

RAS # J-167

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	
Entergy Nuclear Generation Co. and)	
Entergy Nuclear Operations, Inc.)	Docket No. 50-293-LR
)	
)	ASLBP No. 06-848-02-LR
(Pilgrim Nuclear Power Station))	

**PILGRIM WATCH'S PETITION FOR REVIEW OF LBP- 06-848, LBP-07-13,
LBP-06-23 AND THE INTERLOCUTORY DECISIONS IN THE PILGRIM
NUCLEAR POWER STATION PROCEEDING**

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I. INTRODUCTION

Pursuant to 10 C.F.R. § 2.341(b), Pilgrim Watch, by and through its pro se representative, Mary Lampert hereby petitions the Nuclear Regulatory Commission (“NRC” or “Commission”) for review of (1) the Atomic Safety and Licensing Board (“ASLB” or “Board”) Initial Decisions: [LBP-06-848¹]; (2) LBP-07-13, Memorandum and Order (Ruling on Motion to Dismiss Petitioner’s Contention 3 Regarding Severe Accident Mitigation Alternatives) (October 30, 2007); and (3) LBP – 06-23, the Memorandum and Order (Ruling on Standing and Contentions of Petitioners Massachusetts Attorney General and Pilgrim Watch) issued October 16, 2006; and the many interlocutory decisions in this proceeding.

II. PETITION FOR REVIEW OF LBP-06-848 AND INTERLOCUTORY DECISIONS

A. Summary

This is a Petition for Review of the initial decision dated October 30, 2008,² and of interlocutory decisions dated October 17, 2007, December 19, 2007 and January 11, 2008. As originally accepted by the Board, Petitioner’s Contention 1 said:

“The Aging Management Program proposed is inadequate with regard to aging management of buried pipes and tanks that contain radioactively contaminated water, because it does not provide for monitoring wells that would detect leakage.”³

¹ Initial Decision, LBP- 06-848, October 30, 2008

² A majority of the Board filed its decision on October 30, 2008. Chief Judge Young filed a concurring decision on October 31, 2008. The majority decision is cited herein as “MD”; the concurring decision of Judge Young as “CD.”

³ *Entergy Nuclear Generation Co. and Entergy Nuclear Operations Inc.* (Pilgrim Nuclear Power Station), LBP-06-23, 64 NRC 257 (2006) (“Memorandum and Order on Contentions”)

On October 17, 2007, the ASLB modified its original order to say that leaks per se were beyond scope, and that the issue under Contention 1 was:

“...whether Pilgrim’s existing AMPs have elements that provide appropriate assurance as required under relevant NRC regulations that the buried pipes and tanks will not develop leaks so great as to cause those pipes and tanks to be unable to perform their intended safety functions.”⁴

On December 19, 2007 and January 11, 2008,⁵ the Board modified Contention 1 yet again, this time limiting *it to leaks of radioactive water that were so great as to permit a design base failure.*

The effect of the interlocutory decisions was to prevent Petitioner from including within scope a number of the key ways in which the Aging Management Program (AMP) did not provide reasonable assurance that radioactive or other leakage from buried pipes and tanks would comply with the current licensing basis (“CLB”) during license renewal. As a result, the adjudicatory process failed to consider the standard set by the CLB, the standard against which the AMPs must be evaluated, and therefore the public has no assurance, reasonable or otherwise, whether the CLB will be maintained over the license renewal period.

The initial decision concluded, incorrectly and absent relevant facts, that the proposed AMP provides reasonable assurance of ongoing conformity to the CLB.

Pilgrim Watch is not challenging the CLB. Instead, Pilgrim Watch’s petition is grounded in the fact that the Board would not hear argument, regarding 10 C.F.R § 54.21 [Contents of

⁴ Memorandum and Order, LBP-07-12, 66 N.R.C. (October 17, 2007) (Summary Disposition Order); Order Revising Schedule for Evidentiary hearing and Responding to Pilgrim Watch’s December 14 and 15 Motions, LBP-06-848-02 N.R.C.(December 19, 2007); Judge Young filed a separate statement on Dec. 21, 2007, which disagreed in part with the majority’s decision. See Separate Statement of Judge Ann Marshall Young (Regarding [Scheduling Order]) (Dec. 21, 2007); Order Denying Pilgrim Watch’s Motion for Reconsideration, LBP-06-848-02 NRC (January 11, 2008)

⁵ *Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), LBP-07-12, 66 NRC ___ (Oct. 17, 2007) (slip op.) (“Summary Disposition Order”); Order (Revising Schedule for Evidentiary hearing and responding to Pilgrim Watch’s December 14 and 15 Motions), December 19, 2007; Order Denying Pilgrim Watch’s Motion for Reconsideration), January 11, 2008.

application--technical information] and 10 C.F.R. § 54.29, that compliance with the CLB has to be looked at in an aging management review of components once they are determined to be within scope.

B. Errors in the Board's Decisions

In both its Interlocutory and Initial Decisions, the Board improperly limited the scope of the hearing to exclude specific CLB requirements that (1) leakage of radioactive water must be prevented and monitored to assure compliance with the CLB dose limits to the public and control of releases of radioactive materials to the environment and (2) whether or not leaks are “too great,” radioactive water leaks from buried pipes and tanks must be “promptly identified and corrected.” Leak prevention and detection is an implicit element in the AMP during license renewal.

In its Initial Decision, the Board applied an improper standard of “reasonable assurance,” and also improperly refused to consider evidence presented by Pilgrim Watch before the hearing was closed.

C. Issue 1: Scope of License Renewal – Current Licensing Basis (CLB)

The Board misinterpreted the scope of the proceeding and as a consequence failed to consider issues concerning compliance with the Continuing License Basis (CLB) from 2012-2032. It correctly determined that buried pipes and tanks that contain radioactively contaminated water are within scope, but incorrectly said that the only thing that matters about such pipes and tanks is leaks that are so great as to permit a design base failure.

10 C.F.R § 54.4(a) states what “systems, structures and components are within the scope of this part.” But that section does *not*, as claimed by the Board, restrict the aspects of the in-scope systems, structures and components must be considered.

10 C.F.R. § 54.21 [Contents of application--technical information], not 10 C.F.R. § 54.4, explains what has to be looked at in an aging management review of components once they are determined to be within scope. Section 3 of 10 C.F.R. § 54.21 says that, "For each structure and component identified in paragraph (a)(1) of this section, [Pilgrim must] demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation." Also, 10 C.F.R. § 54.29 is clear that renewed license can only be issued "if there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB" during the renewed license term. Thus, determining whether the in-scope buried pipes and tanks will comply with the CLB during any extended term of operation should have been an essential part of the hearing. However, the ASLB erroneously dispensed with it.

10 C.F.R. § 54.29 and the CLB require all in-scope components comply with the license and all NRC regulations over the license extension period, 2012-2032. Entergy may not simply show that PNPS will perform the functions outlined in 10 C.F.R. § 54.4(a)(1)-(3), and ignore all other issues NRC regulations that pertain to important safety components. Regulations are not like a menu where the Board and licensees can choose what they want to order a la carte. The CLB has to be met over the license renewal period and the Board must assure that the AMP will do so. If any party wishes to change the license renewal rules the proper way to do is through the rule making process.

For example, and particularly important here, NRC regulations require the Applicant to have in place an effective program for monitoring radiation on-site and off-site: the release of

unmonitored material is against regulation.⁶ Therefore, the Board was incorrect to narrow the original order⁷ and to exclude unmonitored leakage of radioactive water, unless the leaks happened to be large to permit a design basis failure.⁸

10 C.F.R. § 20.1302 and § 50 Appendix A Criterion 60 require NRC's licensee to demonstrate that effluents, including those from 'anticipated operational occurrences,' do not expose members of the public to excessive radiation doses. Effective monitoring systems are required in order to comply with these regulations, Criterion 64; and there is no basis for assuming that "excessive radiation doses" can result only from sudden leaks that would permit a design basis failure. While leaks of radioactively contaminated water into the ground for extended periods may not have been operational occurrences anticipated when the facilities were initially designed and licensed, they can scarcely be "unanticipated" following the series of such occurrences around the country, most discovered by happenstance and usually remained undetected for an extended period of time permitting larger amounts of contaminated water to enter the ground or air around the facilities.

⁶ NRC's Liquid Radioactive Release Lessons Learned Task Force, Final Report, September 1, 2006, Section 3.2.1.2, Existing Regulatory Framework

10 C.F.R. § 20.1302 Compliance with dose limits for individual members of the public: (a)(b)

10 C.F.R. § 50 Appendix A: Criterion 60--Control of releases of radioactive materials to the environment. The nuclear power unit design shall include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation, including anticipated operational occurrences. Sufficient holdup capacity shall be provided for retention of gaseous and liquid effluents containing radioactive materials, particularly where unfavorable site environmental conditions can be expected to impose unusual operational limitations upon the release of such effluents to the environment. **Criterion 64--Monitoring radioactivity releases.** Means shall be provided for monitoring the reactor containment atmosphere, spaces containing components for recirculation of loss-of coolant accident fluids, effluent discharge paths, and the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents.

⁷ Memorandum and Order, LBP-07-12, 66 N.R.C. (October 17, 2007) (Summary Disposition Order); Order Revising Schedule for Evidentiary hearing and Responding to Pilgrim Watch's December 14 and 15 Motions, LBP-06-848-02 N.R.C. (December 19, 2007); Order Denying Pilgrim Watch's Motion for Reconsideration, LBP-06-848-02 NRC (January 11, 2008)

⁸ Ibid

Tritium, from a yet identified source, was found in samples immediately after Pilgrim installed four (4) monitoring wells as part of its November 2007 voluntary well monitoring program. However, Pilgrim's voluntary wells do not meet accepted design criteria, and thus do not provide reasonable assurance. Four wells may be suitable for a corner service station, but not for a nuclear reactor on the shores of Cape Cod Bay. [Tr., Exh. 2, Dr. Ahlfeld].

Pertinent regulations also include 10 C.F.R § 50 Appendix B, Quality Assurance Criteria; it requires that leaks (not simply leaks that could permit a design basis failure be "promptly identified and corrected." Therefore, in order to comply with this regulation and its CLB during the relicense period, Entergy must identify leaks (not simply leaks that are "too great") and promptly fix them when found. This regulation makes absolute sense. Unidentified leaks in the in-scope buried pipes and tanks may not only result in excessive radiation doses, they also may jeopardize the design and intended functions of safety related systems and components at the Pilgrim Nuclear Power Station. Further, corrosion cannot be assumed gradual; in fact, Dr. Davis, NRC Staff expert, said at the Hearing, "once corrosion starts it goes quickly" [Tr., page 729]. Also the older the component, the more likely it is for leakage to occur;⁹ and corrosion is especially likely in Pilgrim's site specific environment. Pilgrim is located in New England, a moist climate and on the shores of Cape Cod's salt water bay; soil tests provided by the Applicant were neither current nor comprehensive.¹⁰ Last there is no experience with either the AMP or with reactors operating beyond 40 years.

D. Issue 2: The Board Applied an Incorrect Reasonable Assurance Standard

As stated by Judge Young in her concurring opinion,

⁹ Pilgrim Watch Post Hearing Finding of Facts and Conclusion of Law, June 9, 2008, Facts 24-31

¹⁰ Ibid, Fact 42-52.

“At bottom, the contention deals with the adequacy of Pilgrim’s aging management programs for buried pipes in providing ‘reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the [Pilgrim] plant’s [current licensing basis],’ as required at 10 C.F.R. § 54.29(a).”

The applicant has the burden of proving reasonable assurance by a clear preponderance of the evidence. *Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1)*, ALAB-697, 16 N.R.C. 1265, 1271 (1982) (citing 10 C.F.R. § 2.325). But the majority of the Board failed to recognize that proving “reasonable assurance” with a “clear preponderance” of the evidence [*North Anna Env’tl., Coalition v. NRC*, 533 F. 2d 655, 667-68 (D.C. Cir. 1976)] is a two step process.¹¹ As Judge Young correctly recognized:

“[T]his [preponderance of the evidence] standard means only that there must be a preponderance of the evidence that there *is* the required ‘reasonable assurance’ – it does not define what level or degree of ‘assurance’ constitutes a ‘reasonable’ level of assurance.” (CD, p. 55)

The majority decision of the Board never discussed “what level or degree of ‘assurance’ constitutes a ‘reasonable’ level of assurance; and although Judge Young raised the question, she similarly failed to provide an answer to what “reasonable assurance” means and requires.(CD,III,A) Without defining what level of assurance is “reasonable assurance,” there is no way in which any Board, or this Commission, can determine whether Entergy, or any other licensee, has proved, by a “clear preponderance” that this now-undefined standard has been met.

The majority Board decision says nothing at all on this subject. Judge Young provided no definition; but she noted, correctly, that although absolute certainty is not required (CD, 56)

“It does not follow that ‘reasonable assurance’ necessarily means only a 51% certainty or assurance that ‘the activities authorized by the renewed license will continue to be conducted in accordance with the ‘current licensing basis.’”

¹¹ Judge Young’s decision is not a decision of a majority of the Board. Although Judge Young concurred “in the result reached in the majority decision” (CD, 2), no other member of the Board concurred in either Judge Young’s factual or legal analysis.

Pilgrim Watch agrees that “reasonable assurance” requires much more than 51%. It agrees also that what constitutes “reasonable assurance” that a particular aspect of the CLB will be met will require a case-by-case determination. At least one NRC official has said that “reasonable assurance” requires 95% confidence,¹² a level of confidence that is consistent with a number of court decisions.¹³ The potential consequences of a nuclear power plant’s failure to comply with its CLB are severe. Whether or not what is “reasonable” is susceptible to mathematical calculation, nothing short of an extremely high level of assurance that there will be compliance with the CLB is “reasonable.”

Neither Entergy’s nor the NRC’s experts provided any testimony about what level of assurance is “reasonable,” or that the engineering design, pipe condition, or soil conditions surrounding any of Pilgrim’s buried pipes and tanks are such that there is any particular level of assurance the pipes or tanks will not fail over the license extension period; neither did they explain how non-QA wraps, coatings and liners perform QA functions.

The Commission should establish what level of “assurance” is “reasonable assurance,” and remand to the Board to determine whether Entergy can prove, by a clear preponderance of the evidence, that the required level of assurance will exist throughout the license extension period.

¹² Tr., Exh., 17, Transcript of ACRS Meeting (Sept. 6, 2001)

¹³ See, e.g., *Daubert v. Merrell Dow Pharm.*, 509 U.S. 579, 592 (1993), *Merrell Dow Pharms. Inc., v. Havner*, 953 S.W.2d 706, 723-24 (Tex. Sup. Ct. 1997) and *U.S. v. Chase*, 2005 WL 757259, (Jan. 10, 2005 D.C. Super.); See also Frederika A. Kaestle, et al., *Database Limitations on the Evidentiary Value of Forensic Mitochondrial DNA Evidence*, 43 Am. Crim. L. Rev. 53 (2006)].

E. Issue 3: Exclusion of Evidence

The record in this matter was not closed until June 4, 2008.¹⁴ On May 15, 2008, Pilgrim Watch filed a motion to make part of the record evidence demonstrating that critical testimony presented by Entergy and NRC Staff at the April 10, 2008 Oral Hearing - regarding cured in place linings, coatings and cathodic protection/stray current interference - was inaccurate, incomplete and misleading¹⁵. The Board improperly refused to accept, and thus did not consider, this evidence¹⁶ - even though the hearing was then open. The Commission should remand and instruct the Board to consider this evidence.

F. Reasons Why Commission Review Should Be Exercised

The legal errors of the Board identified in this Petition either lacked governing precedent or misinterpreted governing precedent. 10 C.F.R. § 2.341(b)(4)(ii). The factual and legal errors raise substantial and important questions of law and policy because they unreasonably limited the scope of the hearing and they lead to a lack of reasonable confidence that the CLB will be

¹⁴ Memorandum and Order (Ruling on Pilgrim Watch Motions Regarding Testimony and Proposed Additional Evidence Relating to Pilgrim Watch Contention 1), ALBP 06-848, June 4, 2008, at 3

¹⁵ Pilgrim Watch's Motion to Strike Incorrect and Misleading Testimony from The Record, May 15, 2008; Pilgrim Watch Motion to Include as part of the record Exhibits Attached to Pilgrim watch Motion to Strike Incorrect and Misleading Testimony From the record of May 15, 2008 (May 27, 2008); Memorandum and order (Ruling on Pilgrim watch Motions regarding Testimony and Proposed Additional Evidence Relating to Pilgrim Watch Contention 1), LBP 06-848-02-LR, June 4, 2008. For example, at the hearing, the NRC's expert, Dr. James Davis said that, "To backfit cathodic protection on a nuclear power plant is a very dangerous practice." [Transcript, Page 771, lines 5-15 and Page 772, lines 1-3.] The expert testimony, submitted before the hearing was closed but that the Board refused to consider, showed that backfitting cathodic protection is not dangerous; stray currents are a design issue, not a design constraint; and backfitting is not difficult to install because reactors' electrical systems are typically all tied together. Dr. Davis subsequently corrected his statements in an affidavit, saying that, "Perhaps the term I used - "dangerous" - is a bit strong. A better choice of words would be "caution should be exercised when backfitting a cathodic protection system to avoid stray current corrosion...I agree with Mr. Fitzgerald (Petitioner's expert) that as long as a cathodic protection system is properly designed, it will protect the piping."

¹⁶ Memorandum and Order (Ruling on Pilgrim Watch Motions regarding Testimony and Proposed Additional Evidence Relating to Pilgrim Watch Contention 1), June 4, 2008

maintained as required. 10 C.F.R. § 2.341(b)(4)(iii). The identified errors were prejudicial and were contrary to the public interest because they unreasonably excluded a number of issues from the hearing process and allowed license renewal to proceed, even though there is no reasonable assurance that the CLB will be maintained. 10 C.F.R. § 2.341(b)(4)(iv); 10 C.F.R. § 2.341(b)(4)(v). Failing to correct these errors made would lead to a violation of federal statutes.

G. Conclusion

For the foregoing reasons, the Commission should review the Decision and either deny the license renewal application or remand the matter to the Board for further proceedings.

III. PETITION FOR REVIEW OF LBP-07-13, MEMORANDUM AND ORDER (RULING ON MOTION TO DISMISS PETITIONER'S CONTENTION 3 REGARDING SEVERE ACCIDENT MITIGATION ALTERNATIVES), 2-1 DECISION, OCTOBER 30, 2007

A. Brief Summary of Proceeding

Contention 3 challenged the Applicant's handling of Severe Accident Mitigation Alternatives (SAMA). The contention admitted by the Board on October 16, 2006 is that, "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."¹⁷ Entergy moved for Summary Disposition on May 17, 2007. On October 30, 2007 a majority of the Board (Majority) granted Entergy's

¹⁷ Pilgrim, LBP-06-23, 64 NRC at 341

motion [Memorandum and Order Ruling on Motion to Dismiss Petitioner's Contention (Order)].

In an extensive dissent, Chief Judge Young correctly said, (Order, p. 40)¹⁸:

“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 doing so 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 exclude in admitting Contention 3...”

The Commission should review the Order and conclude, as did Judge Young, that the Majority overlooked and ignored genuine issues of material fact that petitioners presented through their reputable experts and improperly granted Entergy's Motion for Summary Disposition. The Matters of Fact and Law raised in the petition for review were previously raised before the presiding officer.¹⁹

B. Errors Made in the Decision

The Majority's flawed decision was reached by: (1) ignoring the rules of Summary Disposition; (2) misinterpreting the October 16, 2006 Order and excluding areas of inquiry that the Order admitted; (3) making unfounded requirements of the Petitioners to provide detailed calculations in their response when no such requirement was in the Order— the Order simply called for “further analysis” by the Applicant, not analysis by the Petitioner; and (4) not requiring the Applicant to analyze in the SAMA the consequences of a spent fuel pool fire and acts of

¹⁸ Judge Young's Dissenting Opinion is pages 27-43 of the October 30, 2007 Order.

¹⁹ Matters of Law were raised in Pilgrim Watch's Answer Opposing Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3 (June 29, 2007) pages 1-3; Pilgrim Watch's Answer to NRC Staff Response To Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3 (July 9, 2007), pages 3-7. Matters of Fact were raised in Pilgrim Watch's Answer Opposing Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3 (June 29, 2007), pages 4-92 and in ten, attached, expert Declarations. Matters of fact were raised also in Pilgrim Watch's Answer to NRC Staff Response To Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 3 (July 9, 2007), pages 5-34

malice [Petitioner's Appeal, October 16, 2006 Order, Ruling Massachusetts Attorney General's Contention and Pilgrim Watch Contention 4 (Regarding Spent Fuel Accidents) at 21].

C. The Majority Improperly Limited the Admitted Contention and Excluded Admitted Areas of Inquiry.

As quoted above, the October 16, 2006 admitted contention said that the "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..."²⁰ The Majority decision's statement that "(the adequacy of the computer code (MACCS2)...; (2) the use for SAMA analysis of probabilistic ... methodologies; and (3) the health effects of low doses of radiation" were "raised and eliminated at the contention admissibility stage" (Order 28) is incorrect. As pointed by Judge Young in her dissent, the Order found "challenging *on a generic basis* the use of probabilistic techniques ... to be inadmissible;" but it did not "exclude specific challenges that might bring into question specific aspects of the SAMA analysis regarding the three types of input we admitted." (Order 26) "[C]ontrary to the majority's viewpoint, [the evidence presented by Pilgrim Watch] does not necessarily involve an attack or generic challenge to use of the MAACS2 code or to the use of probabilistic modeling." (Order 36) Judge Young accurately summarized why the Majority decision limiting the admitted contention is wrong (Order 36-37):

"[B]y 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 meaning challenge to what is put into the code relating to meteorological patterns... Our admission of Contention 3 is thus rendered meaningless with regard to meteorological issues."

²⁰ Pilgrim, LBP-06-23, 64 N.R.C. at 341.

The Majority also incorrectly limited the inquiry in two additional ways. First, the Majority confused the relationship between probabilistic and deterministic methods when they said that the “the use for SAMA analyses of probabilistic (as opposed to deterministic) methodologies” was eliminated at the contention admissibility stage.²¹ What is at issue under the admitted contention is not “what method” to use; it is the adequacy of the inputs used by the Applicant to form the basis of their SAMAs. Second, the Majority improperly eliminated the health cost effects of radiation. The Board made clear to Petitioner that it would not permit health consequences, per se, to be brought forward in re-licensing adjudications [LBP-06-23, 64 N.R.C. at 341-348.] However, it is equally clear that health costs are an important part of the discussion of economic consequences.

D. The Majority Ignored Summary Disposition Rules

In addition to ignoring what Contention 3 admitted, the Majority’s decision also was “in conflict with the relevant legal standards for ruling on motions for summary disposition” (Order 27). Petitioner disputed all material facts presented²² and did not “rely on mere allegations or denials” of the moving party’s facts²³; rather, set forth specific facts disputing Entergy’s material facts supported by declarations provided by “eminently well-qualified experts”[Order 36] and references to NRC, EPA and the Applicant’s own documents.²⁴ The Majority failed, as required,

²¹ Note also that the implication that Probabilistic Models are not based on the same physics as Deterministic Models is incorrect. A probabilistic model, in essence, takes the different results of a deterministic model and assigns probabilities to the outcomes. If the deterministic model is flawed, so is the probabilistic model.

²² Pilgrim Watch’s Answer Opposing Entergy’s Motion Summary Disposition, pages 5-49.

²³ *Duke Cogema Stone & Webster* (Savannah River Mixed Oxide Fuel fabrication Facility), LBP-05-4, 61 N.R.C. 71, 81 (2005) (citations omitted); *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 N.R.C. at 102).

²⁴ Order 29-30, Pilgrim Watch’s meteorological experts; Order 42, Pilgrim Watch’s economic consequence experts

to “view the record in the light most favorable to the party opposing such motion.”²⁵ Rather, it undertook a “*thorough examination of potential materiality of the support* offered by the Parties for their positions” and a “*careful examination of the evidence* presented in the parties’ affidavits.”²⁶ [Order 27, reference to Majority at 6, Emphasis added] As Judge Young noted, this “constitute[s] the sort of weighing of evidence that it not appropriate in a summary judgment context under relevant and binding case law.” (Order 27); at the summary disposition phase, the Board may not try “to untangle the expert affidavits and decide ‘which experts are more correct;’²⁷ As said 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.”²⁸ Judge Young’s dissenting opinion summarizes evidence presented by Pilgrim Watch (see, e.g., Order 29-33), and explains why that evidence “demonstrate[s] that there is a genuine factual issue to be tried.” (Order 37)

E. The Disputed Material Facts Concerning Computer Code Inputs

The Majority states that, “The MACCS2 was used to compute hundreds of scenarios which were weighted according to their probabilities and then to develop a distribution of probabilities of the consequences and risks.” (Order 8) However repeating the same mistakes many times does not give a correct or undisputed answer.

²⁵ *Advanced Med. Sys.* (One Factory Row, Geneva, Ohio 44041), CLI-93-22, 38 NRC 98, 102 (1993)

²⁶ Order 7 and n.9

²⁷ *Duke Cogema Stone & Webster* (Savannah River Mixed Oxide Fuel Fabrication Facility), LBP-05-4, 61 N.R.C. 71, 80 (2005) (citing *Private Fuel Storage*, LBP-01-39, 54 NRC at 510); *Vermont Yankee*, LBP-06-5, 63 N.R.C. at 122

²⁸ *Amergen Energy Company, LLC* (License Renewal for Oyster Creek Generating Company), 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. 1243 (D. Del. 1986), aff’d, 822 F. 2d 388 (3d Cir. 1987); *Private Fuel Storage*, LBP-01-39, 54 N.R.C. at 509-10)

The Majority said [at 8] that, the “MACCS2 is the current standard for performing SAMA analyses.” Petitioners do not dispute that it may be “standard”, but that does not preclude a material dispute whether applicant’s inputs – for example, a standard straight-line Gaussian plume model to estimate the atmospheric dispersion of a point release of radionuclides – are the inputs that should be specifically applied to Pilgrim’s site.

Petitioner’s established a substantive dispute by showing that a variable trajectory plume model – not a straight line Gaussian plume - is appropriate for Pilgrim’s coastal location²⁹ and would bring more SAMAs into play. Variable trajectory inputs are required at Pilgrim’s site to accurately model the effect close in, further out and also over water. For example, EPA has not authorized the use of a straight line steady state Gaussian plume model beyond 31- miles because its accuracy decreases from distance from the source. Therefore Pilgrim Watch demonstrated that the Entergy’s use of the straight line steady state Gaussian plume model leads to a non-conservative geographical distribution of dose within the 50-mile radius of Pilgrim. This could materially affect the costs of mitigation alternatives because the potentially exposed population density within 50-miles from PNPS could substantially change costs because of the large geographic variations of population density within 50 miles of PNPS. Boston, Providence and their immediate densely-packed surrounding communities are just beyond the 31 mile range and well within 50 miles. Further, the Applicant’s inputs ignore that plumes traveling over water remain tightly compacted and later wind shifts can lead to hot spots of radioactivity in

²⁹ NRC Regulatory Guide 123 (Safety Guide 23) On Site Meteorological Programs 1972, NUREG-0737, Supplement 1; EPA’s latest Guideline on Air Quality Models (Federal Register November 9, 2005 Section 7.2.8 Inhomogeneous Local Winds; EPA 2000 report, Meteorological Monitoring Guidance for Regulatory Model Applications, EPA-454/R-99-005, February 2000. Section 3.4; RASCAL Version 1.3 User’s Guide (NUREG/CR-5247). Decl. Beyea, Egan, Rothstein.

unexpected locations, such as Boston, Cape Cod, and places between and bring more SAMAs into play³⁰.

Petitioners further showed that applicant's input underestimate consequences by not modeling re-suspension. [Beyea at 19-20]. Re-suspension of contaminants to off-site locations by wind and water over time is exacerbated by Pilgrim's coastal location that often experiences strong winds – also bringing more SAMAs into play.

Thus, no matter how many different straight-line Gaussian inputs the Applicant's experts may used in their simulations, the output will not reflect what actually will happen at this specific site [Response to Material Facts 9, 11, 15, 16, 17]. As Petitioner's expert, Dr. Egan [Egan Decl. at 13] succinctly stated, "sensitivity studies do not add useful information if the primary model is flawed."

F. The Disputed Material Facts Concerning Meteorological Methodologies

Having confused the relationship between probabilistic and deterministic methods (discussed above at p.12,13) the Majority also was wrong when it justified its summary disposition by deciding, as a matter of fact, that

"...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). Thus, deterministic modeling of these and many other variables is simply not possible, and therefore such variables are treated probabilistically."³¹

³⁰ Pilgrim Watch's Answer Opposing Entergy's Motion for Summary Disposition of Pilgrim watch Contention 3, June 29, 2007, pp.19, response Material Fact 19, citing Angevine 2004.

³¹ Majority at 8

Petitioner's expert explained that the Majority's factual conclusion is not only disputed; it is wrong. Deterministic type modeling (e.g., with AERMOD and CALPUFF) are "routinely used for regulatory applications and for risk assessments" (Egan Decl. at 3).

G. Disputed Material Facts Concerning Health Costs and Emergency Evacuation

The entire applicant's cost calculations, and the Majority's "findings," assume Gaussian Plume meteorological inputs, and, as a result, that a radiological release will affect only a very small area –key hole or wedge. Proper inputs specific to Pilgrim indicate a far larger affected area (potentially including the densely populated centers of Boston, Providence and, at least in summer, Cape Cod), and, thus, far greater consequences/costs and a large increase in evacuation times. These were ignored by the Majority's cost-benefit analysis.

Further, there are disputed facts even under the Majority's limited analysis. Illness due to radiation exposure in a severe accident entails real economic costs; costs that the Majority minimized or failed to take into consideration.

With respect to evacuation, the majority accepted the Applicant's unrealistically low time estimates. It relied on an inappropriate model for the Pilgrim site, the straight-line Gaussian Plume Model, and the incorrect assumption of Entergy's evacuation time estimate contractor, KLD Associates, that not everyone within 10 miles of Pilgrim would have to evacuate, instead of only those 2-miles around and others in the direction of the narrow radiation plume, most within the 2-5 mile wedge. KLD ignored shadow evacuation of those outside the 10 mile zone and KLD's time estimates ignored peak traffic times. Increased exposure from delayed evacuation and consequent projected health related costs in the evacuee population would be greater if an appropriate variable trajectory plume model and correct assumptions were used in KLD's time

estimates. [Petitioners Answer, June 29, 2007 at 10-23,25,30,33,41-43,54-55,57,59,65,72,87-89; Egan Decl. at 3. 5-7; Zeigler and Town of Duxbury Selectman Martechini Decl. regarding “shadow evacuation”(June 20, 2007)].

H. Disputed Facts Concerning Economic Consequences

The Majority ignored the facts put forward by the Petitioner showing that the inputs and the MACCS2 used by the applicant is not the proper diagnostic tool to assess economic consequences. The Petitioner went to David Chanin who coded the cost model of the MACCS and MACCS2. He stated [Chanin Decl.]:

“I have spent many many hours pondering how MACCS2 could be used to calculate economic costs and concluded it was impossible. (and) Speaking as the sole individual who was responsible for writing the FORTRAN in question, which was done many years prior to my original work in SAND 96-0957, I think it’s foolish to think that any useful cost estimates can be obtained with the cost model built into MACCS2....The economic cost numbers produced by MACCS2 have absolutely no basis...If you want to discuss economic costs, I’d be glad to discuss SAND96-0957, but the “cost model” of MACCS2 is not worth anyone’s time.”

The Majority ignored Petitioner’s demonstration showing how Entergy both underestimated the costs they considered and totally ignored other costs that belong in a proper SAMA analysis. For example, the Majority’s assumed value of non-farm wealth was approximately 30% too low for Plymouth County and 40% too low for the Pilgrim EPZ; the value of farm wealth was underestimated by not considering the value of the farm property for development purposes as opposed to agricultural. [Response Finnegan Decl.]; decontamination costs were severely underestimated, as discussed for example in SAND96-0957, Appendix E at 11 and lessons learned from Chernobyl; and the Majority “calculations” did not include the business value of property or, as mentioned above, health costs.

I. The Board Did Not Allow The Discussion Of A Spent Fuel Pool Fire And Terrorism In Its SAMA Analysis

The offsite cost risk of a pool fire is substantially higher than the offsite cost of a release from a core-damage accident; and Entergy has not considered the contribution to severe accident costs made by intentional attacks on Pilgrim's reactor or spent-fuel pool, although such attacks are reasonably foreseeable and indeed are anticipated by the NRC. In addition, SAMAs designed to avoid or mitigate conventional accidents may be different than SAMAs designed to avoid or mitigate the effects of intentional attacks. Moreover, the radiological consequences of a spent-fuel-pool fire are significantly different from the consequences of a core-damage accident.

J. Conclusion

For the foregoing reasons, the Commission should take review and reverse LBP - 07-13 so that the Board shall be required to take the required "hard Look" at the environmental impacts and risks associated with this major federal action. The public deserves a full and fair hearing on these matters that impact public safety and interests and the public's perception of fairness in these proceedings.

IV. PETITION FOR REVIEW OF LBP-06-23 (SPENT FUEL STORAGE) MEMORANDUM AND ORDER (RULING ON STANDING AND CONTENTIONS OF PETITIONERS MASSACHUSETTS ATTORNEY GENERAL AND PILGRIM WATCH) ISSUED OCTOBER 16, 2006; AND THE MANY INTERLOCUTORY DECISIONS IN THIS PROCEEDING

A. Brief Summary of the Proceeding

The Board stated in its Ruling that the determinative issue is what the term "severe accident" encompasses, and that the NRC regulations are unclear on this issue. It then concluded that the decision in *Florida Power and Light Co.* (Turkey Point Nuclear Generating Plant, Units

3 and 4), CLI-01-17, 54 N.R.C. 3, 6-13 (2001) (“*Turkey Point*”) categorically removed the spent fuel pool from SAMA analyses. The Board was wrong. NRC regulations are clear what is a “severe accident;” and the *Turkey Point* decision did not, and the pertinent NRC regulations do not, categorically remove spent fuel pools from SAMA analyses. The Board also failed to consider new and significant information concerning the risk and consequences of spent fuel pool fires.

B. SAMA Analysis Of Spent Fuel Risks Is Required By NRC Regulations

The Board began its discussion of Pilgrim Watch’s SAMA related arguments by stating that the determinative issue “is what the term ‘severe accident’ encompasses, thus defining what accidents are to be examined in the context of a ‘*severe accident* mitigation alternatives’ or ‘SAMA,’ analysis.”³² It then stated that, although the arguments put forth by Pilgrim Watch and the Massachusetts AG seemed “plausible,” the NRC regulations themselves offer no definitive guidance.

The Board looked in 10 C.F.R. § 51.53(c)(3)(ii)(L), and found no definition of severe accidents there. It neglected to consider the GEIS³³ which provides the factual background for the SAMA requirement in the regulations, and *does* define a “severe accident.”

According to Section 5.2.1 of NUREG 1437 “General Characteristics of Accidents,” the “term ‘*accident*’ refers to any unintentional event outside the normal plant operational envelope

³² LBP-06-23, p. 33.

³³ See NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants (May 1960) [hereinafter GEIS]; Final Rule, “Environmental Review for Renewal of Nuclear Power Plant Operating Licenses,” 61 Fed. Reg. 28, 467 (June 5, 1960, amended by 61 Fed. Reg. 66, 537 (Dec. 18, 1996); 10 C.F.R. Pt. 51, Subpart A, Appendix B n.1)

that results in a release or the potential for release of radioactive materials into the environment” and “‘severe’ ... [includes] those involving multiple failures of equipment or function and, therefore, whose likelihood is generally lower than design basis accidents but where consequences may be higher . . .” (emphasis added). This section recognizes the potential for a severe accident in which there are “releases substantially in excess of permissible limits for normal operation.”³⁴

Section 5 focuses on potential *consequences* to determine whether or not a potential accident is severe – and thus within the scope of a Severe Accident Mitigation Analysis. The question is not whether the source of the Severe Accident is the first or second largest inventory of radioactive materials.³⁵

The Board should have found that Severe Accidents resulting from spent fuel pool “releases substantially in excess of permissible limits for normal operation” are within in the scope of Section 5 SAMA analyses, particularly in view of new and significant information.³⁶

C. Turkey Point Does Not Exclude The Spent Fuel Pool From SAMA Analysis

The facts³⁷ in *Turkey Point* do not apply here, and neither does the decision. In *Turkey Point*, the Commission decided that the risk of fuel accidents during normal operations was a

³⁴ The term “accident” refers to any unintentional event outside the normal plant operational envelope that results in a release or the potential for release of radioactive materials into the environment. Generally, the U.S. Nuclear Regulatory Commission (NRC) categorizes accidents as “design basis” (i.e., the plant is designed specifically to accommodate these) or “severe” (i.e., those involving multiple failures of equipment or function and, therefore, whose likelihood is generally lower than design-basis accidents but where consequences may be higher), for which plants are analyzed to determine their response. *The predominant focus in environmental assessments is on events that can lead to releases substantially in excess of permissible limits for normal operation. Normal release limits are specified in the NRC’s regulations* (10 C.F.R. Part 20 and 10 C.F.R. Part 50, Appendix A). GEIS, 5.2.1. Italics added

³⁵ Due to nearly 40 years of operations, the “inventory of radioactive materials” in Pilgrim’s spent fuel pool is approximately eight times that in its reactor core. The statement in sub-section 5.2.1.1 that the spent fuel storage pool contains the second largest inventory after the reactor core does not apply to Pilgrim

³⁶ LBP-06-23 p. 35

“generic issue,” and that the “Mr. Oncavage’s Contention 2 says nothing about mitigation alternatives,” which is the crux of a SAMA.³⁸ The Commission went on to say that SAMAs apply only to reactor accidents and not to spent fuel pool accidents; but in doing so it, like the Board, read the wrong regulation.³⁹

The pertinent regulation, 10 C.F.R. § 51.53(c)(3)(ii)(L), states: “If 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.” (Italics added)

The paragraphs of the GEIS relied on by the Commission in *Turkey Point* for its statements that the GEIS exempts spent fuel pools, were from section 6 of the GEIS.⁴⁰ Section 6 deals with *normal operations* (see, for example, section 6.1: “Accidental releases ... could conceivable result in releases that would cause moderate or large radiological impacts. *Such conditions are beyond the scope of regulations controlling normal operations....*” (Emphasis added).

Section 5, not Section 6, deals with severe accidents. Nothing in Section 5 excludes severe accidents involving what at Pilgrim is the largest inventory of radioactive materials – the spent fuel pool.

³⁷ See Pilgrim Watch Reply to Entergy and Pilgrim Watch Reply to Staff.

³⁸ Ruling p. 33, citing *Turkey Point* (Footnote 143 citing 51.53(c)(ii)(L))

³⁹ We are aware of the Commission’s more recent decision in *Entergy Nuclear Generation Company et al.*, 50-293-LR, but to the extent that decision suggests that *severe accidents* involving spent fuel are a Category 1 issue it simply repeats *Turkey Point’s* failure to consider the right regulation.

⁴⁰ Section 6 in NUREG – 1437, whose conclusions are carried over into Appendix B to Subpart A of Part 51.

D. The Board Should Have Considered The New And Significant Information Presented By Pilgrim Watch Even If It Rejected Inclusion Of The Spent Fuel Pool In The SAMA Analysis.⁴¹

In addition to contending that the ER should have performed a SAMA analysis for the spent fuel pool at Pilgrim, Pilgrim Watch also brought forward new and significant information that demonstrates that the risk and consequences of spent fuel fires is much greater than previously thought; a fact starkly exemplified by the generic statement in section 5 of GEIS that spent fuel pools have the “second” greatest inventory of radioactive materials as contrasted with the site specific fact – at Pilgrim the inventory of long-lived radionuclides, such as Cesium-137, in the spent fuel pool is eight times that in the reactor core.

The Board should have required Entergy to consider the environmental impacts of a spent fuel pool fire under *The National Environmental Policy Act of 1969* (“NEPA”), and required a review of spent fuel pool impacts under 10 C.F.R. § 51.53(c)(3)(iv).

Here, the Board once again found that the regulations themselves do not dictate a rejection of the contention: “Indeed, 10 C.F.R. § 51.53(c)(3)(iv) may be read as in effect creating an exception to 10 C.F.R. § 51.53(c)(3)(i)’s allowance that an applicant’s ER ‘is not required to contain analyses of the environmental impacts of the license renewal issues identified as Category 1 issues in Appendix B.’ Commission precedent supports this reading that the requirement of 10 C.F.R. § 51.53(c)(3)(iv) applies not only to Category 2 issues but also to Category 1 issues”⁴²

⁴¹ No waiver request is necessary for the Board or Commission to consider new and significant information. The waiver rule 2.335 requires a *prima facie* showing in an affidavit to justify why that rule should be waived in the particular instance. This is a vastly different standard than that required for a contention to be admissible in 2.309(f) which only requires “alleged facts or expert opinions,” and does not require a Petitioner to prove its case at the outset, nor to show facts that are unique to that nuclear plant.

⁴² LBP-06-23 p. 38.

The Board also said that this reading appears to apply “also in an adjudication context, particularly in light of the Commission’s statement in *Turkey Point* that ‘[a]djudicatory hearings in individual license renewal proceedings will share the same scope of issues as our NRC Staff review.’”⁴³ Unfortunately, the Board then rejected this obvious and proper interpretation of the rule because of what it called “other statements of the Commission in *Turkey Point* that lead to a contrary conclusion.”⁴⁴ As it did with respect to the SAMA analysis, the Board rejected the plain reading of the regulations.

In *Turkey Point*, the Commission simply said 10 C.F.R. §2.758 permitted it “to waive one or more license rules.” It did not hold that either 10 C.F.R. §2.309(f)(2) or 10 C.F.R. § 51.53(c)(3)(iv) contains any language exempting Category 1 impacts from the scope of issues that must be addressed in NEPA contentions under 10 C.F.R. §2.309(f)(2). Nor can any exception to that clear and unequivocal requirement be found in the language of 10 C.F.R. § 51.53(c)(3)(iv), the preamble to the 1989 Final Rule or in the preamble to the 1996 rule containing 10 C.F.R. §51.53(c)(3)(iv), 61 Fed. Reg. 28,467 (June, 1996).

The new and significant information that Entergy and the Board must address under the applicable regulations are set forth not only in Pilgrim Watch’s filings, but also in Riverkeeper Inc’s New and Amended Contentions, filed September 5, 2008 in Docket Nos. 50-247-LR and 50-286-L.

⁴³ LBP-06-23 p. 39.

⁴⁴ LBP-06-23 p. 39.

V. CONCLUSION

For the foregoing reasons, the Commission should review the Decisions in LBP-06-848, LBP-07-13, and LBP-06-23 and either deny the license renewal application or remand the matters to the Board for further proceedings after the Commission has corrected the many legal and factual errors contained in the three decisions.

Respectfully submitted,

A handwritten signature in black ink that reads "Mary Lampert". The signature is written in a cursive style with a large, sweeping loop at the end of the name.

Mary Lampert

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November 12, 2008

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

In the Matter of

Docket # 50-293-LR

Entergy Corporation

Pilgrim Nuclear Power Station

License Renewal Application

November 12, 2008

CERTIFICATE OF SERVICE

I hereby certify that the following was served November 12, 2008, Pilgrim Watch's Petition for Review of LBP- 06-848, LBP-07-13, LBP-06-23 and the Interlocutory Decisions in the Pilgrim Nuclear Power Station Proceeding

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