingly demonstrates that the evacuation time assumptions (i.e. the input regarding evacuation time) cannot make any difference in determining whether a SAMA analysis would be cost effective. There are three phases of consequence analysis in the MACCS2 models: (1) an emergency phase - covering the period from initiation of release through seven days after the accident; (2) an interdiction phase - covering the period from the end of the emergency phase through the date five years after the accident; and (3) a long term phase - extending to thirty years after the accident. See O’Kula Decl. ¶ 10; WSMS Report at 6. Applicant’s analyses indicate that 83% of the population dose occurs during the interdiction and long-term phases. See O’Kula Decl. ¶¶ 11, 24; WSMS Report at 8 and Table 3 at 10. Thus, only 17% of the population dose occurs in the first seven days, during which evacuation (and, for that matter, the wind which carries the plume) are relevant to estimating the cost effects of population dose. Sensitivity Case 6, assuming no evacuation whatsoever, indicated only a 6% change in the population dose risk (PDR), resulting in a 2% increase in Overall Economic Cost Risk (OECR) (because the PDR represents only 1/3 of the total risk). See O’Kula Decl. ¶¶ 11, 26; WSMS Report at 26. The estimated benefit associated with implementing SAMA 8 (the least costly SAMA - approximately \$5 million implementation cost - not determined to be cost effective to implement) is in the range of \$2.5 million. O’Kula Decl. ¶ 44. Sensitivity Case 6 clearly demonstrates that any errors in assumptions regarding the evacuation time or pattern cannot reasonably be expected to rise to a level necessary to cause implementation of any

SAMA to become cost-effective.¹⁴ Thus it is clear that a trier of fact could not reasonably find that the result of this Agency's determination regarding whether or not any (not implemented) SAMA is cost effective could be affected by errors in assumptions regarding evacuation.

B. Economic Impact

As to the "economic impact" challenge, we note at the outset that cost-related effects in SAMA analyses are customarily (and were in the instant SAMA analyses) separated into those relating to population dose and those relating to offsite economics. Here, the admitted arguments of Pilgrim Watch were that the estimates of economic cost impact failed to properly account for "loss of economic activity" or for "loss of economic infrastructure and tourism." Pilgrim Petition at 44-5. Thus the contention admitted here did not raise, and thus does not pertain to, the cost equivalent effects of radiation upon the health of individuals which is now raised by Pilgrim Watch for the first time in its opposition to the instant motion.¹⁵ Further to the point raised by the relevant portion of Contention 3 as admitted, Pilgrim Watch offers no counterpoints to the results of Entergy's newly supplied analyses examining larger impact from loss of regional economic activity, including effects on business and tourism, which clearly indicate that the size of the changes in economic impact cannot approach the increment required to make any not-implemented SAMA cost effective.

C. Meteorological Patterns

¹⁴ If the potential error in evacuation times can lead only to a 2% error in computed overall economic effect of the event, that translates to changing the overall economic benefit of the implementation of SAMA 8 by \$50,000 (from \$2.5 million to \$2.55 million) - which, even if the computations were off by an order of magnitude (as to which there is no evidence) could not raise the overall economic benefit to anything close to the \$5 million cost of implementation SAMA 8 (the least costly SAMA which has not been selected for implementation).

¹⁵ Furthermore, this Board rejected, *ab initio*, Pilgrim Watch's arguments that the effects of low doses of radiation must be considered, and that argument is the fundamental precept of the "support" Pilgrim Watch offers through the Beyea testimony discussed below.

As to the challenges to meteorologic patterns, these are generally an attack on probabilistic modeling, as these arguments are supported by affidavits arguing, in effect (and, to a large part explicitly) that deterministic modeling must be used to accurately capture the time-dependent effects of variations in meteorology. As such, these attacks have been previously rejected, and, in addition, they offer no express challenge to the “input” to the MACCS2 code relating to meteorology. Furthermore, Sensitivity Case 6 renders some of Pilgrim Watch’s concerns with meteorological patterns moot. Pilgrim Watch raises several issues concerning the impact of various wind patterns, including the effects of sea breeze and the selected plume shape on the SAMA analysis balancing. We note that the SAMA analyses incorporate a wide variation in average wind speeds and plume sizes, see O’Kula Decl. ¶¶ 9, 15, 16; WSMS Report at 13-15, and account for wind direction, atmospheric stability and mixing, NUREG-1437, Supp. 29, Vol. 1, Generic Environmental Impact Statement for License Renewal of Nuclear Plants at G-19 (July 2007) [hereinafter “NUREG-1437, Supp. 29”], thereby incorporating effects of a full spectrum of wind speeds and meteorological patterns. Thus, to the extent that Pilgrim Watch contends errors in wind and meteorological modeling; first, modeling per se is not at issue here; and second, the effects of variations in wind speed and direction, meteorological patterns, and plume shape are fully encompassed by the stochastic/statistical methods used in the SAMA analysis; and therefore, Sensitivity Case 6 (when considered together with the other analyses submitted by Entergy) demonstrates the lack of effect upon the economic viability of any not-implemented SAMA of any potential errors in wind and meteorological modeling during the evacuation phase or thereafter.

VI. Pilgrim Watch’s Opposition to the Motion for Summary Disposition and the Arguments in Respect Thereof.

Pilgrim Watch, in its Answer, argues that there are certain erroneous assumptions and

model limitations which cause the computed societal and environmental consequences to be erroneous. We find, however, as is set out in detail below, that Pilgrim Watch's opposition to the Motion for Summary Disposition is unsupported by any information which indicates that the factual matters they point to are in any manner whatsoever material to the Agency's determination in this proceeding - which is, in this particular instance, whether or not any individual SAMA is cost effective.¹⁶ In this regard, the Applicant notes that the SAMA which comes closest to being cost effective produces an estimated benefit of approximately \$2.5 million, whereas implementation of the related modifications to the facility is estimated to cost approximately \$5 million. See O'Kula Decl. ¶ 44. Thus, in the best of circumstances from the perspective of Pilgrim Watch, the flaws in the SAMA analyses would need to be the sources of errors aggregating nearly 100% in the estimated benefit of implementation, for such a fact to be material. In a series of bounding analyses presented by Entergy in response to admission of the subject contention, they demonstrate (and Staff concurs with their conclusions) that the maximum change which these alleged oversights or errors could produce is on the order of 2%. See O'Kula Decl. ¶ 43; WSMS Report at 39. Pilgrim Watch offers no evidence which contradicts this conclusion. Thus none of the purported errors or flaws are material to the determination the Agency must make. The following discussion describes the Pilgrim Watch petition and its support as we see it.

In support of its assertions, Pilgrim Watch offers affidavits from the following individuals:

- a. Jan Beyea, a Ph. D. in nuclear physics from Columbia University who describes one of his specialties to be geographic exposure modeling of toxic releases. Dr. Beyea's

¹⁶ The Staff's Draft Supplement to its Environmental Impact Statement sets out in Chapter 5 and Appendix G its SAMA analysis. It observes that five SAMAs are sufficiently cost beneficial to warrant further examination. See NUREG-1437, Supp. 29 at 5-8 to -9. The costs and benefits of various SAMAs were assessed by the Staff and the results set out in detail in Appendix G.

affidavit certifies an attached report he prepared for the Massachusetts Attorney General on potential releases from spent-fuel-pool fires - including such fires at Pilgrim. The Applicant has moved to strike this portion of Pilgrim Watch's answer because it merely delivers into this proceeding a report provided to the Attorney General in support of his petition to intervene, which this Board denied and the Commission affirmed, and the "cover declaration" from Dr. Beyea makes no connection whatsoever to the issues in the present proceeding. Entergy's Motion to Strike Portions of Pilgrim Watch's Answer Opposing Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3 at 9-10 (July 9, 2007) [hereinafter "Applicant MTS"]. In addition, the Applicant moves to strike portions of Pilgrim Watch's Answer which seek to argue an error by the Applicant in quantifying the equivalent dollar amount of damages relating to cancer caused by a severe accident, which are based entirely upon the Beyea Report, as outside the scope of this proceeding. Applicant MTS at 3-5. In this regard, the Applicant is correct that the scope of the admitted contention does not include errors in estimating the dollar-equivalent of cancers caused by a severe accident - such costs are simply not reasonably inferable as part of either "loss of economic activity" or for "loss of economic infrastructure and tourism." In fact, in the Pilgrim SAMA analyses, treatment of the effects of "population dose" was expressly separated from treatment of "Economic Costs," see, e.g., O'Kula Decl. ¶ 43; WSMS Report at 7-10, and there is no reason to believe that these two concepts were commingled in Pilgrim Watch's Contention 3 as formulated and supported by them. Thus the Beyea Report and its covering affidavit present matters which are outside the scope of this proceeding, proffering no information regarding the facts at issue. Therefore such materials are unresponsive of Pilgrim

Watch's opposition to the instant motion.¹⁷

- b. Pilgrim Watch also provides a one page affidavit from David I. Chanin, who asserts that he "was primary developer of the MACCS and MACCS2 computer codes . . . while working at Sandia National Laboratories ("SNL") from 1982-1996," and asserts in attached materials gathered by Pilgrim Watch from a blog relating to MACCS2,¹⁸ "[s]peaking as the sole individual who was responsible for writing the FORTRAN in question . . . I think it is foolish to think that any useful cost estimates can be obtained with the cost models built into MACCS2." Id. at 6. Mr. Chanin goes on to assert that "[t]he economic cost numbers produced by MACCS2 have absolutely no basis." Id.

Mr. Chanin's affidavit and attached materials are, at their root, a generalized attack on the MACCS2 computer code, which was rejected *ab initio*, see supra at 11; therefore these portions of Pilgrim Watch's reply are outside the scope of this proceeding. If, in any event, we were to consider the proffered material originating with Mr. Chanin, we find that none of the statements attributed to or made by Mr. Chanin indicate any specific error or flaw in MACCS2 or any input or assumptions made by the Applicant in its use in this proceeding,¹⁹ and therefore offer no information regarding the

¹⁷ The information provided therein is simply not relevant to the present determination. Furthermore, the entire foundation of the Beyea report rests upon arguments that effects of very low levels of radiation be considered - arguments, as we stated earlier, which were rejected by this Board when they were raised at the contention admissibility stage.

¹⁸ Attachments to Affidavit of Chanin.

¹⁹ The computations performed by MACCS2 and the results obtained depend, nearly entirely, upon the input parameters and information provided by the code user. See, e.g. NUREG-1437, Supp. 29 at G-3 to -4. AND the contentions admitted relate singularly to the input in three very specific areas, none of which is challenged by Mr. Chanin's materials. Mr. Chanin's various broad non-specific, unsupported (and therefore bare) challenges to the results one might expect to obtain with MACCS2 are simply insufficient to support the opposition to the motion for summary disposition.

three specific input errors alleged. Finally, we note that Applicant's motion is based in large part upon additional analyses performed by the Applicant in response to Pilgrim Watch's admitted Contention 3, which Applicant posits address the asserted shortcomings by performing conservative computations which envelope the alleged shortcomings, and there is not a single statement by Mr. Chanin addressing any specific result obtained by the Applicant or addressing the Applicant's input or computations in this instance or any other instance in any manner, or indicating, even broadly, that the results obtained by the Applicant are not conservative. This affidavit, therefore, fails to provide any indication that there is a material fact at issue.

- c. On meteorological impacts, evacuation timescales, and certain economic matters, Pilgrim Watch submits the following materials:

(1) Certain correspondence from Richard Rothstein (largely dated in 2005 and 2006, with the most recent being an e-mail dated January, 2007), in which he addresses his general concerns with meteorological and evacuation modeling, but none of which addresses any specific portion of the Applicant's SAMA modeling or any potential flaws or errors in the SAMA analysis. Thus this material is unresponsive to an opposition to the Motion for Summary Disposition because it fails to identify any material fact at issue regarding the SAMA analysis.

(2) An affidavit of Bruce Egan (an asserted expert in meteorological modeling) who asserts that the MACCS2 Code has inherent flaws in that it (a) fails to use boundary layer meteorological parameterization; and (b) uses a Gaussian Plume model which is not the basis for advanced meteorological modeling. He challenges the general approach of MACCS2 of using a large set of computations each using a randomly chosen meteorological condition as opposed to inputting

meteorological conditions as a function of time. Finally, he observes that “models may appear conservative but have incorrect simulations of the underlying physics” and “[s]imilarly, sensitivity studies do not add useful information if the primary model is flawed.” Declaration of Bruce A. Egan, SC.D., CCM, in Support of Pilgrim Watch’s Response Opposing Entergy’s Motion for Summary Disposition of Pilgrim Watch Contention 3 at 5 (June 20, 2007) [hereinafter “Egan Decl.”]. From these he concludes that the Applicant “has relied upon incorrect meteorological assumptions and models and this has caused it to draw incorrect conclusions about the costs versus benefits of possible mitigation alternatives.” *Id.* at 7. Mr. Egan, in substance, argues that the general approach used in the MACCS2 code is not what one would use in modeling time-dependent wind behavior and boundary layer phenomena, asserting that it is error to believe that randomly chosen meteorological conditions would give the same results as inputting meteorological conditions as a function of time. *See* Egan Decl. at 5. Thus, the fundamental assertion by Mr. Egan is that SAMA analyses should use what is customarily referred to by the reactor safety analysis community (and this Agency) as “deterministic” analyses. However, this is, at its foundation, nothing more than a general attack on the stochastic/statistical (probabilistic) approach taken by users of the MACCS2 code²⁰ - an argument which was rejected by this Board. *See supra* at 11. Even were we to consider this approach with regard to the

²⁰ We have no doubt that modeling a steady meteorological pattern for the entirety of an event is not representative of what may be expected from any particular event, but neither is it possible to predict with any confidence how the meteorological patterns would change during an event. Not only is the sort of “deterministic” modeling which is purported to be required impossible, but it has been rejected by this Agency because of the enormity of variation in such scenarios, which, in any event, is accommodated fully by the probabilistic approach this Agency has adopted. It therefore does not offer any useful information to this Board.

Motion for Summary Disposition, his affidavit proffers no support for a challenge to the input to, or the particular results of, the analytical results which lead to the evaluation of the cost-effectiveness of any SAMA. His bare conclusion that the use of the established approach mandated by our regulations leads to erroneous conclusions was rejected *ab initio* because it challenges the use of probabilistic methodologies (and asserts that deterministic methodologies must be used). Furthermore, even that proposition is entirely without support, failing to address the underlying uncertainties and the customary methods used by scientists to deal with them, and failing to address whether or not the approach taken by users of the MACCS2 code is technically sound or produces, as Entergy and Staff aver, conservative results. The dissent's concern that there may be wind patterns which might carry the dose to a wider region, or cause the dose to be differently distributed simply fails to recognize the undisputed fact that the probabilistic methods used by Applicant sample the entire range of wind data, see O'Kula Decl. ¶ 16, and incorporate that data into hundreds of computations from which the overall statistics and probabilistic results are obtained, and thereby subsumes all reasonably possible meteorologic patterns.

As to the criticisms of the Gaussian plume model used in the PNPS MACCS2 SAMA analysis, the use of a Gaussian plume model in the hundreds of computations performed to develop the probabilities, see, e.g., O'Kula Decl. ¶¶ 13-15, and the resulting risks, is a fundamental part of the approach used in these analyses and, as we mentioned earlier, a challenge to the use of probabilistic methodologies and/or the modeling used was rejected by this Board.

Furthermore, as we said at the outset, what remains at issue are challenges to the

input to the code in these three specific arenas, not the modeling itself. In addition, both NRC Staff and Entergy agree that the Gaussian plume model results are in good agreement with and generally more conservative than the results obtained by more sophisticated models, see, e.g., Jones-Bixler Affidavit ¶ 8; O’Kula Decl. ¶ 17, and the MACCS2 code was conservatively applied to the Pilgrim SAMA analysis to cause it to produce overall conservative results. See O’Kula Decl. ¶ 18. Mr. Egan offers no challenge to Entergy’s assertion that the computations prepared by the Applicant are conservative (i.e. they predict worse consequences, and, therefore, higher costs of any particular event), and he certainly presents no specific information which indicates otherwise.²¹ Thus, we have before us uncontroverted testimony indicating that the Applicant’s analyses maximize the effects of the radiation carried by the meteorological pattern in each of the hundreds of particular scenarios computed. Furthermore, Applicant’s analyses encompass any particular scenario which might incorporate the time dependent effects of the “sea breeze” or localized time-dependent wind patterns. See WSMS Report at 19-22. Entergy’s conservative analyses assuming no evacuation at all maximizes, for each specific computation included in the probabilistic analyses, the short term dose to the population which does not evacuate, and, finally, Pilgrim Watch offers not a single specific criticism or contradiction of the newly submitted Entergy analyses providing the foundation for the instant motion. Thus failing to provide any technical support for the

²¹ See, e.g., Egan Decl. at 5. Egan simply notes that models can be conservative and still have incorrect simulations of the underlying physics. This is precisely the point he is making - that only deterministic modeling would capture the details (physics). He does not, however, challenge the statements by Entergy that the results of its SAMA analyses are conservative.

proposition that the input at issue are in error or that the results of the cost-benefit analysis prepared by the Applicant are in error, Mr. Egan's affidavit fails to provide any relevant support for the opposition to the subject motion.²²

- d. Excerpts from the apparent minutes of the Annual Town Meeting of the Town of Duxbury from March 10, 2007, certified by Nancy Oates, Town Clerk, wherein the Town agreed that it would support a change in the plume transport model from a Gaussian straight line model to a more complex model. This material provides no support for any challenge to any material fact.
- e. The declaration of Andre Martecchini, Chairman of the Board of Selectmen of the Town of Duxbury, taking issue with the effectiveness of siren notification, and the estimated speed of evacuation. See Declaration of Andre Martecchini in Support of Pilgrim Watch's Response Opposing Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3. However, Mr. Martecchini fails to address the assumptions in, and conclusions of, the new studies performed by the Applicant, in particular Sensitivity Case 6 wherein the Applicant assumed no evacuation at all in an effort to bound the effects of potential errors in such assumptions. Thus, we find that Mr. Martecchini's declaration fails to identify or challenge any material fact which is at issue, and fails to offer any support for Pilgrim Watch's opposition to the subject motion.²³
- f. The declaration of Matthew Patrick, State of Massachusetts Representative for the 3rd

²² We note that for a fact to be material with regard to the SAMA analysis, it must be a fact which can reasonably be expected to impact the Staff's conclusion that any particular mitigation alternative may (or may not) be cost effective. Mr. Egan's vague conclusory statement that the approach used in MACCS2 to modeling changing and uncertain meteorological patterns has caused the Applicant to draw incorrect cost-benefit conclusions fails entirely to address whether the errors he suggests are present would (or even could) cause the results to be less conservative or, in fact, to be non-conservative.

²³ See supra pp. 20-22 for our discussion of the criticism of the Gaussian plume model.

Barnstable District, noting the wind patterns in the area of the plant, raising the difficulty of evacuation in the event of a severe accident, and noting that the computations of severe accident consequences must consider summer population increases as well as expected increases in population during the extended license period.²⁴ See Declaration of Representative Matthew C. Patrick in Support of Pilgrim Watch's Response Opposing Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3. However, Mr. Patrick's declaration fails to take issue with any specific aspect of or mention any potential error in, the SAMA analysis, or to address any of the input at issue here. Therefore, Mr. Patrick's declaration fails to identify any material fact which is at issue, and fails to offer any support for Pilgrim Watch's opposition to the subject motion.

- g. The declaration of Dr. Donald Zeigler describing a study he performed of the evacuation following the accident at Three Mile Island, and recommending that evacuation planning take into account the natural inclination of people to attempt to evacuate, even if not instructed to do so. See Declaration of Dr. Donald J. Zeigler, PH.D. Professor of Geography, Old Dominion University, in Support of Pilgrim Watch's Response Opposing Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3. However, Dr. Ziegler's declaration fails to take issue with any specific aspect of, or mention any potential error in, the SAMA analysis, and therefore, fails to contravene any material fact which is at issue and fails to offer any support for Pilgrim Watch's opposition to the subject motion.
- h. The declaration of Richard W. Finnegan, certifying and attaching a table of assessed property values for certain real property in the Town of Duxbury. See Declaration of

²⁴ We note Entergy explicitly asserts that these variations were in fact analyzed, see Entergy Motion at 15; see id., at 17-24, and Mr. Patrick has not disagreed with Entergy's assertion.

Richard W. Finnegan, MAA Deputy Assessor, Town of Duxbury, Massachusetts
Regarding Pilgrim Watch's Response Opposing Entergy's Motion for Summary
Disposition of Pilgrim Watch Contention 3. Because Mr. Finnegan's declaration merely
certifies certain data, and does not take issue with any specific aspect of or mention any
potential error in, the SAMA analysis, it fails to identify any material fact which is at issue
and fails to offer any support for Pilgrim Watch's opposition to the subject motion.

- i. The declaration of Timothy Warren, chief executive officer of the Warren Group, attaching
a table of median sales prices for certain residential property in the towns of Duxbury and
Plymouth for the years 1988 through 2007. See Declaration of Timothy Warren in
Support of Pilgrim Watch's Response Opposing Entergy's Motion for Summary
Disposition of Pilgrim Watch Contention 3. Mr. Warren's declaration merely certifies
certain data, and fails to take issue with any specific aspect of or mention any potential
error in, the SAMA analysis (or any property valuation used therein); therefore, it fails to
identify any material fact which is at issue and fails to offer any support for Pilgrim
Watch's opposition to the subject motion.

VII. Finding

We find that Entergy's Motion for Summary Disposition, which is supported by the Staff,
arguing that there remains no genuine issue of any material fact, sets out a thorough and
complete response to Contention 3 as originally admitted, curing any omissions and responding
to the alleged shortcomings in a manner which makes all thereof moot. We find that Pilgrim
Watch has failed to provide any support for their proposition that, after considering Entergy's
submitted additional analyses, a material fact remains in dispute. Furthermore, in examining the
substance of the pleadings here, we find that: (1) the evidence is not susceptible to different
interpretations or inferences that would support a finding that any particular SAMA could become

cost effective; (2) there are no issues of witness credibility that need to be resolved by assessing the witnesses in person at a hearing; and (3) a trial on the merits would neither reveal additional data implying, nor enhance our ability to draw inferences supporting the conclusion, that any particular SAMA could become cost effective.²⁵ Therefore, we find that Pilgrim Watch's Answer fails to indicate or present any material fact over which there is a genuine issue.

VIII. Order

Based, therefore, upon the preceding rulings, findings, and conclusion, it is, on this 30th day of October, 2007, ORDERED that Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3 is granted.

²⁵ We note that our colleague in her dissent, argues that we might all benefit from further exploration of the merits of these three matters, but we are persuaded, as is set out fully in this ruling, that there is insufficient evidence to suggest that a trier of fact might, under any circumstances, find for Pilgrim Watch on any of the challenges in its admitted contention. And, in this instance (under the NRC's adjudicatory system), the trier of fact will be this Board; i.e. the same individuals now examining the appropriateness of a grant of summary disposition.

This Order is subject to appeal to the Commission in accordance with the provisions of 10 C.F.R. § 2.341. Any petitions for review meeting applicable requirements set forth in that section must be filed within fifteen (15) days of service of this Memorandum and Order.

THE ATOMIC SAFETY
AND LICENSING BOARD *

/RA/

Dr. Paul B. Abramson
ADMINISTRATIVE JUDGE

/RA/

Dr. Richard F. Cole
ADMINISTRATIVE JUDGE

Rockville, Maryland
October 30, 2007²⁶

* The dissenting opinion of Judge Young is set forth below.

²⁶ Copies of this Memorandum and Order were sent this date by internet e-mail transmission to all counsel or representatives for the parties.

Dissenting Opinion of Administrative Judge Ann Marshall Young

I dissent from the majority decision because I find it to be in conflict with relevant legal authority on the proper standards for ruling on a motion for summary disposition.

In reaching their conclusion that Entergy has “demonstrated the absence of any genuine issue of material fact” regarding Contention 3,¹ my colleagues focus on “whether there is any genuine issue of *material fact* . . . in dispute,”² and determine that, because they do not view Intervenors as having disputed any material fact — *i.e.*, any fact that might affect “whether or not a particular SAMA is cost effective”³ and thereby affect the outcome of this proceeding — Entergy’s motion should be granted. In order to reach this determination, however, the majority indicates that they have found it necessary to look to whether, after “expanding [the information Intervenors provide in opposition to Entergy’s motion] to its logical limits[,] it can[] support a finding of fact material to the determination the Agency must make.”⁴ They state that it is thus also necessary to undertake a “thorough examination of the potential materiality of the support offered by the Parties for their positions” and a “careful examin[ation of] the evidence presented in the parties’ affidavits.”⁵ I find the majority’s extensive examination of the facts to constitute the sort of weighing of evidence that is not appropriate in a summary disposition context under relevant and binding case law, as I explain in more detail below. Before addressing specifically these legal standards, however, I summarize some of the basic facts and circumstances relating to the motion at issue and the response to it.

¹ See Majority Decision at 2.

² *Id.* at 5.

³ *Id.* at 6; *see id.* at 24-25.

⁴ *Id.* at 6.

⁵ *Id.* at 7 and n.9.

The majority states that, because they were already “raised and eliminated at the contention admissibility stage,” the following matters are not at issue: (1) “the adequacy of the computer code (MACCS2) used to perform the SAMA computations; (2) the use for SAMA analyses of probabilistic (as opposed to deterministic) methodologies; and (3) the health effects of low doses of radiation.”⁶ Also indicated not to be in dispute are that NRC regulations “require the use of probabilistic (as opposed to deterministic) methodology”; that the analyses related to postulated severe accidents “require modeling of extremely complex time and physical condition dependent phenomena, which all those familiar with the field know are generally not amenable to accurate modeling”; and that therefore NRC has determined “that these effects and potential benefits of mitigation be examined using ‘probability weighted consequences.’”⁷ Providing examples including that “actual variations in wind speed and direction are not predictable,” the majority states that “[t]hus, deterministic modeling of these, and many other variables is simply not possible, and therefore such variables are treated probabilistically,” noting as well that “[t]he approach taken by users of MACCS2 is to perform numerous computations with the code using a wide variation in code input to develop a set of results with statistical significance.”⁸

In the preceding context, the majority finds that Pilgrim Watch’s opposition to Entergy’s motion for summary disposition is “unsupported by any information which indicates that the factual matters pointed to by them are in any manner whatsoever material to the Agency’s determination in this proceeding – which is, in this particular instance, whether or not any

⁶ Majority Decision at 2. (The reference to health effects of low doses of radiation is presumably based on the fact that we did not admit Intervenor’s Contention 5. See *Pilgrim*, LBP-06-23, 64 NRC at 341-348.) I discuss *infra* at 8-9 questions I have concerning some of the majority’s statements about the nature of certain information submitted by Intervenor’s.

⁷ Majority Decision at 8.

⁸ *Id.* at 8 n.12.

individual SAMA is cost effective.”⁹ Because Intervenor’s have offered “no evidence [to] contradict[the] conclusion” that “the maximum change which [Intervenor’s] alleged oversights or errors [in Entergy’s SAMA analysis] could produce is on the order of 2%,” when such flaws would have to be the source of “errors aggregating nearly 100% in the estimated benefit of implementation[] for such a fact to be material,” they fail to show any genuine issue of material fact sufficient to overcome Entergy’s motion, according to the majority.¹⁰

I consider the preceding findings and conclusions of the majority in light of the following:

Intervenor’s support their challenge to the input data regarding meteorological patterns with declarations including those of: Bruce Egan, who has an S.M. in Engineering and Applied Physics and an Sc.D. in Environmental Health Sciences from Harvard University and “over 35 years of experience as a manager and an environmental scientist on projects involving the development and application of atmospheric dispersion models to complex topographic situations”;¹¹ Richard Rothstein, who has an M.S. in Meteorology/Air Resources Engineering from New York University and 35 years of experience in various meteorological projects for government agencies, utilities, and industry;¹² and Jan Beyea, who has a Ph.D. from Columbia University in nuclear physics, has taught environmental studies at Holy Cross College, has done

⁹ *Id.* at 15.

¹⁰ *Id.*; *see also id.* at 3.

¹¹ See Pilgrim Watch’s Answer Opposing Entergy’s Motion for Summary Disposition of Pilgrim Watch Contention 3 (June 29, 2007) [hereinafter Pilgrim Watch 6/29/07 Answer], Attached Declaration of Bruce A. Egan (June 20, 2007) [hereinafter Egan Declaration], at 2. During his time at Harvard Dr. Egan, whose doctoral thesis was on the subject of “Numerical Modeling of Urban Air Pollutions Transport Phenomena,” also took courses in meteorology from M.I.T. *Id.*

¹² Pilgrim Watch 6/29/07 Answer, Attached Declaration of Richard Rothstein in Support of Pilgrim Watch’s Response Opposing Entergy’s Motion for Summary Disposition of Pilgrim Watch Contention 3 (June 19, 2007) [hereinafter Rothstein Declaration].

research at Princeton University's Center for Energy and Environmental Studies "modeling the consequences of nuclear accidents," and among other things has a specialty in "geographic exposure modeling of toxic releases."¹³ Intervenors support their challenge to input data regarding costs with the declaration and certain supporting material provided by David Chanin, who states that he "was the primary developer of the MACCS and MACCS2 computer codes under sponsorship of the U.S. NRC and DOE while working at Sandia National Laboratories 1982-1996," and who according to his resume has co-authored several articles on the MACCS2 code as well as three NRC guidance documents including NUREG/CR-6613, Vol. 1, the NRC's User's Guide to the Code Manual for MACCS2.¹⁴

Experts Egan, Rothstein, and Beyea challenge, among other things, the plume and dispersion model used in the MACCS2 code. According to Dr. Egan, "[d]ispersion models rely upon the adequacy of the input meteorological data to represent the important air flow regimes," and "very significant improvements have been made in the parameterization of the atmospheric boundary layer wind profiles, temperature profiles and variations of turbulent mixing rates with height above the ground surface," resulting in "the development of improved models including those defined as guideline models AERMOD and CALPUFF," which "are now routinely used for regulatory applications and for risk assessments."¹⁵ By comparison, the "straight line, steady state Gaussian plume [model used in the MACCS2 code] assumes that meteorological conditions are steady in time and uniform spatially across the study region for each time period of simulation," thereby does not allow for spatially varying winds and wind speeds such as those

¹³ Pilgrim Watch 6/29/07 Answer, Attached Declaration and Report of Jan Beyea, Ph.D. (May 24, 2007) [hereinafter Beyea Declaration].

¹⁴ Pilgrim Watch 6/29/07 Answer, Attached Declaration and Attachments of David I. Chanin (May 27, 2007) [hereinafter Chanin Declaration].

¹⁵ Egan Declaration at 3.

over the ocean and land near the Pilgrim plant, and “[t]hus the presences of sea breeze circulations which dramatically alter air flow patterns are ignored by the model.”¹⁶ In particular, according to Dr. Egan, at a coastal site the sea breeze “would draw contaminants across the land and inland subjecting the population to potentially larger doses.”¹⁷ Dr. Egan has used the improved models in his own work and finds they would produce a better result for the Pilgrim SAMA analysis, and that, because the model used by the Applicant is flawed, its sensitivity analysis likewise does not provide “useful information.”¹⁸

Mr. Rothstein suggests that “Entergy should design, develop, and deploy adequate and appropriate meteorological monitoring equipment and improved air quality dispersion models to help enhance offsite airborne effluent plume tracking capability, and enhance the ability to make and assess reliable dose predictions.”¹⁹ In addition, he states, although “the system and procedures that Entergy currently has in place complies with the *minimum* applicable []NRC regulatory requirements,” and “while []NRC regulatory guidance does identify the circumstances for when coastal-sited nuclear power plants might need to expand their regional meteorological monitoring network beyond just onsite,” this guidance does “not tell the affected licensees how to accomplish that.”²⁰ Moreover, he notes, NRC guidance “does suggest that changes in the existing onsite meteorological monitoring systems could be warranted if [a licensee has] not provided a reliable indication of meteorological conditions that are representative within the 10

¹⁶ *Id.*

¹⁷ *Id.* at 6.

¹⁸ *Id.* at 5; *see id.* at 4-7.

¹⁹ Rothstein Declaration at 11.

²⁰ *Id.* at 12.

mile plume exposure emergency planning zone.”²¹

Mr. Rothstein observes that the Pilgrim plant's “onsite meteorological tower data, by themselves, may not always adequately and properly represent the variable wind flow conditions throughout southern Plymouth County, especially during the spring and summer months such as when sea breeze conditions are prevalent.”²² He points out that the consequence of this could be that, “[i]n the event of a fast-breaking incident requiring immediate protective actions for the public, a situation should not be created where the public is being advised to evacuate, and they inadvertently end up driving right into the path of the radioactive plume.” He compares this situation as being “akin to inadvertently driving right into the right-front semi-circle of a hurricane’s projected path after being told by emergency officials to simply evacuate a region, but not [having been provided] sufficient guidance as to where *not* to drive.”²³ Rothstein recognizes that to quantify, develop, and implement the improvements that he and Mr. Egan suggest “could require considerable time and resources,” but emphasizes that using Entergy’s existing analysis could result in “conservative model over-predictions [leading] to evacuation recommendations when shelter-in-place recommendations would be more appropriate, and non-conservative model under-predictions [leading] to shelter-in-place recommendations when evacuation would be more appropriate.”²⁴

Dr. Beyea suggests that, although the MACCS2 code “does not directly account” for such factors as “wind-driven resuspension,” it “may be possible to mimic their effects in the

²¹ *Id.*

²² *Id.*

²³ *Id.*

²⁴ *Id.* at 12-13.

program.”²⁵ More specifically, he suggests that, if the MACCS2 code could be run

with extra plume segments added on to the end of a standard release sequence, with varying delay times, and a total added release equal to the assumed resuspension fraction times the initial release, then MACCS2 will produce as output the mathematical equivalent of resuspended material being carried in directions different from the main plume.²⁶

It is not clear that the information provided by Intervenors, portions of which I summarize in the preceding discussion, would sufficiently overcome Entergy’s analyses, including its sensitivity analysis and resulting conclusions to the effect that, even considering the issues involved in Contention 3 from various conservative perspectives, the challenges Intervenors pose are not significant enough to affect the ultimate cost-benefit analysis that is at the core of a SAMA analysis. However, it is clear that Intervenors *dispute* Entergy’s conclusions, through, *inter alia*, Dr. Egan’s statement (made in the context of his expertise generally and his additional statements regarding various dispersion models) about sensitivity studies not adding “useful information” given the flawed dispersion model that is used.

²⁵ Beyea Declaration Supporting Document at 19-20. Although the majority would exclude consideration of the Beyea Declaration and attached report on the grounds that it presents “matters which are outside the scope of this proceeding, proffering no information regarding the facts at issue,” Majority Decision at 16, I would consider it at least with regard to meteorological issues, notwithstanding its earlier use to support another party’s contention on certain health issues. Dr. Beyea in his declaration states that the report from which the above quotation is taken was indeed prepared for the Massachusetts Attorney General (another petitioner in this proceeding whose one contention we did not admit, see LBP-06-23, 64 NRC at 280-300, 283 n.103) but that since its original release he has “come across no information or commentary by the applicant or any other person that would cause [him] to significantly change the report’s quantitative concerns.” Beyea Declaration at 1. He obviously prepared this declaration, which is dated May 24, 2007, for Intervenors to support their use of his earlier report in their Answer to Applicant’s Motion for Summary Disposition of Contention 3. Regardless of the relevance of any of the health-related issues discussed in the report, the material I cite (along with other, similar information found therein) is relevant to the meteorological issues raised by Intervenors, and should be considered in support of their Answer with regard to such issues.

²⁶ Beyea Declaration at 24-25.

Although the majority is correct that “modeling *per se* is not at issue here,”²⁷ in admitting Contention 3 as to input data regarding meteorological patterns we were clearly aware that the Intervenor’s contention, insofar as it concerned meteorological issues, centrally involved challenges to the “straight-line Gaussian plume model,”²⁸ and we did not exclude this. The plume model, while not “input” *per se* in the technical sense, is implicitly part of what is “put in” to the MAACS2 code to produce results about meteorological patterns. Also challenged was the fact that the sole source of input for Entergy’s SAMA analysis for the Pilgrim plant was the Plymouth Airport, five miles inland from the reactor site; Intervenor claimed that multiple sites were necessary to better characterize meteorological conditions, including those for wind speed, direction and dispersion.²⁹ Experts Egan, Rothstein and Beyea in their more recent declarations address these subjects in much greater than mere cursory fashion. I note that Egan’s and Rothstein’s suggestions to the effect that the NRC update its own regulatory approach with regard to meteorological monitoring are not relevant in this proceeding. The above summary, however, illustrates that their declarations also suggest specific ways in which the SAMA analysis for the Pilgrim plant might be improved through alternative approaches that could lead to more meaningful input information for, and results of, a SAMA analysis. And, contrary to the majority’s viewpoint,³⁰ this does not necessarily involve an attack or generic challenge to use of the MAACS2 code or to the use of probabilistic modeling.

At this point it may be appropriate to point out that we did *not* actually exclude from

²⁷ Majority Decision at 14.

²⁸ See Request for Hearing and Petition to Intervene By Pilgrim Watch at 35 *et seq.* (May 25, 2006) ADAMS Accession No. ML061630125 [hereinafter Petition].

²⁹ Petition at 36-37.

³⁰ See Majority Decision at 14.

consideration, as the majority states, “the adequacy of the computer code (MACCS2) used to perform the SAMA computations.”³¹ We did state that

to the extent that any part of the contention or basis may be construed as challenging *on a generic basis* the use of probabilistic techniques that evaluate risk, we find any such portion(s) to be inadmissible. The use of probabilistic risk assessment and modeling is obviously accepted and standard practice in SAMA analyses.³²

By stating that we found “inadmissible” any part of the contention that could be construed as “challenging on a generic basis the use of probabilistic techniques that evaluate risk,” we did *not* exclude *specific* challenges that might bring into question specific aspects of the SAMA analysis regarding the three types of input we admitted. Regarding meteorological patterns, what Intervenor challenge are several aspects of what is “put in” to the SAMA analysis on meteorological issues, and through Dr. Beyea they provide a specific proposal as to how their suggestions might be taken into account using the MACCS2 code.

The majority, however, maintain that “the effects of variations in wind speed and direction, meteorological patterns, and plume shape are fully encompassed by the stochastic/statistical methods used in [Entergy’s] SAMA analysis.”³³ Taking this statement at face value, there is essentially nothing of relevance that Intervenor *could* have provided regarding meteorological patterns. The upshot of this is that, although we admitted the issue of whether the input data regarding meteorological patterns were correct, by now excluding consideration of anything relating to the adequacy of the MACCS2 code *as specifically applied with regard to the Pilgrim plant’s SAMA analysis*, the majority in effect excludes any meaningful challenge to what is put into the code relating to meteorological patterns, because such input is

³¹ See *id.* at 2.

³² *Pilgrim*, LBP-06-23, 64 NRC at 340 (emphasis added).

³³ Majority Decision at 14; see *also supra* discussion at 28.

effectively predetermined by the current state of the MACCS2 code.³⁴ Our admission of Contention 3 is thus rendered meaningless with regard to meteorological issues.

To the contrary of my colleagues, I would take more seriously into account the information provided by Intervenors through their eminently well-qualified experts, including their specific dispute with regard to the sensitivity analysis to the effect that, according to Dr. Egan, it does not provide “useful information” because the underlying plume/dispersion model used in the MACCS2 code is flawed.³⁵ Given the qualifications of Intervenors’ experts and the specificity of the information they provide, while I would not permit litigation of any challenges “on a generic basis [to] the use of probabilistic techniques that evaluate risk,”³⁶ I would deny Entergy’s motion and permit a hearing — at least with regard to meteorological patterns, and how the meteorological analysis might affect analysis of the evacuation and cost data.³⁷ Again, although the conclusions reached by the majority based on their “thorough examination” of the parties’

³⁴ Although Intervenors could theoretically challenge the accuracy of one or more days’ results from Pilgrim’s one meteorological monitoring tower, this would seem to be the limit of what could be disputed in the majority’s view.

³⁵ Egan Declaration at 5; *see id.* at 4-7. Dr. Egan’s complete statement in response to various statements of Entergy’s expert, Kevin O’Kula, concerning the general conservatism of the Gaussian plume model, conservative application of the MACCS2 code, and certain sensitivity cases that were run as part of the sensitivity analysis, is the following:

The fact that a model may seem to be conservative in particular applications or in limited data comparisons does not mean that the model is better or should be recommended for an application. Models can be conservative but have incorrect simulations of the underlying physics. Similarly, sensitivity studies do not add useful information if the primary model is flawed.

Egan Declaration at 5.

³⁶ *See* LBP-06-23, 64 NRC at 340; *cf.* Majority Decision at 10, 14, 19-20.

³⁷ If, for example, wind patterns caused releases of radiation to cover a significantly larger area than postulated through use of the “straight-line Gaussian plume model,” it might be possible that significantly greater numbers of the population would need and/or attempt to evacuate, and there could possibly be more costs as well. *See, e.g.,* Pilgrim Watch 6/29/07 Answer at 10-23, 25, 30, 33, 41-43, 54-55, 57, 59, 65, 72, 87-89; Egan Declaration at 3, 5-7 (June 20, 2007). *See also infra* n. 51.

submissions with regard to Entergy's motion may well ultimately be correct, when the opponents of the motion have provided a response that is as well-supported and specific as that provided by Intervenor, and which in fact does dispute the sensitivity analysis that is central to the majority's ruling, I find it inappropriate under relevant case law to grant the motion for summary disposition.

Under this case law, a licensing board ruling on a motion for summary disposition "must view the record in the light most favorable to the party opposing such a motion."³⁸ It is true that, if the proponent of a motion meets its burden, an opponent must "set forth specific facts showing that there is a genuine issue," and may not rely on "mere allegations or denials."³⁹ The opposing party does *not*, however, have to show that it would prevail on the issues, but rather must "demonstrate that there is a genuine factual issue to be tried."⁴⁰ Although this case is a close one, I find that Intervenor has met this standard through the information summarized above.

Summary disposition is not "a tool for trying to convince a Licensing Board to decide, on written submissions, genuine issues of material fact that warrant resolution at a hearing."⁴¹ Although "bare assertions and general denials are insufficient to defend against a properly

³⁸ *Advanced Med. Sys.* (One Factory Row, Geneva, Ohio 44041), CLI-93-22, 38 NRC 98, 102 (1993).

³⁹ *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-06-5, 63 NRC 116, 122 (2006) (citing 10 C.F.R. § 2.710(b); *Advanced Med. Sys.*, CLI-93-22, 38 NRC at 102).

⁴⁰ *Advanced Med. Sys.*, CLI-93-22, 38 NRC at 102; see also *American Mfrs. Mut. Ins. Co. v. American Broadcasting - Paramount Theaters, Inc.*, 388 F.2d 272, 280 (2d Cir. 1967). In addition, if a movant satisfies its initial burden and supports its motion by affidavit, "the opposing party must either proffer rebutting evidence or submit an affidavit explaining why it is impractical to do so," and "[i]f the presiding officer determines from affidavits filed by the opposing party that the opposing party cannot present by affidavit the facts essential to justify its opposition, the presiding officer may order a continuance to permit such affidavits to be obtained, or may take other appropriate action." *Advanced Med. Sys.*, CLI-93-22, 38 NRC at 103. These provisions are incorporated in the NRC rules at 10 C.F.R. § 2.710(c). See also *infra* note 48.

⁴¹ *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-01-39, 54 NRC 497, 509 (2001); see also *Vermont Yankee*, LBP-06-5, 63 NRC at 121-22.

supported motion for summary disposition,⁴² it is inappropriate at the summary disposition stage for a Board to attempt “to untangle the expert affidavits and decide ‘which experts are more correct.’”⁴³ This is consistent with Federal Court rulings that, while “‘wholly conclusory statements for which no supporting evidence is offered’ need not be taken as true for summary judgment purposes,” a court “may not make credibility determinations or weigh the evidence” at the summary judgment stage.⁴⁴ As noted in the *Oyster Creek* license renewal proceeding, “summary judgment is not appropriate if it would require a judge to assess the correctness of facts and conclusions that are embodied in the competing, well-founded opinions of the parties’ experts.”⁴⁵

In this proceeding, Intervenors have provided much more than “mere allegations,” “bare assertions and general denials.” They provide the reasoned statements of several well-qualified experts. They do not, it is true, provide any results of calculations proving the negative of Entergy’s sensitivity analysis. But such a requirement — or anything approaching its essential equivalent — is unreasonable, given the extremely complex, expensive, and time-consuming nature of the computer calculations that would be necessary to do this, which even the Applicant,

⁴² *Duke Cogema Stone & Webster* (Savannah River Mixed Oxide Fuel Fabrication Facility), LBP-05-4, 61 NRC 71, 81 (2005) (citations omitted).

⁴³ *Id.* at 80 (citing *Private Fuel Storage*, LBP-01-39, 54 NRC at 510); *Vermont Yankee*, LBP-06-5, 63 NRC at 122.

⁴⁴ *Banks v. District of Columbia*, 377 F. Supp. 2d 85, 89 (D.D.C. 2005) (citations omitted); *see also More v. Snow*, 480 F. Supp. 2d 257, 274 (D.D.C. 2007); *Mobley v. Continental Casualty*, 405 F. Supp. 2d 42, 47 (D.D.C. 2005); *San Carlos Apache Tribe v. United States*, 272 F. Supp. 2d 860, 880 (D.Ariz. 2003).

⁴⁵ *Amergen Energy Company, LLC* (License Renewal for Oyster Creek Nuclear Generating Station), Memorandum and Order (Denying AmerGen’s Motion for Summary Disposition) at 4 (June 19, 2007) (unpublished), ADAMS Accession No. ML071700768 (citing *United States v. Alcan Aluminum Corp.*, 990 F.2d 711, 722-23 (2d Cir. 1993); *Norfolk S. Corp. v. Oberly*, 632 F. Supp. 1225, 1243 (D. Del. 1986), *aff’d*, 822 F.2d 388 (3d Cir. 1987); *Private Fuel Storage*, LBP-01-39, 54 NRC at 509-10).

with its relatively greater resources, has called “impractical.”⁴⁶ With regard to Dr. Egan’s expert opinion that, given the underlying flawed dispersion model the sensitivity analysis does not add “useful information,” it is not unusual for an expert, particularly in a very technical field, to refrain from providing conclusions that are dependent on complex computations when the expert has not actually performed the computations in question. Considering all the circumstances and the infeasibility of performing such calculations,⁴⁷ and taking into account Dr. Egan’s undisputed expertise on meteorological issues, I find his statement regarding Entergy’s sensitivity analysis to be more than a “mere allegation” or “bare assertion,” and to *dispute* Entergy’s claims regarding the results of its sensitivity analysis. While Entergy might well ultimately prevail on the issue, under relevant case law on summary disposition and summary judgment, Intervenor’s are entitled to have the record viewed in a light most favorable to them, and in such light I find they have disputed the facts Entergy puts forward to support its motion, through the declarations of reputable experts, sufficiently that summary disposition should be denied.⁴⁸

⁴⁶ See Entergy’s Motion for Summary Disposition of Pilgrim Watch Contention 3 at 13 (May 17, 2007).

⁴⁷ Indeed, these calculations might well be part of the “further analysis” that Intervenor’s are seeking in Contention 3. What is at issue in this contention is whether the input data on any of the three stated subjects is incorrect such that the Applicant’s conclusions about the costs versus benefits of possible mitigation alternatives is incorrect *and “further analysis is called for.”* *Pilgrim*, LBP-06-23, 64 NRC at 341. Although the majority in effect says that all the “further analysis” that is necessary has been performed by the Applicant in its recent sensitivity analysis, in my view my colleagues apply a standard that overlooks or ignores genuine issues of material fact that Intervenor’s present through reputable experts, as well as considerations of practical reality and fundamental fairness.

⁴⁸ Also relevant with regard to the issue of resources is the fact that, at the beginning of the time period permitted for responding to the Applicant’s motion for summary disposition, Intervenor’s lost their counsel through no apparent fault of their own. And they have in their Answer cited a provision of Rule 56 of the Federal Rules of Civil Procedure, also found in NRC rules at 10 C.F.R. § 2.710(c), *see also* 10 C.F.R. § 2.1205(c), to the effect that:

If it appears from the affidavits of a party opposing the motion for summary disposition that the party cannot for reasons stated present by affidavit facts essential to justify the party’s opposition, the Board may refuse the application for

I recognize that the Fifth Circuit Court of Appeals has held that, in a case heard by a judge without a jury, a judge may draw factual inferences “without resort to the expense of trial” and “may grant summary judgment if trial would not enhance its ability to draw inferences and conclusions,” if there are “no issues of witness credibility” and “a trial on the merits would reveal no additional data.”⁴⁹ Putting aside the likelihood that a hearing on Contention 3 would actually reveal additional relevant information, and the implicit expert credibility issues that arise out of the majority decision, what is most relevant with regard to this case law is that it is not controlling in the First Circuit, where the Pilgrim plant is located. In the First Circuit, the relevant standard would permit a district court judge in a nonjury case to weigh the evidence and draw inferences *only* where parties cross-move for summary disposition on stipulated facts and have in effect submitted their case “as a case stated”⁵⁰ — which is *not* the situation herein.

Notwithstanding applicable controlling precedent, my colleagues have in all practical effect weighed the evidence in an attempt to “untangle the expert affidavits and decide ‘which experts are more correct,’” and in so doing have also inappropriately found some of the information provided by Intervenors to be improper based on incorrect characterizations of what we did and did not admit and exclude in admitting Contention 3 (the full extent of which I need

summary disposition or may order a continuance as m[a]y be necessary or just. On this basis, even assuming *arguendo* that Intervenors have not sufficiently opposed Entergy’s motion, I would — taking into account the loss of Intervenors’ counsel and the relatively short extension of less than one month we granted Intervenors to respond to Applicant’s motion, see Order (Granting Request for Extension) (May 30, 2007) — deny the motion at this time and set further proceedings as appropriate.

⁴⁹ *Nunez v. Superior Oil Co.*, 572 F.2d 1119, 1123-24 (5th Cir. 1978); see also *Houston North Hospital Properties v. Telco Leasing, Inc.*, 680 F.2d 19, 22 (5th Cir. 1982); cf. Majority Decision at 25 and n.25.

⁵⁰ *Reich v. John Alden Life Ins. Co.*, 126 F.3d 1, 6 (1st Cir. 1997) (citations omitted); see also *United Paperworkers Int’l. Union, Local 14, AFL-CIO-CLC v. Int’l Paper Co.*, 64 F.3d 28, 31 (1st Cir. 1995).

not and do not address herein). In sum, the majority's grant of Entergy's motion for summary disposition is unwarranted, and improper under relevant law. On the other hand, considering the whole record in light of this law, and, as it requires, in the light most favorable to Intervenors, I find there to be genuine issues of material fact (which would likely be elucidated by the provision of additional information in a hearing⁵¹), and would therefore deny Entergy's motion.

With respect to Intervenors' newly-submitted health and other non-tourism-related economic cost factors, it is true that Intervenors provided no notice that these types of costs were challenged in particular, focusing more on economic matters related to lost business value, economic infrastructure, and tourism.⁵² However, they did state in their Petition that, "[w]ithout

⁵¹ To provide just a few examples of information that might be elicited, I would want to ask all the parties' experts: (1) whether it would be possible to use data arising out of the improved meteorological models — which may in themselves normally support "deterministic" rather than probabilistic evaluations — in a probabilistic manner to obtain a probability-weighted dose model that takes into account local geography and wind conditions; and (2) how any possible results of such a calculation would relate to Sensitivity Cases 2, 3, and 6 of Applicant's SAMA analysis, involving analyses using postulated beginning-plume-release conditions, reduced-plume-height (to 0 meters), and no-evacuation models, respectively.

In addition, with regard to the issue of the overall conservatism of the MACCS2 code, I note, with regard to the evacuation input data *when taken alone* in the context of the overall SAMA analysis, that in the absence of any significant changes in the meteorological data the Applicant's sensitivity analysis results in a conclusion that, even with no evacuation, there would be no additional cost-beneficial SAMAs. Without going into the origins and ramifications of this finding, I would agree that Intervenors have not provided sufficient information that would bring this into question from a technical perspective. However, I would further note, with regard to asserted conservatism in the meteorological analysis, that, in addition to referring to the sensitivity analysis models using the beginning of the plume release and a release at ground level (neither of which on its own would result in any new cost-beneficial SAMA), Applicant and its expert merely refer to the Gaussian plume model being "generally more conservative than[] those obtained by more sophisticated models" and to two studies supporting some level of conservatism. I would therefore (3) ask for further explanation by Entergy's experts and further response from Intervenors' experts regarding the conservatisms in the MACCS2 code and its application. It may be that the Gaussian model used in the MACCS2 code and in Entergy's sensitivity analysis is so conservative that the information provided by Intervenors' experts is effectively irrelevant, but, as discussed in the text of my opinion, this requires a weighing of the evidence in a hearing, and a consideration of the relative correctness of the parties' experts that I find goes beyond what the pertinent standards on summary disposition permit.

⁵² See Petition at 43-45.

knowing what parameters were chosen by the Applicant, it is not possible to fully evaluate the correctness of the [SAMA analysis] . . . [but they] have been able to piece together some possible reasons that Entergy's described consequences of a severe accident at Pilgrim look so small."⁵³ Moreover, they do have Mr. Chanin as an expert on costs.⁵⁴ Finally, the term, "economic consequences," is a broad one, which may fairly be said to encompass at least some of the various types of costs Intervenors now wish to litigate. Before finally deciding this issue, I would at least allow oral argument on, among other things, issues relating to the scope of contentions and the types of economic costs that are normally included in SAMA analyses, based in part on the circumstances, addressed above,⁵⁵ relating to Intervenors' losing their counsel and thereby being seriously disadvantaged in responding to Entergy's motion.⁵⁶

In any event, whatever the outcome of any oral argument on health costs,⁵⁷ I would deny the motion for summary disposition of Contention 3 and proceed expeditiously to hearing on relevant matters as discussed above — *i.e.*, at least on the meteorological matters at issue, and whatever impact these might have on the evacuation and cost matters also at issue in Contention 3, as well as on the cost-benefit analysis and the need for "further analysis."

⁵³ Petition at 34; see Pilgrim Watch's Answer Opposing Entergy's Motion to Strike Portions of Pilgrim Watch's Answer Opposing Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3 at 8 (July 17, 2007), ADAMS Accession No. ML072050145 [hereinafter Pilgrim Watch 7/17/07 Answer].

⁵⁴ See *supra* n.14.

⁵⁵ See *supra* n.48.

⁵⁶ I would note, however, that under such circumstances, the response that Intervenors did file was not unimpressive.

⁵⁷ If consideration of the newly-submitted cost information were permitted to any significant extent, denial of summary disposition might be even more appropriate, given the potential impact of such new information.

Finally, I would suggest, with regard to considerations of efficiency, time and expense, that going more directly to hearing in this proceeding, instead of expending the sorts of resources and time that have been spent by all parties and the licensing board on matters relating to the motions for summary disposition we rule on today, might well not only have been *not* significantly more costly, but even significantly *cost-effective and efficient*, in addition to allowing for appropriate questioning of all parties' experts. Even if in the end Entergy were, in such a hypothetical situation, to prevail on all points, the hearing process, appropriately and flexibly handled so as to assure reasonable and meaningful efficiencies, would (as it should always) ultimately allow for differences between the testimony of the parties' various experts on relevant issues to be addressed with all interested parties in one room, without the need for the filing of perhaps so much paper, and with the ability to address much more directly and concisely relevant questions to clarify matters in dispute. Consequently, even if Intervenors lost on these matters, they might well walk away with greater understanding of the issues and a greater sense that fairness and justice had been done. While the resulting increase in public confidence and trust in the NRC adjudication process may not be measurable, I would expect that this would benefit as well from allowing a hearing on the matters of public concern at issue in Contention 3.

None of the above is, of course, to say that Entergy should have no right to seek to have the matters at issue resolved through summary disposition. There are certainly instances in which summary disposition is entirely appropriate. I do not, however, find this to be such an instance.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
ENTERGY NUCLEAR GENERATION CO.)
AND)
ENTERGY NUCLEAR OPERATIONS, INC.) Docket No. 50-293-LR
)
)
(Pilgrim Nuclear Power Station))

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing LB MEMORANDUM AND ORDER (RULING ON MOTION TO DISMISS PETITIONERS CONTENTION 3 REGARDING SEVERE ACCIDENT MITIGATION ALTERNATIVES) (LBP-07-13) have been served upon the following persons by U.S. mail, first class, or through NRC internal distribution.

Office of Commission Appellate
Adjudication
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Administrative Judge
Ann Marshall Young, Chair
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Administrative Judge
Richard F. Cole
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Administrative Judge
Paul B. Abramson
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Susan L. Uttal, Esq.
Andrea L. Silvia, Esq.
Steven R. Hom, Esq.
Office of the General Counsel
Mail Stop - O-15 D21
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

John E. Matthews
Morgan, Lewis & Bockius, LLP
1111 Pennsylvania Avenue, NW
Washington, DC 20004

Docket No. 50-293-LR
LB MEMORANDUM AND ORDER (RULING ON
MOTION TO DISMISS PETITIONERS CONTENTION 3
REGARDING SEVERE ACCIDENT MITIGATION ALTERNATIVES) (LBP-07-13)

John Boska, Project Manager
Plant Licensing Branch I-I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop O-8-C2
Washington, DC 20555-0001

[Original signed by R.L. Giitter]

Office of the Secretary of the Commission

Dated at Rockville, Maryland
this 30th day of October 2007