

In the United States Court of Federal Claims

No. 03-2663C

(Filed Under Seal: September 24, 2010)

(Reissued for Publication: September 29, 2010)¹

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ENTERGY NUCLEAR VERMONT YANKEE,	*
LLC, and ENTERGY NUCLEAR	*
OPERATIONS, INC.,	*
	*
Plaintiffs,	*
	*
v.	*
	*
THE UNITED STATES,	*
	*
Defendant.	*
	*
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Brad Fagg, with whom were *Paul M. Bessette* and *D. Bruce McPherson*, Morgan Lewis & Bockius LLP, Washington, D.C., and *L. Jager Smith*, Wise Carter Child & Caraway, P.A, Jackson, Mississippi, of Counsel, for Plaintiffs.

Jeremiah M. Luongo, with whom were *Tony West*, Assistant Attorney General, *Jeanne E. Davidson*, Director, and *Alan J. Lo Re*, Assistant Director, United States Department of Justice, Civil Division, Commercial Litigation Branch, Washington, D.C., *Marian E. Sullivan*, *Mariana T. Acevedo*, *Seth W. Greene*, *Joseph D. Keller*, *Daniel G. Kim*, and *Jane K. Taylor*, Of Counsel, for Defendant.

¹ The Court issued this opinion under seal on September 24, 2010, and gave the parties until October 4, 2010, to submit any proposed redactions of competition-sensitive, proprietary, confidential, or other protected information. By filings on September 28, 2010, the parties represented that they had no proposed redactions and therefore this opinion is released in its entirety for publication.

OPINION AND ORDER

WHEELER, Judge.

Plaintiff Entergy Nuclear Vermont Yankee, LLC (“ENVY”)² is claiming damages caused by the failure of the Department of Energy (“DOE”) to collect and dispose of spent nuclear fuel generated at the Vermont Yankee Nuclear Power Station (“VYNPS”), a commercial power plant currently owned by ENVY. In June 1983, Vermont Yankee Nuclear Power Corporation (“Vermont Yankee”), the prior owner of the VYNPS, entered into a Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste (“Standard Contract”) with DOE, whereby DOE agreed to begin collecting and disposing of spent fuel from the VYNPS not later than January 31, 1998. To date, DOE has yet to collect and dispose of any spent fuel. In 2002, ENVY purchased the VYNPS from Vermont Yankee. Under their purchase and sale agreement, Vermont Yankee assigned certain Standard Contract rights and duties to ENVY. ENVY filed its complaint in this Court on November 12, 2003, seeking damages for DOE’s partial breach of the Standard Contract. (Compl. 1.)

Initially, the Court consolidated this case with Vermont Yankee Nuclear Power Corporation v. United States, No. 02-898C, a case brought by Vermont Yankee asserting claims arising from its ownership and operation of the VYNPS. On October 19, 2006, the Court granted ENVY’s motion for summary judgment on liability, following Federal Circuit precedent that DOE had breached every utility’s Standard Contract when it failed to accept spent fuel beginning on January 31, 1998. See Vermont Yankee Nuclear Power Corp. v. United States, 73 Fed. Cl. 236, 245 (2006) (citing Maine Yankee Atomic Power Co. v. United States, 225 F.3d 1336, 1342 (Fed. Cir. 2000); Northern States Power Co. v. United States, 224 F.3d 1361, 1367 (Fed. Cir. 2000)). ENVY later moved for partial summary judgment regarding its ownership and right to pursue damages claims against DOE for partial breach of the Standard Contract. The Court granted ENVY’s motion on October 21, 2008, holding that Vermont Yankee’s purchase and sale agreement with ENVY did not reserve for Vermont Yankee any damages or diminution-in-value claims. The Court dismissed Vermont Yankee’s claims with prejudice. Vermont Yankee Nuclear Power Corp. v. United States, 84 Fed. Cl. 339 (2008). Thus, in the present posture, only ENVY’s damages claims remain to be decided. The Tucker Act grants this Court jurisdiction to hear these claims. See PSEG Nuclear, LLC v. United States, 465 F.3d 1343, 1349-50 (Fed. Cir. 2006).

ENVY claims \$47,443,881 in damages for costs it incurred through April 30, 2008. ENVY also seeks recovery of \$7,472,866 for the cost of capital, raising its total claim to \$54,916,747. Defendant concedes liability of \$34,895,467, but argues that

² Co-plaintiff Entergy Nuclear Operations, Inc. is the Nuclear Regulatory Commission license holder for the Vermont Yankee Nuclear Power Station.

ENVY is not entitled to recover the following: (1) \$9,608,189 in costs related to ENVY's legislative efforts to acquire a Certificate of Public Good from the State of Vermont; (2) \$2,008,727 in overhead costs; (3) \$276,980 in costs to transport and dispose of contaminated soil and asphalt; and (4) \$654,518 in costs related to ENVY's purchase of a work platform, characterization of spent fuel, preparatory activities for cask loading, and loading mobilization. Defendant also argues that ENVY is not entitled to recover the cost of capital.

Defendant contends that the costs ENVY incurred in obtaining a Certificate of Public Good from the State of Vermont were not foreseeable as a result of DOE's partial breach. Defendant further argues that Vermont is federally preempted from regulating nuclear power plants, and that ENVY failed to challenge the State legislature's demands on such grounds. Defendant also asserts that ENVY's other costs are unrelated to DOE's delay or otherwise would have been incurred even if DOE had timely commenced accepting spent fuel in January 1998.

The Court conducted a four-day trial in Washington, D.C. from March 28 through April 1, 2010. During trial, the Court received the testimony of fourteen witnesses, two of whom were experts. The parties filed their post-trial briefs on May 20, 2010, and reply briefs on June 25, 2010. The Court heard closing arguments on July 28, 2010.

In brief summary, the Court finds that ENVY is entitled to recover \$46,645,454 in mitigation damages. The Court calculated these damages by starting with the uncontested amount of \$34,895,467, and awarding additional recovery for the following contested items: (1) \$9,608,189 in costs related to the Certificate of Public Good, including contributions to the Clean Energy Development Fund, the visual barrier costs, the river flood analysis cost, and the legal and lobbying fees ENVY incurred toward the enactment of Vermont legislation; (2) \$654,518 in costs associated with the Holtec dry fuel storage project, including costs incurred in characterizing spent nuclear fuel, constructing a work platform, and developing procedures and internal labor costs; (3) \$276,980 for the removal of radioactive soil and asphalt; and (4) \$1,210,300 in "material loader" overhead costs. The Court denies recovery for \$788,414 in "capital suspense" and \$10,013 in "payroll loader" overhead costs as being too attenuated and not proven with reasonable certainty. The Court further denies ENVY's \$7,472,866 cost of capital claim as prohibited by law. Each of ENVY's claims will be addressed in detail below.

Factual Background³

A. Vermont Yankee Nuclear Power Station

The VYNPS is located in Vernon, Vermont, approximately five miles south of Brattleboro, Vermont. (Stip. ¶ 1.)⁴ The VYNPS began commercial operations in 1972, and consists of one Boiling Water Reactor (“BWR”) unit, designed and manufactured by General Electric. Id.; see also Thayer, Tr. 64. The VYNPS currently is licensed to operate until 2012. (Stip. ¶ 2.) ENVY submitted an application to the Nuclear Regulatory Commission (“NRC”) in January 2006 to extend the current license through 2032. Id. The application currently is pending. Id.

A BWR, unlike a pressurized water reactor, is a type of “direct cycle nuclear plant” whereby water in a reactor vessel is heated and boiled to generate steam. (Thayer, Tr. 64.) The steam drives a turbine, mechanically powering a generator to produce electricity. (Thayer, Tr. 64; Brewer, Tr. 1013-14.) Eventually, the water coming out of the turbine is condensed and returned back into the reactor vessel where the process repeats. (Brewer, Tr. 1013-14.)

Nuclear fuel at the VYNPS consists of cylindrically shaped pellets, measured in Metric Tons of Uranium, or “MTUs.” (Stip. ¶ 9.) The uranium pellets are filled in zirconium tubes or rods, which are put together in a “rectangular array” to form an individual fuel assembly. (Stip. ¶ 9; Brewer, Tr. 1015.) Each fuel assembly contains approximately 70 to 80 fuel rods, each rod about the diameter of a finger and ten to eleven feet long. (Thayer, Tr. 68.) The VYNPS reactor core holds 368 fuel assemblies. (Stip. ¶ 7; Thayer, Tr. 68.)

While the fuel assemblies are used to generate electricity, nuclear plants eventually must “refuel,” or change out a portion of the fuel in the reactor core when it is no longer efficient to generate electricity from the burning of that fuel. See generally Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm’n, 461 U.S. 190, 195 (1983) (“A nuclear reactor must be periodically refueled and the ‘spent fuel’

³ This statement of facts constitutes the Court’s principal findings of fact under Rule 52(a) of the Court of Federal Claims (“RCFC”). Other findings of fact and rulings on mixed questions of fact and law are set forth later in the analysis.

⁴ In this opinion, the Court will refer to the trial transcript by witness and page as “Name, Tr. __,” and to trial exhibits as “PX __” for Plaintiffs’ exhibits, and “DX __” for Defendant’s exhibits. The parties’ stipulations of fact, filed on March 8, 2010, will be referred to as “Stip. ¶ __” while the parties’ supplemental stipulations of fact, filed on March 30, 2010, will be referred to as “Supp. Stip. ¶ __.” For lengthy exhibits, citations include a page number where available. Demonstrative exhibits from Plaintiffs and Defendant are referred to as “PDX __” and “DDX __” respectively.

removed.”). These assemblies are considered “spent” and can no longer be used to produce electrical power.⁵ The VYNPS typically refuels on an eighteen-month cycle, during which it removes the spent fuel assemblies from the reactor and places them, at least temporarily, into a spent fuel pool. (Stip. ¶ 8.; Thayer, Tr. 67-68.) The spent fuel assemblies must be stored in the underwater pools because they are highly radioactive and produce thermal heat. (Thayer, Tr. 68.) At the VYNPS, the spent fuel pools are approximately 40 feet deep and are connected directly to the cavity in which the reactor sits. (Thayer, Tr. 86.) During refueling outages, the reactor cavity is filled with water at the same elevation as the water in the fuel pool in order to keep the radioactive fuel rods submerged. (Thayer, Tr. 69.) On January 31, 1998, the licensed capacity of the VYNPS spent fuel pool was 2,870 spent fuel assemblies, and the installed capacity was 2,683 spent fuel assemblies.⁶ (Hoffman, Tr. 413.)

B. The Nuclear Waste Policy Act

In an effort to curb proliferation of nuclear weapons arising from an expanded plutonium-based nuclear economy, on April 7, 1977, President Carter banned all commercial nuclear fuel reprocessing in the United States. See generally Consol. Edison Co. v. United States, 92 Fed. Cl. 466, 478-79 (2010), *appeal docketed*, No. 2010-5154 (Fed. Cir. Sept. 7, 2010); see also H.R. Rep. No. 97-491(I), at 27 (1982), *reprinted in* 1982 U.S.C.C.A.N. 3792, 3794. In response to President Carter’s ban, Congress enacted the Nuclear Waste Policy Act of 1982 (“NWPA”) to address the accumulation of spent nuclear fuel at nuclear power plants. Pub. L. No. 97-425, 96 Stat. 2201 (codified at 42 U.S.C. §§ 10101-10270). The enactment of the NWPA provided a formal means of disposing of spent nuclear fuel and high-level radioactive waste to “protect the public health and safety and the environment.” 42 U.S.C. § 10131(a)(4).

The NWPA specifically authorized DOE’s Secretary to “enter into contracts with any person who generates or holds title to high-level radioactive waste, or spent nuclear fuel, of domestic origin for the acceptance of title, subsequent transportation, and disposal of such water or spent nuclear fuel.” 42 U.S.C. § 10222(a)(1). Under the NWPA, DOE would accept spent nuclear fuel from nuclear utility plants to deposit into a repository beginning not later than January 31, 1998. 42 U.S.C. § 10222(a)(5). In

⁵ The Standard Contract defines “spent nuclear fuel” as “fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.” 10 C.F.R. 961.11 art. I (18) (2009); PX 1.

⁶ The parties stipulated that the installed capacity was 2,690 assemblies, but during trial, Mr. Hoffman, a witness for Plaintiffs, confirmed in his item-by-item review of the ENVY causation analysis that the actual capacity was 2,683 assemblies. See Pl.’s Post-Trial Br. 5, n.1; see also Hoffman, Tr. 413. The seven additional spaces do not affect any issue in this case. (Pl.’s Post-Trial Br. 5, n.1.)

exchange, utilities would pay fees into the Nuclear Waste Fund to support the costs of DOE's spent fuel disposal efforts. 42 U.S.C. §§ 10222(a)(2)-(3); 10131(b)(4).

C. The Standard Contract

Through the passage of the NWPA, Congress required all domestic nuclear utilities to enter into a Standard Contract with DOE as a condition for the issuance or renewal of their operating licenses. 42 U.S.C. §§ 10222(a),(b); Stip. ¶ 4; see also Ind. Mich. Power Co. v. United States, 422 F.3d 1369, 1372 (Fed. Cir. 2005) (“Nuclear plant operators and utilities were mandated by Congress to enter into Standard Contracts . . . as a prerequisite to obtaining renewal of their operating licenses.”); Maine Yankee Atomic Power Co., 225 F.3d at 1337 (“The [NWPA] effectively made entry into such contracts mandatory for the utilities.”). DOE published the terms of the Standard Contract in 10 C.F.R. § 961.11. On June 10, 1983, Vermont Yankee and DOE signed the Standard Contract to address the disposal of spent nuclear fuel and high-level radioactive waste derived from operations at the VYNPS. (Stip. ¶ 5.)

1. Applicable Terms of the Standard Contract

The Standard Contract contains several terms relevant to ENVY's claims in this case. Significantly, Article IV of the Standard Contract sets forth, among other things, responsibilities of DOE. It provides:

1. DOE shall accept title to all [spent nuclear fuel] and/or [high-level waste], of domestic origin, generated by the civilian nuclear power reactor(s) specified in Appendix A, provide subsequent transportation for such material to the DOE facility, and dispose of such material in accordance with the terms of this contract.

2. DOE shall arrange for, and provide, a cask(s) and all necessary transportation of the [spent nuclear fuel] and/or [high-level waste] from the Purchaser's site to the DOE facility. Such cask(s) shall be furnished sufficiently in advance to accommodate scheduled deliveries. Such cask(s) shall be suitable for use at the Purchaser's site, meet applicable regulatory requirements, and be accompanied by pertinent information including, but not limited to, the following:

- (a) written procedures for cask handling and loading, including specifications on Purchaser-furnished casks for containment of failed fuel;
- (b) training for Purchaser's personnel in cask handling and loading, as may be necessary;
- (c) technical information, special tools, equipment, lifting trunnions, spare parts and consumables needed to use and perform incidental maintenance on the cask(s); and
- (d) sufficient documentation on the equipment supplied by DOE.

(PX 1 at 9.) In turn, utilities were required to “arrange for, and provide, all preparation, packaging, required inspections, and loading activities necessary for the transportation of [spent nuclear fuel] and [high-level waste] to the DOE facility.” *Id.* at 8. Nuclear utilities also were required to pay a one-time fee for spent fuel produced from electricity generated prior to April 7, 1983, and a quarterly fee in the amount of 1.0 mill (one-tenth of one cent) per kilowatt-hour on electricity generated on or after April 7, 1983. (Rives, Tr. 252; PX 1 at 17-21.) ENVY pays approximately \$3.5 million in fees annually, totaling over \$91 million through April 2008. (Compl. ¶ 9; Rives, Tr. 253.)

The Standard Contract also contemplates a utility's assignment of rights and duties to another owner. Article XIV of the Standard Contract specifically provides, “[t]he rights and duties of the Purchaser may be assignable with transfer of title to the [spent nuclear fuel] and/or [high-level waste] involved; *provided, however*, that notice of such transfer shall be made to DOE within ninety (90) days of transfer.” (PX 1 at 26 (emphasis in original).)

2. Planned Acceptance Rates

While the Standard Contract required DOE to begin collecting and disposing of spent fuel by January 31, 1998, it did not establish a specific rate or schedule for collecting the spent fuel. Instead, “for planning purposes,” DOE was to begin issuing an annual capacity report (“ACR”) by July 1, 1987, setting forth the “projected annual receiving capacity for the DOE . . . and the annual acceptance ranking . . . for ten (10) years following the projected commencement of operation of the initial DOE facility.” (PX 1 at 10.) In addition, the Standard Contract required DOE to issue annual acceptance priority rankings (“APR”) beginning April 1, 1991. *Id.* The APR is a list of spent fuel discharges establishing the order in which DOE would collect spent fuel from nuclear power plants. *See* Rives, Tr. 240-42; *see also* Consol. Edison Co., 92 Fed. Cl. at 480-81;

Dairyland Power Coop. v. United States, 90 Fed. Cl. 615, 619-20 (2009), *appeal docketed*, No. 2010-5110 (Fed. Cir. Apr. 26, 2010); Pac. Gas & Elec. Co. v. United States, 536 F.3d 1282, 1285-92 (Fed. Cir. 2008). The Standard Contract states that priority ranking is based on the oldest spent fuel being collected first. (Rives, Tr. 240-42, 249; PX 1 at 10); *see also* Pac. Gas & Elec. Co., 536 F.3d at 1285 (“The Standard Contract also included provisions setting priority for acceptance of waste (generally through an oldest fuel first (OFF) scheme) . . .”).) DOE published its latest version of the APR in July 2004, which includes industry discharge dates for spent fuel based on the “oldest fuel first” ranking. (Rives, Tr. 247-48; PX 21.)

Pursuant to the Standard Contract, DOE issued its ACR in June 1987 listing DOE’s spent fuel acceptance obligations for the first ten years of performance (1998 through 2007). (PX 2 at 7.) The 1987 ACR also refers to DOE’s 1987 Mission Plan Amendment (“MPA”), which identifies acceptance rates through 2038. *Id.*; PX 3 at 61. These published industry-wide rates are: 1,200 MTU/year for 1998-2002; 2,000 MTU for 2003; 2,650 MTU/year for 2004-2007; and generally 3,000 MTU/year through 2038. (PX 2 at 7; PX 3 at 61.) In Pacific Gas & Electric Company, the Federal Circuit held that the Standard Contract obligated DOE to accept spent fuel in accordance with the “1987 ACR process,” defined as incorporating both the 1987 ACR and 1987 MPA. 536 F.3d at 1292; *see also* Yankee Atomic Elec. Co. v. United States, 536 F.3d 1268 (Fed. Cir. 2008). Applying the 1987 ACR acceptance rates and 2004 APR discharge data to the VYNPS spent fuel assemblies, DOE was obligated to accept 378 assemblies from the plant in 1998, the first year of performance. (Rives, Tr. 15-16; 250-51; Hoffman, Tr. 409-12; PX 21 at A.2-3.) To date, ENVY has loaded 340 assemblies onto the dry storage facility at the VYNPS. (Rives, Tr. 251.)

D. DOE’s Breach of the Standard Contract

Despite its obligations, DOE did not begin accepting spent fuel from the VYNPS by the January 31, 1998 due date. (Rives, Tr. 234-35.) To date, DOE has yet to accept any spent fuel from the VYNPS or from any other utility. *See* Maine Yankee Atomic Power Co., 225 F.3d at 1338. DOE was aware as early as 1987 that it would not have a functioning permanent repository by 1998 to accept spent fuel from nuclear plants. In DOE’s 1987 MPA, DOE recommended to Congress the construction of an interim Monitored Retrievable Storage (“MRS”) facility to enable DOE to begin disposing of spent fuel by the 1998 deadline. *See* Sys. Fuels, Inc. v. United States, 79 Fed. Cl. 37, 44 (2007), *appeal docketed*, No. 2008-5025 (Fed. Cir. Jan. 9, 2008) (“Sys. Fuels I”); Dairyland Power Coop., 90 Fed. Cl. at 621; Consol. Edison Co., 92 Fed. Cl. at 480-81. DOE reasoned that an interim facility was necessary because a final repository was not likely to open until 2003. Dairyland Power Coop., 90 Fed. Cl. at 621. Congress responded to DOE’s proposal by amending the NWPA and authorizing a “monitored retrievable storage facility subject to [certain] conditions” and also directing DOE to

develop a single permanent repository at Yucca Mountain in Nevada. Pub. L. No. 100-203 § 5021, 101 Stat. 1330-227, 1330-232 (codified at 42 U.S.C. § 10162(b)). Congress, however, prohibited the MRS from storing more than 10,000 MTU and also limited DOE's ability to construct the interim facility until the permanent repository had been licensed for construction. Pub. L. No. 100-203, § 5021, 101 Stat. at 1330-236 (codified as 42 U.S.C. §§ 10168(d)(3), (4)). In 1991, DOE acknowledged that the construction and operation of an MRS facility would not be feasible by 1998 unless Congress lifted the restrictions it placed in constructing the MRS. See generally Sys. Fuels I, 79 Fed. Cl. at 45.

By 1994, DOE was aware of the probability that Congress would not lift the restrictions it had placed on the MRS. On May 25, 1994, DOE's Office of Civilian Radioactive Waste Management issued a Notice of Inquiry advising utilities that it "currently projects that the earliest possible date for acceptance of [spent fuel] for disposal at a repository is 2010." Notice of Inquiry, 59 Fed. Reg. 27,007, 27,008 (May 25, 1994). In the same Notice, DOE announced that it "ha[d] no statutory obligation to accept spent nuclear fuel beginning in 1998 in the absence of an operational repository" Id. One year later, DOE issued its "Final Interpretation of Nuclear Waste Acceptance Issues" stating that it "has become apparent that neither a repository nor an interim storage facility constructed under the Act will be available by 1998." 60 Fed. Reg. 21,793, 21,794 (May 3, 1995). DOE also reiterated that it had no statutory obligation to accept spent fuel in 1998. 60 Fed. Reg. 21,794-95. In 1996, the D.C. Circuit rejected DOE's interpretation of its obligations under the NWPA. See Ind. Mich. Power Co. v. United States, 88 F.3d 1272, 1277 (D.C. Cir. 1996). The D.C. Circuit determined that DOE's obligation to accept spent fuel was not conditioned on the construction of a repository. Rather, the clear language of the NWPA obligated DOE to "perform[] in a timely manner." Id.; see also Northern States Power Co. v. Dep't of Energy, 128 F.3d 754, 758-60 (D.C. Cir. 1997). In 2004, the Federal Circuit further held that "because the government unequivocally announced in 1994 that it would not meet its contractual obligations beginning in 1998, the utilities were in fact obligated to take mitigatory steps" by that date. Ind. Mich. Power Co., 422 F.3d at 1375; see also Yankee Atomic Elec. Co., 536 F.3d at 1275 ("[T]his court . . . viewed 1994 as the latest possible date for the utilities' duty to mitigate.").

DOE's breach of the 1998 Standard Contract impacted the VYNPS's ability to maintain full core reserve in the spent fuel pool. "Full core reserve" refers to a nuclear plant's ability to maintain sufficient open and usable space in the spent fuel pool to ensure that fuel from the reactor core could be fully discharged to the spent fuel pool.

(Thayer, Tr. 69.) Full core reserve is not a regulatory requirement, but is a common objective for economic and risk management purposes. (Stip. ¶ 10; Thayer, Tr. 69.)⁷

ENVY derives its pool capacity from, among other sources, configuration maps generated by ENVY's reactor engineering department. (PX 66; Card, Tr. 293-94; Hoffman, Tr. 396-97.) ENVY tracks fuel discharges from the plant in core management reports and historical summaries that identify "the amount of fuel that was in the spent fuel pool at a given point in time." (Hoffman, Tr. 396; see also PX 18; PX 66.) Projected future discharges similarly are recorded and tracked. (PX 57; Card, Tr. 307-11; Hoffman, Tr. 399.) Such data is used for various purposes, for example, by Mr. John R. Hoffman in his capacity as manager of the dry fuel storage project. (Hoffman, Tr. 390-91.) Using the legally controlling "pick-up" rates described in DOE's 1987 ACR and MPA, as well as DOE's APR and ACR, Mr. Hoffman was able to summarize the impact of DOE's partial breach on the VYNPS's ability to store spent fuel. (Hoffman, Tr. 390-414; PX 72.) Based on his analysis, if DOE had timely performed in 1998, DOE would have been obligated to accept 378 assemblies from the VYNPS in the first year of performance. (Hoffman, Tr. 408-12; PX 21 at A.2 (50 assemblies), A.3 (328 assemblies).) To date, only 340 assemblies have been loaded onto the dry cask storage facility at the VYNPS. (Rives, Tr. 251.) Thus, had DOE timely performed in 1998, there would still be full core reserve at the plant.

E. ENVY's Purchase of VYNPS

On July 31, 2002, ENVY completed the purchase of the VYNPS from Vermont Yankee. (PX 11, PX 12; Rives, Tr. 236-37.) Through the sale, Vermont Yankee assigned certain rights and duties to ENVY pursuant to Article XIV of the Standard Contract. Specifically, Vermont Yankee assigned to ENVY "any claims . . . related to [DOE's] defaults under the . . . Standard Contract accrued as of the Closing, whether relating to periods prior to or following the Closing, excluding such claims as may relate to the one-time fee." See Vermont Yankee Power Corp., 84 Fed. Cl. at 341. Vermont Yankee retained liability for the "one-time" fee due, if and when DOE performs, and any claims that might be related to that fee. Id. The Court ruled that ENVY owns, and has the right to pursue, all pre- and post-closing claims for damages arising out of DOE's partial breach. Id. ENVY's damages claims in this case do not relate to the one-time fee.

ENVY currently is the asset owner for the VYNPS. (Thayer, Tr. 62.) ENVY also is the party that bears all costs associated with the facility. Id. While Entergy Nuclear Operations, Inc. is the legal entity by whom many employees at the VYNPS site are

⁷ While it is "desirable" to maintain full core reserve, the VYNPS lost full core reserve for part or most of an operating cycle in 2007. (Thayer, Tr. 69-70.) Full core reserve was reestablished once some fuel was taken out of the pool and loaded into dry storage casks. Id.

employed, the costs for those employees are borne by ENVY. (Thayer, Tr. 62-63.) Similarly, some personnel performing services benefitting the VYNPS are employed by Entergy Services, Inc. However, the ultimate burden of such costs falls upon ENVY. (Thayer, Tr. 63.)

Prior to its purchase of the VYNPS, ENVY established a three-step “business case” to assess the viability of the plant. First, ENVY wanted to secure an extended power uprate for the VYNPS, in order to increase revenue. (Thayer, Tr. 145-46.) “Power uprate” is a process by which a nuclear utility adds to the plant’s electrical output capacity. Id. Nuclear plants can increase their electrical output in “small steps” through the replacement of equipment and refined analyses. (Thayer, Tr. 66.) Alternatively, nuclear plants can combine all of the small uprates into a single step of a twenty percent increase, called an “extended uprate,” which is the maximum permitted by NRC regulations. (Thayer, Tr. 66-67.) At the time of the 2002 sale, the VYNPS was operating at approximately 540 megawatts, the original output that had been established in 1972. Id. Second, ENVY wanted to secure dry fuel storage at the power plant through the plant’s original operating license. (Thayer, Tr. 135-36, 138-39.) Finally, ENVY wanted to secure an extension of the VYNPS license to operate for an additional twenty years, through 2032. (Thayer, Tr. 135-36.) ENVY identified these three projects as fundamental to making the power station a viable business. (Thayer, Tr. 140-41.)

Vermont statutory law required ENVY to submit an application for review to the Vermont Public Service Board for its approval of the plant sale. See 30 V.S.A § 231(a); Thayer, Tr. 91-92. The Public Service Board is a three-member panel with quasi-judicial authority that supervises “the rates, quality of service, and overall financial management of Vermont’s public utilities.” See Vermont Public Service Board, at <http://psb.vermont.gov>; see also Thayer, Tr. 100-01 (noting that the Public Service Board is akin to a state utilities commission). The Public Service Board has the authority to issue a “Certificate of Public Good” for a utility such as ENVY, to own or operate an electric company, if doing so “will promote the general good of the state.” 30 V.S.A. § 231(a).

ENVY filed a petition with the Vermont Public Service Board for a Certificate of Public Good to own and operate the VYNPS in accordance with state law. (Thayer, Tr. 139-40.) During the application proceedings, ENVY informed the Board of its intent to secure an extended power uprate, construct a dry fuel storage facility, and renew the plant’s operating license. Id. ENVY committed to working with the Board to receive its approval on those projects “in order to have the ability to do business in Vermont.” (Thayer, Tr. 142-44.) After finding that the sale of the plant to ENVY would promote the public good, the Board issued a Certificate of Public Good to ENVY for the sale. See In re Proposed Sale of Vermont Yankee Nuclear Power Station, et al., 829 A.2d 1284, 1286 (Vt. 2003).

F. Power Uprate Certificate of Public Good

In 2003, ENVY returned to the Vermont Public Service Board to petition for the twenty percent power uprate at the plant. (Thayer, Tr. 144.) Pursuant to 30 V.S.A. § 248, the Public Service Board may issue a Certificate of Public Good to a utility company once it establishes that the any proposed modification to a plant “will promote the general good of the state.” (PX 69 (30 V.S.A § 248(a)(3)).) During the petition process, ENVY worked with Vermont’s Department of Public Service to obtain the desired power uprate. The Department of Public Service is an executive branch agency charged with representing the public interest in utility cases before the Public Service Board. (Thayer, Tr. 100-01, 121-22.) The Department also participates in Certificate of Public Good hearings to provide testimony and opinions to the Public Service Board on technical and economic matters as well as whether a Certificate of Public Good petition would promote the public good. Id.

In October 2003, ENVY entered into a Memorandum of Understanding (“MOU”) with the Department of Public Service for a Certificate of Public Good authorizing the twenty percent power uprate at the VYNPS. (Thayer, Tr. 147-48; PX 17 at 1-5.) MOUs are common during the Certificate of Public Good petition process. (Thayer, Tr. 104.) They essentially serve to capture the agreements between the applicant and the Department of Public Service before the agency makes its recommendation to the Public Service Board. (PX 30 at 1-3; Thayer, Tr. 119-20.) In the October 2003 MOU, ENVY and the agency agreed upon a revenue sharing concept whereby a certain percentage of the revenue from the power uprate sold would be paid to the State of Vermont. (Thayer, Tr. 151.) Specifically, ENVY would be required to make payments to the “State Benefit Funds,” which included the “Environmental Benefit Fund,” the “Low Income Benefit Fund,” and the “Entergy Fund for Economic Benefit.” (Thayer, Tr. 151-52; PX 17 at 1-2.) As of the fall of 2003, these funds comprised the revenue sharing fund to which a percentage of the revenue generated from the plant would be directed to the State of Vermont. (Thayer, Tr. 152.)

ENVY initially opposed making payments to the State Benefit Funds, reasoning that the power uprate itself promoted the public good. Id. However, the Department of Public Service disagreed, arguing before the Public Service Board that the power uprate alone was insufficient to provide a direct economic benefit to Vermont. (Thayer, Tr. 152-53.) The Department of Public Service therefore recommended to the Public Service Board that ENVY contribute to the State Benefit Funds. Id. Thereafter, on March 15, 2004, the Vermont Public Service Board issued a Certificate of Public Good authorizing the extended power uprate at the plant. (Thayer, Tr. 153; DDX 1; DX 38.)

The extended power uprate also required the approval of the NRC. Thus, in the fall of 2003, ENVY submitted a twenty percent extended power uprate request to the NRC to increase the plant's output from 1593 MWt to 1912 MWt, or 540 MWe to 650 MWe.⁸ Emerging industry issues delayed the NRC's power uprate approval. (Thayer, Tr. 189-90.) Ultimately, those industry issues were resolved and the NRC approved ENVY's power uprate request in March 2006. (Stip. ¶ 3.) The VYNPS implemented the uprate, increasing the plant output to 1912 MWt. Id.

G. Plaintiffs' Mitigation Efforts

1. Holtec Rack Project

The VYNPS had sufficient spent fuel pool capacity to maintain full core reserve through spring 2001. (Pl.'s Pre-Trial Br. 7.) However, given DOE's announcement in 1995 that disposal of spent fuel would not begin until at least 2010, it had become apparent that Vermont Yankee would "run[] out of space in the spent fuel pool and . . . needed additional space to maintain the operation of the reactor." (Hoffman, Tr. 362-63; see also Thayer, Tr. 85 ("And we were aware that this plant did not have enough space in the pool for storage of spent fuel . . .").) Accordingly, in the late 1990s, Vermont Yankee began installing additional storage racks in the spent fuel pool, called the Holtec Rack Project. (Hoffman, Tr. 362-63; Pl.'s Pre-Trial Br. 8.) The Holtec Rack Project consisted of three racks: two permanent racks and one temporary rack. The first rack, called the "NE" rack because it was placed in the northeast portion of the pool, added 168 storage cells, each of which could hold one assembly. (Hoffman, Tr. 366-67.) The second rack, called "SE" because it was installed in the southeast portion of the pool, added 236 storage cells. Id. The third rack, called "CA" for "cask area," was a temporary rack that could be placed into the cask loading area if needed, and would add 266 storage cells. (Hoffman, Tr. 367-68.) ENVY procured this temporary rack after its acquisition of the plant to provide ENVY with additional temporary fuel storage, if necessary. (Hoffman, Tr. 368; PX 15.) All three racks together increased the licensed capacity of the VYNPS spent fuel pool to 3,353 assemblies. (PX 14 at 044464.)

Vermont Yankee and ENVY spent \$4,884,166 on the Holtec Rack Project. (Stip. ¶¶ 11, 13; see also Johnson, Tr. 545-47; PX 75; PX 76.) Defendant does not contest that ENVY is entitled to recover these expenses.

2. Dry Fuel Storage Facility

In early 2004, since DOE's permanent spent fuel repository still had not materialized, ENVY authorized the necessary expenditures for an on-site spent fuel dry-

⁸ "MWt" is the measure of thermal energy output of the reactor. "MWe" is the electrical output of the turbine generator. (Stip. ¶ 3.)

cask storage facility. (PX 20 at 045341; Hoffman, Tr. 371-73.) The purpose of the project was to enable the VYNPS to have sufficient spent fuel storage space to continue operations beyond 2008. (PX 20 at 045341 (“The proposed project . . . will enable VYNPS to continue operations beyond 2008”); Hoffman, Tr. 371-74.) Without an additional storage facility, ENVY would not have been able to refuel the reactor during the normal 18-month cycle in 2008 and would have ceased operations. (Thayer, Tr. 84 (“[ENVY w]ould have run out of storage space approximately in the year 2008. We would have not been able to operate the plant.”); Hoffman, Tr. 370-71; Drouin, Tr. 488-89.) The 2008 deadline therefore served as an important target date for the dry fuel storage project. (Drouin, Tr. 488-89.)

ENVY decided to use the Holtec International 100S Version B (218) Overpack system with high density concrete for the dry storage facility. (PX 46 at 045500.) Each overpack system contains a steel multi-purpose cask that can hold up to 68 spent fuel assemblies. *Id.*; Drouin, Tr. 493. The overpacks and casks are stored and transported vertically from the spent fuel pool to the 76-foot by 132-foot dry storage pad. (PX 46 at 045500; Drouin, Tr. 493-94.) The storage pad was designed to hold 36 loaded casks, a number sufficient to allow the plant to operate through the end of the potentially renewed NRC license, or through 2032. (PX 46 at 045000; PX 20 at 045341; Hoffman, Tr. 373-74; Thayer, Tr. 80.) While ENVY contemplated constructing two smaller dry storage facilities, ENVY determined that the construction of a long-term dry storage facility would be “reasonable and prudent and cost beneficial.” (Hoffman, Tr. 375-76.)

Because the NRC previously had reviewed and approved the Holtec International cask design, ENVY was able to take advantage of the VYNPS’s “general license” from the NRC for that system. (Thayer, Tr. 86.) Thus, ENVY could use the same design without an NRC “site-specific application and approval,” as long as it complied with all of the terms of the general license. (Thayer, Tr. 86-87; Hoffman, Tr. 445-46; PX 20 at 045370.) In addition to the NRC general license, ENVY also needed approval from the State of Vermont to construct and operate the on-site dry storage facility at the VYNPS. (Thayer, Tr. 169; Hoffman, Tr. 418-19.) ENVY’s attempts to secure authorization from the State of Vermont to construct and operate a dry storage facility at the plant, however, proved to be long and difficult.

H. The Spent Fuel Storage Certificate of Public Good

1. Vermont Statutory Provisions on Dry Fuel Storage

The State of Vermont enacted several statutes regulating a nuclear power plant’s ability to construct or make physical changes to its facility. First, as previously discussed, 30 V.S.A. § 248(a)(2) required electric utilities in Vermont to obtain a Certificate of Public Good from the Public Service Board prior to making any physical

modifications to an existing power generation facility. (PX 69 (30 V.S.A. § 248(a)(2)).) Because the proposed dry fuel storage at the VYNPS would change the basic footprint of the plant (Hoffman, Tr. 378), and essentially involved physical changes to the plant site, a Certificate of Public Good was required. (Thayer, Tr. 91.)

Second, Vermont imposed a statutory provision prohibiting the construction or establishment of spent nuclear fuel storage facilities within the State, unless approved by the general assembly. See PX 70 at 10599; Thayer, Tr. 159-60. Enacted in 1977, 10 V.S.A. § 6501(a) provides that no spent nuclear fuel storage facility “shall be constructed or established in the state of Vermont unless the general assembly first finds that it promotes the general good of the state and approves . . . a petition for approval of the facility.” (PX 70.) In 1979, however, the Vermont legislature added an exemption to Section 6501(a) for “any temporary storage by Vermont Yankee Nuclear Power Corporation of spent fuel elements or other radioactive waste at its present site.” (PX 70 at 10600 (10 V.S.A. § 6505); Thayer, Tr. 160-61.)

In acquiring the VYNPS, ENVY believed that Vermont’s exemption under Section 6505 would also apply to ENVY. (Thayer, Tr. 93, 161; Hoffman, Tr. 449.) ENVY based its belief on the fact that Section 6505 explicitly referenced the physical site of the VYNPS, and ENVY had purchased all of Vermont Yankee’s assets, including the VYNPS and the spent fuel pool. (Thayer, Tr. 93, 161.) However, as ENVY began its preparations for construction of the dry storage facility, the Vermont General Assembly indicated that it was likely to take a contrary position. (Thayer, Tr. 94-97.) Thus, in 2004, ENVY approached the General Assembly and requested its interpretation of the term “Vermont Yankee Nuclear Power Corporation” as stated in Section 6505. (Thayer, Tr. 161-62.) On April 30, 2004, the Office of the Vermont Attorney General issued a letter expressing the view that the exemption would not apply to ENVY. (DX 44; Thayer, Tr. 162.) Therefore, unless Section 6505 was modified, ENVY would need legislative approval from the Vermont General Assembly to construct a dry storage facility. (Thayer, Tr. 166.)

2. ENVY’s Response to the Vermont State Law Requirements

For a host of reasons, ENVY determined that it would not be prudent to attempt to secure separate approval from the Vermont General Assembly pursuant to Section 6501. (Thayer, Tr. 98.) Among other things, ENVY concluded that Vermont’s interpretation of the statutes at issue first required ENVY to obtain the legislative approval prior to starting the Certificate of Public Good process with the Public Service Board. Id. Additionally, the provisions of Section 6501 requiring the approval of the General Assembly did not contain specific standards or criteria by which the legislature could render a decision. Id. ENVY, on the other hand, believed that the Certificate of Public Good process under 30 V.S.A. § 248(a) gave “the state of Vermont a significant examination of the proposed

change to store dry fuel.” Id. Accordingly, during the General Assembly’s 2004 session, ENVY undertook efforts to move the General Assembly’s review of the dry fuel storage project to the Public Service Board. (Thayer, Tr. 99.)

On June 3, 2005, the General Assembly passed H.545, the “Dry Cask Storage Authorization [Act] of 2005.” (Thayer, Tr. 109; PX 22; PX 32 at 00017.) This Act, which was signed into law on June 21, 2005, required owners of the VYNPS to obtain a Certificate of Public Good in accordance with Section 248 before constructing or altering a spent nuclear fuel facility. (PX 32 at 00019; see also Thayer, Tr. 91, 102-03, 106.) In addition, the Act required the Public Service Board to find that ENVY was “in substantial compliance with any memorandum of understanding entered into between the state and [ENVY].” (PX 32 at 00019.) That MOU (discussed below) had been developed by the Department of Public Service and ENVY beforehand, and was essentially drafted and in final form by early June 2005. (Thayer, Tr. 111.) Satisfaction of the Act and the referenced MOU would constitute “compliance with the provisions of this chapter that require that approval be obtained from the general assembly before construction or establishment of a facility for the deposit or storage of spent nuclear fuel” (PX 32 at 00020.) If ENVY complied with the MOU and secured a Certificate of Public Good from the Public Service Board, it could construct the dry storage facility at the VYNPS. (Thayer, Tr. 106.)

3. The Spent Fuel Storage Memorandum of Understanding

Prior to the enactment of the Dry Cask Storage Authorization Act, ENVY engaged in extensive discussions and negotiations with the Vermont Department of Public Service to draft an MOU for the construction of the dry storage facility. (Thayer, Tr. 120.) The parties finalized the MOU in early June and executed it on June 21, 2005, the same date that the Dry Cask Storage Authorization Act went into effect. (PX 30; PX 32.) Securing the MOU with the Department of Public Service ensured ENVY that it would receive a favorable recommendation from that agency during ENVY’s Certificate of Public Good hearing before the Public Service Board. (Thayer, Tr. 174 (agreeing that ENVY negotiated the MOU “in the spirit of settling the dry fuel storage case before the Vermont Public Service Board.”).) The MOU reflected a series of seventeen agreed terms the State intended to impose on the dry storage facility, several of which are relevant to this case. (PX 30.)

a. The Vermont Clean Energy Development Fund

Item 11 of the dry storage MOU required ENVY to make payments totaling \$15,625,000 to the Clean Energy Development Fund created by Section 6523 of the Dry Cask Storage Authorization Act. (PX 32 at 00020-21; Thayer, Tr. 154-55.) The Vermont General Assembly created the Clean Energy Development Fund “to promote

the development and deployment of cost-effective and environmentally sustainable electric power resources” (PX 32 at 00021; Thayer, Tr. 106-07.) It also served as a mechanism for the Vermont legislature to “fund the exploration of renewable energy sources in Vermont.” (Thayer, Tr. 106-07; see also PX 32.)

Under Section 6523 of the Act, the General Assembly redirected proceeds from the State Benefits Funds under ENVY’s power uprate MOU to the Clean Energy Development Fund. (Thayer, Tr. 155-57; PX 32 at 00020.) In accordance with the spent fuel storage MOU, Section 6523 obligated ENVY to make the \$15,625,000 payment during the period January 1, 2006, to March 21, 2012, in quarterly installments of \$625,000. (PX 30 at 011509-10.) This obligation did not take effect until ENVY received “all approvals” necessary from the NRC for the extended power uprate. Id. The NRC’s power uprate approval allowed ENVY to make payments to the Fund. (Thayer, Tr. 117-18; 189-90 (“If [ENVY] did not get approval from the NRC for the power uprate, then there would not have been a Clean Energy Development Fund.”).)

Initially, ENVY opposed making payments to the Clean Energy Development Fund. ENVY argued that building a dry storage facility would not create any additional revenue, but would merely allow the plant to continue to operate through its current license. (Thayer, Tr. 113-14.) ENVY maintained that payments to the Clean Energy Development Fund were not necessary because there was “a considerable amount of public good” in the continued operation of the plant and in delivering electricity to Vermont ratepayers at favorable rates. Id. However, the State of Vermont “did not accept that position.” Id. at 114. As Mr. Jay Thayer, vice-president of ENVY, testified:

We were calling it temporary storage. They were saying it doesn’t sound too temporary to us. And you’re going to have to pay for this privilege. And that was the legislature’s position.

Id. ENVY ultimately decided not to challenge the Vermont legislature’s position, believing that it could affect adversely ENVY’s “day-to-day business of operating the plant.” Id. at 115-16. ENVY also was concerned that if it did not agree to the Clean Energy Development Fund, the plant would shut down in 2008 from not receiving approval from the State for dry fuel storage. (Thayer, Tr. 108-09, 114-15.) As a result, the Clean Energy Development Fund was included in the MOU and in the Dry Cask Storage Authorization Act “based upon . . . the Company’s agreement to fund a Clean Energy Development Fund established by the legislation.” (PX 30 at 011509.)

For the time period at issue in this case, ENVY has made payments to the fund totaling \$5,625,000. (Stip. ¶ 15.)

b. Visual Barrier

In addition to the Clean Energy Development Fund, Item 1 of the spent fuel storage MOU required ENVY to erect a wall on the north and east sides of the dry fuel storage pad to “provide line-of-sight protection.” (PX 30 at 011508.) The visual barrier was intended to shield the visual impact of seeing from the Connecticut River or the State of New Hampshire “what some people thought were the ugly casks that would sit on the dry fuel storage pad.” (Hoffman, Tr. 424-25.)

The visual barrier requirement arose from “discussions with the legislature, legislative leadership, committee chair and the [P]ublic [S]ervice [D]epartment.” (Thayer, Tr. 119.) A local intervenor group called the New England Coalition also wanted the visual barrier incorporated into the MOU. *Id.* at 175. ENVY initially opposed erecting the barrier, arguing that it was unnecessary to the dry fuel storage facility “from a design, safety, and public good standpoint.” (Thayer, Tr. 177; see also Hoffman, Tr. 424-26.)

The Department of Public Service nevertheless proposed earthen berms to be constructed around the dry storage facility. (Hoffman, Tr. 381-82.) However, given the small size of the property surrounding the proposed dry storage facility, ENVY determined that berms were not feasible. *Id.* ENVY alternatively considered putting “stripping and chain-link fence” on the north and east sides of the dry storage facility to shield the casks from public view. (Hoffman, Tr. 425; Thayer, Tr. 179.) An aesthetic consultant that ENVY hired, however, recommended that the visual barrier be made of wood and painted green. *Id.* ENVY agreed to construct the wooden fence, reasoning that it “was going to help” ENVY get approval for a dry fuel storage facility. (Hoffman, Tr. 426.)

In the Public Service Board’s April 26, 2006 Order granting ENVY permission to construct and operate the dry storage facility, the Board determined that the visual barrier was unnecessary. (PX 38; PX 39; Thayer, Tr. 124, 178-79.) The Order provides:

[ENVY] has agreed to mitigate potential aesthetic impacts by constructing a 20-foot-tall fence. It is proposed to be dark green and should appear similar in scale and color to other existing buildings at Vermont Yankee. The fence should screen nearly the entire view of the spent fuel casks from the Connecticut River and the New Hampshire shore.

We are not convinced, however, that the visual barrier is necessary. Vermont Yankee is an industrial site, and from an aesthetic perspective, the addition of a limited number of concrete and metal containers results in little change to the

overall aesthetics of the site. We have accepted the proposal to include a fence, not because we consider it a necessary mitigation step here, but because it came as part of the memorandum of understanding accompanying this proposal.

(PX 39 at 011463.) ENVY ultimately spent \$412,854 on the construction of the line-of-sight barrier.⁹ (Stip. ¶ 15.)

c. Preemption

Item 12 of the spent fuel storage MOU provides that ENVY will not file an action or petition based on the doctrine of federal preemption to prevent enforcement of its obligations under the MOU. (PX 30 at 011510.) The Department of Public Service wanted this provision included in the MOU. (Hoffman, Tr. 441.) Mr. Thayer, as ENVY's signatory and "lead negotiator" of the MOU, testified that he understood that the purpose of this provision was to assure the State of Vermont that ENVY did not seek to "invalidate" the requirements of the spent fuel storage MOU on federal preemption grounds, by arguing that the State had acted inappropriately in putting restrictions on a nuclear power plant, which is licensed by the NRC. (Thayer, Tr. 191-92; see also Hoffman, Tr. 442.)

Mr. Thayer further understood that the State of Vermont was aware of nuclear safety issues falling under federal authority. For example, the Vermont General Attorney on April 30, 2004, informed a member of the Vermont legislature that "nuclear power plants are extensively regulated by the federal government under the Atomic Energy Act" and "[s]tate regulation of operation and safety at such plants is generally preempted." (DX 44 (citing Pac. Gas & Elec. Co., 461 U.S. 190).) In constructing and operating the dry fuel storage facility, ENVY did not challenge the conditions imposed by the State of Vermont on federal preemption grounds. (Thayer, Tr. 192.)

4. The Certificate of Public Good Proceedings

On the same day that the Vermont General Assembly passed the Dry Cask Authorization Act, ENVY submitted an application to the Public Service Board for a Certificate of Public Good. (PX 23; PX 24; see also Thayer, Tr. 121.) That filing commenced the process of submitting pre-filed testimony, notification of parties, and scheduling of proceedings with all parties involved, including the Department of Public Service. (Thayer, Tr. 121-22.) The filing also prompted discovery and other pre-hearing activities, culminating in several days of live hearings, with post-hearing briefs filed by

⁹ In addition, ENVY allocated \$27,159 in overhead costs comprised of materials loader and capital suspense charges to the visual barrier project, for a total cost of \$440,013. The Court will analyze the claims for materials loader and capital suspense charges separately from other costs.

all parties. Id. ENVY hired the law firm of Downs, Rachlin & Martin, LLC in Vermont to represent them in the Certificate of Public Good hearing process. (Thayer, Tr. 122-23; Hoffman, Tr. 451-52; PX 20 at 045370.) ENVY also hired consultants and experts, including the Arno Group, for advice regarding the MOU, the Certificate of Public Good, and the legislative process. (Thayer, Tr. 123, 193.)

For the period prior to April 30, 2008, the parties stipulated that ENVY properly recorded and accounted for \$2,980,381.92 in costs for services provided by Downs, Rachlin, & Martin, LLC. (Supp. Stip. ¶ 18.) The parties also stipulated that ENVY properly recorded and accounted for \$405,401.26 in costs for services provided by the Arno Group. Id. at ¶ 17.

5. River Flood Analysis

On April 26, 2006, the Public Service Board issued ENVY the dry fuel storage Certificate of Public Good. (PX 38; Hoffman, Tr. 383.) The dry fuel storage Certificate of Public Good was supported by a 91-page order. (PX 39.) The order noted that, because of DOE's failure to remove the spent nuclear fuel in a timely fashion, the VYNPS would run out of space to store spent fuel without the construction of a dry fuel storage facility. Id. at 011415. Thus, the Public Service Board found that construction of the dry storage facility at VYNPS would "promote the general good of the state." Id. at 011414.

The dry fuel storage Certificate of Public Good identified several conditions requiring ENVY's compliance. First, ENVY had to "comply with the terms and conditions of the Memorandum of Understanding between [ENVY] and the Department of Public Service dated June 21, 2005." (PX 38 at 002267.) Second, particularly relevant to this case, item 7 required ENVY to perform and file with the Public Service Board a "study addressing the stability of the bank adjacent to the proposed storage pad based upon the assumption that the Connecticut River experiences the probable maximum flood and an avulsion occurs at Vernon Neck." (PX 38 at 002268.)

An avulsion is a "sudden ripping away, [a] nasty sounding injury, and it has a geographical term that's also the rapid loss of soil, earth, caused by a river." (Hoffman, Tr. 384.) A concern that such an event could occur arose during ENVY's Certificate of Public Good hearings for a dry storage facility. A representative from the Vermont Agency of Natural Resources expressed concern that during a flood, the Vernon Neck¹⁰ might erode and release a body of water held by the dam, causing higher velocities in the river, which could then result in an erosion of the river bank where the dry storage

¹⁰ The Vernon Neck is a small strip of land adjacent to a dam on the Connecticut River just below the plant. (Hoffman, Tr. 386-87; PDX 1.)

facility would be located. (Hoffman, Tr. 385-87.) The Vermont Agency of Natural Resources representative felt that such a possibility had not been sufficiently studied. Id.

ENVY did not believe that the Agency's position had merit. (Hoffman, Tr. 388; Thayer, Tr. 182-83.) ENVY presented its own technical specialists during the hearings calling into doubt the Agency's concerns. (Thayer, Tr. 126.) Moreover, ENVY previously conducted a flood analysis in order to obtain a license from the NRC to operate the VYNPS. (Hoffman, Tr. 429-30.) The purpose of the license was to establish a credible flood level at the site to ensure that the utility is designed to protect against potential flooding. Id. The NRC flood analysis took into account a "probable maximum flood" at the site to ensure that such flooding would not create safety issues at the plant or "endanger or prevent the execution of safety functions." (Hoffman, Tr. 386-87.)

ENVY also completed an NRC flood analysis for the design and elevation of the VYNPS. (Hoffman, Tr. 430, 434.) In pursuing the Certificate of Public Good for the dry storage facility, ENVY informed the Vermont Public Service Board that the dry storage facility would be constructed at an elevation of 254 feet above sea level, or two feet above the VYNPS site grade of 252 feet above sea level, in accordance with the NRC design flood analysis. (Hoffman, Tr. 431.) ENVY also informed the Board that the facility was designed to ensure that the multi-purpose casks are above the power station's design basis flood for the site and that flood water, if any, would not come into contact with the casks on the pad. (Hoffman, Tr. 430-31.) ENVY further stated that the placement of the dry storage pad would not contribute to shoreline erosion or instability. (Hoffman, Tr. 431.)

Nevertheless, the issue of whether the Public Service Board could rely on ENVY's previous analysis and findings was "very much contested." (Thayer, Tr. 126.) The Vermont Agency of Natural Resources called upon ENVY to perform an additional analysis demonstrating that the dry storage facility would not be vulnerable to any potential flooding. Id. ENVY considered the Agency's proposed study as a "Noah's Ark-type" analysis, in excess of the Federal Emergency Management Agency's 500-year flood analysis. (Hoffman, Tr. 439.) However, ENVY ultimately agreed to perform the additional river flooding and erosion study to analyze the concerns raised by the Vermont Agency of Natural Resources. (Hoffman, Tr. 439-40; Thayer, Tr. 181.) The Public Service Board incorporated this requirement into its April 26, 2006 Order. (PX 38 at 002267.)

The Board's Order concluded that ENVY's flood analysis was not necessary for it to have obtained a Certificate of Public Good. The Board explained:

The evidence, however, supports the conclusion that the probability of a flood event undermining the dry fuel storage

pad is too remote to be credible . . . We are not convinced of the likelihood of the combined scenario of a probable maximum flood, a breach of the Vernon Neck, channel relocation, and bank scouring which would undermine [the] area around the proposed project. . . .

Although [ENVY] took the position that such a combination of flooding events is not credible, it has agreed to undertake additional study of the matter, and will accept a condition to its [Certificate of Public Good] requiring it to perform and file the study with the Board. . . . While we expect that it will be valuable to learn more about this issue, [ENVY's] decision to conduct this study does not color the conclusion we reached above as to the likelihood of the actual occurrence of sequence of events described above.

(PX 39 at 011457-58.) ENVY spent \$184,552 in performing the river flood analysis.¹¹ (Stip. ¶ 15.)

I. Construction of the Dry Storage Facility

1. Radioactive Waste Transportation and Disposal

With the Public Service Board's April 26, 2006 Order granting ENVY the dry fuel storage Certificate of Public Good, ENVY was able to begin constructing the dry storage facility. However, in order to accommodate the height of the Holtec vertical casks in transferring the spent fuel from the reactor building to the dry fuel storage facility, the existing containment access building at the VYNPS had to be replaced. (Drouin, Tr. 495-96; PX 46 at 045484.) In addition, ENVY had to "install a large concrete pad within [the new building] just to go in and pick up the cask[s]." (Drouin, Tr. 496; PX 46 at 045484.) During excavation, ENVY discovered that the soil and asphalt below the old containment access building were radioactive and contaminated. (Drouin, Tr. 504.) Although the source and cause of the contamination are unclear, the parties agree that there appears to be no connection between the construction of the dry storage facility and the contaminated soil. (Thomas, Tr. 852; Brewer, Tr. 999-1000.)

Because the contaminated soil was above "free-release limits," the soil had to be disposed of at a licensed radioactive waste site. (Drouin, Tr. 505.) "Free-release" means that "there's no detectable contamination [in the soil] and it can go anywhere," such as a landfill. Id. While the contaminated material was above free-release limits, no protective

¹¹ In addition, ENVY allocated \$5,891 in capital suspense charges to the river flood analysis, for a total cost of \$190,443. The Court will analyze claims for capital suspense charges separately from other costs.

clothing or special equipment was required for excavation. Id. ENVY hired a contractor, Duratek, to transport and dispose of the low level radioactive waste. (Drouin, Tr. 503-04.) ENVY considered storing the radioactive waste on-site, but the plant lacked the necessary licensing. (Drouin, Tr. 507-08.) ENVY incurred \$276,980 in radioactive waste transportation and disposal costs. (Stip. ¶ 14.)

2. Preparation for Loading of the Holtec Casks

a. Work Platform

In order to load the spent nuclear fuel into the Holtec casks, ENVY constructed a work platform. Work platforms provide workers with a safe and stable surface upon which to load the casks with fuel assemblies. (Drouin, Tr. 528.) The platform was “designed specifically for the diameter and height of the Holtec cask system.” (Drouin, Tr. 521; see also Thomas, Tr. 865.) The platform actually consisted of two platforms, one welded around the transfer cask and the other at the top of the storage casks, which was mated and locked into place. (Drouin, Tr. 526-27.) The welding platform provided an efficient and safe way to access the cask for decontamination and closure. (Drouin, Tr. 528; Brewer, Tr. 1034-35.) ENVY retained ABSG Consulting to design and fabricate the platform. (Drouin, Tr. 518-19; PX 63.) ENVY incurred costs of \$102,220 to construct the platform. (Stip. ¶ 14.)

b. Spent Fuel Characterization

To prepare the spent nuclear fuel for loading into the Holtec casks for dry storage, ENVY incurred \$156,000 in spent fuel characterization costs. (Stip. ¶ 14.) Characterization is required to assess the condition of the spent fuel before handling and loading it into a cask.¹² (Brewer, Tr. 1014-15.) All NRC-licensed storage and transportation casks, including any that will be supplied by DOE, require that the spent fuel be characterized prior to loading. Id. at 1010. ENVY performed the spent fuel characterization under the direction of John Card, a senior reactor engineer at the VYNPS, who served as the Project Manager for the classification project. (Card, Tr. 287, 291, 312-13.)

As part of the characterization process, ENVY retained Framatone ANP to perform a “Spent Fuel Historical Records Classification Report.” (PX 16; PX 18; Card, Tr. 298, 313.) The purpose of the Report was to “determine what assemblies could be loaded into dry fuel storage without any further work.” (Card, Tr. 298.) Specifically, ENVY collected the information to determine if it could load spent fuel into the dry fuel

¹² In addition, ENVY allocated \$6,152 in capital suspense charges to the characterization, for a total cost of \$162,162. The Court will analyze claims for capital suspense charges separately from other costs.

storage system as is, or whether further precautionary work would be required. (Card, Tr. 300.)

Spent fuel storage casks have individual Certificates of Compliance, or “C of C” issued by the NRC. (Card, Tr. 303-04.) The “C of C” is unique to each cask, including those for the Holtec cask system. (Card, Tr. 304.) The Holtec “C of C” was one of three information inputs upon which the characterization process was based. *Id.* The other two were the NRC “Interim Staff Guidance” (“ISG”) and the 1983 Standard Contract. (Card, Tr. 304; Buchheit, Tr. 903.) Framatone’s fuel characterization procedure established seven categories of classification, consistent with the guidelines set forth in the NRC ISG, and the Standard Contract. (DX 27 at 12537-38; Card, Tr. 329-30; PX 1; PX 13.) Framatone’s spent fuel historical records review classified ENVY’s spent fuel into one of the seven categories based on the condition of the spent fuel cladding.¹³ (Buchheit, Tr. 917; PX 18.) Framatone’s spent fuel historical records report also organized all of ENVY’s spent fuel records. (Card, Tr. 342.) Although ENVY believes that DOE will accept the historical record as they have been organized by Framatone, *id.*, it is possible that another review of the spent fuel condition will be required to load DOE-supplied casks, if and when DOE ever performs under the Standard Contract. (Card, Tr. 305-06; Buchheit, Tr. 960.)

c. Employee Training

To prepare the spent fuel for loading into the Holtec dry storage casks, employees on ENVY’s dry fuel storage core team participated in week-long classroom training and on-the-job mobilization training. (Thomas, Tr. 819-20.) “Mobilization” refers to the movement of the equipment to the refueling floor or the containment access building and to the testing of that equipment to ensure its proper function. (Thomas, Tr. 818.) Employees charged their training time to the dry fuel storage capital project. *Id.* ENVY incurred \$169,087 in costs to develop procedures and training for loading the Holtec casks and \$33,211 in costs to train its employees. (Stip. ¶ 14.)

Discussion

A. Standards for Decision

1. Damages

ENVY is claiming damages for expenses it incurred in mitigating DOE’s partial breach of the Standard Contract. “The recoverability of these expenses logically follows from the duty of a non-breaching party to mitigate.” Energy Northwest v. United States,

¹³ “Cladding” is the metal tube that holds the nuclear fuel within a fuel assembly. (Card, Tr. 330.)

91 Fed. Cl. 531, 540 (2010), *appeal docketed*, No. 2010-5112 (Apr. 27, 2010). Mitigation damages are intended to “reimburse a non-breaching party to a contract for the expenses it incurred in attempting to rectify the injury the breach caused it.” Southern Nuclear Operating Co. v. United States, 77 Fed. Cl. 396, 403 (2007), *appeal docketed*, No. 2008-2050 (Fed. Cir. Jan. 3, 2008) (citing Citizens Fed. Bank v. United States, 474 F.3d 1314, 1320 (Fed. Cir. 2007)). Once a party has reason to assume that the other party will not perform, “he is expected to take such affirmative steps as are appropriate in the circumstances to avoid loss by making substitute arrangements or otherwise.” Energy Northwest, 91 Fed. Cl. at 540 (quoting Restatement (Second) of Contracts § 350 cmt. b (1981)); see also Sys. Fuels I, 79 Fed. Cl. at 51-52. Indeed, the failure to mitigate may reduce the amount of damages awarded to the non-breaching party. Southern Nuclear Operating Co., 77 Fed. Cl. at 403. A plaintiff is not precluded from recovering mitigation damages merely because the breach was only partial. As the Federal Circuit held in Indiana Michigan Power Company, there is “no reason why efforts to avoid damages in contemplation of partial a breach should not . . . be recoverable” just as they are recoverable for mitigation upon total breach. 422 F.3d at 1375.

The remedy for breach of contract, whether partial or otherwise, is “damages sufficient to place the injured party in as good a position as it would have been had the breaching party fully performed.” Ind. Mich. Power Co., 422 F.3d at 1373 (citing San Carlos Irrigation & Drainage Dist. v. United States, 111 F.3d 1557, 1562 (Fed. Cir. 1997)); see also Dairyland Power Coop., 90 Fed. Cl. at 623; Boston Edison Co. v. United States, 93 Fed. Cl. 105, 114 (2010), *appeal docketed*, No. 2010-5136 (Fed. Cir. July 8, 2010). “The general principle is that all losses, however described, are recoverable.” Ind. Mich. Power Co., 422 F.3d at 1373 (quoting Restatement (Second) of Contracts § 347 cmt. c). To recover damages, a plaintiff must demonstrate by a preponderance of the evidence that “(1) the damages were reasonably foreseeable by the breaching party at the time of contracting; (2) the breach is a substantial causal factor in the damages; and (3) the damages are shown with reasonable certainty.” Ind. Mich. Power Co., 422 F.3d at 1373 (citing Energy Capital Corp. v. United States, 302 F.3d 1314, 1320 (Fed. Cir. 2002)); see also Energy Northwest, 91 Fed. Cl. at 541.

a. Foreseeability

Damages are considered foreseeable when they “follow from the breach (a) in the ordinary course of events, or (b) as a result of special circumstances, beyond the ordinary course of events, that the party in breach had reason to know.” Restatement (Second) of Contracts § 351(2). The question of foreseeability is one of fact, Bluebonnet Sav. Bank v. United States, 266 F.3d 1348, 1355 (Fed. Cir. 2001) (“Bluebonnet I”), and generally is determined at the time the contract was executed. Id. See also Ind. Mich. Power Co., 422 F.3d at 1373. The non-breaching party bears the burden of demonstrating that “both the magnitude and type of damages or injury were foreseeable at the time of contract

formation.” Boston Edison Co., 93 Fed. Cl. at 116 (citing Landmark Land Co. v. FDIC, 256 F.3d 1365, 1378 (Fed. Cir. 2001)). The non-breaching party, however, need not demonstrate that a particular means of responding to the particular breach was foreseeable. See Southern Nuclear Operating Co., 77 Fed. Cl. at 405 (“While the general response to a breach must be foreseen, the particular way that a mitigating decision is implemented need not.”); see also Energy Northwest, 91 Fed. Cl. at 541; Citizens Fed. Bank, 474 F.3d at 1321; Consol. Edison Co., 92 Fed. Cl. at 489. Rather, the foreseeability prong “applies to the type of loss, not the means of mitigation.” Sacramento Mun. Util. Dist. v. United States, 293 Fed. App’x 766, 771 (Fed. Cir. 2008) (citing Citizens Fed. Bank, 474 F.3d at 1321).

The parties do not challenge the foreseeability of ENVY’s incurred costs to construct dry storage space that otherwise would not have been required had DOE timely performed. (Def.’s Reply 7-8; Pl.’s Post-Trial Br. 44, 50.) Indeed, the Federal Circuit and this Court continuously have found it foreseeable that DOE’s failure to perform under the Standard Contract would result in nuclear power plants incurring costs to store their spent fuel. See, e.g., Ind. Mich. Power Co., 422 F.3d at 1376; Boston Edison Co., 93 Fed. Cl. at 116 (“The cost of additional on-site storage . . . was inherently foreseeable.”); Consol. Edison Co., 92 Fed. Cl. at 489; Sys. Fuels I., 79 Fed. Cl. at 59; Tenn. Valley Auth. v. United States, 60 Fed. Cl. 665, 674 (2004), *appeal docketed*, No. 2006-5073 (Fed. Cir. Apr. 19, 2006). Accordingly, the Court agrees that ENVY’s decision to construct and maintain an on-site dry fuel storage facility in the face of DOE’s continual breach was “foreseeable both in magnitude and in type.” Boston Edison Co., 93 Fed. Cl. at 116 (citing Dominion Res., Inc. v. United States, 84 Fed. Cl. 259, 274 (2008), *appeal docketed*, No. 2009-5031 (Fed. Cir. Dec. 30, 2008)).

b. Causation

ENVY also bears the burden of proving that DOE’s partial breach caused each of the claimed mitigation costs. Ind. Mich. Power Co., 422 F.3d at 1373. Causation, like foreseeability, is a question of fact. Bluebonnet I, 266 F.3d at 1356. This Court has employed two standards for determining causation, the “but for” test and the “substantial factor” test. In the “substantial factor” test, the breaching party is liable for those damages for which “the breach [was] a substantial factor.” Ind. Mich. Power Co., 422 F.3d at 1373 (citing Energy Capital, 302 F.3d at 1320). The “but for” test, however, places liability on the breaching party for those damages that it “directly and entirely caused.” Citizens Fed. Bank, 474 F.3d at 1318. Although the Federal Circuit in Indiana Michigan Power Company upheld the trial court’s decision to utilize the “substantial factor” test, in Yankee Atomic Electric Company, a more recent spent fuel decision, the Federal Circuit “preferred” the application of the “but for” test. 536 F.3d at 1272. The Court has discretion to apply the appropriate causation standard. Citizens Fed. Bank, 474

F.3d at 1318. In this case, for the claims that are granted, the Court finds that both the “substantial factor” and the “but for” tests are satisfied.

c. Reasonable Certainty

Finally, ENVY can recover only those mitigation damages that it can establish with reasonable certainty. See Restatement (Second) of Contracts, § 352 cmt. a (“A party cannot recover damages for breach of a contract for loss beyond that amount that the evidence permits to be established with reasonable certainty.”). Reasonable certainty also is a question of fact. Bluebonnet I, 266 F.3d at 1356-58. A plaintiff can establish reasonable certainty “if the evidence adduced enables the court to make a fair and reasonable approximation of the damages.” Locke v. United States, 283 F.2d 521, 524 (Fed. Cir. 1960). While the amount of damages need not be “ascertainable with absolute exactness or mathematical precision,” recovery for speculative damages is precluded. San Carlos Irrigation & Drainage Dist., 111 F.3d at 1563 (citation omitted).

In this case, the requisite “reasonable certainty” of the damages sought is not disputed. Through the pretrial efforts of auditors and financial personnel for both parties, Defendant does not contend that any of ENVY’s claimed damages lack adequate support. (Peterson, Tr. 1217 (“There’s no costs that are questioned as being unsupported.”); see also DDX-4.) However, as discussed below, the Court does find that ENVY failed to show “reasonable certainty” in allocating certain overhead costs to its damages claims.

2. Defendant’s Burden

The parties disagree on the burden of proof that Defendant bears in mitigation cases. The purpose of awarding damages is not to place the non-breaching party in a better position than he otherwise would be if there had been no breach. Bluebonnet Savs. Bank v. United States, 339 F.3d 1341, 1344-45 (Fed. Cir. 2003) (“Bluebonnet II”) (citations omitted). Once a plaintiff demonstrates foreseeability, causation, and reasonable certainty, the defendant may eliminate or reduce the alleged damages by showing either that the “[p]laintiffs did not undertake reasonable mitigation efforts, or that the efforts they did undertake were unreasonable.” Carolina Power & Light Co. v. United States, 82 Fed. Cl. 23, 44 (2008), *aff’d in relevant part*, 573 F.3d 1271 (Fed. Cir. 2009); Dairyland Power Coop., 90 Fed. Cl. at 624; Sys. Fuels I, 79 Fed. Cl. at 52 (noting that to eliminate or reduce a plaintiff’s mitigation related damages, defendant must show that the plaintiff’s mitigation efforts were unreasonable) (citing Ind. Mich. Power Co., 422 F.3d at 1375). Additionally, Defendant may seek deductions for costs that ENVY avoided by not having to perform. Dairyland Power Coop., 90 Fed. Cl. at 625. That is, the breaching party may establish that the non-breaching party received a benefit by avoiding certain costs and therefore the amount should be deducted from the total amount claimed. Id.

However, “any ‘benefits’ the government seeks to offset must be shown to a reasonable certainty, or [they] must be denied as too speculative” Sys. Fuels I, 79 Fed. Cl. at 71. Efforts to demonstrate that the plaintiffs failed to make the best choice in mitigating damages are considered irrelevant. See, e.g., Citizens Fed. Bank, 66 Fed. Cl. 179, 185 (2005), *aff’d* 474 F.3d 1314 (Fed. Cir. 2007) (“Monday-morning quarterbacking is irrelevant to an award of mitigation costs.”) (citation omitted); see also Southern Nuclear Operating Co., 77 Fed. Cl. at 416 (“[a]fter-the-fact criticism by the breaching party is irrelevant so long as the mitigating decisions were reasonable.”). Indeed, “[w]here a choice is required between two reasonable courses of action, the party that caused the injury may not complain that one course, rather than the other, was chosen.” Sacramento Mun. Util. Dist. v. United States, 70 Fed. Cl. 332, 367 (2006), *reversed and remanded on other grounds*, 293 Fed. App’x 766 (Fed. Cir. 2008).

These basic principles will guide the Court in its analysis of ENVY’s damages claims.

B. Analysis of ENVY’s Mitigation Claims

1. The Vermont Certificate of Public Good

The single largest contested damages claim in this case is the \$9,608,189 in costs expended by ENVY in connection with the Certificate of Public Good proceedings. The claim includes the following items: (1) \$5,625,000 in payments to the Vermont Clean Energy Development Fund; (2) \$412,854 in visual barrier costs; (3) \$184,552 in river flood analysis costs; and (4) \$3,385,783 in legal and lobbying costs. ENVY contends that these expended costs are recoverable because they were intended to “mitigate the harm caused by DOE’s failure” to begin accepting spent fuel by January 31, 1998, pursuant to the Standard Contract. See Pl.’s Pre-Trial Br. 15; see also Pl.’s Post-Trial Br. 1-2. Defendant argues, however, that ENVY is not entitled to recover any of the aforementioned claims. The Government makes three interrelated arguments in opposing ENVY’s claim: (1) that the costs were not foreseeable to DOE at the time of contract formation, (Def.’s Post-Trial Br. 65-91); (2) that the costs were not caused by DOE’s breach, *id.*; and (3) that ENVY voluntarily assumed liability for these costs because it failed to challenge them on federal preemption grounds. (Def.’s Post-Trial Br. 104-06.) The Court will address each of the Government’s arguments below.

a. Foreseeability

Defendant does not contest the foreseeability of ENVY’s direct expenditures in designing and constructing additional dry storage space. (Def.’s Reply 7-8.) Defendant argues, however, that the Certificate of Public Good costs are not direct costs that DOE

reasonably could have foreseen as a result of its breach of the Standard Contract. (Def.'s Reply 8-10.) According to Defendant, DOE could not have foreseen that, "as a result of the sale and transfer of ownership of the power station to ENVY in 2002, the . . . Vermont [G]eneral [A]ssembly would become involved in the approval process and require ENVY to perform the [Certificate of Public Good] projects as the conditions for legislative approval for dry fuel storage." (Def.'s Post-Trial Br. 67.) The Court cannot agree.

The Federal Circuit has instructed that the specific method of mitigation need not be foreseeable. Sacramento Mun. Util. Dist., 293 Fed. App'x at 771. If a particular mitigation activity is foreseeable, there is no requirement that a plaintiff show that the consequences also were foreseeable. Citizens Fed. Bank, 474 F.3d at 1321. This is because the foreseeability prong applies "to *the type of loss*, not the means of mitigation." Sacramento Mun. Util. Dist., 293 Fed. App'x at 771 (emphasis added). Thus, once a plaintiff demonstrates that the loss would result if the breach occurred, there is no requirement that the plaintiff demonstrate that the "breach itself or the particular way the loss came about also be foreseeable." E. Allan Farnsworth, Farnsworth on Contracts, § 12.14 at 260-61 (3d ed. 2004).

Evidence at trial demonstrates that DOE should have known at the time of contract execution that state or local regulatory costs would likely follow from the breach in the ordinary course of events. See Restatement (Second) of Contracts § 351(2). First, as the Government rightly concedes, it was foreseeable that ENVY would have to find alternative storage for its spent fuel because of DOE's breach. (Def.'s Reply 7-8.) Indeed, trial testimony confirmed that had DOE timely performed the Standard Contract, additional dry storage would not have been necessary. (Hoffman, Tr. 371-72; Thayer, Tr. 84-85.) Second, DOE clearly foresaw that nuclear power plants would be purchased and sold to other entities during the many years that the Standard Contract would be in place. Article XIV of the Standard Contract is an assignment clause providing that "[t]he rights and duties of the Purchaser may be assignable with transfer of title to the [spent nuclear fuel] involved" (PX 1 at 26.) Further, at the time of contract formation, DOE should have been aware that state or local regulatory costs could be imposed on nuclear plant owners or their spent nuclear fuel storage projects. See Rives, Tr. 233 (noting that the construction of nuclear facilities would include "hidden costs and surprises regulatory-wise, either within the states or local jurisdictions as well.") Since the 1970s, federal regulations governing the construction of nuclear power plants required companies to certify compliance with requirements imposed by "State, regional and local agencies having responsibility for environmental protection." 10 C.F.R. Part 51, Subpart B, § 51.20(c); 39 Fed. Reg. 26,281 (July 10, 1979). Moreover, well before DOE executed the 1983 Standard Contract with Vermont Yankee, the State of Vermont required nuclear power plants to secure a Certificate of Public Good prior to making physical modifications to an existing power plant. See 30 V.S.A. § 248 (1969); 10

V.S.A. § 6501 (1979). Taken together, DOE should have reasonably foreseen at the time of contracting that state or local costs might be imposed on nuclear utilities such as the VYNPS, regardless of its owner.

ENVY has adequately demonstrated that the State-imposed costs on its dry storage facility were foreseeable. ENVY need not show that the particular way the State-imposed regulatory costs came to be applied to the VYNPS dry storage facility was foreseeable to DOE. Citizens Fed. Bank, 474 F.3d at 1321. The fact that ENVY was required to negotiate conditions with the Department of Public Service and apply for a Certificate of Public Good to add storage to the plant was all a consequence of its mitigation action. See id.

Contrary to Defendant's assertions, the Court's conclusion does not undermine the Federal Circuit's holding in Indiana Michigan Power Company. See Def.'s Reply 8. In that case, the Federal Circuit rejected the plaintiff's investment in a private storage facility as unforeseeable because the venture was speculative and especially costly. 422 F.3d at 1376. Here, however, the trial record shows that ENVY could not move forward with its plans to construct a dry storage facility unless and until it received the State's legislative approval. (Thayer, Tr. 91; Hoffman, Tr. 378.) Incurring the costs associated with a Certificate of Public Good was a mandatory prerequisite to constructing a dry storage facility at the VYNPS. These costs were not speculative, and they were not undertaken as a mere "business judgment." 422 F.3d at 1376. Indeed, as the Court in Northern States Power Company v. United States, recently held:

It simply cannot be the case that plaintiff should be required to mitigate the damages caused by defendant's breach (a burden that the law in fact imposes), be compelled to pursue that mitigation through the state legislature (again, an effort it was in fact required to undertake), and then in the final analysis be forced to absorb the economic cost of legislative mandates it had no power to avoid – the result defendant urges. Fundamental fairness precludes such a result.

78 Fed. Cl. 449, 464 (2007), *appeal docketed*, No. 2008-5041 (Fed. Cir. Feb. 19, 2008). The Court similarly finds here that ENVY should not have to absorb the State-imposed costs it incurred in an effort to mitigate damages caused by DOE's breach. ENVY needed the State of Vermont's approval through a Certificate of Public Good in order to build a dry storage facility, and to deny such costs as unforeseeable would undermine the very purpose of mitigation damages of placing a non-breaching party "in as good a position as it would have been had the breaching party fully performed." Ind. Mich. Power Co., 422 F.3d at 1373. Accordingly, the Court rejects the proposition that these State-imposed costs should be denied as unforeseeable.

b. Causation

Defendant also argues that DOE did not cause ENVY to incur the costs associated with the Certificate of Public Good for dry storage. (Def.'s Post-Trial Br. 67-74.) According to the Government, the Vermont General Assembly's intervention in ENVY's efforts to construct dry storage "[broke] the chain of proximate causation between DOE's delay and the injury that ENVY claims to have suffered." (Def.'s Post-Trial Br. 67; see also Def.'s Post-Trial Br. 70, 74; Def.'s Reply 19-20.) Defendant argues that ENVY voluntarily committed to work with the Vermont Public Service Board to obtain a Certificate of Public Good and that the General Assembly independently decided to become involved in the approval process for a dry storage facility by enacting legislation in 2005. (Def.'s Post-Trial Br. 67, 72.) These "events," Defendant suggests, severed the proximate cause necessary for ENVY to prevail on its Certificate of Public Good claim. (Def.'s Reply 19-20.) The Court, however, finds no basis to support the Government's assertions.

Whether the Court applies the "but for" or "substantial factor" causation test, a plaintiff need not demonstrate that the government's breach was the "sole cause" of the claimed damage. See Cal. Fed. Bank v. United States, 395 F.3d 1263, 1268 (Fed. Cir. 2005); Franconia Assoc. v. United States, 61 Fed. Cl. 718, 750 (2004); Consol. Edison Co., 92 Fed. Cl. at 505-06. Indeed, "[t]he existence of other factors operating in confluence with the breach will not necessarily preclude recovery based on the breach." Cal. Fed. Bank, 395 F.3d at 1268. Provided that a "causal connection can be 'definitively established' between the breach of contract and the harm to the plaintiffs, mitigation damages can be recovered." Sys. Fuels I, 79 Fed. Cl. at 55; see also Bank of Am. v. United States, 70 Fed. Cl. 246, 251 (2006) (reasoning that mitigation damages are recoverable "even if other business considerations later informed the [plaintiff's] decisions: no business judgment is exercised in a vacuum . . .").

In this case, ENVY knew when it purchased the VYNPS in 2002 that, because of DOE's non-performance, additional dry storage facilities would be needed to assure the continued operations of the plant. (Thayer, Tr. 135-36; Hoffman, Tr. 363.) ENVY's need for additional storage was heightened by the potential risk of having to cease operations in 2008, absent some relief. (Hoffman, Tr. 370-71 ("We were running out of space in the spent fuel pool such that, if we did not have an alternative, we would have to shut down the plant. The plant would not continue to operate."); Thayer, Tr. 84; Drouin, Tr. 488.) A necessary prerequisite to constructing the additional dry storage facility was obtaining the approval of the Vermont Public Service Board through its Certificate of Public Good process. The State of Vermont, however, would not provide its approval — and the Department of Public Services would not endorse ENVY's petition for a Certificate of Public Good — until the company committed to certain obligations, such as

contributing to the Clean Energy Development Fund. (Thayer, Tr. 107-09, 114-15.) As trial testimony demonstrated, ENVY would not have endured the Certificate of Public Good process if the additional storage space were not required. (Thayer, Tr. 118-19, 219.) Thus, contrary to the Government's assertions, ENVY's payments to the State were no more voluntary than its decision to construct a dry storage facility. Rather, DOE's failure to timely perform was the driving force for ENVY to obtain the State approval necessary to construct additional dry storage, or else risk stopping its operations.

The General Assembly's enactment of legislation in 2005 does not lessen the causal connection between DOE's breach and ENVY's harm, as Defendant would suggest. As previously noted, DOE's partial breach of the Standard Contract does not need to be the sole cause of the damage claimed. Cal. Fed. Bank, 395 F.3d at 1268. Here, ENVY has demonstrated that it had to obtain the Certificate of Public Good to build its dry storage facility, or risk shutting down the plant due to the lack of spent fuel storage space. The fact that DOE's performance, at a minimum, was a substantial factor in ENVY incurring State-imposed costs to build dry storage is sufficient to award ENVY its mitigation damages. See Consol. Edison Co., 92 Fed. Cl. at 505. Indeed, the causal link is so compelling that the "but for" causation test also is easily satisfied.

c. The Power Uprate MOU Did Not Break the Chain of Causation.

Defendant also claims that ENVY is not entitled to recover costs paid to the Clean Energy Development Fund because those costs allegedly were related to ENVY receiving its twenty percent power uprate approval from the NRC. (Def.'s Post-Trial Br. 75-80.) Defendant suggests that ENVY's contributions to the Clean Energy Development Fund were "directly conditioned on" the NRC's approval for the power uprate at the VYNPS. Id. at 77. Defendant contends that if ENVY received the power uprate from the NRC, it would "trigger" ENVY's payments to the Clean Energy Development Fund in accordance with the dry storage MOU. Id. at 76. Because of this conditional agreement, Defendant argues that ENVY's claimed damages for the Clean Energy Development Fund were not the direct result of the DOE's breach. Id. at 77. The Court finds no merit to the Government's position.

One of ENVY's first priorities in acquiring the VYNPS in 2002 was to secure additional revenue through an extended power uprate. (Thayer, Tr. 145-46.) Thus, in 2003, ENVY submitted a twenty percent extended power uprate application to the NRC to increase the plant's electrical output. (Thayer, Tr. 144.) ENVY also petitioned the Vermont Public Service Board to obtain a Certificate of Public Good for its proposed twenty percent power uprate plan. Id. In the fall of 2003, ENVY entered into an MOU with the Department of Public Service for the power uprate Certificate of Public Good, authorizing the power uprate at VYNPS. (Thayer, Tr. 152.) Among other things, the MOU required ENVY to make payments to the State Benefit Fund. (Thayer, Tr. 151-52.)

The power uprate project was approved by the State of Vermont when the Public Service Board issued a power uprate Certificate of Public Good on March 24, 2004. (Thayer, Tr. 153; DX 38.) ENVY also received the NRC's approval for the power uprate in March 2006.

ENVY, however, did not pursue the dry storage Certificate of Public Good until June 2005, more than a year after the Public Service Board's approval of ENVY's power uprate request. (Thayer, Tr. 121; PX 23; PX 24.) As demonstrated at trial, the power uprate Certificate of Public Good was a "different project altogether" from the dry storage Certificate of Public Good. (Thayer, Tr. 109-110.) The power uprate and the dry storage projects involved separate dockets, separate applications, separate proceedings, and "resulted finally in separate Certificates of Public Good." (Thayer, Tr. 110; Hoffman, Tr. 380 ("I was not aware of any relationship between the dry storage Certificate of Public Good and the power uprate project."))

Defendant points out that the proceeds from the State Benefits Fund were redirected to the Clean Energy Development Fund under the 2005 dry storage MOU. Defendant maintains that because ENVY's payments to the Clean Energy Development Fund did not take effect until the NRC approved ENVY's power uprate application, ENVY's payments to the Fund were not the direct result of DOE's breach. (Def.'s Post-Trial Br. 77.) Defendant confuses "condition" with "causation." Here, ENVY needed the revenue generated from the NRC's approval of its power uprate to pay the Clean Energy Development Fund. The Clean Energy Development Fund, however, was caused by ENVY's need for the State's approval to construct the dry storage facility. Payment to the Clean Energy Development Fund thus was a prerequisite for ENVY obtaining a Certificate of Public Good for its dry storage facility. (Thayer, Tr. 115 ("It became very clear to [ENVY] that without payments to the State . . . we wouldn't be able to proceed with the [dry storage] project.")) The fact that ENVY needed a source of revenue for the Clean Energy Development Fund does not sever the causal connection between DOE's breach and ENVY's harm. Because ENVY has shown that its Certificate of Public Good costs, including the Clean Energy Development Fund, were caused by DOE's non-performance, it need not prove that its claimed costs were entirely unaffected by outside events. Franconia Assoc., 61 Fed. Cl. at 750.

d. Preemption

Defendant argues that it is not liable for ENVY's Certificate of Public Good costs because federal law preempted the State of Vermont from regulating nuclear power plants. (Def.'s Post-Trial Br. 91-106; Def.'s Reply 30-35.) The Government attempts to convince the Court that its preemption argument is really an objection to ENVY's claimed damages on foreseeability and causation grounds. See Def.'s Post-Trial Br. 91-104. According to Defendant, the State of Vermont allegedly acted beyond the scope of

its authority to impose conditions on ENVY's construction of dry storage. *Id.* at 91. Defendant argues that ENVY's decision not to challenge the Certificate of Public Good costs as federally preempted relieves the Government of liability for the State-imposed costs. *Id.* at 104; see also Def.'s Reply 33.

The Court finds Defendant's argument wholly unpersuasive. Defendant's contention that ENVY should have litigated the preemption issues is, at its very essence, a challenge to the choice of mitigation actions taken. See *Citizens Fed. Bank*, 66 Fed. Cl. at 185. The Government bears the burden of establishing that the mitigation efforts or particular costs claimed were unreasonable under the circumstances. *Energy Northwest*, 91 Fed. Cl. at 542; *Southern Cal. Edison Co. v. United States*, 93 Fed. Cl. 337, 348 (2010), *appeal docketed*, No. 2010-5147 (Fed. Cir. Aug. 20, 2010) (“[T]he government must affirmatively establish that the mitigation was inappropriate or unreasonable.”). The Government cannot satisfy this burden, however, by challenging the non-breaching party's decision between two reasonable courses of action to mitigate its damages. *Dairyland Power Coop.*, 90 Fed. Cl. at 625.

In this case, Defendant has failed to establish that ENVY's efforts to obtain a Certificate of Public Good were inappropriate or unreasonable. Evidence at trial clearly demonstrated that the plant would have run out of space to store spent fuel by 2008 absent additional dry storage space. (Thayer, Tr. 115; PX 20 at 045341.) Constructing a dry fuel storage facility ensured ENVY that it would have sufficient storage to continue operations through 2032, well beyond the expiration of its current license. (PX 20 at 045341.) The Public Service Board, however, required ENVY's compliance with the conditions imposed in the Certificate of Public Good, including the June 2005 MOU. (Thayer, Tr. 111-14; PX 38.) From ENVY's perspective, challenging the State's authority to impose conditions would not have been in the company's best interests. Indeed, the 2008 deadline, after which the VYNPS would not have been able to refuel, was an important motivation for the company. Thus, any delay caused in the company's efforts to obtain the State's approval jeopardized the operations of the plant. (Thayer, Tr. 115-16.) ENVY also maintained a working relationship with the State for other projects requiring a Certificate of Public Good including a twenty-year license extension, an electrical capacity transformer, relocation of its employee parking lot, and a power uprate, among other ventures. (Thayer, Tr. 91-92, 211.) Given its ongoing relationship with the State coupled with the time constraints ENVY faced for dry storage, ENVY's decision not to challenge the State and to comply with the terms of the Certificate of Public Good was reasonable under the circumstances.

Defendant takes particular issue with ENVY's willingness to conduct a river flood analysis and to construct a visual barrier as conditions of the Certificate of Public Good. (Def.'s Post-Trial Br. 80-88.) Defendant suggests that ENVY's compliance with these requirements fails the Federal Circuit's “causation” ruling in *Hercules, Inc. v. United*

States. 24 F.3d 188 (Fed. Cir. 1994), *aff'd on other grounds*, 516 U.S. 417 (1996). In that case, two government contractors sought payment under contractual indemnity and breach of warranty theories to recover litigation expenses and settlement payments the contractors had made to tort claimants, notwithstanding that the contractors previously had secured the dismissal of other similar tort claims on the basis of the “government contractor defense.” 24 F.3d at 191-96. The Federal Circuit concluded that damages asserted by the plaintiffs were not caused by the Government because the government contractor defense provided a “complete defense” to the tort claims. Id. at 200. The Court reasoned that the plaintiffs made a “voluntary decision” to contribute to a settlement fund and therefore the Government was not liable. Id.

Defendant sees similarities between the Hercules case and ENVY’s decision to forego litigation with the State of Vermont on federal preemption grounds. (Def.’s Reply 31-32.) Hercules, however, is distinguishable from the facts at issue here. Unlike the plaintiffs in Hercules, ENVY risked shutting down its plant if it did not receive legislative approval for a dry storage facility. Its decision to commit to the conditions in the Certificate of Public Good therefore was not voluntary. From ENVY’s viewpoint, there was no other way to avoid the Certificate of Public Good costs, and keep the plant from shutting down. See, e.g., Thayer, Tr. 115-16, 220-21. Defendant’s reliance on Hercules, therefore, is misplaced.

The Court acknowledges, as Defendant points out, that ENVY committed to constructing a visual barrier and conducting a river flood analysis even though the Public Service Board found both tasks unnecessary when it granted ENVY the dry storage Certificate of Public Good in April 2006. (PX 39 at 011457-58, 011467.) But when ENVY committed to these conditions in the June 2005 MOU, it had no reason to know how the Public Service Board would rule nearly a year later. (Thayer, Tr. 216.) Indeed, ENVY initially objected to both conditions. (Thayer, Tr. 177-78; Hoffman, Tr. 388.) ENVY agreed to construct the visual barrier because aesthetics was one of the criteria in the Section 248 Certification of Public Good proceeding, and it could not construct a dry storage facility without the Certificate of Public Good. (Thayer, Tr. 177-78.) Thus, ENVY considered it “strategically important” to incorporate the visual barrier into the MOU. Id. ENVY similarly offered to perform the river flood and erosion analysis because it had been a contentious issue for the Department of Public Service and non-profit organizations in Vermont. (Thayer, Tr. 218-19.) In order to ensure that the State’s concerns would not threaten its ability to obtain the State’s approval, ENVY made the reasonable and prudent decision to conduct the river flood erosion study. (Hoffman, Tr. 388.) The Public Service Board’s later determination that both tasks were unnecessary does not diminish the reasonableness of ENVY’s decision to accept both conditions as a part of the Certificate of Public Good.

Even if, as Defendant proposes, challenging the State on federal preemption grounds was a reasonable course of action, such “[a]fter-the-fact criticism by the breaching party is irrelevant.” Southern Nuclear Operating Co., 77 Fed. Cl. at 427; see also Sacramento Mun. Util. Dist., 70 Fed. Cl. at 367. As shown above, ENVY’s decision to undertake the tasks outlined in the Certificate of Public Good was entirely reasonable under the circumstances. The Government may not now criticize ENVY’s conduct “merely for the purpose of showing that [ENVY] might have taken steps which seemed wiser or would have been more advantageous to [Defendant].” In re Kellett Aircraft Corp., 186 F.2d 197, 198-99 (3d. Cir. 1950); see also E. Allan Farnsworth, Farnsworth on Contracts, § 12.12 (3d. ed. 2004) (“[A] party that takes steps that seemed reasonable at the time will not be judged in hindsight.”)

For the reasons stated, the Court finds that the Certificate of Public Good costs were reasonably foreseeable as a consequence of DOE’s breach of the Standard Contract. These costs also were caused by DOE’s failure to timely pick-up ENVY’s accumulated spent fuel. In light of the very real risk that ENVY faced of shutting down the VYNPS operations if it did not receive the State of Vermont’s approval to construct a dry storage facility, ENVY’s mitigation damages were reasonable and prudent under the circumstances. ENVY therefore is entitled to recover \$9,608,189 for the costs incurred in acquiring the dry storage Certificate of Public Good. The categories of allowed damages are shown in the summary of ENVY’s damages at the end of this opinion.

2. Costs for Removal of Contaminated Dirt and Asphalt

ENVY included in its damages \$276,980 in costs incurred to excavate and dispose of contaminated soil and asphalt during construction work on the containment access building. Following DOE’s breach, ENVY chose to mitigate damages by constructing a dry storage facility. Construction of the dry storage facility also required ENVY to replace the original containment access building. During demolition of the containment access building, ENVY discovered the contaminated materials. (Thayer, Tr. 75; Drouin, Tr. 506; Thomas, Tr. 868.) The source and cause of the contamination is unknown. (Thomas, Tr. 852.) Defendant argues that DOE’s non-performance is unrelated to the costs ENVY incurred to remove the contaminated materials because ENVY would have discovered the contamination and incurred this cost during decommissioning even if it had not constructed a dry storage facility. (Def.’s Pre-Trial Br. 20; Def.’s Post-Trial Br. 119-20.) The Court has already considered and rejected a similar argument in Consolidated Edison, 92 Fed. Cl. at 505-06. There is no reason to reach a contrary decision here.

Construction of a dry storage facility to store large quantities of spent nuclear fuel is a reasonable mitigative action for nuclear power plant owners to take in response to DOE’s breach of the Standard Contract. Id. at 505; see also Energy Northwest, 91 Fed.

Cl. at 546; Dominion Res., Inc., 84 Fed. Cl. at 273. Likewise, expenses incurred in construction of the dry storage facility are reasonable. DOE does not challenge the costs of demolishing the containment access building, but rather only challenges the expense incurred to remove the contaminated materials. The removal of the contaminated materials by ENVY was a construction expense and need not be considered separately. Absent DOE's non-performance, ENVY would not have demolished the containment access building when it did as the structure was not scheduled for decommissioning and likely would not have been torn down for many years. (Drouin, Tr. 506; Thomas, Tr. 869-70; Brewer, Tr. 1068-69.)

DOE argues that ENVY's claim must fail because it has not been linked to DOE's performance delay and was not caused by DOE. (Def.'s Pre-Trial Br. 20-21; Def.'s Post-Trial Br. 119-22.) Contrary to Defendant's assertions, the causal link here is clear. See Sys. Fuels, Inc. v. United States, 78 Fed. Cl. 769, 799 (2007), *appeal docketed*, No. 2010-5116 (Fed. Cir. May 11, 2010) ("Sys. Fuels II") (finding that, to meet the substantial causal factor test, plaintiff must definitively establish a causal connection, showing that the modification costs flowed "inevitably and naturally" from DOE's breach). ENVY is not required to show that DOE's breach was the sole cause of the damages. See Consol. Edison Co., 92 Fed. Cl. at 505; see also Franconia Assoc., 61 Fed. Cl. at 750 ("[P]laintiffs need not show that each dollar claimed was entirely unaffected by outside events."). DOE's non-performance is, at a minimum, a substantial causal factor in ENVY discovering the contaminated materials and therefore is sufficient to award ENVY its removal costs. See *id.* The Court finds that the "but for" causation test also is satisfied.

Finally, the Court is not persuaded by the Government's argument that ENVY would have incurred the exact same costs when it decommissions the facility. Such future costs are speculative, at best, and virtually impossible to determine at this time. ENVY argues that the costs to decontaminate an entire facility during decommissioning would be substantially less than piecemeal decontamination of isolated buildings due to economies of scale. (Thomas, Tr. 869; Pl.'s Reply 20-21.) The Court finds ENVY's argument persuasive and consistent with case law. See, e.g., Consol. Edison Co., 92 Fed. Cl. at 505-06. Furthermore, it is the Government, not ENVY, that bears the burden of demonstrating that these future costs at decommissioning would be identical. See, e.g., Carolina Power & Light Co., 82 Fed. Cl. at 44; Dominion Res., Inc., 84 Fed. Cl. at 270. Therefore, because ENVY has met its burden, and the Government has failed to establish that this mitigation expense is unreasonable, ENVY shall be awarded \$276,980 in costs to remove and dispose of the contaminated materials.

3. Costs of Loading the Holtec Casks

The Government argues that the costs incurred by ENVY to load the spent nuclear fuel into the Holtec casks should be deducted from the mitigation damages because these

tasks would have been conducted when DOE performs under the Standard Contract. (Def.'s Pre-Trial Br. 20-21; Def.'s Post-Trial Br. 122-26.) Therefore, according to the Government, absent DOE's breach, ENVY would still have incurred these costs before loading the fuel assemblies. The central tenet of the Government's argument is that these are one-time costs incurred in connection with ENVY's performance of the Standard Contract that will not be incurred again when DOE collects the spent nuclear fuel. Although DOE relies upon the premise that these expenses will not be incurred again by ENVY in the future, DOE is unable to provide any guarantees. It is entirely possible that these efforts will need to be repeated in the future if ENVY is required to unload the fuel assemblies from the Holtec casks and re-load them into DOE-provided casks. Since it is unclear what additional processes, if any, will be required when DOE performs, Defendant should bear the burden of this uncertainty, not ENVY. See Consol. Edison Co., 92 Fed. Cl. at 513.

a. Spent Fuel Characterization

Spent fuel characterization is the process of documenting the physical and nuclear characteristics of spent fuel assemblies. (Card, Tr. 298-331.) All spent fuel assemblies must undergo characterization prior to storage. Id. Defendant argues that the characterization process, which ENVY is required to perform under the Standard Contract, must occur only once and therefore should be deducted from ENVY's mitigation damages. However, Defendant confuses the mitigative steps taken by ENVY as a result of DOE's breach and necessitated by safety and regulatory concerns, with efforts expended in compliance with the Standard Contract. ENVY's contractual obligations have not yet matured and the Court cannot speculate on what characterization processes ENVY will be required to undertake in the future. (Card, Tr. 307; Brewer, Tr. 1081.) This Court previously has held that fuel characterization costs are conceptually similar to costs for loading fuel and it is possible that these costs have not been avoided, but merely deferred. Dominion Res., Inc., 84 Fed. Cl. at 279. It is DOE that must bear the burden of this uncertainty. Therefore, the Court awards ENVY \$156,000 in costs expended for spent fuel characterization.

b. Holtec Work Platform

ENVY expended \$102,220 for the design and fabrication of a welding platform to load the Holtec casks with the spent nuclear fuel assemblies. Defendant argues that these expenses should be removed from ENVY's claim because ENVY would have incurred these costs to load casks furnished by DOE. However, DOE's argument is flawed because this money was not expended in loading DOE's casks. Instead, it was spent on mitigating damages due to DOE's failure to perform. ENVY has demonstrated that this platform was designed and built for loading the Holtec casks. (Drouin, Tr. 519-22.) The Court cannot speculate on what platform will be required or whether the current platform

will be sufficient for loading DOE's hypothetical casks. As with the characterization, it is simply impossible to know whether ENVY will be required to duplicate its efforts when DOE performs. Defendant must bear the burden of this uncertainty. See Dominion Res., Inc., 84 Fed. Cl. at 276. Therefore, the Court awards ENVY \$102,220 in costs incurred to design and construct the Holtec work platform.

c. Holtec Cask Loading Procedures and Training

ENVY incurred costs of \$169,087 to develop cask loading and training procedures, and \$33,211 to train its employees. As with the work platform, Defendant argues that these costs should be deducted from ENVY's claims because it would have had to develop the same procedures for loading DOE-provided casks. (Def.'s Post-Trial Br. 126-27.) ENVY contends that the training was specific to the Holtec casks and it should not have to "pay twice" to train on the hypothetical DOE casks. (Pl.'s Post-Trial Br. 59-60; Drouin, Tr. 498-99; Brewer, Tr. 1076-77.) Again, the Court finds ENVY's position persuasive. ENVY's costs to develop cask loading and training procedures were not expenses in furtherance of contractual obligations, but rather were mitigative expenses directly caused by DOE's failure to perform. The Court cannot speculate on what loading or training procedures may be required when DOE does perform. Therefore, the Court awards ENVY \$169,087 in costs expended to develop loading and training procedures for the Holtec casks, and \$33,211 in labor costs for its employees to attend the training. Whenever DOE might perform the Standard Contract, it is quite likely that employee training will need to be repeated.

d. Mobilization Activities

In addition to the above costs, the Government challenges \$194,000 in loading mobilization costs. Presumably, Defendant is contending that these costs, whatever they may be, have been deferred and not avoided, and therefore are unrecoverable. See, e.g., Def.'s Post-Trial Br. 126-27; Def.'s Reply 47. However, the Government has not provided any documentation, factual testimony, stipulation or other evidence to challenge these costs. Indeed, the only reference to such mobilization costs is the Government's expert testimony stating that the challenged costs relate to a labor element. (Peterson, Tr. 1209.) No further analysis or evidentiary support is provided. Having failed to demonstrate that ENVY's loading mobilization costs were unreasonable, the \$194,000 in mobilization costs will be awarded.

4. Overhead Costs

ENVY has included in its damages claim three categories of overhead or "loader" costs that are not directly chargeable to a specific project, but rather are allocated proportionally to all eligible projects. (Pl.'s Post-Trial Br. 60-66.) These charges

include: (1) \$1,210,300 in materials “loader” charges related to the VYNPS materials storeroom; (2) \$788,414 from a capital suspense pool; and (3) \$531,362 in payroll loader costs. Id. Defendant contests the entirety of the materials loader and capital suspense charges, but only challenges \$10,013 of the payroll loader costs, referred to as “Resource Code 19” charges. (Def.’s Post-Trial Br. 51.) Defendant contends that these overhead charges are not recoverable because they are fixed costs to ENVY, and the costs did not increase due to DOE’s breach. Id. at 114-16.

ENVY asserts that all of the challenged overhead costs were directed toward mitigation projects, were properly allocated, and would cause other projects to assume a disproportionate share of the costs if the overhead charges were disallowed. (Pl.’s Reply 25 (citing Boston Edison Co., 93 Fed. Cl. at 122; Carolina Power & Light Co. v. United States, 573 F.3d 1271, 1277 (Fed. Cir. 2009); Southern Cal. Edison Co., 93 Fed. Cl. at 358-59).) Defendant bears the burden of establishing that the overhead loaders applied in ENVY’s accounting system were unreasonable and should be disallowed. See, e.g., Energy Northwest, 91 Fed. Cl. at 542; Carolina Power & Light Co., 82 Fed. Cl. at 44; Dominion Res., Inc., 84 Fed. Cl. at 270.

a. Materials Loader Charges

At ENVY, a materials loader is a “method of assigning the cost of supervision, labor, and expense incurred in the operations of a storeroom, including purchasing, handling, issuing materials and assigning those costs over material issues.” (Bryars, Tr. 585.) The materials loader is an overhead charge that specifically is associated with a storeroom ENVY maintains at the VYNPS site. (Bryars, Tr. 585-86.) The allocated costs, totaling \$1,210,300, consist of “real costs incurred at the [VYNPS] storeroom for purchasing and handling materials. And those costs were assigned out to material actually used in the dry cask storage project.” (Bryars, Tr. 586.) The costs included in the materials loader pool include payroll costs, expenses of storeroom personnel located at the site, storeroom equipment, information technology, and human resources. (Bryars, Tr. 587-88.) The majority of the employees whose costs go into the material overhead pool are physically located at the VYNPS. (Bryars, Tr. 590.) A small portion of employees, however, are located at Entergy’s nuclear headquarters, including corporate procurement personnel.¹⁴ (Bryars, Tr. 590, 606.)

ENVY allocates materials overhead costs by calculating a loader rate each month, and multiplying the rate by the value of the material being issued out of the VYNPS storeroom. (Bryars, Tr. 595, 599.) The loader rate is calculated by the ratio of the pool, identified as the “FERC 163 account,” to the inventory called the “FERC 154 account.” (Bryars, Tr. 595-96.) Entergy’s financial, plant, and management personnel review the

¹⁴ References to “Entergy” in this discussion of overhead claims refers to the Entergy corporate entity responsible for establishing the overhead allocation practices on a company-wide basis.

rate. ENVY maintains an individual materials overhead rate for each plant. (Bryars, Tr. 597.) Thus, the VYNPS storeroom personnel cannot record their time and costs to a materials overhead pool for another plant. Id. If an item is returned to the storeroom because it is not needed for a project, the material overhead charges follow the item, effectively removing the charges from the project. This “properly state[s] the costs of any materials or charges to a project.” (Bryars, Tr. 599.)

ENVY began using the materials overhead pool methodology when it acquired the VYNPS in 2002. (Bryars, Tr. 600-01.) The process follows Generally Accepted Accounting Principles and Federal Energy Regulatory Commission (“FERC”) Guidelines, and is audited on a frequent basis. (Bryars, Tr. 591-92, 594.) The audits have not impacted how ENVY “handle[s] the pool or the allocation out from the pool.” (Bryars, Tr. 592.)

This Court continually has held that “overhead costs are recoverable as long as a utility can demonstrate that ‘overhead costs were incurred and are properly attributable to mitigation projects and activities.’” Dominion Res., 84 Fed. Cl. at 281 (quoting Carolina Power & Light Co., 82 Fed. Cl. at 48). As the Court in Carolina Power reasoned, “[o]verhead, by definition, is a cost of doing business, and for some period of time, part of [Plaintiff’s] ‘business’ was mitigating DOE’s partial breach.” 82 Fed. Cl. at 48. Thus, if no overhead charges were allocated to the mitigation projects, such as storing dry fuel, the cost of plaintiff’s other projects would increase. Id.; see also Boston Edison Co., 93 Fed. Cl. at 121-22; Southern Cal. Edison Co., 93 Fed. Cl. at 359 (“Although the activities charged to overhead in these cases may differ from our own, the guiding principle is the same. If a proportional amount of the utility’s general overhead is not allocated to [dry storage], other projects and . . . operations will support an unequal share of the overhead costs.”).

Here, ENVY has presented sufficient evidence to demonstrate that its materials overhead pool was tied to the dry storage facility. As testimony at trial showed, ENVY incurred real costs at the VYNPS storeroom to purchase and handle materials actually used in the dry storage project. (Bryars, Tr. 587 (noting that the costs are actual “money going out the door, actual costs incurred by Entergy.”).) Therefore, such costs should be allowable as part of ENVY’s damages. To find otherwise and reject a plaintiff’s “fiscally sound and commonly accepted means of accounting for and allocating overhead expenses . . . would lead to impermissible results.” Southern Cal. Edison Co., 93 Fed. Cl. at 359. Accordingly, the Court grants ENVY \$1,210,300 in materials overhead charges.

b. Capital Suspense Loader Charges

The capital suspense loader at Entergy includes costs associated with overseeing capital projects. (Saragusa, Tr. 624.) At any given time, Entergy will have as many as

20,000 capital projects in progress on a company-wide basis. (Saragusa, Tr. 645.) The capital suspense loader consists of an administrative and general (“A&G”) pool and a nuclear function-specific pool. (Saragusa, Tr. 624, 630.) The A&G pool is comprised primarily of payroll costs for Entergy’s personnel in its property accounting group. (Saragusa, Tr. 630.) The function-specific pool includes charges for Entergy’s Northeast Headquarters in White Plains, New York, and charges for engineers and employees that work in the accounting function at the VYNPS. (Saragusa, Tr. 630-32.) The rate for a capital project at the VYNPS is the sum of the A&G and function-specific rates. (Saragusa, Tr. 636.) Thus, on a given day, if there were multiple capital projects in progress at the VYNPS, the same capital suspense rate would apply to each such project. Id.

Entergy employees bill their time to the capital suspense pool for all time increments of less than 30 minutes, even when their work pertains to an identifiable capital project. (Saragusa, Tr. 628, 641.) The capital suspense pool also includes employee time spent in training or educational programs. (Saragusa, Tr. 628.) Entergy calculates a capital suspense loader on a quarterly basis, adjusting for any fluctuations in the overall pool. (Saragusa, Tr. 635.) Entergy’s objective is to apply all of the capital suspense pool costs to capital projects as an allocated overhead charge. (Saragusa, Tr. 637) (“The goal of adjusting the rates is to clear out the capital suspense pool.”).

Defendant’s expert, Mr. Peterson, observed that the capital suspense overhead pool could be considered a variable cost if there were some correlation between the size of the capital suspense pool and the underlying amount of capital activity. (Peterson, Tr. 1175-76.) However, Mr. Peterson determined that there is no correlation between the size of the capital suspense pool and the underlying amount of capital activity. Id.

As this Court observed in Consolidated Edison Co., Entergy’s capital suspense pool represents “legitimate costs of doing business,” but the method employed to charge time to this pool and allocate them to capital projects “is very imprecise.” 92 Fed. Cl. at 517. The Court’s analysis in Consolidated Edison Co. applies equally here:

Whether the [VYNPS] breach-related projects received a capital suspense loader charge depends more on the number of sub-30-minute employee time charges than anything else. The fact that time entries of greater than 30 minutes were charged as direct costs to specific capital projects suggests that the 30-minute threshold simply was an arbitrary cut-off point imposed for ease of company accounting. The arbitrary imposition of the rate and the underlying imprecision, without any direct tie to [VYNPS] projects caused by DOE’s delay,

makes the recovery of capital suspense loader charges dubious.

92 Fed. Cl. at 517.

In reaching the conclusion that the capital suspense loader costs should be disallowed, the Court is not disagreeing with the Federal Circuit's general approval of overhead allowances in Carolina Power & Light Co., 573 F.3d at 1277. Similarly, the Court is mindful that Entergy's accounting practices follow Generally Accepted Accounting Principles and FERC Guidelines. (Saragusa, Tr. 625-26.) However, damages claims against Defendant still must satisfy a test of reasonableness. The inclusion of costs in Entergy's capital suspense loader pool on the arbitrary basis of whether an employee charges 20 minutes or 45 minutes to an unrelated capital project strikes the Court as an unreasonable method of calculating damages. It is not disputed that recorded employee time of less than 30 minutes could be charged directly to an unrelated project, but Entergy does not do this simply for ease of accounting. Entergy surely can account for employee charges in this manner if it desires, but it is not a reasonable method for holding Defendant responsible for breach damages. To the extent that Entergy might be able to show recoverable portions of the capital suspense loader, such as for training and educational programs, Entergy has not broken out these portions. Therefore, Entergy is not entitled to recover capital suspense loader charges.

c. "Resource Code 19" Payroll Loader Charges

Also included in ENVY's claims are employee-related overhead costs or "payroll loaders." A payroll loader is a component of an employee's total compensation, and includes items such as medical and dental benefits, life insurance, savings plan costs, pension benefits, and stock options, among others. (Canova, Tr. 663-64; Peterson, Tr. 1194.) The purpose of capturing the cost of total employee compensation through payroll loaders is to ensure that the company is "charging [its] projects correctly." (Canova, Tr. 664.) Entergy calculates payroll loaders by developing an appropriate rate and applying it to an employee's base pay. (Canova, Tr. 666.) The payroll loader rates are reviewed quarterly, and are adjusted as necessary "as business conditions dictate." (Canova, Tr. 666-67.)

The payroll loader overhead pool consists of multiple "resource codes." (Canova, Tr. 666.) The Government challenges only the Resource Code 19 payroll loader, which consists of \$10,013 of ENVY's \$531,362 in payroll loader claims. (Peterson, Tr. 1193-97; DDX 4 at 3.) Resource Code 19 costs include pensions, interest costs on employee plans, stock option costs, and gains or losses of pension plans, among other items. (Canova, Tr. 669.) A portion of Resource Code 19 also includes costs for employees who retired before the construction of the VYNPS dry storage facility began. (Canova,

Tr. 675-76.) Defendant contends that ENVY should not recover Resource Code 19 costs because they represent a fixed cost (Def.'s Post-Trial Br. 117-18.; Def.'s Reply 37-40) and include costs associated with individuals who retired prior to commencement of the dry storage project. (Def.'s Post-Trial Br. 51; Canova, Tr. 676; Peterson, Tr. 1197.)

On two occasions, this Court has considered and denied a portion of a nuclear utility's claim for payroll loaders as being unsubstantiated. See Sys. Fuels I, 79 Fed. Cl. at 65-66; Sys. Fuels II, 78 Fed. Cl. at 799. In Sys. Fuels I, the Court concluded that while the payroll loaders associated with employee benefits costs were "for the most part a proper, directly allocable component of the internal labor costs for the mitigation activities," the direct connection between Resource Code 19 costs and the mitigation effort was absent or tenuous at best. 79 Fed. Cl. at 65. The Court thus denied the plaintiff's Code 19 payroll loader costs for lack of causation. Id. at 66. Similarly, in Sys. Fuels II, the Court denied a portion of the plaintiff's payroll loader costs because it captured costs for retired employees and current Entergy employees who did not work on the dry storage facility. 78 Fed. Cl. at 799. The Court concluded that, because it could not identify which portion of the challenged cost related to current employees' retirement benefits, plaintiff's Code 19 payroll loader costs were unrecoverable. Id.

As in Sys. Fuels I and Sys. Fuels II, the Court finds here that the connection between Resource Code 19 costs and ENVY's mitigation efforts is tenuous at best. Accordingly, this small portion (\$10,013) of ENVY's payroll loader claim is denied.

5. Cost of Capital

Finally, ENVY urges this court to award it \$7,472,866 for cost of capital. ENVY asserts that it expended considerable resources to complete the breach-related projects and it should be compensated for the costs required to attain the capital to provide funding for those projects. Defendant argues that the cost of capital claim is equivalent to demanding interest from the Government and is barred by the no-interest rule. The no-interest rule stems from the doctrine of sovereign immunity and provides that the United States generally does not pay interest on claims against it. See England v. Conte Advanced Sys., Inc., 384 F.3d 1372, 1379 (Fed. Cir. 2004) ("The no-interest rule is an aspect of the basic rule of sovereign immunity."). Under 28 U.S.C. § 2516(a), a party may not recover interest on a claim against the United States in this Court unless specifically permitted under a contract or an act of Congress. The no-interest rule applies broadly and "extends to any form of award for the time value of money." Castle v. United States, 48 Fed. Cl. 187, 217 (2000). No act of Congress, including the NWPA, or the Standard Contract, provides that the United States may pay interest on damages in spent nuclear fuel cases.

ENVY argues that the cost of capital is separate and distinct from interest and, therefore, not subject to this rule. (Pl.'s Post-Trial Br. 66-67.) ENVY distinguishes between seeking interest on its claim, versus seeking interest as its claim, which it defines as cost of capital. Id. In this context, ENVY's distinction is without a difference. The cost of capital is nothing more than the opportunity cost ENVY sustained by using its funds to mitigate the damages at issue in this case. (Gibbs, Tr. 682-83.) This opportunity cost is represented as the return, or interest, ENVY could have attained had the funds been invested elsewhere. Id. In other words, because ENVY had to mitigate its damages, it had to forgo receiving interest on the capital it now seeks as damages from the Government. This is the same interest ENVY demands of the Government and the same interest that is barred by the no-interest rule and sovereign immunity. See Consol. Edison Co., 92 Fed. Cl. at 518-19.

The Court has addressed the cost of capital or interest claim distinction in other spent nuclear fuel decisions and rejected the claim in all but one instance. See, e.g., Consol. Edison Co., 92 Fed. Cl. at 518-19; Wis. Elec. Power Co. v. United States, 90 Fed. Cl. 714, 794-99 (2009); Consumers Energy Co. v. United States, 84 Fed. Cl. 670, 674 (2008); Dominion Res., Inc., 84 Fed. Cl. at 285; Carolina Power & Light Co., 82 Fed. Cl. at 53-54; Sys. Fuels I, 79 Fed. Cl. at 69-70; Northern States Power Co., 78 Fed. Cl. at 471-72. In Energy Northwest v. United States, the Court allowed the recovery of incurred interest costs because the plaintiff conclusively demonstrated that those costs were directly traceable to the borrowing for construction of the dry storage facility. 91 Fed. Cl. 531, 559 (2010) (citing Ind. Mich., 422 F.3d at 1375). In that case, Energy Northwest incurred interest costs that were inextricably linked to the breach-related projects. Id. ENVY has made no such showing here.

ENVY relies upon Wickham Contracting Co. v. Fisher for the proposition that interest can be awarded as part of an equitable adjustment. 12 F.3d 1574, 1582-83 (Fed. Cir. 1994). However, Wickham's holding is consistent with Energy Northwest as the court in Wickham ultimately denied the interest claim because the plaintiff did not use borrowed funds to perform the breach-related project and could not show that any specific borrowings occurred because of the Government's actions. Id. at 1583. Similarly, here, ENVY has not demonstrated any connection between a specific financing and the breach-related projects. ENVY did not issue any debt to finance these projects or borrow funds on the open market. (Gibbs, Tr. 727-28.) ENVY's situation is analogous to that of Wickham and the numerous spent nuclear fuel decisions that have denied the cost of capital claims where there was no direct link between the breach-related projects and an incurred financing charge.

ENVY claims that, because it has expended significant resources and paid real costs, it should be made whole. In other words, it should be put in "as good a position" as it would have been had DOE performed. (Pl.'s Post-Trial Br. at 67.) However,

sovereign immunity demands more than equity or fairness for a claim to proceed. The United States specifically must consent to the jurisdiction of this Court. ENVY's cost of capital claim is equivalent to a claim for interest against the Government. Because ENVY has not directly linked the financing for the breach-related projects to any specific borrowing or finance charges, ENVY's claim is barred by the no-interest rule and is therefore denied.

Summary of ENVY's Damages Award

The starting point for ENVY's damages is the \$34,895,467 amount that Defendant does not contest. The Court's rejection of many of Defendant's proposed reductions results in a corresponding increase to ENVY's award, as demonstrated in the chart below. The Court has categorized the disputed damages based on the various charts ENVY and Defendant provided to the Court during the opening and closing arguments.

DESCRIPTION OF COST CLAIMED	TOTAL AMOUNT GRANTED
Uncontested Amount	\$34,895,467
The Clean Energy Development Fund	\$5,625,000
Visual Barrier	\$412,854
River Flood Analysis	\$184,552
Legal and lobbying services	\$3,385,783
Spent Fuel Characterization	\$156,000
Holtec Rack Work Platform	\$102,220
Procedures/Employee Training for Holtec Casks	\$169,087
Labor Costs for Employees to Attend Training	\$33,211
Loading Mobilization	\$194,000
Radioactive Waste Transportation	\$276,980
Materials Loader	\$1,210,300
TOTAL	\$46,645,454

Conclusion

Based upon the foregoing, the Court finds that ENVY is entitled to recover \$46,645,454 due to DOE's partial breach of the Standard Contract. The Clerk shall enter final judgment against Defendant in this amount. Pursuant to RCFC 54(d), the Court awards costs to ENVY as the prevailing party against Defendant.

Within ten days, on or before October 4, 2010, counsel for the parties shall review carefully this opinion for any proprietary, confidential, or other protected information, and submit to the Court proposed redactions, if any, before the opinion is released for publication. The Court has prepared this opinion with the intent of disclosing the entire

contents to the public. Therefore, any proposed redactions must be well supported with an explanation of the specific reasons and authorities.

IT IS SO ORDERED.

s/ Thomas C. Wheeler
THOMAS C. WHEELER
Judge