

July 3, 2006 (11:55am)

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSIONOFFICE OF SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFFBEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the matter of:

Docket No. 50-293-LR

ASLBP No. 06-848-02-LR

ENTERGY NUCLEAR OPERATIONS, INC.

(Pilgrim Nuclear Power Station)

License Renewal Application

July 3, 2006

PILGRIM WATCH REPLY TO ENTERGY ANSWER TO REQUEST FOR  
HEARING AND PETITION TO INTERVENE BY PILGRIM WATCH

Pursuant to 10 C.F.R. § 2.309(h)(2), Pilgrim Watch hereby replies to the Entergy Nuclear Operations, Inc. answer to Pilgrim Watch dated June 26, 2006. Pilgrim Watch has standing to intervene in Entergy's January 27, 2006 application for license renewal for Pilgrim Nuclear Power Station in Plymouth, Massachusetts. In addition, Pilgrim Watch has submitted at least one admissible contention according to the NRC regulations.

**BACKGROUND**

Pilgrim Watch filed a Request for a Hearing and Petition to Intervene in the license renewal for Pilgrim Nuclear Power Plant on May 25, 2006 (hereinafter "Petition") and submitted five contentions which met the requirements of 10 CFR § 2.309. On June 5, 2006, Pilgrim Watch filed Notice that it was adopting the contention and supporting reports filed by the Commonwealth of Massachusetts. On June 15, 2006, the staff of the

Nuclear Regulatory Commission agreed with Pilgrim Watch's adoption of the

TEMPLATE = SECY-037

SECY-02

Commonwealth's contention provided that Pilgrim Watch is otherwise admitted as a party to this proceeding based on its initial petition to intervene and, if the initial sponsor of the contention is not admitted as a party to, or subsequently departs from, this proceeding, Pilgrim Watch then demonstrates an independent ability to litigate any adopted contentions. On June 19, the staff of the Nuclear Regulatory Commission filed a response opposing the Pilgrim Watch Request for a Hearing and Petition to Intervene. On July 26, 2006, Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc. ("Entergy") filed an answer to the Petition opposing the Pilgrim Watch Request for a Hearing and Petition to Intervene and Notice to Adopt Contention.

#### DISCUSSION

In its Answer, Entergy agrees that Pilgrim Watch has demonstrated standing to participate in this proceeding. (Answer, p. 2). However, Entergy argues that Pilgrim Watch has not brought forward a single admissible contention. Pilgrim Watch hereby challenges the legal arguments in Entergy's Answer.

10 C.F.R. §2.309(f) sets out what is required in order for a contention to be admissible. In the case of Petitioner's first three contentions, Entergy appears to mainly argue that Petitioner has not met the requirement of (ii), (v) and (vi) of this section, which are as follows:

(ii) Provide a *brief explanation of the basis* for the contention;

(v) Provide a *concise statement of the alleged facts or expert opinions* which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the *specific sources and documents* on which the requestor/petitioner intends to rely to support its position on the issue.

(vi) Provide *sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact*. This information must include references to specific portions of the application (including the applicant's environmental report and safety report) that the petitioner disputes and the supporting reasons for each dispute, or, if the petitioner believes that the application fails to contain information on a relevant matter as required by law, the identification of each failure and the supporting reasons for the petitioner's belief.

As Petitioners are fully aware, and as Entergy has reiterated in its Answer, the rules governing admission of contentions are "strict by design." (Answer p. 7). However, the regulations do not require Petitioners to *prove* their contentions at the outset. In the Federal Register Notice of the 1989 procedural changes in the hearing process, the Commission stated, "This requirement does not call upon the intervenor to make its case at this stage of the proceeding, but rather to indicate what facts or expert opinions, be it one fact or many, of which it is aware at that point in time which provide the basis for its contention. . . . Where the intervenor believes the application and supporting material do not address a relevant matter, it will be sufficient for the intervenor to explain why the application is deficient." 54 FR 33170, August 11, 1989. In addition, the Commission responded to criticisms that the standard "dispute on a genuine issue of material law or fact" is the same one to be used in ruling on motions for summary judgment: "The Commission expects that at the contention filing stage the factual support necessary to show that a genuine dispute exists need not be in affidavit or formal evidentiary form and need not be of the quality necessary to withstand a summary disposition motion." *Id.* at 33171. Indeed, as the NRC responded in its brief when the

new rule was challenged by the Union of Concerned Scientists, "The new rule simply adds the requirement that a petitioner include in its submission some alleged facts or fact in support of its position sufficient to indicate that a genuine issue of material fact or law exists." *Union of Concerned Scientists (Petitioners) v. United States Nuclear Regulatory Commission and the United States of America (Respondents) and Nuclear Management and Resources Council, Inc., Edison Electric Institute (Intervenor-Respondents)*, On Petition to Review a Final Rule of the US NRC, Brief for Respondents, p. 27 (August 30, 1990).

For the record, Pilgrim Watch, a non-profit citizens' coalition, has not formally engaged the services of an expert at this juncture of the proceeding; for it to be required to do so would be economically prohibitive at this early stage and would derail the purpose of the Commission's intervention rules. Rather, Pilgrim Watch has provided the board with extensive sources as the basis for its contentions, gleaned from scientific, technical, public policy and government reports. We highlight some of factual bases we rely on for these contentions below.

**Contention 1, "The Aging Management Plan Does Not Adequately Inspect and Monitor For Leaks in All Systems and Components That May Contain Radioactively Contaminated Water"**

Entergy claims that this contention is inadmissible because it is overbroad because it refers to "all systems and components that may contain radioactively contaminated water," and there are systems and components at Pilgrim that contain radioactive water that are not subject to the license renewal requirements of 10 CFR 54. However, Petitioners specifically state (Petition p.5) that the Pilgrim Nuclear Power Plant

Application for License Renewal (Application) includes a list of systems that require aging management. Among them are pipes and tanks. (Application, B.1.2 Buried Piping and Tanks Inspection, page B-17. Petitioners then proceed to focus discussion on these specific components. The fact that “all systems and components” may include systems and components that are outside the scope of this proceeding as well as those specifically referred to which are within the scope is not reason to deem the whole contention overly broad and outside the scope. Entergy also argues that because some of the systems and components are not included in 10 CFR 54, this is an impermissible challenge to NRC regulations. Again, just because some of the systems and components are outside the scope of this regulation does not make this contention a challenge to the regulation.

Similarly, Entergy attempts to parse the wording of the Contention to support its argument for an easy dismissal of the Contention’s substance. Entergy states, “Similar claims made throughout Contention 1 that there ‘should be regular and frequent inspections of all components that contain radioactivity in this aging plant’ (e.g., Pet. at 12) are likewise overbroad and impermissibly challenge the Commission’s license renewal regulations . . .” (Answer p. 12). However, Entergy has lifted this concluding sentence from the end of a three paragraph long section which describes the Pilgrim Aging Management of its buried pipes and tanks in detail – in other words, it has quoted Petitioners out of context to make it appear the whole contention is vague and overly broad.

Entergy also alleges that Petitioners provide “no specificity or basis for the alleged deficiencies. Pilgrim Watch identifies no specific PNPS systems or components within the scope of the rule that will not be adequately managed for aging, or that contain

radioactive water that might be released. Pilgrim Watch identifies no alleged deficiencies in the aging management programs at Pilgrim associated with systems containing radioactively contaminated water.” (Answer p. 13). But in fact, Petitioners refer to the Application’s Aging Management Plan in detail, and it is the details of this Plan that Petitioners contend are inadequate. (Petition p. 6-14). A description of the ER’s Aging Management Program for buried pipes and tanks, indicating its deficiencies is given in the Petition on p.12. Petitioners also review several incidents at U.S. nuclear facilities that have experienced leaks, noting that some of those leaks have gone undetected for 10 years. This is pertinent because the aging management program at Pilgrim will inspect buried pipes and tanks on a 10-year cycle - only once during the re-licensing period.

Entergy argues that “radioactive water leakage at other nuclear plants provides no indication, by itself, of any susceptibility to radioactive leakage at Pilgrim or of any asserted deficiency in the aging management programs established for the Pilgrim license renewal.” (Response, p. 13). While it is true that Petitioners learned of this potential problem from other plants, they then discovered a gap in the Aging Management Plan to deal with this issue. Petitioners’ concerns have been borne out by the fact that the Commission itself has deemed this a serious enough issue around the country to appoint a special tritium task force. *NRC Creates Task Force to Examine Tritium Issue*, NRC News Release, March 20, 2006. To upgrade Pilgrim’s Aging Management Plan in awareness of this potential problem would be the prudent approach. Likewise, presumably most of the precautionary procedures in the Aging Management Plan have had some basis in events at other nuclear facilities – or “lessons learned.”

The “site specific attributes” referred to in the Petitioner (p.8) and in Entergy’s Answer (p. 15) include its coastal topography. “Topography source: Pilgrim Nuclear Power Station, Boston Edison Company Docket No. 50-293, May 1972 –U.S. Atomic Energy Commission, Division of Radiological and Environmental Protection, Final EIS ‘The station site is along the rocky western shoreline of Cape Cod Bay. The geology of the site is recognized as primarily glacial deposits. The natural surface stratum in the station area consists of approximately 20 feet of silty and clayey fine sands with scattered boulders. Bedrock is about 30 to 90 feet below mean sea level.’ P. 9 ‘Surface topography is such that surface drainage from the station is seaward and surface water will not leave the Station property otherwise.’ P. 10.” (Petition, footnote 5). The concern is that a leak in an underground pipe or tank would migrate towards the ocean, and would not likely be readily detected.

Entergy states that the Petitioner’s reference, “... to the ‘Bathtub Curve’ of expected failures over the life of a component or structure and argues that leaks are more likely to occur as nuclear power plants age. Pet. at 9-10. However, this assertion is neither specific to Pilgrim nor to underground pipes and tanks. Nor does it provide any basis to claim that the aging management program at Pilgrim is inadequate.” (Answer p. 16). This report was referred to because nuclear plants and their components, such as underground pipes and tanks, are getting older and it is unrealistic to assume that they are not showing signs of aging - especially when buried underground, out-of-sight, in a corrosive salt environment. Similarly, Petitioners reference to G. Bellanger, *Corrosion Induced by Low Energy Radionuclides: Modeling of Tritium and Its Radiolytic and Decay Products Formed in Nuclear Installations* (Elsevier Publications, 2006), ISBN 0

08 0445101, is highly relevant, as it demonstrates that components carrying low energy radioactive water may corrode even more quickly.

Despite Entergy's characterization (Answer, pp. 18-19), Petitioners propose monitoring wells as an adjunct to inspections, and as an integral part of the Aging Management Program at Pilgrim, not as part of its operational radiological monitoring program.

Petitioners describe the Aging Management Program for underground pipes and tanks and show why it is unrealistic to expect to happen upon a leaking pipe during routine maintenance activities, particularly if those activities only take place every ten years. Further they go to the FEIS and show that the topography of the Pilgrim site is such that, were a leak to develop in an underground pipe or tank, the contaminated water would most likely migrate seaward and drain into the ocean. Dilution of an unknown quantity of radioactive water into Cape Cod Bay is not permitted by current regulations and is would be impossible to detect by the Radiological Environmental Monitoring Program, as described in Exhibit C-3. The only effective way to monitor for such an occurrence would be to have on-site monitoring wells located between Pilgrim and the ocean. A suitable array of wells, sampled regularly, could be used to test that the inspection program is working properly. In most of the recent cases of leaked radioactive water, the leaks were detected by monitoring wells, but often not until long after the leaks occurred.

To summarize Petitioners' basis for Contention 1, Petitioners have, in compliance with 10 C.F.R. § 2.309(f) provided a "concise statement of the alleged facts" along with "references to the specific sources and documents" on which they intend to rely to



support the following basis statements: Recent events in several U.S. nuclear facilities have demonstrated that undetected leaks in underground pipes and buried tanks can cause the release of radioactive materials into the ground. Exposure to radioactive materials in the ground water is a threat to human health and a violation of 10 CFR §20.1302 and §50 Appendix A. Aging nuclear plants are more likely to experience corrosion related leaks and corrosion can be induced by low energy radionuclides. The potential risk of leaks at Pilgrim might be increased by the inadvertent past use of counterfeit or substandard parts. The Aging Management Program at Pilgrim does not provide adequate inspection of systems and components such as underground pipes and tanks and does not provide adequate monitoring to ensure that leaks are detected. Current NRC Regulations require Pilgrim to improve its current inspection and monitoring programs. These bases, which are all supported by facts presented by Petitioners, support the Petitioners' contention that the aging management plan does not adequately inspect and monitor for leaks in all systems and components that may contain radioactively contaminated water. The genuine and material issue in dispute is whether or not the Licensee's application sufficiently deals with this safety issue.

**Contention 2: The Aging Management Plan at Pilgrim Fails to Adequately Monitor for Corrosion in the Drywell Liner**

In Contention 2, Petitioners present information that demonstrates that the Aging Management program proposed in the Pilgrim application for license renewal fails to adequately assure the continued integrity of the drywell liner, or shell, for the requested license extension. In particular, the drywell liner wall thickness should be confirmed by periodic ultrasonic testing (UT) measurements at all critical areas, including those which

are inaccessible for visual inspection. The current plan does not adequately monitor for corrosion in these inaccessible areas, nor does it include a requirement for a root cause analysis when corrosion is found.

In the course of preparing this contention, the Commission issued Proposed License Renewal Interim Staff Guidance LR-ISG-2006-01: Plant-Specific Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Steel Containment Drywell Shell, which was published in the Federal Register for comment on May 9, 2006. 71 Fed. Reg. 27,010 (2006). Petitioners stated in their Contention that the best way to assure compliance with NRC standards for public health and safety is to link license renewal to an aggressive Aging Management Program that meets these standards. Upon examination of Pilgrim's Application, Petitioners discovered that Pilgrim does not currently have in place a program that will do so. We requested that the recommendations in LR-ISG-2006-01, *Plant-Specific Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Steel Containment Drywell Shell* should be immediately incorporated into Pilgrim's Aging Management Plan before a license extension is approved.

Presumably in response to this ISG, Applicant submitted an amendment to the license renewal application, written on May 11, 2006, to provide additional information responsive to this proposed guidance. Letter from S. Bethay to U.S. Nuclear Regulatory Commission, License Renewal Application, Amendment No. 1 (May 11, 2006) available at Adams Accession No. ML061380549 (hereinafter referred to as "Amendment No. 1"). Until told of this amendment by NRC Staff in their June 19 "Response to Request for Hearing and Petition to Intervene by Pilgrim Watch," Petitioners were unaware of it. The

Amendment has not been made part of the Application on the Pilgrim I License Renewal Site, and it was not sent to Petitioners by the Applicants. It is not clear when the letter was actually posted on ADAMS for public review. Thus, Entergy is correct (Answer, p. 21) that Petitioners did not mention or address this amendment in their Petition.

The May 11, 2006 Amendment No. 1 to its License Renewal Application, submitted by Entergy, provides additional information about past measurements and steps taken to comply with GL-87-05, whose stated purpose was "to initiate the collection of information of the licensee's current and proposed action to assure the degradation of the Drywell Shell plates adjacent to the sand-cushion has not occurred and to determine if augmented inspections above and beyond those planned by the licensee's are necessary."

For the inaccessible areas of the sand cushion region, Applicant states that it has discontinued measurements of the drywell in embedded regions. "Based on the following four factors, PNPS removed UT thickness measurements in the sand cushion region from the IWE program after the 2001 outage:

- \* Satisfactory results from monitoring for leakage from the annulus air gap drains.
- \* Satisfactory drywell wall thickness at the 9 foot elevation sand cushion region (and upper drywell) after 27 years of operation (as of 1999).
- \* High radiation exists in areas of sand cushion UT exams.
- \* The potential for damage to the drywell shell from concrete removal tools used to facilitate the examinations." (Amendment, p. 3).

The proposed staff guidance on this issue, which the Applicant says "is expected to be finalized by the NRC Staff at the end of the comment period" states: "Specifically, the staff has determined that applicants for license renewal for a plant with a boiling

water reactor Mark I steel containment should provide a plant-specific AMP to address the *potential loss* of material due to corrosion in the *inaccessible areas* of the Mark I steel containment drywell shell for the period of extended operation.” (ISG p. 27011). (emphasis added). The Guidance document includes the instructions to develop a “corrosion rate” for these areas. While the Amendment recently provided by Entergy details some history of UT corrosion measurements, it appears that measurements have only been taken twice in the inaccessible embedded areas, and that these measurements have been discontinued for the above mentioned reasons. This does not appear to conform with the proposed ISG. Petitioners reiterate our request that the recommendations in LR-ISG-2006-01, *Plant-Specific Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Steel Containment Drywell Shell* should be immediately incorporated into Pilgrim’s Aging Management Plan before a license extension is approved.

**Contention 3, “The Environmental Report is inadequate because it ignores the true off-site radiological and economic consequences of a severe accident at Pilgrim in its Severe Accident Mitigation Alternatives (SAMA) analysis,”**

Entergy appears to have misconstrued the substance of Petitioners’ contention completely. In this Contention, Petitioners assert that by inputting incorrect and incomplete data into the accident modeling software, the Applicant has underestimated the true consequences of a severe accident at Pilgrim and this may have caused it to dismiss mitigation alternatives that are cost beneficial. In other words, the analysis was not performed correctly.

1. **Contention 3 Does Not Challenge Commission Regulations**

In its Answer, Entergy claims that Petitioners have misread the NRC Regulations and are therefore impermissibly challenging those regulations. (Answer p.25). In fact, Petitioners quoted the regulations verbatim: “The regulatory requirement that nuclear plants perform a SAMA analysis states: ‘The probability weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to ground water, and societal and economic impacts from severe accidents are small for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives.’ Appendix B to Subpart A of 10 CFR §51.53.” (Petition p. 29). Entergy appears to deliberately mischaracterize Petitioners’ argument by saying, “The Contention goes on to claim that the Commission’s regulations in 10 C.F.R. Part 51 require applicants to “mitigate the consequences” of severe accidents without regard to the likelihood of their occurrence . . . (Petition, p. 29-31).” (Answer p. 25). The words that were underlined and put in quotation marks by Entergy were deliberately taken completely out of context. Petitioners are fully aware that the Regulations do not require mitigation, rather they require a *consideration of mitigation alternatives*. The words underlined in Entergy’s Answer appear to have been taken from Petitioners’ statement: “In other words, even though the probability of a severe accident is so low that the impacts can be considered small, all plants must still **consider alternatives to mitigate the consequences** of those accidents.” (Petition p. 29). (emphasis added)

The only reason that Entergy would so deliberately misquote (or at least underquote) our statement would be to deliberately make it appear to the Board that Petitioners fundamentally misunderstand the whole point of a SAMA analysis. This is not the case. Petitioners fully realize that Entergy is not required by the Commission to mitigate severe

accidents. Rather Entergy is required to perform a cost-benefit (or value-impact) analysis in order to discover whether there is mitigation that can be applied in a cost beneficial way to reduce either the likelihood or the impacts of severe accidents. In its Contention, Petitioners demonstrate that even this low level requirement has not been met by the Applicant.

As part of their discussion of the SAMA analysis performed by Applicant, Petitioners call attention to some of the limitations of Probability Risk Analyses (PRAs). (Petition, p. 30-31). Entergy takes particular exception to this part of the Contention and spends at least four pages addressing it in its Answer. Entergy again misconstrues Petitioners' argument. Our difference on the issue of "risk" appears to be one of semantics. Petitioners argue that multiplying probability of an accident by the consequences of an accident (Applicant's definition of "risk", Application ER E.1.5.1) can distort the analysis by making even reasonable mitigation appear more costly than the costs of the accident. This is not an original argument. It is also not central to Petitioners' Contention, which focuses mainly on the input parameters used in the accident modeling software. However, some aspects of Entergy's Answer deserve a reply, particularly since they appear to support Petitioners' argument.

1. In its discussion of *Limerick*, Entergy says "As an example, the Third Circuit noted that an accident with the same probability of occurrence at different nuclear power plants would produce "a higher risk" for "a plant located in a densely populated area" compared to plants in lower populated areas, and accordingly, a proper evaluation of the costs and benefits of implementing SAMAs would need to account for these different risk profiles." (Answer, p. 26, fn.13). This statement seems to support Petitioners argument

that the *consequences* of a severe accident are the important consideration in evaluating the costs and benefits of implementing SAMAs. (It also supports Petitioners' concerns that Pilgrim is now in a densely populated area and the Emergency Planning inputs used by Applicant underestimate evacuation delay times. (see Petition, p. 41).)

2. Entergy quotes from NUREG 1555, 7.3-6, "NRC Staff review is to "[e]valuate the applicant's basis for estimating the degree to which various alternatives would reduce risk (expressed as a reduction in core damage frequency or in terms of person-rem averted)" (emphasis added by Entergy)." (Answer, p.26, fn.14). This also supports Petitioners claim. Applicant defined risk as "*the product* of consequence and frequency of accidental release." Application ER E.1.5.1. This is a vastly different definition of risk from the one in NUREG – 1555, which is frequency *or* person-rem averted. In Applicant's definition, the "risk" of a catastrophic (high consequence) but low frequency event would be miniscule, whereas in the NUREG – 1555 definition, *either* a large frequency *or* a huge consequence (person-rem) would be a high risk event. The latter is the more prudent and more common sense approach to accident mitigation. By quoting this definition, Entergy is hardly defending the approach taken in the Application.

3. In its discussion of risk and the over-all objectives of a SAMA analysis, Entergy highlights the fact that they did not expect the analysis to result in meaningful severe accident mitigation. It quotes the Commission in 61 Fed. Reg. 28,467, 28,480 (1996) ("Environmental Review for Nuclear Power Plant Operating Licenses") as saying that the Commission "does not expect a properly conducted SAMA analysis "to identify significant [plant] modifications that are cost-beneficial." In other words, the NRC's reassurance to the nuclear industry that SAMAs would not result in expensive plant

upgrades is being used by Entergy as evidence that its analysis for Pilgrim was done properly. Does Entergy, then, consider the whole SAMA exercise a sham? This is a cynical approach to protecting public health and safety around Pilgrim nuclear plant. Petitioners contend that this is not the “hard look” required by NEPA.

To summarize, Petitioners discussed “risk” and PRAs in order to call attention to the fact that probability weighting can make the consequences of even a catastrophic accident seem small. Despite Entergy’s attempts to mischaracterize our arguments, Petitioners claim is that the Applicant’s SAMA analysis may have been inadequate to fully evaluate mitigation alternatives, and one way it was inadequate was by multiplying probability by consequences to determine the risk of an accident. We do not assert that this means Pilgrim must “mitigate the consequences” of all accidents, nor that the “results” of the analysis are wrong. (Answer, pp. 30-32). Rather, we assert that the analysis itself is inadequate, and that, under NEPA, “further analysis is called for.” *Duke Energy* at 13.

**2. Contention 3 Raises a Material Issue of Fact by Highlighting Deficiencies and Errors in the Application**

The bulk of our Contention highlights input data that were incorrect, incomplete or inadequate. Whether any one of these defects would have a “material impact on the results of this analysis” (Answer, p. 30), is both beyond the scope of what Petitioners must show at the admissibility stage, and beyond the abilities of Petitioners, who neither have access to the input parameters used by Entergy, not the software code. “Where the intervenor believes the application and supporting material do not address a relevant



matter, it will be sufficient for the intervenor to explain why the application is deficient.” 54 FR 33170, August 11, 1989. In discussing the materiality requirement, the Atomic Safety and Licensing Board considering the license renewal for Millstone Nuclear Power Station stated “In order to be admissible, the regulations require that all contentions assert an issue of law or fact that is material to the outcome of a licensing proceeding; that is, the subject matter of the contention must impact the grant or denial of a pending license application. Where a contention alleges a deficiency or error in the application, the deficiency or error must have some independent health and safety significance.” *In the Matter of Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3) Docket Nos. 50-336-LR, 50-423-LR ASLBP No. 04-824-01-LR July 28, 2004, p. 7. See *Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation)*, LBP-98-7, 47 NRC 142, 179-80 (1998), *aff’d in part*, CLI-98-13, 48 NRC 26 (1998). In Contention 3, Petitioners demonstrate that there are deficiencies in the Applicant’s SAMA analysis that, by minimizing the true consequences of severe accidents, could have independent health and safety significance.

Entergy improperly applies the Commission’s materiality standard in the present case. It correctly states, “the Commission has defined a ‘material’ issue as meaning one where ‘resolution of the dispute would make a difference in the outcome of the licensing proceeding.’ 54 Fed. Reg. at 33,172.” But then goes on to say, “Here the Contention sets forth nothing to establish that the asserted deficiencies would, if corrected as claimed by the Contention, alter the result of the SAMA evaluations.” (emphasis added by Entergy) (Answer, p. 31). Of course, “a difference in the outcome of the licensing proceeding,” which was the standard cited from *Millstone*, is not the same thing as a “alter the result of

the SAMA evaluations.” As discussed in the Petition, “The question of whether these deficiencies have led to incorrect conclusions about each mitigation alternative is beyond the scope of this contention. . . In *Duke Energy Corp., supra* at 13, the licensee argued that NEPA could not require it to implement any particular SAMA, regardless of how the cost benefit calculations come out, and therefore there was no remedy possible for the Petitioners. But the board rejected this argument, saying ‘While NEPA does not require agencies to select particular options, it is intended to ‘foster both informed decision-making and informed public participation, and thus to ensure the agency does not act upon incomplete information, only to regret its decision after it is too late to correct’ (citing *Louisiana Energy Services* (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 88 (1998)).” It then said “if ‘further analysis’ is called for, that in itself is a valid and meaningful remedy under NEPA.” (Petition, p. 48-49). Petitioners contend that a deficiency in the SAMA analysis is a material defect in the Application, and a requirement for further analysis would be a different outcome of the proceeding.

Entergy has responded to Petitioners example of the SAMA analysis for the DTVS (Petition p. 45-48) by noting, “The Contention focuses solely on the SAMA evaluation for installing a direct torus vent filter at Pilgrim, Pet. at 45-48, for which the evaluation mistakenly identified no benefit.” But then concedes, “Pilgrim is in the process of responding to Requests for Additional Information from the NRC Staff in which this evaluation is being redone and the Applicant will, in accordance with well-established NRC precedent, apprise the Licensing Board and the other parties of the results of this reevaluation upon its completion.” (Answer, p. 31, fn.18). Petitioners included the DTVS in its discussion as an example of how a poorly performed SAMA

analysis can lead to erroneous conclusions. Applicant's SAMA analysis listed this mitigation alternative, which would cut radioactive releases in the event of a severe accident in half, as having zero benefit. This appeared to Petitioners to be a faulty conclusion on its face. By stating in its Answer that Applicant has been required to reevaluate this conclusion, Entergy implies Petitioners were correct.

For all its discussion of the "conservatism" employed by the Applicant in its SAMA analysis, (Answer, p. 30-33), Entergy takes great offense at Petitioners' use of the words "worst case scenario" when discussing the inputs used for evacuation delay times and emergency response data. (Answer, p. 33-35; Petition, p. 40). Petitioners use of these words (which has appeared to trigger an knee-jerk NEPA case discussion from Entergy) was in response to the two "sensitivity analyses" which were performed to consider uncertainty in the start and duration of evacuation of the emergency planning zone ("EPZ") around the Pilgrim plant. The whole point of including these "sensitivity analyses" in the Application is to show that the results used by Entergy for evacuation delay times are reasonable. If the two different analyses yield similar results (which they did) Applicant asserts that it can conclude that its "key assumptions" are correct. (Answer, p. 32). However, Petitioners have raised concerns in their Contention 3 (pp. 39-44) which demonstrate that these assumptions could be wrong by orders of magnitude. As was seen in the evacuation of Houston before Hurricane Katrina, FEMA (and MEMA) may be significantly underestimating the time it would take to evacuate a populous area with inadequate road infrastructure. Petitioners highlight some of the defects in Applicants "key assumptions" including shadow evacuations, delays in evacuation due to an inadequate early warning system, and traffic and weather

assumptions, and refer to published studies to support these claims. It is in this context that Petitioners used the words “worst case scenario” – which was presumably what the Applicant was attempting to account for in its “sensitivity analyses” and “conservative bounding assumptions.” (Answer p. 31). If the bounding assumption used by the Applicant in its sensitivity analysis underestimates the upper limits of the emergency response data, it is no wonder negligible differences were seen. Petitioners do not find the Application’s sensitivity analyses convincing – and it is here (as well as in Emergency Planning, which is beyond the scope of this proceeding) that Petitioners urge consideration of a worst case scenario. We argue this is necessary in order to get meaningful results from the modeling software and SAMA analysis, nor to flout NEPA’s “Rule of Reason” (Answer, pp 33-35) nor to “[distort] the decision making process by overemphasizing highly speculative harms.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 356 (1989); (Answer, p. 34).

Petitioners’ discussion of the limitations of the MACCS2 software was included because it appears that nuclear plant licensees have allowed these limitations to take on a life of their own, and assume the guise of a regulation mandated method. For example, some of the known limitations of the software are listed in the 1997 User Guide: “The atmospheric model included in the code does not model the impact of terrain effects on atmospheric dispersion. The code also does not model dispersion close to the source (less than 100 meters from the source) or long range dispersion. The economic model included in the code models only the economic cost of mitigative actions.” *User Guide for MACCS2, the Code Manual for MACCS2: Volume 1, User’s Guide*, SAND97-0594, section 6. However, rather than seeing these as limitations of the software that should be

compensated for, the Applicant appears to have taken them as a license to ignore these parameters. Even though *the software* cannot include the impact of terrain effects, long range dispersion or economic costs beyond mitigative actions, this does not mean that the NRC Regulations allow a proper SAMA analysis to ignore these. If adding in the true economic costs of a severe accident, for example (as discussed in the Petition pp. 43-45), would result in a consequence cost several orders of magnitude greater than that from simply the costs of mitigative actions, these costs should be estimated and taken into account.

In its Answer (p. 36), Entergy states, "Further, Pilgrim Watch admits that software issues can be avoided by understanding MACCS2 limitations and capabilities. Pet. at 32. Pilgrim Watch does not provide any basis to assume that Entergy failed to understand or misapplied MACCS2. Nor does Pilgrim Watch provide any basis whatsoever for its allegations that Entergy 'ignored warnings about the limitations of the model.'" Petitioners have demonstrated that Applicant did ignore those warnings by using the most simplistic meteorological data and by not supplementing the analysis data to show the full economic costs of severe accidents. This speaks to the fact that either Entergy failed to understand the MACCS2 limitations and capabilities, or chose to ignore them, feeling secure in the knowledge that it was following industry practices.

In its discussion of Applicant's meteorological input data (Petitioner pp. 34-38, Answer pp. 37-39), Petitioners rely on a site specific report prepared for the Pilgrim Nuclear Plant, J.D. Spengler and Dr. G.J. Keeler, *Feasibility of Exposure Assessment for the Pilgrim Nuclear Power Plant*, Prepared for Massachusetts Department of Public Health, May 12, 1988. This report describes the complex sea breeze phenomenon at the

Pilgrim site and concludes that it has a significant effect on estimating area-wide contaminant exposures in coastal environments. *Id.* at 6. It also concludes that Pilgrim's current meteorological monitoring is inadequate. "The meteorological sites available provide limited ability to fully characterize or model the sea breeze circulation in the vicinity of the Pilgrim I Nuclear Power Plant." *Id.* at 1. Although Petitioners cannot *prove* that the deficiencies in meteorological data used in the MACCS2 would, by themselves, materially affect the results of the analysis, they are another defect in the Application that is likely to have a significant health and safety effect, and as such are material to this proceeding. In addition, the use of better weather monitoring for the purposes of SAMA would also allow better predictions of plume dispersion and emergency planning in the event of an actual severe accident and as such would be a reasonable economic investment.

Petitioners have already noted that the bounds of the sensitivity analyses performed in the Application might not have taken into account scenarios of shadow evacuations, delays in evacuation due to an inadequate early warning system, and traffic and weather -- factors that might have pushed the upper bounds of the analysis beyond the limits used by Applicant. Tripling the evacuation delay time and cutting the evacuation speed by 30% do not necessarily reflect what would happen in a panicked population that is notified of a nuclear emergency. Petitioners cited a study published in *Evacuation Behavior In Response To Nuclear Power Plant Accidents*, Donald Ziegler and James Johnson, Jr., The Professional Geographer, (May, 1984), that looked at the population's response to the accident at Three Mile Island. At TMI a limited evacuation advisory of pregnant women and pre-school children within 5 miles of the reactor was recommended

by the Governor; that number would have resulted in 3,400 evacuees. Instead up to 200,000 people actually evacuated, approximately 39% within 15 miles of the reactor. A “shadow” evacuation is not expected to diminish until approximately 25 miles out from the reactor. The study found that in addition to the high rate of voluntary evacuation, those evacuees tended to travel greater distances than observed in other kinds of disasters. The TMI study evidenced that the median distance traveled by evacuees was 85 miles. As shown in Hurricane Katrina, the nation’s highway infrastructure is not capable of handling mass evacuations, and Plymouth County has roads that are notoriously inadequate to handle even holidays and rush hour. As noted in the above study, evacuation from a nuclear plant accident would likely be even more chaotic than evacuation from the path of a hurricane. It is therefore very likely that the upper bounds of Applicant’s evacuation data are optimistic. The fact that a negligible effect was seen in the sensitivity analyses would seem to bear this out rather than confirm Applicant’s assumptions.

The Entergy Answer states, “Furthermore, the validity of the Pilgrim emergency plan and the evacuation time estimates developed as part of the plan should not be subject to challenge in this proceeding. The exclusion of emergency planning issues from license renewal proceedings has been repeatedly reaffirmed by the Commission.” (Answer p.43) Petitioners are aware of this. And yet evacuation delay times and evacuation speed *are* a highly relevant and necessary part of the SAMA analysis. Despite the quote, “Through mandated periodic reviews and emergency drills, ‘the Commission ensures that existing plans are adequate throughout the life of any plant . . .’” 56 Fed. Reg. 64,966; *Turkey Point*, CLI-01-17, 54 N.R.C. at 9, no realistic on-the-ground drills have ever been

performed to test Pilgrim's emergency plan and evacuation times. Without challenging the (untested) plan itself in this proceeding, Petitioners can and do challenge the evacuation data used by Applicant in its SAMA analysis.

Applicant's reliance on the emergency plan to limit the evacuation zone to 10 miles is misplaced. (Answer p. 43). Petitioners have cited a report based on an actual nuclear accident, *Evacuation Behavior In Response To Nuclear Power Plant Accidents*, *supra*, to show that this zone is unrealistic and that the average distance traveled was 85 miles. The difference is critical to evacuation time data because more people traveling farther will slow traffic throughout the region. While the emergency plan may not extend beyond 10 miles, a realistic input for a SAMA analysis should. This is another example of Entergy using deficient data in its analysis which most likely minimizes the cost of a severe accident.

Petitioners also argue that, due to limitations in the economic model of the MACCS2 Code, the SAMA analysis does not account for true economic costs, including the loss of economic activity, such as the business value of property or tourism, and Applicant has failed to account for them. (Petition p. 43-45, Answer p. 46). Entergy claims that we have not provided a basis to show "that this limitation is of any material significance and would in any way alter the determination of potentially cost-beneficial SAMAs." In fact, Petitioners cite a study that shows that tourism accounts for \$11.2 billion in revenues for Massachusetts and the region within 50 miles of Pilgrim is highly dependent on tourism. This demonstrates that just the tourist sector alone would account for costs that dwarf those cited in Applicant's SAMA analysis and would very likely alter the determination of potentially cost beneficial SAMAs.



Petitioners' Contention 3 is within the scope of this proceeding, is material to the outcome of it, and has been supported by "the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue." 10 CFR 2.309. The Petition has shown that probabilistic modeling can underestimate the true consequences of a severe accident and that the Applicant used incorrect meteorological, evacuation and economic input data to analyze severe accident consequences in a way that caused it to ignore the true radiological and economic consequences of severe accidents and may have caused it to dismiss cost effective mitigation alternatives. However, the Petitioners are not required to prove their case at this juncture. Indeed, a Licensing Board should not address the merits of a contention when addressing admissibility. *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), LBP-82-106, 16 NRC 1649, 1654 (1982). The Commission has consistently ruled that in deciding whether the NRC's admissibility standard is satisfied, the substantive merits of a contention may not be reached. *Sierra Club v. NRC*, 862 F.2d at 228, citing *Texas Utilities Electric Co.* (Comanche Peak Steam Electric Station, Unit 1), ALAB-868, 25 NRC 912, 931 (1987).

**Contention 4.** Petitioners have argued that a SAMA analysis for spent fuel pools is a Category 2 issue under 10 C.F.R. Part 51, Appendix B. Its inclusion under "Uranium Fuel Cycle" as a Category 1 issue encompasses only the normal operations of the spent fuel pool, and does not prevent it from being a Category 2 issue for the purposes of "Severe Accidents." Petitioners base this on a rational reading of these regulations, and

the fact that the “Uranium Fuel Cycle” section deals mainly with off-site radiological impacts – which would clearly not be considered “small” in the case of a severe accident. Indeed the introduction to the GEIS Uranium Fuel Cycle section (6.1) also makes this distinction: “For the purposes of assessing radiological impacts, the Commission has concluded that impacts are of small significance if doses and releases do not exceed permissible levels in the Commission's regulations. Accidental releases or noncompliance with the standards could conceivably result in releases that would cause moderate or large radiological impacts. *Such conditions are beyond the scope of regulations controlling normal operations* and providing an adequate level of protection.” (emphasis added). In its answer, Entergy cites the *Turkey Point* decision, to contradict Petitioners’ interpretation of the regulations. (Answer pp. 48-49). However, *Turkey Point* can be distinguished from the present case in that the *Turkey Point* Petitioners, Ms. Lorion and Mr. Oncavage, raised the specter of spent fuel accidents, but not within the context of a category 2 SAMA analysis. In other words, they raised in general the idea of the *risks* associated with the spent fuel pool rather than arguing for its inclusion in the SAMA analysis. The Licensing Board and the Commission both highlighted this defect: “. . . this portion of Ms. Lorion’s contention does not seek to raise any issue related to severe accident mitigation alternatives. Her contention neither identifies any mitigation alternatives that should be considered nor challenges the Applicant’s evaluation of SAMAs in its environmental report. Rather, Ms. Lorion’s final contention simply claims that a severe accident must be addressed.” *Turkey Point*, 53 NRC 160. “. . . Mr. Oncavage has not raised any issue involving mitigation alternatives.” *Id.* at 165. “But Mr. Oncavage’s Contention 2 says nothing about mitigation alternatives.” *Turkey Point*,

54 NRC 21. The Commission then went on to state that, despite the fact that neither the NRC Staff nor FPL raised the issue, there is a distinction between *reactor* accidents and *spent fuel* accidents. "Not only Mr. Oncavage, but also the NRC Staff and FPL, apparently was confused on this point, for no one raised the important distinction between reactor accidents and spent fuel accidents. As we have seen, the GEIS deals with spent fuel." *Id.* Petitioners contend that this decision is not dispositive on this issue. The Board and Commission did not need to decide directly the issue of spent fuel SAMAs because it was not properly presented to them. The Petitioners in that decision presented spent fuel accidents as a separate concern within the scope of environmental impacts, not as part of a SAMA analysis.

Petitioners also present new and significant information that supports the need for a thorough SAMA analysis for the risk of spent fuel fires. (Petition p. 56 – 73). Petitioners contend that present political and technical realities make it likely that the spent fuel will remain on-site far longer than was originally anticipated, and the risk of a fire in the spent fuel pool (which is more densely packed than originally anticipated) is greater than was previously known.

Entergy argues that none of this information is new, and even if it is new, Petitioners failed to submit a petition for waiver or rulemaking. (Answer p. 49). Petitioners refer to the Massachusetts Attorney General's discussion of this issue in his Reply to Entergy's and NRC Staff's Responses to Hearing Request and Petition to Intervene with Respect to Pilgrim License Renewal Proceeding. (Mass AG Reply) June 26, 2006. In particular, "the alternative procedural avenues suggested in *Turkey Point* for seeking consideration of significant new information, *i.e.*, a waiver petition or petition for

rulemaking, are inconsistent with NEPA's requirement for supplementation of EISs as set forth by the Supreme Court in *Marsh*." (Mass AG Reply, p. 10).

Entergy argues that the information brought forward by Petitioners to support their claim that the spent fuel will remain on-site longer than originally anticipated and will be more densely packed than originally anticipated is not new and is outside the scope of this proceeding because it challenges the Commission's "Waste Confidence Decision." (Answer pp. 50-51). It then cites the decision in Oconee, CLI-99-11, 49 N.R.C. at 345, "The Commission sensibly has chosen to address high-level waste disposal generically rather than unnecessarily to revisit the same waste disposal questions, license-by-license, when reviewing individual applications. High-level waste storage and disposal, we have said, 'is a national problem of essentially the same degree of complexity and uncertainty for every renewal application and it would not be useful to have a repetitive reconsideration of the matter.' 61 Fed. Reg. 66,537, 66538 (Dec. 11, 1996). . . ." That decision was issued in 1999. As described in the Petition (pp. 56-62), seven years later we are no closer to a solution for high level waste disposal. Petitioners assert that new and increasing uncertainties about spent fuel waste disposal turn this issue from a generic one into a highly site specific one. It is a problem common to all nuclear plants, but those plants will deal with it in site specific ways. Until a long term high-level waste repository is available, Entergy will be making site specific decisions about how to cope with the excess capacity of spent fuel at Pilgrim. The generation of twenty more years of waste at this site, given these uncertainties, is highly relevant to this license renewal proceeding.

Petitioners also brought forward new and significant information to show an increased risk of fires in densely packed spent fuel pools. (Petition pp. 62-73) Water loss in the pools caused either by accident or by an act of malice or insanity could cause a severe fire in Pilgrim's high-density fuel storage pool and the consequences of such a fire would be extreme. Entergy claims that this information is not new and that it was taken into account in the Commission's Generic treatment of spent fuel. (Answer p. 51-53). It states that "Pilgrim Watch relies primarily on a 2003 article by Robert Alvarez et al. (Pet. at 62) . . ." (Answer p. 51), ignoring Petitioners additional use of the more recent information, for example, *Safety and Security of Commercial Spent Nuclear Fuel Storage Public Report*, National Academy of Sciences, p.36 (April 2005).

Although Petitioners discuss the risk of fires in spent fuel pools caused by accidental water loss (Petition pp. 64-65), we also claim that spent fuel pools, particularly in BWR reactors like Pilgrim, are at risk from terrorist attacks. (Petition pp.65-72) Entergy argues that terrorism need not be addressed in license renewal proceedings. (Answer p.53-54). However, a recent decision by the U.S. Court of Appeals for the 9<sup>th</sup> Circuit disagrees. In *San Luis Obispo Mothers for Peace v. Nuclear Regulatory Commission*, No. 03-74628 (June 2, 2006), the Court held that the Commission's refusal to consider the environmental impacts of terrorist attacks failed to meet NEPA's reasonableness standard and that the question of whether these attacks are reasonably foreseeable is a question of law rather than fact.

Whereas the NRC Staff argued that Petitioners discussion of mitigation alternatives (Petition pp. 73-77) are immaterial and beyond the scope of this proceeding, Entergy argues that Petitioners did not present a sufficiently detailed discussion of

mitigation alternatives. (Answer p. 55). For the purposes of raising an admissible contention a thorough examination of mitigation alternatives should not be required, since that would in effect be requiring the petitioner to prove the contention itself, rather than just demonstrate a deficiency in the Applicant's ER. The Commission has consistently ruled that in deciding whether the NRC's admissibility standard is satisfied, the substantive merits of a contention may not be reached. *Sierra Club v. NRC*, 862 F.2d at 228, citing *Texas Utilities Electric Co.* (Comanche Peak Steam Electric Station, Unit 1), ALAB-868, 25 NRC 912, 931 (1987).

Petitioners have argued that a SAMA analysis for the spent fuel pool at Pilgrim is within the scope of this proceeding as a Category 2 issue. In addition, they have submitted new and significant information which casts doubt on the current generic treatment of this issue and supports their contention that NEPA requires that this issue be reviewed as part of the license renewal process.

**Contention 5.** Entergy argues that Contention 5 is beyond the scope of this proceeding and a challenge to NRC regulations, because it involves a Category 1 issue that has been dealt with generically. However, Petitioners have submitted new information that casts doubt on the generic conclusions regarding off-site radiological exposure as they apply to Pilgrim. These include the National Academies Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII Phase II, 2005 study, demographic changes in the Pilgrim area, and case-controlled and statistical studies of radiation linked disease in communities around Pilgrim.

In its discussion regarding radiological exposures as a Category 1 issue (Answer p. 56), Entergy relies on the *Turkey Point* decision, CLI-01-17, 54 N.R.C. at 17 n. 19.

However, this reference appears to involve off-site radiological exposures to fish and exposures to people through aquatic pathways, not directly. No epidemiological studies were submitted that showed radiation linked disease in humans around that nuclear plant from these pathways.

Entergy claims that to raise a Category 1 issue in a relicensing proceeding, Petitioners must petition for a waiver under 10 CFR 2.335(b). However, Petitioners have brought forward new and significant information on this issue and thus NEPA requires supplementation of EISs as set forth by the Supreme Court in *Marsh*.” (see Mass AG Reply, *supra* at 10).

Entergy challenges Petitioners conclusions drawn from the BEIR VII report (Answer p. 57) and claims that it does not present any different conclusions from the previous reports relied on by the GEIS. However, the 2006 BEIR VII Report does present new information about the risks of ionizing radiation. Whereas BEIR VII mortality figures (5.75 fatal cancers per 10,000 person-rem) did not change much from previous reports, the cancer incidence risk figures increased substantially, by approximately 35%. BEIR VII concludes that if 100,000 people were exposed to 10,000 millirem, 1100 people would get a cancer from the radiation and half of them would die. In addition, the Report states that workers who receive lifetime doses of 250 rem have a 1 in 4 likelihood of getting cancer, rather than a 1 in 8 chance, which the NRC’s risk figures state.

Entergy states that Pilgrim Watch’s discussion of changing demographics is irrelevant. (Answer p. 57). However, Petitioners have presented new information that shows that the increase in population and its changing age composition will result in a

larger dose effect on the population than originally anticipated. The increased population around the plant (much of it now *very close* to the plant) is relevant because it means the dose effects of Pilgrim's permitted releases of radiation will be greater than was originally anticipated in the FEIS. Petitioners also presented information that shows the age of the population is relevant because radiation's damaging effects differ depending on the age of those exposed. The population projections in the Pilgrim area 2012-2032 show an increasingly older population and as studies cited by the Petitioners show, there is an increased sensitivity to low levels of ionizing radiation in older populations. (Petition p. 82-83).

Entergy states that two of the epidemiological studies presented by Petitioners pre-date the GEIS and are not new information. In addition, Entergy wrongly attacks the methodology used. (Answer p. 58). However, these studies were presented because they show an increase in radiation linked disease in the communities around Pilgrim – information more current than that used in the FEIS, and information that is site-specific and thus highly relevant to this proceeding. The Southeastern Massachusetts Health Study 1978-1986 ("SMHS Study"), which was published in 1990 supports risk estimates that are greater than those used by the NRC in the GEIS. "The major findings of the study were: Individuals with the highest potential for exposure to Pilgrim emissions (i.e., those who lived and/or worked the longest and closest to the plant) had almost four times the risk of leukemia as compared to those having the lowest potential for exposure (i.e., those who lived and/or worked the least amount of time and farthest from the plant)." SMHS, page iii.



Entergy attacks the methodology used in the above study (Answer, fn. 39), however, SMHS's methodology was deemed sound by three peer review panels, including the scientific journal, Archives of Environmental Health, the initial peer review panel pre-publication by MDPH, and a second peer review panel done after the study was made public by MDPH. In the latter review half of the panel members were appointed by the implicated industry, Pilgrim Nuclear Power Station. This peer review panel stated clearly in its report, *Review of the Southeastern Massachusetts Health Study* by Hoffman, Lyon, Masse, Pastides, Sandler, Trichopoulos, submitted to the Commissioner of Public Health, October 1992 in the Executive Summary that, "The [original SMHS] study team adhered to generally accepted epidemiologic principles..." and "the findings of the SMHS cannot be readily dismissed on the basis of methodology errors or proven biases..."

Entergy does not address in its answer the other data presented by Petitioners, including increases in childhood leukemia in communities near Pilgrim. (Petition p. 86). From 1998-2002 the Cancer Registry showed a continuing increase in leukemia and thyroid cancer. Prostate and multiple myeloma, both radiation linked diseases, are also elevated and statistically significant for the years 1998-2002. The fact that some of this data predates the GEIS is irrelevant as it postdates the FEIS and is site specific.

Entergy disputes Petitioners assertions that the effects of radiation are cumulative (Answer p. 58), ignoring the studies cited in the Petition (p. 88). It also disputes Petitioners discussion of bioaccumulation, which presents information from Entergy's own Radiological Environmental Monitoring Reports regarding long-lived radio-isotopes that have been released into the environment around Pilgrim. A careful reading shows

that there is no dispute about the numbers quoted in the Petition, including Cesium-137 being 1,000,000 times higher than expected in milk. However, Entergy proffers the licensee's explanation that these levels were due to atmospheric weapons testing (even though they did not show comparably high concentrations of radionuclides in control stations located outside the influence of Pilgrim.) (Answer, fn.40). The fact is, whatever the source of these radionuclides in the environment, they are now there and must be added in when the impact from doses to the population are assessed.

Finally, Entergy disregards Petitioners' discussion of the inadequacy of Pilgrim's monitoring system as, "only a listing of examples of non-mandatory monitoring programs (Pet. at Exhibit C)..." (Answer p. 59). Although not a requirement for the admissibility of this Contention, the Exhibit provides sufficient detail about the deficiencies in Pilgrim's monitoring and reports to demonstrate that Pilgrim cannot provide the necessary data to assure that public health and safety have been, or will be, protected. Given the studies and data presented by Petitioners in Contention 4, Pilgrim should be required to ensure that its monitoring program is effective before a license extension is granted.

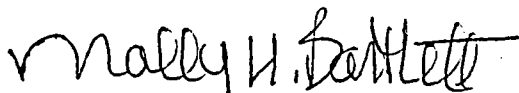
Contention 5 is within the scope of this proceeding because new and significant information has been provided that shows that the off-site radiological effects are greater than was previously known.

To conclude, Petitioners have standing to intervene in this proceeding and have raised five admissible contentions. Entergy's objections that Petitioners have not supported their contentions can be dismissed as an attempt to impose an unduly strict standard at the admissibility stage. Petitioners have supported their contentions with

bases drawn from scientific journals and studies, and have listed these sources and documents. A Petitioner is not required to prove the truth of his contentions at this stage, but is required merely to "indicate what facts or expert opinions, be it one fact or many, of which it is aware at that point in time which provide the basis for its contention. . . .

Where the intervenor believes the application and supporting material do not address a relevant matter, it will be sufficient for the intervenor to explain why the application is deficient." 54 FR 33170, August 11, 1989. This Petition for Intervention meets these NRC regulatory requirements and should be allowed.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Molly H. Bartlett", with a stylized flourish at the end.

Molly H Bartlett  
Attorney for Pilgrim Watch

July 3, 2006

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

**BEFORE THE ATOMIC SAFETY AND LICENSING BOARD**

In the matter of:

Docket No. 50-293-LR

ASLBP No. 06-848-02-LR

ENTERGY NUCLEAR OPERATIONS, INC.

(Pilgrim Nuclear Power Station)

License Renewal Application

July 3, 2006

**CERTIFICATE OF SERVICE**

I hereby certify that copies of the foregoing "Pilgrim Watch Reply to Entergy Answer to Request for Hearing and Petition to Intervene by Pilgrim Watch, and "Pilgrim Watch Reply to NRC's and Entergy's Answers to Notice of Adoption of Contention by Pilgrim Watch" have been served upon the following persons by U.S. Mail, first class.

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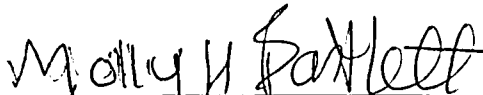
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