

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE SECRETARY

In the Matter of

ENTERGY NUCLEAR OPERATIONS, INC.;
ENTERGY NUCLEAR Palisades; HOLTEC
INTERNATIONAL; and HOLTEC
DECOMMISSIONING INTERNATIONAL,
LLC; APPLICATION FOR ORDER
CONSENTING TO TRANSFERS OF
CONTROL OF LICENSES AND APPROVING
CONFORMING LICENSE AMENDMENTS

Docket Nos.:
50-155
50-255
72-007
72-043

(Palisades Nuclear Plant and Big Rock Point)

**PETITION OF THE MICHIGAN ATTORNEY GENERAL FOR LEAVE
TO INTERVENE AND FOR A HEARING**

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LIST OF ABBREVIATIONS AND ACRONYMS

Applicants	Entergy Nuclear Operations, Inc.; Entergy Nuclear Palisades, LLC; Holtec International; and Holtec Decommissioning International, LLC
ASLB	Atomic Safety and Licensing Board
BWR	Boiling water reactor
CDI	Comprehensive Decommissioning International, LLC
DCE	Decommissioning Cost Estimate
DOE	United States Department of Energy
Enbridge	Enbridge, Inc.
ENOI	Entergy Nuclear Operations, Inc.
Entergy	Entergy Nuclear Operations, Inc.; and Entergy Nuclear Palisades
FERC	Federal Energy Regulatory Commission
GAO	Government Accounting Office
GTCC	Greater-than-class-C waste
HDI	Holtec Decommissioning International, LLC
Holtec	Holtec Intl; CDI; HDI; or Holtec Palisades
Holtec Intl	Holtec International
Holtec Palisades	Holtec Palisades, LLC
ISFSI	Independent spent fuel storage installation
LTA	License transfer application
MPSC	Michigan Public Service Commission
NAMCo	Nuclear Asset Management Company, LLC
NRC	United States Nuclear Regulatory Commission
Oyster Creek	Oyster Creek Nuclear Generating Station (New Jersey)

PFAS	Per- and polyfluorinated alkyl substances
PHMSA	Pipeline and Hazardous Materials Safety Administration
Pilgrim	Pilgrim Nuclear Power Station (Massachusetts)
PNNL	Pacific Northwest National Laboratory
PSDAR	Post-shutdown decommissioning activities report
PWR	Pressurized water reactor
State	State of Michigan
TVA	Tennessee Valley Authority

INTRODUCTION

The Nuclear Regulatory Commission (NRC) is considering whether to grant an application by Entergy Nuclear Operations, Inc. (ENOI); Entergy Nuclear Palisades, LLC (ENP) (together “Entergy”); Holtec International (Holtec); and Holtec Decommissioning International, LLC (HDI), (collectively “Applicants”) requesting approval to transfer the operating licenses for the Palisades Nuclear Plant, Big Rock Point Plant, and associated independent spent fuel storage installation (ISFSI) from Entergy to Holtec and HDI.¹ The license transfer application notes that Entergy plans to transfer all of the assets and liabilities of ENP to a new entity that will become Holtec Palisades, LLC (Holtec Palisades).² The LTA also notes that Nuclear Asset Management Company, LLC (NAMCo), a wholly-owned subsidiary of Holtec, will acquire the equity interests in either the new Holtec Palisades or the parent company owner of Holtec Palisades; either way, emerging as the direct parent company of Holtec Palisades.³ Holtec plans to engage another Holtec subsidiary, Comprehensive Decommissioning International, LLC (CDI) to decommission the single unit at Palisades, restore the site, and manage on-site spent nuclear fuel.⁴ Holtec⁵ represents that it will release the site for unrestricted use “by approximately 2041.”⁶

¹ License Transfer Application (LTA) at 1–2 (Dec. 23, 2020).

² LTA at 2 (Dec. 23, 2020).

³ LTA at 2 (Dec. 23, 2020).

⁴ LTA at 2-3 (Dec. 23, 2020).

⁵ Throughout this petition, use of the term “Holtec” refers to any or all of Holtec Intl, CDI, HDI, or Holtec Palisades.

⁶ LTA at 3 (Dec. 23, 2020).

While the Attorney General supports prompt, thorough, and safe decommissioning and site restoration at Palisades, it does not believe Holtec possesses the financial qualifications or assurances necessary to complete such a risk-intensive project. The Attorney General's chief concerns are as follows: First, HDI's decommissioning cost estimate relies on a series of unreasonable assumptions that, either individually or cumulatively, threaten Holtec's ability to complete license termination and site restoration activities and manage spent nuclear fuel on the timeline and within the budget proposed in the HDI post-shutdown decommissioning activities report (PSDAR). HDI also unreasonably assumes the United States Department of Energy (DOE) will begin taking title to spent nuclear fuel by 2030 and fails to account for likely project delays associated not only with the Palisades project itself, but also with decommissioning and related obligations at the various other sites for which HDI is or plans to be responsible. In view of these and other unreasonable assumptions and errors, HDI—an entity with no nuclear decommissioning track record—underestimates the license termination, site restoration, and spent fuel management liabilities attached to Palisades and Big Rock Point, and so fails to carry its burden to show adequate decommissioning financial assurance. This argument is further developed in Contention MI-1 below.

Second, Holtec's LTA and PSDAR impermissibly assume that Holtec will receive a regulatory exemption authorizing the use of decommissioning trust monies for site restoration and spent fuel management. Since Holtec has yet to receive such an exemption and has not shown another source of funding for site restoration

and spent fuel management, it fails to satisfy the applicable NRC regulations. This argument is further developed in Contention MI-2 below.

To intervene in an NRC licensing proceeding, a petitioner must show standing and proffer at least one admissible contention.⁷ NRC regulations in 10 C.F.R. § 2.309(f)(1) specify the requirements for an admissible contention such as explaining the basis for contention and supporting facts or expert opinion on which the petitioner intends to rely in litigating the contention. Also, as noted earlier, NRC rules of practice and procedure provide that the “applicant or the proponent of an order has the burden of proof.”⁸ A petitioner need only present a disputed material question of fact for hearing and can challenge the level of detail provided by the Applicant in demonstrating this disputed material question of fact.⁹ As NRC Chair Christopher T. Hanson, then Commissioner Christopher T. Hanson, explained in his dissent on the license transfer case dealing with Indian Point, “[e]ven though cost estimates are uncertain by nature, we are obligated to acknowledge claims from interested persons that call these estimates into question” and “[o]ur contention admissibility requirements are not intended to reach the merits of the dispute, but merely to assure that a genuine dispute on a material fact within the scope of the proceeding exists.”¹⁰

⁷ 10 C.F.R. §§ 2.309(a), (d), (f).

⁸ 10 C.F.R. § 2.325.

⁹ Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Station, Unit Nos. I, 2, and 3 and ISFSI), CLI 21-01 (2021) (Commissioner Baran dissent, p 5).

¹⁰ Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Station, Unit Nos. I, 2, and 3 and ISFSI), CLI 21-01 (2021) (Commission Hanson dissent, p 3).

For these reasons and others discussed in detail below, the Attorney General seeks leave to intervene in the pending license transfer proceedings for Palisades and requests that a hearing be held on the questions of whether the proposed licensees have demonstrated adequate financial qualification, adequate decommissioning financial assurance, and adequate funding for spent fuel management as required under the Atomic Energy Act and relevant NRC regulations.

STANDING

Under the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2011 et seq., the Commission must allow individuals “whose interest may be affected by the proceeding” to intervene in NRC licensing proceedings. 42 U.S.C. § 2239(a)(1)(A).¹¹ Petitioners may demonstrate that they have met standing requirements through traditional standing, representational standing based on standing of one or more members, or under the Commission’s proximity presumptions for those within a “geographic zone of potential harm.”¹² A petitioner relying on traditional standing—either for itself or in establishing the standing of one or more of its members—must (1) allege an injury in fact that is (2) fairly traceable to the challenged action and (3) is likely to be redressed by a favorable decision.¹³ With

¹¹ See also 10 C.F.R. § 2.309.

¹² *In re Interim Storage Partners LLC (WCS Consolidated Interim Storage Facility)*, 90 N.R.C. 31, 47–48 (Aug. 23, 2019).

¹³ *In re Fla. Power & Light Co. (Turkey Point Nuclear Generating Plant, Units 3 & 4)*, 82 N.R.C. 389, 394 (Dec. 17, 2015).

respect to injury in fact, the petitioner need show only that the chain of causation is plausible.¹⁴

Michigan Attorney General Dana Nessel is the duly elected and qualified Attorney General of the State of Michigan and holds such office by virtue of and pursuant to the provisions of Const 1963, art 5, § 21, and by mandate of the qualified electorate of the State of Michigan, and she is head of the Department of Attorney General created by the Executive Organization Act, 1965 PA 380, ch 3; MCL 16.150 et seq. MCL 14.28 provides in relevant part:

The attorney general . . . may, when in [her] own judgment the interests of the state require it, intervene in and appear for the people of this state in any other court or tribunal, in any cause or matter, civil or criminal, in which the people of this state may be a party or interested.

The Attorney General has the right to intervene in any administrative proceeding when the Attorney General, in her own discretion, deems it in the public interest to do so.¹⁵ As the chief law officer of the State, the Attorney General has common law authority to represent public interests, as she deems necessary for the protection of public rights.¹⁶ The common law powers and duties of the Attorney General include the power to intervene in all actions that are of concern to the general public.¹⁷

¹⁴ *Sequoyah Fuels Corp. (Gore, Oklahoma Site)*, CLI-94-12, 40 NRC 64, 75 (1994) (citing *Nat'l Wildlife Fed. v. Hodel*, 839 F.2d 694,705 (D.C. Cir. 1992)).

¹⁵ *People v O'Hara*, 278 Mich 281; 270 NW2d 298 (1936), and *Gremore v Peoples Community Hospital Authority*, 8 Mich App 56; 153 NW2d 377 (1967).

¹⁶ *In re Certified Question*, 465 Mich 537, 543-545; 638 NW2d 409 (2002), and *Withee v Lane & Libby Fisheries Co.*, 120 Me 121, 123; 113 A 22, 23 (1921).

¹⁷ *State ex rel Patterson v Warren*, 254 Miss 293; 180 So 2d 293, 299 (1965).

The Attorney General, in her judgment, has determined that the interests of the People of the State of Michigan require her to intervene in this proceeding on their behalf. This proceeding will directly affect a significant number of the People of this State who live and work around both the Palisades Nuclear Plant and the retired Big Rock Nuclear Plant. These residents who reside in Michigan suffer an injury in fact in the form of increased radiological risk as a result of the proposed licensee's failure to establish appropriate financial qualifications.

The Atomic Energy Act requires the NRC to ensure financial assurance to protect public health, safety, and the environment.¹⁸ The requirements for financial assurance were established 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.”¹⁹ Under both the Atomic Energy Act and the Energy Reorganization Act, “the NRC has determined that there is a significant radiation hazard associated with nondecommissioned nuclear reactors.”²⁰ These safety concerns are addressed, in part, by requiring 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

¹⁸ See NRC, Consolidated Decommissioning Guidance: Financial Assurance, Recordkeeping, and Timeliness, NUREG-1757 at 31 (Feb. 2012); see also Briefing on Power Reactor Decommissioning Rulemaking at 9 (March 15, 2016) (ML16078A034) (noting that NRC's “present decommissioning rules are performance-based and risk-informed).

¹⁹ *General Requirements for Decommissioning Nuclear Facilities*, 53 Fed. Reg. 24018, 24019 (June 27, 1988).

²⁰ *Id.* at 24033.

funds does not result in delays that may cause potential health and safety problems.”²¹ “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.”²²

In sum, “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.”²³

Should the Commission approve the Application without a thorough review of the Holtec’s financial qualifications, there is a significant risk that there will not be adequate funds for decommissioning, putting Michigan residents at risk. These residents will be injured by an increased radiological risk.

This risk is supported by Nicholas Capik’s Declaration, which is attached to this petition. Mr. Capik notes a number of environmental and public health concerns based on information provided in the license transfer filing, along with Holtec’s failure to provide adequate financial assurance to protect the public. He concludes that the proposed license transfer from Entergy to Holtec to decommission Palisades and BRP using only the NDT as financial assurance relies

²¹ *Id.*

²² *Financial Assurance Requirements for Decommissioning Nuclear Power Reactors*, 63 Fed. Reg. 50465, 50473 (September 22, 1998).

²³ *In re Entergy Nuclear Vermont Yankee, LLC*, Dkt. No. 50-271-LA-3, LBP15-24, at 22 (Aug. 31, 2015) (citation omitted), *vacated as moot*, CLI-16-8, 93 N.R.C. 463 (June 2, 2016).

on unreasonable and improbable assumptions and does not provide reasonable assurance for the protection of the health and safety of the public. The Attorney General's injuries would be redressed by the Commission requiring Holtec to provide additional evidence of its financial qualifications, including financial assurances as discussed in the Attorney General's Petition to Intervene.

Insufficient decommissioning or unsafe operation as a result of inadequate financial assurances or qualifications present risks to the People of the State of Michigan, who the Michigan Attorney General acts to protect. The proposed license transfer raises significant health, safety, environmental, and financial concerns for residents of the state, and thus the Attorney General seeks to address those concerns through participation in a public hearing.

In the alternative to the above modes of intervention, Attorney General Dana Nessel should be granted standing to intervene because her participation may reasonably be expected to assist in developing a sound record.²⁴ The Attorney General's participation will assist in developing a sound record because she has experience working on Michigan energy issues and the residents of the state have significant property and health interests in the proceeding, which would be adversely affected.

²⁴ 10 C.F.R. § 2.309(e) (allowing for discretionary intervention).

CONTENTIONS

MI-1

Holtec fails to show financial qualification to qualify for a license transfer, by failing to provide adequate decommissioning financial assurance and/or adequate funding for spent nuclear fuel management, in violation of 10 C.F.R. §§ 50.33(f) and (k)(1), 50.40(b), 50.54(bb), 50.75(b)(1) and (e)(1)(i), 50.80(b)(1)(i), 50.82(a)(8)(vii), and 72.30(b) because Holtec's PSDAR and decommissioning cost estimate underestimate license termination and spent fuel management costs.

BASIS

1. Under section 182(a) of the Atomic Energy Act and corresponding NRC regulations, proposed licensees must demonstrate that they are financially qualified to hold an NRC license.²⁵

2. The Commission has long recognized that “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.”²⁶

3. Since then, in view of its statutory duty to adequately protect public health and safety and in keeping with its risk-informed regulatory approach,²⁷ the

²⁵ See 42 U.S.C. § 2232(a); 10 C.F.R. §§ 50.33(f) and (k)(1), 50.40(b), 50.54(bb), 50.75(b)(1) and (e)(1)(i), 50.80(b)(1)(i), 50.82(a)(8)(vii), and 72.30(b).

²⁶ *General Requirements for Decommissioning Nuclear Reactors*, 53 Fed. Reg. 24018, 24019 (June 27, 1988).

²⁷ See NRC, Consolidated Decommissioning Guidance: Financial Assurance, Recordkeeping, and Timeliness, NUREG-1757 at 31 (Feb. 2012); see also Briefing on Power Reactor Decommissioning Rulemaking at 9 (March 15, 2016) (ML16078A034) (noting that NRC's “present decommissioning rules are performance-based and risk-informed).

Commission has developed a set of financial qualification and decommissioning financial assurance requirements²⁸ designed to ensure that holders of NRC licenses possess the financial ability to manage risk associated with their decommissioning and related obligations.

4. Here, if the license transfer application is granted and the transaction closes, the closely held, special purpose limited liability entities HDI and Holtec Palisades—entities with no outside source of revenue—will own the shuttered unit at Palisades and the substantial license termination, site restoration, and spent fuel management liabilities such ownership entails. HDI and Holtec Palisades will also gain access to the ratepayer-funded nuclear decommissioning trust for each unit.

5. Because the Applicants’ decommissioning financial assurance representations are predicated on what HDI claims is a site-specific estimate of the costs to decommission Palisades, restore the site, and manage spent fuel in the manner set forth in its PSDAR, the accuracy of both the PSDAR and the accompanying cost estimate are directly relevant to the core question whether the Holtec LLCs are financially qualified to decommission Palisades under applicable NRC rules.

6. In a recent order, the Commission noted that in the event of a decommissioning funding shortfall, NRC rules “require[] additional financial assurance to cover the estimated cost to complete the decommissioning.”²⁹

²⁸ See, e.g., 10 C.F.R. §§ 50.33(f), 50.75, 72.30.

²⁹ *Exelon Generation Co. (Oyster Creek Nuclear Generating Station)*, CLI-19-06, 2019 WL 2632851, at *6 (2019); see 10 C.F.R. § 50.82(a)(8)(vi).

7. The Commission's observation only reinforces the need to ensure that proposed licensees are financially qualified *before* authorizing a license transfer or granting an exemption allowing trust reimbursement for non-decommissioning expenses. Proposed licensees' financial qualifications cannot be predicated solely on access to existing decommissioning trusts, as the Applicants propose here. Instead, Holtec must be required to demonstrate to the Commission what the license transfer application currently fails to demonstrate: that Holtec and its various associated LLCs are healthy corporate entities with access to the financial resources necessary to procure additional financial assurance, if needed, *now*—not at some indeterminate point in the future when exemptions have been granted and the trusts run short of funds.

8. At this point, Holtec's showing of decommissioning financial assurance is deficient and clearly shows a funding shortfall because the assumptions used by Holtec to justify use of the NDT for purposes other than decommissioning, including spent fuel management and site restoration, are not plausible and as a result the Holtec estimated costs understate what will be the actual decommissioning costs.

These implausible assumptions include:

- A. Estimated decommissioning costs that are substantially less than reasonable estimates accepted by Michigan in rate filings for Palisades;
- B. Unreasonable spent fuel management assumptions which could grossly understate actual management costs;
- C. Calculated decommissioning costs that are substantially less than the NRC generic formula and actual performance at other sites;

- D. Use of an inadequate and unprecedented contingency;
 - E. Potentially understated radioactive waste volume and shipment approaches that are outside the bounds of NRC evaluations;
 - F. Risks that have not been addressed in the DCE;
 - G. Method and cost to transport storage-only fuel canisters off site;
 - H. Unrealistic NDT growth rate assumptions; and
 - I. Inability to provide additional financial assurance beyond the underfunded NDT.
9. For any or all of the foregoing reasons, HDI's cost estimate is unreasonably low. Accordingly, Holtec has failed to demonstrate adequate decommissioning financial assurance or adequate funding for spent fuel management as required under NRC rules.
10. The evidence supporting Contention MI-1 is provided below.

SUPPORTING EVIDENCE

- A. Estimated decommissioning costs that are substantially smaller than reasonable estimates accepted by Michigan in rate filings.**
11. The Attorney General incorporates the allegations in subparts B through I of Contention MI-1 as if fully set forth herein.
12. The Attorney General incorporates the accompanying Declaration of Nicholas Capik.³⁰
13. The Holtec DCE represents a site-specific analysis performed by Holtec for Palisades. This DCE projects expenses of \$443,215,000 for license termination

³⁰ Capik Declaration (decl.) (Attachment A to the petition), ¶¶ 8–11.

activities per 10 C.F.R. § 50.75, \$166,122,000 for spent fuel management activities, and \$34,679,000 for site restoration activities for a total cost of \$644,015,000 (all 2020 dollars).³¹ By comparison, the previous site-specific DCE performed for Palisades by TLG Services, Inc. for Nuclear Management Company, LLC (NMC) and submitted to the NRC on April 21, 2006, projected total expenses (in 2020 dollars) of \$1,350,740,000, comprised of \$821,584,000 for license termination, \$419,020,000 for spent fuel management, and \$110,135,000 for site restoration.³² No explanation has been provided by Holtec to support the 52% reduction in estimated costs nor is sufficient detail included in the Holtec DCE for an independent analysis of any factors that could support this 52% reduction in estimated costs.³³

³¹ Holtec Decommissioning International letter to U.S. NRC dated December 23, 2020, Subject “Post Shutdown Decommissioning Activities Report including Site-Specific Decommissioning Cost Estimate for Palisades Nuclear Plant” (Holtec PSDAR and DCE), DCE p 8.

³² In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150; Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, Appendix B, TLG’s Site-Specific Decommissioning Cost Study Executive Summary And Table 3, page xiii (MPSC Case No. U-14150, Official Exhibit A2, <https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000000w61yAAA>, p 52.) TLG provided costs in 2003 dollars. These 2003-dollar costs were \$584.1 million for license termination, \$297.9 million for spent fuel management, and \$78.3 million for site restoration. For comparison, these costs have been escalated to 2020 dollars using the Consumer Price Index for All Urban Consumers, which averaged 2.027% from 2003 to 2020. This same approach, escalation using the Consumer Price Index for All Urban Consumers, has been used for all year-dollar adjustments in this declaration.

³³ The Holtec DCE includes a 10-year dormancy period. The TLG estimate was for a SAFSTOR approach using a 12.5-year storage period. In the matter of the application of Consumers Energy Company for adjustment of its surcharges for

14. In 2005, the Michigan Public Service Commission (MPSC) authorized continued collection of annual contributions from ratepayers for the decommissioning of Palisades in the amount of \$5.5 million per year.³⁴ This continued collection was in addition to the \$512.5 million already collected through 2004 for decommissioning Palisades (representing over \$701 million in 2020 dollars and well above the \$644 million total cost estimated by Holtec).³⁵

15. One of the key costs identified by NMC in its NRC filing on fuel management costs was a \$6 million annual cost (2003 dollars) for spent fuel management of the Independent Spent Fuel Storage Installation (ISFSI) at Palisades.³⁶ This annual cost escalated to 2020 dollars is \$8.44 million and was estimated by TLG based on actual costs at decommissioning facilities, estimated

nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, Appendix B, TLG's Site-Specific Decommissioning Cost Study Executive Summary And Table 3, page xii (MPSC Case No. U-14150, Official Exhibit A2, p 51).

³⁴ In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, September 20, 2005 MPSC Order; January 3, 2005 Settlement Agreement, p 2. The Palisades and BRP facilities were sold to Entergy at which point all ratepayer contributions ceased. A fraction of the NDT was transferred to Entergy (predicated on growth through continued operation through licensed end-of-life) and the remainder used to benefit ratepayers.

³⁵ In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, Appendix D, Administrative and Incidental Expenses, Exhibit A-4 (MPSC Case No. U-14150, Official Exhibit A2, p 83).

³⁶ NMC letter to U.S. NRC dated April 21, 2006, "Irradiated Fuel Management Plan and Preliminary Decommissioning Cost Estimates for Palisades Nuclear Plant" (ML061140185), Enclosure 1 p 3 of 3.

costs for facilities similar to Palisades, and engineering judgment.³⁷ This \$8.44 million per year is significantly greater than the \$1.7 million per year (2020 dollars) estimated by Holtec for comparable years (2027 through 2029).³⁸ No explanation has been provided for this 80% reduction in estimated annual costs for spent fuel management.

16. Actual costs are available for the BRP ISFSI, which consists of a single concrete storage pad.³⁹ The Palisades ISFSI currently consists of two concrete storage pads, which the Holtec PSDAR states will be consolidated following shutdown.⁴⁰ The Holtec DCE also includes a schedule for pad construction.⁴¹ It is not clear from the DCE whether this is an expansion of one of the existing pads or construction of a new pad. Nonetheless the Holtec estimated cost for maintaining the Palisades ISFSI is 35% less than the actual BRP cost.⁴² No explanation has been provided for this reduced spent fuel management cost.

B. Unreasonable spent fuel management assumptions which could grossly understate actual management costs.

17. The Attorney General incorporates the allegations in subparts A and C through I of Contention MI-1 as if fully set forth herein.

³⁷ *Id.*

³⁸ Holtec DCE, p 46.

³⁹ LTA, Attachment E, p 8.

⁴⁰ Holtec PSDAR, p 9.

⁴¹ Holtec DCE, p 45.

⁴² LTA, PDF p 262 shows an actual ISFSI cost of \$2.6 million for BRP in 2019 and an estimated cost of \$2.7 million for 2020.

18. The Attorney General incorporates the accompanying Declaration of Nicholas Capik.⁴³

19. Holtec assumes that all spent fuel will remain on site until it is transferred to the Department of Energy (DOE), with Holtec incurring annual operating and maintenance costs of approximately \$1.7 million per year.⁴⁴ Holtec further assumes that this transfer of spent fuel to DOE will take place between 2030 and 2040.⁴⁵ Transfer of spent fuel off the Palisades site to a different, non-DOE interim storage facility does not transfer title from Holtec and therefor does not eliminate Holtec's obligation to safely manage this fuel nor incur its continuing costs. The only way to eliminate continuing activities and costs is for DOE to take title to the fuel. This assumed acceptance schedule is not reasonable given DOE's current progress in licensing a repository.⁴⁶

20. The DOE Standard Contract calls for acceptance of spent nuclear fuel on an oldest fuel first basis. That means that allocations for acceptance are generated when fuel is permanently removed from a reactor. These allocations are

⁴³ Capik Decl., ¶¶ 12–15.

⁴⁴ Holtec DCE, pp 12 and 46. Spent fuel management costs increase after 2029 for transferring spent fuel to DOE.

⁴⁵ Holtec DCE, pp 21–22. Holtec references a 2013 DOE plan to implement a pilot program with a goal of accepting spent fuel by 2025. Holtec notes that virtually no progress has been made in the eight years since that plan was issued yet assumes only a five-year delay in implementation of those plans. DOE is not currently working on a pilot interim storage facility nor is there any expectation of such work in the near future.

⁴⁶ It is not reasonable to assume DOE operates an interim storage facility in the near term given the linkage of such a facility to construction of a repository in the Nuclear Waste Policy Act. DOE/RW-0596, Report to Congress on the Demonstration of the Interim Storage of Spent Nuclear Fuel from Decommissioned Nuclear Power Reactor Sites, December 2008, p 7.

measured in metric tons of uranium per the Standard Contract. Beyond Holtec's implausible 2030 start date, the acceptance schedule for spent fuel by DOE that has been upheld by the Court calls for acceptance of 18,600 metric tons of uranium in the first 10 years of repository operation.⁴⁷ It is generally assumed that operation beyond the first 10 years will continue with an acceptance rate of 3,000 metric tons of uranium per year. At these rates and given the amount of spent fuel projected to be covered by the Standard Contract, the last of Palisades spent fuel will not be removed for about 34 years after DOE acceptance commences.⁴⁸ Even assuming a 2030 DOE start date (which is unreasonable), the last Palisades spent fuel would not be accepted by DOE until about 2064. By comparison, in 2003 in support of its ratemaking submittals, Consumers Energy Company (the then-current Palisades owner) assumed a 2013 start and a 2048 final acceptance, for a nearly-identical acceptance period of 35 years.⁴⁹

⁴⁷ DOW/RW-0146, Annual Capacity Report, June 1987, Office of Civilian Radioactive Waste Management, p v.

⁴⁸ The U.S Energy Information Administration identifies 70,000 metric tons of uranium being discharged and stored at 118 commercial U.S. reactors through June 2013. Assuming continued generation at 2,000 metric tons of uranium per year results in about 88,000 metric tons of uranium discharged by the time of Palisades final discharge. 18,600 metric tons are accepted in the first 10 years, leaving almost 70,000 metric tons to be accepted before all Palisades fuel is removed. At 3,000 metric tons per year this requires about 34 years in total.

⁴⁹ In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, p 18 (MPSC Case No. U-14150, Official Exhibit A2, p 29).

21. While the Standard Contract does have provisions that could potentially be used to accelerate acceptance dates, there is no basis to assume that such provisions can be utilized, nor that these provisions would be available without a significant cost.⁵⁰ No discussion or accounting for this substantial uncertainty appears in the Holtec DCE.

22. Given both the implausible 2030 DOE start date and the shortened 11-year acceptance period, the resulting spent fuel assumptions in the Holtec DCE are unreasonable and significantly understate spent fuel management costs.

C. Calculated decommissioning costs that are substantially smaller than the NRC generic formula and actual performance at other sites.

23. The Attorney General incorporates the allegations in subparts A, B, and D through I of Contention MI-1 as if fully set forth herein.

24. The Attorney General incorporates the accompanying Declaration of Nicholas Capik.⁵¹

25. NRC regulations require that during operation a licensee demonstrate adequate decommissioning funding assurance to a generic formula contained in 10

⁵⁰ The two provisions are granting priority for shutdown reactors and exchanges of approved DOE delivery commitment schedules. The industry has previously rejected the priority provision and there is no evidence that the second provision is feasible given the continuing need for on-site storage. DOE/RW-0596, Report to Congress on the Demonstration of the Interim Storage of Spent Nuclear Fuel from Decommissioned Nuclear Power Reactor Sites, December 2008, page 5 (“The Department has been asked, on numerous occasions, to exercise its discretion ... to allow for the priority acceptance of SNF from decommissioned reactors. In all instances, the Department has declined to grant this priority, noting that doing so would ... adversely affect the timely removal of SNF from operating reactor sites.”)

⁵¹ Capik Decl., ¶¶ 16–17.

C.F.R. § 50.75. For Palisades, Holtec calculates this value as \$443 million for an immediate decommissioning approach (typically called DECON).⁵² The purpose of this generic formula is to ensure that the licensee is providing assurance for the “bulk” of funds needs to complete decommissioning.⁵³ The generic formula does not, nor is it designed to, provide a conservative bound to ensure sufficient funding is obtained. Nonetheless, even with this “bulk” standard, Holtec’s estimated site-specific decommissioning cost estimate for license termination activities is no larger than \$402.5 million and at least nine percent smaller than the “bulk” standard.⁵⁴ Historically the “bulk” standard has understated actual license termination costs by 16 to 42%.⁵⁵

⁵² LTA, p 18, fn 1.

⁵³ GAO-12-258, United States Government Accountability Office, Report to the Honorable Edward J. Markey, House of Representatives, NRC’s Oversight of Nuclear Power Reactors’ Decommissioning Funds Could Be Further Strengthened, Summary.

⁵⁴ Holtec’s calculated license termination cost is \$443.215 million including \$40.668 million in dormancy costs from 2026 through 2034). Holtec DCE, p 46. Arguably most of the 2035 costs should also be included in dormancy. In addition, ISFSI demolition costs in 2041 are funding per 10 CFR 72.30 and should be excluded. Thus, Holtec’s license termination costs could be as small as \$387.3 million.

⁵⁵ Compare Yankee Rowe’s \$623 million actual cost to the generic rule amount in 2010 of \$363 million which is a 42 percent understatement. Similarly, Haddam Neck’s \$674 million actual compares to a \$418 million generic rule amount for a 38% understatement, and Maine Yankee’s \$540 million actual compares to a \$453 million generic rule amount for a 16% understatement (all costs in 2010 dollars and rule amounts calculated in 2010). Attempts to perform a similar calculation for other plants, including Rancho Seco and San Onofre Unit 1 are complicated by the decommissioning method used for both facilities (which involved a storage period). An independent analysis of 12 reactors by GAO found that the NRC formula captured 57 to 91 percent of estimated site-specific costs for nine reactors. GAO also noted that the site-specific estimates were as much as \$362 million more than the NRC generic formula would have predicted at that time. GAO-12-258, United States Government Accountability Office, Report to the Honorable Edward J.

26. To date, Holtec is performing or pursuing six decommissioning projects spread across four states. Holtec has not yet completed, nor made substantial progress towards completing, any of these six projects. No other vendor in the United States has ever attempted to decommission six nuclear reactors simultaneously. While this approach could offer efficiencies, any such cost savings has yet to be realized. As a result, and absent additional support, Holtec's projected decommissioning cost not only understates the generic formula but also actual historical experience. As a result it is unreasonable.

D. Use of an inadequate and unprecedented contingency.

27. The Attorney General incorporates the allegations in subparts A through C and E through I of Contention MI-1 as if fully set forth herein.

28. The Attorney General incorporates the accompanying Declaration of Nicholas Capik.⁵⁶

29. Contingency funding is included in decommissioning cost estimates to address inherent uncertainty. Holtec has included a 25 percent contingency on ISFSI decommissioning costs consistent with the NUREG 1757 evaluation criteria key assumption that cost estimates apply a contingency factor of at least 25 percent to the sum of all estimated costs.⁵⁷ For the costs beyond ISFSI decommissioning, Holtec instead applies a 12 percent contingency.⁵⁸ Holtec states that this level of

Markey, House of Representatives, NRC's Oversight of Nuclear Power Reactors' Decommissioning Funds Could Be Further Strengthened, pp 13–14.

⁵⁶ Capik Decl., ¶¶ 18–19.

⁵⁷ Holtec DCE, p 23.

⁵⁸ Holtec DCE, p 41.

contingency was determined to reasonably bound the universe of risks that should be considered.⁵⁹ No evidence was provided to support this contention, and this level of contingency is not consistent with industry norms.⁶⁰ By comparison, Holtec used a 15 percent contingency allowance for its Oyster Creek estimate, a 17 percent contingency for its Pilgrim estimate, and 18 percent for its Indian Point estimate (the same reactor type as Palisades).

30. Increasing the Holtec contingency consistent with recent industry norms (using the 17.15 percent average value from Crystal River, Fort Calhoun, and Monticello) would add about \$29 million to the DCE, which would exceed the NDT funding available for decommissioning. Using the 18 percent contingency from Indian Point would add \$34 million to the DCE, further exceeding the NDT funding available.

E. Potentially understated radioactive waste volume and shipment approach outside the bounds of NRC evaluations.

31. The Attorney General incorporates the allegations in subparts A through D and F through I of Contention MI-1 as if fully set forth herein.

⁵⁹ *Id.*

⁶⁰ *See, e.g.*, Crystal River Nuclear Generating Station Unit 3 Site Specific Decommissioning Cost Estimate (May 2018), Appendix C, Table C (last page) (ML18178A181) (18.2% contingency allowance); Fort Calhoun Station Site-Specific Decommissioning Cost Estimate (attached to PSDAR) (Feb. 2017), Appendix C, Table C (last page) (ML17089A59) (16.33% contingency allowance); Decommissioning Cost Analysis for the Monticello Nuclear Generating Plant, Appendix D, Table D (last page) (Oct. 2014) (ML16005A105) (16.94% contingency allowance). One outlier is Three Mile Island Unit 1 which includes a 12.9% contingency but on a \$1,228 million estimate (approximately double that of Holtec's Palisades estimate).

32. The Attorney General incorporates the accompanying Declaration of Nicholas Capik.⁶¹

33. Holtec's DCE assumes the total radioactive waste volume for Classes A, B, and C low-level radioactive waste will be 92 million pounds.⁶² This waste quantity is significantly smaller than other actual decommissioning projects, including 246 million pounds of low-level radioactive waste at Maine Yankee and 265 million pounds of low-level radioactive waste at Haddam Neck.⁶³ Understating the low-level radioactive waste volume could lead to substantially increased costs over those included in the Holtec DCE. Given Holtec's average disposal cost, an increase in waste volume from the assumed 92 million pounds to the 246 million pounds removed from Maine Yankee would increase disposal costs by \$57.9 million, or 167 percent, much greater than the 12 percent contingency included by Holtec. No detail has been provided by Holtec to evaluate the assumptions leading to this total waste volume or why the total waste volume would deviate so significantly from past decommissioning projects.

34. The Holtec PSDAR states that radioactive waste will be transported from the Palisades site using truck and potentially barge or rail (with a transfer

⁶¹ Capik Decl., ¶¶ 20–21.

⁶² Holtec DCE, Table 3-6, p 36.

⁶³ Both Maine Yankee and Haddam Neck (also known as Connecticut Yankee) were pressurized water reactors, the same type of reactor as Palisades. Maine Yankee was approximately the same generating capacity as Palisades while Haddam Neck was smaller.

EPRI Report 1013511, Connecticut Yankee Decommissioning Experience Report, Detailed Experiences 1996-2006, Table A-1.

EPRI Report, Maine Yankee Decommissioning Experience Report, Detailed Experiences 1997-2004, Table E-1.

facility since the rail spur does not extend to the Palisades site).⁶⁴ Michigan residents will likely be harmed if decommissioning waste is transported from Palisades by truck. For example, frequent waste shipments over local roads will affect traffic flow, cause noise, dust, and pollution emissions, increase the possibility of accidents on local roads, and damage local infrastructure. Based on the use of trucks to transport waste, with the estimated Palisades waste volume and weight shown on Table 3-6 of the Holtec DCE (excluding GTCC), the number of truck shipments required would be about two and a half times as many as evaluated in the NRC generic environmental statement (GEIS) for decommissioning. The GEIS states that with expected truck shipments averaging much less than one per day there would be no detectable or destabilizing effect on traffic flow or road wear. However, the Palisades waste volume could result in over 1.8 shipments per day on average, much greater than “much less than one per day” identified in the GEIS.⁶⁵ 10 C.F.R. § 50.82(a)(6) requires that no decommissioning activities that result in significant environmental impacts be performed unless previously reviewed by the NRC. The Entergy and Holtec License Transfer Application (LTA) does not address how the planned Palisades activities will conform to the GEIS, nor does it identify any evaluation performed to address activities beyond those evaluated in the GEIS. The Holtec PSDAR simply asserts without basis that activities are bounded by the

⁶⁴ Holtec PSDAR, p 11. Additional shipments will be required for non-radiologically but hazardous waste and have not been addressed in these calculations. Based on historical projects, these shipments could be substantial.

⁶⁵ NUREG-0586, Supplement 1, Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Table 4-6 (Nov. 2002) (ADAMS Accession No. ML18057B048).

GEIS and that these shipments will not result in changes to local traffic or damage to local infrastructure.⁶⁶

F. Risks that have not been addressed in the DCE.

35. The Attorney General incorporates the allegations in subparts A through E and G through I of Contention MI-1 as if fully set forth herein.

36. The Attorney General incorporates the accompanying Declaration of Nicholas Capik.⁶⁷

37. As explained in detail below, there are at least seven 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.

38. First, there will likely be delays in the work schedule leading to increased costs for overhead and project management.

39. The risk of delay in the decommissioning schedule exists in all decommissioning projects for reasons including identifying unknown conditions requiring expanding the scope of planned activities or creating the need for additional activities. Such identification of unknown conditions will not only increase the direct cost of decommissioning activities, but the schedule delay will also lead to unaccounted for increased costs for overhead and project management since such costs are closely connected to the project duration.

⁶⁶ Holtec PSDAR, pp 18 and 35.

⁶⁷ Capik Decl., ¶¶ 22–31.

40. Not only does the risk of schedule delay exist in all decommissioning projects but for at least one Holtec decommissioning project, substantial schedule delay has become a reality. Holtec obtained NRC approval to acquire Pilgrim Nuclear Power Station (PNPS) on August 22, 2019 based on an LTA that included a decommissioning schedule for license termination and site restoration of about 5.5 years. Holtec closed on the acquisition of PNPS on August 26, 2019 and 80 days later in a presentation dated November 16, 2019 identified a delay that would increase the PNPS decommissioning schedule by 2.5 to 3 years resulting in a schedule length of about 8 years. Thus, in about 80 days from the acquisition of PNPS, Holtec had identified a schedule increase of about 50 percent. Holtec did not identify the reasons for the dramatic schedule delay or the anticipated cost impact. However, based on cost information provided in the PNPS LTA the increase in overhead and project management arising from the delay can be estimated to be as much as \$100 million. The schedule presented in the Palisades LTA has 6 years for license termination and site restoration following dormancy. A similar risk for schedule growth exists at Palisades as has already happened at PNPS.

41. Second, state requirements beyond those assumed by Holtec 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.

42. This is true because the Holtec plan includes spending funds on site restoration activities prior to the completion of license termination activities. Based

on the cashflow in the DCE, Holtec plans to use NDT funds for site restoration prior to the completion of license termination. Accordingly, site restoration activities will be performed in parallel with license termination. Michigan site restoration requirements beyond those assumed in the Holtec estimated costs would result in a reduction of the funds for radiological decontamination and license termination. As a result, there could be increased costs for overhead and staffing. The limited information in the LTA, PSDAR, and DCE does not identify the assumed requirements for site restoration or any provision for contingency or allowances to account for any state requirements being beyond those assumed. Increased site restoration costs beyond those assumed by Holtec could impact the overall adequacy of the NDT to cover all license termination and spent fuel management activities. Without sufficient detail from Holtec about its assumptions, no independent review can be made concerning the adequacy of the Holtec DCE. It is important to note, however, that the previous Palisades owner estimated site restoration costs at \$78.3 million (2003 dollars), or \$110.1 million (2020 dollars). This site-specific estimate significantly exceeds Holtec's \$34.7 million dollar estimate. Holtec has not provided any explanation or basis for this 69% reduction in estimated costs.

43. Third, there is the possibility of discovering previously unknown radiological or non-radiological contamination.

44. The limited information in the LTA and PSDAR does not identify the specific plans for performing site characterization activities to identify, categorize, and quantify radiological and non-radiological contamination. Complete site

characterization is necessary to determine the extent of radiological and non-radiological contamination and to establish the work needed for decommissioning and restoring Palisades. However, some characterization cannot be completed until some amount of dismantlement is performed. As a result, even if all the characterization work currently possible has been completed, the possibility of finding unexpected contamination later in the decommissioning process remains. Unexpected radiological or non-radiological contamination could significantly increase the cost of decommissioning. The limited information in the LTA, PSDAR, and DCE does not identify any allowance or provision for dealing with the finding of unexpected contamination or contamination greater than currently being assumed by Holtec. The common application of contingency in cost estimates is for uncertainty associated with known scope and is not intended to account for changes in work scope such as adding additional work required to deal with unexpected contamination. Holtec does not provide sufficient detail in its calculation of contingency to evaluate whether any contingency is included for this purpose.

45. Fourth, there is a risk of a radiological incident at the site (for instance, during the transfer of spent nuclear fuel into dry casks).

46. Although the likelihood of a radiological incident decreases once fuel is removed from the reactor, there is still a risk of such an incident when decommissioning a nuclear power plant. For example, there is a risk of an incident during the transfer of spent fuel to dry casks. Such an incident could greatly increase the costs of decommissioning. 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 spent almost one year and considerable resources evaluating this incident and taking actions to ensure that the transfer of spent fuel to dry storage could be completed safely. In addition to the substantial cost for resolving issues arising from such an incident, there will be delay costs for the fuel transfer personnel as well as added overhead and project management costs.

47. Fifth, absent a change to the Standard Contract, Holtec will have to repackage spent nuclear fuel into non-canistered DOE casks prior to transportation to an off-site storage facility or repository.

48. The decommissioning costs presented in the LTA and DCE appear to be consistent with assuming that DOE will accept the canisters in the casks at Palisades at the time of DOE performance in the as-packaged canisters for dry storage and will not require repackaging for transportation. Entergy and other licensees have argued before the U.S. Court of Federal 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.⁶⁸ DOE has also stated that, absent a change to the Standard Contract, it will not accept canistered

⁶⁸ See *e.g.*, *System Fuels, Inc. v. United States*, 818 F.3d 1302, 1306-07 (Fed. Cir. 2016). This is not an issue of whether or not a cask can physically accept the loaded canisters, but rather the contractual obligations from the DOE Standard Contract.

fuel and that fuel must be removed from these canisters and loaded into a non-canistered DOE transportation cask.⁶⁹ If Entergy is correct and DOE were to mandate fuel repackaging, this could cause Holtec to incur significant and apparently unaccounted-for expenses. The cost overrun for repackaging would be exacerbated by the fact that this would occur after the Palisades spent fuel pool has been decommissioned. 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, neither 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.⁷⁰ There would be operating costs to remove the fuel from the current casks and then to package that fuel into DOE provided transportation casks. There is no indication in the LTA that indicates the assessment of funding adequacy accounts for these potential costs.

49. Sixth, DOE may seek 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.

50. Even if DOE accepts the spent nuclear fuel for transportation without repackaging, DOE may then pursue recovery from Holtec for past payments that

⁶⁹ *Ibid.*

⁷⁰ 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>.

DOE made for the original packaging of Palisades 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. It is unclear from the limited information currently available if any type of risk allowance has been included in the estimated costs to account for costs that might be recovered by DOE or how Holtec otherwise would compensate for the substantial cost increase from such a recovery by DOE.

51. Seventh, Holtec's obligation may be 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 2040, as Holtec assumes in its DCE.

52. The DCE assumes that all fuel will be removed from Palisades by 2040. There is no certainty for such an assumption since DOE has not yet started accepting spent fuel and the ability to meet any date for DOE to start is dependent of actions beyond DOE's control. If DOE fails to pick up the spent fuel by the end of 2040, Holtec will begin incurring significant and ongoing cost overruns for spent fuel management that could go on for decades. The NRC's Continued Storage Rule (NUREG-2157) referenced by Holtec in its PSDAR for Palisades, which it thereafter essentially ignores, 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 Palisades, there would no longer be a spent fuel pool to effectuate the repackaging once the fuel is moved to dry storage and the plants are decommissioned. It is unknown how Holtec would provide for the possible contingency of indefinite onsite storage, including all safety and environmental concerns regarding transferring fuel into new dry casks every 100 years.

G. Method and cost to transport storage-only fuel canisters off site.

53. The Attorney General incorporates the allegations in subparts A through F, H and I of Contention MI-1 as if fully set forth herein.

54. The Attorney General incorporates the accompanying Declaration of Nicholas Capik.⁷¹

55. The Palisades site was one of the earliest sites to use dry cask storage. During that time, 18 VSC-24 storage casks were loaded that were licensed to store spent nuclear fuel but not transport that fuel. The canisters in these VSC-24 casks are not currently licensed as part of any transportation system and cannot be moved off site under current regulations. While some work was performed over a decade ago to pursue a license for transport of the VSC-24 canisters, this work was never completed. As a result, either the spent fuel from these 18 VSC-24 canisters must be reloaded into licensed transportable canisters or additional work must be performed to license these canisters for transportation (assuming that this licensing

⁷¹ Capik Decl., ¶ 32.

is even feasible). There is no evidence that any cost has been included for this work or assessment of risk presented on this issue.

H. Unrealistic NDT growth rate assumptions;

56. The Attorney General incorporates the allegations in subparts A through G and I of Contention MI-1 as if fully set forth herein.

57. The Attorney General incorporates the accompanying Declaration of Nicholas Capik.⁷²

58. Holtec provides a cashflow assuming all estimated costs (license termination, spent fuel management, and site restoration) are funded from the NDT transferred from Entergy.⁷³ Holtec assumes that NDT funds will grow at a two percent per year real rate (actual return minus inflation) consistent with the upper limit allowed by NRC regulations. Even with these assumptions, the funds remaining at the projected end of decommissioning are \$19.8 million.⁷⁴ Correction of the implausible and unreasonable assumptions discussed above would result in substantial cost increases which easily exceed the funds available in the NDT.

59. During reactor operation NDT funds are often invested in a manner making the two percent real growth assumption permitted by the NRC reasonable. Even so, continued growth on a year-by-year basis is not a certainty. For example,

⁷² Capik Decl., ¶¶ 33–36.

⁷³ LTA, Attachment E, p 5.

⁷⁴ Holtec DCE, p 46.

the Palisades NDT shrank from \$252.9 million on April 30, 2007 to \$218.8 million on December 31, 2008, a loss of over 12 percent.⁷⁵

60. Even with the typically more aggressive investment strategy during operation, the Palisades NDT only grew at an annual rate of 1.9 percent from April 2007 through December 2010 (from \$252.9 million to \$271.2 million in 2010). During this same period (2007 through 2010), inflation averaged 1.6 percent on an annual basis, resulting in a real NDT growth of 0.3 percent.⁷⁶ Thus, the two percent real growth assumption would not have been reasonable for Palisades for this period of operation. Similarly, prior to the transfer to Entergy, the Palisades qualified NDT suffered losses in four separate years, including each year from 2000 to 2002.⁷⁷

61. This two percent real growth assumption is even less reasonable following permanent shutdown when NDT funds are de-risked and invested more conservatively.⁷⁸ Assuming the qualified NDT tax rate remains 20 percent, a two

⁷⁵ Safety Evaluation by the Office of Nuclear Regulatory Regulation Application for Indirect Transfer of Facility Operations Licenses Due to Entergy Corporation Restructuring (ML081080352), Enclosure 2, page 16. Entergy letter to U.S. NRC dated March 31, 2011, Status of Decommissioning Funding, Attachment 11.

⁷⁶ The latest NDT balance was reported by Holtec as \$552 million on December 2, 2020. It is unclear whether any capital gains due on 2020 earnings are included in this total.

⁷⁷ In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, p 7 (MPSC Case No. U-14150, Official Exhibit A2, p 18).

⁷⁸ For example, even with the extended SAFSTOR project assumed by Consumers, the Palisades NDT was invested in 45% equity and 55% fixed income during operation and was to be invested in 30% equity and 70% fixed income after final

percent annual inflation rate would require fund earnings to be five percent before taxes (after fees). This level of return is not consistent with how decommissioning trust funds have been invested following permanent shutdown making use of this assumption unreasonable given the circumstances.

I. Inability to provide additional financial assurance beyond the underfunded NDT.

62. The Attorney General incorporates the allegations in subparts A through H of Contention MI-1 as if fully set forth herein.

63. The Attorney General incorporates the accompanying Declaration of Nicholas Capik.⁷⁹

64. Holtec proposes that Holtec Palisades own the Palisades and BRP assets and liabilities, including the NDT. The only source of funds available to Holtec Palisades will be the NDT. Holtec asserts that the NDT contains adequate funds for all required activities, but that should a shortfall occur, an alternate funding mechanism will be put in place. No support is provided for how such a mechanism would or could be funded. No analysis has been provided of any Holtec Palisades assets beyond the NDT that could provide or support such funding.

shutdown. In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, p 6 (MPSC Case No. U-14150, Official Exhibit A2, p 17).

⁷⁹ Capik Decl., ¶¶ 37–40.

65. Holtec states that reimbursement of spent fuel management expenses by DOE would provide a substantial source of additional funds if needed.⁸⁰ No analysis is provided to support this statement, nor any commitment made by Holtec to retain these reimbursements.

66. Even so, following the dormancy period, the expected DOE recovery would largely be limited to the on-going costs of spent fuel management and even if retained would not offset any substantial overrun in decommissioning costs.⁸¹ Using the \$1.7 million per year identified by Holtec as the spent fuel management cost during dormancy, the total DOE recovery during license termination activities from 2036 through 2040 would only be about \$8.5 million, and only sufficient to offset continuing ISFSI operating and maintenance costs. Thus, retention of these funds would not substantially mitigate any potential cost overruns.

67. Another alternative suggested to mitigate a funding shortfall is the cessation of decommissioning activities and return of the facility to a long-term storage condition to allow NDT funds to grow. However, even accepting the two percent real rate of return assumed by Holtec, NDT funds during dormancy are only projected to grow at the rate of about \$600,000 per year, or 0.17% per year (using 2027 to 2028 as an example).⁸² At this growth rate, there is no certainty that sufficient time is available in the 60-year NRC limit to decommission the site to allow sufficient fund growth for any potential cost overruns.

⁸⁰ Holtec DCE, p 44.

⁸¹ Whether any of the cost of loading DOE-supplied transportation casks could be recovered from DOE is uncertain.

⁸² LTA, Attachment E, p 5.

MI-2

The PSDAR impermissibly assumes Holtec will receive a regulatory exemption authorizing the use of decommissioning trust monies for site restoration and spent fuel management. Since Holtec has yet to receive such an exemption and has shown no other source of funding for site restoration and spent fuel management, it fails to satisfy NRC regulations at 10 C.F.R. §§ 50.54(bb) and 72.30(b).

1. According to the Applicants, Holtec plans to spend approximately \$35 million on site restoration activities and an additional \$166 million on spent fuel maintenance activities.⁸³ In all, Holtec plans to spend over \$200 million on non-decommissioning activities, or more than *one third* of the current balance of the Palisades decommissioning trust.

2. NRC rules prohibit the use of decommissioning funds for purposes other than for radiological decommissioning.⁸⁴

3. The cost analysis upon which Holtec bases its financial qualification and decommissioning financial assurance representation assumes NRC will grant an exemption from 10 C.F.R. § 50.82(a)(8)(i)(A). Because this has not occurred, the HDI decommissioning cost estimate is speculative and unreliable.

4. Until Holtec obtains a final, non-appealable order granting an exemption from 10 C.F.R. § 50.82(a)(8)(i)(A) and authorizing it to expend decommissioning trust monies on non-decommissioning activities, it must establish that it is financially qualified to hold the Palisades license⁸⁵ and that it has the

⁸³ See LTA, Attachment E, pp 2–4.

⁸⁴ See 10 C.F.R. §§ 50.2, 50.82(a)(8)(i)(A).

⁸⁵ See *id.* § 50.33(f).

independent means to fund spent fuel management activities and decommission the Palisades ISFSI as required by NRC regulations at 10 C.F.R. §§ 50.54(bb), 50.82(a)(8)(vii), and 72.30(b).

5. Further, while Holtec claims the potential recovery of substantial additional funds in spent fuel management expenses from DOE represents a conservatism in their cost estimate,⁸⁶ it does not commit to use the recovered funds to defray decommissioning or site restoration expenses or replenish the trust funds.

SUPPORTING EVIDENCE

6. The Attorney General incorporates the accompanying Declaration of Nicholas Capik as if fully set forth herein.

7. To “decommission” under the NRC rules means “to remove a facility or site safely from service and reduce residual radioactivity to a level that permits,” as relevant here, “[r]elease of the property for unrestricted use and termination of the [NRC] license.”⁸⁷

8. The regulatory definition of decommissioning excludes site restoration and spent fuel management activities.⁸⁸

9. NRC rules require power reactor licensees to provide spent fuel management funding assurance until DOE takes title to and possession of all spent nuclear fuel at the reactor.⁸⁹ ISFSI licensees must submit a decommissioning plan

⁸⁶ See LTA at 18.

⁸⁷ 10 C.F.R. § 50.2.

⁸⁸ See General Requirements for Decommissioning Nuclear Facilities, 53 Fed. Reg. 24018, 24019 (June 27, 1988); see also 10 C.F.R. §§ 50.2, 50.82(a)(8)(i)(A).

⁸⁹ See 10 C.F.R. § 50.54(bb).

demonstrating adequate funding for ISFSI decommissioning following the removal of all spent nuclear fuel and reactor-related greater-than-Class-C (GTCC) waste from the site.⁹⁰

10. NRC regulations authorize the granting of exemptions from regulatory requirements under certain circumstances.⁹¹ While the Applicants indicate that Holtec has sought an exemption from 10 C.F.R. § 50.82(a)(8)(i)(A) to allow them to use decommissioning trust monies for site restoration and spent fuel management purposes,⁹² the exemption request has not been approved.

11. Until Holtec establishes that it is in fact entitled to such an exemption, NRC rules require that it show it is financially qualified to hold the Palisades license and establish adequate financial assurance for spent fuel management and ISFSI decommissioning without resort to the funds currently in the Palisades nuclear decommissioning trust.⁹³ Neither the license transfer application nor the PSDAR indicates how Holtec would fund these non-decommissioning commitments without recourse to the trusts.

12. Accordingly, Holtec fails to carry its burden to show that it is financially qualified to hold the Palisades license under 10 C.F.R. § 50.33(f). Holtec also fails to carry its burden to show adequate funding for spent fuel management or ISFSI decommissioning as required under 10 C.F.R. §§ 50.54(bb) and 72.30.

⁹⁰ See *id.* §§ 72.30(a)–(b).

⁹¹ See *id.* § 50.12.

⁹² See LTA at 18.

⁹³ See 10 C.F.R. §§ 50.33(f), 50.54(bb), 72.30(b).

13. In addition and evidently, insofar as Holtec proposes to spend decommissioning trust fund monies on costs that are not license termination costs, it violates 10 C.F.R. § 50.82(a)(8)(i)(A) unless an exemption is granted.

14. Moreover, to the extent Holtec spends money on spent fuel management (which money, absent a final, non-appealable exemption, cannot be drawn from the Palisades decommissioning trust), it will be able to recover the bulk of those costs in litigation with the Department of Energy (DOE).⁹⁴ While the Applicants claim the existence of the DOE recoveries bolsters the Holtec's financial qualifications,⁹⁵ they fail to note that Holtec nowhere commits to return such recoveries to the trust funds or otherwise ensure their availability to Holtec if and when additional license termination, site restoration, or spent fuel management funds are needed. If Holtec ultimately obtains an exemption to use trust fund monies to pay spent fuel management costs but is not required to reimburse the trusts for monies so used—that is, if HDI is allowed to treat the DOE recoveries purely as a revenue stream—the recoveries will become a profit windfall realized by HDI before it has satisfied the entirety of its decommissioning and site restoration obligations. Absent a requirement that Holtec return any DOE recoveries to the trust funds, Holtec fails to show it is financially qualified to complete license termination and site restoration activities and manage spent nuclear fuel at Palisades.

15. The Palisades decommissioning trusts were funded by Michigan ratepayers for the sole purpose of underwriting radiological decontamination at the

⁹⁴ See, e.g., *System Fuels, Inc. v. United States*, 818 F.3d 1302, 1304 (Fed. Cir. 2016).

⁹⁵ See LTA at 18.

facility. The Commission should not allow Holtec to divert decommissioning trust fund monies to shareholders by granting an unconditioned future exemption. At the very least, if it chooses to approve the license transfer application, the Commission should mandate that Holtec ensure adequate financial qualification and decommissioning financial assurance by returning the anticipated DOE recoveries to the nuclear decommissioning trusts or to a supplemental trust for use in the likely event of an unanticipated cost overrun. In that case, the DOE recoveries would serve as the collateral necessary for the additional financial assurance required under 10 C.F.R. §§ 50.82(a)(8)(vi) and (vii)(C). Once the facility has been satisfactorily decommissioned and the site restored, and once all spent nuclear fuel has been delivered to DOE, any remaining recoveries can be released to Holtec.

CONCLUSION

1. Given the nonstandard risks associated with nuclear powerplant decommissioning and related activities, the consequences of which may not be apparent for decades, and in view of the structure of the proposed transfer, the Applicant's sole reliance on the trust funds to demonstrate financial qualification does not meet regulatory standards.⁹⁶

2. In the likely event of a cost overrun, the license transfer application fails to establish that Holtec will be financially healthy enough to provide additional financial assurance as required pursuant to 10 C.F.R. §§ 50.82(a)(8)(vi) and (vii).

⁹⁶ See 10 C.F.R. § 50.33(f).

3. Due to these concerns and on behalf of the People of the State of Michigan, Attorney General Dana Nessel requests that the Commission require the Applicants to provide additional forms of financial insurance and allow her to intervene in the proceeding.

4. For the reasons stated, the Commission should grant the Attorney General's petition to intervene and associated request for hearing.

Respectfully submitted,

Dana Nessel
Attorney General
State of Michigan

Signed (electronically) by

/s/ Michael E. Moody

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Dated: February 24, 2021

2021-0312583-A Palisades/Petition to Intervene 2021-02-24 v3

⁹⁷ Pursuant to 10 C.F.R. § 2.304(e), the Attorney General designates Michael Moody, Assistant Attorney General, to receive service in this proceeding.

NUCLEAR REGULATORY COMMISSION
BEFORE THE SECRETARY

In the Matter of

ENTERGY NUCLEAR OPERATIONS, INC.;
ENTERGY NUCLEAR Palisades; HOLTEC
INTERNATIONAL; and HOLTEC
DECOMMISSIONING INTERNATIONAL,
LLC; APPLICATION FOR ORDER
CONSENTING TO TRANSFERS OF
CONTROL OF LICENSES AND APPROVING
CONFORMING LICENSE AMENDMENTS

Docket Nos.:
50-155
50-255
72-007
72-043

(Palisades Nuclear Plant and Big Rock Point)

CERTIFICATION OF SERVICE

Pursuant to 10 C.F.R. § 2.305, I certify that I served the Petition of the Michigan Attorney General for Leave to Intervene and for a Hearing in the above-captioned proceeding via the NRC's Electronic Information Exchange on February 24, 2021.

Signed (electronically) by

/s/ Michael E. Moody

Michael E. Moody
Assistant Attorney General
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Dated: February 24, 2021

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of)
)
)
ENTERGY NUCLEAR OPERATIONS,)
INC., ENTERGY NUCLEAR PALISADES,)
LLC, HOLTEC INTERNATIONAL, AND) Docket Nos. 50-255, 72-007, 50-155 &
HOLTEC DECOMMISSIONING) 72-043
INTERNATIONAL, LLC; CONSIDERATION)
OF APPROVAL OF TRANSFER OF)
LICENSE AND CONFORMING)
AMENDMENT)
)
(Palisades Nuclear Plant and Big Rock)
Point)

DECLARATION OF NICHOLAS J. CAPIK

I, Nicholas J. Capik, swear and attest under penalty of perjury the following declarations and statements as follows:

1. I am over the age eighteen and have personal knowledge of the facts stated herein and, if called as a witness, I am competent to testify accordingly.
2. I am President and Managing Director of Four Points Group, Incorporated (FPG). FPG is an engineering consulting firm engaged in providing services to the commercial power industry, specializing in all aspects of nuclear power. The services provided by FPG include decommissioning cost estimating and planning, decommissioning project oversight, decommissioning risk analysis, regulatory compliance, and cost estimating and analysis with respect to spent fuel management and disposition. I have over 35 years of experience in the nuclear power industry and have been involved in decommissioning cost estimating, planning, and execution since 1991.
3. I have a B.S. in Mathematics from the Pennsylvania State University. I have one year of post-graduate training in nuclear power from the United States Navy.

I served as an instructor for nuclear power theory and operation for the United States Navy. Following this role, I served on a U.S. nuclear submarine responsible for reactor operation and maintenance. I then served as a design engineer for the Seawolf class nuclear submarines, focusing on design, operation, management, and construction of nuclear and steam plant systems for this new reactor design. I was also responsible for technical and cost review and implementation of contract modifications related to the design and construction of nuclear supporting systems. After leaving the military in 1991 I served as an engineering and management consultant to the nuclear industry. In this role I performed many activities for nuclear utilities and regulators, including assessments of cost, performance, technical issues, and regulatory compliance. Related specifically to decommissioning, I performed numerous cost estimates for reactor decommissioning projects and provided specific oversight over a number of those projects. This oversight has included reviewing and evaluating performance of numerous decommissioning contractors and evaluating the cost and probability of unanticipated decommissioning risks. I have been involved in litigation of decommissioning costs and spent fuel management in the U.S. Court of Federal Claims and the U.S. Tax Court. I was also responsible for estimating the approach and cost for radiological cleanup of severe nuclear accidents for both domestic and international reactors. Additional information about my background and experience is included in my curriculum vitae, which I have attached to this declaration.

4. I have reviewed the filings related to the transfer of the Palisades Nuclear Plant (Palisades) and the Big Rock Point ISFSI (BRP) from Entergy to Holtec, including the application to transfer Renewed Facility Operating License No. DPR-20 for Palisades and License No. DPR-6 for BRP, submitted to the Nuclear Regulatory Commission (NRC) on December 23, 2020, and the Post Shutdown Decommissioning Activities Report (PSDAR) including the Site-Specific

Decommissioning Cost Estimate submitted to the NRC on December 23, 2020.¹ I have also reviewed the Entergy and Holtec joint presentation submitted to NRC for the Pre-Submittal Meeting on December 8, 2020, the Holtec Request for Exemptions from 10 CFR 50.82(a)(8)(i)(A) and 10 CFR 50.75(h)(1)(iv) dated December 23, 2020, as well as annual filings from Entergy to the NRC concerning decommissioning funding status pursuant to 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v), rate filings associated with Palisades, and other NRC filings associated with Palisades.

5. My testimony below is based on my experience in this field, and on information that is currently publicly available.
6. Based on my review I conclude that the assumptions used by Holtec to justify use of the Nuclear Decommissioning Trust (NDT) for purposes other than decommissioning, including spent fuel management and site restoration, are not plausible and as a result the Holtec estimated costs understate what will be the actual decommissioning costs. In the absence of additional financial assurance beyond the NDT, there is a substantial likelihood that funding will not be sufficient to perform all required activities.
7. These implausible assumptions include:
 - a. Estimated decommissioning costs that are substantially less than reasonable estimates accepted by Michigan in rate filings for Palisades (paragraphs 8 through 11);
 - b. Unreasonable spent fuel management assumptions which could grossly understate actual management costs (paragraphs 12 through 15);
 - c. Calculated decommissioning costs that are substantially less than the NRC generic formula and actual performance at other sites (paragraphs 16 and 17);

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 Palisades, LLC. Similarly, I use the term Holtec to refer to any of the Holtec entities, including Holtec International, Holtec Decommissioning International, LLC (HDI), and Holtec Palisades.

- d. Use of an inadequate and unprecedented contingency (paragraphs 18 and 19);
 - e. Potentially understated radioactive waste volume and shipment approaches that are outside the bounds of NRC evaluations (paragraphs 20 and 21)
 - f. Risks that have not been addressed in the DCE (paragraphs 22 through 31);
 - g. Method and cost to transport storage-only fuel canisters off site (paragraph 32);
 - h. Unrealistic NDT growth rate assumptions (paragraphs 33 through 36); and
 - i. Inability to provide additional financial assurance beyond the underfunded NDT (paragraphs 37 through 40).
8. The Holtec DCE represents a site-specific analysis performed by Holtec for Palisades. This DCE projects expenses of \$443,215,000 for license termination activities per 10 CFR 50.75, \$166,122,000 for spent fuel management activities, and \$34,679,000 for site restoration activities for a total cost of \$644,015,000 (all 2020 dollars).² By comparison, the previous site-specific DCE performed for Palisades by TLG Services, Inc. for Nuclear Management Company, LLC (NMC) and submitted to the NRC on April 21, 2006, projected total expenses (in 2020 dollars) of \$1,350,740,000, comprised of \$821,584,000 for license termination, \$419,020,000 for spent fuel management, and \$110,135,000 for site restoration.³

² Holtec Decommissioning International letter to U.S. NRC dated December 23, 2020, Subject "Post Shutdown Decommissioning Activities Report including Site-Specific Decommissioning Cost Estimate for Palisades Nuclear Plant" (Holtec PSDAR and DCE), DCE page 8.

³ In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150; Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, Appendix B, TLG's Site-Specific Decommissioning Cost Study Executive Summary And Table 3, page xiii (MPSC Case No. U-14150, Official Exhibit A2, <https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000000w61yAAA> page 52.) TLG provided costs in 2003 dollars. These 2003-dollar costs were \$584.1 million for license termination, \$297.9 million for spent fuel management, and \$78.3 million for site restoration. For comparison, these costs have been escalated to 2020 dollars using the Consumer Price Index for All Urban Consumers, which averaged 2.027% from 2003 to 2020. This same approach, escalation using the Consumer Price Index for All Urban Consumers, has been used for all year-dollar adjustments in this declaration.

No explanation has been provided by Holtec to support the 52% reduction in estimated costs nor is sufficient detail included in the Holtec DCE for an independent analysis of any factors that could support this 52% reduction in estimated costs.⁴

9. In 2005, the Michigan Public Service Commission (MPSC) authorized continued collection of annual contributions from ratepayers for the decommissioning of Palisades in the amount of \$5.5 million per year.⁵ This continued collection was in addition to the \$512.5 million already collected through 2004 for decommissioning Palisades (representing over \$701 million in 2020 dollars and well above the \$644 million total cost estimated by Holtec).⁶
10. One of the key costs identified by NMC in its NRC filing on fuel management costs was \$6 million annual cost (2003 dollars) for spent fuel management of the Independent Spent Fuel Storage Installation (ISFSI) at Palisades.⁷ This annual cost escalated to 2020 dollars is \$8.44 million and was estimated by TLG based on actual costs at decommissioning facilities, estimated costs for facilities similar

⁴ The Holtec DCE includes a 10-year dormancy period. The TLG estimate was for a SAFSTOR approach using a 12.5-year storage period. In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, Appendix B, TLG's Site-Specific Decommissioning Cost Study Executive Summary And Table 3, page xii (MPSC Case No. U-14150, Official Exhibit A2, p 51.)

As a result, while there will be differences, a gross comparison of costs is reasonable. One obvious difference is the cost of low-level radioactive waste burial. However, the TLG study included \$61.3 million in 2003 dollars (\$86.2 million 2020 dollars) for radioactive waste disposal compared to the Holtec cost of \$34.6 million (2020 dollars). Thus, this \$51.6 million decrease does not explain the \$378 million total decrease in license termination costs.

⁵ In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, September 20, 2005 MPSC Order; January 3, 2005 Settlement Agreement, page 2.

The Palisades and BRP facilities were sold to Entergy at which point all ratepayer contributions ceased. A fraction of the NDT was transferred to Entergy (predicated on growth through continued operation through licensed end-of-life) and the remainder used to benefit ratepayers.

⁶ In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, Appendix D, Administrative and Incidental Expenses, Exhibit A-4 (MPSC Case No. U-14150, Official Exhibit A2, p 83.)

⁷ NMC letter to U.S. NRC dated April 21, 2006, "Irradiated Fuel Management Plan and Preliminary Decommissioning Cost Estimates for Palisades Nuclear Plant" (ML061140185), Enclosure 1 page 3 of 3.

to Palisades, and engineering judgment.⁸ This \$8.44 million per year cost is significantly greater than the \$1.7 million per year (2020 dollars) estimated by Holtec for comparable years (2027 through 2029).⁹ No explanation has been provided for this 80% reduction in estimated annual costs for spent fuel management.

11. Actual costs are available for the BRP ISFSI, which consists of a single concrete storage pad.¹⁰ The Palisades ISFSI currently consists of two concrete storage pads (not collocated) which the Holtec PSDAR states will be consolidated following shutdown.¹¹ The Holtec DCE also includes a schedule for pad construction.¹² It is not clear from the DCE whether this is an expansion of one of the existing pads or construction of a new pad. Nonetheless the Holtec estimated cost for maintaining the Palisades ISFSI is 35% less than the actual BRP cost.¹³ No explanation has been provided for this reduced spent fuel management cost.

12. Holtec assumes that all spent fuel will remain on site until it is transferred to the Department of Energy (DOE), with Holtec incurring annual operating and maintenance costs of approximately \$1.7 million per year.¹⁴ Holtec further assumes that this transfer of spent fuel to DOE will take place between 2030 and 2040.¹⁵ Transfer of spent fuel off the Palisades site to a different non-DOE interim storage facility does not transfer title from Holtec and therefore does not eliminate Holtec's obligation to safely manage this fuel nor incur its continuing costs. The only way to eliminate continuing activities and costs is for DOE to

⁸ Ibid.

⁹ Holtec DCE, page 46.

¹⁰ LTA, Attachment E, page 8.

¹¹ Holtec PSDAR, page 9.

¹² Holtec DCE, page 45.

¹³ LTA, PDF page 262 shows an actual ISFSI cost of \$2.6 million for BRP in 2019 and an estimated cost of \$2.7 million for 2020.

¹⁴ Holtec DCE, pages 12 and 46. Spent fuel management costs increase after 2029 for transferring spent fuel to DOE.

¹⁵ Holtec DCE, pages 21 and 22. Holtec references a 2013 DOE plan to implement a pilot program with a goal of accepting spent fuel by 2025. Holtec notes that virtually no progress has been made in the eight years since that plan was issued yet assumes only a five-year delay in implementation of those plans. DOE is not currently working on a pilot interim storage facility nor is there any expectation of such work in the near future.

take title to the fuel. This assumed acceptance schedule is not reasonable given DOE's current progress in licensing a repository.¹⁶

13. The DOE Standard Contract calls for acceptance of spent nuclear fuel on an oldest fuel first basis. That means that allocations for acceptance are generated when fuel is permanently removed from a reactor. The Standard Contract measures allocations in metric tons of uranium. Beyond Holtec's implausible 2030 start date, the acceptance schedule for spent fuel by DOE that has been upheld by the Court calls for acceptance of 18,600 metric tons of uranium in the first 10 years of repository operation.¹⁷ It is generally assumed that operation beyond the first 10 years will continue with an acceptance rate of 3,000 metric tons of uranium per year. At these rates and given the amount of spent fuel projected to be covered by the Standard Contract, the last of Palisades spent fuel will not be removed for about 34 years after DOE acceptance commences.¹⁸ Even assuming a 2030 DOE start date (which is an unreasonable assumption), the last Palisades spent fuel would not be accepted by DOE until about 2064. By comparison, in 2003 in support of its ratemaking submittals, Consumers Energy Company (the then-current Palisades owner) assumed a 2013 start and a 2048 final acceptance, for a nearly-identical acceptance period of 35 years.¹⁹
14. While the Standard Contract does have provisions that could potentially be used to accelerate acceptance dates, there is no basis to assume that such provisions *can* be utilized nor that these provisions would be available without a significant

¹⁶ It is not reasonable to assume DOE operates an interim storage facility in the near term given the linkage of such a facility to construction of a repository in the Nuclear Waste Policy Act. DOE/RW-0596, Report to Congress on the Demonstration of the Interim Storage of Spent Nuclear Fuel from Decommissioned Nuclear Power Reactor Sites, December 2008, page 7.

¹⁷ DOW/RW-0146, Annual Capacity Report, June 1987, Office of Civilian Radioactive Waste Management, page v.

¹⁸ The U.S. Energy Information Administration identifies 70,000 metric tons of uranium being discharged and stored at 118 commercial U.S. reactors through June 2013. Assuming continued generation at 2,000 metric tons of uranium per year results in about 88,000 metric tons of uranium discharged by the time of Palisades final discharge. 18,600 metric tons are accepted in the first 10 years, leaving almost 70,000 metric tons to be accepted before all Palisades fuel is removed. At 3,000 metric tons per year this requires about 34 years in total.

¹⁹ In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, p 18 (MPSC Case No. U-14150, Official Exhibit A2, page 29.).

cost.²⁰ No discussion or accounting for this substantial uncertainty appears in the Holtec DCE.

15. Given both concerns (the implausible 2030 DOE start date and the shortened 11-year acceptance period) the resulting spent fuel assumptions in the Holtec DCE are unreasonable and significantly understate spent fuel management costs.

16. NRC regulations require that during operation a licensee demonstrate adequate decommissioning funding assurance based on a generic formula contained in 10 CFR 50.75. For Palisades, Holtec calculates this value as \$443 million for an immediate decommissioning approach (typically called DECON).²¹ The purpose of this generic formula is to ensure that the licensee is providing assurance for the “bulk” of funds needed to complete decommissioning.²² The generic formula does not, nor is it designed to, provide assurance that all required funding is obtained. Nonetheless, even with this “bulk” standard, Holtec’s site-specific decommissioning cost estimate for license termination activities is no larger than \$402.5 million and at least nine percent smaller than the “bulk” standard.²³

Historically the “bulk” standard has understated actual license termination costs by between 16 to 42%.²⁴

²⁰ The two provisions are granting priority for shutdown reactors and exchanges of approved DOE delivery commitment schedules. The industry has previously rejected the priority provision and there is no evidence that the second provision is feasible given the continuing need for on-site storage. DOE/RW-0596, Report to Congress on the Demonstration of the Interim Storage of Spent Nuclear Fuel from Decommissioned Nuclear Power Reactor Sites, December 2008, page 5 (“The Department has been asked, on numerous occasions, to exercise its discretion ... to allow for the priority acceptance of SNF from decommissioned reactors. In all instances, the Department has declined to grant this priority, noting that doing so would ... adversely affect the timely removal of SNF from operating reactor sites.”)

²¹ LTA, page 18, footnote 1.

²² GAO-12-258, United States Government Accountability Office, Report to the Honorable Edward J. Markey, House of Representatives, NRC’s Oversight of Nuclear Power Reactors’ Decommissioning Funds Could Be Further Strengthened, Summary.

²³ Holtec’s calculated license termination cost is \$443.215 million including \$40.668 million in dormancy costs from 2026 through 2034). Holtec DCE page 46. Arguably most of the 2035 costs should also be included in dormancy. In addition, ISFSI demolition costs in 2041 are funding per 10 CFR 72.30 and should be excluded. Thus, Holtec’s license termination costs could be as small as \$387.3 million.

²⁴ Compare Yankee Rowe’s \$623 million actual cost to the generic rule amount in 2010 of \$363 million which is a 42 percent understatement. Similarly, Haddam Neck’s \$674 million actual compares to a \$418 million generic rule amount for a 38% understatement, and Maine Yankee’s \$540 million actual compares to a \$453 million generic rule amount for a 16% understatement (all costs in 2010 dollars and rule amounts calculated in 2010). Attempts to perform a similar calculation for other plants, including Rancho Seco and San Onofre Unit 1 are complicated by the decommissioning method used for both facilities (which involved a storage period).

17. To date Holtec is performing or pursuing six decommissioning projects spread across four states. Holtec has not yet completed, nor made substantial progress towards completion, any of these six projects. No other vendor in the United States has ever attempted to decommission six nuclear reactors simultaneously. While this approach could offer efficiencies, any such cost savings has yet to be realized. As a result, and absent additional support, Holtec's projected decommissioning cost not only understates the generic formula, but also actual historical experience, and is unreasonable.
18. Contingency funding is included in decommissioning cost estimates to address inherent uncertainty. Holtec has included a 25 percent contingency on ISFSI decommissioning costs consistent with the NUREG 1757 evaluation criteria key assumption that cost estimates apply a contingency factor of *at least* 25 percent to the sum of all estimated costs.²⁵ For the costs beyond ISFSI decommissioning, Holtec instead applies a 12 percent contingency.²⁶ Holtec states that this level of contingency was determined to reasonably *bound* the universe of risks that *should be* taken into account.²⁷ No evidence was explicitly provided to support this contention, and this level of contingency is not consistent with industry norms.²⁸ By comparison, Holtec used a 15 percent contingency allowance for its Oyster Creek estimate, a 17 percent contingency for its Pilgrim

An independent analysis of 12 reactors by GAO found that the NRC formula captured 57 to 91 percent of estimated site-specific costs for nine reactors. GAO also noted that the site-specific estimates were as much as \$362 million more than the NRC generic formula would have predicted at that time. GAO-12-258, United States Government Accountability Office, Report to the Honorable Edward J. Markey, House of Representatives, NRC's Oversight of Nuclear Power Reactors' Decommissioning Funds Could Be Further Strengthened, pages 13-14.

²⁵ Holtec DCE, page 23.

²⁶ Holtec DCE, page 41.

²⁷ *Ibid.*

²⁸ See, e.g., Crystal River Nuclear Generating Station Unit 3 Site Specific Decommissioning Cost Estimate (May 2018), Appendix C, Table C (last page) (ML18178A181) (18.2% contingency allowance); Fort Calhoun Station Site-Specific Decommissioning Cost Estimate (attached to PSDAR) (Feb. 2017), Appendix C, Table C (last page) (ML17089A59) (16.33% contingency allowance); Decommissioning Cost Analysis for the Monticello Nuclear Generating Plant, Appendix D, Table D (last page) (Oct. 2014) (ML16005A105) (16.94% contingency allowance). One outlier is Three Mile Island Unit 1 which includes a 12.9% contingency but on a \$1,228 million estimate (approximately double that of Holtec's Palisades estimate).

estimate, and an 18 percent contingency for its Indian Point estimate (the same reactor type as Palisades).

19. Increasing the Holtec contingency consistent with recent industry norms (using the 17.15 percent average value from Crystal River, Fort Calhoun, and Monticello) would add about \$29 million to the DCE which would exceed the NDT funding available for decommissioning. Using the 18 percent contingency from Indian Point would add \$34 million to the DCE further exceeding the NDT funding available.
20. Holtec's DCE assumes the total radioactive waste volume for Classes A, B, and C low-level radioactive waste will be 92 million pounds.²⁹ This waste quantity is significantly smaller than other actual decommissioning projects, including 246 million pounds of low-level radioactive waste at Maine Yankee and 265 million pounds of low-level radioactive waste at Haddam Neck.³⁰ Understating the low-level radioactive waste volume could lead to substantially increased costs over those included in the Holtec DCE. Given Holtec's average disposal cost, an increase in waste volume from the assumed 92 million pounds to the 246 million pounds removed from Maine Yankee would increase disposal costs by \$57.9 million, or 167 percent, much greater than the 12 percent contingency included by Holtec. No detail has been provided by Holtec to evaluate the assumptions leading to this total waste volume nor why the total waste volume would deviate so significantly from past decommissioning projects.
21. The Holtec PSDAR states that radioactive waste will be transported from the Palisades site using truck, and potentially barge or rail (with a transfer facility since the rail spur does not extend to the Palisades site).³¹ Michigan residents

²⁹ Holtec DCE, Table 3-6, page 36.

³⁰ Both Maine Yankee and Haddam Neck (also known as Connecticut Yankee) were pressurized water reactors, the same type of reactor as Palisades. Maine Yankee was approximately the same generating capacity as Palisades while Haddam Neck was smaller.

EPRI Report 1013511, Connecticut Yankee Decommissioning Experience Report, Detailed Experiences 1996-2006, Table A-1.

EPRI Report, Maine Yankee Decommissioning Experience Report, Detailed Experiences 1997-2004, Table E-1.

³¹ Holtec PSDAR, page 11. Additional shipments will be required for non-radiologically but hazardous waste and have not been addressed in these calculations. Based on historical projects, these shipments could be substantial.

will likely be harmed if decommissioning waste is transported from Palisades by truck. For example, frequent waste shipments over local roads will affect traffic flow, cause noise, dust, and pollution emissions, increase the possibility of accidents on local roads, and damage local infrastructure. Based on use of trucks to transport waste, with the estimated Palisades waste volume and weight shown on Table 3-6 of the Holtec DCE (excluding GTCC), the number of truck shipments required would be about two and a half times as many as evaluated in the NRC generic environmental statement (GEIS) for decommissioning. The GEIS states that with expected truck shipments averaging much less than one per day there would be no detectable or destabilizing effect on traffic flow or road wear. However, the Palisades waste volume could result in several shipments per day and over 1.8 shipments per day on average, much greater than "much less than one per day" identified in the GEIS.³² 10 CFR 50.82(a)(6) requires that no decommissioning activities that result in significant environmental impacts be performed unless previously reviewed by the NRC. The Entergy and Holtec License Transfer Application (LTA) does not address how the planned Palisades activities will conform to the GEIS nor does it identify any evaluation performed to address activities beyond those evaluated in the GEIS. The Holtec PSDAR simply asserts without basis that activities are bounded by the GEIS and that these shipments will not result in changes to local traffic or damage to local infrastructure.³³

22. As explained in detail below, there are at least seven 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. State requirements beyond those assumed by Holtec or unanticipated site conditions could require greater expenditures for site restoration work,

³² NUREG-0586, Supplement 1, Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Table 4-6 (Nov. 2002) (ADAMS Accession No. ML18057B048).

³³ Holtec PSDAR, pages 18 and 35.

thus decreasing the amount of funds available for the completion of license termination work. This occurs because the Holtec plan includes spending funds on site restoration activities prior to the completion of license termination activities;

- 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 non-canistered DOE casks prior to transportation to an off-site storage facility or repository;
- f. A successful effort by DOE to recover costs for the packaging of spent nuclear fuel into dry casks if DOE removes the spent fuel without 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 2040 consistent with its cost analysis.

23. *Delays in the work schedule leading to increased costs for overhead and project management.* The risk of delay in the decommissioning schedule exists in all decommissioning projects for reasons including identifying unknown conditions requiring expanding the scope of planned activities or creating the need for additional activities. Such identification of unknown conditions will not only increase the direct cost of decommissioning activities, but the schedule delay will also lead to unaccounted for increased costs for overhead and project management since such costs are closely connected to the project duration.

24. Not only does the risk of schedule delay exist in all decommissioning projects but for at least one Holtec decommissioning project, substantial schedule delay has become a reality. Holtec obtained NRC approval to acquire Pilgrim Nuclear Power Station (PNPS) on August 22, 2019 based on an LTA that included a decommissioning schedule for license termination and site restoration of about

5.5 years. Holtec closed on the acquisition of PNPS on August 26, 2019 and 80 days later in a presentation dated November 16, 2019 identified a delay that would increase the PNPS decommissioning schedule by 2.5 to 3 years resulting in a schedule length of about 8 years. Thus, in about 80 days from the acquisition of PNPS, Holtec had identified a schedule increase of about 50 percent. Holtec did not identify the reasons for the dramatic schedule delay or the anticipated cost impact. However, based on cost information provided in the PNPS LTA the increase in overhead and project management arising from the delay can be estimated to be as much as \$100 million. The schedule presented in the Palisades LTA has 6 years for license termination and site restoration following dormancy. A similar risk for schedule growth exists at Palisades as has already happened at PNPS.

25. Substantial schedule delay has been experienced in other non-Holtec projects. 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 increased work scope was identified with associated schedule expansion, the estimate for expected staff costs was increased to \$168 million in 2010 dollars.
26. *State-law requirements beyond those assumed by Holtec for site restoration decreasing the amount of funds available to pay for license termination.* Based on the cashflow in the DCE Holtec plans to use NDT funds for site restoration prior to the completion of license termination, site restoration activities will be performed in parallel with license termination. Michigan site restoration requirements beyond those assumed in the Holtec estimated costs would result in a reduction of the funds for radiological decontamination and license termination. 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 license termination work. As a result, there could be increased costs for overhead and staffing. The limited information in the LTA, PSDAR, and DCE does not identify the assumed requirements for site restoration or any provision for contingency or allowances

to account for any state requirements being beyond those assumed. Increased site restoration costs beyond those assumed by Holtec could impact the overall adequacy of the NDT to cover all license termination and spent fuel management activities. Without sufficient detail from Holtec about its assumptions, no independent review can be made concerning the adequacy of the Holtec DCE. It is important to note, however, that the previous Palisades owner estimated site restoration costs at \$78.3 million (2003 dollars), or \$110.1 million (2020 dollars). This site-specific estimate significantly exceeds Holtec's \$34.7 million dollar estimate. Holtec has not provided any explanation or basis for this 69% reduction in estimated costs.

27. *The discovery of previously unknown radiological or non-radiological contamination.* The limited information in the LTA and PSDAR does not identify the specific plans for performing site characterization activities to identify, categorize, and quantify radiological and non-radiological contamination. The level of such physical characterization previously performed is not identified nor is the extent and timing of physical characterization yet to be performed. Complete site characterization is necessary to determine the extent of radiological and non-radiological contamination and to establish the work needed for decommissioning and restoring Palisades. *Some characterization cannot be completed until some dismantlement is performed.* As a result, even if all the characterization work currently possible has been completed, the possibility of finding unexpected contamination later in the decommissioning process remains. Unexpected radiological or non-radiological contamination could significantly increase the cost of decommissioning, including staffing, overhead, and waste disposal. The limited information in the LTA, PSDAR, and DCE does not identify any allowance or provision for dealing with the finding of unexpected contamination or contamination greater than currently being assumed by Holtec. The common application of contingency in cost estimates is for uncertainty associated with known scope and is not intended to account for changes in scope such as adding additional work required to deal with unexpected

contamination. Holtec does not provide sufficient detail in its calculation of contingency to evaluate whether any contingency is included for this purpose.

28. *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 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 spent almost one year and considerable resources evaluating this incident and taking actions to ensure that the transfer of spent fuel to dry storage could be completed safely. In addition to the substantial cost for resolving issues arising from such an incident, there will be delay costs for the fuel transfer personnel as well as added overhead and project management costs.

29. *Absent a change to the Standard Contract, Holtec will have to repackage spent nuclear fuel into non-canistered DOE casks prior to transportation to an off-site storage facility or repository.* The decommissioning costs presented in the LTA and DCE appear to be consistent with assuming that DOE will accept the canisters in the casks at Palisades at the time of DOE performance in the as-packaged canisters for dry storage and will not require repackaging for transportation. Entergy (and many other licensees) have argued in testimony and briefs before the U.S. Court of Federal 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.³⁴ DOE has also stated in testimony and briefs that, absent a change to the Standard Contract, it will not accept canistered fuel and that fuel must be removed from these canisters and loaded into a non-canistered DOE transportation cask.³⁵ If Entergy is correct and DOE were to mandate fuel repackaging, this could cause Holtec to incur significant and apparently unaccounted-for expenses. The cost overrun for repackaging would be exacerbated by the fact that this would occur after the Palisades spent fuel pool has been decommissioned. 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.³⁶ There would be operating costs to remove the fuel from the current casks and then to package that fuel into DOE provided transportation casks. There is no indication in the limited information in the LTA that indicates the assessment of funding adequacy accounts for these potential costs.

30. *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 Palisades dry casks.³⁷ 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

³⁴ See e.g., *System Fuels, Inc. v. United States*, 818 F.3d 1302, 1306-07 (Fed. Cir. 2016). This is not an issue of whether or not a cask can physically accept the loaded canisters, but rather the contractual obligations from the DOE Standard Contract.

³⁵ *Ibid.*

³⁶ 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>.

³⁷ In this sense, the term past refers to the past relative to the time at which DOE begins accepting spent fuel from Palisades. Given current expectations about DOE performance, all the spent fuel at Palisades will have been loaded into dry storage casks before DOE begins accepting spent fuel.

significant unaccounted for costs. It is unclear from the limited information currently available if any type of risk allowance has been included in the estimated costs to account for costs that might be recovered by DOE or how Holtec otherwise would compensate for the substantial cost increase from such a recovery by DOE.

31. *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 2040, as Holtec assumes in its DCE.* The DCE assumes that all fuel will be removed from Palisades by 2040. There is no certainty for such an assumption since DOE has not yet started accepting spent fuel and the ability to meet any date for DOE to start is dependent of actions beyond DOE's control. If DOE fails to pick up all of the spent fuel by the end of 2040, then Holtec will begin incurring significant and ongoing cost overruns 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. The NRC's Continued Storage Rule (NUREG-2157) referenced by Holtec in its PSDAR for Palisades 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 Palisades, there would no longer be a spent fuel pool to effectuate the repackaging once the fuel is moved to dry storage, and the plants are decommissioned. It is unknown how Holtec would provide for the possible contingency of indefinite onsite storage, including all safety and environmental concerns regarding transferring fuel into new dry casks every 100 years.

32. The Palisades site was one of the earliest sites to use dry cask storage. During that time, 18 VSC-24 storage casks were loaded that were licensed to store spent nuclear fuel but not transport that fuel. The canisters in these VSC-24 casks are not currently licensed as part of any transportation system and cannot be moved off site under current regulations. While some work was performed

over a decade ago to pursue a license for transport of the VSC-24 canisters, this work was never completed. As a result, either the spent fuel from these 18 VSC-24 canisters must be reloaded into licensed transportable canisters or additional work must be performed to license these canisters for transportation (assuming that this licensing is even feasible). There is no evidence that any cost has been included for this work or assessment of risk presented by this issue.

33. Holtec provides a cashflow assuming all estimated costs (license termination, spent fuel management, and site restoration) are funded from the NDT transferred from Entergy.³⁸ Holtec assumes that NDT funds will grow at a two percent per year real rate (actual return minus inflation) consistent with the upper limit allowed by NRC regulations. Even with these assumptions, the funds remaining at the projected end of decommissioning are \$19.8 million.³⁹ Correction of the implausible and unreasonable assumptions discussed above would result in substantial cost increases which easily exceed the funds available in the NDT.
34. During reactor operation NDT funds are often invested in a manner making the two percent real growth assumption permitted by the NRC reasonable. Even so, continued growth on a year-by-year basis is not a certainty. For example, the Palisades NDT shrank from \$252.9 million on April 30, 2007 to \$218.8 million on December 31, 2008, a loss of over 12 percent.⁴⁰
35. Even with the typically more aggressive investment strategy during operation, the Palisades NDT only grew at an annual rate of 1.9 percent from April 2007 through December 2010 (from \$252.9 million to \$271.2 million in 2010). During this same period (2007 through 2010), inflation averaged 1.6 percent on an annual basis, resulting in a real NDT growth of 0.3 percent.⁴¹ Thus, the two

³⁸ LTA, Attachment E, page 5.

³⁹ Holtec DCE, page 46.

⁴⁰ Safety Evaluation by the Office of Nuclear Regulatory Regulation Application for Indirect Transfer of Facility Operations Licenses Due to Entergy Corporation Restructuring (ML081080352), Enclosure 2, page 16.

Entergy letter to U.S. NRC dated March 31, 2011, Status of Decommissioning Funding, Attachment 11.

⁴¹ The latest NDT balance was reported by Holtec as \$552 million on December 2, 2020. It is unclear whether any capital gains due on 2020 earnings are included in this total.

percent real growth assumption would not have been reasonable for Palisades for this period of operation. Similarly, prior to the transfer to Entergy, the Palisades qualified NDT suffered losses in four separate years, including each year from 2000 to 2002.⁴²

36. This two percent real growth assumption is even less reasonable following permanent shutdown when NDT funds are de-risked and invested more conservatively.⁴³ Assuming the qualified NDT tax rate remains 20 percent, a two percent annual inflation rate would require fund earnings to be five percent before taxes (after fees). This level of return is not consistent with how decommissioning trust funds have been invested following permanent shutdown making use of this assumption unreasonable given the circumstances.
37. Holtec proposes that Holtec Palisades own the Palisades and BRP assets and liabilities, including the NDT. The only source of funds available to Holtec Palisades will be the NDT. Holtec asserts that the NDT contains adequate funds for all required activities, but that should a shortfall occur, an alternate funding mechanism will be put in place. No support is provided for how such a mechanism would or could be funded. No analysis has been provided of any Holtec Palisades assets beyond the NDT that could provide or support such funding.
38. Holtec states that reimbursement of spent fuel management expenses by DOE would provide a substantial source of additional funds if needed.⁴⁴ No analysis is provided to support this statement, nor any commitment made by Holtec to retain these reimbursements.

⁴² In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, p 7 (MPSC Case No. U-14150, Official Exhibit A2, page 18.)

⁴³ For example, even with the extended SAFSTOR project assumed by Consumers, the Palisades NDT was invested in 45% equity and 55% fixed income during operation and was to be invested in 30% equity and 70% fixed income after final shutdown. In the matter of the application of Consumers Energy Company for adjustment of its surcharges for nuclear power plant decommissioning for the Palisades Nuclear Plant, Case No. U-14150, Consumers Energy Company 2004 Report on the Adequacy of the Existing Provision for Nuclear Decommissioning, Palisades Nuclear Plant, March 2004, p 6 (MPSC Case No. U-14150, Official Exhibit A2, page 17.)

⁴⁴ Holtec DCE, page 44.

39. Even so, following the dormancy period, the expected DOE recovery would largely be limited to the on-going costs of spent fuel management and even if retained would not offset any substantial overrun in decommissioning costs.⁴⁵ Using the \$1.7 million per year identified by Holtec as the spent fuel management cost during dormancy, the total DOE recovery during license termination activities from 2036 through 2040 would only be about \$8.5 million, and only sufficient to offset continuing ISFSI operating and maintenance costs. Thus, retention of these funds would not substantially mitigate any potential cost overruns.
40. Another alternative suggested to mitigate a funding shortfall is the cessation of decommissioning activities and return of the facility to a long-term storage condition to allow NDT funds to grow. However, even accepting the two percent real rate of return assumed by Holtec, NDT funds during dormancy are only projected to grow at the rate of about \$600,000 per year, or 0.17% per year (using 2027 to 2028 as an example).⁴⁶ At this growth rate, there is no certainty that sufficient time is available in the 60-year NRC limit to decommission the site to allow sufficient fund growth for any potential cost overruns.
41. I conclude that the proposed license transfer from Entergy to Holtec to decommission Palisades and BRP using only the NDT as financial assurance relies on unreasonable and improbable assumptions and does not provide reasonable assurance for the protection of the health and safety of the public.

I DECLARE THE ABOVE STATEMENTS TO BE TRUE TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

⁴⁵ Whether any of the cost of loading DOE-supplied transportation casks could be recovered from DOE is uncertain.

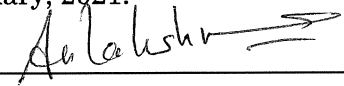
⁴⁶ LTA, Attachment E, page 5.

SULAKSHNA SHARMA
NOTARY PUBLIC
COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES FEB. 28, 2022
COMMISSION # 7613582



Nicholas J. Capik
President and Managing Director
Four Points Group, Inc.

Subscribed and sworn to by this 24 day of
February, 2021.



_____, Notary Public
Fairfax County, Virginia
My commission expires: 2/28/2022
Acting in the county of Fairfax VA



NICHOLAS J. CAPIK

PROFESSIONAL EXPERIENCE SUMMARY

Over 35 years of experience in the design, construction, and operation of complex mechanical and electrical systems for nuclear facilities. Extensive experience in financial modeling and analysis of technical nuclear facility projects, due diligence, operating and maintenance evaluations, decommissioning, and accident cleanup. Developed and maintained several large software products ranging from general-market engineering software to specialized expert systems to assist in compliance with Federal regulations. Provided nuclear decommissioning and engineering training to Federal and State agencies, the military, and the public. Extensive support of technical litigation and arbitration.

EDUCATION

Navy Nuclear Power Training Program
B.S., Mathematics, Pennsylvania State University

DETAILED EXPERIENCE

2016 - Present – Four Points Group, Incorporated

Provided expert support to the Vermont Department of Public Service with oversight of the Vermont Yankee Decommissioning being performed by NorthStar. Responsible for evaluating the technical and financial performance of decommissioning activities and financial assurance.

Provided expert support to the New York State Energy Research and Development Authority (NYSERDA) on negotiating a memorandum of understanding with Holtec for the decommissioning of the Indian Point nuclear site. Provided review and comment on proposed Nuclear Regulatory Commission (NRC) regulations concerning decommissioning. Provided review and comment on plant modifications performed to support spent fuel management and transfer of spent fuel to dry storage.

Provided expert support to the Massachusetts Executive Office of Energy and Environmental Affairs and Office of the Attorney General on negotiating a memorandum of understanding with Holtec for the decommissioning of the Pilgrim nuclear site.

1991 - Present – ABZ, Incorporated

Provided expert support to the U.S. Department of Justice in numerous lawsuits over a partial breach of contract related to spent fuel disposal. Participated in all discovery, pre-trial, trial, and post-trial activities. Developed demonstratives and witness examinations for 13 trials. Supported the U.S. Internal Revenue Service in litigation for three cases related to nuclear decommissioning costs.

Provided third-party review of decommissioning costs to complete an ongoing nuclear decommissioning of a multi-unit site. Provided written testimony to support a decommissioning



rate case. Performed an in-depth review of the regulatory requirements for removing a nuclear power plant from service.

Developed a detailed technical and financial model for estimating the costs for decommissioning nuclear reactors. Performed cost estimates for 14 commercial and government nuclear facilities. Responsible for development of assumptions, selection of scenarios to be analyzed, preparation of the studies, and presentation of study results to utility management. Performed a separate study on long-term escalation of decommissioning costs for a commercial utility.

Provided due diligence related to the purchase of the license holder for the Zion facility. Periodically reviewed performance of the Zion decommissioning to identify and improve future decommissioning performance.

Evaluated decommissioning cost estimates for a state utility commission to ascertain the adequacy and appropriateness of estimated costs for site-specific conditions. The evaluation included physical inspection of three sites (seven reactors) and comparison to actual decommissioning projects and similar estimates across the country. Provided expert testimony to the utility commission.

Evaluated industry efforts in life extension and attainment for the Congressional Office of Technology Assessment. Evaluated the costs, regulations, and uncertainties associated with plant decommissioning for the Wall Street investment firm of Shearson Lehman.

Developed a detailed technical and financial model for estimating the costs for clean-up of severe accidents at nuclear power sites. Performed over 30 severe accident costs analyses for both domestic and international reactors. Performed separate studies for both nuclear property insurers, focusing on cash flow following a severe reactor accident, optimum use of insurance products, and subsequent insurer liability.

Provided engineering and technical support related to a contract dispute over design of heat recovery steam generators. Evaluated software and design methods to determine whether contract obligations were met. Provided a declaration to support arbitration.

Participated in additional activities for commercial nuclear power plant owners related to license renewal, design basis reconstitution, surveillance monitoring and data trending, risk analysis associated with plant modifications, and quality assurance program implementation.

Developed commercial software to perform compressible and incompressible fluid flow analyses. Analyzed nuclear power plant fluid flow and electrical system designs and commercial firefighting system designs. Instructor for engineering classes on fluid flow analysis.

1989 - 1991 – Department of Energy, Division of Naval Reactors

Design Engineer, SEAWOLF Class nuclear submarine steam plant design. Lead responsibility for steam plant performance, safety, and quality. Responsible for design of nine steam plant systems and interface for twelve ship systems. Lead for development of reactor plant and steam system operating and maintenance procedures. Lead for development of steam plant new



construction acceptance test procedures. Lead for propulsion plant integrated logistics support. Responsible for technical and financial aspects of design contract modifications associated with large government contracts.

1987 - 1989 – U.S. Navy, USS RAY (SSN 653)

Served as Sonar and Fire Control Division Officer, Damage Control Assistant, Quality Assurance Officer, and Chemistry and Radiological Controls Assistant on a nuclear-powered submarine. Qualified watch officer for all ship and reactor plant operations, including casualty control. Responsible for reactor plant chemistry, radiological controls and monitoring, and performance, documentation, and quality control of nuclear maintenance. Qualified as Engineering Department Head in March 1989. Awarded Navy Commendation and Navy Achievement medals for professional expertise, sound judgment and superior tactical abilities in support of special mission accomplishments.

1985 - 1987 – Department of Energy, Navy Nuclear Personnel training site

Staff Instructor. Supervised and trained over 1,000 Navy and civilian personnel in all aspects of design, construction, and operation of nuclear reactors and associated plant systems. Additional duties involved operation and supervision of a land-based DOE nuclear power plant. Awarded Navy Achievement Medal for work performed in this assignment.