UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of	)	
ENTERGY NUCLEAR OPERATIONS, INC., ENTERGY NUCLEAR GENERATION COMPANY, AND HOLTEC DECOMMISSIONING INTERNATIONAL, LLC; CONSIDERATION OF APPROVAL OF TRANSFER OF LICENSE AND CONFORMING AMENDMENT	)	Docket Nos. 50-293 & 72-1044
(Pilgrim Nuclear Power Station)	)	

COMMONWEALTH OF MASSACHUSETTS' PETITION FOR LEAVE TO INTERVENE AND HEARING REQUEST

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INTRODUCTION

The Commonwealth of Massachusetts (Commonwealth or Massachusetts) requests that the U.S. Nuclear Regulatory Commission (NRC or Commission) or, in the event the Commission's Secretary refers this Petition to the Chief Administrative Judge of the Atomic Safety and Licensing Board (ASLB), the designated presiding officer, permit the Commonwealth to intervene in this proceeding and grant the Commonwealth's request for an adjudicatory hearing on Entergy Nuclear Operations, Inc. (Entergy) and Holtec International's (Holtec) (collectively, Applicants)[1] License Transfer Application (Application or LTA), Holtec's unconditioned Exemption Request to use Pilgrim's Decommissioning Trust Fund for site restoration and spent fuel management costs (incorporated into the LTA by LTA Enclosure 2), and Holtec's Revised Post-Shutdown Decommissioning Activities Report (PSDAR) and Site-Specific Cost Estimate (incorporated into the LTA by LTA Attachment D).[2] As the state that

[1] In this Petition, Entergy refers to Entergy Nuclear Operations, Inc. and Entergy Nuclear Generation Company, and Holtec refers to Holtec International and Holtec Decommissioning International, LLC.

[2] For clarity, references in this Petition to the License Transfer Application refer to the Applicants' request for the indirect transfer of the Renewed Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station (Pilgrim) and the license for Pilgrim's Independent Spent Fuel Storage Installation (ISFSI). *See* Ltr. from Entergy, to NRC, *Application for Order Consenting to Direct and Indirect Transfers of Control of Licenses and Approving Conforming License Amendment; and Request for Exemption from 10 CFR 50.82(a)(8)(i)(A); Pilgrim Nuclear Power Station*; Docket Nos. 50-293 & 72-1044; License No. DPR-35 (Nov. 16, 2018) (ADAMS Accession No. ML18320A031). References in in this Petition to Holtec's exemption request refer to the exemption request included as Enclosure 2 to the LTA. References to Holtec's Revised PSDAR and Site-Specific Cost Estimate refer to the notification Holtec made to the NRC on November 16, 2019. *See* Ltr. from Holtec, to NRC, *Revised Post-Shutdown Decommissioning Activities Report and Revised Site-Specific Decommissioning Cost Estimate for Pilgrim*, Docket Nos. 50-293 & 72-1044 (Nov. 16, 2018) (ADAMS Accession No. ML18320A040). The Commission published notice of the opportunity for a hearing on January 31, 2019. Pilgrim Nuclear Power Station; Consideration of Approval of Transfer of License and Conforming Amendment, 84 Fed. Reg. 816, 816-17 (Jan. 31, 2019).

will face the financial, environmental, and public health and safety consequences of a funding shortfall, the Commonwealth has a significant interest in ensuring that there exists adequate financial assurance that the licensee will have sufficient funds to decommission and restore the site and manage the anticipated sixty-one spent fuel dry casks (holding 4,114 radioactive spent fuel assemblies) onsite—possibly indefinitely.

The Commonwealth contends that the Applicants have not demonstrated that the Decommissioning Trust Fund, standing alone and in light of Holtec's Exemption Request,[3] will provide adequate financial assurance as required by the Atomic Energy Act (AEA) and the Commission's regulations. Indeed, Holtec's own Cost Estimate predicts that it will have a meager $3.6 million left in the Trust Fund on the license termination date—an amount that, on its face, raises serious questions about whether adequate financial assurance exists. Those questions are made even more serious by the fact that, as explained in detail below, Entergy and Holtec have ignored significant possible contingencies that would, if included, likely result in an estimated shortfall (i.e., insufficient funds to cover all anticipated costs). While the Commonwealth welcomes the possibility of a properly conducted and expedited cleanup and restoration of Pilgrim, the risk of a funding shortfall and the attendant significant health, safety, environmental, financial and economic risks to the Commonwealth and its citizens raise serious questions about the realization of that benefit. The risk of a funding shortfall is radiological, environmental, and financial. If, for example, the Decommissioning Trust Fund is insufficient to cover all of Holtec's costs, there is no guarantee that Massachusetts citizens will not become the

[3] The Exemption Request, if allowed in its current form, would allow Holtec to effectively syphon approximately $500 million from the Fund to cover spent fuel management costs into its own accounts without any commitment from Holtec to use its recovery of most of those funds from the U.S. Department of Energy for any funding shortfalls in decommissioning, site restoration, or spent fuel management.

payers of last resort. On the current record, the Commission cannot find, as it must, that the LTA would, if allowed, provide "adequate protection to the health and safety of the public." 42 U.S.C. § 2232(a).

The Commonwealth also contends that the Commission must conduct, at a minimum, an environmental assessment of the potential direct and indirect environmental consequences of the proposed action, i.e., the combined effect of the LTA, the Exemption Request, and the Revised PSDAR, which, as noted above, have been presented as a single proposal for Commission consideration and action. In particular, the categorical exclusion in 10 C.F.R. § 51.22(c)(21) is inapplicable to the LTA and special circumstances exist that would preclude reliance on it even if it did apply, because (i) the Applicants, by proposing to eliminate the License's existing $50 million contingency allowance for decommissioning costs, propose an amendment that is not required to approve the license transfer; (ii) the Exemption Request ignores the potential environmental consequences of a resulting shortfall in the Fund; and (iii) new and significant information, namely, the potential environmental consequences of climate change, which is not bounded by any prior Generic Environmental Impact Statement (GEIR) or the 2007 Pilgrim Site-Specific Supplemental Environmental Impact Statement (SEIS), require preparation of a supplemental Environmental Impact Statement. As such, the Commission's action on the LTA, Exemption Request, and Revised PSDAR constitutes a major federal action and the NRC must conduct an environmental review.

In short, the Commonwealth has standing because Pilgrim is located in Massachusetts, and it has presented in this Petition two contentions that meet all regulatory requirements and are admissible pursuant to 10 C.F.R. § 2.309(f). Entergy and Holtec have failed to demonstrate that, if allowed, the LTA, the Exemption Request, and the Revised PSDAR will ensure adequate

protection of public health, safety, and the environment. As detailed below, Entergy and Holtec have omitted certain highly material facts from their application and request and have ignored possible contingencies. As a result, there exists a genuine dispute about whether Holtec has the financial ability to decommission and restore the site and manage the spent fuel onsite indefinitely. The Atomic Energy Act, the Administrative Procedure Act (APA), and the National Environmental Policy Act (NEPA) require a hearing to address these and other issues discussed below.

STANDING

The Commonwealth has standing because Pilgrim "is located within the boundaries of the State." 10 C.F.R. § 2309(h)(2). Accordingly, "no further demonstration of standing [under 10 C.F.R. § 2.309(d)] is required." *Id.*[4]

THE COMMONWEALTH PRESENTS TWO CONTENTIONS THAT MEET ALL REQUIREMENTS OF 10 C.F.R. § 2.309(f) AND ARE ADMISSIBLE

The Commonwealth's contentions identify specific regulatory requirements for which Entergy and Holtec have failed to present sufficient evidence of compliance. The Commonwealth's first contention is that the Applicants have provided insufficient evidence to demonstrate reasonable assurance of adequate protection for public health and safety. The Commonwealth's second contention is that the NRC cannot approve the LTA, the Exemption Request, and the Revised PSDAR until it conducts an environmental review under NEPA because the request is not bounded by the general or site-specific environmental impact

[4] *See, e.g., In re Entergy Nuclear General Co. and Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station)*, Docket No. 50-293-LR, LBP-06-23, at 9 (October 16, 2006) (ADAMS Accession No. ML062890259) (finding that "the Massachusetts Attorney General has standing to participate in proceeding" concerning Entergy's application to renew its operating license for Pilgrim).

statement. The Commonwealth supports each contention, with facts and expert opinions. These matters are within the scope of the proceeding and material to the findings the NRC must make to support the proposed license transfer and amendment. Both contentions thus meet the requirements of 10 C.F.R. § 2.309(f) and are therefore admissible.

The Atomic Energy Act grants the Commonwealth a right to a hearing in this proceeding because it, among other things, concerns an application to "transfer control" of Pilgrim and Pilgrim's operating and ISFSI licenses to Holtec, substantively "amend" Pilgrim's operating license by deleting the license's existing $50 million contingency allowance for decommissioning costs, and "modif[y]" the Commission's regulations by granting the Exemption Request. 42 U.S.C. § 2239(a)(1)(A). Contrary to the Commission's perfunctory notice and refusal to accept comment on the issue, *see* 84 Fed. Reg. at 817 col.2, the contentions and supporting factual statements and expert opinions demonstrate that "significant hazards" exist regarding the operating license transfer request and that "genuine issue[s exist] as to whether the health and safety of the public will be significantly affected" by the ISFSI license transfer request. *See* 10 C.F.R. § 2.1315(a). The Commission and its staff may not "prejudge the merits of the issues raised by a proposed license amendment," *San Luis Obispo Mothers for Peace v. U.S. Nuclear Regulatory Comm'n*, 799 F.2d 1268, 1270 (9th Cir. 1986), as has apparently occurred here, and, accordingly, the Commission may not allow the LTA and Exemption Request before it holds a hearing on the issues raised in this Petition, *see id.* at 1271. Moreover, the Commission did not, as required by the AEA, consult with the Commonwealth in making the "no significant hazards consideration" finding in its Federal Register Notice. 42 U.S.C. § 2239(a)(2)(A).

CONTENTION I

The Applicants Failed to Provide Sufficient Evidence to Demonstrate That, If Approved, There Will be Reasonable Assurance of Adequate Protection for Public Health and Safety as Required by Section 182(a) of the Atomic Energy Act (42 U.S.C. § 2232(a)).

A. Contention

1. The Commonwealth specifically incorporates by reference, as if fully set forth here, the attached Declarations of Brewer, Howland, Locke, Newhard, Priest and all paragraphs under Contention II.[5]

2. Entergy and Holtec have not presented sufficient evidence to the NRC of adequate financial assurance to meet the statutory and regulatory requirements for the proposed LTA, Exemption Request, and Revised PSDAR as required by Section 182(a) of the Atomic Energy Act. 42 U.S.C. § 2232(a). Specifically, the LTA, Exemption Request, and the Revised PSDAR involve a potential significant safety hazard and environmental hazard because the Applicants have failed to present sufficient evidence to demonstrate that there will exist a reasonable assurance of adequate protection for public health and safety if the requested action is allowed, as required by 42 U.S.C. § 2232(a), 10 C.F.R. § 50.82(a)(8)(i)(B) and (C), and 10 C.F.R. § 50.75(h)(1)(iv). The Commonwealth requests a hearing to address these issues.

[5] Consistent with 10 C.F.R. § 2.309(f)(1)(ii), the bases for the Commonwealth's contentions are not all the bases or all the details of the bases that support the contention, but merely "a brief explanation of the basis for the contention."

B. Basis for Contention

1. The License Transfer and Amendment Request, Exemption Request, and Revised Post-Shutdown Decommissioning Activities Report Do Not Comply with 10 C.F.R. § 50.82(8)(i)(B) and (C).

3. The LTA, Exemption Request, and Revised PSDAR, fail to comply with 10 C.F.R. § 50.82(a)(8)(i)(B) and (C). Those regulations explicitly require licensees to maintain a level of financial assurance and utilize decommissioning funds in a manner that is sufficient to protect public health, safety, and the environment in the event "unforeseen conditions or expenses arise." 10 C.F.R. § 50.82(a)(8)(i)(B). And the NRC prohibits the use of trust funds in a way that would "inhibit the ability of the licensee to complete funding of any shortfalls in the decommissioning trust needed to ensure the availability of funds to ultimately release the site and terminate the license." 10 C.F.R. § 50.82(a)(8)(i)(C).

4. The Atomic Energy Act requires the NRC to ensure financial assurance to protect public health, safety, and the environment:

> The NRC has a statutory duty to protect the public health and safety and the environment. The requirements for financial assurance were issued because inadequate or untimely consideration of decommissioning, specifically in the areas of planning and financial assurance, could result in significant adverse health, safety and environmental impacts. The requirements are based on extensive studies of the technology, safety, and costs of decommissioning (53 FR 24018). The NRC determined that there are significant radiation hazards associated with non-decommissioned nuclear reactors. The NRC also determined that the public health and safety can best be protected if its regulations require licensees to use methods which provide reasonable assurance that, at the time of termination of operations, adequate funds are available so that decommissioning can be carried out in a safe and timely manner and that lack of funds does not result in delays that may cause potential health and safety problems (53 FR 24018, 24033). The purpose of financial assurance is to provide a second line of defense, if the financial operations of the licensee are insufficient, by themselves, to

> ensure that sufficient funds are available to carry out decommissioning (63 FR 50465, 50473).[6]

In short, "assuring adequate funds for a reactor owner to meet its decommissioning obligations is part of the bedrock on which NRC has built its judgment of reasonable assurance of adequate protection for the public health and safety and protection of the environment." *In re Entergy Nuclear Vermont Yankee, LLC*, Dkt. No. 50-271-LA-3, LBP-15-24, at 22 (Aug. 31, 2015) (citation omitted), *vacated as moot*, CLI-16-8, 93 N.R.C. 463 (June 2, 2016).

5. The LTA is explicitly intertwined with Holtec's Exemption Request and Holtec's plan for immediate decommissioning as described in its Revised PSDAR, which includes cost estimates for decommissioning, spent fuel management, and site restoration. Indeed, Holtec acknowledges that it needs the requested exemption from 10 C.F.R. § 50.82(a)(8)(i)(A)'s decommissioning trust fund account use restriction because Holtec needs to use those funds to cover its spent fuel management costs and because it "*must*" perform "site restoration activities" "prior to completion of radiological decommissioning." LTA, Encl. 2, at E-1. In claiming that Holtec is financially qualified to become the licensee, Entergy and Holtec also admit that "Holtec . . . will be responsible for funding the costs of decommissioning, spent fuel management and site restoration," and that the trust fund "will be adequate to fund the costs of decommissioning Pilgrim, spent fuel management, and site restoration including the eventual cost for decommissioning the ISFSI." LTA at 16-17. Consequently, approving the LTA request effectively approves the Revised PSDAR and its financial and environmental analysis, which estimates—even without accounting for the significant contingencies discussed below—that only

[6] NRC, *Questions and Answers on Decommissioning Financial Assurance*, Encl. 5, at 1 (ADAMS Accession No. ML111950031).

$3.6 million will remain in the fund on the predicted license termination date. The Revised PSDAR is thus material to this proceeding "because it concerns the real-world consequences of approving the [license amendment request]." *In re Entergy Nuclear Vermont Yankee, LLC*, LBP-15-24, at 41. The LTA also relies on aspects of Entergy's previous PSDAR and Decommissioning Cost Estimate.

6. Entergy and Holtec have an obligation to present the Commission with "[i]nformation" that is "complete and accurate in all material respects," 10 C.F.R. § 50.9(a), and the Commonwealth may, accordingly, "rely on alleged inaccuracies and omissions" in the LTA, Exemption Request, and Revised PSDAR to challenge the requests in them, *In re Entergy Nuclear Vermont Yankee, LLC*, Dkt. No. 50-271-LA-3, LBP-15-24, at 13. In this case, as explained further below, Entergy and Holtec have failed to: (i) acknowledge or justify the requested elimination of the $50 million contingency fund in Entergy's license; (ii) acknowledge and consider the financial implications of an outstanding, $40 million legal claim on Pilgrim's Decommissioning Trust Fund; (iii) provide sufficient information to ascertain whether Holtec's Cost Estimate adequately accounts for unanticipated costs; and (iv) independent of the foregoing issues, provide sufficient financial assurance to decommission and restore the site and manage the spent nuclear fuel onsite indefinitely.

Proposed Elimination of the Contingency Fund

7. In Entergy's existing operating license for Pilgrim, which was renewed in May 2012, *see* Renewed Facility Operating License No. DPR-35, the Commission maintained the requirement that Entergy "have access to a contingency fund of not less than fifty million dollars ($50m) for payment, if needed, of Pilgrim operating and maintenance expenses, the cost to transition to decommissioning status in the event of a decision to permanently shut down the

unit, and *decommissioning costs*," *id*. at 4 ¶ J.4 (emphasis added). The Commission required both that the contingency fund be independent of Entergy's decommissioning trust fund assurance obligations (i.e., the Commission will evaluate compliance with the trust fund financial assurance requirements without reference to the $50 million license contingency allowance requirement), and that Entergy "will" use any funds remaining at the time of decommissioning for decommissioning purposes if the funds are needed "for safe and prompt decommissioning." *Id.* In other words, the Commission anticipated that the $50 million contingency allowance would be drawn on to cover "unforeseen conditions or expenses." *See* 10 C.F.R. § 50.82(a)(8)(i)(B). As the Commission has previously acknowledged, such a contingency allowance is particularly important for merchant reactors like Pilgrim, which cannot collect additional money from ratepayers in the event of a funding shortfall or supplement existing funds with new revenue generated through the sale of electricity after shutdown. *See* 61 Fed. Reg. 39,278, 39,285 (July 29, 1996).

8. The Commission included the $50 million contingency fund requirement on its own initiative, as supported and requested by NRC staff, in 1999 as a condition of the Commission's approval of the transfer of Pilgrim's operating license from Boston Edison Company to Entergy on April 29, 1999. The Commission retained the contingency provision when it approved Entergy's application to renew its operating license in May 2012—just seven years ago. Yet, without any mention or justification in the LTA whatsoever, Entergy and Holtec propose that the Commission strike from Entergy's license the $50 million contingency fund allowance intended to cover, among other things, unforeseen conditions and expenses that arise during

decommissioning. LTA, Encl. 1, Attach. A, at 4 ¶ J.4 (red line).[7] This omission in and of itself justifies this hearing request. Indeed, the proposed red line deletion is not a conforming change like substituting Holtec's name for Entergy's throughout the Operating License, but instead a substantive change to a condition the Commission required to ensure adequate protection to the health and safety of the public in light of the unique financial risk that merchant generators like Pilgrim face in a deregulated market like Massachusetts. The fact, as explained below, that Holtec needs such a contingency fund to comply with the Commission's financial assurance requirements cements that justification.

Outstanding Boston Edison Legal Claim

9. Entergy and Holtec also fail to inform the Commission that Boston Edison Company (doing business as Eversource) has an outstanding legal claim that is likely to decrease the amount of money that Holtec may recover from the U.S. Department of Energy (DOE) for spent fuel management by approximately $40 million. When Boston Edison Company sold Pilgrim to Entergy, Boston Edison claims that it provided Entergy with funds to cover post-decommissioning spent fuel management costs. *In re Boston Edison Co*., 1999 WL 239703, 192 P.U.R. 4th 418, 3-4 (Mass. D.T.E. 1999). Boston Edison then sued DOE to recover those costs, arguing that absent DOE's breach of the Standard Contract, Boston Edison would not have incurred them.

10. After a lengthy trial, the United States Court of Claims Federal Circuit Court agreed with Boston Edison and valued Boston Edison's damages at approximately $40 million. Subsequently, the United States Court of Appeals for the Federal Circuit agreed that Boston

[7] Indeed, Applicants' tactic of burying this change in the red line version without explanation highlights the need to closely scrutinize Applicants' license transfer and amendment request.

Edison had spent approximately $40 million due to DOE's breach at the time of sale, but "the estimated value of future damages agreed upon by two private parties should not set the amount of the government's liability for partial breach." *Boston Edison v. United States*, 658 F.3d 1361, 1367 (Fed. Cir. 2011). Thus, "the damages of DOE's pre-transfer breach cannot be determined until the actual costs of [spent nuclear fuel] disposal are incurred at the time of decommissioning." *Boston Edison Co. v. United States*, 106 Fed. Cl. 330, 334 (Fed. Cl. 2012) (citing *Boston Edison*, 658 F.3d at 1367). Consequently, the Court reserved Boston Edison's claim of $40 million until after the commencement of decommissioning and spent fuel management costs are incurred. *Entergy Nuclear Generation Co. v. United States*, 130 Fed. Cl. 466, 472-73 (Fed. Cl. 2017) (citations omitted). Throughout this litigation, DOE has consistently stated that if the Court orders DOE to pay Boston Edison damages for spent fuel management, DOE will reduce the amount that it pays Entergy by the same (i.e., DOE will not pay twice for the same spent fuel management damages).

11. Entergy and Holtec have not accounted for this potential reserved claim in the LTA and related Cost Estimate. Indeed, Holtec does not even mention Boston Edison's future claim when discussing future litigation or settlement of claims due to DOE's breach of the Standard Contract. *See* LTA, Encl. 1, at 18-19. Instead, Holtec states that it intends to recover from DOE all of its spent fuel management costs caused by DOE's breach of the Standard Contract. *Id.* However, this reliance is misplaced because it fails to acknowledge that any spent fuel management costs it recovers is likely to be reduced by at least the approximately $40 million potentially due to Boston Edison. This omission provides further reason to question the analysis that adequate financial assurance exists in this case.

Failure to account for unanticipated costs

12. The LTA, Exemption Request, and Revised PSDAR also fail to comply with 10 C.F.R. § 50.82(a)(8)(i)(B) and (C) because, as explained in detail in the attached declarations, there are multiple ways that Holtec could experience significant, unaccounted for, cost overruns. These cost overruns could very likely lead to a shortfall in the Decommissioning Trust Fund and an associated public health, safety, and environmental risk. They include:

(a) Delays in the work schedule leading to increased costs for overhead and project management. Even without any added direct costs, a delay in a single activity would likely delay the overall decommissioning schedule, which would lead to a significant, unaccounted for increase in costs for overhead and project staffing and management. Brewer Decl. ¶¶ 8-9;

(b) Compliance with existing Massachusetts standards for non-radiological hazardous materials cleanup under the Massachusetts Oil and Hazardous Material Release Prevention and Response Act, Mass. Gen. L. c. 21E, §§ 1-22 (Chapter 21E) and its regulations, the Massachusetts Contingency Plan (MCP), 310 C.M.R. §§ 40.0000, *et seq.*, or unanticipated site conditions that are not accounted for in Holtec's Cost Estimate. Brewer Decl. ¶ 10; Locke Decl. ¶¶ 6-9; Howland Decl. ¶¶ 6-7. These unaccounted-for requirements and issues could result in higher than estimated costs and a longer timeline for completion, which, in turn, could result in delays and a shortfall in the Decommissioning Trust Fund. Brewer Decl. ¶ 10;

(c) The likely discovery of previously unknown radiological or non-radiological contamination. Brewer Decl. ¶ 11; Locke Decl.¶¶ 3-4; Howland Decl. ¶¶ 5-7; Priest Decl. ¶¶ 11-14. Holtec has not yet performed a site characterization of Pilgrim. Locke

Decl.¶¶ 7-9; Howland Decl. ¶¶ 5-7; Priest Decl. ¶¶ 5-14. Thus, Holtec based its cost estimate only on historical data, which it has not disclosed in its Revised PSDAR. Brewer Decl. ¶ 11; Locke Decl.¶¶ 7-9; Howland Decl. ¶¶ 5-7. The actual extent of any contamination is thus unknown. Locke Decl.¶¶ 7-9; Howland Decl. ¶¶ 5-7; Priest Decl. ¶¶ 5-14. In the likely event that currently unidentified and unknown contamination is discovered, it could significantly increase the cost of decommissioning and site restoration. Brewer Decl. ¶ 11; Howland Decl. ¶¶ 5-6;

(d) A radiological incident at the site. Brewer Decl. ¶ 12. Once the spent nuclear fuel is in dry cask storage, the chances of a radiological incident decreases. *Id.* However, until that occurs, there is a risk of a radiological event. *Id.* For instance, there is a risk of a radiological event occurring during the transfer of spent nuclear fuel into the spent fuel pool, and again into dry casks. *Id.* Should this occur, a shortfall in the Decommissioning Trust Fund could occur from significant increases in both costs and delays. *Id.*;

(e) A DOE requirement to repackage spent nuclear fuel into new containers that DOE has approved for transportation in the event DOE fulfills its legal obligation to take possession of all spent nuclear fuel stored onsite. Brewer Decl. ¶ 13. Holtec assumes that DOE will accept the spent nuclear fuel as-is, i.e., in the dry storage casks acquired by Entergy and Holtec. *Id.* However, DOE could arguably require the spent nuclear fuel to be repackaged into certain specific dry casks for transport. *Id.* If DOE were to require repackaging of the spent nuclear fuel, this could require Holtec to incur significant unaccounted-for costs, especially because Holtec will already have dismantled the spent nuclear fuel pool. *Id.*;

(f) A successful effort by DOE to recover all or some of its past reimbursements for the packaging of spent nuclear fuel into dry casks. Brewer Decl. ¶ 14. To date, Entergy has successfully recovered from DOE the costs to package the spent nuclear fuel into dry casks. *Id.* However, DOE may attempt to recover these original packaging costs from Entergy. *Id.* If the DOE is successful, this could lead to a significant cost overrun because the cost for loading three casks, and starting five others, was $6 million, and Pilgrim will require over 60 casks to load in total. *Id.*;

(g) Holtec's failure to secure permission to dispose of Class B and C waste with the Texas Compact Commission. Newhard Decl. ¶ 7. If Holtec cannot secure permission to dispose of its Class B and C waste at the Texas Facility, then, based on the NRC's own recent estimate, Holtec's waste disposal costs may increase by as much as $170 million, *id.* ¶ 8—an amount that far exceeds the $3.6 million balance that Holtec's Cost Estimate anticipates remaining in the Fund at the time of license termination.

13. Each of the potential cost overruns listed above could lead to a significant shortfall in the Decommissioning Trust Fund. The shortfall could be greater if more than one of the above events occurs, or if Holtec encounters other cost overruns not listed above.

14. The likelihood of at least one of these events occurring is significant, if not already present. For example, tritium has been detected in groundwater on the Pilgrim site, and the exact cause of this tritium contamination has yet to be definitively identified. Priest Decl. ¶¶ 8-10. During the groundwater sampling period, which began in 2007, groundwater tritium concentrations fluctuated both above and below the U.S. Environmental Protection Agency's

(EPA) drinking water limit.[8] If later sampling during the decommissioning process discovers exceedances, Holtec will be required to address those exceedances—at great expense—because "keeping radionuclides below the EPA limit is necessary to maintain public safety at a decommissioning facility." *In re Entergy Nuclear Vermont Yankee, LLC*, LBP-15-24, at 25. There is also contaminated soil located in multiple locations around the site, and other historical releases into the environment associated with a former condenser tube refurbishment building. Priest Decl. ¶¶ 8-10; *see also* Locke Decl. ¶¶ 8-9 (identifying releases reported to the Massachusetts Department of Environmental Protection (MassDEP)). The age of Pilgrim also makes it likely that Holtec will discover polychlorinated biphenyls (PCBs) and asbestos in and around the buildings. Howland Decl. ¶ 7; Locke Decl.¶ 6. The cost to legally remediate, transport, and dispose of this non-radiological contamination, much of which is likely to be co-mingled with radiologically contaminated material, can be extraordinary. Yet, the LTA, Revised PSDAR, and associated Cost Estimate fail to consider the costs associated with these contingencies, which, given site-specific information and experience at other decommissioning projects, are likely to occur. Brewer Decl. ¶¶ 8-9, 11; Howland Decl. ¶¶ 5-7; Priest Decl. ¶¶ 11-14.

15. The NRC has held in prior proceedings that, for example, when evaluating potential expenses related to the cleanup of other nuclear sites, a decommissioning trust fund shortfall from groundwater contamination is a significant possibility, and a shortfall arising from unexpected spent fuel management expenses is "very possible."[9] *See also* Brewer Decl. ¶¶ 13, 15 (noting that the cost to construct a fuel transfer station is between $150 and $450 million and

[8] *See* Pilgrim Nuclear Power Station (PNPS): Tritium in Groundwater Monitoring Wells (Feb. 7, 2014); https://www.mass.gov/files/documents/2016/07/vv/pnps-update-02-07-14.pdf.

[9] *See In re Entergy Nuclear Vermont Yankee, LLC*, LBP-15-24, at 26.

that it is "very possible" that Holtec would incur $7 million in spent fuel management costs beyond its currently estimated 2016 end date). These, and the other potential funding shortfalls listed above, are thus not "remote and highly speculative."[10] Even if Holtec is aware of the known and likely radiological and non-radiological contamination at Pilgrim, until a full site characterization is completed, including a complete assessment of the vertical and horizontal extent of the non-radiological contamination, Holtec will not know the extent of these contingencies or if there are any others. Priest Decl. ¶¶ 11-14; Locke Decl. ¶¶ 7-9; Howland Decl. ¶¶ 5-7.

16. Indeed, Holtec's Cost Estimate is precisely that: an *estimate*, not a guarantee. And, as described in detail in the attached Brewer, Howland, Locke, Priest, and Newhard Declarations, Holtec's Cost Estimate itself is deficient in many respects that cause it to significantly underestimate possible costs to decommission and restore the site and manage Pilgrim spent nuclear fuel. At Connecticut Yankee, for example, previously undiscovered strontium-90 required excavation and remediation of a large trench around the reactor water storage tank. Priest Decl. ¶¶ 11-12. The cost of performing this unanticipated work *doubled* the estimated decommissioning costs for Connecticut Yankee. During the decommissioning of Maine Yankee, the licensee encountered pockets of highly contaminated groundwater dammed up by existing structures, which caused significant cost increases. Yankee Rowe, located in Massachusetts, incurred similarly significant decommissioning cost increases when PCBs were discovered in paint covering the steel from the vapor container that housed the nuclear reactor, as well as in sheathing on underground cables. Howland Decl. ¶ 5. It is thus reasonably foreseeable that

[10] *See San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016, 1030 (9th Cir. 2006) (citations omitted) (outlining when outcome is "remote and highly speculative").

Holtec's site-specific cost estimate significantly underestimates the likely actual costs that it will incur.

Unreasonable assumptions regarding spent fuel management costs

17. Holtec's assumptions about the long-term storage of spent fuel and the costs associated with it also fail to demonstrate how Holtec will ensure the availability of funds to terminate both the operating and ISFSI licenses. In particular, Holtec's site specific cost estimate is based on the assumption that DOE will begin removing spent fuel from the site in 2030 and that DOE will complete removal of all spent fuel by 2062. Revised PSDAR, Encl. 1, at 43. Nowhere, however, does Holtec explain or seek to justify this conclusion. Holtec's assumptions are incongruous with the NRC's analysis in the Continued Storage Rule, as confirmed by ASLB in a prior proceeding, that "the indefinite storage of spent fuel on-site is a very possible outcome."[11] *See also* Brewer Decl. ¶ 15. And, in that regard, NRC staff have previously acknowledged that "the potential consequences of insufficient off-site storage for spent fuel was precisely one of the unforeseen conditions that 10 C.F.R. § 50.82(a)(8)(i)(B) was promulgated to address."[12] Holtec fails to explain how it would address this contingency of indefinite onsite storage, including all safety and environmental concerns regarding transferring fuel into new dry casks every 100 years. Brewer Decl. ¶ 15. The potential expenses identified in the NRC's Continued Storage Rule would include for Pilgrim: (a) the construction of a Dry Fuel Transfer Station; (b) the purchase of 61 new casks and all other labor and material costs for transferring the fuel every 100 years; and (c) the costs of maintaining security at the site for any time after 2063 should onsite storage continue past that time. *Id.* What is more, even if its assumption

[11] *In re Entergy Nuclear Vermont Yankee, LLC*, LBD-15-24, at 26 (citations omitted).

[12] *Id.* (citations omitted).

does prove to be correct, Holtec also fails to reconcile why its ISFSI decommissioning site estimate is half of what Entergy has estimated those costs to be ($4,197,000.00 (Holtec estimate) versus $9,400,000.00 (Entergy estimate)).[13] These significant deficiencies thus provide an additional reason why the Commonwealth's contention is admissible and requires a hearing.

Likelihood of Price Overruns and Delays

18. Decommissioning a nuclear power plant is a major industrial activity with many unknowns. *See* Howland Decl. ¶¶ 4-6; Locke Decl. ¶ 6. The NRC's website currently claims that "[a]lthough there are many factors that affect reactor decommissioning costs, generally [decommissioning] range[s] from $300 million to $400 million."[14] Yet, a few years ago, the NRC recognized that under its "minimum formula" for decommissioning, every reactor will cost more than $400 million to decommission.[15] Further, in the few instances where operators have done site-specific cost estimates, the NRC has now seen multiple examples where those estimates resulted in expected costs which roughly double what the minimum formula predicted.[16] In particular, four reactors (Diablo Canyon 1, Diablo Canyon 2, San Onofre 2, and San Onofre 3) each went from an estimate of $521 million to an estimate of over $1 billion.[17]

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[13] *Compare* Revised PSDAR, Encl. 1, App. A, Table A-1, *with* Letter from Entergy to NRC, *Update to Spent Fuel Management Plan Pursuant to 10 CFR 50.54(bb) Pilgrim Nuclear Power Station*; Docket No. 50-293; License No. DPR-35, Attach. 1, at 5 (Nov. 16, 2018) (ADAMS Accession No. ML18320A036).

[14] NRC, *Backgrounder on Decommissioning Nuclear Power Plants*, https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/decommissioning.html.

[15] *See, e.g.*, NRC, SECY-13-0105, at Summary Table (Oct. 2, 2013), https://www.nrc.gov/reading-rm/doc-collections/commission/secys/2013/2013-0105scy.pdf (listing estimated costs under the NRC's minimum formula ranging from $438 million, counting River Bend Station as one unit, to over $1 billion).

[16] *See id.*

[17] *Id.*

19. DOE has a similar track record of routinely underestimating the costs of remediating radiological contamination at the nuclear sites it oversees. For instance, a 2008 Government Accountability Office report notes that five DOE cleanup sites already have cost overruns of more than 40 percent at best, and at least one of those sites is at risk of more than doubling its expected costs.[18] Since the 2008 report, DOE increased the projected lifecycle completion costs by at least 100% for nearly every site listed.[19]

20. Decommissioning delays by themselves can cause significant decommissioning cost increases, and there is no reason to believe that Holtec would be immune from these cost increases, especially given its ambitious schedule. Brewer Decl. ¶¶ 8-9. Indeed, Holtec recently experienced a long delay at another nuclear decommissioning site due to a Holtec mishap: San Onofre Nuclear Generating Station ("San Onofre"). *Id.*[20] There, a Holtec employee was lowering a dry cask into a Cavity Enclosure Container at the ISFSI pad, when the cask got caught on an inner ring, causing the slings supporting the canister to come off while the canister remained wedged. *Id.*[21] As a result of this near miss, fuel transfer operations at San Onofre have

[18] GAO, *Action Needed to Improve Accountability and Management of DOE's Major Cleanup Projects*, GAO-08-1081, at 13 (Sept. 2008), http://www.gao.gov/new.items/d081081.pdf.

[19] *Compare id., with* DOE, *Cleanup Sites: Progress through Action*, https://www.energy.gov/em/cleanup-sites.

[20] San Onofre is operated by Southern California Edison, which contracted with Holtec to assist in decommissioning the site.

[21] Southern California Edison Press Release: Southern California Edison Statement on Spent Nuclear Fuel Canister (Aug. 10, 2018), https://www.songscommunity.com/news/releases/southern-california-edison-statement-on-spent-nuclear-fuel-canister; Southern California Edison Press Release: SCE to Brief Path Forward for Fuel Transfer Operations Restart (Nov. 28, 2018), https://www.songscommunity.com/news/releases/sce-to-brief-path-forward-for-fuel-transfer-operations-restart.

been suspended until at least February 2019, causing substantial cost increases due to work delay and required assessment. *Id.*[22]

21. The NRC subsequently investigated Holtec's actions at San Onofre. It identified "two apparent violations," which "involved the failure to: (1) ensure important-to-safety equipment was available to provide redundant drop protection features for a spent fuel canister during downloading operations; and (2) make a timely notification to the NRC Headquarters Operations Center for the August 3, 2018, disabling of important-to-safety equipment."[23] The NRC cited three Severity Level IV violations, "involv[ing] failures to: (1) identify conditions potentially adverse to quality for placement into [the licensee's] corrective actions program; (2) assure that operations of important to safety equipment were limited to trained and certified personnel or under direct supervision; and (3) provide adequate procedures for dry cask storage operations involving downloading operations."[24]

22. Though a catastrophic event did not occur as a result of the near miss at San Onofre, its occurrence certainly weighs in favor of prudent financial assurance requirements. A similar mishap at Pilgrim could potentially place the public health, safety, and environment in great danger. *See* Brewer Decl. ¶ 12. At the very least, barring a major radioactive event, the NRC would certainly investigate, and Pilgrim would likely halt decommissioning activities for at least several months. This delay alone could lead to a shortfall in the Decommissioning Fund.

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[22] Southern California Edison Press Release: SCE to Brief Path Forward for Fuel Transfer Operations Restart (Nov. 28, 2018), https://www.songscommunity.com/news/releases/sce-to-brief-path-forward-for-fuel-transfer-operations-restart.

[23] Ltr. from NRC, to Southern California Edison Company, *Revised NRC Special Inspection Report 050-00206/2018-005, 050-00361/2018-005, 050-00362/2018-005, 072-0041/2018-001 And Revised Notice of Violation*, San Onofre Nuclear Generating Station, EA-18-155, at 1 (Dec. 19, 2018) (ADAMS Accession No. ML18341A172).

[24] *Id.* at 3.

Holtec's inadequate contingency allowance and uncertainty risk

23. Holtec's attempt to account for contingencies and uncertainty risk is woefully deficient. First, Holtec's site-specific cost estimate relies on an undisclosed Monte-Carlo analysis that resulted in a claimed application of a 17 percent contingency allowance to license termination, spent fuel management (except for ISFSI decommissioning), and site restoration costs. Revised PSDAR, Encl. 1, at 39-41. Unlike Entergy's cost estimate's contingency allowance, which follows standard industry practice, Holtec's contingency allowance accounts for traditional contingency "as well as increased costs for discrete events and project uncertainties." Brewer Decl. ¶ 8. Despite Holtec's claimed inclusion of uncertainties and risks not accounted for in Entergy's contingency allowance, "the total license termination costs for both estimates are essentially equal when the costs for SAFSTOR in the Entergy estimate are excluded," *id.*, and fails to offer "any basis or explanation for how the estimated cost does not increase from that of Entergy when allowance for other types of risk are included in the Holtec estimate," *id.* ¶ 9. Nor, for that matter, does Holtec disclose how it applied its own derived 17 percent contingency allowance in its cost estimate, including to particular line items. *Compare* Revised PSDAR, Encl. 1, at 39-41, *with* Brewer Decl. ¶ 9.

24. Second, even if valid, Holtec's 17 percent contingency allowance is not a contingency allowance at all. Instead, Holtec makes clear that the undisclosed amount of "the Contingency Allowance . . . is expected to be *fully consumed*" during "decommissioning." Revised PSDAR, Encl. 1, at 41 (emphasis added). In other words, its contingency allowance covers costs *it expects* to incur. In contrast, Holtec provides no information quantifying the amount, if any, it includes in its cost estimate for uncertainty risks, or the costs that it may incur due to "unforeseen conditions or expenses that arise" during decommissioning. *See* 10 C.F.R. § 50.82(a)(8)(i)(B).

Holtec acknowledges these uncertainty risks associated with the scope and schedule of decommissioning activities, but provides insufficient information regarding how they factor into its analysis.

Holtec's Corporate Structure Increases Risks

25. The financial and attendant safety, health, and environmental risks associated with the LTA are further increased by the corporate structure of the proposed transferee and new site operators. Holtec Decommissioning International and Holtec Pilgrim, the proposed licensee and new site operator, respectively, are both structured as Limited Liability Companies ("LLCs"). LTA at 1, Fig.2: Simplified Organization Chart (Post-Transfer). This raises a significant risk that the owner and operator could at some point have liabilities that outstrip their assets and could therefore choose to file for bankruptcy before site decontamination and restoration are complete. *See* Newhard Decl. ¶ 5. This, in turn, raises numerous thus-far-unanalyzed health, safety, and environmental concerns, including the significant possibility that certain decommissioning, spent fuel management, or site restoration activities will not occur due to lack of funding; thus, potentially leaving the Commonwealth and its taxpayers to bear the financial burden and responsibility for finishing the work.

26. Because Holtec is an independent company (rather than a rate-regulated utility), it cannot go back to ratepayers if it has underestimated the costs of decommissioning, spent fuel management, or site restoration. Nor can anyone necessarily assume that Holtec can obtain additional funds from a parent company because, as the NRC has said previously, a "parent company is not an NRC licensee" and the "NRC does not have the authority to require a parent company to pay for the decommissioning expenses of its subsidiary-licensee, except to the extent

the parent may voluntarily provide" a parent company guarantee.[25] Holtec is also involved in other decommissioning projects at other nuclear plant sites, such as San Onofre in California, which will potentially draw upon its parent company's resources and detract from the attention needed at Pilgrim. The lack of a guaranteed ratepayer base or a parent company that is liable for any cost overruns raises numerous thus-far-unanalyzed health, safety, and environmental concerns, including the significant possibility that certain decommissioning, spent fuel management, or site restoration activities will not occur due to lack of funding.

2. The License Transfer and Amendment, and Revised PSDAR Request Does Not Comply with 10 C.F.R. § 50.75(h)(1)(iv).

27. Holtec's proposed use of the Decommissioning Trust Fund does not comply with 10 C.F.R. § 50.75(h)(1)(iv) because disbursements from the Decommissioning Trust Fund "are restricted to decommissioning expenses." 10 C.F.R. § 50.75(h)(1)(iv). This "do[es] not include the cost of removal and disposal of spent fuel or of nonradioactive structures and materials beyond that necessary to terminate the license." *Id.* at § 50.75 n.1. Neither Entergy nor Holtec have yet obtained an exemption to allow either of them to use the Decommissioning Trust Fund for site restoration or spent fuel management expenses. Thus, until an exemption is granted, the proposed LTA and Holtec's Revised PSDAR, would violate these regulatory requirements because they depend on Holtec's ability to use the Decommissioning Trust Fund to cover site restoration and spent nuclear fuel management costs.

28. Holtec presumes that it can use the Decommissioning Trust Fund for site restoration and spent fuel management expenses based on its Exemption Request, which was filed as an enclosure to, and incorporated in, the LTA. However, this exemption has not been, and might

[25] NRC, *Questions and Answers on Decommissioning Financial Assurance*, Encl. 5, at 2 (ADAMS Accession No. ML11195031).

not be, granted. Holtec does not consider in its analysis the possibility that the NRC may not grant the requested exemption.[26] Instead, Entergy and Holtec make their acceptance of the Commission's potential approval of the LTA contingent on the Commission's decision to grant the Exemption Request. Holtec does not consider the consequences of an NRC decision to deny the Exemption Request, because it lacks sufficient funds to itself pay for site restoration or spent nuclear fuel management costs[27]—a point that underscores the fragility of the financial viability of the proposed license transfer as currently structured.

29. The Commonwealth is entitled to a hearing on the Exemption Request to use the Decommissioning Trust Fund for spent fuel management and site restoration expenses because it is "directly related" and inextricably intertwined with this license transfer and amendment.[28] As the NRC has noted, "[t]o hold otherwise would exclude critical safety questions from licensing hearings merely on the basis of an 'exemption' label."[29] Until Holtec receives such an exemption, the regulatory requirements of disbursements from the Decommissioning Trust Fund "are restricted to decommissioning expenses." 10 C.F.R. § 50.75(h)(1)(iv). All withdrawals must be "for legitimate decommissioning activities consistent with the definition of decommissioning in [10 C.F.R.] § 50.2." 10 C.F.R. § 50.82(a)(8)(i)(A). These are "regulation[s] that otherwise would have applied to the licensing" process, and an exemption from these

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[26] *See* LTA, Encl. 1, at 18 (stating that denial of the exemption request would prevent the transaction from occurring).

[27] *See id.*

[28] *In re Private Fuel Storage, LLC*, CLI-01-12, 53 N.R.C. 459, 476 (2001); *see also, e.g.*, *In re Honeywell Int'l, Inc.*, CLI-13-1, 77 N.R.C. 1, 7 (2013) ("But when a licensee requests an exemption in a related license amendment application, we consider the hearing rights on the amendment application to encompass the exemption request as well.").

[29] *In re Private Fuel Storage, LLC*, CLI-01-12, 53 N.R.C. at 467, *see also, e.g.*, *id.* at 467, n.3 ("We are aware of no licensing case where we have declared exemption-related safety issues outside the hearing process altogether.") (citations omitted).

regulations is thus properly within the scope of this license transfer and amendment application.[30]

30. The Commonwealth is entitled to a hearing on the Exemption Request, because allowing the request without conditions poses a significant risk that insufficient funds will exist to decommission and restore the site and manage spent nuclear fuel on an indefinite basis. As currently proposed, Holtec plans to withdraw approximately $500 million from the Decommissioning Trust Fund to cover what it characterizes as its spent nuclear fuel costs through 2063, and to then seek to recover those costs from DOE based on a claimed breach of the Standard Contract. Holtec, however, nowhere commits to placing the funds it recovers on a recurring basis from DOE back into the Decommissioning Trust Fund to cover ongoing costs and contingencies until DOE removes the spent fuel and the license is terminated, or even to make all of those funds available to cover such a potential shortfall in the Decommissioning Trust Fund prior to license termination. Instead, it appears that Holtec may use the Exemption Request as a means to divert those funds from the Decommissioning Trust Fund and into its own accounts for whatever use it desires. Given the risks of a potential shortfall in the Decommissioning Trust Fund outline above, an NRC decision to unconditionally grant the Exemption Request would be wholly unreasonable and a hearing on this issue (and the issues related to it) is thus necessary.

[30] *In re Entergy Nuclear Vermont Yankee, LLC & Entergy Nuclear Operations, Inc.*, CLI-16-12, 2016 WL 3476306, at *3 (2016); *see also Consumers Power Co. (Midland Plant, Units 1 & 2)*, CLI-74-3, 7 A.E.C. 7, 12 (1974) (holding that the Commission "will not close [its] eyes to the fact that this proceeding, though separate from the earlier ones for some purposes, is merely another round" in a series of related matters).

CONTENTION II

The License Transfer and Amendment Request Do Not Include The Environmental Report Required By 10 C.F.R. § 51.53(d), and Have Not Undergone the Environmental Review Required by the National Environmental Policy Act and 10 C.F.R. §§ 51.20, 51.70, and 51.101

A. Contention

31. The Commonwealth specifically incorporates by reference, as if fully set forth here, the attached Declarations of Brewer, Howland, Locke, Newhard, Priest and all paragraphs under Contention I.

32. The Commission must conduct, at a minimum, an environmental assessment or a Supplemental Environmental Impact Statement of the potential direct and indirect environmental consequences of approving the Applicants' LTA, Holtec's Exemption Request, and Holtec's revised PSDAR and Site-Specific Cost Estimate, because (i) the categorical exclusion in 10 C.F.R. § 51.22(c)(21) is inapplicable to the license transfer and amendment request and, regardless, special circumstances exist that would preclude reliance on it; (ii) the LTA, the Exemption Request, and the PSDAR create a plausible risk that insufficient funds will be available to completely decommission Pilgrim, restore the site, and manage spent nuclear fuel onsite indefinitely; and (iii) Holtec's PSDAR and Site-Specific Cost Estimate are not bounded by prior environmental analysis.

B. Basis for Contention

1. Regulatory Framework

33. The National Environmental Policy Act (NEPA) declares a national policy to, *inter alia*, "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of [all people]." 42 U.S.C. § 4321. In this regard, NEPA requires all federal agencies, including the NRC, to prepare an Environmental Impact Statement

(EIS) to consider the environmental consequences of all proposed "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(C); *accord* 10 C.F.R. § 51.20(a)(1). Federal action includes an agency decision that "permits action by other parties which will affect the quality of the environment."[31] To satisfy NEPA, agencies are required to take a "hard look" at the environmental consequences of a proposed action.[32]

34. NEPA applies both to affirmative actions by an agency (such as a licensing decision) and to actions by a licensee that "are potentially subject to Federal control and reasonability." "Actions include the circumstance where the responsible officials fail to act and that failure to act is reviewable by courts or administrative tribunals under the Administrative Procedure Act or other applicable law as agency action."[33] In other words, NEPA responsibilities are triggered by the fact that a federal agency, as is the case here, "has actual power to control the project."[34]

35. NEPA established the Council of Environmental Quality (CEQ) in the Executive Office of the President and authorized CEQ to issue regulations applicable to all federal agencies to implement NEPA's procedural requirements. 42 U.S.C. § 4344; 40 C.F.R. § 1500.3 (2018). CEQ's regulations require federal agencies to adopt procedures to supplement the CEQ regulations. 40 C.F.R. §§ 1505.1, 1507.3.

36. The CEQ regulations allow a federal agency to prepare an Environmental Assessment (EA) to determine whether the agency is required to prepare an EIS. 40 C.F.R. § 1501.4(a)-(b). An EA is "a concise public document" that "[b]riefly provide[s] sufficient evidence and analysis

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[31] *Scientists' Inst. For Pub. Info., Inc. v. Atomic Energy Comm'n*, 481 F.2d 1079, 1088 (D.C. Cir. 1973).

[32] *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983).

[33] 40 C.F.R. § 1508.18; *see also* 5 U.S.C. § 551(13) (Administrative Procedure Act referring to an agency's "failure to act.")

[34] *Ross v. Fed. Highway Admin.*, 162 F.3d 1046, 1051 (10th Cir. 1998).

for determining whether to prepare an [EIS] or a finding of no significant impact [FONSI]." 40 C.F.R. § 1508.9(a)(1). An EA must include a discussion of alternatives to the proposed action that were considered by the federal agency. 40 C.F.R. § 1508.9(b). Only if an agency reasonably determines, based on an evaluation of all the evidence, that its action "will not have a significant effect on the human environment," may it issue a Finding of No Significant Impact (FONSI).[35] In those circumstances, the FONSI must be accompanied by "a convincing statement of reasons to explain why a project's impacts are insignificant."[36] The EA and FONSI must also include consideration of "[t]he degree to which the proposed action affects public health or safety."[37]

37. The mere *possibility* of significant environmental impacts precludes a FONSI and triggers the need for an EIS.[38] An agency must "evaluate seriously the risk" that the problem will occur, and what environmental consequences would ensue in those circumstances.[39] NEPA explicitly requires an EIS if an action has "effects that *may be* major and which are *potentially* subject to Federal control and responsibility." 40 C.F.R. § 1508.18 (emphasis added). Agencies are required to resolve "close call[s]" in favor of preparing an EIS.[40] Thus, the required NEPA

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[35] 40 C.F.R. § 1508.13; *see also id.* § 1501.4, 1508.14; *New York v. NRC I*, 681 F.3d 471, 477 (D.C. Cir. 2012).

[36] *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998).

[37] 40 C.F.R. § 1508.27(b)(2); *see also Citizens Against Toxic Sprays, Inc. v. Bergland*, 428 F. Supp. 908, 927 (D. Or. 1977) ("No subject to be covered by an [environmental impact statement] can be more important than the potential effects of a federal [action] upon the health of human beings [and the environment]."); *Maryland-Nat'l Capital Park & Planning Comm'n v. U.S. Postal Service*, 487 F.2d 1029 (D.C. Cir 1973).

[38] 42 U.S.C. § 4332(2)(C); *see also, e.g.*, *Blue Mountains*, 161 F.3d at 1211.

[39] *Found. on Econ. Trends. v. Heckler*, 756 F.2d 143, 154 (D.C. Cir. 1985).

[40] *National Audubon Soc'y v. Hoffman*, 132 F.3d 7, 13 (2d Cir. 1997) (reversing a decision by the U.S. Forest Service not to prepare an environmental impact statement because the forest

analysis must be comprehensive and address all "potential environmental effects," unless those effects are so unlikely as to be "remote and highly speculative."[41] Courts will reverse an agency's decision not to prepare an EIS when the agency has failed to consider all of the substantially possible effects of its action.[42] A "potential" significant effect suffices.[43]

38. Determining whether the effect on the human environment is significant requires agencies to consider both the context of the action and the intensity of the potential environmental impacts. 40 C.F.R. § 1508.27. CEQ's NEPA regulations list ten intensity factors agencies must consider. 40 C.F.R. § 1508.27(b) (listing the ten factors). Courts often consider the factors as a whole or as a group.[44] Courts frequently examine the agency's consideration and analysis of these factors when deciding whether the agency was correct in issuing a FONSI.[45] Although there is not a "prescribe[d] weight to be given to these criteria,"[46] the NRC "must consider" these criteria.[47] The presence of intensity factors requires the preparation of an EIS.[48]

Service failed to consider the possible effects of the challenged action); *see also id.* at 18 (Agencies should "err in favor of preparation of an" EIS).

[41] *San Luis Obispo Mothers for Peace*, 449 F.3d at 1030.

[42] *Id.* (finding NRC's refusal under NEPA to consider environmental effects of terrorist attack on proposed ISFSI pad or nuclear facility in general was not reasonable).

[43] *Id.* at 1030; *see Found. on Econ. Trends*, 756 F.2d at 154 ("Ignoring possible environmental consequences will not suffice.").

[44] *Sierra Club v. U.S. Forest Serv.*, 843 F.2d 1190, 1193 (9th Cir. 1988); *Found. for North Am. Wild Sheep v. U.S. Dep't of Agric.*, 681 F.2d 1172, 1181-81 (9th Cir. 1982).

[45] *Sierra Club v. Van Antwerp*, 661 F.3d 1147 (D.C. Cir. 2011).

[46] *Friends of the Ompompanoosuc v. FERC*, 968 F.2d 1549, 1556 (2d Cir. 1992) (citations omitted).

[47] *Ocean Advocates v. U.S. Army Corps of Eng'rs*, 402 F.3d 846, 865 (9th Cir. 2005).

[48] *See, e.g.*, *Lower Alloways Creek Tp. v. Public Service Elec. & Gas Co.*, 687 F.2d 732 (3d Cir. 1982); *Advocates for Transportation Alternatives, Inc. v. U.S. Army Corps of Eng'rs*, 453 F. Supp. 2d 289 (D. Mass. 2006); *Friends of Back Bay v. U.S. Army Corps of Eng'rs*, 681 F. 3d 581 (4th Cir. 2012).

39. NEPA also requires analysis of cumulative impacts. NEPA regulations define a "cumulative impact" as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions." 40 C.F.R. § 1508.7. An action is significant, and thus requires an EIS "if it is reasonable to anticipate a cumulatively significant impact on the environment." 40 C.F.R. § 1508.27(b)(7). Agencies must consider all foreseeable direct, indirect, and cumulative impacts before applying an established categorical exclusion.[49]

40. The CEQ regulations also allow a federal agency to adopt criteria for classes of action "[w]hich normally do not require either an [EIS] or an [EA]," known as categorical exclusions. 40 C.F.R. § 1507.3(b)(2)(ii). The CEQ regulations define categorical exclusions as "a category of actions which do not individually or cumulatively have a significant effect on the human environment and which have been found to have no such effect in procedures adopted by a Federal agency in implementation of these regulations (§ 1507.3) and for which, therefore, neither an [EA] nor an [EIS] is required." 40 C.F.R. § 1508.4. The CEQ regulations require that in listing categorical exclusions a federal agency must "provide for extraordinary circumstances in which a normally excluded action may have a significant environmental effect." *Id.*

41. To facilitate this environmental review, NRC regulations place specific burdens on applicants for license amendments and regulatory exemption requests.[50] For instance, under 10 C.F.R. § 51.53(d), every applicant for a

[49] *See Brady Campaign to Prevent Gun Violence v. Salazar*, 612 F. Supp. 2d 1, 23 (D.D.C. 2009); *see also, e.g.*, *In re Northern States Pwr. Co.* (Prairie Island Nuclear Island Nuclear Generating Plant), 76 N.R.C. 503, 514 (2012) (Licensing Board agreed that cumulative impacts analysis of initial storage facility must take into account later application to expand storage facility, because it is "reasonably foreseeable" that the facility will be expanded).

[50] The NRC may not have the resources to independently analyze these potential impacts. According to a 2015 report from the Office of the Inspector General, the NRC has, at times, had

> license amendment approving a license termination plan or decommissioning plan under § 50.82 of this chapter either for unrestricted use or based on continuing use restrictions applicable to the site … shall submit with its application a separate document, entitle "Supplement to Applicant's Environmental Report—Post Operating License Stage," which will update "Applicant's Environmental Report—Operating License Stage," as appropriate, to reflect any new information or significant environmental change associated with the applicant's proposed decommissioning activities or with the applicant's proposed activities with respect to the planned storage of spent fuel.

10 C.F.R. § 51.53(d).

42. NEPA requires environmental review before the NRC acts on matters that have potential direct or indirect impacts on the environment. NEPA's obligations are also imposed—first on Holtec and then on the NRC—by NRC regulations, including 10 C.F.R. §§ 51.20, 51.53(d), 51.70, 51.101, and 51.103. Neither the NRC nor the Applicants have complied with NEPA or applicable NRC regulations because, to date, they have not completed any environmental analysis of any of the proposed actions and their potential direct and indirect environmental consequences.

2. License Transfer and Amendment Request

43. The Applicants' claim that the request to transfer Pilgrim's Operating License to Holtec "is exempt from environmental review because it falls within the categorical exclusion contained in 10 CFR 51.22(c)(21)." LTA, Encl. 1, at 20. "Except in special circumstances," 10 C.F.R. § 51.22(b), the Commission's regulations categorically exclude from NEPA further

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only "one" employee available "to conduct regulatory analysis cost estimates" in the division overseeing decommissioning. NRC Office of the Inspector General, *Audit of NRC's Regulatory Analysis Process*, OIG-15-A-15, at 8 (June 24, 2015) (ADAMS Accession No. ML15175A344), https://www.nrc.gov/docs/ML1517/ML15175A344.pdf. In addition, the NRC "has no formal comprehensive cost estimator training/qualification program, (2) it does not implement or practice established knowledge management techniques, and (3) cost benefit guidance documents are outdated." *Id.*

review "[a]pprovals of direct or indirect transfers of any license issued by NRC and any associated amendments of license required to reflect the approval of a direct or indirect transfer of an NRC license," *id.* at § 51.22(c)(21). Regarding license amendments, the regulation's text makes clear that this categorical exclusion contemplates only those amendments "*required* to reflect the approval of a direct or indirect transfer of an NRC license." *Id.* (emphasis added); Streamlined Hearing Process for NRC Approval of License Transfers, 63 Fed. Reg. 66,721, 66,728 (Dec. 3, 1998). In this case, however, the Applicants propose without even the slightest acknowledgement or justification in the application itself to delete the License's current $50 million allowance guarantee to cover payments for, among other things, decommissioning—an amendment that, unlike substituting Holtec for Entergy where Entergy's name appears in the License, is undisputedly not *required* to reflect the requested approval. For that reason, the license transfer categorical exclusion by its own terms is inapplicable here and, therefore, the Commission cannot rely on it to satisfy its NEPA obligations.

44. Even if the license transfer categorical exclusion did apply, special circumstances exist that preclude NRC from relying on it in this case to comply with NEPA. *See* 10 C.F.R. § 51.22(b). The Commission purposefully chose not to define the term "special circumstances" in the regulations, *In re Pa'ina Hawaii, LLC*, 63 N.R.C. 99, 110 (Jan. 24, 2016), and it made that choice, as the ALSB has previously found, to preserve "flexibility" in determining when special circumstances exist that preclude reliance on a categorical exclusion based on the particular facts of each case. *Id.* at 110 (quoting 49 Fed. Reg. 9,352, 8,377 (Mar. 12, 1984)); *cf.* 40 C.F.R. § 1508.4 (agencies must "provide for extraordinary circumstances in which a normally excluded action may have a significant environmental effect."). Indeed, here, as in *In re Pa'ina Hawaii, LLC*, the regulatory history for the license transfer categorical exclusion does not "even hint that

the Commission considered" the possibility of approving substantive license amendments like the one the Applicants have requested here—the elimination of a $50 million contingency allowance to cover unanticipated decommissioning costs. 63 N.R.C. at 110. Instead, the regulatory history indicates that the NRC contemplated coverage only for "*administrative* amendments to licenses." 63 Fed. Reg. at 66,728 (emphasis added). That fact, coupled with the fact that the Applicants' have failed, as explained in detail above, to demonstrate that Holtec's exclusive source of funding (Pilgrim's Decommissioning Trust Fund) will provide adequate financial assurance constitute the type of "special circumstances" that require completion of at least an environmental assessment.

3. Decommissioning Trust Fund Exemption Request

45. Holtec claims that there will be no potential direct or indirect environmental consequences associated with an NRC decision to grant its request for an *unconditional* exemption from 10 C.F.R. § 50.82(a)(8)(i)(A) so that it may use money from Pilgrim's Decommissioning Trust Fund for spent fuel management and site restoration costs. LTA, Encl. 2, at E-7 to E-9. The exemption request is unconditional because, to the surprise of at least one NRC official at the January 15, 2019 public meeting,[51] the NRC's regulations do not require Holtec to pay any money it recovers from DOE for spent fuel management costs back into the Trust Fund or into a separate account dedicated to covering costs at the site until DOE removes the spent fuel and the ISFSI license is terminated, and Holtec has not voluntarily agreed to do so to date. In support of its claim, Holtec states, among other things, that the potential environmental impacts would be the same with or without the requested exemption, that granting

[51] Transcript of January 15, 2019 Public Meeting at 108, lines 3-13 (Adams Accession No. ML19029A025).

the exemption would not "increase the probability or consequences of radiological accidents," and that the requested exemption "only involves a change in the source of funds allowed for managing spent fuel or restoring the site." LTA, Encl. 2, at E-8 to E-9. But those assertions are demonstrably false.

46. First, if allowed, Holtec's request for an unconditional exemption will drain the Decommissioning Trust Fund of all but $3.615 million by the year 2063 and leave Holtec with no guaranteed or committed source of funds to cover spent fuel management costs after that year (the annual costs of which are at least twice what it will have left in the fund in 2063 even without accounting for the other possible contingencies discussed above). Without a committed source of funds to pay for the "very possible outcome" of the indefinite storage of spent fuel onsite, *In re Entergy Nuclear Vermont Yankee, LLC*, LBD-15-24, at 12, Holtec simply cannot plausibly claim that, for example, granting an unconditional exemption will not "increase the probability or consequences of radiological accidents" from the 61 dry casks that it will be responsible for securing onsite if it has no committed funds to pay for those costs. Nor, for that matter, can Holtec plausibly claim that that the requested exemption "involves a [mere] change in the source of funds allowed for managing spent fuel or restoring the site." Holtec has identified only *one* source of funds—the Decommissioning Trust Fund—and, as explained above, Holtec fails to demonstrate that the existing fund is sufficient to cover all of the costs associated with decommissioning, site restoration, and spent fuel management.

47. Second, if allowed, the exemption request could also lead to yet-to-be analyzed potential non-radiological environmental consequences. *See* LTA, Encl. 2, at E-8. As the Commonwealth has explained, it is likely that large quantities of non-radiological hazardous materials have been released at the site, Locke Decl. ¶ 6; Howland Decl. ¶ 7, and Holtec will

thus also have to comply with the Massachusetts Oil and Hazardous Material Release Prevention and Response Act, Mass. Gen. L. c. 21E, §§ 1-22 (Chapter 21E), and its regulations, the MCP, 310 C.M.R. §§ 40.0000 *et seq.*, among other state and federal non-radiological laws, to assess and remediate those releases, Locke Decl. ¶¶ 2-3. While Holtec's PSDAR acknowledges that it needs to address "state environmental response and remediation requirements . . . in a timely manner," Revised PSDAR, at 22, Holtec has yet to complete the type of site assessment that would allow it to understand both the extent of the non-radiological contamination at the site and the associated costs to remediate that contamination and, thus, has not properly accounted for these contingencies in its Site-Specific Cost Estimate. Locke Decl. ¶¶ 7-9; Howland Decl. ¶ 7. Pilgrim is located adjacent to and over several important natural resources (Cape Cod Bay, wetlands, and a Potentially Productive Aquifer). Locke Decl. ¶ 6. The exemption request, however, would permit Holtec to divert approximately $500 million from the Trust Fund, leaving it with little or no money to address non-radiological contamination impacting these resources and causing detriment to public health, and Holtec has failed to address in its exemption request the environmental consequences caused by this contingency.

4. Holtec's Revised PSDAR and Site-Specific Cost Estimate

48. The Commission's regulations at 10 C.F.R. § 50.82(a)(4)(i) required Holtec to include in its PSDAR a "discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements." *Id.* This requirement is included because, as courts have made clear, "[r]egardless of the label the [Nuclear Regulatory] Commission places on its decision," the act of "permitting [a licensee] to decommission the facility" requires NEPA review, "[a]n agency cannot skirt NEPA or other statutory commands by

essentially exempting a licensee from regulatory compliance, and then simply labelling its decision 'mere oversight' rather than a major federal action. To do so is manifestly arbitrary and capricious."[52] When a federal agency has a "mandatory obligation to review" plans, as is the case here, the agency's "failure to disapprove" of those plans constitutes a "major federal action" that triggers NEPA review.[53]

49. In this case, the proposed federal action is, as Holtec has conceded, the totality of the activities associated with "decommissioning, spent fuel management and site restoration." *See* LTA, Encl. 1, at 16-17; *see* Revised PSDAR, at 5. The proposed license transfer and amendment expressly state that they are intended to facilitate a more rapid decommissioning of Pilgrim and are accompanied by a Revised PSDAR that is contingent upon the proposed license transfer and amendment. The NRC's approval of this combined proposal thus constitutes a "major federal action."[54]

50. The NRC must conduct a comprehensive analysis to avoid unlawfully segmenting its analysis into discrete parts without ever looking at their full combined effects, an approach that NEPA prohibits.[55] Separate NRC environmental reviews of the proposed license transfer and

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[52] *Citizens Awareness Network, Inc. v. Nuclear Regulatory Comm'n*, 59 F3d 284, 293 (1st Cir. 1995).

[53] *Ramsey v. Kantor*, 96 F.3d 434, 445 (9th Cir. 1996).

[54] 40 C.F.R. § 1508.18 (defining "major federal action" as "actions with effects that may be major and which are potentially subject to Federal control and responsibility," including "[a]pproval of specific projects" or other instances where regulatory approval is necessary to a licensee's actions).

[55] *See, e.g., Del. Riverkeeper Network v. FERC*, 753 F.3d 1304, 1314 (D.C. Cir. 2014) ("The justification for the rule against segmentation is obvious: it prevents agencies from dividing one project into multiple individual actions each of which individually has an insignificant environmental impact, but which collectively have a substantial impact." (quotation and alteration marks omitted)); *see also, e.g., NRDC v. Callaway*, 524 F.2d 79, 88 (2d Cir. 1975) (NEPA is meant to provide "a more comprehensive approach so that *long term and cumulative effects of small and unrelated decisions could be recognized*, evaluated and either avoided,

amendment, exemption request, and the Revised PSDAR would improperly segment the environmental analysis, and fail to address cumulative impacts. All of Holtec's proposed uses of the Decommissioning Fund are "reasonably foreseeable" and thus must be considered together.[56]

51. Contrary to Holtec's claim in the PSDAR, *see* Revised PSDAR, at 20, the potential environmental impacts of the proposed license transfer and amendment request, the exemption request, and the associated Revised PSDAR, are not all bounded by any previous EISs and there exists new and significant information that requires preparation of a site-specific supplemental EIS. *See Marsh v. Oregon Nat. Resources Council*, 490 U.S. 360, 374 (1989). The completion of an EIS for a proposed action does not end an agency's responsibility to weigh the environmental impacts of a proposed action. *Id.* at 371-72. As the Supreme Court recognized, it would be incongruous with NEPA's "action-forcing" purpose to allow an agency to put on "blinders to adverse environmental effects," just because the EIS has been completed. *Id.* Accordingly, up until the point when the agency is ready to take the proposed action, it must supplement the EIS if there is new information showing that the remaining federal action will affect the quality of the human environment "in a significant manner or to a significant extent not already considered." *Id.* at 374.

52. Holtec's Revised PSDAR environmental analysis fails to comply with 10 C.F.R. § 50.82(a)(4)(i) because it fails to address new and significant information regarding the reasonably foreseeable potential that the increasingly adverse effects of climate change will impact site decommissioning, site restoration, and spent fuel management activities. While Holtec rests on the fact that the NRC staff did not identify during the 2007 license renewal

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mitigated, or accepted as the price to be paid for the major federal action under consideration" (emphasis added & citations omitted)).

[56] *Blue Mountains*, 161 F.3d at 1215.

environmental review "any new and significant information," Revised PSDAR, at 36, recently released data and information reveal that the impacts of climate change have grown significantly since 2007 and are likely to increase in both intensity and frequency in the near term. In particular, the U.S. Global Change Research Program's November 23, 2018 4th National Climate Assessment, which was prepared by over 300 federal and non-federal experts and peer reviewed by the National Academies of Sciences, Engineering, and Medicine, found that sea levels are rising in the Northeast at rates "three to four times higher than the global average rate."[57] At the same time, impacts associated with rising sea levels are being exacerbated by an increase in the intensity and frequency of extreme weather events, like the January and March 2018 storms that caused substantial coastal flooding and resulted in the highest recorded high tides since tide level data began being collected in 1921.

53. Located on the shore of Cape Cod Bay, Pilgrim is at the forefront of rising sea levels, extreme snow storms, and powerful hurricanes. The increased intensity of these climate change-related events, coupled with Pilgrim's unique close-proximity to the coast, places such potential environmental risks outside the scope of the 2002 GEIS and the 2007 Site-Specific SEIS. Rising sea levels, increased intensity and frequency of major storms, and the attendant storm surges, pose unique, previously unanalyzed potential environmental consequences for Holtec's proposed decommissioning, site restoration, and spent fuel management activities. For example, the increased frequency of storm surges and their height could exacerbate existing non-radiological contamination on-site if not properly managed by causing the further dispersal of contaminants

[57] U.S. Global Change Research Program, *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment* 689 (Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart eds., U.S. GPO) (2018), https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf

into previously uncontaminated areas and increasing the likelihood through runoff of contaminant releases to Cape Cod Bay. These same events could cause significant, unaccounted for costs due to significant work delays and increased work necessitated by the need to manage on-site contamination during and after storm events.

54. Holtec's Revised PSDAR environmental analysis also fails to comply with 10 C.F.R. § 50.82(a)(4)(i) because it fails to address new and significant information regarding the reasonably foreseeable potential impacts of climate change and its significance to the potential for spent fuel pool fires or dry cask rupture. The generic environmental impact statement (GEIS) was published in 2002 and, in assessing offsite related accidents, only considered seismic events, aircraft crashes, tornados with high winds, and fuel related accidents, such as fuel drops and loss of water in spent nuclear fuel pools.[58] However, since 2002, Massachusetts, and the country as a whole, has experienced extreme, record-breaking weather-related effects of climate change. While NUREG-1437, Revision 1, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, June 2013, does acknowledge the significant impacts of climate change, it does not consider those impacts in the specific context of decommissioning and site restoration.

55. Holtec's Revised PSDAR environmental analysis also fails to comply with 10 C.F.R. § 50.82(a)(4)(i) because it fails to address new and significant information regarding the reasonably foreseeable potential impacts of the consequences of a mishap during the transfer of fuel to the spent fuel pool for cooling, transfer of spent fuel from the pool to dry casks, and the transfer of the dry casks to the ISFSI. Holtec, however, recently experienced a mishap at San Onofre during the transfer of dry casks to the dry cask storage area, *see infra* at 20-22. While a

[58] NUREG-0586, Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors (2002), available at: https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0586/.

catastrophic radiological event did not occur, it demonstrates that decommissioning accidents are certainly possible. If a decommissioning accident does occur at Pilgrim, a radiological event could result. For example, a 2013 NRC study found that a severe spent fuel pool accident could render an area *larger than the Commonwealth* uninhabitable for decades, displacing millions of people.[59] A 2006 Massachusetts study found that a major spent fuel pool fire at Pilgrim or Vermont Yankee Nuclear Power Station could cause $488 billion in damage and render hundreds of miles uninhabitable.[60] While dry casks are more stable than spent nuclear fuel pools, a hole with an equivalent diameter of 2.3 millimeters could release radioactive gases and particles, resulting in an inhalation dose of 6.3 millirem to an individual 900 meters downwind.[61] Thus, the possible likelihood of a repeat decommissioning accident by Holtec, coupled with the likelihood of a resulting radiological event, places the proposed license transfer and amendment, and Revised PSDAR outside the scope of the GEIS and requires, at minimum, completion of an environmental assessment.

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[59] *Consequence Study of a Beyond Design-Basis Earthquake Affecting the Spent Fuel Pool for A U.S. Mark I Boiling Water Reactor*, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission 232 (Tbl. 62) & 162 (Tbl. 33) (October 2013) (ADAMS Accession No. ML13256A342).

[60] The 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 Plants Operating License and Petition for Backfit Order Requiring New Design features to Protect Against Spent Fuel Pool Accidents, Docket No. 50-293, May 26, 2006 includes a Report to The Massachusetts Attorney General On The Potential Consequences Of A Spent Fuel Pool Fire At The Pilgrim Or Vermont Yankee Nuclear Plant, Jan Beyea, PhD., May 25, 2006 (NRC RC Electronic Hearing Docket, Pilgrim 50-293-LR), 2—6 pleadings, MAAGO 05/26 (ML061640065) & Beyea (ML061640329).

[61] Dr. Gordon R. Thompson *Environmental Impacts of storing Spent Nuclear Fuel and High-Level Waste from Commercial Nuclear Reactors: A Critique of NRC's Waste Confidence Decision and Environmental Impact Determination* (Cambridge, Massachusetts: Institute for Resource and Security Studies, February 2009).

56. Holtec's PSDAR environmental analysis also does not comply with 10 C.F.R. § 50.82(a)(4)(i) because it fails to address new and significant information regarding the reasonably foreseeable potential impacts of the consequences of the very real possibility of a shortfall in the Trust Fund before the site is radiologically decontaminated and restored. If that occurs, it would place public health, safety, and the environment at risk, and would likely have significant health, safety, environmental, and economic effects, none of which have been analyzed by the NRC. And the possibility of a shortfall in the Pilgrim Decommissioning Fund is likely, considering the potential unknown scenarios listed above and supported by the attached affidavits. NEPA requires an analysis of environmental impacts in the event of a shortfall in the Decommissioning Fund.

57. The NRC has not complied with NEPA or applicable NRC regulations because, to date, it has not done any environmental analysis of the proposed transfer and license amendment. The NRC has not analyzed the potential environmental impacts of the reasonably foreseeable possibility of a shortfall in the Decommissioning Fund. The NRC has not considered cumulative impacts resulting from the non-decommissioning expenses that Applicants propose to withdraw from the Decommissioning Fund. Nor has the NRC evaluated reasonable alternatives, such as imposing license conditions requiring additional financial assurance. At a minimum, if the NRC is going to allow the Applicants to engage in activities with environmental impacts without it first issuing a detailed environmental impact statement, the NRC must undertake an environmental analysis. 40 C.F.R. § 1501.4; *id.* § 1508.14.

58. NEPA requires an environmental impact statement, with a full list and analysis of alternatives, before the NRC can approve the proposed license transfer and amendment and the significant shift in decommissioning methods that Holtec proposes in the Revised PSDAR. An

environmental impact statement will "insure[] the integrity of the agency process by forcing it to face those stubborn, difficult-to-answer objections without ignoring them or sweeping them under the rug" and will enable " the public [to] weigh [the] project's benefits against its environmental costs."[62] NEPA's procedures serve a "vital purpose" that "can be achieved only if the prescribed procedures are faithfully followed."[63]

CONCLUSION

The Commonwealth and its citizens have a direct and ongoing interest in all aspects of the decommissioning, spent fuel management, and site restoration of Pilgrim. While operations will cease on June 1, 2019, the Commonwealth will continue to be burdened by the legacy of the plant and spent nuclear fuel stored onsite for many decades, perhaps even centuries, to come. Until the spent nuclear fuel is removed, full site restoration will not occur. And unforeseen site complications can lead to cost overruns and long-term, yet unknown health, safety and environmental effects if not properly managed. As the host of this nuclear power plant, the Commonwealth and its citizens have ongoing financial health, safety, and environmental concerns.

Both of the Commonwealth's contentions meet the requirements of 10 C.F.R. § 2.309(f) and are therefore admissible. Each contention identifies specific regulatory requirements for which Applicants have failed to present sufficient evidence of compliance. The Commonwealth has briefly explained the basis, with supporting facts and proposed expert opinions, for each contention. The Commonwealth has further demonstrated that these matters are within the scope

[62] *Hoffman*, 132 F.3d at 12 (citing *Sierra Club v. United States Army Corps of Eng'rs*, 772 F.2d 1043, 1049 (2d Cir. 1985)).

[63] *Lathan v. Brinegar*, 506 F.2d 677, 693 (9th Cir. 1974).

of the proceeding and material to the findings the NRC must make to support the proposed license transfer and amendment.

For these reasons, the Board should grant this petition to intervene and the Commonwealth's associated hearing request.

Respectfully submitted,

COMMONWEALTH OF MASSACHUSETTS

By their attorneys,

MAURA HEALEY
ATTORNEY GENERAL

Signed (electronically) by
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Dated: February 20, 2019

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of	)	
ENTERGY NUCLEAR OPERATIONS, INC., ENTERGY NUCLEAR GENERATION COMPANY, AND HOLTEC DECOMMISSIONING INTERNATIONAL, LLC; CONSIDERATION OF APPROVAL OF TRANSFER OF LICENSE AND CONFORMING AMENDMENT	)	Docket Nos. 50-293 & 72-1044
(Pilgrim Nuclear Power Station)	)	

CERTIFICATION OF SERVICE

Pursuant to 10 C.F.R. § 2.305, I certify that copies of the Commonwealth of Massachusetts's Petition for Leave to Intervene and Hearing Request and the Five attached Declarations have been served upon the Electronic Information Exchange, the NRC's e-filing system, in the above-captioned proceeding this 20th day of February 2019.

Signed (electronically) by
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Dated: February 20, 2019

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of	)	
ENTERGY NUCLEAR OPERATIONS, INC., ENTERGY NUCLEAR GENERATION COMPANY, AND HOLTEC DECOMMISSIONING INTERNATIONAL, LLC; CONSIDERATION OF APPROVAL OF TRANSFER OF LICENSE AND CONFORMING AMENDMENT	)	Docket Nos. 50-293 & 72-1044
(Pilgrim Nuclear Power Station)	)	

DECLARATION OF WARREN K. BREWER

I, Warren K. Brewer, declare and state as follows:

1. I am an Executive Consultant for Four Points Group, Incorporated, an engineering consulting firm providing services related to the nuclear industry, including decommissioning cost estimating and planning, and cost analysis with respect to spent fuel management and disposition. I have over 40 years of experience in the nuclear industry and have been involved in decommissioning cost estimating and planning since 1989. I submit this declaration in support of the Commonwealth of Massachusetts' petition for leave to intervene and hearing request in this matter.

2. I have a B.S. in electrical engineering from Louisiana Tech University and an M.S. in nuclear engineering from the Massachusetts Institute of Technology. I completed a graduate-level course of study in areas related to nuclear power and power plant design at the Bettis Reactor Engineering School. After obtaining my Master's degree, I worked for 10 years at the Division of Naval Reactors, the joint United States Department of Defense and Department of

Energy organization responsible for all aspects of design, construction, maintenance, and operation of nuclear reactors in U.S. Navy ships and training facilities. I left the Division of Naval Reactors in 1986 and accepted a position with Pickard, Lowe and Garrick, a nuclear industry engineering consulting company. In late 1986, two colleagues and I formed ABZ. I now work with both ABZ, Inc. and Four Points Group. I have previously provided expert witness testimony related to engineering and the nuclear industry before state regulatory bodies, the United States Tax Court, the United States Court of Federal Claims (numerous cases), and in an international arbitration proceeding. Additional information about my background and experience is included in my curriculum vitae, which I have attached to this declaration.

3. I have reviewed filings related to the transfer of the Pilgrim Nuclear Power Station (PNPS) from Entergy to Holtec, including the application to transfer, among other things, PNPS's Renewed Facility Operating License to Holtec and the Revised Post-Shutdown Decommissioning Activities Report (PSDAR) and Preliminary Decommissioning Cost Estimate (DCE) submitted by Holtec to the Nuclear Regulatory Commission (NRC) on November 16, 2018.[1]

4. My testimony below is based on my experience in this field, and on information that is currently publicly available.

5. Based on publicly available information, the transfer of PNPS to Holtec and Holtec's request for an exemption to use PNPS's decommissioning trust fund for site restoration and spent fuel management costs, if approved, could lead to a shortfall in the amount of funding available to fully and safely decommission and radiologically decontaminate PNPS, restore the site, and

[1] Throughout this affidavit, I use the term Entergy to identify any of the Entergy entities, including Entergy, Entergy Nuclear Operations, Inc., and Entergy Nuclear Generating Company. Similarly, I use the term Holtec to refer to any of the Holtec entities, including Holtec, Holtec Decommissioning International, LLC (HDI), Holtec Pilgrim, and NamCo.

manage PNPS's spent nuclear fuel onsite. Any such shortfall could place public health, safety, and the environment at risk. Such a shortfall would also contradict Entergy's position that Holtec is financially qualified to hold the PNPS license because the decommissioning trust fund is sufficient to pay for license termination, site restoration, and spent fuel management costs. Holtec's Site-Specific Cost Estimate does not allow for virtually any cost-overrun since it projects that only $3.615 million will remain in the fund by the year 2063. There has been no showing that the Holtec subsidiary that will be the PNPS licensee if the requested license transfer is allowed has the financial capability to handle any shortfall in decommissioning, site restoration, or spent fuel management funding. Without limitation to other statements I could attest to and affirm, I specifically attest to and affirm the following as support for this statement:

6. The amount of publicly available information is limited. This, in itself, raises a significant concern that, if approved, the transfer of PNPS to Holtec could lead to a shortfall in the funding available to fully and safely decommission and radiologically decontaminate PNPS, restore the site, and manage its spent nuclear fuel. Absent funding from some other unidentified source, this could leave PNPS in a state that puts public health, safety, and the environment at risk.

7. As explained in detail below, there are at least seven (7) ways Holtec could experience significant, unaccounted for, cost overruns that could lead to a shortfall in funding and place public health, safety, and the environment at risk:

(a) Delays in the work schedule leading to increased costs for overhead and project management;

(b) Unidentified State requirements or unanticipated site conditions could require greater expenditures for site restoration work, thus decreasing the amount of funds

available for the completion of license termination work. This is true because the Holtec plan includes spending funds on site restoration activities prior to the completion of license termination activities. Further, the Holtec plan results in a balance of less than $4 million at the end of decommissioning even without unanticipated work scope changes or discovery that compliance with Massachusetts regulatory requirements result in needed actions beyond those assumed by Holtec in its cost estimate;

(c) The discovery of previously unknown radiological or non-radiological contamination;

(d) A radiological incident at the site (for instance, during the transfer of spent nuclear fuel into dry casks);

(e) Absent a change to the Standard Contract, Holtec will have to repackage spent nuclear fuel into new, DOE approved containers prior to transportation to an off-site storage facility or repository;

(f) A successful effort by DOE to recover all or some of the costs for the packaging of spent nuclear fuel into dry casks if DOE removes the spent fuel without prior-repackaging; or

(g) Holtec's obligation to maintain spent nuclear fuel onsite and to repackage the spent fuel one or more times as well as perform other NRC required maintenance activities if DOE fails to remove all spent nuclear fuel by 2062, as Holtec assumes in its Cost Estimate.

8. *Delays in the work schedule leading to increased costs for overhead and project management.* The Holtec cost estimate includes a 17% contingency allowance. As a general practice, decommissioning cost estimates, including the Entergy estimate for PNPS, include

contingency only for the types of routine events that are expected to happen in any project but cannot be attributed in advance to those events such as equipment failures or weather. As such, the contingency in the Entergy cost estimate is not intended to account for changes in scope from discrete events or project uncertainties in scope or regulations. Entergy defines these other risks under the broad label of financial risk and no allowance is included in the Entergy estimate for such risks. By way of contrast, the 17% contingency allowance included in the Holtec cost estimate is described as accounting for the traditional contingency as well as increased costs for discrete events and project uncertainties including changes in scope. Although the contingency included in the Holtec estimate is claimed to account for uncertainties and risks beyond the contingency allowance in the Entergy estimate, the total license termination costs for both estimates are essentially equal when the costs for SAFSTOR in the Entergy estimate are excluded.

9. The presently available information in Holtec's analysis does not quantify the amount included in the Holtec estimate to account for the types of risk not addressed in the Entergy estimate. Additionally, the presently available information in Holtec's analysis does not provide any basis or explanation for how the estimated cost does not increase from that of Entergy when allowance for other types of risk are included in the Holtec estimate. Further, the presently available information in Holtec's analysis does not provide detail on how the risk analysis was performed or how the confidence level was calculated. For example, unlike Entergy's PSDAR, Holtec's revised PSDAR does not describe how the 17% contingency allowance was applied in the cost estimate (e.g., whether it was applied to some or all of the line items or to the total cost estimate) or why the same 17% allowance was deemed reasonable across all activities to which it was applied (assuming it was applied to specific line-items, something again that cannot be

ascertained from Holtec's analysis). As such, the reasonableness of Holtec's analysis cannot be assessed. The analysis purported to have been performed by Holtec to arrive at the contingency amount would need to include costs for indirect work delays and added overhead costs. That is, if a specific activity takes longer than anticipated, then, even without any added direct costs for that activity, the overall decommissioning schedule would likely be delayed. Such delay would lead to increased, currently unaccounted for, costs for overhead and project staffing and management. These costs could be significant. For instance, at the Humboldt Bay facility, a 2006 TLG Report estimated the staff costs for that project at $107.6 million in 2010 dollars. After the start of the project, the estimate for expected staff costs was increased to $168 million in 2010 dollars. A post-project-start cost increase of even half of this amount at PNPS would increase Holtec's costs well beyond the $3.615 million its site-specific cost estimate indicates will remain in the trust fund when Holtec estimates PNPS's operating and Independent Spent Fuel Storage Installation (ISFSI) licenses will be terminated and the site released. Finally, the presently available information in Holtec's analysis does not explain the basis for Holtec's decision to use an 85% confidence level or the cost-impact of basing the estimate on a higher confidence level.

10. *State-law requirements for site restoration decreasing the amount of funds available to pay for radiological decontamination.* Holtec's plan for decommissioning includes expenditures of funds for site restoration prior to the completion of license termination and thus, site restoration activities will be performed somewhat in parallel with radiological decontamination. Massachusetts site restoration requirements resulting in higher than estimated costs, could result in a shortfall of funds for radiological decontamination. Further, state-law requirements for site restoration may impact the duration or scheduling of license termination

activities given that site restoration activities are planned to be performed prior to completion of radiological decontamination. As a result, there could be increased costs for overhead and staffing. These increased costs could be in excess of the unspecified allowance Holtec states was included to satisfy an 85% confidence level. Holtec's site-specific cost estimate does not quantitatively identify any allowance to account for these costs or how it would cover cost increases consistent with risks outside the 85% confidence level.

11. *The discovery of previously unknown radiological or non-radiological contamination*. According to Holtec's PSDAR, Holtec plans to perform site characterization activities during decommissioning to identify, categorize, and quantify radiological and non-radiological contamination. Since such physical characterization has not yet been performed, including an assessment of the horizontal and vertical extent of all radiological and non-radiological contamination, the estimated cost for decommissioning and restoring PNPS is based on assumptions informed only by historical information. The actual levels and extent of contamination could be greater than assumed. Holtec appears to understand this uncertainty, as the PSDAR states that Holtec's characterization efforts will continue during decommissioning to ensure that decommissioning activities are adjusted as needed. If unknown radiological or non-radiological contamination is discovered, it could significantly increase the cost of decommissioning, including staffing, overhead, and waste disposal. These increased costs could be in excess of unspecified allowance Holtec states was included to satisfy an 85% confidence level. Holtec's site-specific cost estimate does not quantitatively identify specific allowances to account for these costs or how it will cover cost increases consistent with risks outside the 85% confidence level.

12. *A radiological incident at the site (for instance, during the transfer of spent nuclear fuel into dry casks).* Although the likelihood of a radiological incident decreases once fuel is removed from the reactor, there is still a risk of such an incident even at a decommissioning nuclear power plant. For instance, there is a risk of an incident during the transfer of spent fuel to the spent fuel pool and then from the spent fuel pool to dry casks. If such an incident were to occur, it would increase the costs of decommissioning and depending on the extent of such an incident it could greatly increase the costs of decommissioning. The effect on cost would be both direct and indirect by causing substantial delay in the decommissioning efforts. Although there was no radiological consequence, in August 2018 there was an incident at the Southern California Edison (SCE) San Onofre facility during the transfer of spent fuel to dry storage, which was being managed by Holtec. This incident involved a situation where a loaded spent fuel canister was nearly dropped. SCE has spent considerable time and resources evaluating this incident and taking actions to ensure that the transfer of spent fuel to dry storage can be completed safely. The San Onofre incident has yet to be fully resolved such that transfer of fuel to dry storage may be resumed. In addition, during such a similar delay, there will be delay costs for the fuel transfer personnel as well as added overhead and project management costs. It is not clear from presently available information if Holtec accounts for these risks or the costs associated with a substantial incident.

13. *Absent a change to the Standard Contract, Holtec will have to repackage spent nuclear fuel into new, DOE approved containers prior to transportation to an off-site storage facility or repository*. Holtec's cost estimate assumes that DOE will accept the canisters in the planned 61 dry casks at PNPS as packaged for dry storage, and not require repackaging for transportation. Entergy (and many other licensees) have argued in testimony and briefs before

the U.S. Court of Claims and the U.S. Court of Appeals for the Federal Circuit that DOE has the authority to mandate licensees to repackage spent fuel into DOE-approved transportation casks.[2] If Entergy is correct and DOE were to mandate fuel repacking, this could cause Holtec to incur significant unaccounted-for expenses. The cost overrun for repackaging would be exacerbated by the fact that this would occur after the PNPS spent fuel pool had been dismantled. Without a spent fuel pool onsite, repackaging spent fuel might involve first transporting the fuel to another plant site, or building an onsite Dry Transfer Station (none of which currently exist in the United States). This could lead to cost overruns on the order of hundreds of millions of dollars as indicated by the Government Accountability Office estimate of $150 to $450 million for construction of a fuel transfer station.[3] There is no indication in Holtec's currently available documentation that indicates that Holtec's site-specific cost estimate accounts for these potential costs.

14. *A successful effort by DOE to recover all or some of its past payments for the packaging of spent nuclear fuel into dry casks if DOE removes the spent fuel without prior-repackaging*. Even if DOE accepts the spent nuclear fuel for transportation without repackaging, DOE may then pursue recovery from Holtec for some or all past payments that DOE made for the original packaging of PNPS dry casks. Entergy has recovered those costs to date on the theory that DOE has as of yet been unwilling to agree to acceptance of the fuel without repackaging. If DOE pursues such recovery and is successful, this could lead to significant unaccounted for costs. To date, Entergy has recovered about $6 million dollars for complete

[2] *E.g., System Fuels, Inc. v. United States*, 818 F.3d 1302, 1306-07 (Fed. Cir. 2016).

[3] U.S. GOVERNMENT ACCOUNTABILITY OFFICE, GAO-10-48, NUCLEAR WASTE MANAGEMENT: KEY ATTRIBUTES, CHALLENGES, AND COSTS FOR THE YUCCA MOUNTAIN REPOSITORY AND TWO POTENTIAL ALTERNATIVES 55 (Nov. 2009), https://www.gao.gov/assets/300/298028.pdf.

loading of three casks and initial work on loading of five more casks at PNPS. Entergy or Holtec, if the NRC approves the application, will have to load over 60 casks to accommodate all of the spent fuel at PNPS. It is unclear from Holtec's presently available information if Holtec has included any type of risk allowance to account for such cost overrun or how it otherwise would compensate for the substantial cost increase from such a recovery by DOE.

15. *Holtec's obligation to maintain spent nuclear fuel onsite and to repackage the spent fuel one or more times as well as perform other NRC required maintenance activities if DOE fails to remove all spent nuclear fuel by 2062, as Holtec assumes in its Cost Estimate.* There is no certainty in the Holtec assumption that DOE will have removed all spent nuclear fuel from PNPS by 2062 since DOE has not yet started accepting spent fuel and the latest estimated DOE start date is still more than a decade in the future and DOE's ability to meet that estimated start date depends on preliminary actions that DOE does not control. If DOE fails to pick up all of the spent fuel by the end of 2062 (as Holtec assumes), then Holtec will begin incurring significant and ongoing cost overruns for spent fuel management. Generally speaking, these annual costs would be the approximately $7 million per year that Holtec identifies for spent fuel management costs in the years 2025 through 2062 assuming those costs are accurate. In my experience, licensees have often underestimated their annual expenditures for spent fuel management. Such costs could go on for many decades if not indefinitely. This raises a significant risk of much greater cost overruns, on the order of hundreds of millions of dollars. The NRC's Continued Storage Rule (NUREG-2157), referenced in Holtec's PSDAR but then essentially ignored, explicitly recognizes that spent fuel may be stored indefinitely at each reactor site. In that indefinite storage scenario, the NRC assumes that each reactor operator will need a Dry Fuel Transfer Station to move spent fuel into new dry casks every 100 years. This is because, at sites

like PNPS, there would no longer be a spent fuel pool to effectuate the repackaging once the fuel is moved to dry storage, and the plant is decommissioned. The Holtec PSDAR and DCE do not presently account for how Holtec would address the very possible contingency of indefinite onsite storage, including all safety and environmental concerns regarding transferring fuel into new dry casks every 100 years. The PSDAR also does not identify any funding source for:

(a) Construction of a Dry Fuel Transfer Station;

(b) Purchase of 61 new casks and all the labor and material costs for transferring the fuel every 100 years; and

(c) Costs of maintaining security at the site indefinitely. These currently unaccounted for costs, could easily run hundreds of millions of dollars.

16. Each of the cost overruns listed above could lead to a significant shortfall in PNPS's decommissioning trust fund. The shortfall could be even greater if more than one of the above cost overruns occurs, or if Holtec encounters other cost overruns not listed above. The only source of funding for decommissioning (radiological decontamination, spent fuel management and site restoration) identified by Holtec is PNPS's nuclear decommissioning trust fund. Because of this and the fact that the three categories of activities will be performed, at least in part, in parallel, a cost overrun or delay in any of these three categories has the potential to jeopardize funding for the other areas.

17. I, Warren K. Brewer, have read the above statement consisting of 11 pages, and I certify under penalty of perjury that the foregoing is true and correct. Executed on February 18, 2019.

Warren K. Brewer

WARREN K. BREWER
Executive Consultant
Four Points Group, Inc.

WARREN K. BREWER

EDUCATION

Bettis Reactor Engineering School, 1976

M.S., Nuclear Engineering, Massachusetts Institute of Technology, 1976

B.S., Electrical Engineering, Louisiana Tech University, 1974

EXPERIENCE

1986 - Present - ABZ, Incorporated and Four Points Group, Incorporated starting 2017

Executive Consultant specializing in nuclear power plant operations, decommissioning cost estimating and planning and severe accident analysis. This experience has included work related to regulatory compliance, inservice inspection and testing (ISI/IST), configuration management, procedure and technical specification reviews and design basis documentation.

More specifically, the experience in these areas has included:

Provided engineering and management services as part of an integrated team to validate and update the Southern California Edison San Onofre nuclear plant design basis documentation.

Managed the development of advanced computer systems for assisting nuclear plant staff in compliance with regulatory requirements. These systems assisted in scheduling of NRC required plant condition dependent surveillance testing, collecting and evaluating test data, managing of system operability information and plant license limiting conditions for operation, compliance with nuclear plant operator scheduling and overtime regulations, and compliance with NRC event reportability regulations. The surveillance test scheduling system was used by one utility for almost 20 years with no failures.

Developed methods for verification and validation of expert system computer codes based on industry guidelines and accepted criteria for conventional codes. Presented lecture to the NRC on methods of verification and validation as part of a lecture series on software quality assurance

Provided expert assistance to the programmers in developing a state-of-the-art desktop nuclear power plant simulator for training operators to learn and understand event-based Emergency Operating Procedures (EOPs).

Over 20 years experience in preparation and review of decommissioning plans and cost estimates. Participated in conferences and workshops on decommissioning costs and funding adequacy. Provided on-site monitoring of decommissioning activities.

Provided assistance concerning decommissioning costs, planning and progress as part of process to negotiate sale of a nuclear plant.

Conducted specific studies relative to projected costs of low-level waste disposal and spent fuel management providing the results to state agencies and companies in the nuclear industry.

Prepared reports for state regulators evaluating cost estimates for decommissioning, low-level waste disposal, and extended spent fuel storage. Provided training to state regulators on decommissioning technology and methodology of decommissioning cost estimating.

Developed methodology for evaluating costs for recovery from severe reactor accidents. This methodology has been used by the majority of the US nuclear industry, foreign utilities and nuclear insurers to advise them on potential losses and insurance recoveries as well as to assist risk managers in determining the coverage levels to obtain.

Performed evaluations of the liability claims that could arise from transportation of nuclear material. These evaluations included assessment of the technical conditions that might result from such events, the probability of such events, and all liability costs that might be incurred (cleanup, property damage, health effect, business interruption or losses, etc.).

Performed reviews of maintenance, operations, and quality assurance programs. Such reviews included comparison of the program elements with the regulations, evaluation of specific work packages and implementation of work in the field.

Provided DOE with expert assistance in evaluating the generic environmental impact statements for the New Production Reactor. This included verification and validation of offsite releases, environmental impacts, and the technical aspects of operation.

Managed and participated in the development of computer program for fluid flow analysis. The program is applicable to a wide range of facilities and industries. The program has been marketed world-wide since 1992 with an estimated 25,000 users.

Extensive experience in providing litigation support and expert witness services related to nuclear plant operation, decommissioning planning and costs, spent fuel management and general engineering. Expert testimony has been provided before the US Court of Federal Claims, US Tax Court, state regulatory agencies and arbitration tribunals.

This litigation support and expert witness experience has included:

Over 12 years experience in evaluation of claims resulting from the US Department of Energy's (DOE) breach of the contract with nuclear plant operators for the disposal of spent nuclear fuel. This has included evaluation of spent fuel storage options, dry storage facilities and cask designs, specific plant decisions, equipment, incurred costs and spent fuel transportation options. Prepared expert witness reports and provided expert testimony.

Provided rate case support in proceedings before state and federal regulators. Issues addressed included the adequacy of decommissioning cost estimates, as well as

prudence of operational actions, management effectiveness, technical soundness of operation, technical design basis and details, and regulatory compliance and adherence to industry standards. Work included testimony, as well as assisting in preparing data and information for testimony by others. Prepared reports for state regulators evaluating cost estimates for decommissioning, low-level waste disposal, and extended spent fuel storage. Provided training to state regulators on decommissioning technology and methodology of decommissioning cost estimating.

1986 - Pickard, Lowe and Garrick, Inc.

Consulting Engineer.

Conducted detailed review of technical specification surveillance test requirements for a nuclear power plant. This included detailed review of the implementing programs and procedures, and providing detailed comments for procedure revisions to ensure regulatory compliance.

Conducted detailed review of technical specification requirements, technical specification basis, regulatory background, industry practice, and implementing procedures at a nuclear power plant for required logic system functional testing and simulated automatic actuation testing of emergency core cooling systems and primary containment isolation.

Reviewed plant-specific probabilistic risk assessment (PRA). Along with general evaluation, provided assessment of operational considerations and/or lessons resulting from the PRA.

Participated in procedure review and upgrade project.

1982 - 1986 - United States Navy, Division of Naval Reactors

Head, Reactor Plant Systems - New Design Submarine.

Lead responsibility for reactor plant performance, safety, and quality.

Conducted various trade-off studies to establish overall design criteria for new design reactor and propulsion plant. This included evaluation of possible performance maintainability, survivability, constructability, and cost. Established general design characteristics for further development.

Evaluated various proposed core designs to determine optimum design to fit overall propulsion plant design goals. This included evaluation of thermal hydraulic performance, safety evaluation, normal plant response analysis, and reactor structural design assessment, including response under shock loading.

Reviewed and approved conceptual system designs, performance criteria, and detailed design bases. As design progressed, this included increasing levels of detail to system design descriptions, design calculations, component sizing, system schematics, and construction details.

Participated in design of major plant components to ensure structural soundness, compliance with overall design goals, and ability to interface with other systems and propulsion plant arrangement.

Reviewed and approved design of reactor plant structures, such as component foundations.

Reviewed and approved plant equipment and system arrangements.

Reviewed reactor and plant control system designs for compatibility with mechanical system designs and core performance and capabilities.

Reviewed and approved operating transient response predictions to be used in life-cycle evaluations of plant.

Developed life-cycle plant operating profile based on mission requirements and data from previous submarine classes.

Had lead responsibility for design initiatives to mitigate the consequences of complete loss of AC power and to ensure safety of surrounding population if this type event occurred near port.

Participated in extensive effort to reduce plant weight. Potential weight reduction concepts were each evaluated for its total effect on capability, constructability, life-cycle cost, and maintainability.

Participated in Naval Reactors crew quizzes for crews of operating submarines to test knowledge and ability of ship crew to safely and efficiently operate the propulsion plant. Responsibility was mainly for testing in the area of reactor plant mechanical system operation.

1980 - 1982 - United States Navy, Division of Naval Reactors

Head, Reactor Plant Systems - TRIDENT Submarines.

Supervised engineering group. Directed efforts concerning design, construction, operation, maintenance, testing, and configuration control of reactor plant fluid systems and structures for TRIDENT submarine. Similar duties in connection with land-based TRIDENT reactor plant prototype.

Responsible for shock design of shipboard reactor plant components and structures. Similarly, responsible for seismic design of structures, systems, and components unique to land-based prototype. Seismic design was done to the same criteria imposed on commercial nuclear power plants.

Developed IST/ISI program for land-based prototype conforming to ASME Code, Section XI. These programs were in compliance with the requirements imposed on commercial nuclear power plants.

Responsible for design, acceptance testing, operation and maintenance procedure for emergency core cooling system for the land-based prototype. This system was

designed to comply with NRC requirements imposed on commercial power plants for similar systems.

Responsible for preparation of reactor plant operating, maintenance, and test procedures.

Evaluated operation incidents and established corrective actions based on these evaluations.

Evaluated and resolved construction deviations from specified requirements.

Participated in examination of prototype operating crews to evaluate level of knowledge and capability to safely operate the reactor plant.

Responsible for design, construction, operation, and maintenance of support systems, such as process cooling water and associated cooling tower to support prototype operation.

1976 - 1980 - United States Navy, Division of Naval Reactors

Project Engineer, TRIDENT Class submarine propulsion plant design.

Coordinated government laboratory and shipyard work in all phases of design, construction, operation, testing, and maintenance of steam plant fluid systems for TRIDENT submarines and land-based TRIDENT submarine prototype.

Responsible for design of shipboard structures and piping systems in accordance with shock design criteria.

Responsible for preparation of verbatim compliance operating and maintenance procedures. This included performance of procedure verification and validation.

Responsible for design of safety systems unique to the land-based prototype, including compliance with NRC requirements for similar systems in commercial power plants.

Evaluated and resolved shipyard construction deviations for structures and systems.

Participated in the evaluation, analysis, and resolution of large-scale shipyard error resulting in unapproved material substitutions. This involved tracking and identifying where incorrect materials had been used, evaluating and testing the acceptability of the material as-built, and approving the as-built condition or specifying the required rework.

Testimony

State of New Hampshire Decommissioning Finance Committee hearing on the Seabrook Nuclear Power Plant decommissioning funding, 1994.

Mitsubishi Heavy Industries, Ltd (Japan) v. Finmeccanica S.p.A., Azienda Ansaldo (Italy), as successor in interest to Ansaldo S.p.A., International Court of Arbitration, Case Number 10269/OL/ESRT/TE, June 2001.

Tennessee Valley Authority v. United States of America, Case No. 01-249C, July 2005.

SFI Mississippi v. United States of America, Case No. 03-2624C, September 2006.

Boston Edison v. United States of America, Case No. 99-447C and 03-2626C, June 2007.

Wisconsin Electric v. United States of America, Case No. 00-697C, September 2007.

Dairyland Power Cooperative v. United States of America, Case No. 04-0106C, July 2008.

Entergy Corporation and Affiliated Subsidiary Companies v. Commissioner of Internal Revenue, Docket No. 10557-08, June 2008.

Consolidated Edison Company of New York, Inc. v. United States of America, Case No. 04-33C, June 2009.

Entergy Nuclear Indian Point 2, LLC v. United States of America, Case No. 03-2622C, June 2009.

Entergy Nuclear Generation Company v. United States of America, Case No. 03-2626C, September and October 2009.

Entergy Nuclear Vermont Yankee, LLC v. United States of America, Case No. 02-898C, March and April 2010.

Portland General Electric, the City of Eugene Oregon, and Pacificorp v. United States of America, Case No. 04-0009C, November 2011.

System Fuels, Inc. and Entergy Arkansas, Inc. v. United States, Case No. 03-2623C, October and November, 2012.

State of Vermont Public Service Board, Docket No. 7862, Petition for Amendment of Certificate of Public Good for Vermont Yankee Nuclear Power Station.

System Fuels, Inc. and Entergy Arkansas, Inc. v. United States, Case No. 12-389C, July 2014.

System Fuels Inc., System Energy Resources, Inc., and South Mississippi Electric Power Association v. United States, Case No. 11-511C, October 2014.

Entergy Gulf States, Inc. and Entergy Gulf States Louisiana, LLC. V. United States, Case No. 03-2625C, May 2015.

Entergy Nuclear FitzPatrick, LLC., Entergy Nuclear Indian Point 3, LLC., and Entergy Nuclear Operations, Inc. v. United States, Case No. 03-2627C, August 2015.

Entergy Nuclear Indian Point 2, LLC v. United States, Case No. 13-19C, April 2016.

Sacramento Utility District v. United States, Case No. 15-577C, October 2016.

State of Vermont Public Utilities Commission, Docket No. 8880, Joint Petition to Transfer Ownership of Entergy Nuclear Vermont Yankee, May 2018.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of	)	
ENTERGY NUCLEAR OPERATIONS, INC., ENTERGY NUCLEAR GENERATION COMPANY, AND HOLTEC DECOMMISSIONING INTERNATIONAL, LLC; CONSIDERATION OF APPROVAL OF TRANSFER OF LICENSE AND CONFORMING AMENDMENT	)	Docket Nos. 50-293 & 72-1044
(Pilgrim Nuclear Power Station)	)	

DECLARATION OF DAVID E. HOWLAND

I, David E. Howland, declare and state as follows:

1. I am classified as an Environmental Engineer IV and serve as the Regional Engineer in the Western Regional Office for the Massachusetts Department of Environmental Protection (MassDEP). I joined the Massachusetts Department of Water Pollution Control, a precursor to MassDEP, in 1974. Since that time, I have held positions and roles with progressively increasing responsibility in multiple program areas such as Water Pollution Control, Air Pollution Control, Solid Waste Management, Hazardous Waste Management, Waste Site Clean-up, Drinking Water, and Wetlands until I reached my current position in 2000. I hold a Masters of Public Health from the University of Massachusetts – Amherst and a Bachelor of Science Degree from St. Lawrence University. Additional details about my background and experience are included in my resume, which is attached to this declaration. I submit this declaration in support of the Commonwealth of Massachusetts' petition for leave to intervene and hearing request in this matter.

2. In my current position, I manage complex special projects for MassDEP such as the decommissioning of the Mt. Tom Coal Burning Power Station in Holyoke, Massachusetts (Mt. Tom). As the project lead for MassDEP, I drafted and helped negotiate an Administrative Consent Order (ACO) with Mt. Tom's owner that sets forth the Commonwealth's requirements for remediating soil contamination, closing coal ash disposal areas and demolishing structures. During the decommissioning process, I worked with MassDEP program staff and Mt. Tom's representatives to execute the ACO. This work draws on my extensive experience in environmental protection and hazardous material remediation and work-related training in such areas as asbestos abatement, wastewater treatment, drinking water protection, and risk assessment. My graduate education focused on environmental health and engineering, which provided me with foundations in ecology, chemistry, pollution control design, and policy development. I also managed or helped to manage the MassDEP oversight of the non-radiological decommissioning of the Yankee Nuclear Power Station in Rowe, Massachusetts (Yankee Rowe) between 2001 and 2007. This was the period of site assessment, remediation and demolition of Yankee Rowe. In that capacity, I supervised MassDEP employees in various environmental program areas such as groundwater contamination assessment, solid waste management, hazardous waste management, asbestos abatement, wetland protection and the Massachusetts Contingency Plan (MCP)—all programs that had regulatory authority over activities undertaken by Yankee Rowe to decommission the site. I also met with Yankee Rowe managers, engineers and scientists to review in detail decontamination plans and environmental permit requirements. I reviewed progress reports and visited the site regularly.

3. I have reviewed Entergy Nuclear Generation Company and Holtec International's application to transfer, among other things, Pilgrim Nuclear Power Station's (Pilgrim) Renewed

Facility Operating License to Holtec and Holtec's Revised Post-Shutdown Decommissioning Activities Report (Holtec PSDAR) and Revised Site-Specific Decommissioning Cost Estimate for Pilgrim (Cost Estimate). Based on my review of the application and Holtec's PSDAR and Cost Estimate, there exists a significant possibility that Pilgrim's Decommissioning Trust Fund does not, and will not, provide Holtec with sufficient funds to complete the work outlined in its PSDAR, including decommissioning and restoring the site, and also managing spent nuclear fuel onsite. As outlined more fully below, that conclusion is based on my experience with Yankee Rowe and the absence of a comprehensive site characterization (radiological surveys and a non-radiological assessment) for Pilgrim that would allow for the accurate and reliable cost estimate that is currently missing.

4. One of the most important lessons learned from the Yankee Rowe decommissioning process was the need and importance of a comprehensive (radiological and non-radiological) site characterization. A comprehensive site characterization is used to fully determine the scope of site contamination, the appropriate remediation method, and to estimate the cost to clean-up the site. Until a comprehensive site characterization is performed, radiation specialists, environmental engineers and other consultants simply cannot estimate with any reasonable certainty how much it will cost to perform all necessary work. At Yankee Rowe, for example, the licensee used the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), modified to incorporate non-radiological assessment, as guidance to characterize site contamination. The MARSSIM uses an iterative process to characterize the scope of contamination that is much like site characterization process outlined in the MCP, *see, e.g.*, 310 C.M.R. § 40.830 (2014). For this reason, it formed the basis for using the MCP to conduct a combined risk assessment (radiological and non-radiological) to ascertain both human health risk

and ecological risk at the site after decommissioning. The environmental standards in the MCP were utilized as a guide to determine the level of remediation needed to dismantle the facility and remediate site contamination.

5. The site characterization conducted at Yankee Rowe led to the discovery of previously unaccounted for contamination that caused costs to escalate significantly above and well beyond the original, pre-characterization cost-estimates. At Yankee Rowe, for example, the discovery of polychlorinated biphenyl (PCB) contaminated soils and structures and the discovery of a tritium release from the spent fuel pool dramatically increased actual cleanup costs. The PCB contamination by itself caused significant cost increases because it is extraordinarily expensive to recover and treat PCB contaminated soils and sediment. The discovery of PCB-coated steel and concrete building components also proved costly, because the PCBs had to be removed prior to recycling, reusing, or local landfill disposal of non-PCB contaminated materials. Remaining PCB contaminated waste had to be transported to a PCB licensed disposal facility. In addition, the discovery of the tritium release necessitated an extensive and costly hydrological assessment to accurately depict the plume. Without a thorough facility characterization of potentially impacted areas, these types of issues and the associated cost increases cannot be quantified and decommissioning and site restoration costs cannot be estimated with any reasonable certainty.

6. The Yankee Rowe decommissioning process also reinforces the fact that one cannot isolate the costs associated with radiological decontamination work from the costs associated with the remediation of non-radiological contamination. At Yankee Rowe, for example, the comprehensive site characterization discovered that facility structures at the site would contain both radiological and chemical contamination. Because of this discovery, Yankee Rowe had to

work with both state and federal regulatory authorities to select appropriate abatement and disposal options for the debris. It was also difficult to isolate the radiological wastes from the non-radiological wastes, which caused the incurrence of costs that could not be attributed solely to radiological or non-radiological decontamination efforts. Holtec's plan recognizes this fact, as it proposes to conduct both radiological and non-radiological work at the same time and over a short eight-year period. Based on my experience, I do not believe radiological decontamination can be conducted independently from hazardous materials decontamination. For this reason, it is not possible to evaluate whether Pilgrim's Decommissioning Trust Fund contains sufficient funds by looking only at radiological decontamination costs.

7. In this case, Holtec's PSDAR also does not reference any site-based empirical data to support the work plan or its cost projections. For this reason, MassDEP is unable to determine if Holtec can perform the non-radiological clean up and restoration work outlined generally in its PSDAR without significant cost overruns. For example, as outlined above, the presence of PCBs can result in significant cost increases due to the need to assess and remediate contaminated soil, groundwater, and dispose of structural components. Given Pilgrim's age, it is likely that Holtec will discover PCBs in coatings, caulk and oils throughout the plant once it performs a comprehensive site assessment. As with PCBs, asbestos abatement of mastics, mortar mixes, caulk, flooring, wall board, ceiling tiles, roofing and insulation will be a significant and costly environmental clean-up obligation. Other materials such as lead and halogenated degreasers like trichloroethylene can require extensive work to remediate and are likely to be found at Pilgrim given its age and the activities conducted at the site.

8. I, David E. Howland, have read the above statement consisting of 6 pages, and I certify under penalty of perjury that the foregoing is true and correct. Executed on February 19, 2019.

DAVID E. HOWLAND
Regional Engineer
Western Regional Office
Massachusetts Department of
Environmental Protection

David E. Howland

Address: 436 Dwight St. Springfield, Mass. 01103
Office: (413) 755 - 2280
E-mail: David.Howland@mass.gov

Professional Profile

As **Regional Engineer** (present) for the Massachusetts Department of Environmental Protection (DEP) - Western Regional Office in Springfield, Massachusetts I manage complex projects such as:

- Mt. Tom Power Station – decommissioning project under a MassDEP ACO
- Palmer Renewable Energy – licensing of wood fuel to energy project 35 MW
- NPDES Permit for PEDA/General Electric Co. – permit renewal for PCB contaminated flows
- June 2011 Tornado Response Team – disaster response action
- Yankee Nuclear Power Station in Rowe – decommissioning project under a MassDEP MOU
- Mormon Hollow Landfill – emergency response action to stabilize major slope failure,
- Clean Energy Results Program – initiative to encourage clean energy development

In addition, I serve on the Regional Enforcement Review Committee, the Coordinating Council of the Plan Progress Committee for the Pioneer Valley Planning Commission and the Independent Service Operators Environmental Advisory Committee.

Since joining the DEP I have worked in progressively more responsible roles from Field Engineer to Acting Regional Director. I have direct experience in water supply, water pollution control, hazardous and solid management, toxic use reduction, waste site clean up and air quality programs. I have a working knowledge of most environmental laws and regulations in the Commonwealth of Massachusetts.

As **Acting Deputy Regional Director** (1996 -2000) I supervised section chiefs (up to 6) and their reporting staff (up to 30) in the development of program plans, the issuance of permits and the initiation of enforcement actions. Major accomplishments include: the implementation of a multi-media inspection program for the industrial sector, the establishment of the watershed approach in regional water program decisions and the refinement of regional compliance and enforcement activities.

As **Acting Regional Director** (1993-1996) I directed all operational functions of the regional office. The regional office was staffed with 120 people at that time and responsible for enforcing the Commonwealth's environmental laws in 101 cities and towns. Major accomplishments included; the consolidation of programs into new office space with a local personal computer network system, the implementation of an enforcement review process, and the advancement of DEP affirmative action goals.

As **Air Quality Chief** (1980 -1988) I directed the Berkshire and Pioneer Valley Air Pollution Control Districts. The districts had a professional staff (up to 14) that enforced the State Implementation Plan of the Clean Air Act (CAA). Functions included the approval of new sources of air pollution, inspection of facilities for compliance CAA and the maintenance of an ambient air quality monitoring network.

As a **Water Pollution Control Engineer** I performed various duties such as stream sampling, water quality basin plans, POTW inspections and reviewed new industrial waste treatment permits.

Credentials and Professional Honors

- Massachusetts Registered Sanitation, Number 716 – 2019
- OSHA ACM Project Manager Certification (40 hr.) – 2015, (8 hr.) – 2019
- EPA Hazardous Waste Operations and Emergency Response (40 hr.) - 1993, (8 hr.) – 2019
- Manuel Carballo Governor's Award for Excellence in Public Service – 1993, 2012
- Legislative Citation for Service to DEP - 1996
- Performance Recognition – 1992 (W. Stockbridge Water Crisis), 1988 (Springfield Chemical Fire)

Education (highest level achieved)

- 1984 - University of Massachusetts, Masters Public Health (MPH), Amherst, Massachusetts

Papers

- Authored and presented a paper to the 77th APCA Annual Meeting entitled, "An Assessment of the Relative Source Impact of Residential Woodburning on the Ambient TSP Levels".

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of	)	
ENTERGY NUCLEAR OPERATIONS, INC., ENTERGY NUCLEAR GENERATION COMPANY, AND HOLTEC DECOMMISSIONING INTERNATIONAL, LLC; CONSIDERATION OF APPROVAL OF TRANSFER OF LICENSE AND CONFORMING AMENDMENT	)	Docket Nos. 50-293 & 72-1044
(Pilgrim Nuclear Power Station)	)	

DECLARATION OF PAUL W. LOCKE

I, Paul W. Locke, declare and state as follows:

1. I am the Assistant Commissioner of the Bureau of Waste Site Cleanup (BWSC) at the Massachusetts Department of Environmental Protection (MassDEP). I joined the agency in 1987, when it was known as the Massachusetts Department of Environmental Quality Engineering, as a human health and environmental risk assessor in the Office of Research and Standards (ORS). Before I became Assistant Commissioner in 2015, I was the Section Chief for Risk Analysis in ORS, Director of Policy & Program Development in BWSC, and Director of Response & Remediation in BWSC. I hold a Master of Science (MS) degree in Civil Engineering (Public Health Program) from Tufts University and a Bachelor of Arts (BA) in Chemistry from Harvard College. Additional details about my background and experience are included in my resume, which is attached to this declaration. I submit this declaration in support of the Commonwealth of Massachusetts' petition for leave to intervene and hearing request in this matter.

2. In my role at MassDEP, I have been involved in and supervised MassDEP employees who have been involved in the development, promulgation, and implementation of Massachusetts' regulations, known as the Massachusetts Contingency Plan (MCP), that govern the assessment, cleanup and closure of oil and hazardous material disposal sites (310 C.M.R. §§ 40.0000 *et seq.*). The Massachusetts Oil and Hazardous Material Release Prevention and Response Act, Mass. Gen. L. c. 21E, §§ 1-22 (Chapter 21E) authorizes MassDEP to issue the MCP. In this capacity, I have been involved in and supervised Department staff involved in the assessment and cleanup of numerous large and complex disposal sites subject to the MCP, including sites that are subject to multiple regulatory authorities, such as Federal Superfund sites, Resource Conservation and Recovery Act (RCRA) Corrective Action sites, and U.S. Department of Defense sites, and have included multiple sources of contamination, multiple contaminated media (such as soil, groundwater, surface water, sediment and indoor air), and multiple contaminants (such as oil, polychlorinated biphenyls (PCBs), metals, chlorinated solvents, and radioactive waste). These sites include manufacturing facilities, military bases, power plants, laboratories, and oil terminals. The requirement to assess and cleanup a facility under Chapter 21E and the MCP can arise while a facility is in operation, during decommissioning or after a facility has been abandoned.

3. The MCP specifies the requirements for site notification, assessment (similar to a site characterization in the nuclear power plant decommissioning context), cleanup (if necessary), and site closure. These requirements are applicable to any release of oil or hazardous material. For sites that are considered "Adequately Regulated" pursuant to 310 C.M.R. § 40.0110, the MCP requirements are narrowed to minimize duplicative regulation while maintaining consistent substantive results. There are no "Adequately Regulated" provisions in the MCP for

decommissioning activities under Nuclear Regulatory Commission oversight, therefore the Pilgrim Nuclear Power Plant (Pilgrim) does not qualify under this provision as Adequately Regulated. Specific categories of "Adequately Regulated" sites are listed in the MCP and currently include federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and RCRA sites, state regulated hazardous waste and solid waste landfill facilities, and spills addressed by the U.S. Coast Guard. Both Chapter 21E and the MCP, which, again, Chapter 21E authorizes MassDEP to issue, define the term "hazardous material" broadly to include "any material, in whatever form, which, because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment." Mass. Gen. Laws c. 21E, § 2, 310 C.M.R. § 40.0006 (definitions). MassDEP has identified radioactive constituents as Contaminants of Concern, i.e., hazardous material, at several disposal sites addressed through the MCP.

4. The MCP allows for the site assessment and cleanup process to match the level of complexity of the contamination found at the site: simple releases can be addressed quickly with minimal cost and, conversely, multiple releases over several years with widespread or unknown contaminant levels can take years and the expenditure of large sums of money to address. To account for site differences, the MCP establishes a phased, seven step approach that is designed to begin and end in six years (a deadline that can be extended upon request), but that allows the responsible party to "close" the site at any point during that process if it can demonstrate that the site poses "No Significant Risk" of harm to health, safety, public welfare or the environment during any foreseeable period of time.

5. At a high level, the seven steps are: (i) notification to MassDEP of any release of oil or hazardous material that meet specified criteria, 310 C.M.R. § 40.0300; (ii) a Phase 1 Initial Site Investigation Report within 1 year of notification, which includes, among other things, site and release history and the nature and extent of the contamination, 310 C.M.R. § 40.0480; (iii) a Phase 2 Comprehensive Site Investigation if the Phase I Investigation does not allow the responsible party to close the site, which includes a comprehensive assessment of the nature and vertical and horizontal extent of contamination and risk characterization, 310 C.M.R. §§ 40.0800 and 40.0900; (iv) an evaluation in Phase 3 of remedial alternatives and the selection of a comprehensive remedial action if a site cannot be closed after Phase 2, 310 C.M.R. § 40.0850; (v) the design, construction, and implementation in Phase 4 of the selected comprehensive remedial action and development of the remedial action plan, 310 C.M.R. § 40.0870; (vi) operation, maintenance, and monitoring in Phase 5 of the selected comprehensive remedial action, 310 C.M.R. § 40.0890; and (vii) site closure when the responsible party can show that they have achieved either a Permanent Solution (i.e., a condition of No Significant Risk exists at the site) or a Temporary Solution (i.e., requires ongoing obligations until a Permanent Solution is achieved), 310 C.M.R. § 40.1000.

6. Pilgrim is located on Cape Cod Bay, adjacent to wetlands, and sits above a Potentially Productive Aquifer. A Potentially Productive Aquifer is an aquifer delineated by the U.S. Geological Survey (USGS) as a high or medium yield aquifer (310 C.M.R. § 40.0006) and such aquifers are protected for their potential future use as a public water supply source (310 C.M.R. § 40.0932). Any oil or hazardous material released to the environment at Pilgrim has the potential to affect both human and environmental receptors through direct contact with contaminated soil, use of the groundwater, and migration to adjacent surface waters and wetland

resources. Based on my experience at MassDEP, large industrial facilities, including power plants like Pilgrim, use a variety of oil and hazardous material as part of their operations and facilities. These include asbestos, transformer oils (including PCB-containing oils), and cleaning and/or degreasing solvents (including chlorinated volatile organic compounds, or cVOCs). Methods for handling, storing and disposing of oil and hazardous materials have evolved over time, and it is not uncommon for older facilities like Pilgrim to have released oil and hazardous materials to the environment following common past practices. The potential impact of any such release is unknown until a comprehensive site assessment is conducted. Both Chapter 21E and the MCP define a "site" to be the location where oil or hazardous material has come to be located. A comprehensive site assessment includes the identification of releases of oil or hazardous material on a property and delineation of the extent of those release – including the investigation of off-property migration that may have occurred.

7. I have reviewed the November 16, 2018 Revised Post-Shutdown Decommissioning Activities Report and DECON Site-Specific Decommissioning Cost Estimate prepared by Comprehensive Decommissioning International, LLC for Holtec Decommissioning International, LLC (HDI). The Revised Post-Shutdown Decommissioning Report notes that Holtec will perform site characterization activities during the decommissioning process to supplement what is currently known about the nature and extent of radiological and non-radiological contamination at the site. Holtec will then use that information to establish contamination levels throughout the plant and adjust activities accordingly. On its face, the Report is, in my opinion, deficient because it (i) does not include an inventory of oil and hazardous materials that have been used at the facility and which may have been released to the surrounding environment and (ii) does not describe assessment activities that would occur

outside the plant that would identify past releases of oil or hazardous materials and any contaminated media that Holtec legally needs to address.

8. I have also reviewed the release notifications and site cleanup activities that have occurred at Pilgrim pursuant to the MCP. As noted above, both Chapter 21E and the MCP require a site owner or operator to notify MassDEP when a release of hazardous material occurs that meets certain specified criteria. MassDEP's records indicate that work was conducted under fourteen (14) distinct Release Tracking Numbers (RTNs) for release notifications that occurred from November 16, 1994 through December 20, 2016. An RTN is the unique file number assigned by MassDEP to a release or threat of release reported in accordance with 310 C.M.R. § 40.0300. The following briefly summarizes those RTNs:

(a) Nine (9) RTNs were assigned for releases of hydrogen gas, and no analysis of impacts to groundwater or soil was performed.

(b) One (1) RTN addressed a release of hydraulic oil to pavement, and no analysis of impacts to groundwater or soil was performed.

(c) One (1) RTN addressed a heating fuel release at a former residential property distant from the facility itself and was not related to plant operation.

(d) One (1) RTN addressed an exothermic reaction of an epoxy/hardener mixture that occurred within a 55-gallon drum and liner, and no analysis of impacts to groundwater or soil was performed.

(e) Two (2) RTNs addressed releases of transformer oil at the Main Transformer system, which included soil and groundwater characterization in the immediate vicinity of the releases.

As noted, eleven (11) of the releases required no investigation of underlying soil or groundwater. The remaining three (3) releases involved limited (localized) soil and groundwater sampling. The results of these investigations provide little insight as to any potential environmental contamination that may be present throughout the site.

9. Based upon my review of this material and my experience at MassDEP, it is my opinion that Holtec has not adequately evaluated and included in its cost estimate the costs of environmental site assessment, remediation, and restoration and that it is likely that Holtec's cost estimate significantly underestimates what it will actual cost to perform that work. My opinion is also informed by the following facts:

(a) Past environmental site assessments conducted for releases of oil and hazardous material at Pilgrim have been limited in nature and are not indicative of potential contamination present.

(b) The Revised Post-Shutdown Decommissioning Activities Report does not specifically address any environmental assessment of the site soil, groundwater, wetlands and surface water resources that would be implemented as part of the decommissioning.

(c) The costs of environmental remediation and site restoration depend upon the nature and extent of contamination and, ultimately, the risk posed to potentially affected human and environmental receptors. These costs are best estimated following a comprehensive site assessment. The cost estimates for the work at the Pilgrim plant appear to be based on expectations rather than even a Preliminary (Phase 1) Site Assessment that is required under the MCP.

10. I, Paul W. Locke, have read the above statement consisting of 8 pages, and I certify under penalty of perjury that the foregoing is true and correct. Executed on February 19, 2019.

PAUL W. LOCKE
Assistant Commissioner of the Bureau of Waste Site Cleanup
Massachusetts Department of Environmental Protection

8 of 8

PAUL W. LOCKE

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Paul@Locke.net

EDUCATION

MS in Civil Engineering/Program in Public Health — 1987
Tufts University, Medford, MA

AB in Chemistry — 1982
Harvard College, Cambridge, MA

EMPLOYMENT HISTORY

2015-present 2011 (Acting)	Assistant Commissioner **Bureau of Waste Site Cleanup** **Massachusetts Department of Environmental Protection (MassDEP)**
2006-2015	Division Director – Response & Remediation **Bureau of Waste Site Cleanup** **Massachusetts Department of Environmental Protection (MassDEP)**
2004-2006	Acting **Division** Director – Policy & Program Development **Bureau of Waste Site Cleanup** **Massachusetts Department of Environmental Protection (MassDEP)**
2003-2004	Acting **Deputy** Division Director Policy & Program Development **Bureau of Waste Site Cleanup** **Massachusetts Department of Environmental Protection (MassDEP)**
1992-2002	Chief, Risk Analysis Group **Office of Research and Standards** **Massachusetts Department of Environmental Protection (MassDEP)**
1987-1992	Environmental Analyst (Human Health Risk Assessment) **Office of Research and Standards** **Massachusetts Department of Environmental Protection (MassDEP)**
1985-1987	Darkroom Technician (weekend supervisor) **Ferranti-Dege, Inc., Cambridge MA**
1985-1986, 1980-1983	Blood Transfusion Laboratory Technician **Massachusetts General Hospital, Boston MA**
1983-1985	High School Physics and Chemistry Teacher **U.S. Peace Corps - Lycée de Niamtougou, Togo**
1982-1983	Research laboratory technician **Children's Hospital, Boston MA**

EXPERIENCE

Program & Project Management

- Currently manages the MassDEP Bureau of Waste Site Cleanup, comprised of approximately 80 staff in three major programs:
  - Massachusetts Oil Spill Prevention & Response Act (MOSPRA) Program,
  - Massachusetts Natural Resource Damage (NRD) Program
  - Massachusetts Waste Site Cleanup Program

  Together, the three programs ensure that releases of oil and hazardous material to the environment are reported, assessed, cleaned up, and where applicable, restoration activities are implemented.

- Directed the Waste Site Cleanup Division of Response and Remediation, comprised of approximately 25 technical staff in four areas:
  - Federal Sites Program
  - Information/Communications
  - Compliance & Enforcement
  - Audit Coordination

  The Division is responsible for the implementation of the Massachusetts Contingency Plan; co-ordination of Bureau operations across four Regional Offices; development, and implementation of the 21E Site Audit Program; coordination of BWSC compliance and enforcement activities; development of information systems integral to the operation of the cleanup program; development of stakeholder and municipal outreach; development of technical and regulatory training for DEP BWSC staff and Licensed Site Professionals; and coordination with USEPA on federal sites under CERCLA, Federal Facilities; FUDs, Federal Brownfields, and RCRA Corrective Action programs.

- Provides technical oversight and senior review for professional staff preparing enforcement cases, managing state and federal sites, conducting audits, conducting human health and environmental risk assessments, developing policy and writing guidance.

- Lead external Advisory Committees and Workgroups of private-sector risk assessors, environmental consultants, site managers, lawyers and other stakeholders that provide input on DEP regulatory and policy initiatives.

- Prepares project budgets and manage technical assignments including schedule and budget compliance.

- Directs technical and policy staff developing regulations, policies and guidance in all areas of hazardous waste site assessment and remediation.

- Oversees the development of the BWSC Program Plan and the BWSC input to the DEP/EPA Performance Partnership Agreement, coordinating Bureau efforts in Boston and the Regional Offices.

Environmental Regulations, Policies and Guidance

- Directed the development of policy and regulations for the privatized Waste Site Cleanup Program (2003-2004).

- Authored the risk characterization requirements (Subpart I) of the Massachusetts Contingency Plan, 310 CMR 40.0000.
  - Developed and documented cleanup standards and Reportable Concentrations for over 100 chemicals in 3 groundwater and 3 soil categories.
  - Supervised and co-authored the DEP's Guidance for Disposal Site Risk Characterization.
  - Periodically reviewed and revised the regulations and standards, including the "Wave 2" revisions to the MCP and BWSC regulations specific to perchlorate in the environment.

- Authored or participated in the development of numerous DEP policies, including policies for the management of soil (e.g., quarry reclamation activities, asbestos-contaminated soil, and "Similar Soil"), implementing Best Management Practices for Gardening, determining the feasibility of approaching or achieving background, implementing Best Management Practices for the construction of Rail Trails, identifying background conditions, the identification and evaluation of imminent hazards, the implementation of Activity and Use Limitations, and development of audit protocols.

- Participated as a Subject Matter Expert in the development of the examination for Licensed Site Professionals.
- Represent DEP in policy discussions with outside stakeholders, other state regulators and U.S. EPA staff at advisory committee meetings, workshops and other venues.
- Participated in the development of the Hazardous Waste regulations allowing assessment and remediation of RCRA Corrective Action sites under the Waste Site Cleanup privatized program.
  - Promulgated 2007, effective March 2008.
  - Authored DEP policy and developed protocols for Licensed Site Professionals to make "Contained-In" determinations pursuant to RCRA for the efficient management of soil containing low levels of hazardous waste;
- Participated in the development of regulations to address Cumulative Impacts in the siting of solid waste facilities
  - Drafted and revised regulatory language.
  - Co-authored the *Interim Risk-Evaluation Guidance Document for Solid Waste Facility Site Assignment and Permitting in Support of 310 CMR 16 & 19.000* (2001).

Synthesis, Analysis, and Presentation of Environmental Data

Characterize risks to receptors at hazardous waste sites, solid waste landfills, RCRA facilities and public and private water supplies.

- Development of sampling designs and direction field investigations.
- Evaluation/analysis of chemical analytical data.
- Screening and quantification of potential exposures.
- Evaluation of literature-based and site-specific toxicological data.
- Risk characterization, including probabilistic analysis.
- Documentation of uncertainties and limitations of risk assessments.
- Presentation of results to DEP staff, Potentially Responsible Parties and their consultants, and at public meetings.

Technical Review of Human Health and Ecological Risk Characterizations

- Acted as liaison with the Waste Site Cleanup Audit Group.
- Reviewed Phase II Risk Characterization Reports, Phase II Scopes of Work and Final Remedial Response Plans submitted under the state's 21E program.
- Reviewed landfill closures and evaluations of alternative use under the Solid Waste program.
- Reviewed RCRA Closure and Corrective Action documents submitted under the Massachusetts Hazardous Waste Program.
- Reviewed RI/FS Reports and RODs submitted for Federal Superfund sites in Massachusetts.
- Reviewed monitoring data from contaminated public drinking water supplies under the Massachusetts Drinking Water Program.
- Provided technical assistance to DEP Regional staff.

Environmental Education, Presentations and Community Involvement

- Developed and produced MassDEP's first live, online streaming public meetings, which are also archived on YouTube for broader outreach.
- Represented DEP at site-specific public meetings to present regulatory, policy, and health and environmental risk assessment information.
- Develops/presents training courses on technical, regulatory and policy issues, for DEP employees and private-sector consultants.
- Developed/presented graduate and undergraduate courses on risk assessment and the Massachusetts Contingency Plan as guest lecturer (Tufts University, Boston University, and Northeastern University).
- Develops/delivers technical and policy presentations at national and regional conferences (including the Society for Risk Analysis, Association of State and Territorial Solid Waste Management Officials, and U.S. EPA workshops).
- Melrose Conservation Commissioner, 1995-2007. Administered the Massachusetts Wetlands Protection Act.
- Recycler, composter and former Little League coach.

COMPUTER WORK SKILLS AND EXPERIENCE

- Advanced skills in word processing, spreadsheet, photography, graphic and web development programs.
- Developed/programmed the *Risk Assessment ShortForm* (semi-finalist, Innovations in American Government Awards)
- Founder and former manager of the Massachusetts DEP World Wide Web site and the Society for Risk Analysis – New England site. Currently manager for the Melrose Incarnation Youth Baseball League and the Harvard 1982 – 25th Reunion websites.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of ENTERGY NUCLEAR OPERATIONS, INC., ENTERGY NUCLEAR GENERATION COMPANY, AND HOLTEC DECOMMISSIONING INTERNATIONAL, LLC; CONSIDERATION OF APPROVAL OF TRANSFER OF LICENSE AND CONFORMING AMENDMENT (Pilgrim Nuclear Power Station)	)	Docket Nos. 50-293 & 72-1044

DECLARATION OF JOHN M. PRIEST, JR.

I, John M. Priest, Jr., declare and state as follows:

1. I am the Director of the Radiation Control Program at the Massachusetts Department of Public Health (DPH). I have held that position since 2014 when I joined the agency. Prior to my employment at DPH, I worked for 26 years in varying capacities at multiple nuclear power plants, including Pilgrim Nuclear Power Station (Pilgrim). During that time, for example, I was responsible for oversight of radiological plant surveys to support power plant operations, the radiological monitoring of the station staff and members of the public, and emergency planning activities with federal, state and local agencies. I hold a Bachelor of Science degree in Radiological Health Physics from the University of Lowell. A copy of my curriculum vitae, which includes a complete list of my experience, is attached to this declaration. I submit this declaration in support of the Commonwealth of Massachusetts' petition for leave to intervene and hearing request in this matter.

2. In my role at DPH, I have implemented a comprehensive environmental laboratory monitoring program, including a real-time monitoring system in the vicinity of Pilgrim. Additionally, the Radiation Control Program conducts environmental radiation monitoring outside the Pilgrim fence line (Mass. Gen. Laws c. 111, § 5k), collecting food samples such as milk, vegetables, fish, etc. In this role, I am also responsible for reviewing and approving applications for Massachusetts Radioactive Material Licenses, including oversight of low-level radioactive waste generation, and for overseeing the decommissioning of Massachusetts-licensed facilities pursuant to 105 C.M.R. §§ 120.244-120.258. Under Massachusetts' facility decommissioning regulations, sites are acceptable for unrestricted use where residual radioactivity is equal to or less than 0.10 mSv per year (10 millirems/yr.). In addition, I have also been involved in emergency planning and response activities at Pilgrim.

3. I am familiar with the proposed sale of Pilgrim from Entergy to Holtec, Inc. I have reviewed documents filed with the Nuclear Regulatory Commission (NRC) by Holtec International, including Holtec's Revised Post-Shutdown Decommissioning Activities Report and Revised Site-Specific Decommissioning Cost Estimate (Holtec PSDAR) for Pilgrim and the License Transfer application. Based on my review of the Holtec PSDAR, my knowledge of Pilgrim, gained both through my work at the plant and industry experience related to reactor decommissioning, and my role as Director of Massachusetts' Radiation Control Program, I do not believe that Holtec has reasonably accounted for all site-specific factors in its decommissioning cost estimate. I reached this conclusion for the following reasons.

SITE-SPECIFIC INVESTIGATION AND ENVIRONMENTAL ASSESSMENTS

4. Holtec has not done and has not indicated to DPH that it plans to do, a full site investigation (radiological and non-radiological) before acquiring Pilgrim from Entergy. A full

site investigation is necessary to accurately determine the ultimate anticipated cost of decommissioning, spent fuel management, and site restoration. Instead, Holtec relied on a series of NRC Generic Environmental Impact Statements for nuclear power plant decommissioning and license termination and renewal, including:

(a) NUREG-0586, Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors (2002);

(b) NUREG-1496, Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Nuclear Facilities (1997);

(c) NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 29, Regarding Pilgrim Nuclear Power Station, Final Report, July 2007; and

(d) NUREG-1437, Revision 1, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, June 2013.

5. The National Environmental Policy Act (NEPA) requires the NRC to prepare a detailed statement assessing the environmental impact of and alternatives to major federal actions, which includes decommissioning of nuclear power plants.

6. In their PSDAR, Holtec relied on previously filed Generic Environmental Impact Statements related to Pilgrim in evaluating whether the environmental impacts associated with decommissioning activities will be constrained by those previous statements and in estimating the costs associated with decommissioning, spent fuel management, and site restoration. NUREG-1437, Revision 1, Generic Environmental Impact Statement for License Renewal of

Nuclear Plants, June 2013, briefly discusses climate change. However, the PSDAR does not discuss the potential future impact of changes to the coastline or water table due to climate change, including the ability to adequately survey below ground components or structures and the discovery of contaminants in previously unassessed areas.

7. NUREG-1437, Revision 1, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, June 2013, Section S.5, discusses the environmental significance of tritium in groundwater and its potential for moderate impact. In 2006, the Nuclear Energy Institute proposed that nuclear power plants begin a voluntary groundwater protection initiative aimed at monitoring for tritium in groundwater. In response, Entergy began monitoring for tritium in groundwater in 6 monitoring wells at Pilgrim Station. In 2007, Entergy voluntarily began reporting its results to DPH; those reports can be found here: https://www.mass.gov/lists/environmental-monitoring-data-for-tritium-in-groundwater-at-pilgrim-nuclear-power-station#summaries.

8. In 2010, Entergy reported increased tritium measured at one well. In response to recommendations from DPH, Entergy has installed additional wells and continued to monitor for tritium and investigate possible sources. To date, the cause of the tritium contamination has not been definitively identified. Entergy reported to DPH that it believed the contaminant was released from cracks in the basement of the condenser bay and into the adjacent seismic gaps between the buildings. To the extent tritium is discovered in groundwater in excess of the drinking water maximum contaminant levels (MCL) set by the U.S. Environmental Protection Agency (EPA), Holtec will have to ensure remediation. It is unknown whether the potential cost of having to remediate tritium in the groundwater was considered in Holtec's PSDAR.

9. Based on my site knowledge, contamination has previously been identified by the utilities in the soil in the vicinity of the condensate water storage tank, the reactor truck lock and radioactive waste building. Further, there were other releases into the environment associated with a former condenser tube refurbishment building east of the radioactive waste truck lock. Historically, contaminated soil from previous site remediation has been "stockpiled" on a small hill along the east protected area fence. DPH does not know whether these sites and others were captured as part of decommissioning records required by 10 C.F.R. § 50.75(g), communicated to Holtec and evaluated by Holtec in its decommissioning cost estimate. Based on my knowledge of this site and experience at other nuclear power plants, it is reasonable to assume based on this site's history that other contaminants will be identified once excavation and demolition begins.

10. Long-lived radionuclides are likely to be found in soils and groundwater far from the small excavation made to repair the leaks that likely allowed reactor condensate to enter into the site soils for many years. In addition, these same long-lived radionuclides are likely to be found in many other structures, systems, and components, which may also have unknowingly leaked over the decades into soils and the groundwater at the Pilgrim property.

INDUSTRY EXPERIENCE

11. During radiological surveys that occurred prior to decommissioning of the Vermont Yankee Nuclear Power Plant, the Vermont Department of Health found cesium-137, strontium-90, and other long half-life radioactive materials in soil samples. In addition to Vermont Yankee, other New England decommissioning projects at Maine Yankee and Connecticut Yankee uncovered long half-life radioactive materials and hard-to-detect radionuclides in soils. Similar contaminants can be expected at the Pilgrim property, including carbon-14, nickel-63, strontium-

90, cesium-137and transuranics, which include radioisotopes of plutonium, curium, neptunium, and americium.

12. Discussions with the New England Compact, Health Department staff in Vermont and Maine and Department of Energy and Environmental Protection staff in Connecticut indicate that decommissioning activities commonly reveal previously unidentified and unknown radiologically contaminated media that must be addressed and remediated during decommissioning and prior to license termination. For example, highly contaminated pockets of groundwater were discovered dammed up by existing subsurface structures at Maine Yankee and caused significant cost increases. In addition, the licensee at Connecticut Yankee had to excavate a large trench in soil around the reactor and its components that was not identified or accounted for in Connecticut Yankee's initial planning and cost estimates.

13. The Holtec PSDAR neither identifies nor reasonably accounts for the challenges of remediating contaminants encountered during decommissioning, including but not limited to tritium, radioactive "hard to detect" or other long-lived radionuclides in the soil and in structures, systems, and components. These considerations should be factored into the planning and funding for the decommissioning of Pilgrim, but it is not apparent from the PSDAR that Holtec did so.

14. The discovery of additional contamination not accounted for in previous site investigations or previously filed Generic and Site-Specific Environmental Impact Statements will result in additional costs to Holtec. A complete site characterization (i.e., an assessment of the vertical and horizontal extent of all radiological and non-radiological contamination at the site) and a Supplemental Environmental Impact Statement that considers the information yielded by such a site-specific characterization and considers climate change effects is necessary to provide a more accurate basis on which to estimate costs of decommissioning.

EXCAVATION / DEMOLITION

15. During discussions with DPH, Holtec has stated that previous remediation of Pilgrim eliminates the need to excavate deeper than three feet below grade. Consistent with this, Holtec's PSDAR states that "During demolition, above-ground structures will be removed to a nominal depth of three (3) feet below the surrounding grade level. Characterization surveys will then be performed in the remainder of the below ground structures and any areas with activity exceeding established [Derived Concentration Guideline Levels (DCGLs)] will be removed."

16. Industry experience regarding the presence of "hard to detect" and long-lived radionuclides at other nuclear decommissioning sites, as discussed above, creates doubt that Holtec will not need to excavate deeper than three feet below grade.

17. The Holtec PSDAR does not detail their plan to address soils outside the structures and components and how they would be characterized and remediated. As written, Holtec does not account for the costs or evaluate the health and safety effects of such a contamination. It is not clear from the Holtec PSDAR that Holtec addressed these issues in the contingency analysis in its cost estimate or, if it did so, whether it properly accounted from them. A detailed analysis of the likelihood of further excavation and associated costs is necessary to accurately estimate those contingencies.

ENVIRONMENTAL RADIATION MONITORING

18. The Holtec PSDAR does not describe the planned radiological environmental monitoring program, including both continuation of "real time" monitoring, direct radiation exposure dosimetry and environmental land use analysis (monitoring power plant by-product radionuclides in milk, vegetation, seafood, etc.). These activities should be conducted through the decommissioning timeframe, including spent fuel pool cleanout, dry fuel storage cask

loading, reactor building and associated structure demolition, and finally site restoration. The values in table 3-1 of the cost estimate included in the PSDAR represent a small fraction of costs needed to continue the current level of environmental monitoring. These considerations should be factored into the planning and funding for the decommissioning of the Pilgrim property.

19. The radiological environmental monitoring program should include a plan to submit all legacy and NRC-filed site assessments and surveys to Massachusetts, conduct radiological and non-radiological groundwater contamination sampling, report results to Massachusetts, and provide split samples as requested.

EMERGENCY PLANNING

20. The PSDAR does not adequately address preparedness in the event of a radiological emergency during decommissioning or the transfer of spent fuel to the spent fuel pool or from the spent fuel pool to dry casks or consider the cost of such an incident. An adequate radiological emergency preparedness plan would include specific protocols for both "small scale" host community events and "larger scale" state resource scenarios.

21. Holtec does not adequately address their capabilities to monitor and respond to the following:

(a) Leaks of large quantities of radioactive materials in solid or liquid form into the environment;

(b) Deficiencies in the structures, systems, and components containing stored radioactive materials;

(c) Response plan for emergent scenarios including combustible fires containing either low level radioactive contaminants or spent fuel, and hostile actions that destroy key structures that store radioactive materials;

(d) Security measures surrounding the dry fuel pad, which should include substantial physical barriers, especially once it is relocated closer to a nearby road;

(e) Details on remote and onsite radiation monitoring of the facility and spent fuel storage; or

(f) Adequate routine physical inspection of dry casks and detailed contingency for damaged/degraded dry fuel storage containers.

22. All of these items represent discrete, foreseeable risks that Holtec did not provide sufficient detail that they have considered and accounted for in the PSDAR.

RADIOACTIVE WASTE TRANSPORTATION

23. The Holtec PSDAR addresses the transportation approach for Class A, Low Specific Activity, or Surface Contaminated Object classes of waste. It states Holtec will use a combination of truck, rail and potentially barge to support bulk quantity removal of waste. Since there is no active rail line at the site, Holtec states that a truck will be used to deliver the waste to a transload facility in Massachusetts. However, no such transload facility is licensed by the Massachusetts Radiation Control Program to perform such waste processing or repackaging for waste transfer. A more specific waste removal plan would be necessary to provide an accurate cost estimate.

24. Additionally, regarding the safety of transfer and storage of radioactive materials, the Holtec PSDAR does not include details describing state review for removal and transportation of all radioactive waste, and does not describe provision of funding to agencies that will expend resources on plan review, approval and implementation, such as the Massachusetts State Police for route planning and escort of high level waste.

RADIOLOGICAL STANDARDS

25. The Holtec PSDAR only references the NRC Final Status limit of 25 millirems per year for unrestricted release from all pathways. The Massachusetts standard for unrestricted release of residual radioactivity (cleanup) is no more than 10 millirems per year (105 C.M.R. § 120.245). In addition, EPA has established a drinking water MCL of no more than 4 millirems per year. The Holtec PSDAR does not include details describing Holtec's plan for testing and demonstration for meeting the Massachusetts cleanup standard or the EPA drinking water MCL for all property transferred from Entergy to Holtec.

26. In order to apply a consistent clean up standard for all sites containing radioactive materials in Massachusetts, DPH issued a formal request that Holtec submit a proposed compliance document detailing the methods and protocols for compliance with the Massachusetts clean-up and EPA drinking water MCL prior to the unrestricted release of all or any part of the property transferred from Entergy to Holtec. DPH additionally requested these clean-up standards be incorporated into Holtec's PSDAR.

27. Holtec's PSDAR neither incorporated the Massachusetts cleanup standard nor the EPA groundwater standard, but noted that they are "actively engaged in discussions with the Commonwealth of Massachusetts related to the establishment of an independent voluntary agreement regarding radiological release standards." Holtec has expressed a willingness to sign an agreement with the Commonwealth on the radiological release standard.

28. I, John. M. Priest, Jr., have read the above statement consisting of 11 pages, and I certify under penalty of perjury that the foregoing is true and correct. Executed on February 19, 2019.

JOHN. M. PRIEST, JR.
Radiation Control Program, Director
Massachusetts Department of Public Health

CURRICULUM VITAE

JOHN M. PRIEST, JR.

EDUCATION - PROFESSIONAL EXPERIENCE

BS- Radiological Health Physics, University of Lowell, 1986.
ANSI N45.2.23 Certified Lead Quality Assurance Auditor

Director Radiation Control Program – Commonwealth of Massachusetts
March 2014-present
Areas of responsibility are: license users of ionizing radiation producing equipment and radioactive materials; register owners of non-ionizing radiation producing equipment; maintain emergency planning and response capabilities; implement a comprehensive environmental laboratory monitoring program, including a real-time monitoring system in the vicinity of an operating nuclear power plant; regulate mammography facilities; direct a radioactive materials licensing and inspection program, including the maintenance of the Agreement State Program.

Manager Emergency Preparedness
Pilgrim Nuclear Station, Entergy
Accountable to facilitate emergency operations and recovery activities in accordance with Nureg-0654. Responsible manager for utility first Hostile Action Based Exercise Preparations. No Findings and positive comments from regulators on the performance of the drill and exercise. Responsible for managing the budget including grants and contract management to support the emergency preparedness program.

Project Manager Entergy
Pilgrim Nuclear Station, Entergy
Project Manager for the Entergy, Pilgrim Nuclear Station Fukushima Flex response. This included the sourcing, procurement and testing for the Pilgrim Flex Strategy equipment. I was responsible for the management of a $1.2M annual operating O&M and capital budget to support this project.

Radiation Protection Manager
Pilgrim Nuclear Station, Entergy
Oversight and development of the Entergy, Pilgrim Nuclear Station Radiation Protection program. I was responsible for the management of an annual operating O&M and capital budget to support plant operations. No NRC findings or INPO Significant RP events during my tenure.

Radiation Protection Manager
Fermi Nuclear Station, Detroit Edison
Fermi 2 BWR, decommissioning of the Fermi 1 plant and the non-nuclear (fossil and gas) Detroit Edison radioactive material licenses. Detroit Edison has an operating staff of 70+ technicians, scientific professionals and contract support staff. In addition, Detroit Edison provides contract NVLAP dosimeter processing services to the industry.

Health Physicist/ Radiological Engineer
First Energy/Detroit Edison
ALARA planning and shielding analyses for both BWR and PWR facilities, implementation of various teledosimetry / remote monitoring systems including the oversight of programs for internal / external dosimetry, instrument calibrations, air sampling, environmental releases; Preparation and submission of the Offsite Dose Calculation Manual, write environmental operating reports, examining multiple waste streams, and submission of other technical reports for demonstration of current program status, or to seek regulatory modifications; responsibilities included the development of plans, procedures and drill scenarios for offsite radiological monitoring.

Lead Quality Assurance Auditor (ANSI N45.2.23)
Detroit Edison
Completion of routine audits and self-assessments relating to all areas of power plant functions including Operations, Maintenance, Radiation Protection, Security and industrial safety programs; Performance of vendor quality related audits and surveillances to support both NUPIC and utility procurement programs; Radiation Protection/ Environmental specialist for licensee peer audits.

EMPLOYERS

Entergy, Pilgrim Nuclear Power Station	6/2008 – 3/2014
Detroit Edison, Fermi 2 Nuclear Power Station	7/2000 – 6/2008
First Energy, Davis Besse Nuclear Power Station, Perry Nuclear Power Station	3/1988 - 6/2000
Westinghouse Hanford, Hanford Reservation Richland, WA	9/1987 - 3/1988
United Nuclear Corp., N-Reactor, Richland, WA	7/1986 - 9/1987

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of	)	
ENTERGY NUCLEAR OPERATIONS, INC., ENTERGY NUCLEAR GENERATION COMPANY, AND HOLTEC DECOMMISSIONING INTERNATIONAL, LLC; CONSIDERATION OF APPROVAL OF TRANSFER OF LICENSE AND CONFORMING AMENDMENT	)	Docket Nos. 50-293 & 72-1044
(Pilgrim Nuclear Power Station)	)	

DECLARATION OF TIMOTHY NEWHARD

I, Timothy Newhard, declare and state as follows:

1. I am a financial analyst with the Massachusetts Office of the Attorney General ("OAG") working in the Energy and Telecommunications Division of the Energy and Environment Bureau. I have held that position since 1981 when I joined the Office. I hold a Master's Degree in Business Administration from Northeastern University and a Bachelor's of Science Degree in Engineering Physics from the University of Maine. A copy of my curriculum vitae, which includes a complete list of may experience, is attached to this declaration. I submit this declaration in support of the Commonwealth of Massachusetts' petition for leave to intervene and hearing request in this matter.

2. In my role at the OAG, my responsibilities include reviewing utilities' requests for the recovery of costs of providing rate regulated utility service. The costs that the utilities request for recovery include a return of and on their investment in their generation plants as well as the decommissioning costs of those plants. During my time at the OAG, I have reviewed at

various times the reasonableness of the decommissioning costs of all of the nuclear power plants in New England, including Yankee Rowe, Maine Yankee, Connecticut Yankee, Millstones 1, 2 and 3, Seabrook, and Pilgrim.

3. I am familiar with the proposed transfer of Pilgrim Nuclear Power Plant (Pilgrim) from Entergy to Holtec, Inc. In particular, I have reviewed: (i) Entergy Nuclear Generation Company and Holtec International's application to transfer, among other things, Pilgrim's Renewed Facility Operating License to Holtec and (ii) Holtec's Revised Post-Shutdown Decommissioning Activities Report and Revised Site-Specific Decommissioning Cost Estimate (Revised PSDAR) for Pilgrim. Based on my review of the license transfer application and Revised PSDAR and my knowledge and understanding of nuclear power plant decommissioning costs, I do not believe that Holtec has sufficient funds in the Nuclear Decommissioning Trust Fund as described in the application (including Holtec's request for an exemption to use the Pilgrim Decommissioning Trust Fund to cover site restoration and spent fuel management costs) to guarantee covering the reasonably expected costs of decommissioning Pilgrim, restoring the site, and managing the spent nuclear fuel until it has been removed from the site.

4. Holtec's application provides for only one source of funds to decommission Pilgrim and restore the site and manage spent fuel onsite until it is removed, Pilgrim's Decommissioning Trust Fund and the expected earnings from investing the funds in that account.

5. Holtec indicates that the entity that will own Pilgrim after the transfer will be a limited liability company with no other significant resources to cover all of the costs of the activities discussed in the Revised PSDAR other than the Decommissioning Trust Fund. Thus, unlike rate regulated utility owners of generation plants, Holtec will not be able to recover from ratepayers any additional money to cover any possible shortfall. Additionally, Holtec's parent

has not supplied any assurance or guarantee to cover those costs, if there is a shortfall in the Fund.

6. Holtec did not provide the workpapers, calculations, formulas, assumptions, and other supporting documentation for its Cost Estimate for Pilgrim, and therefore the reasonableness of the Cost Estimate (including particular line items) cannot be determined.

7. Holtec's PSDAR contains its decommissioning cost estimates, which includes as one of the most significant costs of decommissioning—the cost of disposal of radioactive materials. Holtec estimates the disposal cost to be $152 million, stated in 2018 dollars, assuming that it has full access to the Andrews County, Texas facility. Holtec does not indicate that it is affiliated with or has contracted with the Texas facility or with any other particular disposal facility.

8. The United States Nuclear Regulatory Commission ("NRC") issued its "Report on Waste Burial Charges: Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities, Final Report" in February 2019. That Report estimates the costs for Boiling Water Reactors ("BWRs") like Pilgrim that expect to use the Andrews County, Texas ("Texas") disposal facility. In the February 2019 Report, the NRC estimates that the disposal cost for a BWR, using the Texas facility, is $199 million in 2018 dollars. The NRC estimate would be approximately $47 million more than Holtec's estimate for disposal. In the February 2019 Report, the NRC estimates that the disposal cost for a BWR, using a non-compact disposal facility and the Texas facility is $257 million in 2018 dollars. This estimate is approximately $105 million more than Holtec's estimate for disposal. In the February 2019 Report, the NRC estimates that the disposal cost for a BWR, using a non-compact disposal facility is $322 million in 2018 dollars. This estimate is approximately $170 million more than Holtec's estimate for disposal. Holtec has not provided the workpapers, calculations, formulas, assumptions, and

other supporting documentation for its disposal cost estimates for Pilgrim. Without having that documentation, there is no basis for which to determine the reasons that Holtec's disposal cost estimate is so much lower than the NRC's estimate and whether that difference is reasonable or justified.

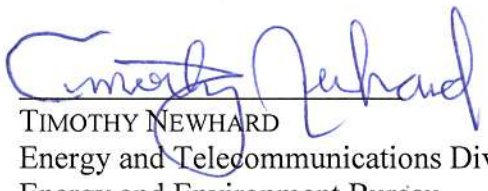
9. The entity prepared to decommission Vermont Yankee Nuclear Power Station ("Vermont Yankee") has provided much more in financial assurances, beyond the nuclear decommissioning trust fund, towards the decommissioning of that plant than has been provided for Pilgrim. These financial assurances include, among others, approximately $400 million for bonding of major subcontracted work on decommissioning to provide some assurance that subcontractors complete work in a cost effective and timely manner, $25 million in the form of a letter of credit tied to the start and/or completion date milestones to assure that decommissioning activities overall occur in a reasonable timeframe to minimize costs, a support agreement from the affiliated services company for $140 million payable to the decommissioning trust fund, an escrow account with a minimum balance of $55 million for a Site Restoration Trust to insure that some designated funds are available for site restoration and the retention of proceeds from the Department of Energy Standard Contract litigation for spent fuel management to cover the other costs of decommissioning. None of these financial assurances are present or being offered by Holtec here.

10. Holtec's assumption regarding the earnings on the decommissioning trust fund is also overly optimistic. The Revised PSDAR assumes a real rate of return of two percent per year on the investments in the trust fund each and every year over the 44-year life of the trust with the earnings being reinvested in the trust to be used to cover the decommissioning costs.[1] However,

[1] The real rate of return is that return on an investment adjusted for inflation.

under Holtec's analysis, a significant amount of the earnings occurs during the first seven years of decommissioning when Holtec is incurring substantially all of its License Termination Costs. If there is a recession and/or significant inflation in the U.S. markets during that seven-year period, the return on the decommissioning trust fund assets could be significantly less than the two percent real rate of return that Holtec assumes during that period. Indeed, the return could be negative, meaning that Holtec's Pilgrim Cash Flow Analysis would create an overall shortfall in the trust fund well before the 44-year term of decommissioning.

11. I, Timothy Newhard, have read the above statement consisting of 5 pages, and I certify under penalty of perjury that the foregoing is true and correct. Executed on February 19, 2019.



TIMOTHY NEWHARD
Energy and Telecommunications Division
Energy and Environment Bureau
Massachusetts Attorney General's Office

TIMOTHY NEWHARD

Energy and Telecommunications Division
Massachusetts Office of the Attorney General

EXPERIENCE:

1981-Present *Massachusetts Office of the Attorney General*, Boston MA

Financial Analyst - Regulated Industries Division

- Created policy and procedures to restructure the electric utility industry in Massachusetts including the deregulation of the electric generation business;
- Analyzed the depreciation and decommissioning costs of distribution, transmission, and generation plant, including nuclear power plants;
- Created policy and procedures to restructure the gas utility industry in Massachusetts including the deregulation of the gas supply business;
- Created policy and procedures to restructure the telephone industry in Massachusetts including the deregulation of the long distance and the local exchange businesses;
- Trained attorneys and other office staff on finance, accounting, economics, and ratemaking principles;
- Provided expert testimony on the costs of capital for investments in electric, gas, and telephone utility common stock;
- Provided expert testimony on various ratemaking principles and accounting issues that were being litigated before the Massachusetts Department of Public Utilities;
- Audited utilities' costs of providing service and advised attorneys on Generally Accepted Accounting Principles and regulatory accounting issues;
- Analyzed proposed utility financings for cost/benefit to ratepayers;
- Analyzed the economics of capital investment projects including nuclear power versus coal power and coal conversion of oil-fired plants;
- Analyzed and formed policy regarding utility mergers and acquisitions;
- Analyzed utilities' diversification efforts and reviewed methods of cost allocation and isolation of risk from the regulated utility;

EXPERIENCE (continued):

- Formed policies on various pricing, cost allocation, finance, accounting, and revenue requirement issues for case litigation and settlement;

- Prepared discovery, cross-examination, motions and briefs for proceedings before the Massachusetts Department of Public Utilities and the Federal Energy Regulatory Commission.

EDUCATION:

1989-1991 *Chartered Financial Analyst's Examination*

Successfully completed Levels One, Two and Three of the Chartered Financial Analyst Examinations

1985 *Certified Public Accountant's Examination*

Successfully completed all parts of the May 1985 Certified Public Accountant's Examination

1979-1981 *Northeastern University*

Received a Master's degree in Business Administration with concentration in Finance and Economics

1975-1979 *University of Maine at Orono*

Received a Bachelor of Science degree in Engineering Physics with honors;
Member of the Physics Honor Society

OTHER EDUCATION:

Attended Various Training Sessions including:

- Securitizing Stranded Utility Assets

- Price Cap Regulation

- Regulatory Policies and Ratemaking at Michigan State University