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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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USNRC

Before the Atomic Safety and Licensing Board

July 21, 2006 (3:37pm)

OFFICE OF SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

In the Matter of )

)

Entergy Nuclear Generation Company and )  
Entergy Nuclear Operations, Inc. )

Docket No. 50-293-LR  
ASLBP No. 06-848-02-LR

)

(Pilgrim Nuclear Power Station) )

**ENTERGY'S BRIEF ON NEW AND SIGNIFICANT INFORMATION  
IN RESPONSE TO LICENSING BOARD ORDER OF JULY 14, 2006**

**I. INTRODUCTION**

Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc. (hereinafter collectively referred to as "Entergy") hereby file their Brief on New and Significant Information responding to the July 14, 2006 Order<sup>1</sup> of the Atomic Safety and Licensing Board ("Licensing Board" or "Board"). In its Order, the Board directed the parties to file briefs by Friday, July 21, 2006 discussing the relevance and import of the NRC Staff's Guidance in Regulatory Guide 4.2S1<sup>2</sup> concerning the meaning and application of "new and significant information" as that term is used in 10 C.F.R. § 51.53(c)(3)(iv). Order at 3.

<sup>1</sup> Order (Regarding Need for Further Briefing on Definition of "New and Significant Information" As addressed in Participants' Petitions, Answers and Replies Relating to Massachusetts Attorney General Contention and Pilgrim Watch Contention 4; Setting Deadlines for Briefs and Responses; and Scheduling Telephone Conference) (July 14, 2006) ("Order").

<sup>2</sup> Supplement 1 to Regulatory Guide 4.2, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses (Sept. 2000) ("Reg. Guide 4.2S1").

TEMPLATE = SECY-037

SECY-02

As set forth below, the NRC Staff's guidance in Regulatory Guide 4.2S1 confirms that the information presented by Petitioners concerning the alleged need for the Environmental Report ("ER") to address the environmental impacts of severe spent fuel pool accidents does not constitute new and significant information as that term is used in 10 C.F.R. § 51.53(c)(3)(iv). The information is not new in that it was considered in the environmental impact analyses summarized in NUREG 1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants (1995) ("GEIS" or "NUREG-1437"). Nor is the information significant, for it would not lead to an impact finding for on-site spent fuel storage different from that codified in Appendix B to Subpart A of 10 C.F.R. Part 51.

## II. PROCEDURAL BACKGROUND

Entergy submitted its application, dated January 25, 2006, requesting renewal of Operating License DPR-35 for the Pilgrim Nuclear Power Station (the "Application"). On March 27, 2006, the Nuclear Regulatory Commission ("NRC" or "Commission") published a Notice of Acceptance for Docketing of the Application and Notice of Opportunity for Hearing ("Notice") regarding Entergy's application. 71 Fed. Reg. 15,222 (Mar. 27, 2006). The Notice permitted any person whose interest may be affected to file a request for hearing and petition for leave to intervene within 60 days of the notice. Id.

On May 25, 2006, Pilgrim Watch filed its petition to intervene<sup>3</sup> seeking the admission of five contentions, including Pilgrim Watch Contention 4 alleging the need for the ER to address the environmental impacts of severe spent fuel pool accidents because of asserted new and significant information concerning the likelihood and severity of such accidents. On May 26, the

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<sup>3</sup> Request for Hearing and Petition to Intervene by Pilgrim Watch (May 25, 2006) ("Pilgrim Watch Pet.").

Massachusetts Attorney General filed its petition to intervene seeking admission of a single contention similarly concerning the alleged need for the ER to address the environmental impacts of severe spent fuel pool accidents.<sup>4</sup>

The NRC Staff and Entergy filed their Answers to Pilgrim Watch's Petition on June 19 and June 26, 2006 respectively.<sup>5</sup> Both the NRC Staff and Entergy acknowledged Pilgrim Watch's standing but determined that Pilgrim Watch had not submitted an admissible contention. Concerning Pilgrim Watch Contention 4, both the Staff and Entergy found the Contention to be procedurally defective (because Pilgrim Watch had neither sought waiver of the rules nor petitioned for rulemaking to amend the rules) and further determined that Pilgrim Watch had supplied no new and significant information concerning spent fuel pool fires. Pilgrim Watch filed its replies to the NRC Staff and Entergy Answers on June 27, 2006 and July 3, 2006 respectively.<sup>6</sup>

On June 22, 2006, Entergy and the NRC Staff filed their answers to the Massachusetts Attorney General's petition, acknowledging the standing of the Massachusetts Attorney General but arguing that the Attorney General's sole contention concerning spent fuel pool fires was inadmissible for the same reasons as Pilgrim Watch 4 – i.e., the contention was procedurally defective because the Attorney General had neither sought waiver of the rules nor petitioned for rule-

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<sup>4</sup> Massachusetts Attorney General's Request for a Hearing and Petition for Leave to Intervene with Respect to Entergy Nuclear Operations, Inc.'s Application for Renewal of the Pilgrim Nuclear Power Plant Operating License and Petition for Backfit Order Requiring New Design Features to Protect Against Spent Fuel Pool Accidents (May 26, 2006) ("Mass. AG Pet.").

<sup>5</sup> NRC Staff's Response to Request for Hearing and Petition to Intervene Filed by Pilgrim Watch (June 19, 2006) ("Staff Pilgrim Watch Answer"); Entergy's Answer to the Request for Hearing and Petition to Intervene by Pilgrim Watch and Notice of Adoption of Contention (June 26, 2006) ("Entergy Pilgrim Watch Answer").

<sup>6</sup> Pilgrim Watch Reply to NRC Answer to Request for Hearing and Petition to Intervene by Pilgrim Watch (June 27, 2006) ("Pilgrim Watch Staff Reply"); 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 (July 3, 2006) ("Pilgrim Watch Entergy Reply").

making to amend the rules, and was otherwise inadmissible because the Contention failed to supply any new and significant information concerning spent fuel pool fires.<sup>7</sup> On June 29, the Massachusetts Attorney General's filed his reply to the Entergy and NRC Staff Answers.<sup>8</sup>

A Prehearing conference was held July 6 and 7, 2006, during which the Licensing Board heard oral argument concerning the admissibility of the Petitioners' contentions.<sup>9</sup> On July 14, 2006, the Board issued its Order requesting additional briefing on NRC Staff guidance in Regulatory Guide 4.2S1 concerning new and significant information which none of the parties had referenced in their pleadings or in oral argument before the Board.<sup>10</sup>

### III. RELEVANCE AND IMPORT OF REGULATORY GUIDE 4.2S1

#### A. The Only Relevance and Application of "New and Significant Information" Is In the Context of a Petition for Waiver or Rulemaking, which Petitioners Have Not Sought

Before addressing the meaning of "new and significant" information, Entergy reiterates its position that new and significant information has no application except in the context of a request to waive the finality of a Category 1 issue, either by a petition for waiver under 10 C.F.R. §

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<sup>7</sup> NRC Staff Answer Opposing Massachusetts Attorney General's Request for Hearing and Petition for Leave to Intervene and Petition for Backfit Order (June 22, 2006) ("Staff Mass. AG Answer"); Entergy's Answer to the Massachusetts Attorney General's Request for a Hearing, Petition for Leave to Intervene, and Petition for Backfit Order (June 22, 2006) ("Entergy Mass. AG Answer").

<sup>8</sup> Massachusetts Attorney General's Reply to Entergy's and NRC Staff's Responses to Hearing Request and Petition to Intervene With Respect to Pilgrim License Renewal Proceeding (June 29, 2006) ("Mass. AG Reply").

<sup>9</sup> In the Matter of Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station), Docket No. 50-293-LR, ASLBP No. 06-848-02-LR, Oral Arguments on Contentions (July 6 and 7, 2006) ("Prehearing Tr.").

<sup>10</sup> The Board's Order refers to a question directed to counsel for Entergy on "whether there existed any guidance on 'a definition of what would constitute new and significant information in [§] 51.53(c)(3)(iv)'" to which Counsel answered that "he was 'not aware of any Commission guidance on that point'" and to which NRC Staff Counsel did not "step in to provide any response or identify any definition of 'new and significant' information." Order at 1-2. The question directed to Counsel was specific, however, to whether "the Council for Environmental Quality or the Commission, Nuclear Regulatory Commission, provide[d] any guidance to the staff or applicants on a definition of what would constitute new and significant information in [§] 51.53(c)(3)(iv)." Prehearing Tr. at 106-07 (emphasis added). Thus, Counsel did not understand the question to be asking whether there was any NRC Staff guidance on this issue.

2.335 or by a petition for rulemaking under 10 C.F.R. § 2.802. In the Statement of Considerations for the environmental rules governing license renewal, the Commission indicated that if there are comments providing new and significant information demonstrating that an impact codified in the rules (i.e., a Category 1 finding) is incorrect in significant respects, a petition for rulemaking or petition for waiver should be sought depending on whether the new and significant information is generic or specific to the particular plant in question. 61 Fed. Reg. 28,467, 28,470 (1996). This same procedure must apply also in an adjudicatory proceeding. As the Commission has stated, the scope of review under its rules determines the scope of admissible issues in a renewal hearing. 60 Fed. Reg. 22,461, 22,482 n.2 (May 8, 1995). "Adjudicatory hearings in individual license renewal proceedings will share the same scope of issues as our NRC Staff review . . ." Florida Power & Light Co. (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 N.R.C. 3, 10 (2004).

Consistent with these statements, the Commission has held:

In the hearing process . . . petitioners with new information showing that a generic rule would not serve its purpose at a particular plant may seek a waiver of the rule. See 10 C.F.R. § [2.355] . . . Petitioners with evidence that a generic finding is incorrect for all plants may petition the Commission to initiate a fresh rulemaking.

Id. at 12 (emphasis added). Similarly, in establishing the environmental requirements, the Commission stated, "Litigation of environmental issues in a hearing will be limited to unbounded category 2 and category 3 issues [now combined as Category 2 issues] unless the rule is suspended or waived." SECY-93-032, 10 CFR Part 51 Rulemaking on Environmental Review for Renewal of Nuclear Power Plant Operating Licenses (Feb. 9, 1993) ("SECY-93-032") at 4.<sup>11</sup>

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<sup>11</sup> In his reply, the Massachusetts Attorney General suggests that SECY-93-032 was merely a memorandum to the Commissioners in which the "NRC Staff proposed to make a number of changes to the 1991 proposed rule" that  
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Moreover, considering new and significant information in the context of a petition for waiver or rulemaking is the only approach that reconciles the Commission's intent to resolve issues generically,<sup>12</sup> so that they do not have to be considered in individual proceedings, against the potential need for supplementation when appropriate.

Here, the Petitioners have not sought a waiver of the finality rules. Accordingly, the issue of whether there is any new and significant information affecting a Category 1 finding is not properly before the Board. If the Board nevertheless considers whether there is new and significant information, the following considerations would apply.

#### B. General Overview of the Regulatory Guide

10 C.F.R. § 51.53(c)(3)(iv) provides that an "environmental report must contain any new and significant information regarding the environmental impacts of license renewal of which the applicant is aware." (Emphasis added). It does not require an applicant to address information

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were not adopted by the Commissioners and not codified in the final rule. Mass. AG Reply at 8 n. 7 (emphasis added). However, each of the Commissioners voted on and approved the modifications to the proposed rule negotiated with the Council for Environmental Quality and the Environmental Protection Agency as set forth in this part of SECY-93-032. See Notation Vote and Response Sheets of Chairman Selin dated April 6 and April 19, 1993 and Notation Vote and Response Sheets of Commissioners Rogers, Curtiss, Remick, and de Planque dated February 25, 1993, March 9, 1993, April 7, 1993, and April 7, 1993 respectively. See also Prehearing Tr. at 103.

<sup>12</sup> See 56 Fed. Reg. 47,016, 47,023 (1991) ("The purpose of this rulemaking is to resolve as many National Environmental Policy Act (NEPA) issues as possible before beginning plant-by-plant license renewal reviews."); id. at 47,016 ("[T]he environmental impacts that can be generically evaluated will not have to be evaluated for each plant."); id. at 47,017 ("By assessing and codifying certain potential impacts on a generic basis, no need exists to address these impacts in each future license renewal"). This purpose of the rulemaking is echoed in NUREG-1529 responding to the public comments received concerning the rule:

Based on the NRC's confidence in the applicability of its generic review, it does not see any reason to require that an applicant perform a site-specific validation of GEIS conclusions. The NRC believes that such a requirement eliminates the efficiency and stability sought by the Part 51 rulemaking.

NUREG-1529, "Public Comments on the Proposed 10 CFR Part 51 Rule for Renewal of Nuclear Power Plant Operating Licenses and Supporting Documents: Review of Concerns and NRC Staff Response" (Feb. 1996) at p. C9-14. The intent to resolve issues generically so that they do not have to be considered in individual proceedings is also reflected in 10 C.F.R. § 51.53(c)(3)(i), which provides that that an environmental report need not contain analyses of Category 1 issues.

that some other party thinks is significant, or to analyze or revalidate Category 1 issues. Regulatory Guide 4.2S1 is consistent with this limited provision. The Regulatory Guide indicates that an applicant should state whether it is aware of any new and significant information and recommends that the applicant describe the process that the applicant used (Reg. Guide 4.2S1 at 4.2-S-4, 4.2-S-52), but nowhere does the Regulatory Guide suggest that an applicant must provide an analysis or revalidate Category 1 issues.

Regulatory Guide 4.2S1 provides guidance<sup>13</sup> on the meaning of “new and significant information.” The Regulatory Guide defines new and significant information as consisting of two types:

(1) information that identifies a significant environmental issue that was not considered in NUREG-1437 and, consequently, not codified in Appendix B to Subpart A of 10 C.F.R. Part 51, or (2) information that was not considered in the analyses summarized in NUREG-1437 and that leads to an impact finding different from that codified in 10 C.F.R. Part 51.

Reg. Guide 4.2S1 at 4.2-S-4.<sup>14</sup>

The Regulatory Guide goes on to note that the information supplied by an applicant in accordance with 10 C.F.R. § 51.53(c)(3)(iv) is but one source of information from which the Staff may conclude that new and significant information exists concerning the generic conclusions of the GEIS. The Regulatory Guide states in this respect:

An applicant should state in the ER whether it is or is not aware of any new and significant information and explain any actions that were taken to identify new information and evaluate its significance. This information will assist the staff in fulfilling its responsibilities under C.F.R. 51.70(b), which in part states, “The

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<sup>13</sup> As recognized by the Board, the information in Regulatory Guide 4.2S1 is “merely ‘guidance’” and is not “binding on the Licensing Board.” Order at 3. Indeed, a Regulatory Guide is only one recommended means of meeting a regulation and does not foreclose alternative approaches.

<sup>14</sup> This is the same definition that Entergy used in canvassing the existence of any new and significant information that might impact the findings of the GEIS. Application, Appendix E (“Environment Report”) at 5-1.

NRC staff will independently evaluate and be responsible for the reliability of all information used in the draft environmental impact statement.” New and significant information may also be identified by other parties and the NRC in the scoping and public comment process.

Reg. Guide 4.2S1 at 4.2-S-4 (emphasis added). Thus, the guidance in Regulatory Guide 4.2S1 focuses on the processes that an applicant employs to identify potential new and significant information so as to enable the Staff to perform its functions and not on the environmental analysis of any such information. See also id. at 4.2S-52.

Regulatory Guide 4.2S1 does not discuss how new and significant information identified by an applicant – or independently by the Staff or other parties – is to be addressed by the Commission. Rather, this topic is covered in SECY-93-032 which expressly states (in the context of information provided by other parties) as follows:

- a. The staff may determine that the information furnished [by a commenter] is not new and significant and therefore the analysis codified in the rule stands. A commenter dissatisfied with such a response may file a petition for rulemaking under 10 CFR § 2.802 or seek a waiver under 10 CFR § 2.758 [now 10 CFR § 2.335] in order to pursue the matter in a hearing.
- b. If the staff determines that the information furnished is new and significant, and relevant to both the plant and to other plants, the staff will seek Commission approval to either suspend the application of the rule with respect to that analysis or to delay granting the renewal application (and possibly other renewal applications) until the rule can be amended.
- c. If the staff determines that the information furnished is new and significant, but relevant only to the specific plant, the staff will seek Commission approval to waive the appropriate section of the rule in that renewal proceeding.

SECY-93-032, at 3-4 (emphasis added).

### C. Import of the Guidance Concerning New and Significant Information

As set forth above, the definition of new and significant information in Regulatory Guide 4.2S1 has two prongs. It cannot seriously be contended that any of the postulated new and sig-

nificant information supplied by Pilgrim Watch and the Massachusetts Attorney General meets the first prong of this definition – that the information “identifies a significant environmental issue that was not considered in NUREG-1437 and, consequently, not codified in Appendix B to Subpart A of 10 C.F.R. Part 51.” Reg. Guide 4.2S1 at 4.2-S-4 (emphasis added). To satisfy this prong of the definition, the information would need to address a significant environmental issue that had not been considered at all in the GEIS. Here, the GEIS expressly considered severe spent fuel pool accidents and concluded that “even under the worst probable cause of a loss of spent-fuel pool coolant (a severe seismic-generated accident causing a catastrophic failure of the pool), the likelihood of a fuel-cladding fire is highly remote.” GEIS at 6-72 – 6-75 (citation omitted). Thus, none of Petitioners’ information would constitute new and significant information under the first prong of the definition in Regulatory Guide 4.2S1.

The second prong of the definition of new and significant information in the Regulatory Guide consists of two separate, equally important, requirements. The information must first be new, in that it “was not considered in the analyses summarized in NUREG-1437.” The Regulatory Guide does not state that anything not explicitly discussed is new, but rather only information that was not considered. Entergy understands this recommendation to mean that information is new if it was not within the knowledge base on which the analyses in the GEIS are based. This knowledge base includes any studies or reports that were referenced in the GEIS, as well as other publicly available information that would have been within the knowledge of a reasonable NRC reviewer at the time that the GEIS was prepared.<sup>15</sup>

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<sup>15</sup> As an example, the numerous health physics studies concerning the health effects of radiation would be an underlying part of any determination concerning the effects of radiation analyzed as part of the GEIS, even if such studies, generally or specifically, are not identified in the GEIS. Any contrary interpretation of the guidance in Regulatory Guide 4.2S1 could lead to an overly rigid and formalistic application that would mandate addressing the

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Second, the information must be significant in that it “leads to an impact finding different from that codified in 10 C.F.R. Part 51.” Reg. Guide 4.2S1 at 4.2-S-4 (emphasis added). With respect to this latter requirement, the GEIS defined three “impact” findings that could arise from license renewal: “small,” “moderate,” or “large.” GEIS at 1-4 – 1-5; Reg. Guide 4.2S1 at 4.2-S-5. The GEIS determined that the environmental impacts for on-site spent fuel storage during the period of extended operation will be “small.” GEIS at 6-86; 10 C.F.R. Part 51, Subpart A, Appendix B. Thus, to be significant or material under this prong of the definition, the Petitioners’ postulated new information must “lead[] to an impact finding” of “moderate” or “large” for on-site spent fuel storage.

Relevant to the guidance on whether information is considered new, the GEIS states that “[c]urrent and potential environmental impacts from spent-fuel storage have been studied extensively and are well understood.” GEIS at 6-81. Thus, the GEIS analysis is clearly based on and considered the Commission’s knowledge of past studies concerning the potential for spent fuel pool fires. Further, the GEIS’s determination that the occurrence of a zirconium spent fuel pool fire is “highly remote” (GEIS at 6-72 – 6-75) references the Commission’s 1990 Review and Revision of the Waste Confidence Decision (55 Fed. Reg. 38,474 (Sept. 18 1990)), which in turn references a series of technical studies. Thus, the information considered in the analyses summarized in NUREG-1437 would include the Commission’s Waste Confidence Decision – the cited basis for the conclusion stated in the GEIS that the “likelihood of a [spent] fuel cladding fire is highly remote” (GEIS at 6-72 – 6-75) – as well as the series of technical studies underlying the

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large number of such studies that are within the general knowledge base of the NRC and which underlie its regulatory program for ensuring the public health and safety.

Waste Confidence decision. It would also include, as stated above, information within the general state of knowledge of the NRC Staff.

Thus, under the second prong of the definition of new and significant information in Regulatory Guide 4.2S1, the information must both be new information that was not explicitly or implicitly considered in the analyses summarized in NUREG-1437, and be significant, or material, information that would “lead[] to an impact finding” of “moderate” or “large” for on-site spent fuel storage. As discussed below, none of the new and significant information postulated by the Massachusetts Attorney General and by Pilgrim Watch meets either of these requirements.

D. Evaluation of the Petitioners’ Information Under the Second Prong of the Regulatory Guide 4.2S1 Definition of New and Significant Information

The Board’s Order requests that the parties focus their discussions of the relevance and import of Regulatory Guide 4.2S1 on the Regulatory Guide’s definition of new and significant information as it may apply to the Petitioners’ “postulated ‘new and significant information’” and that “each item of postulated ‘new and significant information’ . . . be addressed separately in this regard (for example, separating information regarding accident initiators and accident consequences).” Order at 4. Entergy does so below. It addresses separately accident initiators (e.g., a dropped cask) and accident consequences (i.e., the likelihood of a spent fuel pool fire and the radiological consequences resulting from such a fire). Whether information is new and significant, however, must be evaluated in the context of the findings in the GEIS. Where, as here, the GEIS concludes that the risk of spent fuel pool fires is highly remote, it is the probability of accident initiators that is most relevant. Where, as here, there is no new and significant information that would alter this conclusion, allegations concerning the radiological consequences of a spent fuel pool fire are simply irrelevant.

The Massachusetts Attorney General identifies three sources for its postulated new and significant information: NUREG-1738,<sup>16</sup> the National Academy of Sciences report concerning spent nuclear fuel storage,<sup>17</sup> and the reports of Drs. Gordon Thompson<sup>18</sup> and Jan Beyea.<sup>19</sup> Mass. AG Pet. at 22, 24, 30. Pilgrim Watch also identifies NUREG-1738 and the NAS reports as sources for its postulated new and significant information, as well as a paper by Alvarez, et al. on which Drs. Thompson and Beyea were co-authors. Pilgrim Watch Pet. at 62-67. These sources are discussed below in connection with each accident initiator as well as accident consequences as appropriate.

#### 1. Non-Terrorist Accident Initiators

Both the Massachusetts Attorney General and Pilgrim Watch refer to various non-terrorist accident initiators that assertedly could lead to a spent fuel pool fire. Mass. AG Pet. at 32-33; Pilgrim Watch Pet. at 62-65; see also Thompson Rept. at 18. However, neither the Massachusetts Attorney General nor Pilgrim Watch provide any new or significant information with respect to accident initiators not previously considered in the analyses underlying the GEIS, as would be necessary under the second prong of the definition of new and significant information in Regulatory Guide 4.2S1.

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<sup>16</sup> NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants" (Jan. 2001) ("NUREG-1738").

<sup>17</sup> National Academy of Sciences Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, "Safety and Security of Commercial Spent Nuclear Fuel Storage" (The National Academies Press: 2006) ("NAS Rept.").

<sup>18</sup> Gordon R. Thompson, "Risks and Risk-Reducing Options Associated with Pool Storage of Spent Nuclear Fuel at the Pilgrim and Vermont Yankee Nuclear Power Plants" (May 25, 2006) ("Thompson Rept.").

<sup>19</sup> Jan Beyea, "Report to the Massachusetts Attorney General on the Potential Consequences of a Spent-Fuel-Pool Fire at the Pilgrim or Vermont Yankee Nuclear Power Plant" (May 25, 2006) ("Beyea Rept.").

As noted above, the GEIS's determination that the occurrence of a zirconium spent fuel pool fire is "highly remote" (GEIS at 6-72 – 6-75) cites and is based on the Commission's 1990 Waste Confidence Decision, which in turn is based on a long series of technical studies dating back to 1979 and before. As set forth in NUREG-1353,<sup>20</sup> which the NRC discussed in its Waste Confidence Decision (55 Fed. Reg. at 38,481), these technical studies analyzed a wide range of potential accident initiators that could result in drain-down or boil-down of the spent fuel pool. NUREG-1353 at 4-13 – 4-36.<sup>21</sup> Based on these analyses, the Commission concluded in the Waste Confidence decision that, "even if the timing of the pool failure were conducive to fire," the likelihood of such events causing a spent fuel pool fire is "extremely rare." 55 Fed. Reg. at 38,481. The Commission further noted that the dominant accident sequence contributing to the risk of a spent fuel pool fire is gross structural failure of the pool due to beyond design basis seismic events and that risks due to other accident scenarios – such as structural failure of the pool due to high energy tornado or other missiles, aircraft crashes, and heavy load drops, inadvertent drainage of the pool, and boil-down of the pool due to loss of spent fuel cooling or make-up water – "are at least an order of magnitude smaller." Id.

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<sup>20</sup> NUREG-1353, Regulatory Analysis for the Resolution of Generic Issue 82, "Beyond Design Basis Accidents in Spent Fuel Pools" (April 1989) ("NUREG-1353").

<sup>21</sup> The claim in the Massachusetts Attorney General's Reply (at 18) that nowhere in NUREG-1353 was partial drainage or boil-down of the spent fuel pool considered is simply wrong. Pages 4-15 – 4-20 of NUREG-1353 discuss leakage from spent fuel pools due to failure of pool seals; pages 4-20 through 4-22 discuss the potential for "inadvertent draining of the spent fuel pool" and discuss "a number of recent events resulting in partial draining of spent fuel pools;" and pages 4-22 through 4-28 discuss the potential for "loss of cooling/makeup" in a spent fuel pool and the flow required to makeup for boil-down of the pool in such circumstances.

Indeed, the Attorney General's claim in this respect is based solely on its mischaracterization of NUREG-1353. The Attorney General claims (Reply at 18) that NUREG-1353's "assumption of total and instantaneous drainage of the pool" (NUREG-1353 at 4-8) shows that NUREG-1353 did not consider partial drainage. However, NUREG-1353 expressly states that the assumption of instantaneous draining of the pool (which simplified the analysis) "is not intended to be representative of any accident sequence other than perhaps the catastrophic failure" due to a beyond design basis earthquake. Id. at 4-8 (emphasis added). Thus, contrary to the baseless claims of the Attorney General, the assumption of instantaneous drainage of the pool does not mean that NUREG-1353 did not consider partial drain-down or boil-down events, for clearly the discussion in NUREG-1353, as well as that in the Commission's Waste Confidence Decision, shows that such events were considered.

In the Waste Confidence Decision, the Commission stated that the probability of a seismically induced major spent fuel pool failure was calculated at two chances per million per reactor year of operation,<sup>22</sup> which the Commission considered “extremely rare.”<sup>23</sup> The probabilities of other accident scenarios considered in NUREG-1353, on which the Waste Confidence Decision and hence the GEIS relied, are at least an order of magnitude smaller, including the probability of a drain-down or boil-down scenario that might result in the type of partial fuel uncovering to which Dr. Thompson refers. These probabilities are summarized in Table 1 below.

TABLE 1 NUREG-1353 Accident Initiators and Associated Probabilities		
Accident Initiator	Probability of Spent Fuel Pool Drain-down or Boil-down	NUREG-1353 Page References
Tornado and Other High Energy Missiles	$1 \times 10^{-8}$	4-13 – 4-18, 4-36
Aircraft Crash	$6 \times 10^{-9}$	4-14, 4-36
Heavy Load Drop	$3.1 \times 10^{-8}$	4-14 – 4-15, 4-36
Inadvertent Drainage, (including Pneumatic Seal Failure)	$4.2 \times 10^{-8}$	4-15 – 4-22, 4-36
Boil-down due to Loss of Cooling or Makeup	$6.0 \times 10^{-8}$	4-22 – 4-28, 4-36

The Petitioners asserted that “[s]ignificant new information shows the credibility” of non-terrorist “events leading to a fuel pool accident.” Mass. AG Pet. at 32; see also Pilgrim Watch Pet. at 62-65; Thompson Rept. at 18. However, the Petitioners provided no new information of

<sup>22</sup> 55 Fed. Reg. at 38,481, citing NUREG-1353 at ES-3-4. In a subsequent study, the NRC concluded that the risk of a seismically induced structural failure of the spent fuel pool was in the range of  $2 \times 10^{-6}$  to  $2 \times 10^{-7}$ . NUREG-1738 at 3-36 to 3-38.

<sup>23</sup> 55 Fed. Reg. at 38,481.

any type to show that accident induced probabilities of pool drain-down or boil-down underlying the analyses in the GEIS are anything but “extremely rare” as determined by the Commission in the Waste Confidence Decision. Pilgrim Watch simply referred to accidents that could cause the accidental drainage of the spent fuel pool (Pilgrim Watch Pet. at 64-65), and provided no information that would in any way affect the accident induced probabilities of pool drain-down or boil-down underlying the GEIS set forth in NUREG-1353.

Similarly, while Dr. Thompson alleged in his report (at 18) that certain accident events could lead to spent fuel pool fire at Pilgrim, he too provided no information to demonstrate that the accident induced probabilities of pool drain-down or boil-down underlying the GEIS set forth in NUREG 1353 are incorrect. See Entergy Mass. AG Answer at 18-20. Dr. Thompson did postulate that a severe reactor accident would trigger a spent fuel pool accident, but he completely ignored that, even in such an event, pool drain-down due to structural failure of the pool or pool boil-down due to loss of cooling or make-up water capability must still occur before a spent fuel pool fire could be triggered. See Entergy Mass. AG Answer at 20-24. For example, his entirely unsupported assumption of a 50% conditional probability of a spent fuel pool fire given a severe reactor accident ignored that “there are only limited circumstances after containment failure in which cooling would be lost,” as found in the Harris proceeding.<sup>24</sup> This is confirmed both by the

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<sup>24</sup> Carolina Power & Light Co. (Shearon Harris Nuclear Power Plant), LBP-01-9, 53 N.R.C. 239, 257-58 (2001) (emphasis added). The Massachusetts Attorney General’s claim (Reply at 25-27) that the Dr. Thompson’s 50% conditional probability is supported by the parties’ assumption in Harris that the conditional probability for a fire in Harris pools C and D was 1 if water were lost from Harris pools A and B is incorrect and misstates the parties’ position and testimony in Harris. The conditional probability of 1 of a fire in pools C and D given a fire in pools A and B referred to in the cited Staff and CP&L testimony concerns going from step 6 to step 7, where steps 3 through 6 (loss of cooling and make-up capability and inability to restore this capability over a period of days prior to boil-down) had already occurred in both sets of pools. This is expressly stated in the quoted testimony of the Staff that “it is assumed conservatively that the probability [of a fire] is 1, given that the sequence has progressed to the point that the water in the pools has been lost through evaporation.” Mass. AG Reply at 26 (emphasis added); see also Prehearing Tr. at 243-44.

actual conditional probabilities determined in the Harris proceeding,<sup>25</sup> as well as by the probabilities stated in Table 1 above from NUREG-1353.

Thus, Petitioners have not presented any new information regarding non-terrorist accident initiators not previously considered in the analyses summarized in GEIS. Furthermore, even assuming any such information were new, it is not significant in that it would not “lead[] to an impact finding different from that codified in 10 C.F.R. Part 51” as would be necessary under the second prong of the definition in Regulatory Guide 4.2S1. The lack of significance of any of the information provided by Petitioners is confirmed by NUREG-1738, one of the major sources of Petitioners’ postulated new and significant information.

NUREG 1738 considered initiating events similar to those considered in NUREG-1353 and reached similar conclusions regarding the improbability of those events causing pool drain-down or boil-down. The probability of occurrence of pool drain-down or boil-down resulting from the various accident scenarios evaluated in NUREG-1738 are set forth in Table 2 below.

TABLE 2 NUREG-1738 Accident Initiators and Associated Probabilities		
Accident Initiator	Probability of Spent Fuel Pool Drain-down or Boil-down	NUREG-1738 Page References
Tornado Missile	$<1.0 \times 10^{-9}$	3-38
Aircraft Crash	$2.9 \times 10^{-9}$	3-38

<sup>25</sup> As reflected in the Harris decision, the probability that a release of radioactivity from the containment (step 2) would cause a spent fuel pool fire (step 7) is on the order of 1% or less. See Shearon Harris, LBP-01-9, 53 N.R.C. at 267; see also id. at 254, 256-57; Energy Mass. AG Answer at 22. If one were to apply such a conditional probability to the early release frequency as calculated by Dr. Thompson’s Report based on the current ER ( $1.07 \times 10^{-6}/\text{yr}$ ), see Staff Mass. AG Answer at 15 n. 8, it would produce a total accident probability on the order of  $10^{-8}$ .

Cask Drop	$2 \times 10^{-7}$	3-38
Boil-down (Loss of Cooling, Makeup, etc.)	$1.8 \times 10^{-7}$	3-35
Drain-down Due to Seismic Events <sup>26</sup>	$2 \times 10^{-6}$ (LLNL) $2 \times 10^{-7}$ (EPRI)	3-36 – 3-38

Based on these probabilities, NUREG-1738 concluded that there is a “very low likelihood” of a zirconium pool fire (NUREG-1738 at ix, xi, 5-1 and 5-3; emphasis added), which parallels and reconfirms the conclusion of the GEIS that the likelihood of a fuel cladding fire is “highly remote” (GEIS at 6-72 – 6-75).<sup>27</sup>

It is well established that, in determining the admissibility of a contention, licensing boards are to “carefully examine[.]” documents provided in support of a contention to determine whether they “supply an adequate basis for the contention.” See, e.g., Dominion Nuclear North Anna, LLC (Early Site Permit for North Anna ESP Site), LBP-04-18, 60 N.R.C. 253, 265 (2004). Where the board’s independent examination of document shows no basis for the contention, the contention must be dismissed. See, e.g., Yankee Atomic Electric Co. (Yankee Nuclear

<sup>26</sup> NUREG-1738 utilized the separate seismic hazard estimates that had been developed independently by Lawrence Livermore National Laboratory (“LLNL”) and the Electric Power Research Institute (“EPRI”) for U.S. nuclear power plants and developed separate spent fuel pool fire estimates based on each. See NUREG-1738 at ix, 3-7 – 3-9, 3-36 – 3-38.

<sup>27</sup> The Massachusetts Attorney General incorrectly seeks to dismiss (Reply at 13-14) this conclusion of NUREG-1738 because the study concerned decommissioned plants. The reference to NUREG-1738 at 5-2 relied upon by the Attorney General of a large number of different accident sequences at operating plants concerns severe reactor accidents and not spent fuel pool accidents which would be subject to the same types of accident sequences (e.g., loss of spent fuel cooling and makeup) at both operating and shutdown plants. Furthermore, NUREG-1738 conducted analyses for plants that had only recently been shut down (starting at 30 or 60 days after final shutdown depending on the analyses) and moreover assumed that, because the plant was permanently shutting down, the full core would be unloaded into the spent fuel pool. NUREG-1738 at 2-1, 3-28, A1A-3 – A1A-4, A4-2; see also NAS Rept. at 45. Because of its assumption that the full core had just recently been off-loaded to the spent fuel pool, the analysis in NUREG-1738 is in fact highly conservative compared to an operating plant where typically only one-third of the core is off-loaded to the spent fuel pool at each refueling outage.

Power Station), LBP-96-02, 43 N.R.C. 61, 88-90 (1996).<sup>28</sup> In Yankee Atomic, the petitioner had claimed that the applicable NEPA analysis for decommissioning the Yankee Rowe plant had failed to consider a transportation accident scenario evaluated by a Sandia National Laboratory technical report. Id. at 89. However, upon its independent examination, the licensing board found that the report had concluded that such an accident event had “a very low probability” of occurring, and, on that basis, dismissed the contention since NEPA does not require evaluation of “remote and speculative” events. Id. at 89-90.

Similarly here, if the Board does not dismiss Petitioners’ Contentions for failing to seek waiver of the Commission’s rules, the Licensing Board should nevertheless dismiss the Petitioners’ Contentions based on its review of NUREG-1738 – touted by Petitioners as a major source of new information for the asserted certainty of spent fuel pool fires following drain-down or boil-down – because review of NUREG-1738 shows a “very low likelihood” for a spent fuel pool fire even assuming that pool drain-down or boil-down invariably results in a spent fuel pool fire. Hence, NUREG-1738 shows such an event to be remote and speculative and not requiring evaluation under NEPA, as concluded by the Commission in the Waste Confidence Decision.

In short, Petitioners have provided no information that is either new or significant falling within the definition of new and significant information provided in Regulatory Guide 4.2S1 which undercuts the analyses and conclusion of the GEIS that the likelihood of spent fuel pool fires is “highly remote.” GEIS at 6-72 – 6-75.

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<sup>28</sup> Reversed in part on other grounds, Yankee Atomic Electric Co. (Yankee Nuclear Power Station), CLI-96-7, 43 N.R.C. 235 (1996).

## 2. Terrorist Accident Initiators

Petitioners cite the September 11, 2001 terrorist attacks and the NAS Report as new and significant information concerning the potential for a terrorist attack to initiate a spent fuel pool fire. Mass. AG Pet. at 33-47; Pilgrim Watch Pet. at 65-67. However, as discussed in Entergy's Answers, the Commission has ruled that terrorism is not cognizable under NEPA and that NEPA "imposes no legal duty on the NRC to consider intentional malevolent acts, such as [the September 11, 2001 attacks] on a case-by-case basis in conjunction with commercial power reactor license renewal applications." E.g., Entergy Mass. AG Answer at 25-26, quoting Duke Energy Corp. (McGuire Nuclear Station, Units 1 and 2), CLI-02-26, 56 N.R.C. 358, 365 (2002) (footnote omitted); see also Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), CLI-02-25, 56 N.R.C. 340, 357 (2002). The Licensing Board is bound by this Commission precedent, and, under this precedent, the existence of new and significant information is irrelevant because NEPA imposes no requirement to consider terrorist attacks.

Moreover, even assuming that terrorism were covered by NEPA and subject to the new and significant information standard, the Petitioners have not supplied any new and significant information within the guidance of Regulatory Guide 4.2S1 that would affect the GEIS determinations. As set forth in Entergy's Answers, although beyond the scope of NEPA, the GEIS did consider the impact of a sabotage event and concluded that if such an event were to occur, the resultant core damage and radiological releases would be no worse than those expected from a severe reactor accident. E.g., Entergy Mass. AG Answer at 26, citing McGuire, supra, CLI-02-26, 56 N.R.C. at 365 n.24. Thus, the GEIS expressly concluded that "the risk from sabotage . . . at existing nuclear power plants is small." GEIS at 5-18 (emphasis added).

The Petitioners claim, however, that the resultant consequences of a spent fuel pool fire could be “more severe” than the consequences of a severe reactor accident. See, e.g., Mass. AG Pet. at 19, 47. However, Petitioners’ claims of far reaching consequences of a spent fuel pool fire are, as set forth in Entergy’s Answers, based on excessive conservatisms as well as technical assumptions (e.g., use of a supra-linear dose-response curve) unsupported by any recognized authoritative body. E.g., Entergy Mass. AG Answer at 24-25. In this respect, the technical studies underlying the GEIS determinations evaluated the consequences of a spent fuel pool fire (e.g., NUREG-1353 at 3-36 – 3-42) and, while noting differences between severe reactor accidents and spent fuel fires (e.g., id. at 3-41), the results showed that consequences from a spent fuel pool fire “could be comparable to those for a severe reactor accident.” NUREG-1738 at 3-28 (emphasis added). This conclusion is confirmed by the recent analysis in NUREG-1738. Id. at 3-28 – 3-34. Thus, any new information presented by Petitioners regarding terrorist activities has no material impact on the GEIS conclusion that the impacts of sabotage at existing nuclear plants are small because Petitioners have failed to provide any significant information (within the meaning of Regulatory Guide 4.2S1 or otherwise) to show that the risks of terrorist induced pool drain-down or boil-down are anything other than small.

### 3. Likelihood of a Spent Fuel Fire Assuming an Accident Initiation Event

Both the Massachusetts Attorney General and Pilgrim Watch make various asserted claims regarding new and significant information concerning the likelihood of a spent pool fire assuming an accident initiator has resulted in pool drain-down or boil-down. Mass. AG Pet. at 30-32; Pilgrim Watch Pet. at 62-63. Judged against the guidance of Regulatory Guide 4.2S1, however, none of the Petitioners’ claims raises new and significant information. First, the information raised by Petitioners was “considered in the analyses summarized in NUREG-1437,”

and hence is not new. Second, the information would not “lead[] to an impact finding different from that codified in 10 C.F.R. Part 51,” and hence is not significant.

The Petitioners’ claim that NUREG-1738’s conclusion that partial pool drain-down is more severe than complete pool drain-down constitutes new information not previously by the NRC (e.g., Mass. AG Pet. at 30; Mass. AG Reply at 14) is refuted by NUREG/CR-0649.<sup>29</sup> That NUREG, published by Sandia National Laboratories in March 1979, expressly considered the “Effect of Incomplete Drainage” of the spent fuel pool and concluded that “[i]t is clear” . . . that an incomplete drainage [of the pool] can potentially cause a more severe heatup problem than a complete drainage” of the pool. NUREG/CR-0649, § 5.1 (“Effect of Incomplete Drainage”) at 73-78 (emphasis added). NUREG/CR-0649 was one of the authoritative sources extensively relied upon and subsumed within the technical analyses underlying the Commission’s Waste Confidence Decision and the GEIS. See, e.g., NUREG-1353 at 4-7 – 4-11, 8-1. Thus, this information was considered in the analyses summarized within NUREG-1437 and is not new.

Moreover, even if new, the information is not significant. The fact that spent fuel in a partially obstructed pool may be more likely to burn or may burn sooner is subsumed by the Commission’s conclusion in the Waste Confidence Decision that, “even if the timing of a spent fuel pool failure were conducive” to a spent fuel pool fire, the likelihood of such a fire would be “extremely rare.” 55 Fed. Reg. at 38,481. Furthermore, as is self evident from the Tables 1 and 2 above, the probability calculations of accident initiators in NUREG 1738 – which expressly account for partially obstructed pool fires – is virtually identical to those in NUREG-1353, and, as also discussed above, NUREG-1738’s conclusion that there is a “very low likelihood” of a

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<sup>29</sup> NUREG/CR-0649, “Spent Fuel Heatup Following Loss of Water During Storage (Mar. 1979) (“NUREG/CR-0649”).

spent fuel pool fire is identical to that in both the GEIS and the Waste Confidence Decision. Hence, the information in NUREG 1738 that partial drainage of a pool is a more severe condition than total, instantaneous drainage would not “lead[] to an impact finding different from that codified in 10 C.F.R. Part 51,” and thus is not significant even if new.

The Petitioners’ related claims that NUREG-1738 provided new and significant information that a fire may not be ruled out in fuel of any age (Mass. AG Pet. at 30-31; Mass. AG Reply at 14-15; Pilgrim Watch Pet. at 62-63) is likewise without merit. As discussed, the Waste Confidence decision assumed that the timing of a spent fuel pool failure was “conducive” to the occurrence of a spent fuel pool fire such that the age of the spent fuel was irrelevant to the Commission’s conclusion that the likelihood of such a fire is “extremely rare.” 55 Fed. Reg. at 38,481. Hence, the potential for fuel of any age to burn was subsumed within the analyses summarized in the GEIS and does not constitute new information.<sup>30</sup> For the same reason, being subsumed within the analysis, it does not constitute significant information that would “lead[] to an impact finding different from that codified in 10 C.F.R. Part 51.” Its lack of significance is further confirmed by NUREG-1738 which expressly assumed that fuel of any age could burn and reached the identical conclusion as the Waste Confidence decision and the GEIS that the likelihood for a spent fuel pool fire is “very low.”

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<sup>30</sup> NUREG-1353 assumed (at ES-2 and 4-10) that the probability of fire for PWR spent fuel storage pools was 1.0 and that the probability of fire for BWR pools was 0.25. The lower probability for BWR spent fuel pools was based on the lower amount of residual heat contained in BWR spent fuel assemblies and the configuration of BWR spent fuel storage and not the age of the spent fuel. *Id.* at 4-8 – 4-11. Thus, for both PWR and BWR spent fuel, NUREG-1353 assumed that fuel of any age could burn, as the age of the spent fuel was not considered. Hence, the Massachusetts Attorney General’s claim (Mass. AG Reply at 14-15) that “NUREG-1353 did not take into account NUREG-1738’s principal conclusion that a fire may not be ruled out in fuel of any age” is clearly incorrect and, as such, provides no basis for an admissible contention.

Finally, the Petitioners' claims regarding current usage of high density spent fuel storage racks (e.g., Pilgrim Watch Pet. at 62-63) does not constitute new and significant information when judged against the guidance of Regulatory Guide 4.2S1. In the Commission's Waste Confidence Decision, on which the GEIS relied (55 Fed. Reg. at 38,481), the Commission expressly considered a claim made by Public Citizen that "high-density racks" would "severely" restrict air flow and result in "very vigorous" oxidation and failure of the fuel rods. *Id.* Hence, information concerning the use of high-density racks was considered in the analyses summarized within NUREG-1437 and is not new. Likewise, even if new, the information it is not significant for the reasons already stated, namely NUREG-1738's confirmation that the likelihood of a spent fuel pool fire is "very low."

#### 4. Radiological Consequences of a Spent Fuel Pool Fire

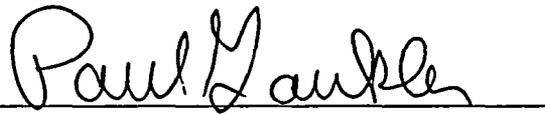
Petitioners claim as an aspect of their asserted new and significant information that a spent fuel pool fire would have far ranging consequences different from, and more severe, than the consequences resulting from a severe reactor accident. *See, e.g.,* Mass. AG Pet. at 19, 47 and Exh. 2 (Beyea Rept.). However, as noted above, these claims of far reaching consequences are irrelevant to non-terrorist initiated spent fuel pool fires absent any new information altering the conclusion that such fires are highly remote. With respect to terrorism, the Board must follow the Commission's precedent in *McGuire*. In any event, as discussed above, the allegations regarding consequences are based on excessive conservatisms as well as technical assumptions unsupported by any recognized authoritative body, and, furthermore, both NUREG-1353 and NUREG-1738 show that the consequences from a spent fuel pool fire "could be comparable to those for a severe reactor accident." NUREG-1738 at 3-28. Thus, Petitioners have failed to pro-

vide any significant information (within the meaning of Regulatory Guide 4.2S1 or otherwise) to show that the risks of spent fuel pool fire are anything other than small.

#### IV. CONCLUSION

For the reasons stated above, the guidance of Regulatory Guide 4.2S1 shows that the information provided by the Massachusetts Attorney General and Pilgrim Watch concerning the asserted need for the ER to address the environmental impacts of severe spent fuel pool accidents is neither new nor significant. Accordingly, wholly apart from the procedural defects of failing to seek waiver or amendment of the Commission's rules, the Contentions should be dismissed for failing to provide the basis for an admissible contention.

Respectfully Submitted,



David R. Lewis  
Paul A. Gaukler  
PILLSBURY WINTHROP SHAW PITTMAN LLP  
2300 N Street, N.W.  
Washington, DC 20037-1128  
Tel. (202) 663-8474

Counsel for Entergy Nuclear Generation Company  
and Entergy Nuclear Operations, Inc.

Dated: July 21, 2006

**UNITED STATES OF AMERICA**  
**NUCLEAR REGULATORY COMMISSION**  
Before the Atomic Safety and Licensing Board

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

CERTIFICATE OF SERVICE

I hereby certify that copies of "Entergy's Brief on New and Significant Information in Response to Licensing Board Order of July 14, 2006" dated July 21, 2006, were served on the persons listed below by deposit in the U.S. Mail, first class, postage prepaid, and where indicated by an asterisk by electronic mail, this 21st day of July, 2006.

\*Administrative Judge  
Ann Marshall Young, Esq., Chair  
Atomic Safety and Licensing Board  
Mail Stop T-3 F23  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001  
amy@nrc.gov

\*Administrative Judge  
Dr. Richard F. Cole  
Atomic Safety and Licensing Board  
Mail Stop T-3 F23  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001  
rfc1@nrc.gov

\*Administrative Judge  
Dr. Nicholas G. Trikouros  
Atomic Safety and Licensing Board  
Mail Stop T-3 F23  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001  
ngt@nrc.gov; n.trikouros@att.net

\*Secretary  
Att'n: Rulemakings and Adjudications Staff  
Mail Stop O-16 C1  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001  
secy@nrc.gov, [hearingdocket@nrc.gov](mailto:hearingdocket@nrc.gov)

Office of Commission Appellate Adjudication  
Mail Stop O-16 C1  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Atomic Safety and Licensing Board  
Mail Stop T-3 F23  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

\*Susan L. Uttal, Esq.  
\*Harry E. Wedewer, Esq.  
Office of the General Counsel  
Mail Stop O-15 D21  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001  
slu@nrc.gov; hew@nrc.gov

\*Diane Curran, Esq.  
Harmon, Curran, Spielberg, and Eisenberg, L.L.P.  
1726 M Street, N.W., Suite 600  
Washington, D.C. 20036  
[dcurran@harmoncurran.com](mailto:dcurran@harmoncurran.com)

\*Matthew Brock, Esq.  
Assistant Attorney General  
Environmental Protection Division  
Office of the Attorney General  
One Ashburton Place  
Boston, MA 02108  
[Matthew.brock@ago.state.ma.us](mailto:Matthew.brock@ago.state.ma.us)

\*Molly H. Bartlett, Esq.  
52 Crooked Lane  
Duxbury, MA 02332  
[mollyhbartlett@hotmail.com](mailto:mollyhbartlett@hotmail.com)

\*Ms. Mary Lampert  
148 Washington Street  
Duxbury, MA 02332  
[lampert@adelphia.net](mailto:lampert@adelphia.net)

\*Sheila Slocum Hollis, Esq.  
Duane Morris LLP  
1667 K Street, N.W.  
Suite 700  
Washington, D.C. 20006  
[sshollis@duanemorris.com](mailto:sshollis@duanemorris.com)

\*Mr. Mark D. Sylvia  
Town Manager  
Town of Plymouth  
11 Lincoln St.  
Plymouth MA, 02360  
[msylvia@townhall.plymouth.ma.us](mailto:msylvia@townhall.plymouth.ma.us)

  
Paul A. Gaukler